

AIR PUBLICATION 1661B
Volume I

BOMBS

Prepared by direction of the Minister of Aircraft Production

A. J. Rowlands

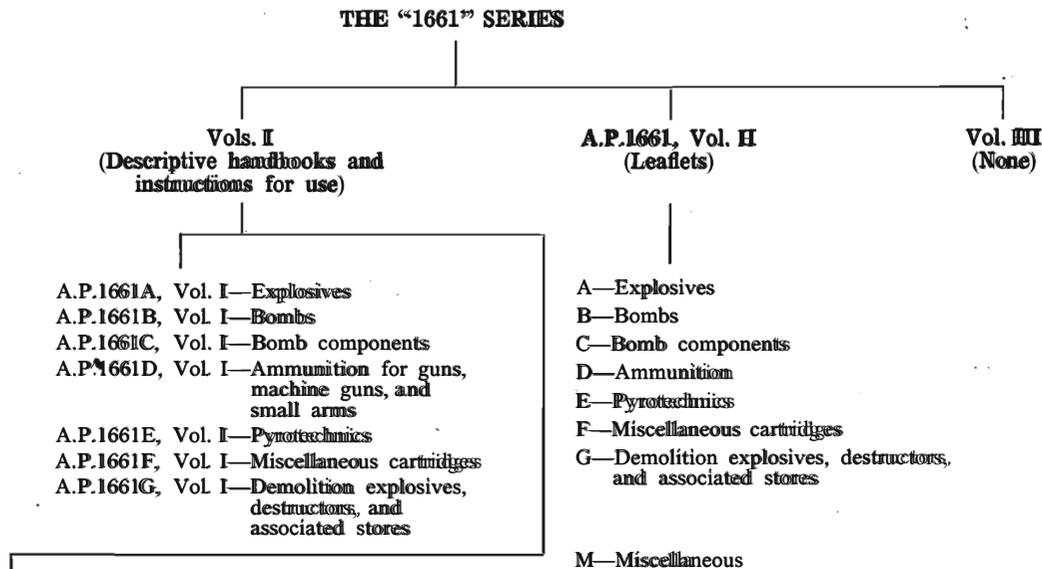
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A.P.1661B, Vol. I

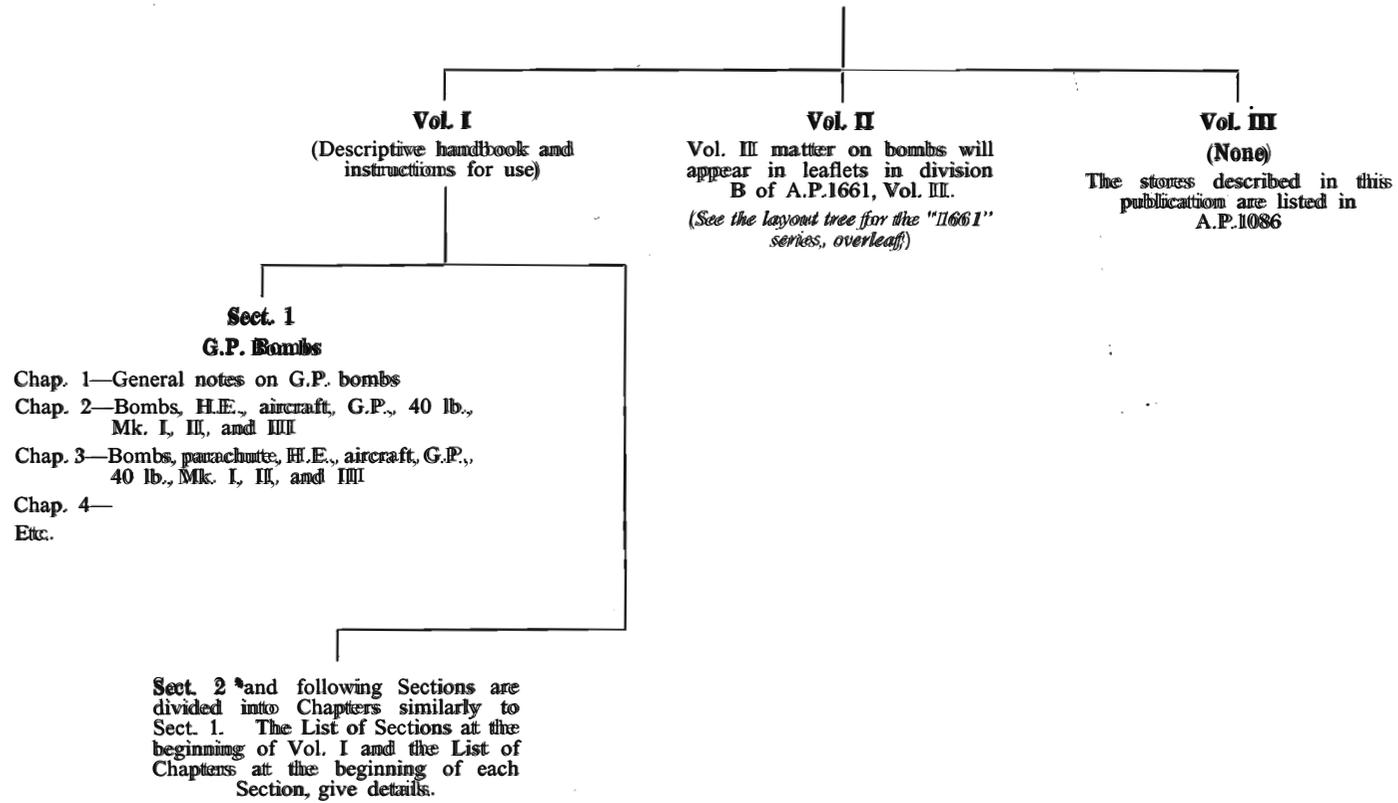
**LAYOUT TREE FOR THE "1661" SERIES
OF AIR PUBLICATIONS**



Each of the above Vols. I, with exception of A.P. 1661A, Vol. I, is divided into Sections, and each Section is divided into Chapters. The List of Sections at the beginning of each Volume, and the List of Chapters at the beginning of each Section, give details.

- Notes.*—(i) From this tree it will be noted that A.P.1661, Vol. II, is the combined Vol. II for the whole of this series.
- (ii) The layout tree for the Vol. I containing this page is given overleaf.
- (iii) The issue of A.P.1661D, Vol. I—Ammunition for guns, machine guns, and small arms—and its corresponding division D in A.P.1661, Vol. II, is suspended until further notice. For the present, information on ammunition is contained in A.P.2058A—Provisional ammunition memoranda.

**A.P.1661B
BOMBS**



LAYOUT TREE FOR A.P. 1661B

*Relevant amendments up to A.L. 72
incorporated in this reprint
January, 1944*

A.P.1661B, Vol. I

BOMBS

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- SECTION 2—A.P. bombs
- SECTION 3—S.A.P. bombs
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NOTE TO OFFICIAL USERS

Air Ministry Orders and Volume II leaflets as issued from time to time will affect the subject matter of this publication. It should be understood that amendment lists are not always issued to bring the publication into line with the orders or leaflets and it is for holders of this book to arrange the necessary linking-up.

Where an order or leaflet contradicts any portion of this publication, an amendment list will generally be issued, but when this is not done the order or leaflet must be taken as the overriding authority.

AIR PUBLICATION 1661B
Volume I

Section II

G.P. BOMBS

*Relevant amendments up to A.L. 72
incorporated in this reprint
January, 1944*

A.P.1661B, Vol. I

SECTION 1

G.P. BOMBS

GENERAL CONTENTS LIST

Note.—A detailed contents list appears at the beginning of each chapter.

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CHAPTER 2—Bombs, H.E., aircraft, G.P., 40 lb., Mk. I, II, and III

CHAPTER 3—Bombs, parachute, H.E., aircraft, G.P., 40 lb., Mk. I, II, and III

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CHAPTER 5—Bombs, H.E., aircraft, G.P., 250 lb., Mk. IV, and 500 lb., Mk. IV

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CHAPTER 8—Bombs, H.E., aircraft, G.P., 4,000 lb., Mk. I and II

APPENDIX 1—Components used with G.P. bombs

*This chapter issued with A.L. No. 29
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CHAPTER 1

General notes on G.P. bombs

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CHAPTER 1

General notes on G.P. bombs

Introduction

1. G.P. bombs are heavy-cased bombs ranging in weight, at the present time, from 40 lb. to 1,900 lb. The smaller bombs are used mainly as anti-personnel bombs, whilst the larger bombs are used for general bombardment purposes.

2. The earlier marks of bombs are fitted with central tubes to take the exploding components, but later marks are fitted with an exploder container at the nose end or at the nose and tail ends.

3. Bombs with central tubes or exploder containers at each end may be fuzed at both ends or at either end, depending on the operational requirements. Bombs fuzed at the nose only are fitted with instantaneous detonators, whilst bombs fuzed at the tail are usually fitted with delay detonators. If bombs are fuzed at both the nose and tail with instantaneous detonators, the nose assembly will function first, due to the direct action of the nose pistol.

Precautions to be observed when fuzing or unfuzing bombs

4. Only the smallest number of bombs compatible with the circumstances are to be worked on at one time in the fuzing area.

5. Components must not be inserted in, or removed from, bombs whilst they are loaded in or on aircraft.

6. Fuzing must not be done within 75 yds. of any aircraft, petrol store, or any building other than one which has been specially erected and/or sited for this purpose, nor must it be done in the open to the rear of any aircraft having its engines running, owing to the dust disturbed by the slipstream.

7. Bombs must not be fuzed in or near the bomb or other explosives storehouse or dump.

8. Bombs, when fuzed in the open, must always be fuzed over soft ground.

9. The central tubes of bombs so fitted, must be clean and dry.

10. The screw-threads of nose and tail adapters, exploder containers, and detonator holders, must be clean.

11. Nose and tail pistols or fuzes must be tested before inserting them into bombs.

12. Fuzing components must not be left exposed to the rays of the sun.

13. When a bomb has been fuzed, it is to be marked with chalk to that effect.

14. In bombs with central tubes, the nose pistol must be screwed in to the full depth of thread, and the tail pistol must be screwed in at least four full threads.

Repair and examination of bombs

15. Only such repair and examination of bombs as is specified in Sect. 20, Chap. 1, is to be done by armament personnel. Any bombs found to have major damage or defects must be set aside for A.I.D. inspection.

16. Fuzed bombs, whether loaded on to aircraft, or stored in the fuzed bomb area, must be examined at the intervals stated in Sect. 20, Chap. 2.

Supply

17. The smaller bombs and some of the older marks of larger bombs are supplied in boxes, with or without tail units. Later marks of heavy bombs are supplied fitted with transit bases, the tail units being separately supplied in containers, with or without nose pistols. Some bombs are supplied plugged with transit plugs; in others, the nose or tail pistol may be supplied in position, in which instance the pistol acts as a transit plug.

Storage of bombs, bomb tails, and components

18. The regulations governing the storage of bombs are given in A.P.1245, Chap. 3. Tail units, pistols, detonator holders, etc., may be stored in the same explosives storehouse as the filled bombs, but the packages containing them must be stacked well clear of the filled stores.

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CHAPTER 2

BOMBS, H.E., AIRCRAFT, G.P., 40 lb., Mk. I, II, and III

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Note.—Bomb, H.E., aircraft, A.P., 2,000 lb., Mk. I has been declared obsolete by A.M.O.
(N) 1242/45. A.L. 130)

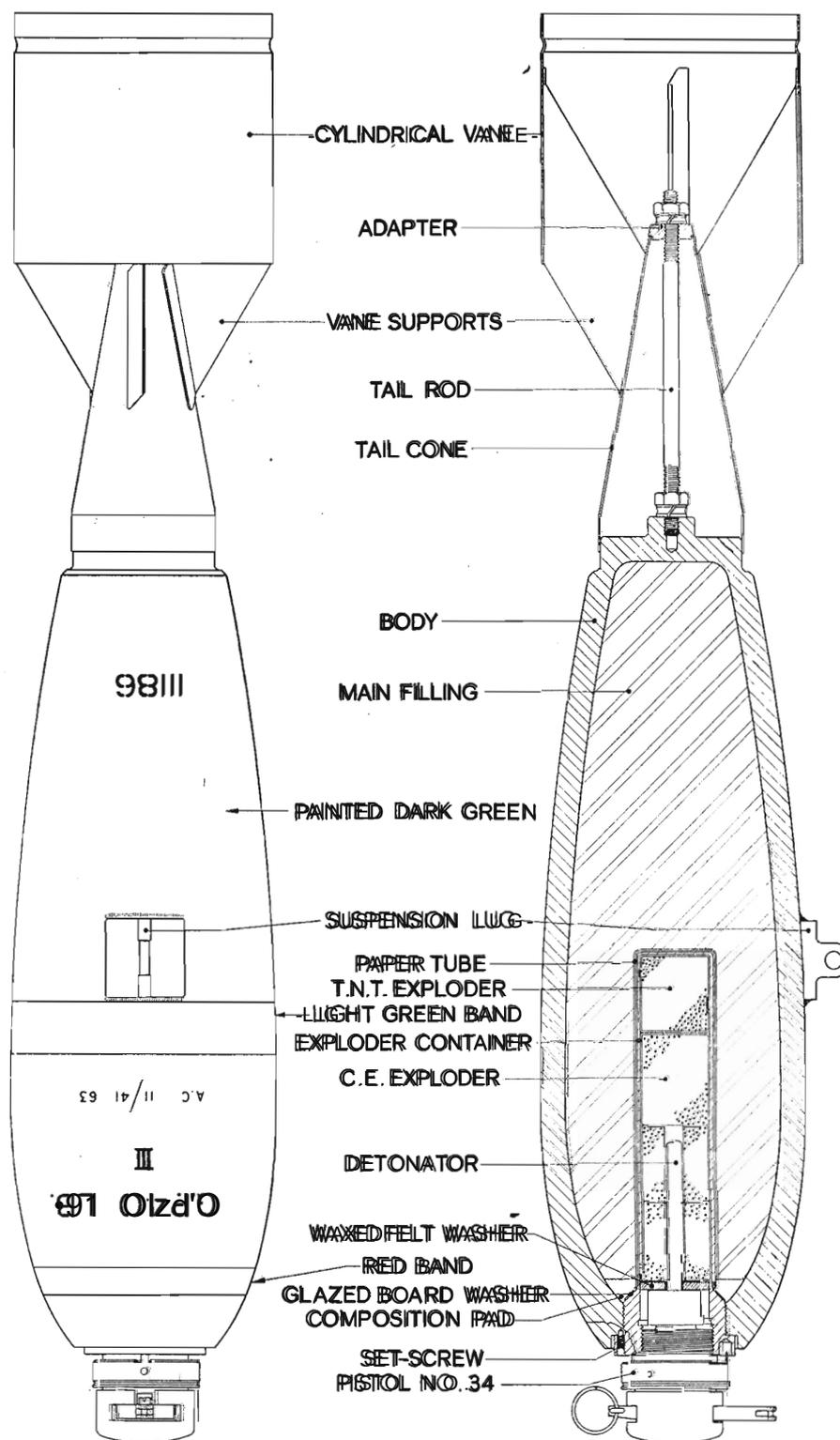


Fig. 11.—Bomb, H.E., aircraft, G.P., 40 lb., Mk. III

CHAPTER 2

BOMBS, H.E., AIRCRAFT, G.P., 40 lb., Mk. I, H, and III

Introduction

1. The 40 lb. G.P. bomb is intended for general bombardment and low altitude bombing operations, and is carried in the 250 lb. Small Bomb Container or on the Light Series bomb carrier. It is fuzeed at the nose only, and is issued complete with pistol, exploder, and tail unit in position. Either pistol No. 34 or 38 may be used with this bomb, the pistol serving as a nose plug during transit and storage.

BOMB, H.E., AIRCRAFT, G.P., 40 lb., Mk. I

Leading particulars

| | | |
|----|--|----------------------|
| 2. | Stores Ref. | 12A/313 |
| | Overall length (pistol and tail in position) ... | 2 ft. 3-25 in. |
| | Maximum diameter ... | 5-01 in. |
| | Weight of body ... | 27 lb. 5 oz. |
| | Weight and nature of filling ... | 6-3 lb. amatol 80/20 |
| | Terminal velocity ... | 1,070 ft. per sec. |

GENERAL DESCRIPTION

Bomb body, fig. 1

3. The bomb body is made of steel, the nose end being open and threaded internally to receive an exploder container, which is screwed and cemented in position and locked by a set-screw. The rear end of the bomb body is closed and reduced in diameter to form a spigot and a boss on the spigot is drilled and tapped to receive the forward threaded end of a tail rod. The exploder container is in the form of a tube, closed at one end, the open end being threaded internally to take the pistol.

4. The Mk. I bombs are not normally fitted with suspension lugs, for carriage on the Light Series bomb carrier, although a limited number have been so fitted and may be carried either on the Light Series bomb carrier or in the 250 lb. Small Bomb Container.

Filling

5. The bomb body is filled with amatol 80/20, which is sealed by a pad of approved composition and a glazedboard washer in the nose end of the bomb body.

6. An exploder, T.N.T., 1 oz. 7 dr., and an exploder, C.E., 4 oz. 6 dr., retained by a waxed felt washer, are housed in the exploder container, which is protected from the main filling by a paper tube.

Tail

7. The tail consists of a cylindrical vane attached to a tail cone by four vane supports. It is secured in position on the bomb body by the tail rod which extends axially through the tail cone and has its forward end screwed into the central boss on the spigot at the rear end of the bomb body, being locked in position by a spring washer and a lock-nut. The rear end of the tail cone is fitted with an internally threaded flanged adapter which screws on to the rear threaded end of the tail rod, and correctly locates the tail cone on the bomb body. The tail is locked in position by a spring washer and lock-nut screwed against the adapter.

Identification colouring and markings

8. The exterior of the bomb body and the tail are painted dark green. A red band, $\frac{1}{2}$ in. wide, is painted round the bomb body 1 in. from the nose end, and a light green band, 1 in. wide, approximately $5\frac{1}{2}$ in. from the nose end.

9. Stencilled in black letters between the red and green bands are the following particulars:—

- (i) G.P. 40 lb. I, indicating the type of bomb, weight, and mark number.
- (ii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iii) The date of filling, month and year.
- (iv) The lot number of the filling.

10. Stamped on the bomb body, near the nose, are the body manufacturer's markings, as follows:—

- (i) G.P. 40 lb. I.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

11. Near the tail end of the bomb body is stencilled, in black, the design number of the method of filling.

Functioning

12. When the bomb is released from the Light Series bomb carrier, the safety fork of the No. 34 pistol, if fitted, is first withdrawn, and the safety cap then removed by the action of the safety cap spring.

13. When the bomb is released from the 250 lb. Small Bomb Container, the safety cap of the No. 34 pistol is immediately removed by the action of the safety cap spring.

14. With the No. 38 pistol, the safety cap is removed by the action of the arming vanes, which rotate during the fall of the bomb.

15. On impact of the bomb with the target, the pistol fires the detonator, the detonator fires the exploder, and the exploder detonates the main filling.

INSTRUCTIONS FOR USE

Fuzing the bomb

16. The following procedure is to be adopted for fuzing the bomb:—

- (i) Unscrew and remove the pistol by hand.
- (ii) Ensure that the detonator cavity is unobstructed, and that the exploder is in the correct position. Gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 12A/349) must be used for this purpose. If the waxed felt washer has become loose, or has shifted, it is to be pushed back into place with the gauge. Bombs which fail to pass this gauge test are to be set aside for A.I.D. inspection.
- (iii) Insert the required detonator into the detonator cavity. **Force must not be used when inserting the detonator.**
- (iv) Replace and screw home the pistol by hand until it is well seated on its washer and locked by its locking spring.

Loading the bomb into the 250 lb. Small Bomb Container

17. Load the bomb into the Small Bomb Container as described in A.P. 1664, Vol. I, Chap. 3. The bombs are issued assembled to the correct length for this purpose. Should any bomb be found a tight fit in the Small Bomb Container, no attempt must be made to correct the length, but the bomb is to be set aside for A.I.D. inspection.

18. After the bombs are finally in position in the Small Bomb Container, and it is certain that the bombs cannot leave the Small Bomb Container except under conditions of normal release, the safety pins of the No. 34 or 38 pistols are to be removed.

19. After the loaded Small Bomb Container has been installed in the aeroplane, as described in A.P. 1664, Vol. I, Chap. 3, all tests of release mechanism and electrical circuits have been made, and all switches are in the OFF position, the safety forks of No. 34 pistols are to be removed. The safety pins and safety forks, if any, should be handed to the pilot or the bomb aimer, or be placed in the aeroplane.

Loading the bomb on to the Light Series bomb carrier

20. Load the bomb on the Light Series bomb carrier as described in A.P. 1664, Vol. I, Chap. 2, using the No. 1A attachment, and connect the safety fork of the No. 34 pistol, if used, to the withdrawal cable.

21. Remove the safety pins of the No. 34 and 38 pistols after the bombs are finally in position on the carrier. Hand the safety pins to the pilot or the bomb aimer, or place them in the aeroplane.

A.P.1661B, Vol. I, Sect. 1, Chap. 2

Unloading the bomb from the 250 lb. Small Bomb Container

22. Replace the safety fork if the No. 34 pistol is fitted. Replace also the safety pin of the No. 34 or 38 pistol. Unload the bomb from the Small Bomb Container as described in the relevant chapter of A.P.1664, Vol. I.

Unloading the bomb from the Light Series bomb carrier

23. Replace the safety pin of the No. 34 or 38 pistol, and then, if No. 34 pistol is fitted, disconnect the safety fork from the withdrawal cable. Unload the bomb from the carrier as described in the relevant chapter of A.P.1664, Vol. I.

Unfuzing the bomb

24. If it is necessary to unfuze the bomb, remove the pistol by hand and extract the detonator, using extractor, detonator, No. 2, Mk. I (Stores Ref. 12A/348). Replace the pistol.

SUPPLY AND STORAGE

Supply

25. Two bombs, and one drop bar for use with the Small Bomb Container, are packed in Box B.272, Mk. I (Stores Ref. 12A/316).

Storage

26. The bombs are classified, for the purpose of storage, in Group VII.

BOMB, H.E., AIRCRAFT, G.P., 40 lb., Mk. II

Leading particulars

| | | | | | |
|--|-----|-----|-----|-----|--------------------|
| 27. Stores Ref. | ... | ... | ... | ... | 12A/314 |
| Overall length (pistol and tail in position) | ... | ... | ... | ... | 2 ft. 3.25 in. |
| Maximum diameter | ... | ... | ... | ... | 5.05 in. |
| Weight of body | ... | ... | ... | ... | 29 lb. 4 oz. |
| Weight and nature of filling | ... | ... | ... | ... | 6.5 lb. T.N.T. |
| Terminal velocity | ... | ... | ... | ... | 1,070 ft. per sec. |

GENERAL DESCRIPTION

28. The Mk. II bomb is similar in dimensions and construction to the Mk. I bomb, its maximum diameter, however, being slightly larger, and its filling T.N.T. The letters T.N.T. are stencilled in black at three equi-distant places on the light green band.

Note.—If the letters T.N.T. are followed by the letters G.D.2, the bomb is filled with Grade 2 T.N.T. Bombs so marked are unsuitable for storage in hot climates.

29. Mk. II bombs, as supplied, are not fitted with a suspension lug, being normally intended for carriage in the 250 lb. Small Bomb Container, but they may be fitted with band, suspending, No. 7, Mk. I (Stores Ref. 12A/471) so as to adapt them for carriage on the Light Series bomb carrier.

BOMB, H.E., AIRCRAFT, G.P., 40 lb., Mk. III

Leading particulars

| | | |
|--|--------|--------------------|
| 30. Stores Ref. | ..... | 12A/470 |
| Overall length (pistol and tail in position) | ... .. | 2 ft. 3.25 in. |
| Maximum diameter | ... .. | 5.05 in. |
| Weight of body | ... .. | 29 lb. 6 oz. |
| Weight and nature of filling | ... .. | 6 lb. amatol 80/20 |
| Terminal velocity | ... .. | 1,070 ft. per sec. |

GENERAL DESCRIPTION

31. The Mk. III bomb is similar in dimensions and construction to the Mk. I and II bombs, but is fitted with a suspension lug, and can be used in the 250 lb. Small Bomb Container or on the Light Series bomb carrier. It is filled with amatol.

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CHAPTER 3

BOMBS, PARACHUTE, H.E., AIRCRAFT, G.P., 40 lb., Mk. I, II, and III

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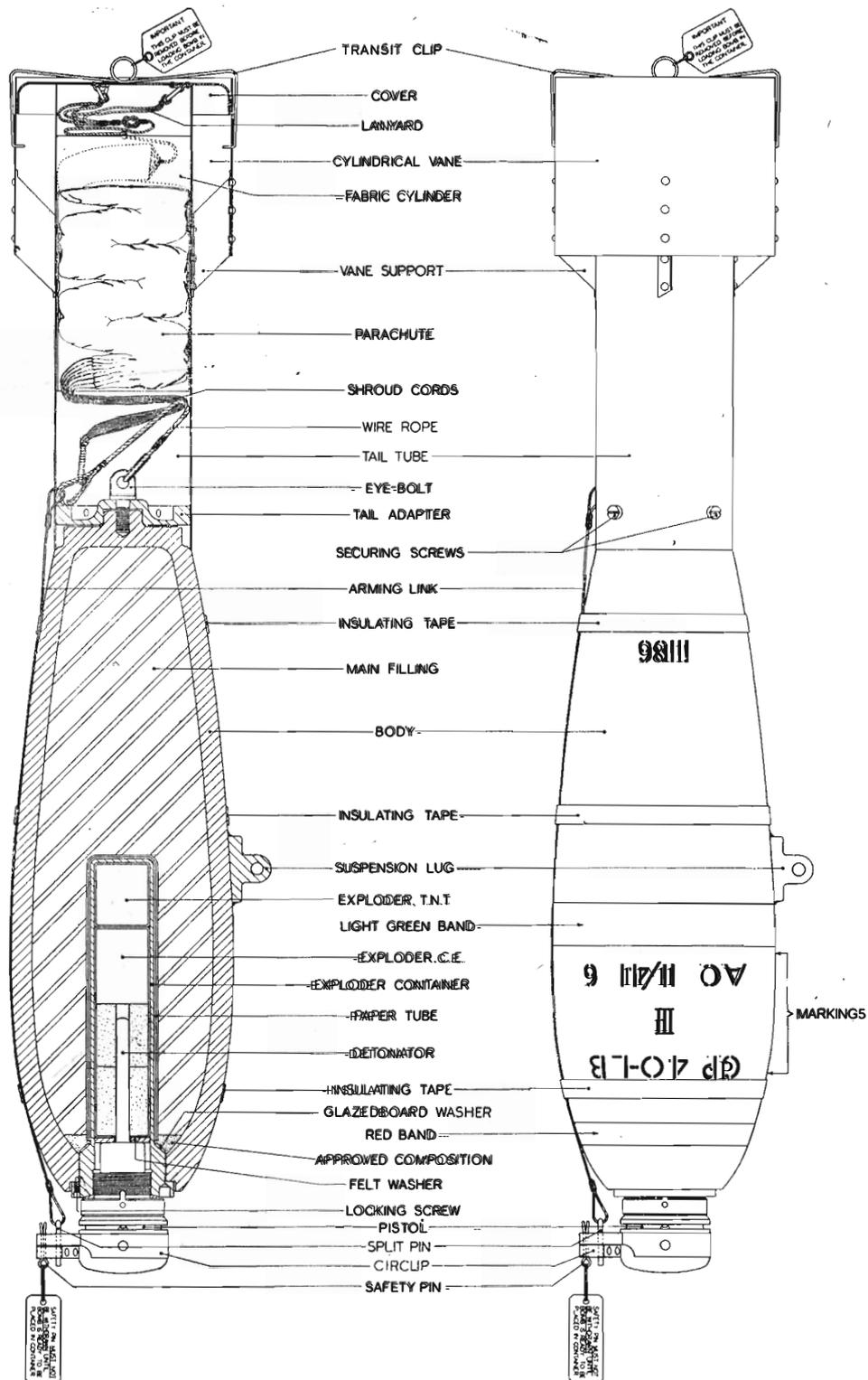


Fig. 1.—Bomb, parachute, H.E., aircraft, G.P., 40 lb., Mk. III

CHAPTER 3

BOMBS, PARACHUTE, H.E., AIRCRAFT, G.P., 40 lb., Mk. I, H, and III

Introduction

1. The 40 lb. G.P. parachute bombs, Mk. I, II, and III, are identical with the corresponding standard 40 lb. G.P. bombs as regards dimensions, general construction, and the provision or otherwise of suspension lugs.

2. The bombs are fuzed at the nose only, and are issued exploded and with the parachute tail unit and the nose pistol in position, the pistol serving as a nose plug during transit and storage.

BOMB, PARACHUTE, H.E., AIRCRAFT, G.P., 40 lb., Mk. III

Leading particulars

| | | | | | | |
|----|--|-----|-----|-----|-----|-----------------------------|
| 3. | Stores Ref. | ... | ... | ... | ... | 12A/468 |
| | Overall length (pistol and tail in position) | ... | ... | ... | ... | 2 ft. 3.25 in. |
| | Maximum diameter | ... | ... | ... | ... | 5.05 in. |
| | Weight of body | ... | ... | ... | ... | 29 lb. 6 oz. |
| | Weight and nature of filling | ... | ... | ... | ... | 6 lb., amatol 80/20 |
| | Terminal velocity | ... | ... | ... | ... | 85 ft. per sec. (estimated) |

GENERAL DESCRIPTION

Bomb body, fig. 11

4. The bomb body is made of steel, the nose end being fitted with an exploder container which is screwed and cemented in position and locked by a locking screw. The exploder container is threaded internally to take the pistol. The rear end of the bomb body is closed, and is reduced in diameter to form a spigot with a central boss, which is drilled and tapped to receive an eye-bolt which secures the parachute tail unit to the bomb body.

5. A suspension lug is welded to the bomb body, for use when the bomb is carried on the Light Series bomb carrier. This lug does not interfere with the loading of the bomb into the 250 lb. Small Bomb Container.

Filling

6. The bomb body is filled with amatol 80/20, which is sealed by a pad of approved composition and a glazed board washer in the nose end of the bomb body.

7. An exploder, T.N.T., 1 oz. 7 dr., and an exploder, C.E., 4 oz. 6 dr., retained by a waxed felt washer, are housed in the exploder container, which is protected from the main filling by a paper tube.

Tail unit

8. The parachute tail unit consists of a cylindrical vane attached to the rear end of a tail tube by four vane supports. The tail tube, which constitutes a housing for the parachute, has an adapter secured in its forward end by four screws.

9. The forward face of the adapter is recessed to accommodate the boss on the tail end of the bomb body and so locate the tail centrally, and the eye-bolt passes through a central hole in the adapter and into the tapped hole in the boss to secure the tail unit in position.

10. A flexible wire rope, attached to the eye-bolt, has its rear end connected to the shroud cords of the parachute and also to the rear end of a wire arming link which passes through a longitudinal slot in the tail tube. This arming link is pulled taut over the bomb body, to which it is secured by three bands of insulating tape, and its forward end carries a split pin which is engaged in registering holes in the pistol circlip and has its ends slightly opened out to prevent accidental withdrawal.

11. The parachute is folded and packed in a fabric cylinder, which is closed at its rear end and fits inside the tail tube; the shroud cords, which cross one another and are sewn together at the vented peak of the parachute, are connected by a cord to the centre of the closed rear end of the fabric cylinder.

12. The rear end of the fabric cylinder is connected by pilot lanyards to a flanged cover which fits loosely in the cylindrical vane of the tail and, during transit and storage, is retained in position, closing the rear end of the tail tube, by a wire transit clip the ends of which are engaged in holes drilled for the purpose in the cylindrical vane.

Identification colouring and markings

13. The exterior of the bomb body and of the tail are painted yellow. A red band, $\frac{1}{2}$ in. wide, is painted round the bomb body 1 in. from the nose end, and a light green band, 1 in. wide, approximately 5 $\frac{1}{2}$ in. from the nose end.

- 14. Stencilled in black letters between the red and green bands are the following particulars:—
 - (i) G.P., 40 lb., III, indicating the type, weight, and mark of the bomb.
 - (ii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
 - (iii) The date of filling, month and year.
 - (iv) The lot number of the filling.

15. Stamped on the bomb body, near the nose, are the body manufacturer's markings, as follows:—

- (i) G.P. 40 lb. III. ■
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

16. The design number of the method of filling is stencilled, in black, near the tail end of the bomb body.

Functioning

17. When the bomb is released from the 250 lb. Small Bomb Container or from the Light Series bomb carrier, the cover is displaced from the cylindrical vane of the tail by the air stream, so as to tighten the pilot lanyards and withdraw the fabric cylinder with its parachute from the tail tube. The drag exerted by the cover then draws the fabric cylinder off the parachute which opens as the shroud cords and the wire rope become taut and the load is taken by the eye-bolt; at the same time the pull on the wire arming link withdraws the split pin from the circlip of the nose pistol, and the circlip and cap of the pistol are immediately expended to leave the pistol armed.

18. On impact of the bomb with the target, the pistol fires the detonator, the detonator fires the exploder, and the exploder detonates the main filling.

INSTRUCTIONS FOR USE

Fuzing the bomb

19. The following procedure is to be adopted for fuzing the bomb:—

- (i) Remove the split pin attached to the wire arming link from the circlip on the No. 33, Mk. I pistol.
- (ii) Remove the pistol by hand, engaging the stop pins in the pistol body with the slots in the safety cap.
- (iii) Ensure that the detonator cavity is unobstructed, and that the exploders are in the correct positions. Gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 12A/349) must be used for this purpose. If the waxed felt washer has become loose, or has shifted, it is to be pushed back into place with the gauge. Bombs which fail to pass this gauge test are to be set aside for A.I.D. inspection.
- (iv) Insert the detonator into the detonator cavity. **Force must not be used when inserting the detonator.**
- (v) Replace and screw home the pistol by hand until it is well seated on its washer and locked.
- (vi) Replace the arming link split pin in the circlip of the pistol, adjusting the circlip around the pistol as necessary, and open up the ends of the split pin slightly to prevent accidental withdrawal.

Loading the bomb into the 250 lb. Small Bomb Container

20. Remove the safety pin from the pistol and the wire transit clip from the cylindrical vane, retaining the cover in position by hand until loading is completed. Load the bomb into the 250 lb. Small Bomb Container as described in A.P. 1664, Vol. I, Chap. 3. The transit clip and the safety pin should be handed to the pilot or bomb aimer, or be placed in the aircraft. The bombs are issued assembled to the correct length for the Small Bomb Container, and no attempt must be made to adjust this length; any bomb which is found, through incorrect adjustment of length, to be a tight fit in the 250 lb. Small Bomb Container must be set aside for A.I.D. inspection, after first replacing the safety pin in the circlip of the pistol and the transit clip on the cylindrical vane.

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Loading the bomb on to the Light Series bomb carrier

21. Remove the wire transit clip from the cylindrical vane, retaining the cover in position by hand, and load the bomb on to the Light Series bomb carrier as described in A.P. 1664, Vol. I, Chap. 2, using the No. 1A attachment adjusted to bear lightly on the cap of the pistol and the No. 7 attachment to retain the cover in the cylindrical vane. Remove the safety pin from the pistol and hand it and the transit clip to the pilot or the bomb aimer, or place the clip and pin in the aircraft.

Unloading the bomb from the 250 lb. Small Bomb Container

22. Unload the bomb from the 250 lb. Small Bomb Container as described in A.P.1664, Vol. I, Chap. 3, retaining the cover in the cylindrical vane by hand. Replace the safety pin in the pistol immediately, and replace the transit clip on the tail.

Unloading the bomb from the Light Series bomb carrier

23. Replace the safety pin in the pistol, and unload the bomb from the Light Series bomb carrier as described in A.P. 1664, Vol. I, Chap. 2, retaining the cover in the cylindrical vane by hand. Replace the transit clip on the tail.

Unfuzing the bomb

24. If it is necessary to unfuze the bomb, remove the split pin on the wire arming link from the circlip of the pistol, remove the pistol by hand, extract the detonator, using extractor, detonator, No. 2, Mk. I (Stores Ref. 12A/348), and replace the pistol and the split pin, rotating the circlip, as necessary, about the pistol, to bring the holes for the pin in line with the arming link.

SUPPLY AND STORAGE

Supply

25. Two bombs and one drop bar for use with the 250 lb. Small Bomb Container are supplied packed in Box, B.272, Mk. I (Stores Ref. 12A/316), as for the corresponding standard 40 lb. G.P. bombs, the markings on the box being modified as necessary to indicate that the bombs are of the parachute type.

Storage

26. The bombs are classified, for storage purposes, in Group VII

BOMB, PARACHUTE, H.E., AIRCRAFT, G.P., 40 lb., Mk. II

Leading particulars

| | | |
|-----|--|-----------------------------|
| 27. | Stores Ref. | 12A/467 |
| | Overall length (pistol and tail in position) ... | 2 ft. 3.25 in. |
| | Maximum diameter | 5.085 in. |
| | Weight of body | 29 lb. 4 oz. |
| | Weight and nature of filling | 6.5 lb. T.N.T. |
| | Terminal velocity | 85 ft. per sec. (estimated) |

GENERAL DESCRIPTION

28. The Mk. II bomb is similar to the Mk. III bomb, except that it is filled with T.N.T. and is not fitted with a suspension lug. The nature of the filling is indicated by the letters T.N.T. stencilled in black in three places on the light green band; if G.D.Z is also stencilled on the light green band, the bomb is filled with Grade 2 T.N.T. and is unsuitable for storage in hot climates.

29. The Mk. III bomb may be adapted for carriage on the Light Series bomb carrier by fitting it with band, suspending, No. 7, Mk. I (Stores Ref. 12A/471), which is provided with a strap for correctly locating the band on the bomb body.

INSTRUCTIONS FOR USE

30. The instructions for use detailed in para. 19 to 24, apply to the Mk. II bomb, except that the No. 7, Mk. I suspending band requires to be fitted to the bomb for loading on to the Light Series bomb carrier. The suspending band is fitted before fuzing the bomb.

Fitting the No. 7, Mk. I suspending band

31. The No. 7, Mk. I suspending band is fitted to the bomb as follows:—
- (i) Remove the arming link split pin from the circlip of the pistol.
 - (ii) Remove, as necessary, the insulating tape which secures the arming link to the bomb body.
 - (iii) Remove the pistol by hand, engaging the stop pins in the pistol body with the slots in the safety cap.
 - (iv) Slacken off the clamping bolt of the suspending band.
 - (v) Fit the suspending band over the bomb body with the suspension lug diametrically opposite the slot in the tail tube from which the arming link protrudes, ensuring that the ring of the strap on the suspending band rests upon the face of the exploder container.
 - (vi) Tighten the clamping bolt so as to secure the suspending band on the bomb body, taking care not to overstrain the bolt, and then screw home the pistol by hand, or fuze the bomb at this stage if immediately required for operations.
 - (vii) Rotate the circlip on the pistol, if necessary, to bring the holes for the split pin into alignment with the arming link.
 - (viii) Insert the arming link split pin in the circlip holes, open up the ends of the split pin *slightly* to prevent its accidental withdrawal, and then secure the arming link to the bomb body with bands of insulating tape, using at least one-and-a-half complete turns of tape for each band.

SUPPLY AND STORAGE**Supply**

32. The bombs are supplied as stated in para. 25.
33. Bands, suspending, aircraft bomb, No. 7, Mk. I (Stores Ref. 12A/471) are supplied separately, as required.

Storage

34. The bombs are classified, for storage purposes, in Group VII.

BOMB, PARACHUTE, H.E., AIRCRAFT, G.P., 40 lb., Mk. I**Leading particulars**

| | |
|--|-----------------------------|
| 35. Stores Ref..... | 12A/466 |
| Overall length (pistol and tail in position) ... | 2 ft. 3.25 in. |
| Maximum diameter | 5.01 in. |
| Weight of body | 27 lb. 5 oz. |
| Weight and nature of filling | 6.3 lb. amatol 80/20 |
| Terminal velocity | 85 ft. per sec. (estimated) |

GENERAL DESCRIPTION

36. The Mk. I bomb is similar to the Mk. III bomb except for the small differences in maximum diameter, weight of body, and weight of the main filling.
37. The Mk. I bombs are not normally fitted with a suspension lug, although a limited number have been so fitted and may thus be carried either on the Light Series bomb carrier or in the 250 lb. Small Bomb Container.

INSTRUCTIONS FOR USE

38. The instructions for use detailed in para. 19, 20, 22, and 24 apply to all Mk. I bombs, and, in addition, para. 21 and 23 apply to Mk. I bombs fitted with suspension lugs.

SUPPLY AND STORAGE**Supply**

39. The bombs are supplied as stated in para. 25.

Storage

40. The bombs are classified, for storage purposes, in Group VII.

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CHAPTER 4

BOMBS, H.E., AIRCRAFT, G.P., 120 lb., Mk. I and II, 250 lb., Mk. I, II, and III, and 500 lb., Mk. I, II, and III

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4. Base, transit, aircraft bomb, No. 1, Mk. I
5. Bomb, H.E., aircraft, G.P., 500 lb., Mk. I, II, or III, exploded to Schemes A, B, and C

CHAPTER 4

BOMBS, H.E., AIRCRAFT, G.P., 120 lb., Mk. I and II, 250 lb., Mk. I, H, and HI,
and 500 lb., Mk. I, H, and HI

Introduction

1. The 120 lb. Mk. I and II, 250 lb. Mk. I, II, and III, and 500 lb. Mk. I, II, and III, G.P. bombs are used for general bombardment purposes. They differ from the later types of G.P. bombs in that they are fitted with central tubes instead of exploder containers, and the tail is secured by a tail socket instead of four spring clips.

2. Since September, 1938, the bombs have been supplied with exploders in position in the central tube. Three methods of exploding are employed, namely, Schemes A, B, and C. Schemes A and B are applicable to 250 lb. and 500 lb. bombs only, and Scheme C is applicable to 120 lb., 250 lb., and 500 lb. bombs.

3. Scheme A employs detonator holders and brass-cased exploders, as used in the fuzing of bombs when supplied unexploded. Scheme B employs adjustable detonator holders, and in the 250 lb. bombs, a reduced number of brass-cased exploders. Scheme C employs adjustable detonator holders and paper-cased exploders retained in position by millboard washers.

BOMB, H.E., AIRCRAFT, G.P., 120 lb., Mk. I

Leading particulars

| | |
|---|---|
| 4. Stores Ref. (unexploded) | 12A/251 |
| Stores Ref. (exploded to Scheme C) | 12A/251C |
| Length, with tail | 3 ft. 6.4 in. |
| Maximum diameter | 8.11 in. |
| Weight and nature of filling | 32.5 lb. T.N.T., or 30 lb. amatol 80/20 |
| Terminal velocity | 1,230 ft. per sec. |

GENERAL DESCRIPTION

5. The bomb consists of a body, filled with high explosive, and a tail retained in position by a tail socket. The bomb is supplied plugged at the nose and tail.

Bomb body, fig. 1

6. The bomb body is made of steel and is open at both the nose and tail ends. The nose end is threaded internally to accommodate a nose bush, which is screwed in position and the joint between the nose bush and the body welded or soldered. The nose bush is threaded internally to receive a nose pistol or transit plug, and a boss is formed on its inner end which is also threaded internally to receive the central tube. The nose bush is provided with a threaded hole for a pistol securing screw. A suspension lug is secured to the bomb body by four screws.

7. The tail end of the bomb body is threaded internally to accommodate a filling plug, which is screwed into position, the screw-threads being sealed with luting. A hole is provided at the centre of the filling plug, through which protrudes the central tube. This hole is counterbored and threaded to receive a gland nut which passes over the central tube and screws into the filling plug to form a gland which is packed with an approved sealing composition. A spigot is formed on the tail end of the body to form a location for the tail, and a locating pin is screwed into the face of the tail end, in alignment with the suspension lug, to locate the tail correctly when it is assembled to the bomb body.

8. The central tube, which is a plain tube threaded externally at both ends, is screwed into the nose bush and welded in position. It passes through the gland in the filling plug, and protrudes through a cone socket in the bomb tail. A tail socket screws on to the rear end of the central tube and retains the tail in position on the bomb.

9. The tail socket is threaded internally to receive a tail pistol or transit plug, and is also threaded internally for screwing on to the central tube, to which it is locked by a securing screw. It is provided with four equi-spaced retaining shear pins, which retain the collar carrying the vane supports and the cylindrical vane on the tail cone. A threaded hole is provided in the tail socket to receive a pistol securing screw.

Filling, fig. 1

10. The bomb may be filled with T.N.T., or with amatol 80/20. Amatol-filled bombs are not suitable for stowage in H.M. ships.

Bombs supplied unexploded

11. The filling is sealed at the nose end with a pad of approved composition, and at the tail end with a pad of approved composition and a glazedboard washer, or a waxed felt washer and a glazedboard washer. The nose end of the bomb, as supplied, is plugged with a plug, No. 7A, Mk. II, or with a plug, No. 21, Mk. I, and the tail end of the bomb with a plug, No. 13, Mk. I, or with plug, No. 22, Mk. I. A holder, detonator, 6-7 in., Mk. I (Stores Ref. 12G/110) is supplied in position in the tail end of the central tube.

Bombs supplied exploded to Scheme C, fig. 2

12. These bombs are supplied sealed and plugged in the same manner as bombs supplied unexploded. In the tail end of the central tube is located a holder, detonator, adjustable, No. 3, Mk. I (Stores Ref. 12G/363), and assembled in the central tube, between two millboard washers, are three paper-cased exploders, namely, two exploders, 3-7 in., No. 22, Mk. I, and one exploder 8-82 in., No. 21, Mk. I. The 3-7 in. exploders have detonator cavities.

13. Located in the nose end of the central tube is an adapter, central tube, aircraft bomb, Mk. I. If the bomb is plugged at the nose end with a plug, No. 7A, and at the tail end with a plug, No. 13, wooden packing pieces are inserted at the ends of the central tube between the plugs and the components, to prevent movement of the components. If No. 21 and 22 plugs are used, the packing pieces are omitted.

Tail, fig. 1

14. The tail consists of a tail cone, and a cylindrical vane attached to a collar by three equi-spaced vane supports. Attached to the front end of the tail cone is a cone ring which is provided with a slot to engage the locating pin in the face of the tail end of the bomb body. A locating pin is provided in the cone socket to engage a slot in the collar when the cylindrical vane is assembled. The tail cone is secured to the bomb body by the tail socket, and the collar carrying the cylindrical vane and vane supports is retained by the four retaining shear pins of the tail socket. A small clearance between the rear face of the collar and these shear pins allows slight movement of the cylindrical vane.

Transit plugs

15. The No. 7A, Mk. II plug is threaded for screwing into the nose bush of the bomb body, and has a square-section tapered hole to take the key used for inserting and removing the plug. The plug is provided with a leather washer.

16. The No. 13, Mk. I plug is threaded for screwing into the tail socket. It is bored and threaded on the inside to take the detonator holder. Spanner flats are formed on the head, and the plug is provided with a leather washer.

17. The No. 21, Mk. I plug is in the form of a tube closed at one end, and is threaded externally for screwing into the nose bush. It is provided with spanner flats and a slot, and a leather washer is provided under its head.

18. The No. 22, Mk. I plug is similar in shape to the No. 21 plug but fits into the tail socket, and is provided with a leather washer.

Identification colouring and markings, fig. 1*Colouring*

19. The exterior of the bomb body and tail is painted yellow, with the exception of a $\frac{1}{2}$ in. red band 1 in. from the face of the nose bush, and a 1 in. green band 10 in. from the face of the nose bush.

20. When the bomb is supplied exploded to Scheme C, a 1 in. green bar is painted on the bomb body behind the red band. Another green bar is painted on the tail cone and extended on to the bomb body. Both bars are in line with the suspension lug.

Markings on the bomb body

21. On the same side as the suspension lug, between the red and green bands, is stencilled the following information:—

- (i) G.P., 120 lb., I.

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- (ii) The monogram of the filling station, or the filling contractor's initials or recognized trade mark.
- (iii) The date of filling, month and year.
- (iv) The lot number of the filled bomb.

Between the suspension lug and the tail end of the body is stencilled the design number of the method of filling.

22. When the bomb is filled with T.N.T., the letters T.N.T. are stencilled, in black, in three places equi-spaced round the green band.

23. Towards the rear of the bomb body, in line with the suspension lug, is stencilled the serial number of the empty bomb.

24. When the bomb is exploded to Scheme C, the letters EXPD. C are stencilled on the bomb body in front of the rear green bar.

25. Stamped on the bomb body, between the face of the nose bush and the suspension lug, are the body manufacturer's markings as follows:—

- (i) I, G.P., 1120 lb.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture.

The serial number of the empty bomb is stamped towards the rear of the body in line with the suspension lug.

Markings on the tail

26. The serial number of the empty bomb is stencilled and stamped on the rear end of the tail cone in line with the serial number on the bomb body, and also on the collar for the vane supports in line with the markings on the rear of the tail cone. The same serial number is also stamped towards the front end of the tail cone in line with the other markings on the tail cone.

Markings on the transit plugs

27. Around the head of the No. 7A transit plug is stamped the following information:—

- (i) P, No. 7A, IIM, IIS, or IIF, the suffix to the mark number depending on the material from which the plug is made.
- (ii) The manufacturer's initials or recognized trade mark.

28. On the head of the No. 1B transit plug is stamped the following information:—

- (i) No. 1B, IM or IS.
- (ii) The manufacturer's initials or recognized trade mark.

29. Around the head of the No. 21, Mk. I plug is stamped or cast the following information:—

- (i) NOSE.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.
- (iv) No. 21, IZ.

30. Around the head of the No. 22, Mk. I plug is stamped or cast the following information:—

- (i) TAIL.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.
- (iv) No. 22, IZ.

Functioning

31. When the bomb is released from the bomb carrier, the fuze-setting control link removes the safety clip from the nose pistol. The arming vanes of both pistols rotate due to the air pressure on them and free the strikers. On impact of the bomb with the target, the strikers are forced against their respective detonators, firing the detonators, which in turn fire the exploders, causing detonation of the main filling.

INSTRUCTIONS FOR USE

Fuzing the bomb when supplied unexploded

32. Unscrew and remove the nose and tail plugs, and remove the detonator holder. Examine the central tube of the bomb and ensure that it is clean; if necessary wipe it out with a soft dry rag. On no account must metal scrapers be used for cleaning the central tube.

33. Lay the components out on a clean bench in the order in which they are to be inserted in the central tube. Screw the detonator holder into an exploder, H.E., bomb, No. 19, Mk. III (Stores Ref. 12G/52), and insert the appropriate detonator for tail fuzing into the detonator holder. Insert the appropriate detonator for the nose fuzing into an exploder, H.E., bomb, No. 13, Mk. I (Stores Ref. 12G/104). Screw the nose pistol into the No. 13 exploder. The transit spring of the tail pistol is to be removed and the arming vane screwed down to the free position against the pistol body and the pistol screwed into the detonator holder. Insert a 1-1 in. wooden packing piece between the two exploders. A pistol, bomb, tail, No. 21, Mk. I (Stores Ref. 12G/311) or Mk. II (Stores Ref. 12G/312) is used in the tail fuzing, and a pistol, bomb, D.A., No. 19, Mk. I (Stores Ref. 12G/162) or Mk. II (Stores Ref. 12G/366) is used in the nose fuzing.

34. Measure the length of the central tube available for the assembled components, using a suitable non-ferrous metal gauge. Measure the length of the components, assembled in their correct order, and compare this length with the space available in the central tube. If the length of the components is less than the available length of the central tube, add felt adjusting washers to make up the deficiency. The felt washers should be manufactured locally, and it should be noted that the felt compresses to about one-fifth of its original thickness. If the length of the components is greater than the available length of central tube, a fresh set of components should be assembled and measured. If the length is still too great, the bomb is to be set aside for A.I.D. inspection.

35. Insert the components in the central tube of the bomb. To do this, first insert the packing piece and any adjusting washers found necessary, and then insert the two pistol assemblies, screwing in the nose pistol to its full depth of thread and the tail pistol as far as it will go; at least four threads of the tail pistol are to engage. Lock the pistols in position with their respective securing screws.

Fuzing the bomb when supplied exploded to Scheme C

36. The components supplied assembled in the central tube are not to be removed. Unscrew and remove the nose and tail plugs, and remove the wooden packing pieces if fitted.

37. Gauge the detonator cavity in the nose end of the central tube, using gauge, cavity, detonator, No. 7, Mk. I (Stores Ref. 12A/575), as described in Sect. 19, Chap. 2. If the bomb fails to pass this test, it is to be set aside for A.I.D. inspection, or used fuzed at the tail only, see para. 39 and 40, in which instance the plug, and packing piece if fitted, are to be replaced.

38. Insert the appropriate detonator, and screw in the pistol, No. 19, Mk. I or II, to its full depth of thread and lock it in position with the securing screw.

39. Gauge the detonator cavity in the tail end of the central tube, using gauge, cavity, detonator, No. 11, Mk. I (Stores Ref. 12A/301), as described in Sect. 19, Chap. 2. If the bomb fails to pass this test, it is to be unfuzed at the nose and set aside for A.I.D. inspection, or used fuzed at the nose only, in which instance the tail plug, and wooden packing piece if necessary, are to be replaced.

40. Insert the appropriate detonator, remove the transit spring from the tail pistol, No. 21, Mk. I or II, and screw the arming vane down to the free position against the pistol body. Screw in the pistol as far as it will go and lock it in position with the securing screw.

Loading the bomb on to the aircraft bomb carrier

41. Load the bomb on to the bomb carrier as described in the relevant chapter of A.P.1664, Vol. I. When the bomb is finally in position on the carrier, connect the fuze-setting control link to the safety clip of the nose pistol. Immediately before the aircraft is ready to take off, remove the safety pins from the nose and tail pistols and hand them to the pilot or bomb aimer.

Unloading the bomb from the aircraft bomb carrier

42. Insert the safety pins in the nose and tail pistols and disconnect the fuze-setting control link from the nose pistol. Unload the bomb from the bomb carrier as described in the relevant chapter of A.P.1664, Vol. I.

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Unfuzing a bomb supplied unexploded

43. Unscrew the screws securing the nose and tail pistols and remove the pistols. Screw the arming vane of the tail pistol back on to the screw-threads of the striker and insert the transit spring.

44. Remove the components from the pistols, and the packing piece and felt washers, if fitted, from the central tube. Extract the detonators. Pack the components in their respective packages. Replace the nose and tail plugs and the detonator holder in their respective positions in the central tube. The threads of the plugs are to be coated with luting, thin, Mk. V (Stores Ref. 12F/41).

Unfuzing a bomb exploded to Scheme C

45. Remove the nose and tail pistols as described in para. 43. Screw the arming vane of the tail pistol back on to the screw-threads of the striker and insert the transit spring. Remove the detonators using extractor, detonator, No. 1, Mk. I (Stores Ref. 12A/302). Replace the nose and tail plugs in the central tube, together with the packing pieces if necessary. The threads of the plugs are to be coated with thin luting.

SUPPLY AND STORAGE**Supply**

46. The bomb, H.E., aircraft, G.P., 120 lb., Mk. I, is supplied, with its tail, in Box, B.220, Mk. I (Stores Ref. 12A/252). Boxes containing bombs exploded to Scheme C will be marked with a longitudinal green strip, painted on one side, between the battens, and with EXPD. C stencilled below the strip and on each end of the box.

Storage

47. The boxed bombs, supplied unexploded or exploded to Scheme C, are classified, for the purpose of storage, in Group VII.

BOMB, H.E., AIRCRAFT, G.P., 120 lb., Mk. II**Leading particulars**

48. Stores Ref. (unexploded) ... 12A/262
Stores Ref. (exploded to Scheme C) 12A/262C

The other leading particulars are as for the Mk. I bomb, see para. 4.

GENERAL DESCRIPTION

49. The general description of the Mk. I bomb, given in para. 5 to 31, applies also to the Mk. II bomb, the only difference between the two bombs being in the type of suspension lug. The mark number II is substituted for the mark number I, as necessary.

INSTRUCTIONS FOR USE

50. The instructions for use of the Mk. II bomb are as for the Mk. I bomb, see para. 32 to 45.

SUPPLY AND STORAGE**Supply**

51. The bomb, H.E., aircraft, G.P., 120 lb., Mk. II, is supplied in the same manner as the Mk. I bomb, see para. 46, the marking on the box being amended to agree with the contents.

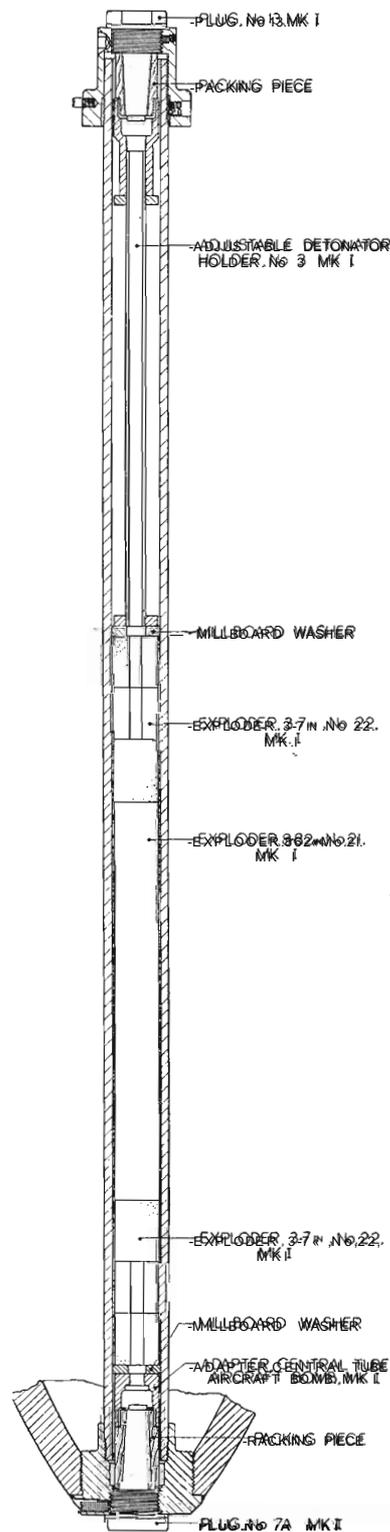


Fig. 2.—Bomb, H.E., aircraft, G.P., 120 lb Mk. I or II, exploded to Scheme

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Unfuzing a bomb supplied unexploded

43. Unscrew the screws securing the nose and tail pistols and remove the pistols. Screw the arming vane of the tail pistol back on to the screw-threads of the striker and insert the transit spring.

44. Remove the components from the pistols, and the packing piece and felt washers, if fitted, from the central tube. Extract the detonators. Pack the components in their respective packages. Replace the nose and tail plugs and the detonator holder in their respective positions in the central tube. The threads of the plugs are to be coated with luting, thin, Mk. V (Stores Ref. 12F/41).

Unfuzing a bomb exploded to Scheme C

45. Remove the nose and tail pistols as described in para. 43. Screw the arming vane of the tail pistol back on to the screw-threads of the striker and insert the transit spring. Remove the detonators using extractor, detonator, No. 1, Mk. I (Stores Ref. 12A/302). Replace the nose and tail plugs in the central tube, together with the packing pieces if necessary. The threads of the plugs are to be coated with thin luting.

SUPPLY AND STORAGE**Supply**

46. The bomb, H.E., aircraft, G.P., 120 lb., Mk. I, is supplied, with its tail, in Box, B.220, Mk. I (Stores Ref. 12A/252). Boxes containing bombs exploded to Scheme C will be marked with a longitudinal green strip, painted on one side, between the battens, and with EXPD. C stencilled below the strip and on each end of the box.

Storage

47. The boxed bombs, supplied unexploded or exploded to Scheme C, are classified, for the purpose of storage, in Group VII.

BOMB, H.E., AIRCRAFT, G.P., 120 lb., Mk. I**Leading particulars**

48. Stores Ref. (unexploded) 12A/262
Stores Ref. (exploded to Scheme C) 12A/262C

The other leading particulars are as for the Mk. I bomb, see para. 4.

GENERAL DESCRIPTION

49. The general description of the Mk. I bomb, given in para. 5 to 31, applies also to the Mk. II bomb, the only difference between the two bombs being in the type of suspension lug. The mark number II is substituted for the mark number I, as necessary.

INSTRUCTIONS FOR USE

50. The instructions for use of the Mk. II bomb are as for the Mk. I bomb, see para. 32 to 45.

SUPPLY AND STORAGE**Supply**

51. The bomb, H.E., aircraft, G.P., 120 lb., Mk. II, is supplied in the same manner as the Mk. I bomb, see para. 46, the marking on the box being amended to agree with the contents.

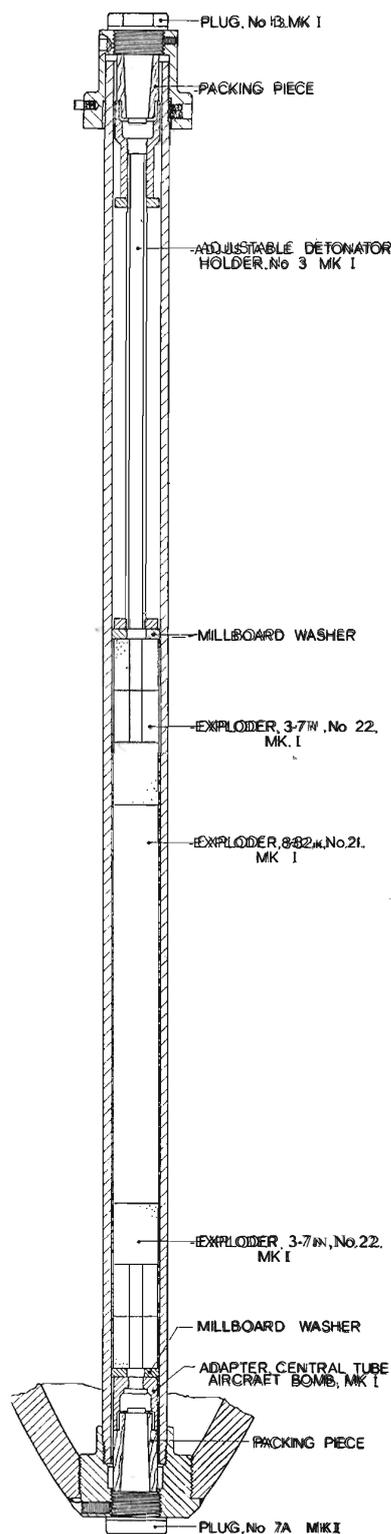


Fig. 2.—Bomb, H.E., aircraft, G.P., 120 lb., Mk. I or II, exploded to Scheme C

Storage

52. The boxed bombs, supplied unexploded or exploded to Scheme C, are classified, for the purpose of storage, in Group VII.

BOMB, H.E., AIRCRAFT, G.P., 250 lb., Mk. I**Leading particulars**

| | |
|-------------------------------------|---------------------------------------|
| 53. Stores Ref. (unexploded) | 12A/185 |
| Stores Ref. (exploded to Scheme A) | 12A/185A |
| Stores Ref. (exploded to Scheme B) | 12A/185B |
| Stores Ref. (exploded to Scheme C) | 12A/185C |
| Length, with tail | 4 ft. 6 in. |
| Maximum diameter | 10.28 in. |
| Weight and nature of filling... | 68 lb. T.N.T., or 63 lb. amatol 80/20 |
| Terminal velocity | 1,440 ft. per sec. |

GENERAL DESCRIPTION**Bomb body**

54. The bomb body is similar to the 120 lb. Mk. I bomb body, see para. 6 to 9, differing only in weight and dimensions.

Filling

55. The bomb may be filled with T.N.T., or with amatol 80/20. Amatol-filled bombs are not suitable for stowage in H.M. ships.

Bombs supplied unexploded

56. The filling is sealed at the nose end with a pad of approved composition, and at the tail end with a pad of approved composition and a glazedboard washer, or a waxed felt washer and a glazedboard washer. The nose end of the bomb, as supplied, is plugged with a plug, No. 7A, Mk. II, or a plug, No. 21, Mk. I, and the tail end with plug, No. 7A, Mk. II, or plug, No. 13, Mk. I, or plug, No. 22, Mk. I. A 6-7 in. Mk. I detonator holder is supplied in position in the tail end of the central tube.

Bombs supplied exploded to Scheme A, fig. 3

57. The bombs are sealed in the same manner as bombs supplied unexploded, and are plugged with a No. 7A, Mk. II plug in the nose and a No. 13, Mk. I plug in the tail end of the bomb. Assembled in the central tube, in the following order, starting from the nose end, are two exploders, H.E., bomb, No. 16, Mk. I (Stores Ref. 12G/103), and an exploder, H.E., bomb, No. 19, Mk. III (Stores Ref. 12G/52) to which is attached a 6-7 in. Mk. I detonator holder. Wooden packing pieces are inserted at the ends of the central tube between the plugs and the components.

Bombs supplied exploded to Scheme B, fig. 3

58. The bombs are sealed and plugged in a similar manner to bombs exploded to Scheme A. Assembled in the central tube, at the nose end, is a No. 16, Mk. I exploder, and a No. 19, Mk. III exploder which is attached to a holder, detonator, adjustable, No. 1, Mk. I (Stores Ref. 12G/361) or Mk. II (Stores Ref. 12G/374). Wooden packing pieces are inserted at the ends of the central tube between the plugs and the components.

Bombs supplied exploded to Scheme C, fig. 3

59. These bombs are sealed in a manner similar to the bombs supplied unexploded, and are plugged at the nose end of the central tube with a No. 7A, Mk. II plug, or a No. 21, Mk. I plug, and at the tail end with a No. 7A, Mk. II plug, or a No. 22, Mk. I plug. Assembled in the central tube, starting from the nose end, is an adapter, central tube, aircraft bomb Mk. I, an exploder, H.E., bomb, 3-7 in., No. 22, Mk. I, and exploder, H.E., bomb, 5-6 in., No. 20, Mk. I, and another No. 22, Mk. I exploder. At the tail end of the central tube is a holder, detonator, adjustable, No. 4, Mk. I (Stores Ref. 12G/364). The exploders are located between millboard washers. If the bomb is plugged with No. 7A, Mk. II plugs, wooden packing pieces are inserted at the ends of the central tube between the plugs and the components. When No. 21 and 22 plugs are used, the packing pieces are omitted.

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Tail

60. The tail is similar to the tail for the 120 lb. Mk. I bomb, see para. 14, differing mainly in weight and dimensions, and in having four vane supports instead of three.

Identification colouring and markings

Colouring

61. The exterior of the bomb body and tail is painted yellow, with the exception of a $\frac{1}{2}$ in. red band 1 in. from the face of the nose bush, and a 1 in. green band 13 in. from the face of the nose bush.

62. When the bomb is exploded to Scheme A, B, or C, a 1 in. green bar is painted on the bomb body behind the red band. Another green bar is painted on the tail cone and extended on to the bomb body. Both bars are in line with the suspension lug.

Markings on the bomb body

63. On the same side as the suspension lug, between the red and green bands, is stencilled the following information:—

- (i) G.P., 250 lb., I.
- (ii) The monogram of the filling station, or the filling contractor's initials or recognized trade mark.
- (iii) The date of filling, month and year.
- (iv) The lot number of the filled bomb.

Between the suspension lug and the tail end of the bomb body is stencilled the design number of the method of filling.

64. When the bomb is filled with T.N.T., the letters T.N.T. are stencilled, in black, in three places equi-spaced round the green band.

65. Towards the rear of the bomb body, in line with the suspension lug, is stencilled the serial number of the empty bomb.

66. When the bomb is supplied exploded, the letters EXPD., followed by the appropriate letter A, B, or C, are stencilled on the bomb body in front of the rear green bar.

67. Stamped on the bomb body, between the face of the nose bush and the suspension lug, are the body manufacturer's markings as follows:—

- (i) I, G.P., 250 lb.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture.

The serial number, of the empty bomb is stamped towards the rear of the body in line with the suspension lug.

Markings on the tail

68. The serial number of the empty bomb is stamped on the rear end of the tail cone in line with the serial number on the bomb body, and also on the collar for the vane supports in line with the markings on the rear of the tail cone. The same serial number is also stamped towards the front end of the tail cone in line with the other markings on the tail cone.

Functioning

69. When the bomb is released from the carrier, the fuze-setting control link removes the safety clip from the nose pistol. The arming vanes of both pistols unscrew due to the air pressure on them and thus release the strikers. On impact of the bomb with the target, the strikers are forced in against their respective detonators, firing the detonators, which in turn fire the exploders, causing detonation of the main filling in the bomb.

INSTRUCTIONS FOR USE

Fuzing the bomb when supplied unexploded

70. Unscrew and remove the nose and tail plugs, and remove the detonator holder. Examine the central tube of the bomb and ensure that it is clean; if necessary, wipe it out with a dry cloth. A metal scraper must not be used for cleaning the central tube.

C (1661B)

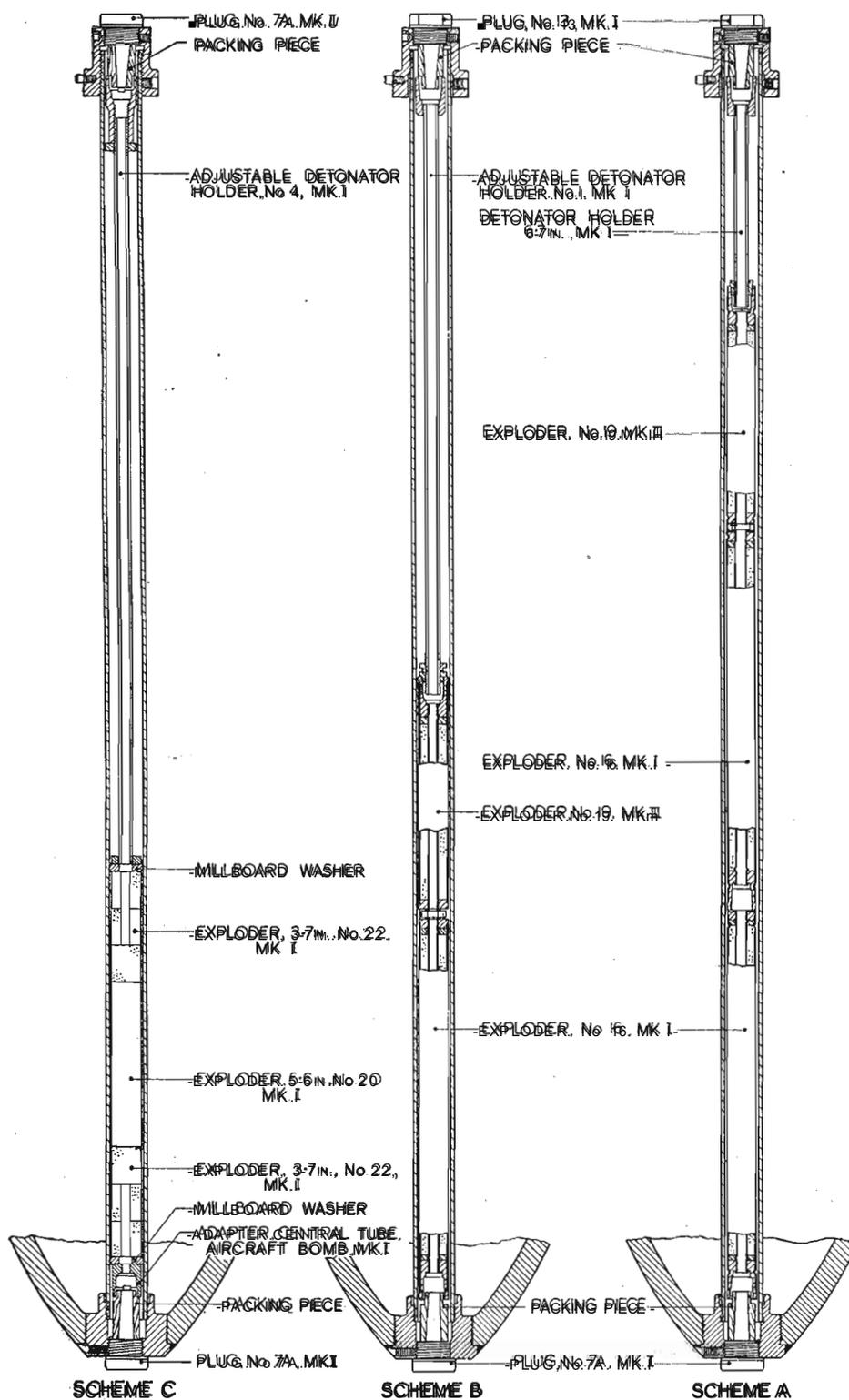


Fig. 3.—Bomb, H.E., aircraft, G.P., 250 lb., Mk. I, II, or III, exploded to Schemes A, B, and C

71. Lay out the components on a clean bench in the order in which they are to be inserted in the central tube. Screw the detonator holder into a No. 19, Mk. III exploder, and insert the appropriate detonator for tail fuzing into the detonator holder. Insert the appropriate detonator for nose fuzing into a No. 16, Mk. I exploder for the nose, and insert a 45 grain detonator into the detonator clip of a second No. 16, Mk. I exploder for use in the central position. Screw the nose pistol into the nose exploder. The transit spring of the tail pistol is to be removed and the arming vane screwed down to the free position against the pistol body, and the tail pistol screwed into the detonator holder. A pistol, bomb, tail, No. 22, Mk. I (Stores Ref. 12G/202) or Mk. II (Stores Ref. 12G/203) is used in the tail fuzing, and a pistol, bomb, D.A., No. 19, Mk. I (Stores Ref. 12G/162) or Mk. II (Stores Ref. 12G/366) is used in the nose fuzing.

72. Measure the length of the central tube available for the components, using a suitable non-ferrous metal gauge. Measure the length of the components, assembled in their correct order, and compare this length with the available space in the central tube. If the length of the components is less than the available length of the central tube, felt adjusting washers, manufactured locally, should be used to make up the deficiency, it being noted that felt compresses to about one-fifth of its original thickness. If the length of the components is greater than the available length of central tube, a fresh set of components should be measured. If the length is still too great, the bomb is to be set aside for A.I.D. inspection.

73. Insert the components into the central tube. To do this, first insert the nose pistol, screwing it in to its full depth of thread, insert the centre No. 16 exploder with the detonator end to the rear, and any felt adjusting washers found necessary, insert the tail pistol, screwing it in as far as it will go; at least four full threads are to be engaged. Lock the pistols in position with their respective securing screws.

Fuzing the bomb when supplied exploded to Scheme A

74. Unscrew and remove the nose and tail plugs, and remove the wooden packing pieces.

75. Remove the No. 16 exploder from the nose end and the No. 19 exploder and the detonator holder from the tail end of the bomb. Remove the remaining No. 16 exploder by pushing it out with a stick or other suitable implement.

76. Insert the appropriate detonators into the nose exploder and the detonator holder, and insert a 45 grain detonator into the detonator clip of the central No. 16 exploder. Screw the nose pistol, No. 19, Mk. I or II, into the nose exploder. Remove the transit spring of the tail pistol, No. 22, Mk. I or II, and screw the arming vane down to the free position against the pistol body, and screw the tail pistol into the detonator holder.

77. Insert the components in the central tube in the order tail, central, and nose; the detonator end of the central exploder is to be towards the rear. Lock the pistols with their respective securing screws.

Note.—(i) On no account must any adjustment be made to the length of the detonator holder.

(ii) Components are to be replaced in the bomb from which they were withdrawn.

Fuzing the bomb when supplied exploded to Scheme B

78. Remove the nose and tail plugs and the wooden packing pieces from the central tube. Insert the appropriate detonator in the adjustable detonator holder in the tail end of the central tube. Remove the transit spring from the No. 22, Mk. I or II tail pistol, and screw the arming vane down to the free position against the pistol body. Screw the pistol into the tail end of the bomb body as far as it will go, and lock it in position with the securing screw.

79. Partially withdraw the exploder from the nose end of the central tube, and insert the appropriate detonator. Screw the No. 19, Mk. I or II nose pistol into the exploder and screw the assembled components into the bomb. Lock the pistol in position with the securing screw.

Fuzing the bomb when supplied exploded to Scheme C

80. The components supplied assembled in the central tube of the bomb are not to be removed. Unscrew and remove the nose and tail plugs, and remove the wooden packing pieces, if fitted.

81. Gauge the detonator cavity in the nose end of the central tube, using gauge, cavity, detonator, No. 7, Mk. I, as described in Sect. 19, Chap. 2. If the bomb fails to pass this test, it is to be set aside for A.I.D. inspection, or used fuized at the tail only, see para. 83 and 84, in which instance the nose plug is to be replaced together with the packing piece, if required.

82. Insert the appropriate detonator, and screw in the No. 19, Mk. I or II nose pistol, and lock it in position with the securing screw.

83. Gauge the detonator cavity in the tail end of the central tube, using gauge, cavity, detonator, No. 1, Mk. I, as described in Sect. 19, Chap. 2. If the bomb fails to pass this test, it is to be unfuzed at the nose and set aside for A.I.D. inspection, or used fuzed at the nose only, in which instance the tail plug, and wooden packing piece if necessary, are to be replaced.

84. Insert the appropriate detonator, remove the transit spring from the No. 22, Mk. I or II tail pistol, and screw the arming vane down to the free position against the pistol body. Screw the pistol in as far as it will go and lock it in position with the securing screw.

Loading the bomb on to the aircraft bomb carrier

85. Load the bomb on to the bomb carrier as described in the relevant chapter of A.P. 1664, Vol. I. When the bomb is finally in position on the carrier, connect the fuze-setting control link to the safety clip of the nose pistol. Immediately before the aircraft is ready to take off, remove the safety pins from the nose and tail pistols and hand them to the pilot or bomb aimer.

Unloading the bomb from the aircraft bomb carrier

86. Insert the safety pins from the nose and tail pistols and disconnect the fuze-setting control link from the nose pistol. Unload the bomb from the bomb carrier as described in the relevant chapter of A.P. 1664, Vol. I.

Unfuzing a bomb supplied unexploded

87. Unscrew the screws securing the nose and tail pistols and remove the pistols. Screw the arming vane of the tail pistol back on to the screw-threads of the striker and insert the transit spring.

88. Remove the components from the pistols and the central tube of the bomb, and extract the detonators. Pack the components in their respective packages. Replace the detonator holder and the nose and tail plugs in their respective positions in the central tube. The threads of the plugs are to be coated with lutim, thin, Mk. V.

Unfuzing a bomb exploded to Scheme A

89. Remove the nose and tail pistols, and screw the arming vane of the tail pistol back on to the screw-threads of the striker and insert the transit spring.

90. Remove the components from the pistols and the central tube, and extract the detonators. Pack the components in their respective packages. Replace the detonator holder and the exploders in the central tube, and insert the wooden packing pieces and replace the nose and tail plugs. The threads of the plugs are to be coated with thin lutim.

Unfuzing a bomb exploded to Scheme B

91. Remove the nose and tail pistols. Screw the arming vane of the tail pistol back on to the screw-threads of the striker and insert the transit spring.

92. Remove the components from the nose pistol and extract the detonators. Replace the exploder in the central tube, and insert the packing pieces and replace the plugs. The threads of the plugs are to be coated with thin lutim.

Unfuzing a bomb exploded to Scheme C

93. Remove the nose and tail pistols, and screw the arming vane of the tail pistol back on the screw-threads of the striker and insert the transit spring. Remove the detonators, using extractor, detonator, No. 1, Mk. I. Replace the nose and tail plugs, together with the wooden packing pieces if necessary. The threads of the plugs are to be coated with thin lutim.

SUPPLY AND STORAGE

Supply

94. The bomb, H.E., aircraft, G.P., 250 lb., Mk. I, is supplied, with its tail, in Box, B.221, Mk. I (Stores Ref. 12A/186). Boxes containing bombs exploded to Scheme A, B, or C, will be marked with a longitudinal green strip, painted on one side, between the battens, and with EXPD.A, B, or C, stencilled below the strip and on each end.

Storage

95. The boxed bombs, supplied unexploded or exploded to Scheme A, B, or C, are classified for the purpose of storage, in Group VII.

BOMB, H.E., AIRCRAFT, G.P., 250 lb., Mk. II**Leading particulars**

| | | | | |
|-----|------------------------------------|-----|-----|----------|
| 96. | Stores Ref. (unexploded) | ... | ... | 12A/263 |
| | Stores Ref. (exploded to Scheme A) | ... | ... | 12A/263A |
| | Stores Ref. (exploded to Scheme B) | ... | ... | 12A/263B |
| | Stores Ref. (exploded to Scheme C) | ... | ... | 12A/263C |

The other leading particulars are as for the Mk. I bomb, see para. 53.

GENERAL DESCRIPTION

97. The Mk. II bomb is similar to the Mk. I bomb, differing only in the type of suspension lug. The mark II is substituted for the mark number I as necessary.

INSTRUCTIONS FOR USE

98. The instructions for use of the Mk. I bomb, see para. 70 to 93, apply also to the Mk. II bomb.

SUPPLY AND STORAGE**Supply**

99. The bomb, H.E., aircraft, G.P., 250 lb., Mk. II, is supplied, with its tail, in Box, B.220, Mk. I (Stores Ref. 12A/252). The box is marked as described in para. 94 when containing bombs exploded to Scheme A, B, or C.

Storage

100. The boxed bombs, supplied unexploded or exploded to Scheme A, B, or C, are classified, for the purpose of storage, in Group VII.

BOMB, H.E., AIRCRAFT, G.P., 250 lb., Mk. III**Leading particulars**

| | | | | |
|--------|------------------------------------|-----|-----|----------|
| « 101. | Stores Ref. (unexploded) | ... | ... | 12A/264 |
| | Stores Ref. (exploded to Scheme A) | ... | ... | 12A/264A |
| | Stores Ref. (exploded to Scheme B) | ... | ... | 12A/264B |
| | Stores Ref. (exploded to Scheme C) | ... | ... | 12A/264C |

The other leading particulars are as for the Mk. I bomb, see para. 53.

GENERAL DESCRIPTION

102. The Mk. III bomb is similar to the Mk. II bomb, differing only in minor dimensions to ensure interchangeability of tail units. The bomb is fitted with tail, bomb, H.E., aircraft, G.P., 250 lb., No. 1, Mk. I (Stores Ref. 12A/280), which may be supplied with the bomb, or packed separately in a crate, in which instance the bomb is supplied unboxed and fitted with a base, transit, aircraft bomb, No. 1, Mk. I (Stores Ref. 12A/272). The tail cone assembly is supplied with the bomb.

Transit base, fig. 4

103. The transit base has a wooden cylindrical body made up of two or three laminations secured together by six coach bolts. It is bored and counterbored to fit over the cone socket in the tail. A dished steel washer is secured to the bottom of the counterbore by three equi-spaced nails. The transit base is secured on the cone socket by the tail socket.

Identification colouring and markings**Colouring**

104. The colouring of the Mk. III bomb is identical with that of the Mk. I bomb, see para. 61 and 62.

Markings on the bomb body

105. Between the green band and the suspension lug is stencilled G.P., 250 lb., III. Between the suspension lug and the tail end of the bomb body are stencilled the following:—

- (i) The monogram of the filling station, or the filling contractor's initials or recognized trade mark.
- (ii) The date of filling, month and year.
- (iii) The lot number of the filled bomb.

On the reverse side is stencilled the design number of the method of filling.

106. All other markings on the bomb body are as stated for the Mk. I bomb, see para. 64 to 67, the mark number III being substituted for the mark number I as necessary.

Markings on the tail

107. In addition to the markings on the tail described in para. 68, the following information is stencilled on one vane support:—

- (i) No. 1, I.
- (iii) G.P., 250 lb., III.

108. Stamped on another vane support is the following information:—

- (i) No. 1, I.
- (ii) G.P., 250 lb.
- (iii) The manufacturer's initials or recognized trade mark.
- (iv) The date of manufacture.

Markings on the transit base

109. The following particulars are branded on one face of the transit base:—

- (i) I, II.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The year of manufacture.

INSTRUCTIONS FOR USE

110. The instructions for use of the Mk. I bomb, see para. 70 to 93, apply also to the Mk. III bomb. A bomb supplied fitted with a transit base is to be prepared for fuze by unscrewing the tail socket and removing the transit base, fitting the tail to the bomb and securing the tail in position with the tail socket. The bomb should then be fuze in the same way as the Mk. I bomb.

111. After unfuze a bomb supplied with a transit base, the tail is to be removed. Before replacing the transit base, the external threads and the exposed portion of the central tube, the outer surface of the cone socket and the inner surface of the steel washer in the transit base are to be lightly coated with jelly, mineral (Stores Ref. 12F/6). After assembly of the transit base, the heads of the tail plug and securing screw, and the exterior of the tail socket, are to be similarly treated.

SUPPLY AND STORAGE

Supply

112. The bomb, H.E., aircraft, G.P., 250 lb., Mk. III (Stores Ref. 12A/264) may be supplied, with its tail, in Box, B.221, Mk. I (Stores Ref. 12A/186). If the bomb is exploded to Scheme A, B, or C, the box will be marked as stated in para. 94. Bomb bodies supplied separately will be fitted with base, transit, aircraft bomb, No. 1, Mk. I, and will be accounted for as Stores Ref. 12A/279. Tails supplied in crates will be accounted for as Stores Ref. 12A/280, and two tails will be supplied in a crate.

Storage

113. Bombs, unexploded or exploded to Scheme A, B, or C, boxed or unboxed, are classified, for the purpose of storage, in Group VII. Tails, in crates, may be stored in the same explosives storehouse as the filled bombs, but they must be stacked well clear of the filled stores.

BOMB, H.E., AIRCRAFT, G.P., 500 lb., Mk. I

Leading particulars

| | |
|--------------------------------------|---|
| 114. Stores Ref. (unexploded) | 12A/187 |
| Stores Ref. (exploded to Scheme A) | 12A/187A |
| Stores Ref. (exploded to Scheme B) | 12A/187B |
| Stores Ref. (exploded to Scheme C) | 12A/187C |
| Length, with tail | 5 ft. 8-7 in. |
| Maximum diameter | 13 in. |
| Weight and nature of filling... | 143-5 lb. T.N.T., or 133-5 lb. amatol 80/20 |
| Terminal velocity | 1,580 ft. per sec. |

GENERAL DESCRIPTION

Bomb body

115. The bomb body is similar to the 120 lb. Mk. I bomb body, see para. 6 to 9, differing only in weight and dimensions.

Filling

116. The bomb may be filled with T.N.T., or with amatol 80/20. Amatol-filled bombs are not suitable for stowage in H.M. ships.

Bombs supplied unexploded

117. The filling is sealed at the nose end with a pad of approved composition, and at the tail end with a pad of approved composition and a glazedboard washer, or a waxed felt washer and a glazedboard washer. The nose end of the bomb, as supplied, is plugged with plug, No. 7A, Mk. II, or with plug, No. 21, Mk. I, and the tail end with plug, No. 7A, Mk. II, or plug, No. 13, Mk. I, or plug, No. 22, Mk. I. A holder, detonator, 30.8 in., Mk. II (Stores Ref. 12G/39) is supplied in position in the tail end of the central tube.

Bombs supplied exploded to Scheme A, fig. 5

118. Bombs exploded to Scheme A are sealed in the same manner as bombs supplied unexploded. The nose and tail ends are plugged with a No. 7A, Mk. II, and a No. 13, Mk. I plug respectively. Assembled in the nose end of the central tube is an exploder, H.E., bomb, No. 16, Mk. I. Assembled in the tail end is a holder, detonator, 30.8 in., Mk. II, and an exploder, H.E., bomb, No. 19, Mk. III. Wooden packing pieces are inserted between the components and the plugs in the central tube.

Bombs supplied exploded to Scheme B, fig. 5

119. Bombs exploded to Scheme B are similar to those exploded to Scheme A, except that a holder, detonator, adjustable, No. 2, Mk. I (Stores Ref. 12G/362) is supplied in place of the 30.8 in. Mk. II detonator holder.

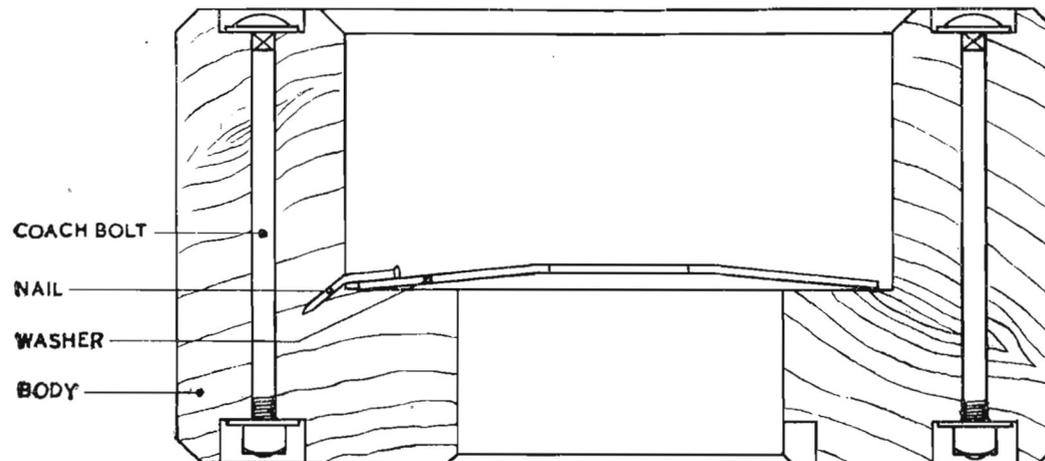


Fig. 4.—Base, transit, aircraft bomb, No. 1, Mk. I

Bombs supplied exploded to Scheme C, fig. 5

120. Bombs exploded to Scheme C are sealed in the same manner as bombs supplied unexploded. They are plugged at the nose end with a plug, No. 7A, Mk. II, or a plug, No. 21, Mk. I, and at the tail end with a plug, No. 7A, Mk. II, or a plug, No. 22, Mk. I. An adapter, central tube, aircraft bomb, Mk. I, is supplied in place in the nose end of the central tube, and a holder, detonator, adjustable, No. 5, Mk. I (Stores Ref. 12G/365) in position in the tail end of the central tube. Also located in the central tube, between two millboard washers, are two exploders, H.E., bomb, 3.7 in., No. 22, Mk. I and one exploder, H.E., bomb, 5.6 in., No. 20, Mk. I. When the bomb is plugged at the nose and tail ends with No. 7A, Mk. II plugs, wooden packing pieces are inserted at the ends of the central tube between the plugs and the components to prevent movement of the components. When No. 21, Mk. I, and No. 22, Mk. I, plugs are used, the packing pieces are omitted.

Tail

121. The tail is similar to the tail used on the 120 lb. Mk. I bomb, see para. 114 differing mainly in weight and dimensions, and in having four vane supports instead of three.

Identification colouring and markings

Colouring

122. The exterior of the bomb body and tail is painted yellow, with the exception of a $\frac{1}{2}$ in. red band 1 in. from the face of the nose bush, and a 1 in. green band 17 in. from the face of the nose bush.

123. When the bomb is supplied exploded to Scheme A, B, or C, a 1 in. green bar is painted on the bomb body behind the red band. Another green bar is painted on the tail cone and extended on to the bomb body. Both bars are in line with the suspension lug.

Markings on the bomb body

124. On the same side as the suspension lug, between the red and green bands, is stencilled the following information:—

- (i) G.P., 500 lb., I.
- (ii) The monogram of the filling station, or the filling contractor's initials or recognized trade mark.
- (iii) The date of filling, month and year.
- (iv) The lot number of the filled bomb.

Between the suspension lug and the tail end of the bomb body is stencilled the design number of the method of filling.

125. When the bomb is filled with T.N.T., the letters T.N.T. are stencilled, in black, in three places equi-spaced round the green band.

126. Towards the rear of the bomb body, in line with the suspension lug, is stencilled the serial number of the empty bomb.

127. When the bomb is supplied exploded to Scheme A, B, or C, the letters EXPD., followed by the appropriate letter A, B, or C, are stencilled on the bomb body in front of the rear green bar.

128. Stamped on the bomb body, between the face of the nose bush and the suspension lug, are the body manufacturer's markings as follows:—

- (i) I, G.P., 500 lb.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture.

The serial number of the empty bomb is stamped towards the rear of the bomb body in line with the suspension lug.

Markings on the tail

129. The serial number of the empty bomb is stencilled and stamped on the rear end of the tail cone in line with the serial number on the bomb body, and also on the collar for the vane supports in line with the markings on the rear of the tail cone. The same serial number is also stamped towards the front end of the tail cone in line with the other markings on the tail cone.

Functioning

130. When the bomb is released from the bomb carrier, the fuze-setting control link removes the safety clip from the nose pistol. The arming vanes of both pistols unscrew due to the action of the air pressure on them and release the strikers. On impact of the bomb with the target, the strikers are forced against their respective detonators, firing the detonators, which in turn fire the exploders, causing detonation of the main filling in the bomb.

INSTRUCTIONS FOR USE

Fuzing the bomb when supplied unexploded

131. Unscrew and remove the nose and tail plugs, and remove the detonator holder. Examine the central tube of the bomb and ensure that it is clean; if necessary, wipe it out with a soft dry rag. A metal scraper must not be used for cleaning the central tube.

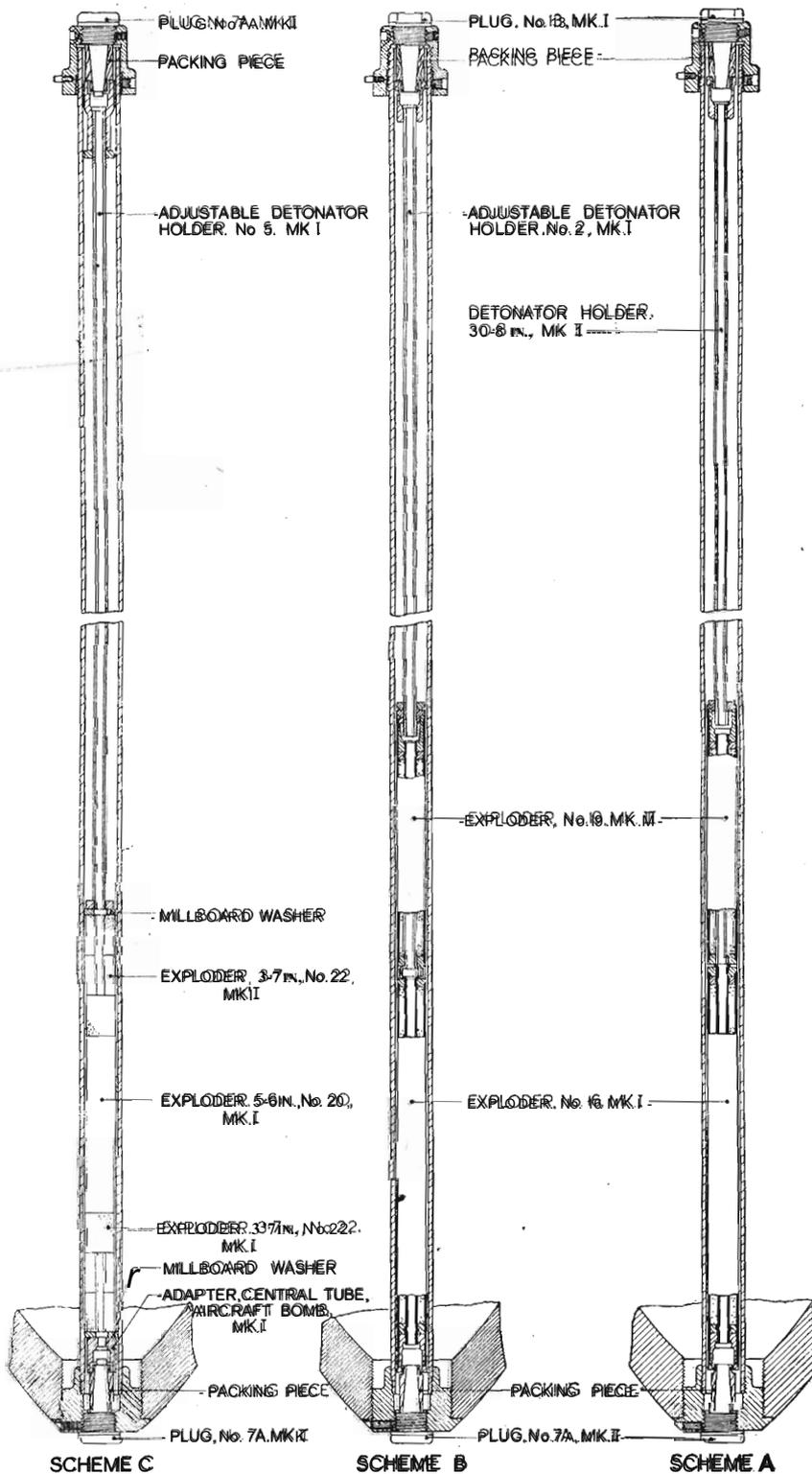


Fig. 5.—Bomb, H.E., aircraft, G.H., 500 lb., Mk. II, III, or IIII, exploded to Schemes A, B, and C

132. Lay out the components on a clean bench in the order in which they are to be inserted in the central tube. Screw the detonator holder into an exploder, H.E., bomb, No. 19, Mk. III, and insert the appropriate detonator for tail fuzing into the detonator holder. Insert the appropriate detonator for the nose into an exploder, H.E., bomb, No. 16, Mk. I. Screw a No. 19, Mk. I or II pistol into the No. 16 exploder, and a No. 22, Mk. I or II pistol into the detonator holder. The transit spring of the tail pistol is to be removed and the arming vane screwed down to its free position against the body of the pistol before the pistol is assembled to the components.

133. Measure the length of the central tube available for the components, using a suitable non-ferrous metal gauge. Measure the length of the components, assembled in their correct order, and compare this length with the length available in the central tube. If the length of the components is less than the available length of the central tube, felt adjusting washers, manufactured locally, should be added between the exploders to make up the deficiency, it being noted that felt compresses to about one-fifth of its original thickness. If the length of the components is greater than the available length of central tube a fresh set of components should be assembled and measured. If the length is still too great, the bomb is to be set aside for A.I.D. inspection.

134. Insert the components in the central tube. To do this, first insert any adjusting washers found necessary and then insert the two pistol assemblies, screwing the nose pistol in to its full depth of thread, and the tail pistol in as far as it will go: at least four full threads of the tail pistol are to be engaged. Lock the pistols in position with their respective securing screws.

Fuzing the bomb when supplied exploded to Scheme A

135. Unscrew and remove the nose and tail plugs, and remove the packing pieces.

136. Partially withdraw the detonator holder from the tail end of the central tube, and insert the detonator. Remove the transit spring of the tail pistol, No. 22, Mk. I or II, and screw the arming vane down to its free position against the pistol body. Screw the tail pistol into the detonator holder, and screw the assembled components into the central tube as far as they will go.

137. Partially withdraw the exploder from the nose end of the central tube and insert the appropriate detonator. Screw the nose pistol, No. 19, Mk. I or II, into the exploder and screw the assembled components into the central tube: the pistol must be screwed in to its full depth of thread. Lock the nose and tail pistols in position with their respective securing screws.

Note.—No adjustment is to be made to the length of the detonator holder.

Fuzing the bomb when supplied exploded to Scheme B

138. Unscrew and remove the nose and tail plugs, and remove the wooden packing pieces from the central tube.

139. Insert the appropriate detonator into the detonator holder in the tail end of the central tube. Remove the transit spring from the No. 22, Mk. I or II tail pistol and screw the arming vane down to its free position against the pistol body. Screw the pistol into the bomb as far as it will go and lock it in position with the securing screw.

140. Partially withdraw the exploder from the nose end of the central tube, and insert the appropriate detonator. Screw the No. 19, Mk. I or II pistol into the exploder, and screw the assembled components into the bomb. Lock the pistol in position with the securing screw.

Fuzing the bomb when supplied exploded to Scheme C

141. The components supplied in the central tube are not to be withdrawn. To fuze the bomb, unscrew and remove the nose and tail plugs, and remove the packing pieces, if fitted.

142. Gauge the detonator cavity in the nose end of the central tube, using gauge, cavity, detonator, No. 7, Mk. I, as described in Sect. 119, Chap. 2. If the bomb fails to pass this test, it is to be set aside for A.I.D. inspection, or used fuze at the tail only, see para. 144 and 145, in which instance the nose plug, and packing piece if fitted, is to be replaced.

143. Insert the appropriate detonator, and screw in the No. 19, Mk. I or II nose pistol. Lock the pistol in position with the securing screw.

144. Gauge the detonator cavity in the tail end of the central tube, using gauge, cavity, detonator, No. 1, Mk. I, as described in Sect. 119, Chap. 2. If the bomb fails to pass this test, it is to be unfuzed at the nose and set aside for A.I.D. inspection, or used fuze at the nose only, in which instance the tail plug is to be replaced, together with the wooden packing piece, if any.

145. Insert the appropriate detonator, remove the transit spring from the No. 22, Mk. I or II tail pistol and screw the arming vane down to its free position against the pistol body. Screw the pistol into the bomb as far as it will go, and lock it in position with the securing screw.

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Loading the bomb on to the aircraft bomb carrier

146. Load the bomb on to the bomb carrier as described in the relevant chapter of A.P.1664, Vol. I. When the bomb is finally in position on the carrier, connect the fuze-setting control link to the safety clip of the nose pistol. Immediately before the aircraft is ready to take off, remove the safety pins from the nose and tail pistols and hand them to the pilot or bomb aimer.

Unloading the bomb from the aircraft bomb carrier

147. Insert the safety pins into the nose and tail pistols and disconnect the fuze-setting control link from the nose pistol. Unload the bomb from the carrier as described in the relevant chapter of A.P.1664, Vol. I.

Unfuzing a bomb supplied unexploded

148. Unscrew the screws securing the nose and tail pistols, and remove the pistols. Screw the arming vane of the tail pistol back on to the screw threads of the striker and insert the transit spring.

149. Remove the components from the pistols and any adjusting washers from the central tube. Extract the detonators from the exploder and from the detonator holder, and pack the components in their respective packages. Replace the detonator holder and nose and tail plugs in their respective positions in the central tube. The threads of the plugs are to be covered with luting, thin, Mk. V.

Unfuzing a bomb exploded to Scheme A

150. Remove the nose and tail pistols. Screw the arming vane of the tail pistol back on to the screw-threads of the striker and insert the transit spring.

151. Remove the components from the pistols and extract the detonators. Replace the detonator holder and the exploders in the central tube. Insert the wooden packing pieces and replace the nose and tail plugs. The threads of the plugs are to be coated with thin luting.

Unfuzing a bomb exploded to Scheme B

152. Remove the nose and tail pistols and screw the arming vane of the tail pistol back on to the screw-threads of the striker and insert the transit spring.

153. Remove the components from the nose pistol and extract the detonators. Replace the exploders in the central tube. Insert the packing pieces, if necessary, and replace the plugs. The threads of the plugs are to be coated with thin luting.

Unfuzing a bomb exploded to Scheme C

154. Remove the nose and tail pistols, screw the arming vane of the tail pistol back on to the screw-threads of the striker and insert the transit spring. Remove the detonators using extractor, detonator, No. 1, Mk. I. Replace the nose and tail plugs in the central tube, together with the wooden packing pieces if necessary. The threads of the plugs are to be coated with thin luting.

SUPPLY AND STORAGE

Supply

155. The bomb, H.E., aircraft, G.P., 500 lb., Mk. I, is supplied, with its tail, in Box, B:222, Mk. I (Stores Ref. 12A/188). Boxes containing bombs exploded to Scheme A, B, or C will be marked with a longitudinal green strip, painted on one side, between the battens, and with EXPD.A, B, or C, stencilled below the strip and on each end of the box.

Storage

156. The boxed bombs, supplied unexploded or exploded to Scheme A, B, or C, are classified, for the purpose of storage, in Group VII.

BOMB, H.E., AIRCRAFT, G.P., 500 lb., Mk. II**Leading particulars**

| | | | | |
|-------|------------------------------------|-----|-----|-----------|
| 1157. | Stores Ref. (unexploded) | ... | ... | 12A/2355 |
| | Stores Ref. (exploded to Scheme A) | ... | ... | 12A/2355A |
| | Stores Ref. (exploded to Scheme B) | ... | ... | 12A/2355B |
| | Stores Ref. (exploded to Scheme C) | ... | ... | 12A/2355C |

The other leading particulars are as for the Mk. I bomb, see para. 114.

GENERAL DESCRIPTION

1158. The Mk. II bomb is similar to the Mk. I bomb, differing only in the type of suspension lug. The mark number II is substituted for the mark number I as necessary.

INSTRUCTIONS FOR USE

1159. The instructions (or use of the Mk. I bomb, see para. 1131 to 1154, apply also to the Mk. II bomb.

SUPPLY AND STORAGE**Supply**

1160. The bomb, H.E., aircraft, G.P., 500 lb., Mk. II, is supplied, with its tail, in Box, B.220, Mk. I (Stores Ref. 12A/252). The box is marked as described in para. 1155.

Storage

1161. The boxed bombs, supplied unexploded or exploded to Scheme A, B, or C, are classified, for the purpose of storage, in Group VII.

BOMB, H.E., AIRCRAFT, G.P., 500 lb., Mk. III**Leading particulars**

| | | | | |
|-------|------------------------------------|-----|-----|----------|
| 1162. | Stores Ref. (unexploded) | ... | ... | 12A/266 |
| | Stores Ref. (exploded to Scheme A) | ... | ... | 12A/266A |
| | Stores Ref. (exploded to Scheme B) | ... | ... | 12A/266B |
| | Stores Ref. (exploded to Scheme C) | ... | ... | 12A/266C |

The other leading particulars are as for the Mk. I bomb, see para. 114.

GENERAL DESCRIPTION

1163. The Mk. III bomb is similar to the Mk. II bomb, differing in minor dimensions to ensure interchangeability of tail units. The bomb is fitted with tail, bomb, H.E., aircraft, G.P., 500 lb., No. 1, Mk. I (Stores Ref. 12A/282), which may be supplied with the bomb, or packed separately in a crate, in which instance the bomb is supplied unboxed and fitted with a base, transit, aircraft bomb, No. 2, Mk. I (Stores Ref. 12A/273). The tail cone assembly is supplied in position on the bomb.

Transit base

1164. The transit base is similar to the No. 1, Mk. I transit base, see para. 1103, differing mainly in weight and dimensions. Eight coach bolts are used to secure the laminations instead of six.

Identification colouring and markings*Colouring*

1165. The colouring of the Mk. III bomb is identical with that of the Mk. I bomb, see para. 1122 and 1123.

Markings on the bomb body

1166. Between the green band and the suspension lug is stencilled G.P., 500 lb., III. Between the suspension lug and the tail end of the bomb body is stencilled the following information:—

- (ii) The monogram of the filling station, or the filling contractor's initials or recognized trade mark.
- (iii) The date of filling, month and year.
- (iii) The lot number of the filled bomb.

On the reverse side is stencilled the design number of the method of filling.

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167. All other markings on the bomb body are as stated for the Mk. I bomb, see para. 125 to 128, the mark number III being substituted for the mark number I as necessary.

Markings on the tail

168. In addition to the markings described in para. 129, the following information is stencilled on one vane support:—

- (i) No. 1, I.
- (ii) G.P., 500 lb., III.

169. Stamped on another vane support is the following information:

- (i) No. 1, I.
- (ii) G.P., 500 lb.
- (iii) The manufacturer's initials or recognized trade mark.
- (iv) The date of manufacture.

Markings on the transit base

170. The following particulars are branded on one face of the transit base:

- (i) 2, I.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The year of manufacture.

INSTRUCTIONS FOR USE

171. The instructions for use of the Mk. I bomb, see para. 131 to 154, apply also to the Mk. III bomb. Bombs supplied fitted with transit bases are to be prepared for fuze by unscrewing the tail socket and removing the transit base, fitting the tail to the bomb and securing the tail with the tail socket. The bomb is then to be fuze in the same way as the Mk. I bomb.

172. After unfuzeing a bomb supplied with a transit base, the tail is to be removed. Before replacing the transit base, the external threads and the exposed portion of the central tube, the outer surface of the cone socket and the inner surface of the steel washer in the transit base are to be lightly coated with jelly, mineral (Stores Ref. 12F/6). After assembly of the transit base, the heads of the tail plug and securing screw, and the exterior of the tail socket, are to be similarly treated.

SUPPLY AND STORAGE

Supply

173. The bomb, H.E., aircraft, G.P., 500 lb., Mk. III (Stores Ref. 12A/266) may be supplied, with its tail, in Box, B.222, Mk. I (Stores Ref. 12A/188). Bomb bodies supplied separately will be fitted with base, transit, aircraft bomb, No. 2, Mk. I, and will be accounted for as Stores Ref. 12A/281. Tails supplied in crates will be accounted for as Stores Ref. 12A/282, and two tails will be supplied in a crate.

Storage

174. Bombs, unexploded or exploded to Scheme A, B, or C, boxed or unboxed, are classified, for the purpose of storage, in Group VII. Tails, in crates, may be stored in the same explosives storehouse as the filled bombs, but they must be stacked well clear of filled stores.

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RESTRICTED
AIR MINISTRY

This is A.L. No. 141 to A.P.1661B, Vol. I
Section 1. Remove and dispose of the existing Chapter 5, substitute
this chapter, and make an entry in the Amendment Record Sheet at
the beginning of the Volume.

ARMAMENT

CHAPTER 5
BOMBS, H.E., AIRCRAFT, G.P., 250 lb., Mk. IV, and 500 lb., Mk. IV

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 5. Tail, bomb, H.E., aircraft, G.P., 500 lb., No. 26, Mk. II

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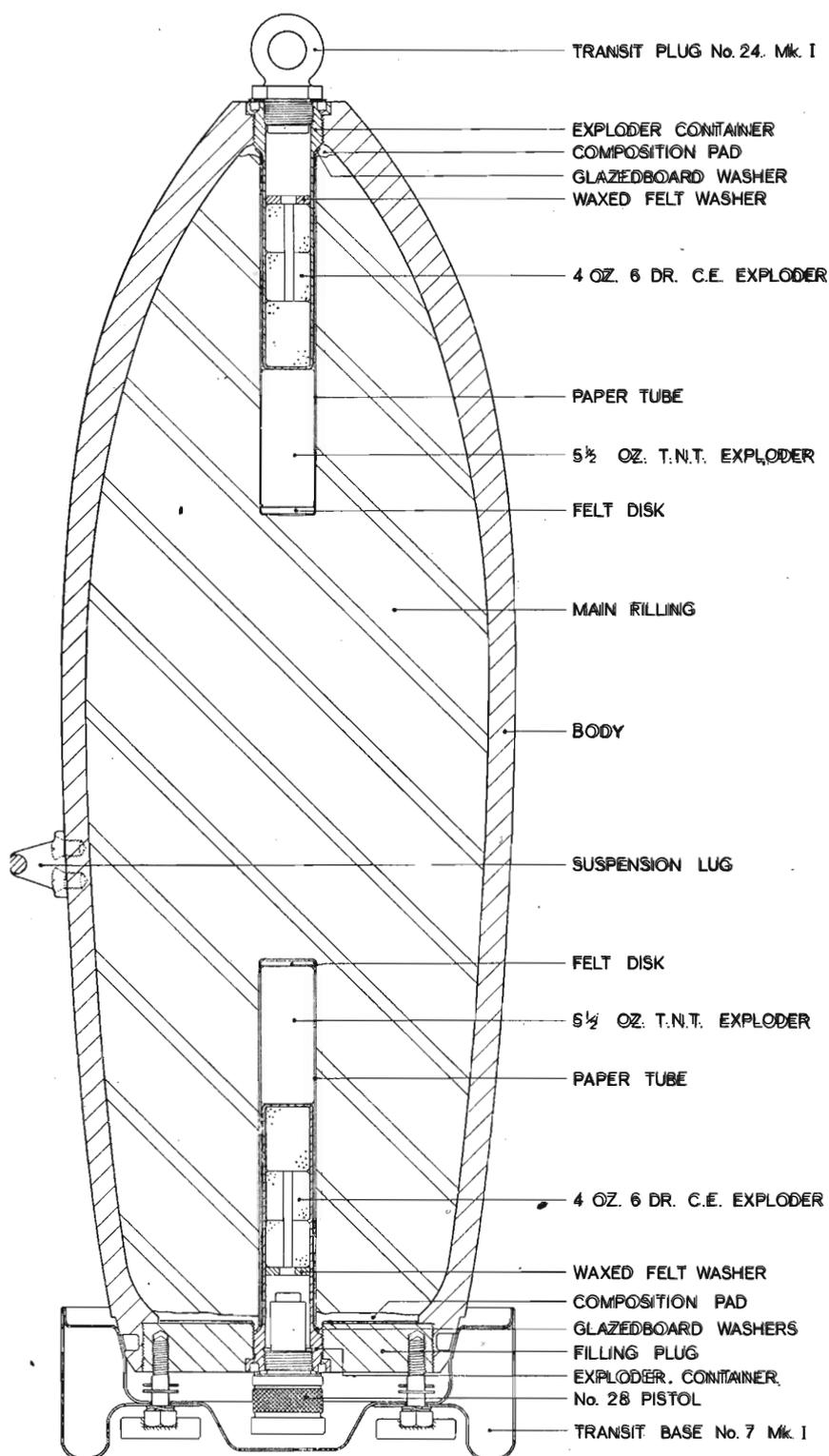


Fig. 1.—Bomb, H.E., aircraft, G.P., 500 lb., Mk. IV, with transit plug, No. 24, Mk. I, and transit base, No. 7, Mk. I

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CHAPTER 5

BOMBS, H.E., AIRCRAFT, G.P., 250 lb., Mk. IV, and 500 lb., Mk. IV

Introduction

1. The 250 lb. and 500 lb. Mk. IV G.P. bombs may be fuzed both nose and tail, if required, and are used for general bombardment purposes.

BOMB, H.E., AIRCRAFT, G.P., 250 lb., Mk. IV

Leading particulars

Body, bomb, H.E., aircraft, G.P., 250 lb., Mk. IV

| | | |
|----|------------------------------|---|
| 2. | Stores Ref. | 12A/287 |
| | Length, with tail | 4 ft. 8 in. |
| | Maximum diameter | 10.2 in. |
| | Weight of body | 151 lb., approx. |
| | Weight and nature of filling | 67.75 lb. T.N.T., or 63.6 lb. amatol 80/20 |
| | Terminal velocity | 1,440 ft. per sec. |

Tails, bomb, H.E., aircraft, G.P., 250 lb., No. 2, Mk. I, II, and III

| | | |
|----|----------------------------|---------------|
| 3. | Stores Ref., Mk. I | 12A/288 |
| | Stores Ref., Mk. II | 12A/902 |
| | Stores Ref., Mk. III | 12A/1654 |
| | Length, Mk. I, II, and III | 2 ft. 3-7 in. |

General description, fig. 1 and 2

Bomb body

4. The bomb body is a hollow steel casting, open at each end. The nose end of the body is threaded internally and is recessed to house an exploder container, which is locked in position by a locking screw.

5. The tail end of the body is threaded internally to accommodate a filling plug. The tail end externally is shaped to take the tail cone, and is provided with four equally spaced slots which locate the spring clips on the tail when it is assembled to the bomb body. A locating pin is also provided on the coned portion, at 45 deg. to the centre line of the suspension lug, to locate the tail when it is assembled to the bomb body. The suspension lug, for attaching the bomb to the bomb carrier, is secured by four countersunk screws to the bomb body.

6. The filling plug, which is in the shape of a disk, is threaded externally for screwing into the bomb body, and seats on an internal flange formed at the bottom of the screw-thread in the tail end of the body. It is threaded internally and recessed to house an exploder container, which is locked to it by a locking screw. It is provided with two holes on its outer face which are threaded to receive the securing bolts of the transit base, and two plain holes to receive the key used when screwing the filling plug into the bomb body after the bomb has been filled.

7. Each exploder container is in the form of a tube closed at one end, and has a head which is threaded internally for part of its length to take the threaded portion of the nose or tail pistol or the transit plug. It is threaded externally for screwing into the bomb body or the filling plug. Four plain holes are provided on the outer face to take the key used for screwing the exploder container into the bomb body or filling plug. The lug on the locking ring of the pistol is located in one of these holes when the pistol is in position in the bomb. A threaded hole is also provided on the outer face to accommodate the locking screw which locks the exploder container in position.

Tails

8. The tails, bomb, H.E., aircraft, G.P., 250 lb., No. 2, Mk. I, II, and III are of sheet metal, and are attached to the bomb body by four spring clips.

9. The No. 2, Mk. I tail consists of a tail cone with a cylindrical tail vane attached to it by four vane supports. The four spring clips are fitted to the base of the cone, which is slotted to engage with the locating pin in the bomb body.

At the apex of the tail cone is fitted a bush, which locates one end of an arming spindle, which is supported at the opposite end by a diaphragm near the base of the tail cone.

10. The inner end of the arming spindle has attached to it an arming fork, which engages with the arming fork of the No. 28 or other tail pistol in the bomb. The outer end of the arming spindle has attached to it an arming vane, which is secured to the spindle by a nut and tab washer. A safety clip, having an arming vane stop, is assembled over the bush at the apex of the tail, and prevents the arming mechanism from rotating during transit or when the bomb is dropped safe.

11. The No. 2, Mk. II tail is similar to the No. 2, Mk. I tail, except that each spring clip is fitted with a locking clip which swivels about a rivet and locks the spring clip in position when the tail is assembled to the bomb.

Note.—Early issues of the No. 2, Mk. II tails are provided with two swivel locking clips only. The No. 2, Mk. I tail is provided without the swivel locking clips fitted; Clips, locking (Stores Ref. 12A/842) a spring-on type, for use with these tails, are issued separately.

12. The No. 2, Mk. III tail is similar to the No. 2, Mk. II tail, except that it is fitted for horizontal fuzing. The safety clip is removed, and over the bush of the tail cone is fitted an arming wire guide having two tubular channels. The arming vane has a small hole drilled through each blade. A safety wire, passing through the appropriate channel and arming vane blade is secured by two safety clips, and prevents rotation of the arming mechanism except when the bomb is released "live".

Note.—The No. 2, Mk. I and III tails are of the safety clip type, and as such are not to be assembled to the bomb if horizontal fuzing is required. If only the Mk. I or III tail unit is available, and horizontal fuzing is required, it may be converted for use as described in Sect. 10, Chap. 1, App. 5, of this volume.

Transit bases

13. Two types of transit base may be fitted to the 250 lb., Mk. IV, G.P. bomb body, namely, base, transit, aircraft bomb, No. 5, Mk. I (Stores Ref. 12A/293), or base, transit, aircraft bomb, No. 8, Mk. I (Stores Ref. 12A/296).

Transit base, No. 5, Mk. I

14. The No. 5, Mk. I transit base is a wooden cylinder resembling the No. 6 transit base, see fig. 3. It is bored

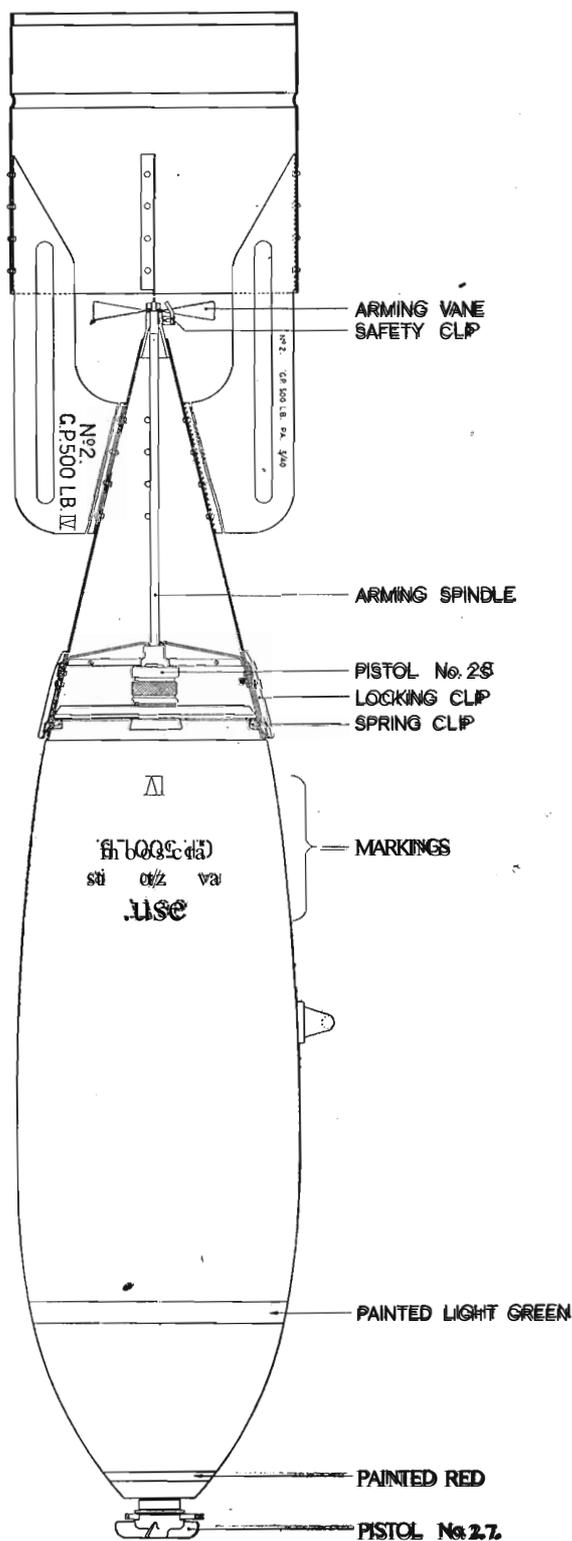
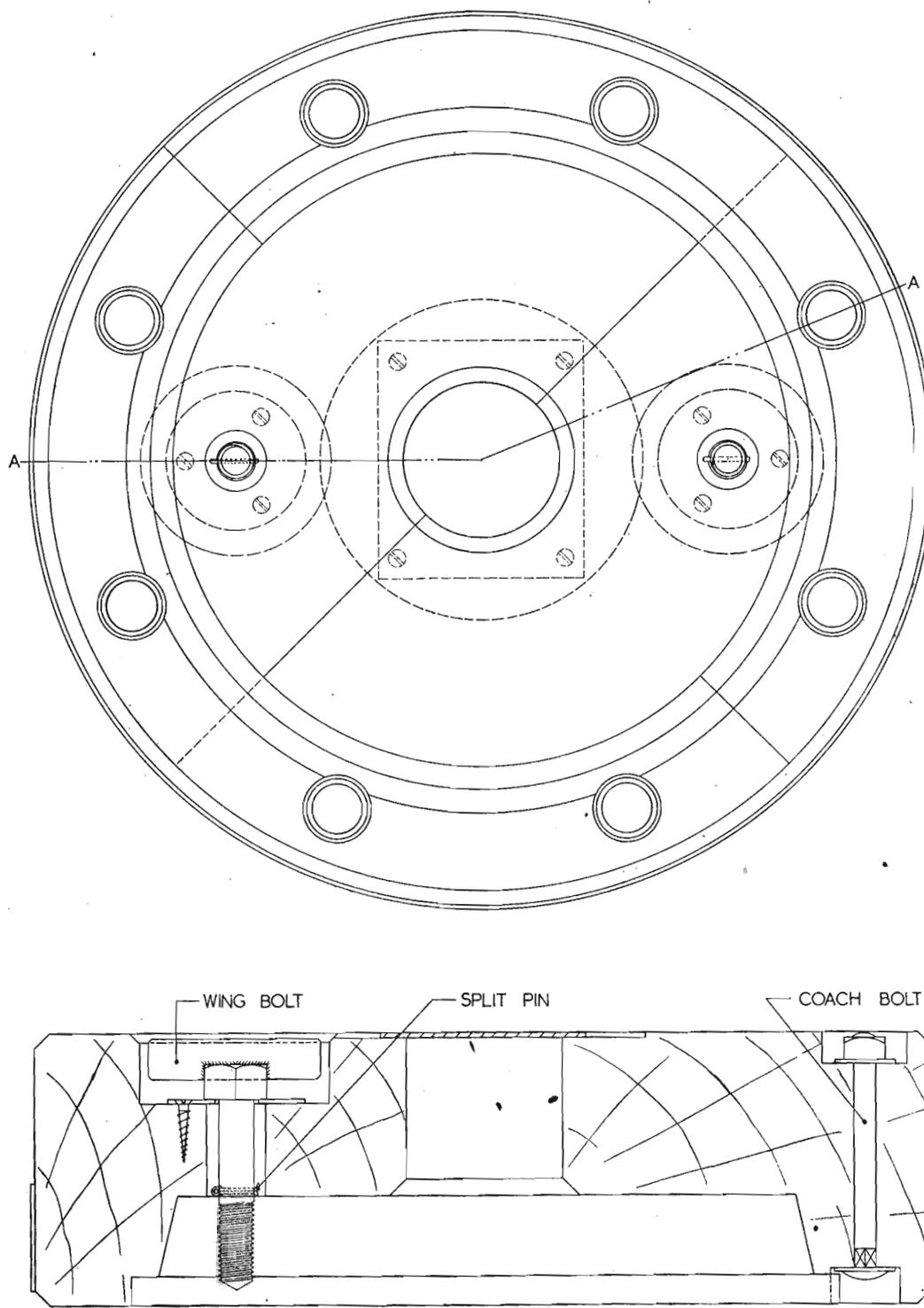


Fig. 2.—Bomb, H.E., aircraft, G.P., 500 lb., Mk. IV, with nose pistol, and tail, No. 2, Mk. II

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SECTION ON A.A.

Fig. 3.—Base, transit, aircraft bomb, No. 6, Mk. I

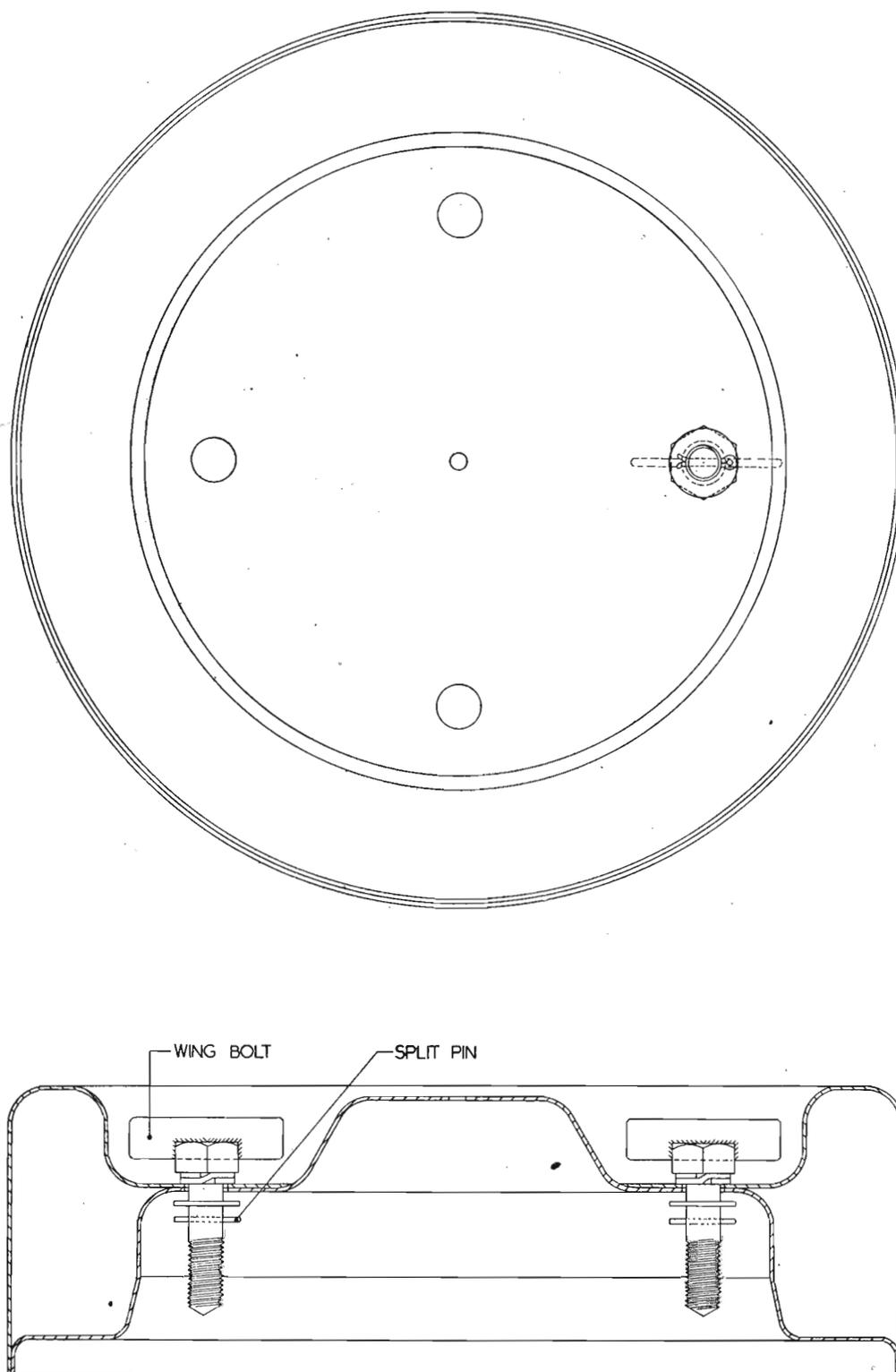


Fig. 4.—Base, transit, aircraft bomb, No. 8, Mk. I

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centrally and counterbored to fit over the tail end of the bomb body. The transit base is made up of three laminations glued together, and secured by six equally spaced coach bolts; a metal band, for strengthening purposes, is secured to the circumference by three screws. A rectangular steel plate is secured by four screws over the end of the bore of the transit base.

15. The transit base is provided with two wing bolts, retained in position by a split pin passing through the shank of each bolt, for screwing into the holes in the filling plug in the bomb body. The head of each bolt is accommodated in a recess cut in the transit base, and seats on to a washer secured in position by three equally spaced screws.

Transit base, No. 8, Mk. I, fig. 4

16. The No. 8, Mk. I transit base consists of two metal pressings secured together by either riveting, riveting and sweating, or riveting and cramping. The inner pressing is shaped to fit over the tail end of the bomb body. The No. 8 transit base is secured to the filling plug in the bomb body in a similar manner to the No. 5 transit base.

Transit plug

17. The plug, transit, No. 24, Mk. I (Stores Ref. 12A/643) is in the form of an eye-bolt, the shank being threaded for screwing into the nose exploder container. It is provided with a steel tab washer and a leather washer. The flange has two flats for the key used when inserting or removing the plug.

Note.—The No. 24, Mk. I transit plug is superseded by the plug, transit, No. 24, Mk. II which is dome-shaped, and has a threaded portion provided with a fibre insert for locking the plug in the bomb.

Filling

18. The bomb, H.E., aircraft, G.P., 250 lb., Mk. IV, is filled with either T.N.T. or amatol 80/20. The filling is sealed at the nose end with a glazedboard washer and a pad of approved composition, and at the tail end of the bomb body by two glazedboard washers and a pad of approved composition.

19. Located at the end of each exploder container, and housed in a paper tube, is a 5½ oz. T.N.T. exploder, having a felt disk interposed between it and the end of the tube. Located in each exploder container, by a waxed felt washer, is a 4 oz. 6 dr. C.E. exploder.

Identification colouring and markings

Colouring

20. The bomb body is painted dark green, except for a ½ in. red band painted round the body 1 in. from the nose, and a 1 in. light green band 6 in. from the nose. On T.N.T. filled bombs, the initials T.N.T. are stencilled in three places round the green band. A white line, 1 in. by ¼ in., is painted on the base of the body and on the filling plug after the body has been filled and the filling plug screwed finally into position.

Markings on the bomb body

21. When the bomb is filled with T.N.T., behind the suspension lug is stencilled, in black, the following information:—

- (1) G.P. 250 lb. IV
- (2) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor
- (3) The date of filling (month and year)
- (4) The lot number of the filling.

On the reverse side is stencilled the design number of the method of filling.

22. When the bomb is filled with amatol 80/20, at the rear of the bomb in line with the suspension lug, is stencilled in black, the following information:—

- (1) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor
- (2) The date of filling (month and year)
- (3) The lot number of the filling
- (4) G.P. 250 lb. IV.

On the reverse side is stencilled the design number of the method of filling.

23. Towards the nose of the bomb are stamped the body manufacturer's markings as follows:—

- (1) G.P. 250 lb.
- (2) The manufacturer's initials or recognized trade mark
- (3) The date of manufacture (month and year).

Markings on the tails

24. One vane support of the tail is marked with the following:—

- (1) No. 2 I. (II or III) G.P. 250 lb.
- (2) The manufacturer's initials or recognized trade mark
- (3) The date of manufacture (month and year).

When the bomb tail is for issue to the R.N., the following markings are stencilled on one other vane support:—

- (4) No. 2 I. (II or III)
- (5) G.P. 250 lb. IV.

Markings on the transit bases

25. On one face of the No. 5 transit base is branded the following information:—

- (1) No. 5 I
- (2) The manufacturer's initials or recognized trade mark
- (3) The date of manufacture.

26. On the underside of the No. 8 transit base is stamped the following information:—

- (1) The manufacturer's initials or recognized trade mark
- (2) 8 I

On the same side of the transit base is stencilled the following:—

- (3) No. 8, Mark I
- (4) G.P. 250 lb.

Markings on the transit plug

27. The flange of the transit plug is stamped with the following information:—

- (1) The manufacturer's initials or recognized trade mark
- (2) The date of manufacture (month and year)
- (3) No. 24 I or No. 24 II, as appropriate.

Fuzing the bomb and assembling the tail

28. The bomb may be fuzed at the nose and tail, or at the tail only, in which instance the No. 24 transit plug is left in position.

Nose fuzing

29. When the Mk. I transit plug is used, unlock the tab washer. Remove the transit plug.

30. Ensure that the exploder is in the correct position, and that the detonator cavity is clear, using gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 12A/349). If this test is passed, insert the detonator in the detonator cavity, and screw in the No. 27 or other nose pistol by hand until it is well seated on its washer and locked in position.

Tail fuzing

31. Remove the transit base by unscrewing the two wing bolts, and remove the No. 28 pistol by hand.

32. Ensure that the exploder is in the correct position and that the detonator cavity is clear, using the No. 2, Mk. I detonator cavity gauge. If this test is passed, insert the required detonator.

33. Remove the press-cap and safety plate from the No. 28 or other tail pistol, and screw the fork lightly against the pistol body.

34. Insert the pistol in the bomb, screwing it in by hand until it is well seated on its washer and locked in position.

Assembling the tail

35. Examine the tail for serviceability. Remove the arming vane stop, or safety wire and safety clips, and test the arming vanes for freedom of rotation. Replace the arming vane stop, or insert the safety wire through the appropriate tube and hole in the arming vane and secure with two safety clips. The tail is now ready for use.

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36. Offer up the tail to the tail end of the body, ensuring that the slot in the tail cone is in line with the locating pin in the bomb body, and taking care that the arming fork in the pistol is correctly engaged by the arming mechanism in the bomb tail.

Note.—When using tails requiring the addition of the Clips, locking (Stores Ref. 112A/842), one of these clips is to be fitted into the U-shaped portion of each of the tail spring clips after the tail is assembled to the bomb.

37. Push the tail on to the bomb body until the spring clips on the tail engage with the slots in the bomb body; pressure should be applied to individual springs to ensure correct assembly. Rotate the locking clips, if fitted, on the spring clips to lock them in position.

38. Remove the arming vane stop from the arming mechanism in the tail, and rotate the arming vane two complete turns in an anti-clockwise direction. Replace the arming vane stop, ensuring that it is positioned correctly. If a tail fitted for horizontal fuzeing is being used, remove the safety clips and safety wire from the arming mechanism and rotate the arming vane two complete turns in an anti-clockwise direction. Replace the safety wire and safety clips, ensuring that approximately 2 in. of the safety wire protrudes beyond the arming vane.

Note.—The arming vane must rotate freely, and any stiffness must be investigated and rectified; if the stiffness cannot be rectified the tail must be rejected.

Loading the bomb on to the aircraft bomb carrier

39. Load the bomb on to the bomb carrier as described in the relevant chapter of A.P. 1664, Vol. I. Engage the appropriate fuse-setting control links with the safety clip, or safety wire, on the arming mechanism of the bomb tail, and with the safety clip of the No. 27 pistol, if the bomb is fuzeed at the nose. Remove the safety pin on the safety clip of the No. 27 pistol immediately before the aircraft takes off, and hand it to the pilot or bomb aimer.

Functioning

40. When the bomb is released from the aircraft, the appropriate fuze-setting control links, depending on the fuzeing selected by the pilot or air bomber, remove the safety clip, or safety wire, from the arming mechanism in the bomb tail, and/or the safety clip from the No. 27 pistol.

41. As the bomb falls, the arming vanes rotate, due to the air pressure, thus freeing the strikers of the pistols. On impact of the bomb with the target, the strikers are forced against their respective detonators, which fire the exploders, which in turn detonate the main fuzeing in the bomb.

Note.—If instantaneous detonators are used in both the nose and tail assemblies, the nose assembly will function first.

Unloading an unexpended bomb from the aircraft bomb carrier

42. Insert the safety pin in the safety clip of the No. 27 pistol, if fitted.

43. Disconnect the fuse-setting control links from the safety clips or wires of the arming mechanism in the bomb tail, and of the No. 27 pistol, if the bomb is fuzeed at the nose.

44. Unload the bomb, following the procedure detailed in the relevant chapter of A.P. 1664, Vol. I.

Unfuzing the bomb

45. Release the locking clips, or remove the spring-on clips from the spring clips on the bomb tail, and remove the tail by disengaging the four spring clips from the slots in the bomb body.

46. Replace the safety plate and press-cap of the pistol and remove the tail pistol by hand. Extract the detonator, using extractor, detonator, No. 2, Mk. I (Stores Ref. 112A/348) and replace the pistol.

Note.—In the event of the arming fork of the pistol standing proud of the pistol body, the press-cap is not to be replaced until after the pistol has been removed from the bomb.

47. Remove the No. 27 pistol from the nose of the bomb by hand, and extract the detonator using the No. 2, Mk. I detonator extractor. Replace the No. 24 transit plug, and lock it in position with the tab washer when the Mk. I plug is used.

Supply

48. Bombs, H.E., aircraft, G.P., 250 lb., Mk. IV, are supplied fitted with a base, transit, aircraft bomb, No. 5, Mk. I, or a base, transit, aircraft bomb, No. 8, Mk. I, in position. The nose is plugged with a plug, transit, No. 24, Mk. I or II, and a No. 28 pistol is fitted in position in the tail end of the bomb body, where it acts as a transit plug.

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49. The tails, bomb, H.E., aircraft, G.P., 250 lb., No. 2, Mk. I, II, and III are supplied in Container, B.270, Mk. I (Stores Ref. 12S/400); a proportion of the containers contain a pistol bomb, D.A., No. 27, used for the nose fuze of the bomb.

Storage

50. Bombs, H.E., aircraft, G.P., 250 lb., Mk. IV, are classified, for the purpose of storage, in Group VII. The tails in their containers may be stored in the same explosives storehouse as the filled bombs, but they must be stacked well clear of the filled stores.

BOMB, H.E., AIRCRAFT, G.P., 500 lb., Mk. IV

Leading particulars

Body, bomb, H.E., aircraft, G.P., 500 lb., Mk. IV

| | | |
|-----|---|--|
| 51. | Stores Ref. | 12A/289 |
| | Length, with tail, No. 2, Mk. I | 5 ft. 10.6 in. |
| | Length, with tail, No. 26, Mk. I, II, and III | 4 ft. 7.6 in. |
| | Maximum diameter | 12.9 in. |
| | Weight of body | 311 lb., approx. |
| | Weight and nature of filling | 144.5 lb. T.N.T., or 134.6 lb. amatol 80/20 |
| | Terminal velocity | 1,580 ft. per sec. |

Tail, bomb, H.E., aircraft, G.P., 500 lb., No. 2, Mk. I

| | | |
|-----|-------------|----------------|
| 52. | Stores Ref. | 12A/290 |
| | Length | 2 ft. 11.4 in. |

Tails, bomb, H.E., aircraft, G.P., 500 lb., No. 26, Mk. I, II, and III

| | | |
|-----|----------------------------|---------------|
| 53. | Stores Ref., Mk. I | 12A/984 |
| | Stores Ref., Mk. II | 12A/1116 |
| | Stores Ref., Mk. III | 12A/1656 |
| | Length, Mk. I, II, and III | 1 ft. 8.4 in. |

Tail, bomb, H.E., aircraft, G.P., 500 lb., No. 77, Mk. I

| | | |
|-----|-------------|---------------|
| 54. | Stores Ref. | 12A/1727 |
| | Length | 2 ft. 9.4 in. |

General description

Bomb body

55. The 500 lb. Mk. IV bomb body differs from the 250 lb. Mk. IV bomb body only in weight and dimensions.

Tail, bomb, H.E., aircraft, G.P., 500 lb., No. 2, Mk. I

56. The 500 lb., No. 2, Mk. I tail differs from the 250 lb., No. 2, Mk. I tail mainly in weight and dimensions. Two of the spring clips are fitted with swivel locking clips.

Tail, bomb, H.E., aircraft, G.P., 500 lb., No. 26, Mk. I, fig. 5

57. The No. 26, Mk. I tail, which is to be used on 500 lb. Mk. IV G.P. bombs when carried externally on high-speed fighter aircraft, or internally on fighter-bombers of the Mosquito type, is similar to the 500 lb., No. 2, Mk. I tail, differing mainly in weight and dimensions. The tail vane and vane supports are shorter, and it has a two-bladed arming vane instead of the four-bladed arming vane used on the No. 2, Mk. I tail. The shortening of the vane supports and tail vane causes the arming vane, the safety clip, and the apex of the tail cone to protrude beyond the end of the tail vane. The tail is fitted with two swivel locking clips.

Note.—Early issues of the No. 26, Mk. I tail may not be provided with swivel locking clips fitted, but Clips, locking, (Stores Ref. 12A/842) a spring-on type, are issued separately for use with this tail.

Tail, bomb, H.E., aircraft, G.P., 500 lb., No. 26, Mk. II

58. The No. 26, Mk. II tail is similar to the No. 26, Mk. I tail, except that it is fitted with four swivel locking clips.

Tail, bomb, H.E., aircraft, G.P., 500 lb., No. 26, Mk. III

59. The No. 26, Mk. III tail is similar to the No. 26, Mk. II tail, except that it is fitted for horizontal fuze (para. 12).

Note.—The 500 lb., No. 2, Mk. I, and the No. 26, Mk. I and III tails are of the safety clip type, and as such are not to be assembled to the bomb body when horizontal fuze is required. If only these tails are available, and horizontal fuze is required, they may be converted for use as described in Sect. 10, Chap. 1, App. 5, of this volume.

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Tail, bomb, H.E., aircraft, G.P., 500 lb., No. 77, Mk. I

60. The No. 77, Mk. I tail is of standard length and replaces the No. 26, Mk. I, II, and III tails on bombs carried externally where sufficient clearance is available. It is substantially strengthened to enable it to be carried externally on high-speed aircraft; this carriage is dependent on a number of factors and is the subject of specific instructions.

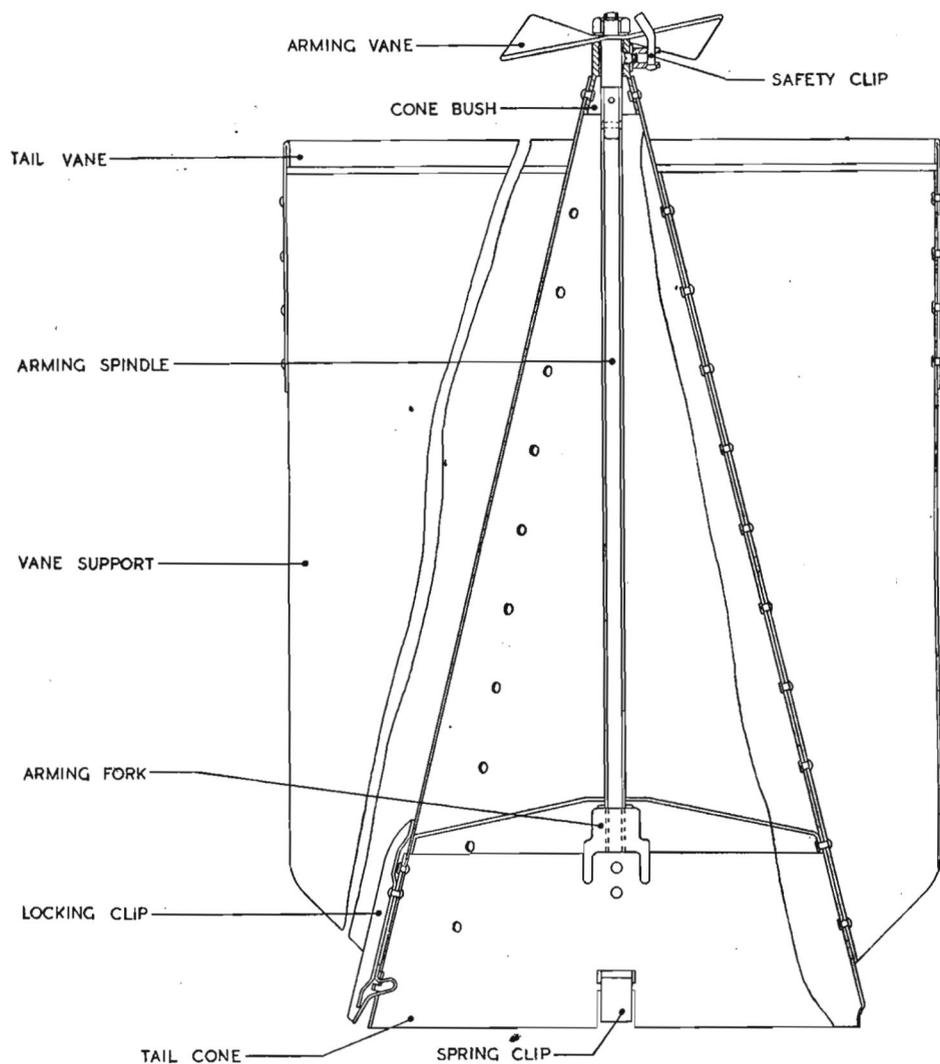


Fig. 5.—Tail, bomb, H.E., aircraft, G.P., 500 lb., No. 26, Mk. II

61. The No. 77, Mk. I tail differs from previous standard length tails as follows:—

- (1) The vane supports are stronger and are secured by additional rivets.
- (2) The tail is arranged for horizontal fuzing (*para.* 12).
- (3) A two-bladed arming vane of 4½ in. overall length is fitted.
- (4) The spring clips retaining the tail on the bomb are backed by a second leaf. The spring clip, backing leaf, and swivel locking clip are of heavier gauge material.

Note.—Some early issues of this tail may have normal single springs fitted, and where this is found, Clips, locking (Stores Ref. 12A/842), a spring-on type, are to be used. These clips are supplied with the early issues of these tails.

- (5) Each tail is supplied complete with a No. 1, Mk. I safety wire and two No. 1, Mk. I safety clips.

Transit bases

62. Two types of transit base may be fitted to the 500 lb. Mk. IV bomb, namely, base, transit, aircraft bomb, No. 6, Mk. I (Stores Ref. 12A/294), or base, transit, aircraft bomb, No. 7, Mk. I (Stores Ref. 12A/295).

Transit base, No. 6, Mk. I, fig. 3

63. The No. 6, Mk. I transit base differs from the No. 5, Mk. I transit base, (*para. 14*), only in weight and dimensions, and in that the No. 6 transit base has eight coach bolts instead of six.

Transit base, No. 7, Mk. I

64. The No. 7, Mk. I transit base differs from the No. 8, Mk. I transit base, (*para. 16*), only in weight and dimensions.

Transit plug

65. The No. 24, Mk. I or II transit plug is fitted in the nose of the 500 lb. Mk. IV G.P. bomb, (*para. 17*).

Filling

66. 500 lb. Mk. IV G.P. bomb bodies are filled in a manner similar to the 250 lb. Mk. IV bomb bodies, (*para. 18 and 19*), the only difference being in the weight of the main filling.

Identification colouring and markings

67. The colouring and markings used to distinguish the 500 lb. Mk. IV bomb are the same as those used to distinguish the 250 lb. Mk. IV bomb, except that the marking 500 lb. is used in place of the marking 250 lb., and the green band denoting the filling is 8 in. from the nose instead of 6 in.

Fuzing the bomb and assembling the tail

68. The operations are as for the 250 lb. bomb, (*para. 28 to 38*); the No. 2, Mk. I, No. 26, Mk. I, II, and III, and No. 77, Mk. I tails are assembled to the bomb in the same manner.

Loading the bomb on to the aircraft bomb carrier

69. The operations for loading are as stated in *para. 39*.

Functioning

70. The 500 lb. Mk. IV G.P. bomb functions in a manner similar to the 250 lb. Mk. IV bomb, (*para. 40 and 41*).

Unloading an unexpended bomb from the aircraft bomb carrier

71. The bomb is unloaded from the aircraft bomb carrier in a manner similar to the 250 lb. bomb, (*para. 42 to 44*).

Unfuzing the bomb

72. The operations for unfuzing the bomb are as stated for the 250 lb. bomb, (*para. 45 to 47*).

Supply

73. Bombs, H.E., aircraft, G.P., 500 lb., Mk. IV, are supplied fitted with base, transit, aircraft bomb, No. 6, Mk. I, or base, transit, aircraft bomb, No. 7, Mk. I, in position. The nose is plugged with plug, transit, No. 24, Mk. I or II, and a No. 28 pistol is supplied in position in the tail end of the bomb body, where it acts as a tail plug.

74. The tail, bomb, H.E., aircraft, G.P., 500 lb., No. 2, Mk. I, is supplied in Container, B.269, Mk. I (Stores Ref. 12S/399); a proportion of the containers contain a pistol, bomb, D.A., No. 27, used for the nose fuzing of the bomb.

75. The tails, bomb, H.E., aircraft, G.P., 500 lb., No. 26, Mk. I, II, and III are supplied in Container, B.382, Mk. I (Stores Ref. 12S/417).

76. The tail, bomb, H.E., aircraft, G.P., 500 lb., No. 77, Mk. I, is supplied in Container, B.269, Mk. I (Stores Ref. 12S/399).

Storage

77. Bombs, H.E., aircraft, G.P., 500 lb., Mk. IV, are classified, for the purpose of storage, in Group VII. The tails in their containers may be stored in the same explosives storehouse as the filled bombs, but they must be stacked well clear of the filled stores.

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CHAPTER 6

BOMBS, H.E., AIRCRAFT, G.P., 1,000 lb., Mk. I, II, III, and IV

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2. Bomb, H.E., aircraft, G.P., 1,000 lb., Mk. I, prepared for transit
3. Tail, bomb, H.E., aircraft, G.P., 1,000 lb., No. 29, Mk. I
4. Base, transit, aircraft bomb, No. 24, Mk. I

CHAPTER 6

BOMBS, H.E., AIRCRAFT, G.P., 1,000 lb., Mk. I, H, HI, and IV

Introduction

1. The 1,000 lb. Mk. I and II G.P. bombs may be fuzed both at the nose and tail if required, or may be fuzed at the nose or tail only. The Mk. III and IV bombs are fuzed only at the tail. The bombs are used for general bombardment purposes.

BOMB, H.E., AIRCRAFT, G.P., 1,000 lb., Mk. I

Leading particulars

Body, bomb, H.E., aircraft, G.P., 1,000 lb., Mk. I

| | | | | | | | |
|----|----------------------------------|-----|-----|-----|-----|-----|----------------------|
| 2. | Stores Ref. | ... | ... | ... | ... | ... | 12A/543 |
| | Length, with tail, No. 13, Mk. I | ... | ... | ... | ... | ... | 7 ft. 2-5 in. |
| | Length, with tail, No. 29, Mk. I | ... | ... | ... | ... | ... | 5 ft. 11 in. |
| | Maximum diameter | ... | ... | ... | ... | ... | 1 ft. 4-15 in. |
| | Weight and nature of filling | ... | ... | ... | ... | ... | 333 lb. amatol 80/20 |
| | Terminal velocity | ... | ... | ... | ... | ... | 1,840 ft. per sec. |

Tail, bomb, H.E., aircraft, G.P., 1,000 lb., No. 13, Mk. I

| | | | | | | | |
|----|-------------|-----|-----|-----|-----|-----|----------------|
| 3. | Stores Ref. | ... | ... | ... | ... | ... | 12A/544 |
| | Length | ... | ... | ... | ... | ... | 2 ft. 11-5 in. |

Tail, bomb, H.E., aircraft, G.P., 1,000 lb., No. 29, Mk. I

| | | | | | | | |
|----|-------------|-----|-----|-----|-----|-----|-------------|
| 4. | Stores Ref. | ... | ... | ... | ... | ... | 12A/1047 |
| | Length | ... | ... | ... | ... | ... | 1 ft. 8 in. |

GENERAL DESCRIPTION

5. The bomb consists of a body filled with high explosive, and a detachable tail secured to the bomb body by four wing bolts. Two types of tail are supplied for use with this bomb, namely, the No. 13, Mk. I tail, and the No. 29, Mk. I tail. The No. 29, Mk. I tail will supersede the No. 13, Mk. I tail, and has been designed to improve the stowage of the bomb in heavy bomber aircraft.

Bomb body, fig. 1 and 2

6. The bomb body is a hollow steel casting open at each end. The nose end of the body is threaded internally to house a nose bush, which is screwed and cemented in position, the joint between the body and the nose bush being welded or soldered.

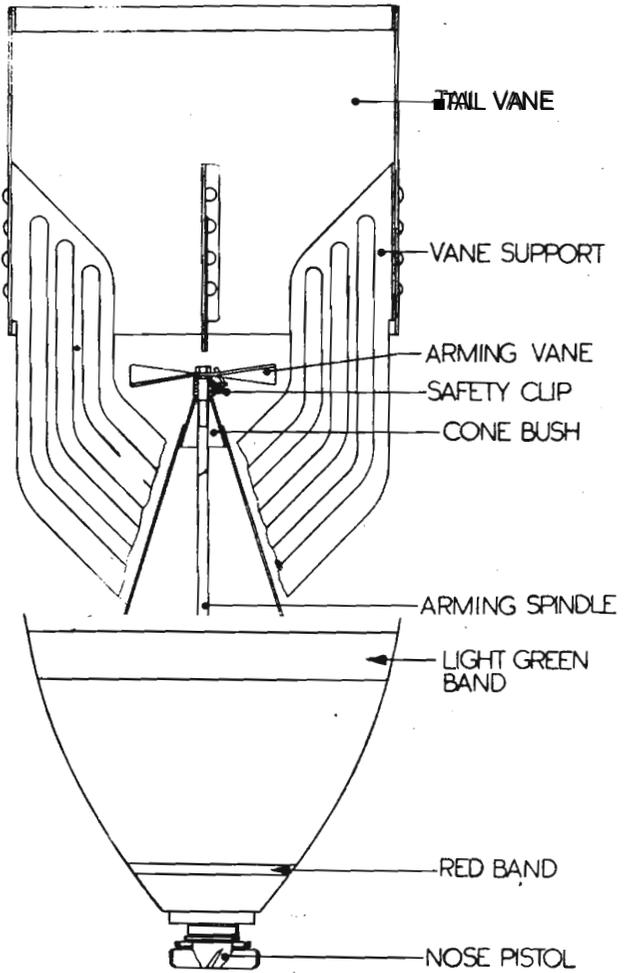
7. The nose bush, which has a flange shaped to suit the contour of the body, is bored centrally, and threaded for part of its length to take an exploder container which is screwed and cemented in position. The exploder container is locked to the nose bush by a locking screw.

8. The exploder container, which is in the shape of a hollow tube closed at one end, is flanged at the open end and has an external screw-thread for screwing into the nose bush. The flange has two diametrically opposite slots to take the key used for inserting the exploder container, and is provided with a threaded hole for the locking screw. The exploder container is threaded internally at the open end to house a detonator holder which is screwed and cemented in position, and locked with a locking screw.

9. The detonator holder is similar in shape to the exploder container, the closed end having a hole at the centre to house the stem of the detonator; a box-cloth washer is secured to the bottom of the detonator holder. Four plain holes are provided in the flange to take the key used for inserting the detonator holder, and also to take the lug on the locking spring of the pistol when it is assembled in the bomb. The detonator holder is threaded internally at the open end to take a pistol or a transit plug.

10. The tail end of the bomb body is shaped externally to take the tail, and is provided with a locating pin to locate the tail when in position on the bomb. The face of the tail end is spigoted to locate a transit base which is fitted to the body for transit purposes. Four holes are drilled in the face and are threaded to receive the wing bolts used for attaching the tail or the transit base to the bomb body.

32



44 2500 C & P Gp. 959

Fig. 1.- Bomb, H.E., aircraft, G.P., 1000 lb, Mk I., with nose and tail pistols in position, and fitted with No. 13, Mk. I, tail

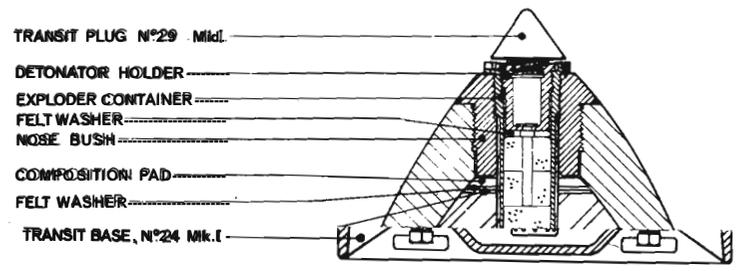


Fig. 2.- Bomb, H.E., aircraft, G.P., 1000 lb, Mk I., prepared for transit

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11. The tail end of the bomb body is recessed and threaded to take a filling plug which is screwed and cemented in position. The filling plug is in the form of a disc threaded externally for screwing into the bomb body, and bored and threaded internally to receive an exploder container. It is provided with two plain holes to take the key used for screwing it into the bomb body.

12. The exploder container and detonator holder used in the tail end of the body are identical with those used in the nose end, and are inserted and locked in a like manner.

13. A flat seating is provided on the bomb body which is drilled and tapped to receive the securing screws of a suspension lug which is attached to the body when required, for locating the bomb on, or suspending it from, the aircraft bomb carrier. A plain hole is provided for a guide pin on the suspension lug. The screw holes are plugged with transit screws when the lug is not in position.

14. The suspension lug is in the form of a rectangular stop plate to which is welded a lug. Two holes are provided to receive the screws for attaching the lug to the bomb body. The suspension lug is housed in the transit base when not in position on the bomb.

Filling

15. The bomb is filled with amatol 80/20, which is sealed at the nose end with a pad of approved composition, a felt washer, and a layer of T.N.T. The tail end is sealed by a layer of T.N.T., two felt washers, and a glazedboard washer. The exploder containers are protected from the filling by paper tubes.

16. Located in each exploder container is a 2 oz. 14 dr., Mlk. I, T.N.T. exploder, and an 11 oz. 2 dr., Mlk. I, C.E. exploder. A waxed felt washer is located between the 11 oz. 2 dr. exploder and the detonator holder in each instance.

Tail, bomb, H.E., aircraft, G.P., 1,000 lb., No. 13, Mlk. I, fig. 1

17. The tail, bomb, H.E., aircraft, G.P., 1,000 lb., No. 13, Mlk. I, consists of a tail cone, a cylindrical tail vane attached to the cone by four corrugated vane supports, and an arming mechanism used for arming the tail pistol.

18. Near the base of the tail cone is a tail ring, which is drilled to house four wing bolts which are used for attaching the tail to the bomb body. The four wing bolts are each provided with double spring washers, and are retained on the tail ring by a split pin passing through the shank of each bolt. The base of the tail cone has a slot which engages with the locating pin on the tail end of the bomb body when the tail is assembled. The tail cone is provided with four hand holes to allow access to the four wing bolts.

19. Attached to the tail cone, to the rear of the tail ring, is a spider in the form of a cross, which supports the fork end of the arming mechanism. One arm of the spider is in line with the locating slot in the tail cone. The rear end of the tail cone is closed by a bush, which supports the arming vane end of the arming mechanism.

20. The arming mechanism consists of an arming spindle, at one end of which is attached a fork which engages with the arming fork of the No. 28 or other tail pistol in the bomb. At the opposite end of the arming spindle is an arming vane, secured to the spindle by a nut and tab washer. The arming vane and arming spindle are prevented from rotating during transit by a safety clip, which fits over the end of the bush in the tail cone.

Tail, bomb, H.E., aircraft, G.P., 1,000 lb., No. 29, Mlk. I, fig. 3

21. The No. 29, Mlk. I tail is similar to the No. 13, Mlk. I tail, see para. 17 to 20, differing only in dimensions.

22. The tail vane and vane supports are shorter in the No. 29 tail, and the vane supports are not corrugated. The shortening of the tail vane and vane supports causes the arming vanes, the safety clip, and the apex of the tail cone to protrude beyond the end of the tail vane.

Transit base, fig. 4

23. The base, transit, aircraft bomb, No. 24, Mlk. I (Stores Ref. 12A/546), is of cast steel, and is provided with four wing bolts used for attaching the transit base to the tail end of the bomb body. The wing bolts are secured in a manner similar to the wing bolts in the tail, see para. 18. Eight webs are cast in the transit base for strengthening purposes, alternate webs having machined

bosses which form seatings for the wing bolts. One web has a machined seating for the suspension lug. This seating is drilled and threaded for two securing bolts used for attaching the lug to the transit base. Three other holes are provided in the seating, one for the suspension lug locating pin, and the other two for the securing screws used for securing the suspension lug to the bomb body.

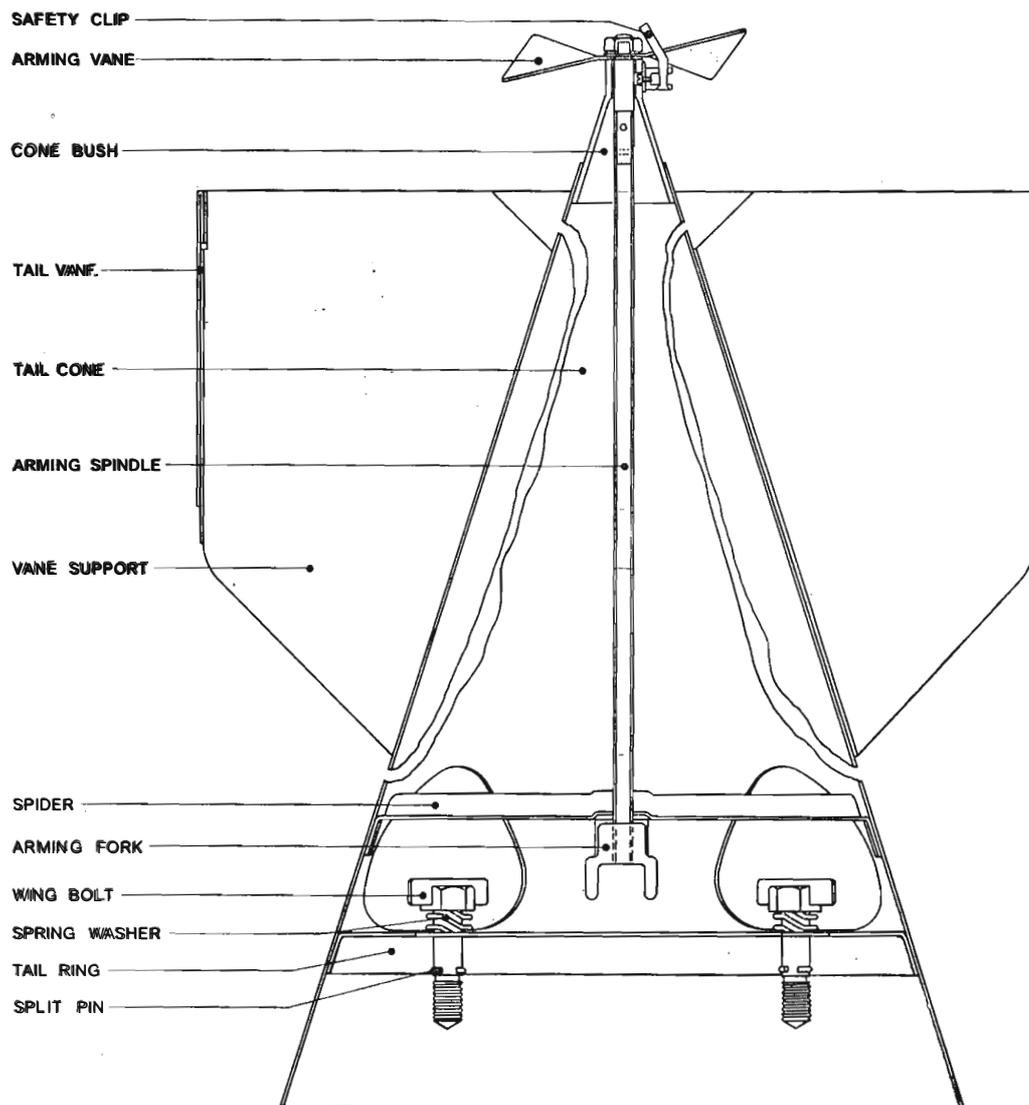


Fig. 3.—Tail, bomb, H.E., aircraft, G.P., 1,000 lb., No. 29, Mk. I

Transit plug

24. The plug, transit, No. 29, Mk. I (Stores Ref. 12A/547), is conical in shape and has a shank threaded for screwing it into the detonator holder in the nose of the bomb body. A leather washer is provided under the plug. A tommy bar hole is provided in the plug for use when the plug is being inserted or removed from the bomb body.

identification colouring and markings

Colouring

25. The exterior of the bomb body and tail is painted dark green, with the exception of a $\frac{5}{8}$ in. red band, 2 in. from the face of the nose bush, and a 2 in. light green band, $9\frac{1}{2}$ in. from the face of the nose bush. The transit base is also painted dark green.

Markings on the bomb body

26. Towards the tail end of the bomb body, and on the same side as the suspension lug, is stencilled in black, the following information:—

- (i) The monogram of the filling station, or the filling contractor's initials or recognized trade mark.
- (ii) The date of filling, month and year.
- (iii) The lot number of the filled bomb.
- (iv) G.P., 1,000 lb., I.

On the reverse side is stencilled the design number of the method of filling.

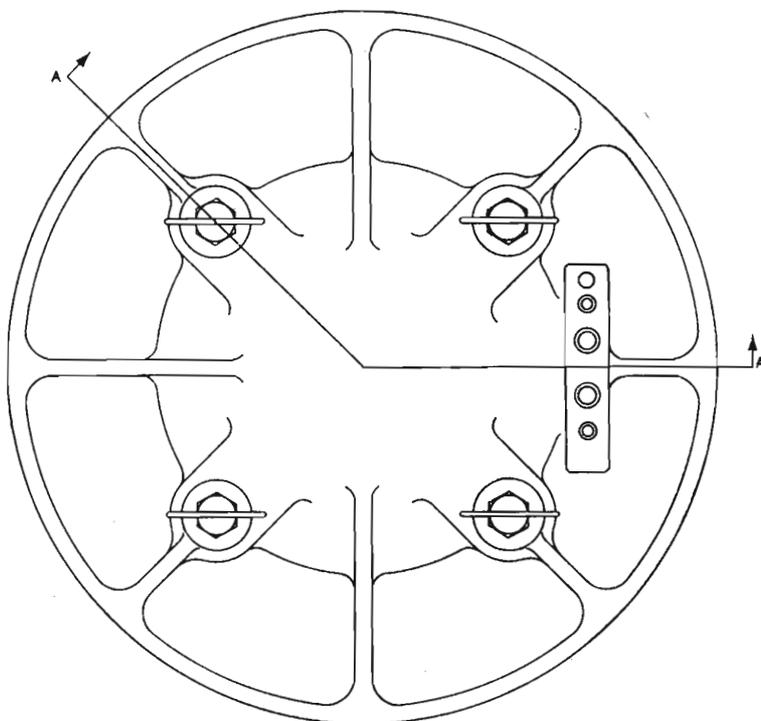
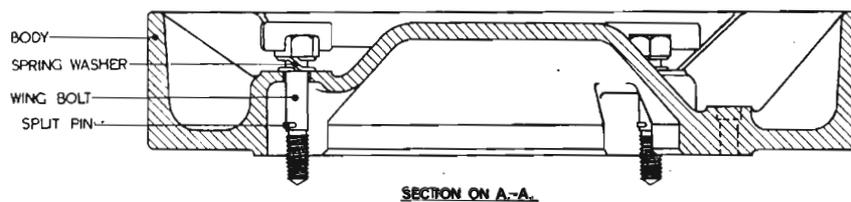


Fig. 4.—Base, transit, aircraft bomb, No. 24, Mk. I

27. On the body, towards the nose, and on the same side as the suspension lug, are stamped the body manufacturer's markings as follows:—

- (i) I, G.P., 1,000 lb.
- (ii) The body manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the tail, No. 13, Mk. I

28. On the cylindrical vane is stamped the following information:—

- (i) No. 13, I.
- (ii) G.P., 1,000 lb.
- (iii) The manufacturer's initials or recognized trade mark.
- (iv) The date of manufacture, month and year.

29. After the tail has been painted, on the vane is stencilled No. 13, I.

Markings on the tail, No. 29, Mk. I

30. Stencilled in black on one vane support is No. 29, I.

Markings on the transit base and transit plug

31. On one face of the transit base is stencilled No. 24, Mk. I, G.P., 1,000 lb. On the other face is stamped or cast the following information:—

- (i) The date of manufacture, month and year.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) 24, I.

32. The following information is stamped on the transit plug:—

- (i) The date of manufacture, month and year.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) No. 29, I.

Functioning

33. When the bomb is released from the bomb carrier, the appropriate fuze-setting control links remove the safety clips from the arming mechanism in the tail and the No. 27 or other nose pistol if the bomb is fuzed at the nose, thus allowing the arming vanes to rotate due to air pressure.

34. After a certain number of revolutions of the arming vanes, the strikers in the pistols are freed, and on impact of the bomb with the target, the strikers are forced against their respective detonators causing them to function. The flash from the detonators passes to the exploders, which in turn detonate the main filling in the bomb.

35. If the bomb is fuzed both at the nose and at the tail, each with instantaneous detonators, the nose assembly will function first.

INSTRUCTIONS FOR USE**Fuzing the bomb and assembling the tail and suspension lug**

36. The bomb may be fuzed both at the nose and at the tail, or at the nose or tail only. When fuzed only at the tail, the No. 29 transit plug is left in position.

Fuzing at the nose

37. Remove the No. 29 transit plug.

38. Ensure that the detonator cavity is clear, using gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 12A/349); the engraved line for the 250/500 lb. bombs is applicable to the 1,000 lb. G.P. bomb. Bombs which fail to pass this test must be set aside for A.I.D. inspection, or used fuzed at the tail only.

39. Insert the appropriate detonator in the detonator cavity. Insert the No. 27 or other nose pistol in the detonator holder in the bomb body and screw it in by hand until it is well seated on its washer and locked in position.

Fuzing at the tail

40. Remove the No. 24 transit base by unscrewing the four wing bolts.

41. Remove the tail pistol by hand.

42. Ensure that the detonator cavity is clear, using the No. 2, Mk. I cavity gauge; the engraved line for the 250/500 lb. bombs is applicable. Bombs which fail to pass this test are to be set aside for A.I.D. inspection, or used fuzed at the nose only.

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43. Insert the appropriate detonator in the detonator cavity.
44. Remove the overseal, press-cap, and safety plate from the No. 28 or other tail pistol, and test the arming fork of the pistol for freedom of rotation, finally screwing it lightly against the body of the pistol.
45. Insert the pistol in the detonator holder in the bomb body, and screw it in by hand until it is well seated on its washer and locked in position.

Assembling the tail and suspension lug

46. Offer up the tail to the tail end of the bomb body, with the slot in the base of the tail cone in line with the locating pin in the bomb body, and ensure that the arming fork in the pistol is not fouled by the arming mechanism in the tail.
47. Push the tail firmly into position and secure it to the bomb body by screwing the four wing bolts fully home.
48. Remove the safety clip from the arming mechanism in the tail, and unscrew the arming vanes two complete turns. Replace the safety clip, ensuring that the screw in the safety clip engages with the slot in the bush in the tail cone.
49. Remove the suspension lug from its seating in the transit base, and remove the transit screws from the holes in the suspension lug seating on the bomb body. Place the suspension lug in position on the bomb body, and secure it by screwing in the two screws which for transit purposes are normally housed in the recesses in the seating in the transit base. The transit screws are to be replaced in the seating in the transit base for further use as required.

Loading the bomb on to the aircraft bomb carrier

50. Load the bomb on to the bomb carrier as described in the relevant chapter of A.P.1664, Vol. I. Attach the appropriate fuze-setting control links of the bomb carrier to the safety clip of the arming mechanism in the bomb tail, and to the safety clip of the nose pistol if the bomb is fuzed at the nose. Remove the safety pin from the safety clip in the nose pistol immediately before the aircraft is ready to take off and hand it to the pilot or bomb aimer.

Unloading the bomb from the aircraft bomb carrier

51. Replace the safety pin in the safety clip of the No. 27 or other nose pistol if the bomb is fuzed at the nose.
52. Disengage the fuze-setting control links from the safety clips, and unload the bomb as described in the relevant chapter of A.P.1664, Vol. I.

Unfuzing the bomb*Nose*

53. Remove the nose pistol, if fitted, by hand, and remove the detonator, using extractor, detonator, No. 2, Mk. I (Stores Ref. 12A/348). Screw a No. 29 transit plug securely in position.

Tail

54. Remove the tail by unscrewing the four wing bolts.
55. Replace the safety plate and press-cap of the tail pistol. In the event of the arming fork of the pistol standing proud of the edge of the pistol body, the safety plate and press-cap are not to be replaced until the pistol has been removed from the bomb, when the arming fork is to be lightly screwed up to the pistol body and the safety plate and press-cap replaced.
56. Remove the pistol, and extract the detonator, using the No. 2, Mk. I detonator extractor. Screw in the pistol by hand.
57. Remove the suspension lug from the bomb body, by unscrewing the two securing screws, and replace the transit screws in the bomb body.
58. Insert the securing screws for the lug in the recesses in the seating in the transit base, and fit the suspension lug to its seating in the transit base using the screws in the base.
59. Attach the transit base to the bomb body by screwing in the four wing bolts.

E (1661B)

SUPPLY AND STORAGE

Supply

60. The bomb, H.E., aircraft, G.P., 1,000 lb., Mk. I, is supplied with a plug, transit, No. 29, Mk. I, in position in the nose. A pistol, bomb, tail, No. 28, is supplied in the bomb body, where it acts as a transit plug. A base, transit, aircraft bomb, No. 24, Mk. I, is assembled to the bomb body.

Note.—Consequent on the change-over to sensitive type detonators the bomb may be supplied with a No. 30 pistol in position instead of a No. 28 pistol.

61. The tail, bomb, H.E., aircraft, G.P., 1,000 lb., No. 13, Mk. I, is supplied in Box, B.321, Mk. I (Stores Ref. 12A/545), together with a pistol, bomb, D.A., No. 27, used in the nose fuizing of the bomb as necessary. Only 50 per cent. of the boxes will contain a pistol, those without a pistol being stencilled accordingly. The tail may also be supplied alone in Clamp, protecting, B.360, Mk. I (Stores Ref. 12A/843).

62. The tail, bomb, H.E., aircraft, G.P., 1,000 lb., No. 29, Mk. I, is supplied in Clamp, protecting, B.398, Mk. I (Stores Ref. 12A/1083), two tails in a clamp.

Storage

63. Bombs, H.E., aircraft, G.P., 1,000 lb., Mk. I, are classified, for the purpose of storage, in Group VII. The tails, and nose pistols, in their packages, may be stored in the same explosives storehouse as the filled bombs, but they must be stacked well clear of the filled stores.

BOMB, H.E., AIRCRAFT, G.P., 1,000 lb., Mk. H

Leading particulars

64. Stores Ref. 12A/1074
All other leading particulars are as for the Mk. I bomb, see para. 2 to 4.

GENERAL DESCRIPTION

65. The Mk. II bomb is similar to the Mk. I bomb, see para. 5 to 35, except that the spigot on the tail end of the bomb body for locating the transit base, and the seating on the bomb body for the suspension lug, are omitted. Certain other minor modifications have been incorporated to facilitate manufacture. The mark number II is substituted for the mark number I where appropriate.

66. Both types of tail, namely, the No. 13, Mk. I, and the No. 29, Mk. I, may be used with Mk. II bomb bodies.

INSTRUCTIONS FOR USE

67. The instructions for use of the Mk. II bomb are as for the Mk. I bomb, see para. 36 to 59.

SUPPLY AND STORAGE

Supply

68. The bomb, H.E., aircraft, G.P., 1,000 lb., Mk. II, is supplied with a plug, transit, No. 29, Mk. I, in position in the nose. A pistol, bomb, tail, No. 28, or No. 30, is supplied in position in the bomb body, where it acts as a transit plug. A base, transit, aircraft bomb, No. 24, Mk. III (Stores Ref. 12A/1078), which is similar in construction to the Mk. I base, see para. 23, is assembled to the bomb body.

69. One tail, bomb, H.E., aircraft, G.P., 1,000 lb., No. 13, Mk. I, is supplied in Clamp, protecting, B.360, Mk. I (Stores Ref. 12A/843).

70. The tail, bomb, H.E., aircraft, G.P., 1,000 lb., No. 29, Mk. I, is supplied in Clamp, protecting, B.398, Mk. I (Stores Ref. 12A/1083), two tails in a clamp.

Storage

71. The conditions governing the storage of the Mk. II bomb are the same as for the Mk. I bomb, see para. 63.

BOMB, H.E., AIRCRAFT, G.P., 1,000 lb., Mk. III

Leading particulars

72. Stores Ref. 12A/1075
All other leading particulars are as for the Mk. I bomb, see para. 2 to 4.

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GENERAL DESCRIPTION

73. The Mk. III bomb is similar to the Mk. I bomb, see para. 5 to 35, except that the nose exploder container and detonator holder are not fitted. The nose is plugged with a special adapter and a No. 29, Mk. I transit plug; both these components are welded in position to prevent accidental removal. The mark number III is substituted for the mark number I where appropriate.

74. Both types of tail, namely, the No. 13, Mk. I, and the No. 29, Mk. I, may be used with Mk. III bomb bodies.

INSTRUCTIONS FOR USE

75. The instructions for fuzing the Mk. II bomb at the tail are as for the Mk. I bomb, see para. 40 to 45. The instructions for unfuzing the Mk. I bomb at the tail, see para. 54 to 59, also apply, as also do the instructions for fitting the tail and the suspension lug, see para. 46 to 49.

SUPPLY AND STORAGE

Supply

76. The bomb, H.E., aircraft, G.P., 1,000 lb., Mk. III, is supplied with a pistol, bomb, tail, No. 28, or No. 30, in position in the bomb body, where it acts as a transit plug. A base, transit, aircraft bomb, No. 24, Mk. I (Stores Ref. 12A/546) or Mk. II (Stores Ref. 12A/1077) is assembled to the bomb body.

77. The No. 13, Mk. I, or No. 29, Mk. I tail is supplied as stated in para. 69 or 70, respectively.

Storage

78. The conditions governing the storage of Mk. III bomb are the same as for the Mk. I bomb, see para. 63.

BOMB, H.E., AIRCRAFT, G.P., 1,000 lb., Mk. IV

Leading particulars

79. Stores Ref. 12A/1076
All other leading particulars are as for the Mk. I bomb, see para. 2 to 4.

GENERAL DESCRIPTION

80. The Mk. IV bomb body is similar to the Mk. II bomb body, see para. 65, except that the nose is permanently plugged in a similar manner to the Mk. III bomb, see para. 73. The mark number IV is used where appropriate.

81. Both types of tail, namely, the No. 13, Mk. I, and the No. 29, Mk. I, may be used with Mk. IV bomb bodies.

INSTRUCTIONS FOR USE

82. The instructions for fuzing the Mk. IV bomb at the tail are as for the Mk. I bomb, see para. 40 to 45. The instructions for unfuzing the Mk. I bomb at the tail, see para. 54 to 59, also apply, as also do the instructions for fitting the tail and the suspension lug, see para. 46 to 49.

SUPPLY AND STORAGE

Supply

83. The bomb, H.E., aircraft, G.P., 1,000 lb., Mk. IV, is supplied with a pistol, bomb, tail, No. 28, or No. 30, in position in the bomb body, where it acts as a transit plug. A base, transit, aircraft bomb, No. 24, Mk. III (Stores Ref. 12A/1078), is assembled to the bomb body.

84. The No. 13, Mk. I, or No. 29, Mk. I tail is supplied as stated in para. 69 or 70.

Storage

85. The conditions governing the storage of Mk. IV bomb are the same as for the Mk. I bomb, see para. 63.

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CHAPTER 7

BOMB, H.E., AIRCRAFT, G.P., 1,900 lb., Mk. I

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CHAPTER 7

BOMB, H.E., AIRCRAFT, G.P., 1,900 lb., Mk. I

Introduction

1. The bomb, H.E., aircraft, G.P., 1,900 lb., Mk. I, may be fuzed either at the nose and tail or only at the nose or tail, as required. The bomb is used for general bombardment purposes.

Leading particulars

Body, bomb, H.E., aircraft, G.P., 1,900 lb., Mk. I

| | | | | | | | | |
|----|------------------------------|-----|-----|-----|-----|-----|-----|----------------------|
| 2. | Stores Ref. | ... | ... | ... | ... | ... | ... | 12A/653 |
| | Length, with tail | ... | ... | ... | ... | ... | ... | 8 ft. 2 in. |
| | Maximum diameter | ... | ... | ... | ... | ... | ... | 1 ft. 6'7 in. |
| | Weight and nature of filling | ... | ... | ... | ... | ... | ... | 450 lb. amatol 80/20 |
| | Terminal velocity | ... | ... | ... | ... | ... | ... | 2,100 ft. per sec. |

Tail, bomb, H.E., aircraft, G.P., 1,900 lb., No. 14, Mk. I

| | | | | | | | | |
|----|-------------|-----|-----|-----|-----|-----|-----|---------------|
| 3. | Stores Ref. | ... | ... | ... | ... | ... | ... | 12A/642 |
| | Length | ... | ... | ... | ... | ... | ... | 2 ft. 9-3 in. |

GENERAL DESCRIPTION

4. The bomb consists of a body, filled with high explosive, and a detachable tail unit secured to the bomb body by four wing bolts.

Bomb body, fig. 1 and 2

5. The bomb body is a hollow steel casting open at each end. The nose end of the body is threaded internally to house a nose bush, which is screwed and cemented in position, the joint between the body and the nose bush being welded or soldered.

6. The nose bush, which has a flange shaped to suit the contour of the body, is bored centrally, and threaded for part of its length to take an exploder container which is screwed and cemented in position. The exploder container is locked to the nose bush by a locking screw.

7. The exploder container, which is in the shape of a tube closed at one end, is flanged at the open end and has an external screw-thread for screwing into the nose bush. The flange has two diametrically opposite slots to take the key used for inserting the exploder container, and is provided with a threaded hole for the locking screw. The exploder container is threaded internally at the open end to house a detonator holder which is screwed and cemented in position, and locked with a locking screw.

8. The detonator holder is similar in shape to the exploder container, the closed end having a hole at the centre to house the stem of the detonator; a box-cloth washer is secured inside the bottom of the holder. Four plain holes are provided in the flange to take the key used for inserting the detonator holder, and also to take the lug on the locking spring of the pistol when it is inserted in the bomb. The detonator holder is threaded internally at the open end to take a pistol or transit plug.

9. The tail end of the bomb body is shaped externally to take the tail, and is provided with a locating pin to locate the tail when in position on the bomb body. The face of the tail end is spigoted to locate a transit base which is fitted to the body for transit purposes. Two sets of four threaded holes are provided in the face, one set to receive the wing bolts used for attaching the tail and the other set to receive the wing bolts of the transit base. Two locating screws are screwed into the rear face to locate the transit base when it is assembled.

10. The tail end of the bomb body receives a filling plug which is screwed and cemented in position. The filling plug is in the form of a disc, screwed into the bomb body, and bored and threaded internally to receive an exploder container. It is provided with two plain holes to take the key used for screwing it into the bomb body.

11. The exploder container and detonator holder used in the tail end of the bomb body are identical with those used in the nose end, and are inserted and locked in a like manner.

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12. A flat seating is provided on the bomb body which is drilled and tapped to take four securing screws which are used to secure a suspension lug when required for locating the bomb on, or suspending it from, the aircraft bomb carrier. These screw holes are plugged with transit screws when the suspension lug is not in position.

13. The suspension lug is in the form of a stop plate with an integral lug, and four holes are provided for the securing screws used for attaching it to the bomb body. The suspension lug is housed in the transit base when not in position on the bomb.

Filling

14. The bomb is filled with amatol 80/20, which is sealed at the nose end with a pad of approved composition, and a $\frac{1}{8}$ in. layer of T.N.T. into which is pressed a felt washer. The tail end of the bomb body is sealed with a $\frac{1}{8}$ in. layer of T.N.T., a pad of approved composition, and a glazedboard washer. The exploder containers are protected from the filling by paper tubes.

15. Located in each exploder container is a 2 oz. 14 dr., Mk. I, T.N.T. exploder, and an 11 oz. 2 dr., Mk. I, C.E. exploder. A waxed felt washer is located between the 11 oz. 2 dr. exploder and the detonator holder in each instance.

Tail, fig. 11

16. The tail, bomb, H.E., aircraft, G.P., 1,900 lb., No. 14, Mk. I, consists of a tail cone, a cylindrical tail vane attached to the cone by four vane supports, and an arming mechanism used for arming the tail pistol.

17. Near the base of the tail cone is a tail ring, which is drilled to house four wing bolts used for attaching the tail to the bomb body. Each wing bolt is provided with a double spring washer, and is retained in the tail ring by a split pin passing through each bolt. The base of the tail cone has a slot which engages with the locating pin on the tail end of the bomb body when the tail is assembled. The tail cone is provided with four hand holes to allow access to the four wing bolts.

18. Attached to the tail cone, to the rear of the tail ring, is a spider in the form of a cross, which supports the fork end of the arming mechanism. The rear end of the tail cone is closed by a bush which supports the arming vane end of the arming mechanism.

19. The arming mechanism consists of an arming spindle, to one end of which is attached a fork which engages with the arming fork of the tail pistol in the bomb. At the opposite end of the arming spindle is an arming vane, secured to the spindle by a nut and tab washer. The arming vane and arming spindle are prevented from rotating by a safety clip, which fits over the end of the bush in the tail cone.

Transit base, fig. 3

20. The base, transit, aircraft bomb, No. 28, Mk. I (Stores Ref. 112A/640), is of cast steel, and is provided with four captive wing bolts used for attaching the transit base to the tail end of the bomb body. Eight webs are cast in the transit base for strengthening purposes, alternate webs having machined bosses which form seatings for the wing bolts. One web has a machined seating for the suspension lug, provided with holes drilled and threaded for the four securing screws used for securing the lug to the transit base. Four holes are also provided in the seating to house the four screws used for securing the lug to the bomb body. Two holes, diametrically opposite each other, are provided to engage the heads of the transit base locating screws on the bomb body.

Transit plug

21. The plug, transit, No. 30, Mk. I (Stores Ref. 112A/641) is conical in shape and has a threaded shank for screwing it into the detonator holder in the bomb body. Spanner flats are machined on the conical portion, which is also provided with a tommy bar hole for use when inserting or removing the plug. A leather washer is provided under the head of the plug.

Identification colouring and markings*Colouring*

22. The exterior of the bomb body and tail is painted dark green, with the exception of a $\frac{1}{2}$ in. red band, 2 in. from the face of the nose bush, and a 2 in. light green band, 11 $\frac{1}{2}$ in. from the face of the nose bush. The transit base is also painted dark green.

Markings on the bomb body

23. Towards the tail end of the bomb body, and on the same side as the suspension lug, is stencilled in black the following information:—

- (i) The monogram of the filling station, or the filling contractor's initials or recognized trade mark.
- (ii) The date of filling, month and year.
- (iii) The lot number of the filled bomb.
- (iv) G.P., 1,900 lb., I.

On the reverse side is stencilled the design number of the method of filling.

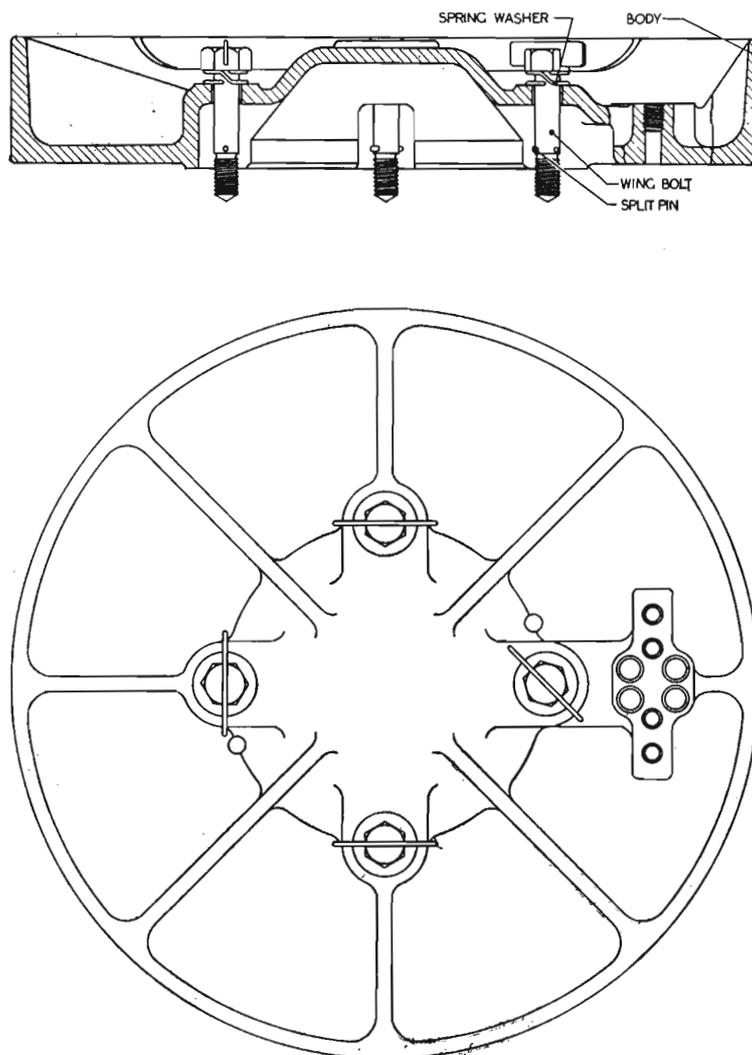


Fig. 3.—Base, transit, aircraft bomb, No. 28, Mk. I

24. On the body, towards the nose, and on the same side as the suspension lug, are stamped the body manufacturer's markings as follows:—

- (i) **L, G.P., 1,900 lb.**
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the tail

25. On the cylindrical vane is stamped the following information:—

- (i) No. 14, I.
- (ii) G.P., 1,900 lb.
- (iii) The manufacturer's initials or recognized trade mark.
- (iv) The date of manufacture, month and year.

26. After the tail has been painted, on the vane is stencilled No. 14, I.

Markings on the transit base and transit plug

27. On one face of the transit base is stencilled No. 28, Mk. I, G.P., 1,900 lb. On the other face is stamped or cast the following:—

- (i) The date of manufacture, month and year.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) 28, I.

28. The following information is stamped on the transit plug:—

- (i) The date of manufacture, month and year.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) No. 30, I.

Functioning

29. When the bomb is released from the bomb carrier, the appropriate fuze-setting control links remove the safety clips from the arming mechanism in the tail and from the nose pistol, if fitted, thus allowing the arming vanes to rotate due to air pressure.

30. After a certain number of revolutions of the arming vanes, the strikers in the pistol are freed, and on impact of the bomb with the target, the strikers are forced against their respective detonators causing them to function. The flash from the detonators passes to the exploders, which in turn detonate the main filling in the bomb.

31. If the bomb is fuzed both at the nose and the tail, each with instantaneous detonators, the nose assembly will function first.

INSTRUCTIONS FOR USE**Fuzing the bomb and assembling the tail and suspension lug**

32. The bomb may be fuzed at the nose and at the tail, or at the nose or tail only. When fuzed only at the tail, the No. 30 transit plug is left in position.

Fuzing at the nose

33. Remove the No. 30 transit plug.

34. Ensure that the detonator cavity is clear, using gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 12A/349); the engraved line for the 250/500 lb. bombs is applicable to the 1,900 lb. G.P. bomb. Bombs which fail to pass this test must be set aside for A.I.D. inspection, or used fuzed at the tail only.

35. Insert the appropriate detonator in the detonator cavity. Insert the nose pistol in the detonator holder in the bomb body and screw it in by hand until it is well seated on its washer and locked in position.

Fuzing at the tail

36. Remove the No. 28 transit base by unscrewing the four wing bolts.

37. Remove the tail pistol by hand.

38. Ensure that the detonator cavity is clear, using the No. 2, Mk. I detonator cavity gauge; the engraved line for the 250/500 lb. bombs is applicable. Bombs which fail to pass this test are to be set aside for A.I.D. inspection, or used fuzed at the nose only.

39. Insert the appropriate detonator in the detonator cavity.

40. Remove the overseal, press-cap, and safety plate from the tail pistol; test the arming fork of the pistol for freedom of rotation, finally screwing it lightly against the body of the pistol.

41. Insert the pistol in the detonator holder in the bomb body, and screw it in by hand until it is well seated on its washer and locked in position.

Assembling the tail and suspension lug

42. Offer up the tail to the tail end of the bomb body, with the slot in the base of the tail cone in line with the locating pin in the bomb body, and ensure that the arming fork in the pistol is not fouled by the arming mechanism in the tail.

43. Push the tail firmly into position and secure it to the bomb body by screwing the four wing bolts fully home.

44. If the bomb is fuzed at the tail, remove the safety clip from the arming mechanism in the tail, and unscrew the arming vane two complete turns. Replace the safety clip, ensuring that the screw in the safety clip engages with the slot in the bush in the tail cone.

45. Remove the suspension lug from its seating in the transit base, and remove the transit screws from the suspension lug seating on the bomb body. Place the suspension lug in position on the bomb body, and secure it with the four screws which for transit purposes are housed in the recesses in the suspension lug seating in the transit base. The transit screws are to be placed in the seating in the transit base for further use.

Loading the bomb on to the aircraft bomb carrier

46. Load the bomb on to the aircraft bomb carrier as described in the relevant chapter of A.P.1664, Vol. I. Attach the appropriate fuze-setting control links of the bomb carrier to the safety clip of the arming mechanism in the tail, if the bomb is fuzed at the tail, and to the safety clip of the nose pistol, if the bomb is fuzed at the nose. Remove the safety pin from the safety clip in the nose pistol immediately before the aircraft is ready to take off, and hand it to the pilot or bomb aimer.

Unloading the bomb from the aircraft bomb carrier

47. If the bomb is fuzed at the nose, replace the safety pin in the safety clip of the nose pistol.

48. Disengage the fuze-setting control links from the safety clips, and unload the bomb as described in the relevant chapter of A.P.1664, Vol. I.

Unfuzing the bomb

Nose

49. Remove the pistol by hand, and remove the detonator, using extractor, detonator, No. 2, Mk. I (Stores Ref. 12A/348). Screw a No. 30, Mk. I transit plug securely in position.

Tail

50. Remove the tail by unscrewing the four wing bolts.

51. Replace the safety plate and press-cap of the tail pistol. In the event of the arming fork of the pistol standing proud of the edge of the pistol body, the safety plate and press-cap are not to be replaced until the pistol has been removed from the bomb; the arming fork is then to be lightly screwed up to the pistol body and the safety plate and press-cap replaced.

52. Remove the pistol, and extract the detonator, using the No. 2, Mk. I detonator extractor. Replace the pistol in the bomb, screwing it in by hand.

53. Remove the suspension lug from the bomb body, by unscrewing the four securing screws, and replace the transit screws in the suspension lug seating on the bomb body.

54. Insert the securing screws for the lug in the recesses in the suspension lug seating in the transit base, and fit the suspension lug to its seating in the transit base using the screws in the base.

55. Attach the transit base to the bomb body by screwing in the four wing bolts.

SUPPLY AND STORAGE

Supply

56. The bomb, H.E., aircraft, G.P., 1,900 lb., Mk. I, is supplied with a plug, transit, No. 30, Mk. I, in position in the nose. A pistol, bomb, tail, No. 28, or No. 30, is supplied in the bomb body, where it acts as a transit plug. A base, transit, aircraft bomb, No. 28, Mk. I, is assembled to the bomb body.

57. The tail, bomb, H.E., aircraft, G.P., 1,900 lb., No. 144, Mk. I, is supplied in Box, B.343, Mk. I (Stores Ref. 12A/339), together with a nose pistol, used for the nose fuzeing of the bomb. Only a certain percentage of the boxes will contain a nose pistol, those without a pistol being stencilled accordingly.

Storage

58. Bombs, H.E., aircraft, G.P., 1,900 lb., Mk. I, are classified, for the purpose of storage, in Group VII. The tails, and nose pistols, in their boxes, may be stored in the same explosives storehouse as the filled bombs, but they must be stacked well clear of the filled stores.

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Relevant amendments up to A.L. 72
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January, 1944

CHAPTER 8

BOMBS, H.E., AIRCRAFT, G.P., 4,000 lb., Mk. I and II

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CHAPTER 8

BOMBS, H.E., AIRCRAFT, G.P., 4,000 lb., Mk. I and H

Introduction

1. The 4,000 lb. G.P. Mk. I and II bombs, which are for special operations, are fuze at the tail and also at the nose if required. In addition to the tail and nose fuze positions, the Mk. I bomb has two side fuze positions near the rear end, this being the only difference between the two marks.

2. The bombs are issued on transit bases, and they have a tail pistol in position, serving as a transit plug, and a nose plug which has to be removed when the bomb is to be fuze at the nose.

BOMB, H.E., AIRCRAFT, G.P., 4,000 lb., Mk. H

Leading particulars

3. *Body, bomb, H.E., aircraft, G.P., 4,000 lb., Mk. II*

| | |
|---|--|
| Stores Ref..... | 12A/1092 |
| Length, with nose plug and tail assembled ... | 8 ft. 8-5 in., approx. |
| Maximum diameter | 2 ft. 0-5 in., approx. |
| Weight of body, empty | 2,450 lb., approx. |
| Weight and nature of filling | 1,070 lb., approx., amatol 50/50 or 60/40, or 1,081 lb., approx., amatex 51/40/9 |
| Terminal velocity of bomb | 2,400 ft. per sec. (estimated) |

4. *Tail, bomb, aircraft, No. 34, Mk. I*

| | |
|------------------|---------------|
| Stores Ref. | 12A/10886 |
| Length | 2ft., approx. |

GENERAL DESCRIPTION

5. The bomb consists of a body, filled with high explosive, and a detachable tail which is secured to the bomb body by four wing bolts.

Bomb body

6. The bomb body, see fig. 1 and 2, is a hollow steel casting with an opening at each end. The opening in the nose is fitted with a nose bush which is screwed in and welded in position, and the opening in the rear end is fitted with a filling plug which has a central bore. The bore of the nose bush and that of the filling plug are threaded.

7. Two exploder containers, which are similar except in length, are screwed one into the nose bush and the other into the filling plug, the longer one being in the nose bush. These exploder containers are closed at their inner ends and flanged at their outer ends, the flanges being seated on shoulders in the nose bush and filling plug respectively. The exploder containers are locked in position by locking screws, and their outer ends accommodate detonator holders.

8. Each detonator holder is screwed into the exploder container, and has a flange at its outer end which seats in a recess in the exploder container. The detonator holders are locked in position by locking screws, and are threaded internally to take a pistol or a plug, whilst the inner end of each detonator holder has a central hole for the detonator stem. The flange of each detonator holder has four plain holes to take the lug on the locking spring of the pistol when assembled to the bomb. The tail pistol is in position when the bomb is supplied, and the detonator holder in the nose is closed by the nose plug.

9. The bomb body has three sets of tapped holes for the securing screws of a central suspension lug and fore and aft hoisting brackets, which fittings are assembled to the bomb body when required for suspending and locating the bomb on the aircraft. The tapped holes are plugged with transit screws during transit of the bomb body on its transit base, and the suspension and hoisting fittings, with their securing bolts, are carried in the transit base.

10. The rear end of the bomb body is shaped to receive the tail, and is provided with a pin for locating the tail in correct relation to the suspension and hoisting fittings, whilst the rear face has two sets of four threaded holes, one set for the wing bolts of the tail, and the other set for the bolts securing the transit base to the bomb body.

Filling

11. The main filling consists of amatol 50/50 or 60/40, or amatex 51/40/9, and it is sealed at the ends by layers of approved composition.

12. The exploder container in the nose of the bomb body houses a T.N.T. and a C.E. exploder covered by a felt washer, and it is protected from the main filling by a paper tube.

A.P.116611B, Vol. I, Sect. 1, Chap. 8

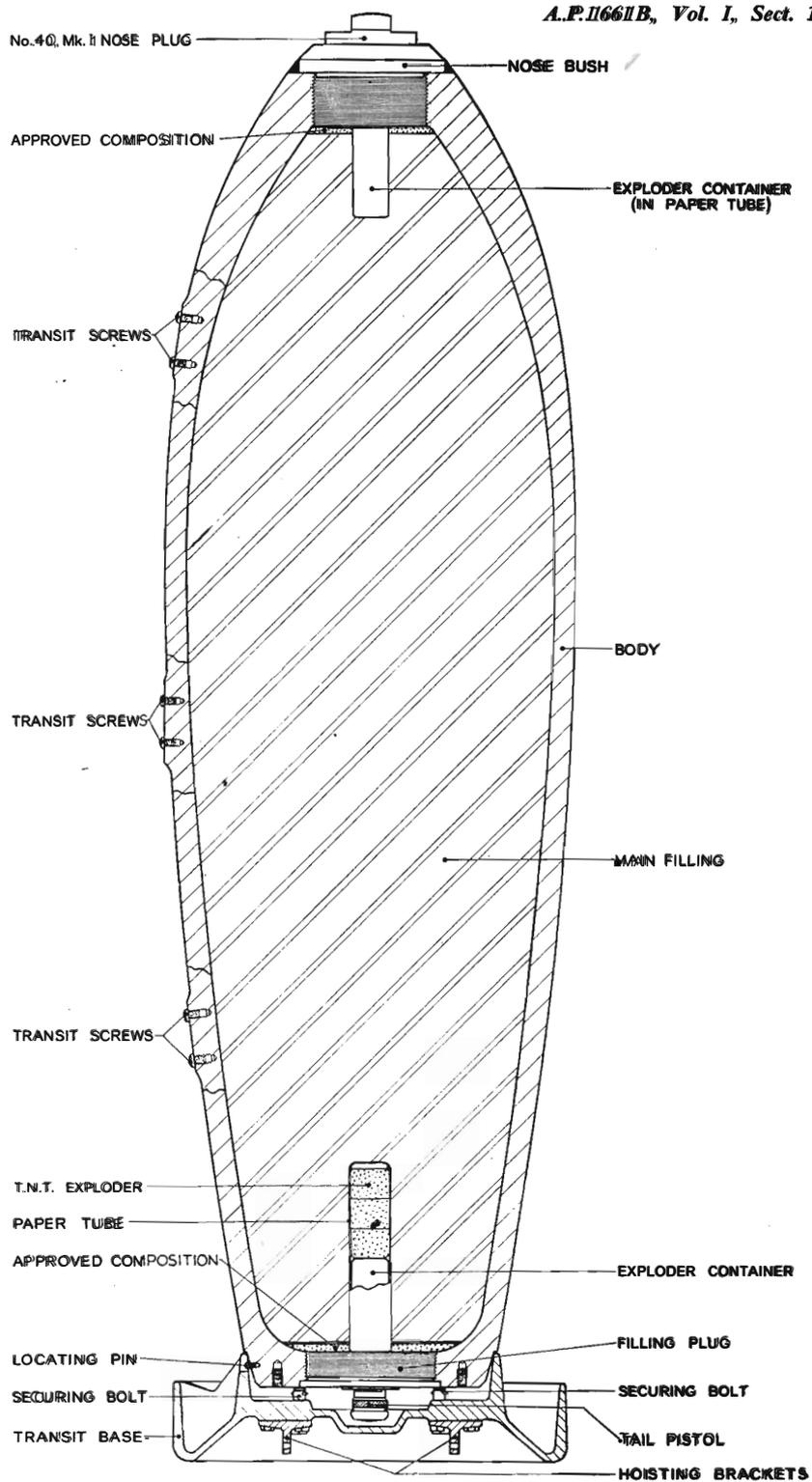


Fig. 1.—Bomb, H.E., aircraft, G.P., 4,000 lb., Mk II, on transit base

13. The exploder in the tail fuzeing position houses a C.E. exploder covered by a felt washer; and it is protected from the main filling by a paper tube which also houses a T.N.T. exploder with a felt disc at the inner end.

Nose plug

14. The plug, bomb, nose, No. 40, Mk. I consists of a disc which has on its underside a shallow recess with a short screwed spigot at the centre for screwing into the detonator holder in the nose of the bomb, the spigot being fitted with a sealing washer. The top of the disc has a head with a transverse hole for a tommy bar.

Tail

15. The tail, bomb, aircraft, No. 34, Mk. I, see fig. 3, consists of a cylindrical tail vane connected by four vane supports to a tail cone which is fitted with an arming mechanism for the tail pistol.

16. A cone ring is riveted in the tail cone a short distance from its forward edge, and it has four holes each of which accommodates a wing bolt for securing the tail to the bomb body. Each wing bolt has a spring washer on its shank between the head and the cone ring, and the bolt is prevented from withdrawal from the cone ring by a split pin passed through a hole in its shank.

17. Four hand holes are provided in the tail cone to give access to the heads of the wing bolts, and a notch is provided in the forward edge of the tail cone for engaging the tail locating pin on the rear end of the bomb body.

18. A spider, formed of crossed strips, is secured in the tail cone to the rear of the cone ring, and it has a bearing hole at the centre for the forward end of an arming spindle which extends through a cone bush secured in the apex of the cone.

19. The forward end of the arming spindle has secured to it a fork for engaging the arming fork of the tail pistol, whilst the rear end of the spindle is fitted with a four-bladed arming vane which is prevented from rotating by a safety clip fitted over the end of the cone bush and positioned by the head of a screw on the clip engaging a hole in the cone bush. The apex of the tail cone, with its cone bush and arming vane, projects beyond the rear edge of the cylindrical tail vane.

Transit base

20. The base, transit, aircraft bomb, No. 30, Mk. I, see fig. 4, is a circular casting having a central recess which accommodates the rear end of the bomb body, and a depression at the centre of this recess houses the head of the tail pistol.

21. Four equi-spaced holes are fitted with bolts for securing the transit base to the bomb body. The securing bolts carry spring washers between their heads and the underside of the transit base, and they are prevented from removal by split pins passed through holes in the bolt shanks.

22. The upper edge of the flange of the transit base surrounding the recess is formed with a notch to accommodate the tail locating pin on the rear end of the bomb body, and the inner face of this flange has bearing surfaces for locating the rear end of the bomb body centrally in the recess.

23. The underside of the transit base is formed with seatings for the suspension lug and for the two hoisting brackets, threaded holes being provided to take the screws which secure the fittings in position. The seating for the suspension lug also has four counterbored clearance holes to accommodate spare securing screws, which are retained in position by the suspension lug so long as it is secured to the transit base.

24. The transit base is recessed on its underside to afford clearance and protection for the fittings which it accommodates, and also for the heads of the bolts which secure it to the bomb body.

Identification colouring and markings

Colouring

25. The bomb body is painted dark green with a light green band, 2 in. wide, round its maximum diameter, and a red band, $\frac{1}{2}$ in. wide, round the nose. The tail is painted dark green, and the transit base is painted buff.

Markings on the bomb body

26. Towards the rear end of the bomb body, and on the same side as the suspension lug and hoisting bracket positions, are stencilled in black the following particulars:—

- (i) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (ii) The date of filling, month and year.
- (iii) The lot number of the filling.
- (iv) The type, weight, and the mark of the bomb.
- (v) The design number of the method of filling.

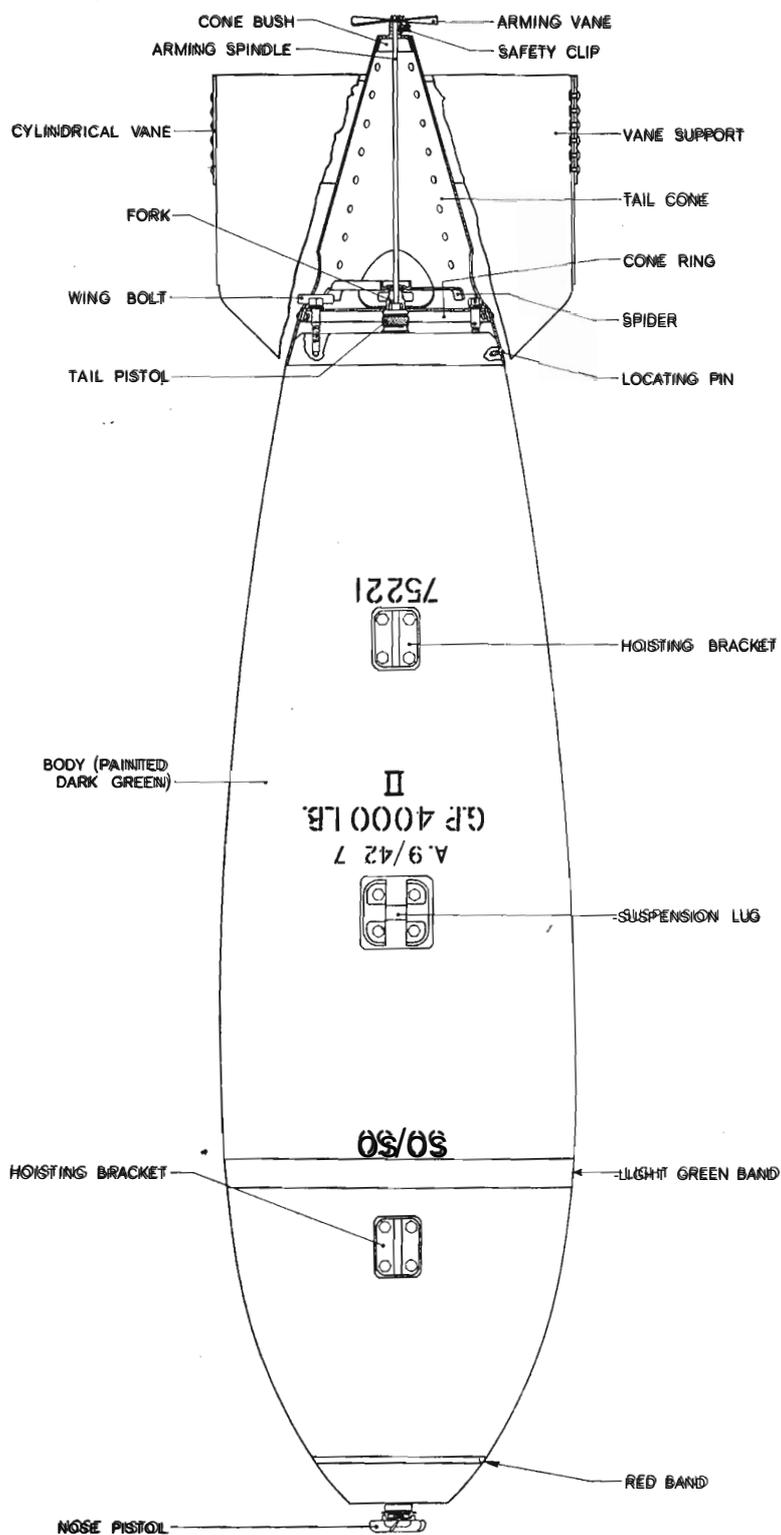


Fig. 3.—Bomb, H.E., aircraft, G.P., 4,000 lb., Mk. III, with tail fitted (bomb fuzed nose and tail)

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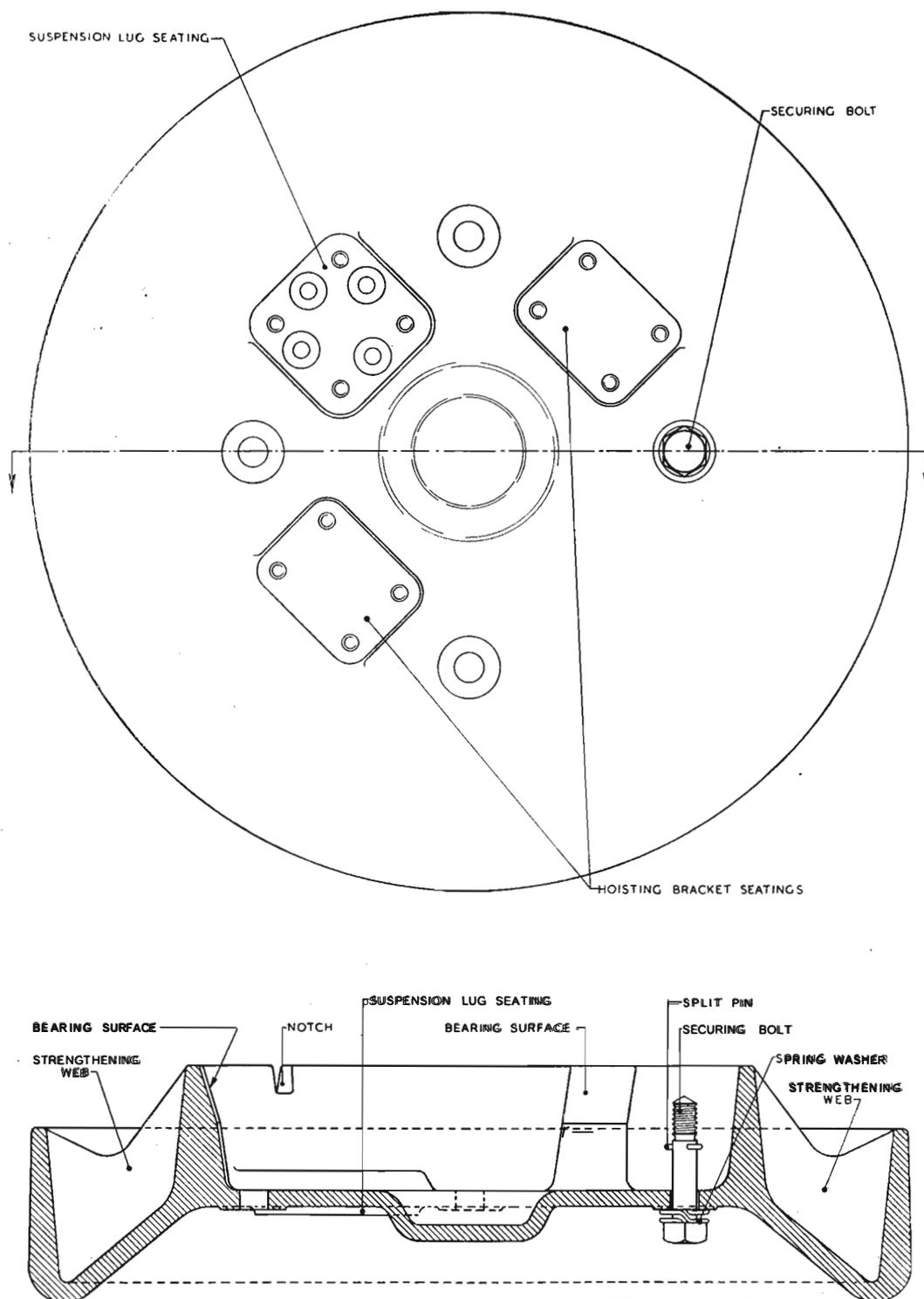


Fig. 4.—Base, transit, aircraft bomb, No. 30, Mk. I

F (1661B)

The ratio 50/50, or 60/40, as applicable, for the amatol filling, or the marking "AMATEX 51/40/9," is stencilled, in black, to the rear of the light green band.

27. Towards the nose of the bomb body, and on the same side as the suspension lug position, are stamped the following body manufacturer's markings:—

- (i) The type, weight, and mark of the bomb.
- (ii) The body manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the nose plug

28. The following markings are stamped on the head of the nose plug:—

- (i) The date of manufacture, month and year.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) "No. 40. I".

Markings on the tail

29. The following markings are stamped on the cylindrical tail vane:—

- (i) "No. 34. I".
- (ii) The manufacturer's initials or recognized trade mark
- (iii) The date of manufacture, month and year.

After the tail has been painted, the marking "No. 34. I" is stencilled in black, on the cylindrical tail vane.

Markings on the transit base

30. The marking "No. 30 Mk. I. 3800 lb." is cast on the underside of the transit base, and the manufacturer's initials and the date of manufacture, month and year, are cast on the bottom of the central recess in the upper side of the transit base.

Functioning

31. When the bomb is released from the aircraft, the appropriate fuze-setting control links remove the safety clips from the arming mechanism in the tail, and from the nose pistol if the bomb is fuzed at the nose, thus freeing the arming vanes.

32. During the flight of the bomb, the arming vanes rotate so as to arm the pistols, and on impact of the bomb with the target, the pistol strikers are forced against their respective detonators, causing them to function. The firing of the detonators initiates the associated exploders which detonate the main filling of the bomb.

33. If the bomb is fuzed both at the nose and the tail, each with an instantaneous detonator, the nose fuze will function first.

INSTRUCTIONS FOR USE

Fuzing the bomb

34. The bomb may be fuzed at both the nose and the tail or at the tail only, in which latter instance the nose plug is left in position.

Fuzing at the nose

35. Remove the nose plug.

36. Ensure that the detonator cavity is clear, using gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 112A/344); the engraved line for the 250/500 lb. bombs is applicable to the 4,000 lb. G.P. bombs. Bombs which fail to pass this gauge test must be set aside for A.I.D. inspection.

37. Insert the appropriate detonator in the detonator cavity. Insert the nose pistol in the detonator holder in the nose of the bomb and screw it in by hand until it is well seated on its washer and locked in position.

Fuzing at the tail

38. Remove the transit base by unscrewing the four securing bolts.

39. Remove the tail pistol, by hand, from the detonator holder in the rear end of the bomb.

40. Ensure that the detonator cavity is clear, using gauge, cavity, detonator, No. 2 Mk. I (Stores Ref. 112A/344); the engraved line for the 250/500 lb. bombs is applicable to the 4,000 lb. G.P. bombs. Bombs which fail to pass this gauge test must be set aside for A.I.D. inspection.

41. Insert the appropriate detonator in the detonator cavity.

42. Remove the overseal, press-cap, and safety plate from the tail pistol, and test the arming fork of the pistol for freedom of rotation, finally screwing it lightly against the body of the pistol.

43. Insert the tail pistol in the detonator holder in the rear end of the bomb and screw it in by hand until it is well seated on its washer and locked in position.

Assembling the tail to the bomb body

44. Offer up the tail to the rear end of the bomb body with the notch in the forward edge of the tail cone in line with the tail locating pin on the bomb body, and ensure that the arming fork of the tail pistol is not fouled by the fork of the arming mechanism in the tail.

45. Push the tail firmly into position on the rear end of the bomb body and secure it by screwing home the four wing bolts.

Assembling the suspension fittings

46. Remove the suspension lug and hoisting brackets from the underside of the transit base by unscrewing the screws which secure them to their seatings. Remove the four spare screws from the counterbored holes in the suspension lug seating, and replace the four screws which secured the suspension lug to the transit base.

47. Remove the four transit screws from the suspension lug position on the side of the bomb body and set them aside for use again should this be necessary. Place the suspension lug in position on the bomb body and secure it with the four spare screws; these screws have fibre inserts, and care should be taken to ensure that they are screwed tightly home to clamp the suspension lug firmly to the bomb body.

48. Remove the four transit screws from each of the hoisting bracket positions on the side of the bomb body, and screw them one into each hole in the hoisting bracket seatings in the transit base for use again if necessary. Place the hoisting brackets in position on the side of the bomb body and secure them with the screws which held them on their seatings on the transit base.

Loading the bomb on to the aircraft

49. Load the bomb on to the aircraft as described in the relevant chapter of A.P.1664, Vol. I, or in the Air Publication relevant to the aircraft, and in A.P.1005, Vol. I, Sect. X, Chap. 6 which describes the loading and cocking of the E.M. release unit, Type F and F/W. Finally connect the safety clip of the arming mechanism in the tail of the bomb, and also the safety clip of the nose pistol if the bomb is fuzeed at the nose, to appropriate fuze-setting control links on the aircraft, remove the safety pin from the nose pistol, if fitted, and hand it to the pilot or the bomb aimer immediately before the aircraft is ready to take off.

Unloading the bomb from the aircraft

50. Replace the safety pin in the safety clip of the nose pistol if the bomb is fuzeed at the nose,

51. Disconnect the fuze-setting control link from the safety clip on the arming mechanism in the tail of the bomb, and, if the bomb is fuzeed at the nose, disconnect the other fuze-setting control link from the safety clip of the nose pistol. Finally unload the bomb from the aircraft as described in the relevant chapter of A.P.1664, Vol. I or in the Air Publication relevant to the aircraft, making sure that the bomb is adequately supported by the hoisting gear before operating the mechanical release of the E.M. release unit, Type F or F/W, to free the suspension lug and allow the bomb to be lowered.

Unfuzeing the bomb**Nose**

52. Remove the nose pistol by hand, and remove the detonator, using extractor, detonator No. 2, Mk. I (Stores Ref. 12A/348). Replace the No. 40 plug in the nose of the bomb, screwing it tightly home into the detonator holder.

Tail

53. Remove the tail from the bomb body by unscrewing the four wing bolts.

54. Replace the safety plate and the press-cap of the tail pistol. **In the unlikely event of the pistol arming fork standing proud of the top of the pistol body, no attempt must be made to replace the safety plate and the press-cap whilst the pistol is in position in the detonator holder; in that event, the tail pistol must be removed from the detonator holder by hand and the arming fork then screwed lightly home against the pistol body before replacing the safety plate and the press-cap.**

55. Remove the tail pistol by hand, if this has not already been done, and extract the detonator using extractor, detonator, No. 2, Mk. I (Stores Ref. 12A/348). Replace the tail pistol in the detonator holder.

Assembling the bomb to the transit base

56. Assemble the transit base to the rear end of the bomb body with the notch in the inner flange of the transit base engaging the tail locating pin on the bomb body; and screw the four bolts in the transit base into the tapped holes in the rear end of the bomb body.

57. If the bomb is to be prepared for transit, the suspension and hoisting fittings should be removed from the bomb and be replaced on the transit base, for protection, as follows:—

- (i) Remove the suspension lug and hoisting brackets from the bomb, and replace the transit screws in the tapped holes in the bomb body. The transit screws for the hoisting brackets are in the transit base.
- (ii) Replace the four spare screws for the suspension lug in the plain counterbored holes in the suspension lug seating on the transit base, remove the other four securing screws from the tapped holes in that seating, place the suspension lug in the seating, and secure it in position with the securing screws.
- (iii) Replace the hoisting brackets on their seatings on the transit base, and secure them in position with their securing screws.

SUPPLY AND STORAGE

Supply

58. The bomb, H.E., aircraft, G.P., 4,000 lb., Mk. II is supplied under Stores Ref. 12A/1092, assembled to base, transit, aircraft bomb, No. 30, Mk. I (Stores Ref. 12A/1088). A plug, bomb, nose, No. 40, Mk. I (Stores Ref. 12A/1085) is supplied assembled to the nose of the bomb, and a No. 28 pistol, or a No. 30 pistol, in the rear end of the bomb body, serves as a transit plug. No. 27 or other pistols required for nose fuzeing are issued separately.

59. The tail, bomb, aircraft, No. 34, Mk. I is supplied under Store Ref. 12A/1086, packed in a clamp, protecting, B.396, Mk. I (Stores Ref. 12A/1087).

Storage

60. The bombs, H.E., aircraft, G.P., 4,000 lb., Mk. II are classified, for storage purposes, in Group VII. The No. 34, Mk. I tails, in their protecting clamps, and also the nose pistols, may be stored in the same explosives storehouse as the filled bombs, but they must be stacked well clear of the filled stores.

BOMB, H.E., AIRCRAFT, G.P., 4,000 lb., Mk. I

Leading particulars

61. Stores Ref. 12A/1084

The remaining leading particulars are the same as for the Mk. II bomb see para. 3 and 4.

GENERAL DESCRIPTION

Comparison with the Mk. II bomb

62. The G.P. 4,000 lb. Mk. I bomb differs from the G.P. 4,000 lb. Mk. II bomb in that it has two side fuzeing positions, near the rear end of the bomb body, in addition to the nose and tail fuzeing positions. These side fuzeing positions are afforded by adapters welded into the bomb body and fitted with exploder containers and detonator holders similar to those in the tail fuzeing position, the exploder containers being fitted with exploders and the detonator holders being closed by transit plugs which must be kept screwed up tight. The exploder containers of the side fuzeing positions extend radially into the bomb body from opposite sides and at an angle of 45 deg. to the suspension lug.

INSTRUCTIONS FOR USE

63. The instructions for use given in para. 34 to 57 apply equally to the G.P. 4,000 lb. Mk. I bomb.

64. The side fuzeing positions of the Mk. I bomb are to be used with special pistols if these are required for the particular operation, and only when specific instructions to side fuze the bomb are given.

SUPPLY AND STORAGE

Supply

65. The supply of the bomb, H.E., aircraft, G.P., 4,000 lb., Mk. I (Stores Ref. 12A/1084) is the same as for the Mk. II bomb, see para. 58, except that in addition the side fuzeing positions are closed by transit plugs.

66. The tail, bomb, aircraft, No. 34, Mk. I (Stores Ref. 12A/1086) is supplied as described in para. 59.

Storage

67. The bomb, H.E., aircraft, G.P., 4,000 lb., Mk. I is classified, for storage purposes, in Group VII. The No. 34 Mk. I tails, in their protecting clamps, and also the nose pistols, may be stored in the same explosives storehouse as the filled bombs, but they must be stacked well clear of the filled stores.

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Relevant amendments up to A.L. 72
incorporated in this reprint
January, 1944

APPENDIX 1

COMPONENTS USED WITH G.P. BOMBS

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APPENDIX 1
COMPONENTS USED WITH G.F. BOMBS

TABLE 1
BOMBS, H.E., AIRCRAFT, G.P., 40 lb., Mk. I, II, and III

| <i>Nose fuuzing</i> | | |
|---|------------------------|----------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 29, Mk. I or II or No. 38, Mk. IM, II, IIM, III, or IV | No. 43, Mk. I (inst.) | Special, supplied in position |
| No. 45, Mk. I | No. 52, Mk. II (inst.) | |

TABLE 2
BOMBS, PARACHUTE, H.E., AIRCRAFT, G.P., 40 lb., Mk. I, II, and III

| <i>Nose fuuzing</i> | | |
|---------------------|-----------------------|----------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 33, Mk. I | No. 43, Mk. I (inst.) | Special, supplied in position |

TABLE 3
BOMBS, H.E., AIRCRAFT, G.P., 120 lb., Mk. I and H, supplied unexploded

| <i>Nose fuuzing</i> | | | <i>Tail fuuzing</i> | | | |
|------------------------|-------------------------|-------------------|------------------------|--|--------------------------|---------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator holder</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 19, Mk. I or II | No. 4, Mk. I (inst.) | No. 113, Mk. I | No. 21, Mk. I or II | 6-7 in., Mk. I, supplied in position | No. 22, Mk. I (inst.) | No. 119, Mk. III |

TABLE 4
BOMBS, H.E., AIRCRAFT, G.P., 120 lb., Mk. I and H, exploded to Scheme C

| <i>Nose fuuzing</i> | | | <i>Tail fuuzing</i> | | | |
|------------------------|-------------------------|-------------------------------------|------------------------|---|--------------------------|-------------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator holder</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 19, Mk. I or II | No. 4, Mk. I (inst.) | Special, supplied in position | No. 21, Mk. I or II | Adjustable, No. 3, Mk. I, supplied in position | No. 22, Mk. I (inst.) | Special, supplied in position |

TABLE 5

BOMBS, H.E., AIRCRAFT, G.P., 250 lb., Mk. I, II, and III, supplied unexploded

| <i>Nose fuuzing</i> | | | | | <i>Tail fuuzing</i> | | | |
|------------------------|----------------------------|------------------|------------------------------|------------------|------------------------|---|-----------------------------|--------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator holder</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 19, Mk. I or II | No. 4, Mk. I (inst.) | No. 16, Mk. I | 45 grain, No. 1, Mk. I | No. 16, Mk. I | No. 22, Mk. I or II | 6-7 in., Mk. I, supplied in position | No. 22, Mk. I (inst.) | No. 19, Mk. III |

TABLE 6

BOMBS, H.E., AIRCRAFT, G.P., 250 lb., Mk. I, H, and III, exploded to Scheme A

| <i>Nose fuuzing</i> | | | | | <i>Tail fuuzing</i> | | | |
|---------------------------|----------------------------|--|------------------------------|--|---------------------------|---|-----------------------------|--|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator holder</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 19, Mk. I or II | No. 4, Mk. I (inst.) | No. 16, Mk. I, supplied in position | 45 grain, No. 1, Mk. I | No. 16, Mk. I, supplied in position | No. 22, Mk. I or II | 6-7 in., Mk. I, supplied in position | No. 22, Mk. I (inst.) | No. 19, Mk. III, supplied in position |

TABLE 7

BOMBS, H.E., AIRCRAFT, G.P., 250 lb., Mk. I, H, and III, exploded to Scheme B

| <i>Nose fuuzing</i> | | | <i>Tail fuuzing</i> | | | |
|------------------------|-------------------------|--|------------------------|---|--------------------------|--|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator holder</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 19, Mk. I or II | No. 4, Mk. I (inst.) | No. 16, Mk. I, supplied in position | No. 22, Mk. I or II | Adjustable, No. 1, Mk. I or II, supplied in position | No. 33, Mk. I (inst.) | No. 19, Mk. III, supplied in position |

TABLE 8

BOMBS, H.E., AIRCRAFT, G.P., 250 lb., Mk. I, II, and III, exploded to Scheme C

| <i>Nose fuuzing</i> | | | <i>Tail fuuzing</i> | | | |
|------------------------|-------------------------|-------------------------------------|------------------------|--|--------------------------|-------------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator holder</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 19, Mk. I or II | No. 4, Mk. I (inst.) | Special, supplied in position | No. 22, Mk. I or II | Adjustable, No. 4, Mk. I, supplied in position | No. 33, Mk. I (inst.) | Special, supplied in position |

TABLE 9
BOMB, H.E., AIRCRAFT, G.P., 250 lb., Mb. IV

| <i>Nose fuuzing</i> | | | <i>Tail fuuzing</i> | | |
|-------------------------|--------------------------------|--|---|--|--|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 27, Mk. I* or II | No. 43, Mk. I (inst.) | Special, supplied in position | No. 28, Mk. I, II, II*, III, or IV | No. 43, Mk. I (inst.) No. 49, Mk. I or III (0.025 sec.) No. 44, Mk. I, II, or III (1 sec.) No. 35, Mk. II, III, or V (11 sec.) | Special, supplied in position |
| No. 42, Mk. I or II | No. 52, Mk. I or II (inst.) | | No. 30, Mk. II, III, III*, IV, or V | No. 52, Mk. I or II (inst.) No. 51, Mk. I (0.025 sec.) No. 50, Mk. I (0.14 sec.) No. 54, Mk. I (3 sec.) No. 55, Mk. I (11 sec.) | |
| No. 44, Mk. I | No. 52, Mk. II (inst.) | | | | |

TABLE 10
BOMBS, H.E., AIRCRAFT, G.P., 500 lb., Mb. I, II, and III, supplied unexplodered

| <i>Nose fuuzing</i> | | | <i>Tail fuuzing</i> | | | |
|------------------------|-------------------------|------------------|------------------------|---|--------------------------|--------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator holder</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 19, Mk. I or II | No. 4, Mk. I (inst.) | No. 16, Mk. I | No. 22, Mk. I or II | 30.8 in., Mk. II, supplied in position | No. 18, Mk. I (inst.) | No. 19, Mk. III |

TABLE 11
BOMBS, H.E., AIRCRAFT, G.P., 500 lb., Mb. I, II, and III, explodered to Scheme A

| <i>Nose fuuzing</i> | | | <i>Tail fuuzing</i> | | | |
|------------------------|-------------------------|---|------------------------|--|--------------------------|---|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator holder</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 19, Mk. I or II | No. 4, Mk. I (inst.) | No. 16, Mk. I, supplied in position | No. 22, Mk. I or II | 30.8 in., Mk. II, supplied in position | No. 18, Mk. I (inst.) | No. 19, Mk. III, supplied in position |

TABLE 12
BOMBS, H.E., AIRCRAFT, G.P., 500 lb., Mb. I, II, and III, explodered to Scheme B

| <i>Nose fuuzing</i> | | | <i>Tail fuuzing</i> | | | |
|------------------------|-------------------------|---|------------------------|--|--------------------------|---|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator holder</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 19, Mk. I or II | No. 4, Mk. I (inst.) | No. 16, Mk. I, supplied in position | No. 22, Mk. I or II | Adjustable, No. 2, Mk. I, supplied in position | No. 18, Mk. I (inst.) | No. 19, Mk. III, supplied in position |

TABLE 13
BOMBS, H.E., AIRCRAFT, G.P., 500 lb., Mk. I, II and III, exploded to Scheme C

| <i>Nose fuuzing</i> | | | <i>Tail fuuzing</i> | | | |
|------------------------|-------------------------|-------------------------------------|------------------------|--|--------------------------|-------------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator holder</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 19, Mk. I or II | No. 4, Mk. I (inst.) | Special, supplied in position | No. 22, Mk. I or II | Adjustable, No. 5, Mk. I, supplied in position | No. 18, Mk. I (inst.) | Special, supplied in position |

TABLE 14
BOMB, H.E., AIRCRAFT, G.P., 500 lb., Mk. IV

| <i>Nose Fuuzing</i> | | | <i>Tail fuuzing</i> | | |
|-------------------------|--------------------------------|--|--|---|--|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 27, Mk. I* or II | No. 43, Mk. I (inst.) | Special, supplied in position | No. 28, Mk. I, II, II*, III, or IV | No. 43, Mk. I (inst.) No. 49, Mk. I or III (0-025 sec.) No. 47, Mk. I or III (0-12 sec.) No. 44, Mk. I, II, or III (1 sec.) No. 35, Mk. II, III, or V (11 sec.) | Special, supplied in position |
| No. 42, Mk. I or II | No. 52, Mk. I or II (inst.) | | No. 30, Mk. II, III, III*, IV or V | No. 52, Mk. I or II (inst.) No. 51, Mk. I (0-025 sec.) No. 50, Mk. I (0-14 sec.) No. 54, Mk. I (3 sec.) | |
| No. 44, Mk. I | No. 52, Mk. II, (inst.) | | | | |

TABLE 15
BOMBS, H.E., AIRCRAFT, G.P., 1,000 lb., Mk. I and II

| <i>Nose fuuzing</i> | | | <i>Tail fuuzing</i> | | |
|-------------------------|--------------------------------|--|--|---|--|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 27, Mk. I* or II | No. 43, Mk. I (inst.) | Special, supplied in position | No. 28, Mk. I, II, II*, or III | No. 43, Mk. I (inst.) No. 49, Mk. I or III (0-025 sec.) No. 47, Mk. I or III (0-12 sec.) No. 44, Mk. I, II, or III (1 sec.) No. 35, Mk. II, III, or V (11 sec.) | Special, supplied in position |
| No. 42, Mk. I or II | No. 52, Mk. I or II (inst.) | | No. 30, Mk. II, III, III*, or IV | No. 52, Mk. I or II (inst.) No. 51, Mk. I (0-025 sec.) No. 50, Mk. I (0-14 sec.) No. 55, Mk. I (11 sec.) | |
| No. 44, Mk. I | No. 52, Mk. II (inst.) | | | | |

TABLE 16
BOMBS, H.E., AIRCRAFT, G.P., 1,000 lb., Mk. III and IV

| <i>Tail fuzeing</i> | | |
|--------------------------------|---|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 28, Mk. I, II, II*, or III | No. 43, Mk. I (inst.) No. 49, Mk. I or III (0-025 sec.) No. 47, Mk. I or III (0-12 sec.) No. 44, Mk. I, II, or III (1 sec.) No. 35, Mk. II, III, or V (11 sec.) | Special, supplied in position |
| No. 30, Mk. II, III* or IV | No. 52, Mk. I or II (inst.) No. 51, Mk. I (0-025 sec.) No. 50, Mk. I (0-14 sec.) No. 55, Mk. I (11 sec.) | |

TABLE 17
BOMB, H.E., AIRCRAFT, G.P., 1,900 lb., Mk. I

| <i>Nose fuzeing</i> | | | <i>Tail fuzeing</i> | | |
|----------------------|-----------------------------|-------------------------------|----------------------------------|--|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 27, Mk. I* or II | No. 43, Mk. I (inst.) | Special, supplied in position | No. 28, Mk. I, II, II* or III | No. 43, Mk. I (inst.) No. 49, Mk. I or III (0-025 sec.) No. 47, Mk. I or III (0-12 sec.) No. 44, Mk. I, II, or III (1 sec.) | Special, supplied in position |
| No. 42, Mk. I or II | No. 52, Mk. I or II (inst.) | | No. 30, Mk. II, III, III*, or IV | No. 52, Mk. I or II (inst.) No. 51, Mk. I (0-025 sec.) No. 50, Mk. I (0-14 sec.) No. 55, Mk. I (11 sec.) | |

TABLE 18
BOMBS, H.E., AIRCRAFT, G.P., 4,000 lb., Mk. I and H

| <i>Nose fuzeing</i> | | | <i>Tail fuzeing</i> | | |
|---------------------|-----------------------------|-------------------------------|---------------------------------|--|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 42, Mk. I or II | No. 52, Mk. I or II (inst.) | Special, supplied in position | No. 30, Mk. II, III, III* or IV | No. 52, Mk. I or II (inst.) No. 51, Mk. I (0-25 sec.) No. 50, Mk. I (0-14 sec.) No. 55, Mk. I (11 sec.) | Special, supplied in position |

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Section 2

A.P. BOMBS

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SECTION 2

A.P. BOMBS

LIST OF CHAPTERS

Note.—A list of contents appears at the beginning of each chapter.

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CHAPTER 2—Bombs, H.E., aircraft, A.P., 2,000 lb., Mk. I, II, and III

CHAPTER 3—Bombs, H.E., aircraft, A.P., 2,000 lb., Mk. II**, III* and IV

APPENDIX 1—Components used with A.P. bombs

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CHAPTER 1

General notes on A.P. bombs

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CHAPTER 1

General notes on A.P. bombs

Introduction

1. Only one type of A.P. bomb is at present in general use in the Service, namely the 2,000 lb. A.P. bomb, see Sect. 2, Chap. 2. A.P. bombs are used for the attack of heavily-armoured targets, such as capital ships, and are so constructed and fuzed that the bomb does not break up during penetration of the armour, and detonation of the bomb does not occur until penetration has been achieved. Owing to the thickness of the walls of the bomb body the charge/weight ratio is very small. A.P. bombs are fuzed only at the tail.

Fillings for A.P. bombs

2. A.P. bombs are usually filled with a picric type explosive, such as shellite. These explosives are very insensitive to shock or friction. This type of filling is rendered necessary by the friction between the filling and the bomb body caused by the rapid deceleration of the bomb whilst penetrating the target.

Precautions to be observed when fuizing or unfuizing bombs

3. Attention is called to the precautions detailed in Sect. 1, Chap. 1, which apply also to A.P. bombs.

Repair and examination of bombs

4. Only such repair and examination of bombs as is specified in Sect. 20, Chap. 1, is to be done by armament personnel. Any bomb found having major damage or defects is to be set aside for A.I.D. inspection. Particular attention is to be paid to the painting of bombs filled with picric type explosives; *lead-free paint, oils, etc., only are to be used.*

5. Fuzed bombs, whether loaded on to aircraft, or stored in the fuzed bomb area, must be examined at the intervals stated in Sect. 20, Chap. 2.

Supply

6. At present, A.P. bombs are supplied fitted with transit bases. Tail units and fuzes are supplied in separate packages.

Storage of bombs, bomb tails, and components

7. The regulations governing the storage of A.P. bombs are given in A.P.1245, Chap. 3. Tail units, in their packages may be stored in the same explosives storehouse as the filled bombs provided that the paint used on the tail packages is a lead-free paint. Tail units may also be stored in any suitable building or under suitable coverings.

8. Fuzes for use with A.P. bombs must be stored in the appropriate Explosives Group storehouse.

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CHAPTER 2

BOMBS, H.E., AIRCRAFT, A.P., 2,000 lb., Mk. I, H, and III

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 2. Fitting of tail to the Mk. I bomb
 3. Fitting of transit base to the Mk. I bomb
 4. Fitting of tail to the Mk. II bomb
 5. Fitting of transit base to the Mk. II bomb

CHAPTER 2

BOMBS, H.E., AIRCRAFT, A.P., 2,000 lb., Mk. I, II, and III

Introduction

1. The Mk. I, II, and III 2,000 lb. A.P. bombs are solid-nosed bombs, fuzed at the tail only. They are normally carried on the 2,000 lb. bomb carrier, Type A or B. The Mk. II and III bombs are similar and differ from the Mk. I bomb in having a different type of tail and transit base.

BOMB, H.E., AIRCRAFT, A.P., 2,000 lb., Mk. I

Leading particulars

Body, bomb, H.E., aircraft, A.P., 2,000 lb., Mk. I

- 2. Stores Ref. ... 12A/339
- Length, with tail adapter ... 6 ft. 5-9 in.
- Length, with tail ... 9 ft. 4-7 in.
- Maximum diameter ... 1 ft. 1-5 in.
- Weight of body ... 1,650 lb., approx.
- Weight of filling ... 166 lb., approx.
- Filling ... Shellite
- Terminal velocity ... 2,810 ft. per sec.

Tail, bomb, H.E., aircraft, A.P., 2,000 lb., No. 1, Mk. I

- 3. Stores Ref. ... 12A/340
- Length ... 2 ft. 10-65 in.

General description, fig. 1, 2, and 3

Bomb body

4. The bomb body is made of steel, and has a sharp solid nose approximately 11 ft. 9 in. long. The bomb body tapers slightly from the maximum diameter near the nose end to the tail end. The body is hollow and has an internal diameter of 8-7 in. The tail end of the bomb body is threaded internally to house a base adapter, which is screwed and cemented in position; it is also threaded externally to accommodate a tail adapter.

5. The base adapter is threaded internally and houses an exploder container which is screwed and cemented in position and which seats on to a composition washer. The exploder container is closed at one end, and is threaded internally at the opposite end, into which is screwed a fuze securing ring. This ring secures the fuze in position when the bomb is fuzed, or retains a No. 17 transit plug in position when the bomb is prepared for transit. A slot is cut on the inside of the exploder container, below the internal thread, to accommodate a positioning pin on the fuze body when the fuze is in position.

P4175 MI /25S7 4/44 7900 C&P Gp. 1

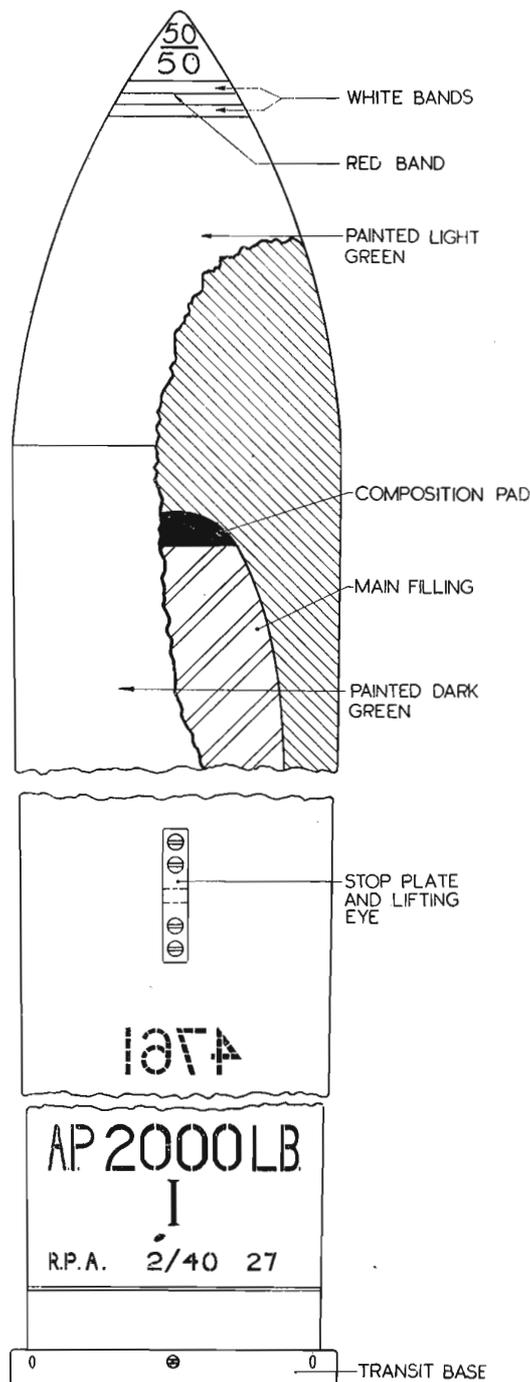


Fig. 1.—Bomb, H.E., aircraft, A.P., 2,000 lb., Mk. I, with transit base

A.P.1661B, Vol. I, Sect. 2, Chap. 2

6. The tail adapter is in the form of a ring, threaded internally at one end for screwing on to the bomb body, to which it is cemented and locked in position by a securing screw, which is positioned in the same plane as the slot in the exploder container. The opposite end of the tail adapter is flanged and tapered to take the bomb tail or transit base, either of which is secured to the tail adapter by six screws. The base adapter, exploder container, and tail adapter, have two holes each for inserting a key or tommy bar when assembling these items.

7. To facilitate handling and to locate the bomb on the bomb carrier, a combined stop plate and lifting eye is secured to the bomb body by four screws.

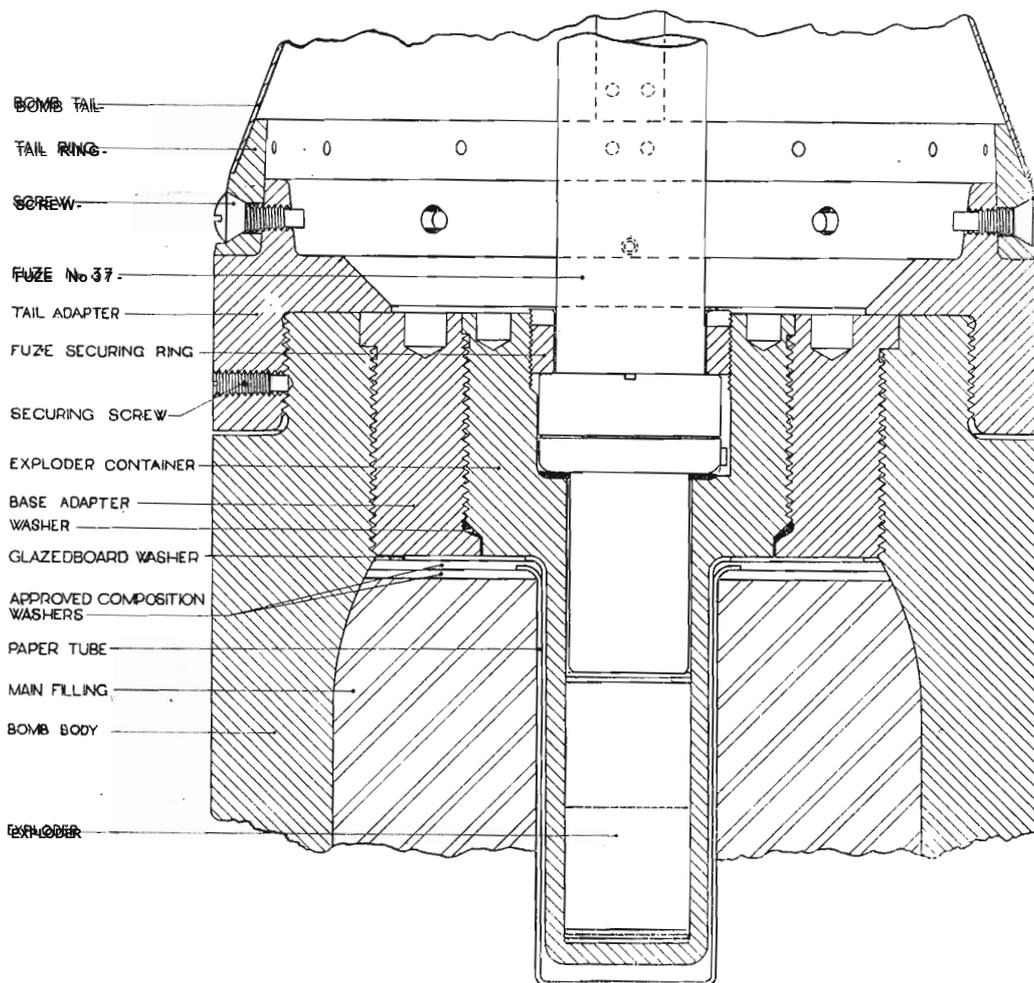


Fig. 2.—Fitting of tail to the Mk. I bomb

Tail

8. The tail, No. 1, 2,000 lb., A.P., Mk. I, is made of aluminium alloy, and consists of a cylindrical wane, attached to a tail cone by four wane supports. The tail cone is strengthened at the base by a tail ring, which, when the tail is assembled to the bomb, is secured to the tail adapter by the six screws used for securing the transit base to the tail adapter. A slot in the tail ring engages with a locating screw in the tail adapter, and locates the tail in the correct position.

Transit base

9. The bomb is supplied fitted with a base, transit, aircraft bomb, No. 9, Mk. I (Stores Ref. 112A/342), to protect the base of the bomb during transit. This transit base is in the form of a ring, and is secured to the tail adapter by six screws.

G (1661B)

Transit plug

10. The bomb is issued with a plug, transit, No. 17, Mk. I (Stores Ref. 12A/638), in position in the exploder container in place of the fuze. The plug seats on to a leather washer, and is secured

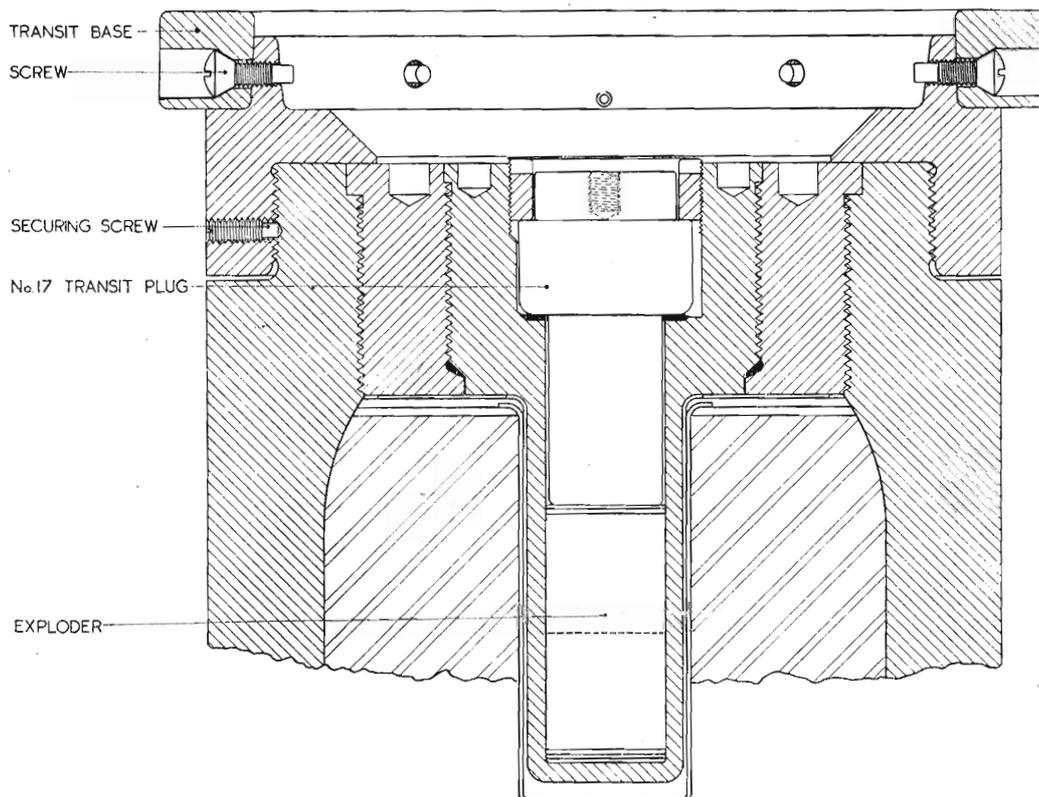


Fig. 3.—Fitting of transit base to the Mk. I bomb

in position by the fuze securing ring, and is provided with a tapped hole at the centre of its outer end to facilitate its removal.

Filling

11. The bomb body is filled with shellite, a pad of approved composition being inserted in the nose end of the body, and the filling being sealed with washers and cement. The exploder container is protected from the filling by a paper tube. An exploder, 8 oz., C.E., Mk. II, is issued in position in the exploder container, being located between packing disks at the inner end and sealing disks at the outer end.

Identification colouring and markings

Colouring

12. The exterior of the bomb and tail is painted dark green. The nose of the bomb is painted light green, except for three $\frac{1}{2}$ in. bands, coloured white, red, and white, respectively, positioned 4 in. to 5 $\frac{1}{2}$ in. from the tip of the nose. Stencilled in black between the tip of the nose and the first white band is the marking 50/50, denoting the composition of the shellite used in the filling of the bomb.

Markings on the bomb body

13. Near the base of the bomb, and on the same side as the stop plate, is stencilled in black the following information:—

- (i) A.P. 2,000 lb. I.

A.P.1661B, Vol. I, Sect. 2, Chap. 2

- (ii) The monogram of the filling station, or the filling contractor's initials or recognized trade mark.
 - (iii) The date of filling, month and year.
 - (iv) The lot number of the filled bomb.
14. On the reverse side of the body is stencilled in black the design number of the method of filling.
15. Stamped on the bomb body, near the stop plate, are the body manufacturer's markings as follows:—
- (i) I A.P. 2,000 lb.
 - (ii) The manufacturer's initials or recognized trade mark.
 - (iii) The date of manufacture.
16. The serial number of the bomb is stamped on the face of the exploder container and the base adapter, and on the side of the body and the tail adapter.

Markings on the transit plug and transit base

17. On the outer end of the transit plug is stamped No. 17, I, followed by the letter M, S, or F, denoting the material from which the plug is made, and the manufacturer's initials or recognized trade mark.

18. The transit base is marked as follows:—
- (i) 9 I, denoting the number and mark of the transit base.
 - (ii) The manufacturer's initials or recognized trade mark.

Fuzing the bomb

19. The fuze, percussion, aircraft bomb, tail, No. 37, Mk. I, is used in the fuzing of the bomb. A description of the fuze is given in A.P.1661C, Vol. I.

Preparing the fuze

20. Examine the fuze, and ensure that the lead seal and the wire that passes through the arming vane hub spigot and the safety pillar are intact. If the wire is broken or missing, or if the lead seal appears to have been damaged or to be of the wrong type, the fuze should be regarded as having been tampered with, and must not be used.

21. Remove the whipcord becket and the wire, with lead seal, from the arming vane hub spigot and the safety pillar.

22. Unscrew and remove the safety pillar from the end piece of the fuze.

23. Grip the arming vane hub spigot between the finger and thumb, and rotate it ten complete turns in an anti-clockwise direction when viewed from the arming vane end of the fuze. Then rotate it the same number of turns in a clockwise direction when viewed from the same end. This is done to ensure that the arming mechanism of the fuze is free. These turns can easily be counted by observing the number of times the half-round recess in the arming vane hub spigot passes the position in which the safety pillar was mounted.

Warning.—The arming vane should not be given more than ten turns in either direction, or the fuze may be armed.

24. Replace the safety pillar by screwing it into the end piece of the fuze.

25. Ensure that there is a rubber washer on the body of the fuze, and that the washer is in serviceable condition.

Preparing the bomb

26. Unscrew the six screws securing the transit base to the tail adapter, and remove the transit base.

27. Unscrew the fuze securing ring and remove the No. 17 transit plug, using a No. 129 key.

28. Insert the fuze into the exploder container in the bomb body, ensuring that the positioning pin on the fuze enters the slot in the exploder container. Place the fuze securing ring in position over the fuze and screw the securing ring tightly into the exploder container, using a No. 129 key. Test the firmness of the fuze by gripping the tail-piece; there should be no movement of the fuze if the fuze securing ring has been correctly tightened.

29. Place the tail over the end of the bomb body, ensuring that the locating screw in the tail adapter enters the slot in the tail ring, and secure the tail firmly in position on the tail adapter, using the six screws used for securing the transit base.

Loading the bomb on to the 2,000 lb. bomb carrier

30. Load the fuze**d** bomb on to the aircraft bomb carrier as described in A.P. 1664, Vol. I, Chap. 5, ensuring that the stop plate engages with the key plate on the bomb carrier.

31. Fit the hub of the arming vane on to the arming vane hub spigot, insert the split pin into the hole in the arming vane hub and spigot, and open out the ends of the split pin.

32. Fit the safety clip round the end piece of the fuze, and engage the fuze-setting control link with the safety clip.

33. Unscrew the safety pillar and remove it from the end piece of the fuze immediately before the aircraft is ready to take off.

Functioning

34. When the bomb is released from the carrier, the safety clip is pulled off the end piece of the fuze, and the arming vane of the fuze rotates due to the air pressure. After the requisite number of turns of the arming vane, the fuze becomes fully armed, and on impact of the bomb with the target the detonator in the fuze is fired. After a fixed delay of 0-10 sec., the explosion of the filling in the magazine of the fuze initiates the exploder in the exploder container in the bomb body, which in turn detonates the main filling in the bomb.

Unloading an unexpended bomb from the 2,000 lb. bomb carrier

35. Replace the safety pillar by screwing it into the end piece of the fuze.

36. Disengage the fuze-setting control link from the safety clip, and remove the safety clip from the fuze.

37. Withdraw the split pin, and remove the arming vane from the arming vane hub spindle.

38. Unload the bomb from the bomb carrier as described in A.P. 1664, Vol. I, Chap. 5.

Unfuzing the bomb

39. Remove the tail from the bomb by unscrewing the six securing screws.

40. Unscrew the fuze securing ring, using key No. 129, and remove the fuze from the bomb. Thoroughly dry the exterior of the fuze with a dry cloth.

41. After the No. 37 fuze has been dried, it should be treated as described in A.P. 1661C, Vol. I, Sect. 2, and repacked in its cylinder and box.

42. Dry the exploder container in the bomb body, insert the transit plug, with leather washer, and secure it in position with the fuze securing ring.

Supply

43. The bomb, H.E., aircraft, A.P., 2,000 lb., Mk. I, is supplied with a base, transit, aircraft bomb, No. 9, Mk. I, and a plug, transit, No. 17, Mk. I, in position. The tail, bomb, H.F., aircraft, A.P., 2,000 lb., No. 11, Mk. I, is supplied in Box B.245, Mk. I (Stores Ref. 12A/341).

Storage

44. Bombs, H.E., aircraft, A.P., 2,000 lb., Mk. I, are classified, for the purpose of storage, in Group VII.

BOMB, H.E., AIRCRAFT, A.P., 2,000 lb., Mk. II

45. The bomb, H.E., aircraft, A.P., 2,000 lb., Mk. II, is similar to the Mk. I bomb, except for the differences described in the following paragraphs.

Leading particulars

Body, bomb, H.E., aircraft, A.P., 2,000 lb., Mk. II

| | | |
|-----|---------------------------|---------------|
| 46. | Store Ref. | 12A/838 |
| | Length, with tail adapter | 6 ft. 5-9 in. |
| | Length, with tail | 9 ft. 4-5 in. |

Tail, bomb, H.E., aircraft, A.P., 2,000 lb., No. 15, Mk. I

| | | |
|-----|-------------|----------------|
| 47. | Stores Ref. | 12A/840 |
| | Length | 2 ft. 11-5 in. |

General description, fig. 4 and 5

Bomb body

48. The body, base adapter, and exploder container, are similar to those of the Mk. I bomb. The tail adapter, which is screwed on to the bomb body and is locked in a similar manner to the tail adapter in the Mk. I bomb, has four equi-spaced holes which are threaded for the attachment of the tail. Four threaded holes are also provided for the attachment of the transit base. A locating screw is also provided on the tail adapter for positioning the tail on assembly, and two holes on the face of the tail adapter provide a location for the transit base when it is assembled to the bomb. The stop plate is not fitted to the bomb body when in transit, and the holes for its securing screws are plugged with transit screws.

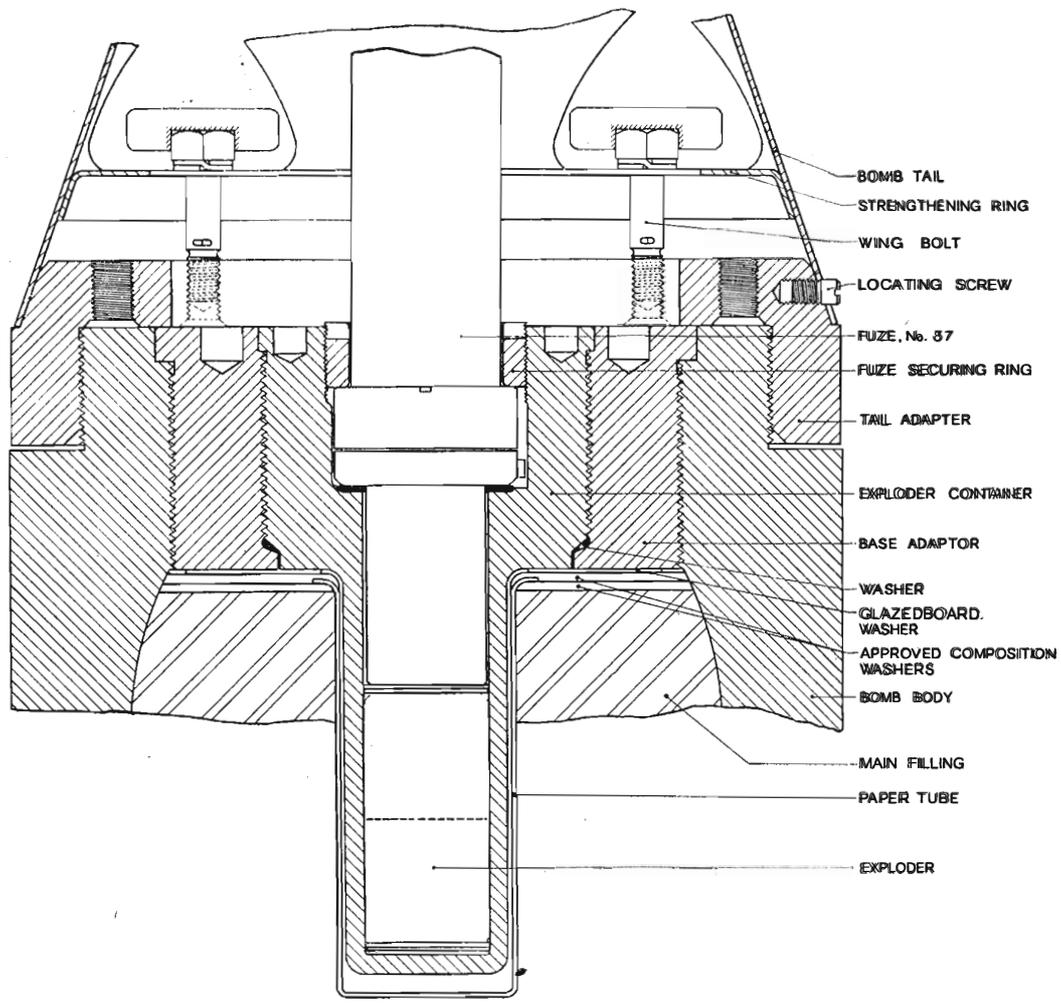


Fig. 4.—Fitting of tail to the Mk. II bomb

Tail

49. The tail, No. 15, Mk. I, is similar in construction to the No. 1, Mk. I tail used on the Mk. I bomb, but is made of steel. It has a strengthening ring fitted 2 in. from the base, instead of a tail ring, and it is screwed to the tail adapter by four wing bolts, each locked in position by a spring washer. A locating slot in the base of the tail cone engages with the locating screw in the tail adapter and positions the tail on assembly. In the tail cone, opposite each wing bolt, is a hand hole.

Transit base

50. The bomb is supplied with base, transit, aircraft bomb, No. 27, Mk. II (Stores Ref. 12A/839) in position on the tail adapter. This transit base is secured to the tail adapter by four wing bolts, locked by spring washers. Two locating screws are screwed into the transit base, the heads of the screws engaging in the holes provided in the tail adapter when the transit base is assembled to the bomb body. A seating is provided in the transit base for the stop plate, and in this seating are recesses to take four screws for securing the stop plate to the bomb body. The stop plate is retained on the seating by four securing screws.

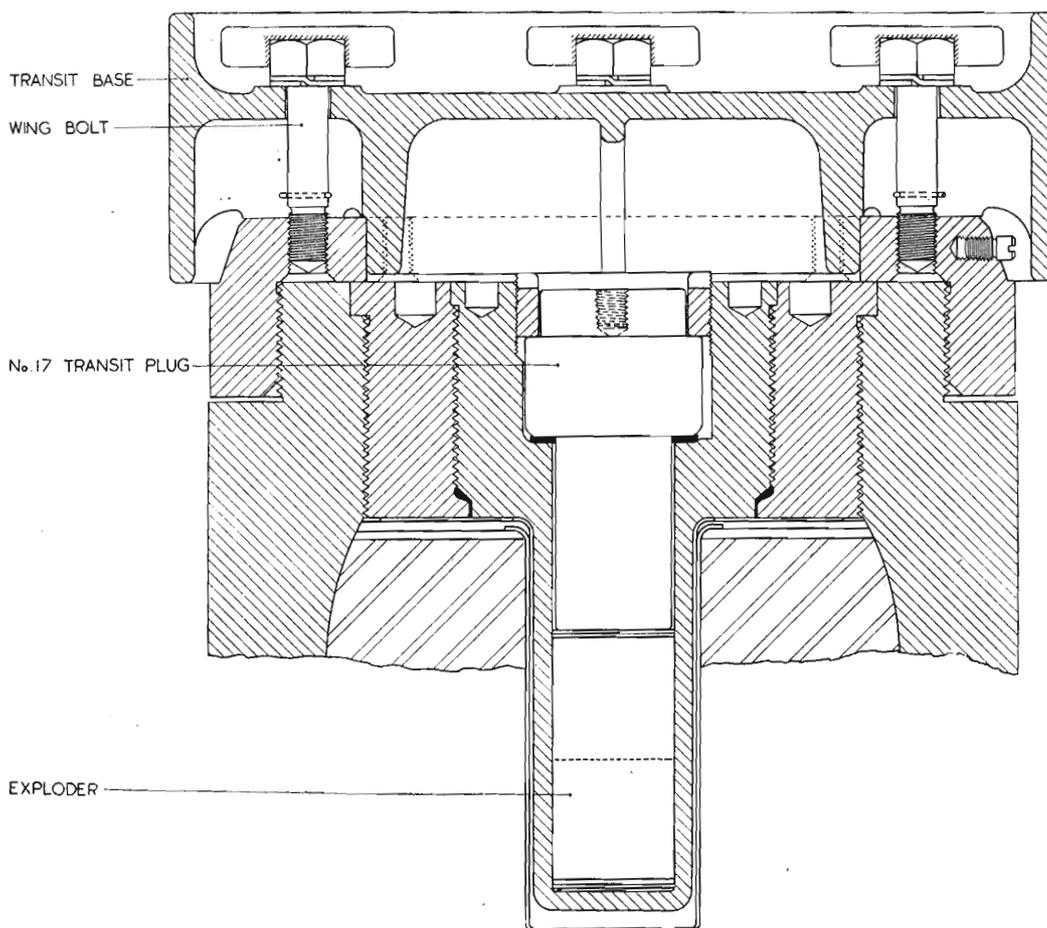


Fig. 5.—Fitting of transit base to the Mk. II bomb

Identification colouring and markings

Colouring

51. The exterior of the bomb and tail is painted dark green. The nose of the bomb is painted light green, except for three $\frac{1}{2}$ in. bands, coloured white, red, and white, respectively, positioned 4 in. to $5\frac{1}{2}$ in. from the tip of the nose. Stencilled in black between the tip of the nose and the first white band is the marking 50/50, denoting the composition of the shellite used in the filling of the bomb.

Markings on the bomb body

52. Near the base of the bomb, and on the same side as the stop plate is stencilled in black, the following information:—

- (a) A.P. 2,000 lb. II.

A.P.1661B, Vol. I, Secl. 2, Chap. 2

- (ii) The monogram of the filling station, or the filling contractor's initials or recognized trade mark.
- (iii) The date of filling, month and year.
- (iv) The lot number of the filled bomb.

53. On the reverse side of the bomb is stencilled in black the design number of the method of filling.

54. Stamped on the bomb body, near the stop plate, are the body manufacturer's markings as follows:—

- (i) II A.P. 2,000 lb.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture.

The last two markings are also stamped on the side of the stop plate, on the reverse side of which is the marking No. 3 I.

55. The serial number of the bomb is stamped on the face of the exploder container and the base adapter, and on the side of the body and the tail adapter.

Markings on the tail

56. On the outside of the cylindrical tail vane is stencilled in black, No. 15 I. On the opposite side of the vane is stamped the following:—

- (i) No. 15 I A.P. 2,000 lb.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture.

Markings on the transit plug and transit base

57. On the outer end of the transit plug is stamped No. 17, I, followed by the letter M, S, or F, denoting the material from which the plug is made, and the manufacturer's initials or recognized trade mark.

58. The transit base is painted dark green, and on the top is stencilled in black, the following:—

- (i) No. 27, Mk. I.
- (ii) A.P., 2,000 lb.

On the reverse side is stamped or cast the following:—

- (i) 27 I.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture.

Fuzing the bomb

59. Unscrew and remove the four transit screws from the stop plate position on the bomb body.

60. Unscrew the four wing bolts and remove the transit base from the tail adapter. Remove the stop plate from the transit base and secure it firmly in position on the bomb body, using the four screws housed in the recesses in the transit base.

Note.—The four screws should be screwed in securely, and the transit screws used in the bomb body are to be inserted in the transit base for further use.

61. Fuzed the bomb as described in para. 20 to 25, and para. 27 and 28.

62. Place the tail over the end of the bomb body, ensuring that the locating slot engages with the locating screw in the tail adapter, and secure the tail firmly in position with the four wing bolts.

Loading the bomb on to the 2,000 lb. bomb carrier

63. Load the fuzed bomb on to the bomb carrier as described in A.P.1664, Vol. I, Chap. 5, and para. 31 to 33.

Functioning

64. The bomb functions in a similar manner to the Mk. I bomb, see para. 34.

Unloading an unexpended bomb from the 2,000 lb. bomb carrier

65. Unload the bomb from the bomb carrier as described in para. 35 to 37, and A.P.1664, Vol. I, Chap. 5.

Unfuzing the bomb

66. Remove the tail from the tail adapter by unscrewing the four wing bolts.
67. Remove the fuze and replace the No. 17 transit plug as described in para. 40 to 42.

Supply

68. The bomb, H.E., aircraft, A.P., 2,000 lb., Mk. II, is supplied with a base, transit, aircraft bomb, No. 27, Mk. I, and a plug transit, No. 17, Mk. I in position. The tail, bomb, H.E., aircraft, A.P., 2,000 lb., No. 15, Mk. I, is supplied in Clamp, protecting, B.344, Mk. I (Stores Ref. 12A/841).

Storage

69. Bombs, H.E., aircraft, A.P., 2,000 lb., Mk. II, are classified for the purpose of storage in Group VII.

*This leaf issued with A.L. No. 82
June, 1944*

A.P.1661B, Vol. I, Sect. 2

CHAPTER 3

BOMBS, H.E., AIRCRAFT, A.P., 2,000 lb., Mk. II, HI* and IV**

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1. Sectional view through Mk. IV bomb, ready for use
 2. Mk. IV bomb, ready for transit

CHAPTER 3

BOMBS, H.E., AIRCRAFT, A.P., 2,000 lb., Mk. II**, III*, and IV

Introduction

1. These bombs are for use against heavily armoured targets. They are carried on the 2,000 lb. bomb carrier.

2. The bombs are fuzed only at the tail using a No. 30 Mk. IV pistol and a No. 56, 0.05 sec. delay detonator (Stores Ref. 12G/843). The pistol is supplied fitted to the bomb body. The Mk. II** and III* bombs are similar in their constructional and functioning characteristics to the Mk. IV bomb and are converted Mk. II and III bombs adapted for pistol/detonator fuzing in lieu of using the No. 37 fuze. The "horizontal" system of fuzing is to be employed, this system utilizing a "horizontal" pull-off of a safety wire threaded through the tail arming mechanism.

3. Attention is directed to Chapter 1 of this Section which contains general information on A.P. bombs.

Leading particulars

| | |
|--|-------------------------|
| 4. Stores Ref. of Mk. II** bomb body fitted with tail pistol No. 30 Mk. IV | 12A/1776 |
| Stores Ref. of Mk. III* bomb body fitted with tail pistol No. 30 Mk. IV | 12A/1777 |
| Stores Ref. of Mk. IV bomb body fitted with tail pistol No. 30 Mk. IV | 12A/1623 |
| Stores Ref. of tail No. 47, Mk. I | 12A/1651 |
| Stores Ref. of tail No. 47, Mk. II | 12A/1652 |
| Length of bomb, with tail unit assembled | 9 ft. 4-7 in., approx. |
| Maximum diameter, without suspension lug | 1ft. 11-45 in., approx. |
| Weight of bomb body | 1,765 lb., approx. |
| Weight and nature of filling | 166 lb. shellite |
| | 50/50 or 70/30 |
| Charge/weight ratio | 8.6 per cent. |
| Terminal velocity | 2,730 ft. per sec. |

Bomb body

GENERAL DESCRIPTION

5. The bomb body is of thick walled steel construction, the nose being solid for approximately 1 ft. 9 in. The rear end of the body is threaded to accommodate a base adapter internally and a tail adapter externally.

6. The tail adapter is provided with a locating screw and has two sets of four tapped holes to receive the four securing bolts of the tail unit or transit base when assembled to the bomb body.

7. The base adapter is fitted with an exploder container which houses a detonator holder and a 12 oz. 3 dr. C.E. exploder. The exploder container is separated from the main filling by a paper tube and the exploder is covered by a felt washer.

8. The bomb body is filled with shellite, protected by a composition pad at the nose end and sealed into the rear end of the body with washers and cement.

9. A single suspension lug for attachment to the bomb body is stowed within the transit base. Holes in the bomb body, closed during transit and storage by transit screws, are provided to receive the screws securing the suspension lug to the bomb.

Tail units

10. The No. 47 Mk. I and II tail units are designed for use in conjunction with the "horizontal" system of fuzing. They consist of a tail cone to which a cylindrical vane is attached by four vane supports. The base of the tail cone is fitted with a strengthening ring. Four wing bolts, accessible through hand holes in the tail cone and locked by spring washers, secure the tail unit to the bomb body. A slot in the base of the tail cone engages with the locating screw on the tail adapter, thus ensuring that the tail is correctly fitted to the bomb body.

11. An arming mechanism is fitted into the tail unit. It consists of an arming spindle which is supported at its rear end by a cone bush and which has an arming fork at its forward end and a two-bladed arming vane attached at its rear end. This vane is flattened at its centre and has a small hole drilled through each of its two blades.

12. On the side of the tail cone, at the rear end, is fitted a channel bracket which forms a safety wire guide. In the ends of the bracket are two holes directly opposite to each other and these, together with the hole in one of the arming vane blades, are used to carry the safety wire when the bomb is fuzed.

Note.—The No. 47 Mk. I tail unit has been produced by conversion of the No. 115 Mk. I tail, used with the 2,000 lb. Mk. II and III A.P. bombs, so as to incorporate the features described in para. 11 and 12. The No. 47 Mk. II tail is of new manufacture and is essentially the same as the No. 47 Mk. I tail unit.

*This leaf issued with A.L. No. 82
June, 1944*

A.P. 2661 B, Vol. I, Sect. 2, Chap. 3

Transit base

13. The No. 27 Mk. I transit base (Stores Ref. 12S/41) is positioned on the bomb body by two locating screws which engage with holes in the tail adapter, and is secured in position by four wing bolts each locked by a spring washer. A seating is provided in the transit base to accommodate the suspension lug. The screws holding the lug in the transit base are used to secure it to the bomb body. Four spare securing screws are located in recesses in the seating.

Identification colouring and markings

14. The exterior of the bomb body and tail is painted dark green, except that the nose is painted a lighter green colour. Three $\frac{1}{2}$ in. bands coloured white, red, and white, respectively, are painted round the nose. Stencilled in black between the tip of the nose and the first white band is the marking "50/50" or "70/30", denoting the composition of the shellite filling.

15. The following information is stencilled on the bomb body:—

- (i) The design number of the method of filling.
- (ii) "A.P. 2,000 lb. II**", III* or IV", as appropriate.
- (iii) The monogram of the filling station or the initials or recognized trade mark of the filling contractor.
- (iv) The date of filling, month and year.
- (v) The lot number.
- (vi) "PISTOL No. 30", indicating that this pistol is fitted in the tail end of the bomb body.

16. Stamped on the bomb body, near the suspension lug, are the body manufacturer's markings.

17. The number and mark of the tail units, either "No. 47-I" or "No. 47-II" is stencilled on the cylindrical vane of the tail unit. On the opposite side of the vane is stamped "No. 47-I (or II) A.P. 2,000 lb.", together with the manufacturer's markings.

18. The No. 27 Mk. I transit base bears the following stencil markings:—

- (i) "No. 27-I".
- (ii) "A.P. 2,000 lb."

Functioning

19. On "live" release of the bomb from its carrier, the fuze-setting control link withdraws the safety wire from the tail arming mechanism. During the fall of the bomb the arming vane rotates, due to air pressure, and arms the tail pistol.

20. On impact of the bomb with the target, the pistol striker moves in to fire the detonator, and this results in detonation of the exploder and the main filling of the bomb.

SUPPLY AND STORAGE

Supply

21. Bodies, bomb, H.E., aircraft, A.P., 2,000 lb., Mk. II**, III* or IV are supplied with transit base and pistol fitted.

22. Tails No. 47 Mk. I and No. 47 Mk. II are supplied packed in protecting clamps, B.459 Mk. I (Stores Ref. 12S/395), one tail to each clamp. One wire, safety, No. 1, Mk. I and two clips, safety, No. 1, Mk. I are normally secured by adhesive tape to each tail unit.

Storage

23. The filled bomb bodies are classified, for the purpose of storage, in Group 7, see A.P. 2608A, Chap. 7.

INSTRUCTIONS FOR USE

Assembling the suspension lug

24. To assemble the suspension lug, proceed as follows:—

- (i) Remove the four transit screws from the side of the bomb body.
- (ii) Remove the transit base by unscrewing the four wing bolts.
- (iii) Remove the four screws securing the suspension lug within the transit base, and secure the lug firmly to the bomb body using the same four securing screws.

Note.—The four screws must be tightened securely, and the transit screws are to be inserted in the transit base for further use. Four spare securing screws are also provided in recesses in the transit base.

Fuzing a bomb

25. To fuze a bomb, proceed as follows:—

- (i) Unscrew and remove the tail pistol by hand.
- (ii) Ensure that the exploder is in the correct position and that the detonator cavity is clear, by using gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 12G/1001). The engraved line for 250/500 lb. bombs is applicable. If the bomb fails to pass this test, it must be set aside for A.I.D./A.I.S. inspection.
- (iii) Remove the overseal, press-cap, and safety plate from the tail pistol and test the arming fork for freedom of rotation, finally screwing it up lightly against the pistol body.
Note.—If the tail is not to be immediately fitted to the bomb body, the safety plate, press-cap, and overseal must be replaced immediately after testing the pistol.
- (iv) Insert a No. 56 detonator into the detonator cavity.
- (v) Screw the pistol, by hand, into the bomb until it is well seated on its washer and locked in position.

Fitting the tail unit and safety wire

26. Assemble the tail unit to the bomb body as follows:—

- (i) Remove the overseal, press-cap, and safety plate, if in position, from the tail pistol. Test the tail arming mechanism for freedom of rotation. Any stiffness must be investigated and, where practicable, rectified. If it is not possible to correct this, the tail must be rejected.
- (ii) Offer up the tail unit to the bomb body, ensuring that the locating screw in the tail adapter engages with the slot in the tail cone. Also ensure that the arming fork in the pistol is correctly engaged with the tail arming mechanism.
Note.—When assembling the tail unit, care must be taken to prevent accidental rotation of the arming vane.
- (iii) Secure the tail to the bomb body by tightening the four wing bolts.
- (iv) Rotate the arming vane two complete turns in an anti-clockwise direction and ensure that there is no stiffness.

Warning.—Should the tail be subsequently removed from the bomb body, the safety plate, press-cap, and overseal of the pistol must be replaced. If, however, the pistol arming fork should be found standing proud of the pistol body, *no attempt must be made to replace the safety plate, press-cap, and overseal.* The pistol must be unscrewed from the bomb, by hand, and the arming fork screwed down lightly on to the pistol body before the safety plate, press-cap, and overseal are replaced.

27. Rotate the arming vane sufficiently (but not more than one complete turn) to bring one of the small holes in the blades into alignment with the channel bracket on the tail unit.

28. Insert the plain end of a wire, safety, No. 1, Mk. I (Stores Ref. 12G/807) through the holes of the channel bracket and then through the hole in the arming vane blade until this end protrudes approximately 3 in. Attach two clips, safety, No. 1, Mk. I (Stores Ref. 12G/806) to the wire, positioning the inner clip so that it bears lightly against the arming vane blade.

Loading a bomb on to its bomb carrier

29. Load the fuzeed bomb on to a 2,000 lb. bomb carrier, as described in A.P. 1664, Vol. I, Chap. 5.

30. To the loop end of the safety wire already fitted to the tail, connect the hook end of a flexible fuze-setting control link. Then insert the loop end of the fuze-setting control link into the E.M. fuzeing unit in the normal manner. Since a "horizontal" pull on the safety wire is required, the E.M. fuzeing unit must *not* be positioned *vertically* above the channel bracket but must be moved inward towards the suspension lug a *minimum* distance of 3 in., measured from a vertical line through the channel bracket. Preferably, however, the unit should be moved inwards towards the bomb lug as far as is permitted by the contour of the bomb.

Note.—Two or more fuze-setting control links, attached end to end, may be required.

Unloading a bomb from its bomb carrier

31. Disconnect the fuze-setting control link from the E.M. fuzeing unit. Then unload the bomb from its carrier as described in A.P. 1664, Vol. I, Chap. 5.

Unfuzing a bomb

32. To unfuze a bomb, proceed as follows:—

- (i) Disconnect the fuze-setting control link from the safety wire.

Warning.—Do not remove the safety wire until after the tail unit has been detached from the bomb body.

*This leaf issued with A.L. No. 82
June, 1944*

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- (ii) Unscrew the tail securing bolts and remove the tail.
- (iii) Replace the safety plate, press-cap, and overseal on the pistol, heeding the **Warning** at the end of para. 26.
- (iv) Unscrew and remove the pistol, by hand, and extract the detonator using an extractor, detonator, No. 2, Mk. I (Stores Ref. 12G/998). Replace the pistol.
- (v) Remove the suspension lug from the bomb body and replace the transit screws. Attach the lug by its securing screws within the transit base. Then fit the transit base to the bomb body.
- (vi) Remove the safety clips from the tail-safety wire and withdraw this wire from the arming vane and channel bracket. Return the tail, together with safety wire and clips secured to it by tape, to its protecting clamp.

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must not be used again.

*This leaf issued with A.L. No. 82
June, 1944*

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**APPENDIX 1
COMPONENTS USED WITH A.P. BOMBS**

**TABLE 1
BOMBS, H.E., AIRCRAFT, A.P., 2,000 lb., Mk. I, II, and III**

| <i>Tail fuuzing</i> | |
|---------------------|-------------------------------|
| <i>Fuze</i> | <i>Exploder</i> |
| No. 37 Mk. I | Special, supplied in position |

**TABLE 2
BOMBS, H.E., AIRCRAFT, A.P., 2,000 lb., Mk. II**, III* and IV**

| <i>Tail fuuzing</i> | | |
|---------------------|---------------------------|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 30 Mk. IV | No. 56, Mk. I (0.05 sec.) | Special, supplied in position |

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Volume I

Section 3

S.A.P. BOMBS

*Relevant amendments up to A.L. 72
incorporated in this reprint
January, 1944*

A.P.1661B, Vol. I

SECTION 3

S.A.P. BOMBS

GENERAL CONTENTS LIST

Note.—A detailed contents list appears at the beginning of each chapter.

CHAPTER 1—General notes on S.A.P. bombs

CHAPTER 2—Bombs, H.E., aircraft, S.A.P., 250 lb., Mk. II, IIc, III, IIIc, and IV, and 500 lb., Mk. II, IIc, III, IIIc, and IV

CHAPTER 3—Bombs, H.E., aircraft, S.A.P., 250 lb., Mk. V, and 500 lb., Mk. V

APPENDIX 1—Components used with S.A.P. bombs

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January, 1944*

A.P.1661B, Vol. I, Sect. 3

CHAPTER 1

General notes on S.A.P. bombs

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CHAPTER 1

General notes on S.A.P. bombs

Introduction

1. Only 250 lb. and 500 lb. S.A.P. bombs are at present used in the Service. They are fuzed at the tail only, and are for use against hard targets, such as reinforced concrete, or medium-armoured targets, where penetration of the target is required before the bomb is detonated. Owing to the thickness of the walls of the bomb body, the charge/weight ratio is comparatively low.

2. Earlier marks of the bombs are initiated by a fuze, while later marks employ a pistol/detonator combination.

Precautions to be observed when fuzing or unfuzing bombs

3. Attention is directed to the precautions detailed in Sect. 1, Chap. 1, which apply also to S.A.P. bombs.

Repair and examination

4. Only such repair and examination of bombs as is specified in Sect. 20, Chap. 1, is to be done by armament personnel. Any bomb found having major damage or defects is to be set aside for A.I.D. inspection.

5. Fuzed bombs, whether loaded on to aircraft, or stored in the fuzed bomb area, must be examined at the intervals stated in Sect. 20, Chap. 2.

Supply

6. Earlier marks of S.A.P. bombs are supplied in boxes, the later marks being supplied fitted with transit bases. In later marks of bombs, the pistol used for fuzing is supplied in position in the bomb, where it acts as a transit plug.

Storage

7. The regulations governing the storage of S.A.P. bombs are given in A.P. 1245, Chap. 3. Tail units may be stored in the same explosives storehouse as the filled bombs, but the packages containing them must be stacked well clear of the filled stores.

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A.P.1661B, Vol. I, Sect. 3

CHAPTER 2

BOMBS, H.E., AIRCRAFT, S.A.P., 250 lb., Mk. H, II C, III, III C, and IV,
and 500 lb., Mk. H, H C, HI, HI C, and IV

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CHAPTER 2

**BOMBS, H.E., AIRCRAFT, S.A.P., 250 lb., Mk. II, H C, HI, HI C, and IV,
and 500 lb., Mk. H, H C, IH, III C, and IV**

Introduction

1. The 250 lb. and 500 lb. Mk. II to IV series S.A.P. bombs are employed for attacking hard targets, such as lightly armoured ships and reinforced concrete structures, which necessitate the use of bombs having greater penetrative power than the corresponding G.P. bombs. They are supplied exploded for use with the No. 30 tail fuze, which provides a delay to allow for penetration of the target before the bomb explodes.

2. In this chapter, the Mk. IV bombs of each weight are first completely described, and the earlier marks are then dealt with by comparison.

BOMB, H.E., AIRCRAFT, S.A.P., 250 lb., Mk. IV

Leading particulars

Body, bomb, H.E., aircraft, S.A.P., 250 lb., Mk. IV

| | | | |
|----|------------------------------|-------|------------------------|
| 3. | Stores Ref. | ..... | 12A/326 |
| | Length, with tail | ..... | 4 ft. 1-5 in., approx. |
| | Maximum diameter | ..... | 9-2 in., approx. |
| | Weight of body | ..... | 177 lb. 8 oz., approx. |
| | Weight and nature of filling | ..... | 41-5 lb. T.N.T. |
| | Terminal velocity | ..... | 1,440 ft. per sec. |

Tail, bomb, H.E., aircraft, S.A.P., 250 lb., No. 5, Mk. I

| | | | |
|----|-------------|-------|------------------------|
| 4. | Stores Ref. | ..... | 12A/327 |
| | Length | ..... | 1 ft. 6-6 in., approx. |

Base, transit, aircraft bomb, No. 10, Mk. I

| | | | |
|----|-------------|-------|---------|
| 5. | Stores Ref. | | 12A/336 |
|----|-------------|-------|---------|

GENERAL DESCRIPTION

Bomb body

6. The bomb body, which is similar to the 500 lb. Mk. IV bomb body, see fig. 1 and 2, is made of steel and its wall thickness reduces progressively from the sharp-pointed nose to the tail end, which is formed with an externally threaded spigot to receive a tail adapter and has a threaded axial bore in which a steel exploder container is screwed and cemented in position. The body is fitted with a suspension lug.

7. The exploder container has a tubular stem, closed at its forward end, which projects into the filling space of the bomb body, and an enlarged head at the rear end. The rear portion of this head is internally threaded to receive a fuze securing ring, and the inner surface of the head has a longitudinal locating slot for a locating pin on the body of the fuze; this locating slot is so positioned in relation to the suspension lug as to locate the fuze correctly for connection to the fuze-setting control link on the aircraft bomb carrier.

8. The tail adapter, which screws on to the tail end of the bomb body, consists of a coned ring having an annular groove around its conical surface to accommodate spring clips on the tail unit. A locating pin for the tail unit is provided on the adapter, in line with the suspension lug, and also serves as a locking screw to lock the adapter in position on the tail end of the bomb body.

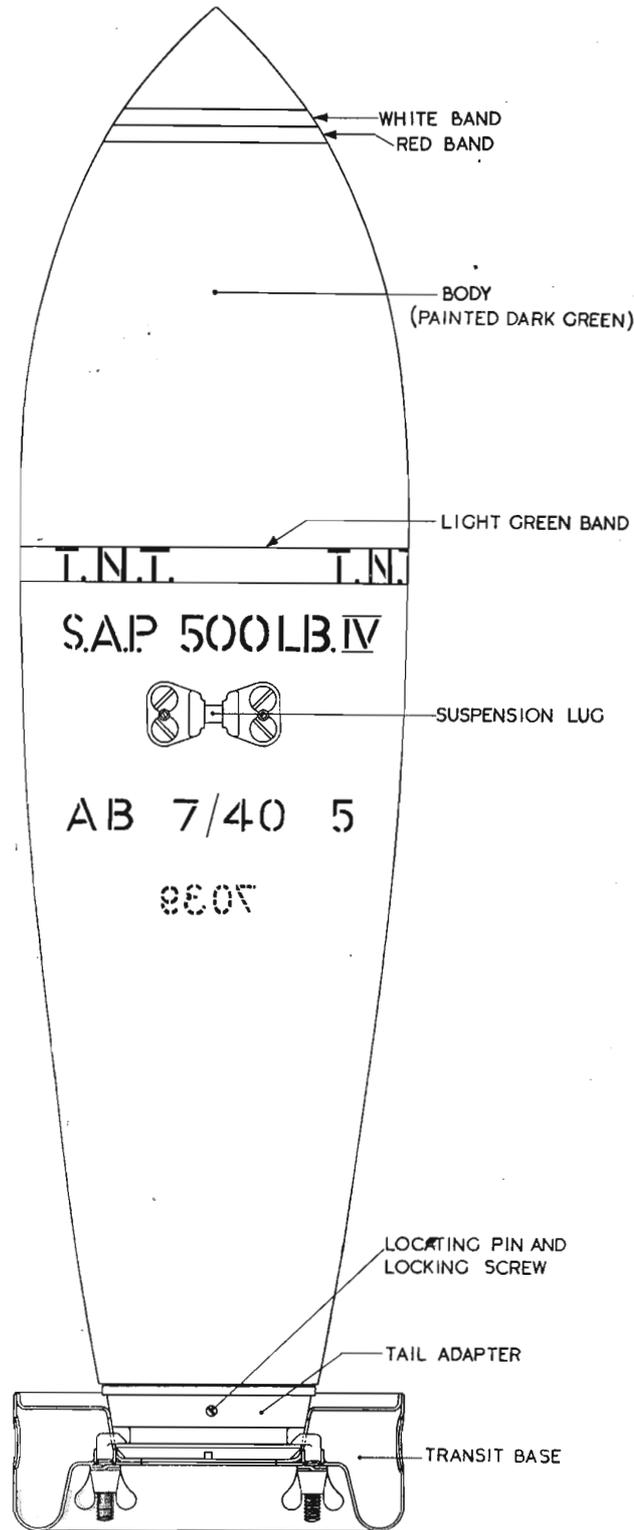


Fig. 11.—Bomb, H.E., aircraft, S.A.P., 500 lb., Mk. IV

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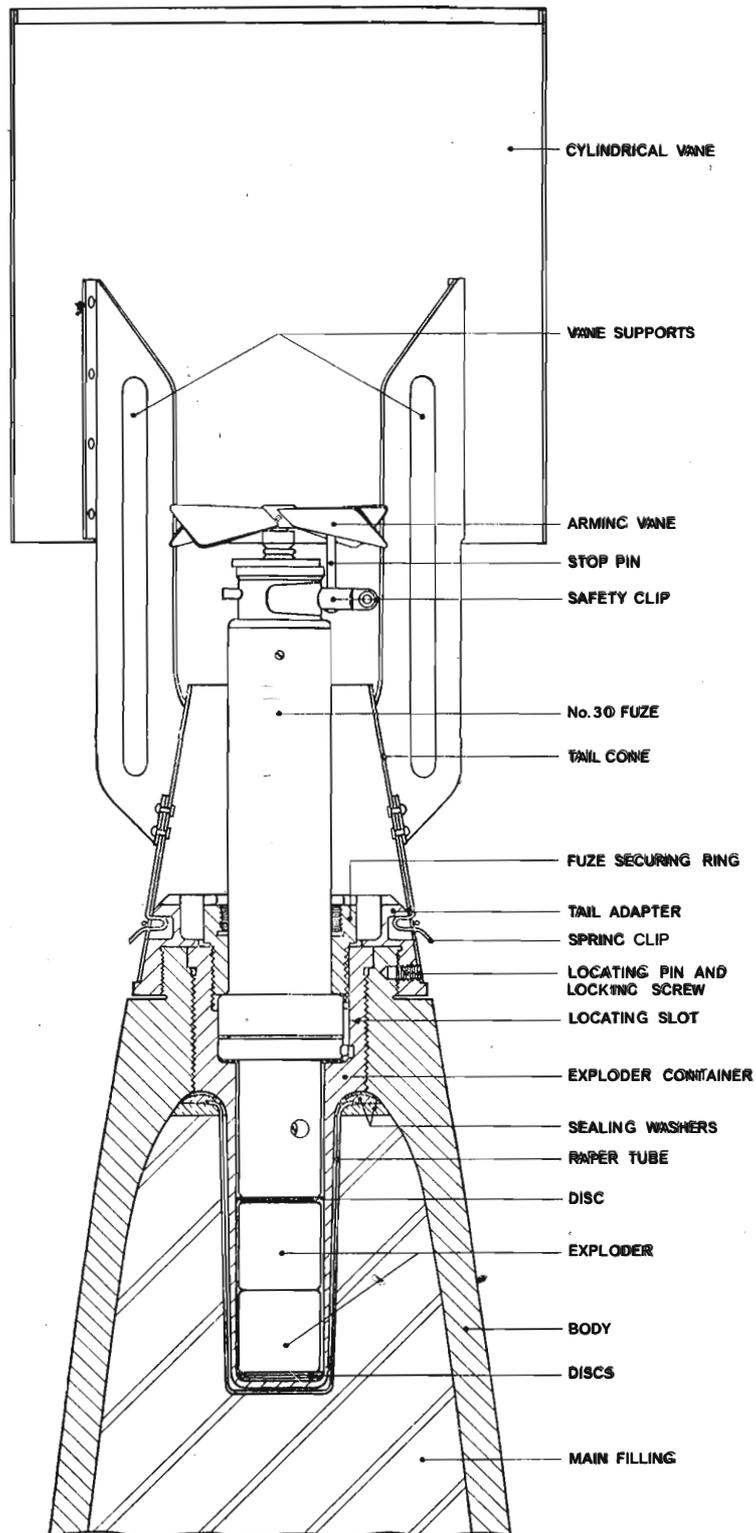


Fig. 2.—Bomb, H.E., aircraft, S.A.P., 500 lb., Mk. IV (fuze detail)

Filling

9. The main filling consists of T.N.T. with a pad of approved composition in the nose end, and a layer of approved material, or waxed felt washers and a glazedboard washer, for sealing purposes, at the rear end of the bomb body. A waxed paper tube encloses the stem of the exploder container.

10. An exploder, pellet, C.E., 8 oz., Mk. II is housed in the forward end of the exploder container stem between cloth discs, one or more glazeboard packing discs being inserted in the end of the stem as necessary.

Tail plug

11. A tail plug, No. 17, Mk. I, with leather washer, is accommodated in the rear end of the exploder container during transit and storage of the bomb, and is held in position by the fuze securing ring.

Transit plug

12. A transit plug, No. 26, Mk. I (Stores Ref. 12A/338), closes the rear end of the fuze securing ring during transit and storage of the bomb.

Tail

13. The tail consists of a cylindrical tail vane secured by four vane supports to a tail cone. The tail cone has four slots in its forward edge at positions central between adjacent vane supports, so that when the tail is assembled to the bomb with the locating pin on the tail adapter engaging one of these slots, the vane supports will be at 45 deg. to the suspension lug. Four spring clips are attached to the tail cone and extend one through each of the four slots so that they will snap into engagement with the groove in the tail adapter when the tail is assembled to the bomb.

Transit base

14. The bomb is supplied fitted with a No. 10, Mk. I transit base, which consists of two metal pressings secured together, the inner pressing accommodating the tail end of the bomb body and the tail adapter of the bomb. The transit base is secured to the bomb by claw bolts which pass through ferrules in the outer pressing, and have their claw ends projecting through bayonet slots in the inner pressing so as to engage in the groove in the tail adapter. The outer ends of the claw bolts are threaded and fitted with spring washers and wing nuts which are slackened off to allow the bolts to be turned and thus to disengage the claws from the groove and permit removal of the transit base from the bomb body.

Identification colouring and markings*Colouring*

15. The exterior of the bomb body and tail adapter are painted dark green. A light green band, 1 in. wide, is painted round the widest part of the bomb body, a white band, $\frac{1}{2}$ in. wide, is painted round the bomb body 3 in. from the nose end, and a red band, $\frac{1}{2}$ in. wide, is painted round the bomb body $3\frac{1}{2}$ in. from the nose end. The tail is painted dark green.

Markings on the bomb body

16. The letters T.N.T. are stencilled, in black, on the light green band in three places equally spaced. "G.D.2" may also be stencilled, in one place only, on the light green band; this will indicate that the bomb is filled with grade 2 T.N.T. and is unsuitable for storage in hot climates.

17. To the rear of the light green band are stencilled, in black, the following particulars:—

- (i) S.A.P., 250 lb., IV.
- (ii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iii) The date of filling, month and year.
- (iv) The lot number of the filling.

On the reverse side of the bomb body is stencilled, in black, the design number of the method of filling.

18. The manufacturer's serial number is stamped on the bomb body and is also stencilled in registering positions on the tail end of the bomb body and the tail adapter.

19. Stamped on the bomb body, on the same side as the suspension lug and towards the tail end, are the following markings:—

- (i) IV S.A.P. 250 lb.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the tail

20. The following markings are stencilled in black on the cylindrical vane:—

- (i) No. 5 I.
- (ii) S.A.P., 250 lb., IV

21. The following markings are stamped on the cylindrical vane:—

- (i) No. 5 I.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the transit base

22. The following markings are stencilled on the flange of the transit base inner pressing:—

- (i) No. 10 Mk. I S.A.P. 250 lb.

23. The following markings are stamped on the flange of the transit base inner pressing:—

- (i) 10 I.
- (ii) The manufacturer's initials or recognized trade mark.

Markings on the tail plug

24. The following markings are stamped on the tail plug:—

- (i) "No. 17 I" followed by "M", "S", or "F", depending on the material from which the plug is made.
- (ii) The manufacturer's initials or recognized trade mark.

Markings on the transit plug

25. The following markings are stamped on the transit plug:—

- (i) "No. 26 I" followed by "M", "S", or "F", depending on the material from which the plug is made.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Functioning

26. When the fuzed bomb is released from the bomb carrier, the safety clip is first removed from the fuze by the fuze-setting control link so as to free the arming vane.

27. During the fall of the bomb the arming vane rotates so as to arm the fuze which, on impact with the target, functions through the delay mechanism to fire the C.E. in the magazine of the fuze, as described in A.P. 1061C, Vol. I, Sect. 2, Chap. 2.

28. The detonation of the magazine charge fires the exploder, and the exploder detonates the main filling.

INSTRUCTIONS FOR USE

Fuzing the bomb

29. Fuzing is to be done before assembling the tail to the bomb, and can be effected without removing the transit base.

30. Remove the transit plug from the fuze securing ring.

31. Screw the two tommies into the body of a Key, No. 134 (Stores Ref. 12A/344) and engage the projections on the end of the key in the slots in the fuze securing ring. Insert the rod provided through the hole in the centre of the key and screw it into the threaded hole in the rear end of the tail

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plug. Continue to turn the key clockwise to unscrew the fuze securing ring, which has a left-hand thread, and withdraw the ring with the tail plug on the end of the key. Remove the tail plug from the key by unscrewing it from the rod, and withdraw the rod from the key end.

32. Prepare and test the No. 30 fuze as described in A.P.1661C, Vol. I, Sect. 2, Chap. 2, and then proceed as follows:—

- (i) Locate the locating pin on the fuze body in the locating slot in the exploder container, see para. 7, and push the fuze fully home into the exploder container.
- (iii) Thread the fuze securing ring over the body of the fuze and screw it home into the exploder container, using the key No. 134. Withdraw the key and test the firmness of the fuze by gripping its tail piece. If there is any slackness or side play, tighten up the fuze securing ring still further until the fuze is held rigidly.

Removing the transit base

33. To remove the transit base from the bomb, slacken off the wing nuts, turn the claw bolts to disengage them from the groove in the tail adapter, and then withdraw the transit base from the tail adapter.

Assembling the tail to the fuze bomb

34. Offer up the tail cone to the tail adapter, register one of the slots in the forward edge of the tail cone with the locating pin on the tail adapter, and press the tail home. Ensure that the spring clips are fully engaged with the annular groove in the tail adapter by applying pressure to them individually.

Protecting the fuze

35. If the fuze bomb, either fitted with transit base or with tail assembled, is not to be used forthwith, the fuze should preferably be protected by a cover, tail fuze, aircraft bomb, No. 3, Mk. I (Stores Ref. 112G/344), which is passed over the fuze and screwed into the rear end of the fuze securing ring until its washer is well seated on that end. Key, No. 134 (Stores Ref. 112A/344) should be used for this purpose.

Loading the fuze bomb on to the aircraft bomb carrier

36. Load the bomb on the bomb carrier as described in the relevant chapter of A.P.1664, Vol. I, and then proceed as follows:—

- (i) Unscrew and remove the fuze cover, if fitted (see para. 35).
- (ii) Assemble the arming vane to the D-sectioned end of the arming vane spigot on the end piece of the fuze, and secure it with the split pin, splaying the ends of the split pin to retain it in position.
- (iii) Fit the safety clip with stop pin to the end piece of the fuze so that the safety clip spigot engages the locating slot in the end piece, and connect the safety clip to the fuze-setting control link on the bomb carrier.
- (iv) Immediately before the aircraft is ready to take off, remove the safety pillar from the fuze and hand it to the pilot or to the bomb aimer.

Unloading the bomb from the aircraft bomb carrier

37. If a bomb is to be removed from the bomb carrier proceed as follows:—

- (i) Ensure that the aircraft fuze-setting control switch is set to the SAFE position.
- (ii) Replace the safety pillar of the fuze.
- (iii) Disconnect the fuze-setting control link from the safety clip on the fuze.
- (iv) Remove the safety clip with stop pin from the fuze.
- (v) Remove the arming vane from the fuze, and fit the fuze cover to the bomb.
- (vi) Unload the bomb from the carrier as described in the relevant chapter of A.P.1664, Vol. I.

Unfuzing the bomb

38. Remove the fuze cover and the No. 30 fuze from the bomb, using key No. 134, without its centre rod, to unscrew the fuze securing ring from the exploder container.

39. Replace the tail plug in the exploder container and secure it in position by screwing in the fuze securing ring, using key No. 134, without its centre rod, for this purpose.

40. Replace the transit plug.

SUPPLY AND STORAGE

Supply

41. The bomb, H.E., aircraft, S.A.P., 250 lb., Mk. IV is supplied, under Stores Ref. 12A/326, with tail plug, No. 17, Mk. I, and transit plug, No. 26, Mk. I (Stores Ref. 12A/338) in position, on base, transit, aircraft bomb, No. 10, Mk. I.

42. The tails, bomb, H.E., aircraft, S.A.P., 250 lb., No. 5, Mk. I, are supplied packed two in Crate, B.287, Mk. I (Stores Ref. 12A/332).

43. Covers, tail fuze, aircraft bomb, No. 3, Mk. I (Stores Ref. 12G/344), are supplied packed five in Box, B.300, Mk. I (Stores Ref. 12G/350), or ten in Box, B.299, Mk. I (Stores Ref. 12G/349).

Storage

44. The bombs are classified, for storage purposes, in Group VII. Tail units may be stored in the same explosives storehouse as the filled bombs, but crates containing them must be stacked well away from the filled stores.

BOMB, H.E., AIRCRAFT, S.A.P., 500 lb., Mk. IV

Leading particulars

Body, bomb, H.E., aircraft, S.A.P., 500 lb., Mk. IV

| | | |
|-----|-------------------------------------|------------------------|
| 45. | Stores Ref. | 12A/328 |
| | Length with tail | 5 ft. 2.2 in., approx. |
| | Maximum diameter | 11.5 in., approx. |
| | Weight of body | 390 lb., approx. |
| | Weight and nature of filling | 90 lb. T.N.T. |
| | Terminal velocity | 1,880 ft. per sec. |

Tail, bomb, H.E., aircraft, S.A.P., 500 lb., No. 6, Mk. I

| | | |
|-----|--------------------|----------------------|
| 46. | Stores Ref. | 12A/329 |
| | Length | 1 ft. 9 in., approx. |

Base, transit, aircraft bomb, No. 11, Mk. I

| | | |
|-----|--------------------|---------|
| 47. | Stores Ref. | 12A/337 |
|-----|--------------------|---------|

GENERAL DESCRIPTION

Comparison with the 250 lb. Mk. IV bomb

48. The 500 lb. Mk. IV bomb is similar to the 250 lb. Mk. IV bomb, and the description in para. 6 to 28 applies if the appropriate type numbers and nominal weight figures are substituted for those given in para. 14, 17, and 19 to 23.

INSTRUCTIONS FOR USE

49. The instructions for use given in para. 29 to 40 apply to the 500 lb. Mk. IV bomb.

SUPPLY AND STORAGE

Supply

50. The bomb, H.E., aircraft, S.A.P., 500 lb., Mk. IV, is supplied, under Stores Ref. 12A/328, with tail plug No. 17, Mk. I, and transit plug, No. 26, Mk. I (Stores Ref. 12A/338), in position, on base, transit, aircraft bomb, No. 11, Mk. I.

51. The tails, bomb, H.E., aircraft, S.A.P., 500 lb., No. 6, Mk. I, are supplied, packed two in a Crate, B.286, Mk. I (Stores Ref. 12A/333).

52. The tail fuze covers (No. 3) are supplied as described in para. 43.

Storage

53. The bombs are classified, for storage purposes, in Group VII, and tail units may be stored in the same explosives storehouse as the filled bombs, but crates containing them must be stacked well away from the filled stores.

BOMB, H.E., AIRCRAFT, S.A.P., 250 lb., Mk. III**Leading particulars**

Body, bomb, H.E., aircraft, S.A.P., 250 lb., Mk. III

| | | |
|-----|-------------------------------------|-------------------------|
| 54. | Stores Ref. | 12A/283 |
| | Length with tail | 4 ft. 11.5 in., approx. |
| | Maximum diameter | 9.2 in., approx. |
| | Weight of body | 177 lb. 8 oz., approx. |
| | Weight and nature of filling | 41.5 lb. T.N.T. |
| | Terminal velocity | 1,440 ft. per sec. |

Tail, bomb, H.E., aircraft, S.A.P., 250 lb., No. 1, Mk. I

| | | |
|-----|--------------------|------------------------|
| 55. | Stores Ref. | 12A/284 |
| | Length | 1 ft. 5.6 in., approx. |

Base, transit, aircraft bomb, No. 3, Mk. I

| | | |
|-----|------------------|---------|
| 56. | Stores Ref. | 12A/274 |
|-----|------------------|---------|

GENERAL DESCRIPTION**Comparison with the 250 lb., Mk. IV bomb***Bomb body*

57. The bomb body, which is similar to that of the 500 lb., Mk. III bomb, see fig. 3, differs from that of the 250 lb., Mk. IV bomb, see para. 6 to 8, in that the tail adapter is in the form of a plain internally threaded coned ring with a short tail tube welded to it, the rear end of the tail tube, being threaded internally to receive plug, bomb, transit, tail, No. 25, Mk. I (Stores Ref. 12A/276), and externally to receive a tail nut, with a locking screw, whereby the tail is secured to the bomb body.

Filling

58. The bomb is filled and exploded as described in para. 9 and 10.

Tail

59. The tail is similar to the tail for the corresponding Mk. IV bomb except that it has no spring clips and accommodating slots, and a single locating notch is provided in the tail cone at its front edge to engage a locating pin on the tail adapter to ensure that the vane supports will be at 45 deg. to the suspension lug when the tail is assembled to the bomb. The rear edge of the tail cone is turned inwards for engagement by the tail nut on the tube of the tail adapter.

Transit base

60. The transit base, see fig. 4, is not built up from metal pressings, but consists of a wooden ring built up from overlapped laminations, the central bore taking the tail tube of the tail adapter, and central recesses being provided to receive the coned ring of the tail adapter and the tail nut on the end of the tail tube. The transit base is strengthened by a series of equi-spaced clamping bolts, the heads and nuts of which, with their associated washers, are accommodated in recesses so as not to stand proud. The shoulders at the inner ends of the central recesses, which accommodate the tail end of the bomb, have steel washers secured by screws.

Identification colouring and markings

61. The colouring of the bomb body, tail adapter, and tail is as described in para. 115, and the markings are as given in para. 116 to 21, and 24 and 25, except for the substitution of the appropriate type and mark numbers. The transit base is branded with the following markings:—

- (i) The number and mark.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The year of manufacture.

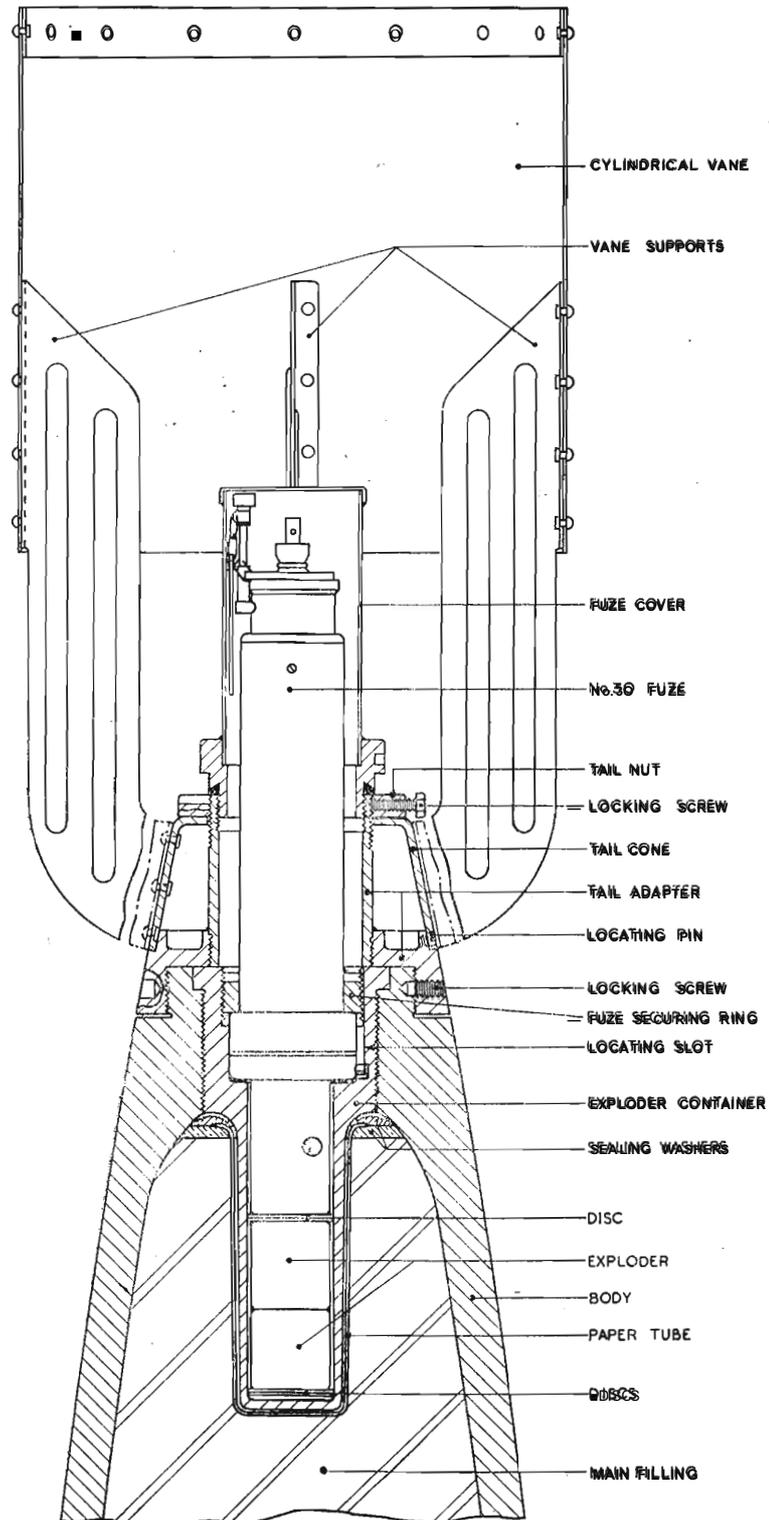


Fig. 3.—Bomb, H.E., aircraft, S.A.P., 500 lb., Mk. III (fuze detail)

INSTRUCTIONS FOR USE

Fuzing the bomb

62. Fuzing is to be done before assembling the tail to the bomb, and can be effected without removing the transit base.

63. Remove the transit plug from the fuze securing ring.

64. Screw the two tommies into the body of a Key, No. 111, Mk. I (Stores Ref. 12A/240), and engage the projections on the end of the key in the slots in the fuze securing ring. Insert the rod provided through the hole in the centre of the key and screw it into the threaded hole in the rear end of the tail plug. Continue to turn the key clockwise, to unscrew the fuze securing ring, which has a left-hand thread, and withdraw the ring with the tail plug on the end of the key. Remove the tail plug from the key by unscrewing it from the rod, and withdraw the rod from the key end.

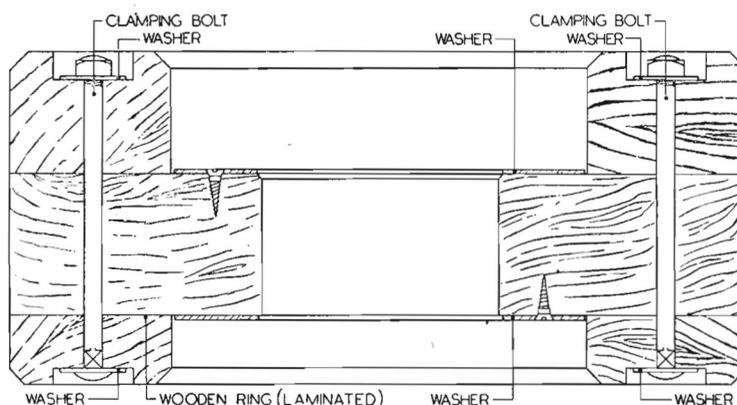


Fig. 4.—Wooden transit base (typical)

65. Prepare and test the No. 30 fuze as described in A.P.1661C, Vol. I, Sect. 2, Chap. 2, and then proceed as follows:—

- (i) Locate the locating pin on the fuze body in the locating slot in the exploder container, see para. 7, and push the fuze fully home into the exploder container.
- (ii) Thread the fuze securing ring over the body of the fuze and screw it home into the exploder container, using the key No. 111. Withdraw the key and test the firmness of the fuze by gripping its tail piece. If there is any slackness or side play, tighten up the fuze securing ring still further until the fuze is held rigidly.

Removing the transit base

66. The transit base is removed from the bomb by slackening off the tail nut locking screw, unscrewing and removing the tail nut from the tube of the tail adapter and then withdrawing the transit base from the tail adapter. The tail nut should be replaced if the tail unit is not to be assembled to the bomb immediately.

Assembling the tail to the fuzed bomb

67. After removing the tail nut the tail can be assembled to the fuzed bomb by passing the tail cone over the tail adapter with the locating notch in register with the locating pin, pressing the tail home on the adapter, replacing the tail nut so as to clamp the tail tightly in position, and finally locking the tail nut by tightening its locking screw.

Protecting the fuze

68. If the fuzed bomb, either fitted with transit base or with tail assembled, is not to be used forthwith, the fuze should preferably be protected by a cover, tail fuze, aircraft bomb, No. 1, Mk. I (Stores Ref. 12G/305), which is passed over the fuze and screwed into the rear end of the fuze securing ring until its washer is well seated on that end. Key, No. 123 (Stores Ref. 12A/303) should be used for this purpose.

Loading the fuze bomb on to the aircraft bomb carrier

69. Load the bomb on the bomb carrier as described in the relevant chapter of A.P. 1664, Vol. I, and then proceed as follows:—

- (i) Unscrew and remove the fuze cover, if fitted (see para. 68).
- (ii) Assemble the arming vane to the D-sectioned end of the arming vane spigot on the end piece of the fuze, and secure it with the split pin, splaying the ends of the split pin to retain it in position.
- (iii) Fit the safety clip with stop pin to the end piece of the fuze so that the safety clip engages the locating slot in the end piece, and connect the safety clip to the fuze-setting control link on the bomb carrier.
- (iv) Immediately before the aircraft is ready to take off, remove the safety pillar from the fuze and hand it to the pilot or to the bomb aimer.

Unloading the bomb from the aircraft bomb carrier

70. If the bomb is to be removed from the bomb carrier, proceed as follows:—

- (i) Ensure that the aircraft fuze-setting control switch is set to the SAFE position.
- (ii) Replace the safety pillar of the fuze.
- (iii) Disconnect the fuze-setting control link from the safety clip on the fuze.
- (iv) Remove the safety clip with stop pin from the fuze.
- (v) Remove the arming vane from the fuze, and fit the fuze cover to the bomb.
- (vi) Unload the bomb from the carrier as described in the relevant chapter of A.P. 1664, Vol. I.

Unfuzing the bomb

71. Remove the fuze cover and the No. 30 fuze from the bomb, using key No. 123 for the cover, and key No. 111, without its centre rod, to unscrew the fuze securing ring from the exploder container.

72. Replace the tail plug in the exploder container and secure it in position by screwing in the fuze securing ring, using key No. 111, without its centre rod, for this purpose.

73. Replace the transit plug.

SUPPLY AND STORAGE**Supply**

74. The bomb, H.E., aircraft, S.A.P., 250 lb., Mk. III, is supplied, with tail plug, No. 17, Mk. I, and transit plug, No. 25, Mk. I (Stores Ref. 12A/276), in position, either on base, transit, aircraft bomb, No. 3, Mk. I, or singly with tail unassembled in Box, B.224, Mk. I (Stores Ref. 12A/217), or singly with tail either assembled or unassembled in Box, B.237, Mk. I (Stores Ref. 12A/218).

75. The tails, bomb, H.E., aircraft, S.A.P., 250 lb., No. 1, Mk. I, if supplied separately from the bombs, are packed two in a wooden crate.

76. The No. 1, Mk. I fuze covers are supplied packed either ten in Box, B.297, Mk. I (Stores Ref. 12G/347), or five in Box, B.298, Mk. I (Stores Ref. 12G/348).

Storage

77. The bombs are classified, for storage purposes, in Group VII, and tail units may be stored in the same explosives storehouse as the filled bombs, but the crates containing them must be stacked well away from the filled stores.

BOMB, H.E., AIRCRAFT, S.A.P., 500 lb., Mk. III**Leading particulars**

Body, bomb, H.E., aircraft, S.A.P., 500 lb., Mk. III

| | | |
|-----|-------------------------------------|------------------------|
| 78. | Stores Ref. | 12A/285 |
| | Length with tail | 5 ft. 2.2 in., approx. |
| | Maximum diameter | 11.5 in., approx. |
| | Weight of body | 390 lb., approx. |
| | Weight and nature of filling | 90 lb. T.N.T. |
| | Terminal velocity | 1,880 ft. per sec. |

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Tail, bomb, H.E., aircraft, S.A.P., 500 lb., No. 1, Mk. I

| | | |
|-----|--------------------|----------------------|
| 79. | Stores Ref. | 12A/286 |
| | Length | 1 ft. 6 in., approx. |

Base, transit, aircraft bomb, No. 4, Mk. I

| | | |
|-----|--------------------|---------|
| 80. | Stores Ref. | 12A/275 |
|-----|--------------------|---------|

GENERAL DESCRIPTION

Comparison with the 500 lb., Mk. IV bomb

81. The 500 lb., Mk. III bomb, see fig. 3, differs from the 500 lb., Mk. IV bomb in the same details as the 250 lb., Mk. III bomb differs from the 250 lb., Mk. IV bomb, see para. 57 to 61.

INSTRUCTIONS FOR USE

82. The instructions for use of the 250 lb., Mk. III bomb, given in para. 62 to 73 apply also to the 500 lb., Mk. III bomb.

SUPPLY AND STORAGE

Supply

83. The bomb, H.E., aircraft, S.A.P., 500 lb., Mk. III, is supplied, with tail plug No. 17, Mk. I and transit plug No. 25, Mk. I (Stores Ref. 12A/276), in position, either on base, transit, aircraft bomb, No. 4, Mk. I, or singly with tail unassembled in Box, B.223, Mk. I (Stores Ref. 12A/221), or singly with tail assembled or unassembled in Box, B.236, Mk. I (Stores Ref. 12A/222).

84. The tails, bomb, H.E., aircraft, S.A.P., 500 lb., No. 1, Mk. I, if supplied separately from the bombs, are packed two in a wooden crate.

85. The No. 1, Mk. I fuze covers are supplied as described in para. 76.

Storage

86. The classification and instructions for storage are as described in para. 77.

BOMBS, H.E., AIRCRAFT, S.A.P., 250 lb., Mk. III C, and 500 lb., Mk. III C

GENERAL DESCRIPTION

Comparison with the Mk. III bombs

87. These bombs, see fig. 5, are conversions of the corresponding Mk. III bombs, the conversion consisting in providing on the tube of the tail adapter, see para. 57, a flanged sleeve, to afford between the flange of the sleeve and the coned ring of the tail adapter, an annular groove for engaging spring clips on a clip-on tail.

88. Tail, bomb, H.E., aircraft, S.A.P., 250 lb., No. 3, Mk. I (Stores Ref. 12A/322), and tail, bomb, H.E., aircraft, S.A.P., 500 lb., No. 4, Mk. I (Stores Ref. 12A/325), are conversions of the corresponding No. 1, Mk. I tails, see para. 59, for Mk. III bombs, the conversion consisting in forming four equi-spaced slots in the forward edge of the tail cone at positions centrally between the vane supports, and fitting spring clips which project one through each slot to engage the annular groove in the modified tail adapter, see para. 87. One of the slots is engaged with the locating pin on the coned ring of the tail adapter when the tail is assembled to the bomb so as to ensure that the vane supports are at 45 deg. to the suspension lug.

INSTRUCTIONS FOR USE

89. The instructions for use of the Mk. III C bombs are as given in para. 33, 34, 62 to 65, and 68 to 73.

SUPPLY AND STORAGE

Supply

90. The bomb, H.E., aircraft, S.A.P., 250 lb., Mk. III C (Stores Ref. 12A/321) is supplied with tail plug, No. 17, Mk. I, and transit plug, No. 25, Mk. I (Stores Ref. 12A/276) in position, on base, transit, aircraft bomb, No. 14, Mk. I (Stores Ref. 12A/334), which is similar to the No. 10, Mk. I transit base described in para. 14.

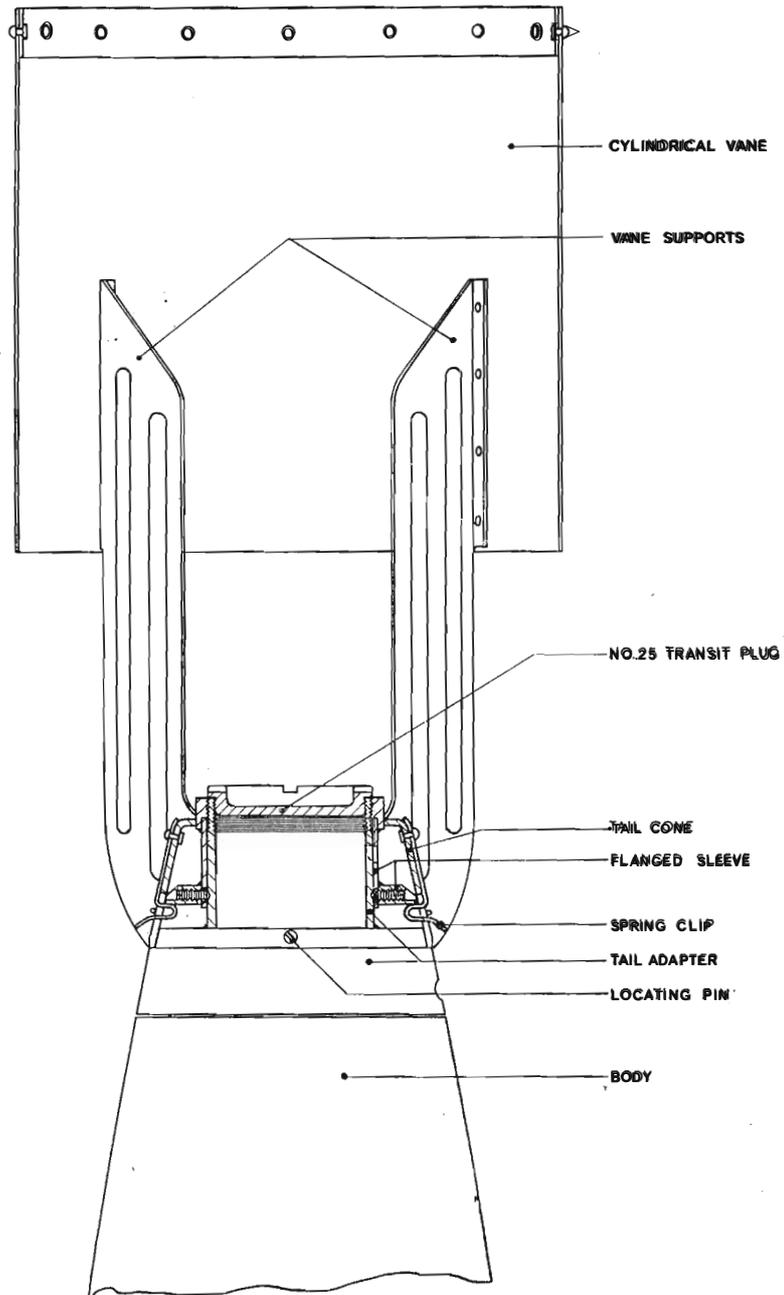


Fig. 5.—Bomb, H.E., aircraft, S.A.P., 500 lb., Mk. III C (tail fitting)

91. The tails, bomb, H.E., aircraft, S.A.P., 250 lb., No. 3, Mk. I (Stores Ref. 12A/322), are supplied packed two in a wooden crate, B.275, Mk. II (Stores Ref. 12A/330).

92. Bomb, H.E., aircraft, S.A.P., 500 lb., Mk. III C (Stores Ref. 12A/324) is supplied with tail plug, No. 17, Mk. I and transit plug, No. 25, Mk. I (Stores Ref. 12A/276) in position, on base, transit, aircraft bomb, No. 15, Mk. I (Stores Ref. 12A/335) which is similar to the No. 10, Mk. I transit base described in para. 14.

93. The tails, bomb, H.E., aircraft, S.A.P., 500 lb., No. 4, Mk. I (Stores Ref. 12A/325) are supplied packed two in a wooden crate, B.278, Mk. II (Stores Ref. 12A/321).

94. The No. 1, Mk. I fuze covers are supplied packed either ten in Box, B.297, Mk. I (Stores Ref. 12G/347) or five in Box, B.298, Mk. I (Stores Ref. 12G/348).

Storage

95. The bombs are classified, for storage purposes, in Group VII, and tail units may be stored in the same explosives storehouse as the filled bombs, but the crates containing them must be stacked well away from the filled stores.

BOMBS, H.E., AIRCRAFT, S.A.P., 250 lb., Mk. II, and 500 lb., Mk. II

GENERAL DESCRIPTION

Comparison with the Mk. III bombs

96. These bombs, see fig. 6, are generally similar in construction and dimensions to the corresponding Mk. III bombs described in para. 57 to 59, except that, instead of a steel exploder container, a base adapter, having the form of the head of an exploder container, is fitted to take the No. 30 fuze, and the exploder is housed in a paper former and paper tube which separate it from the main filling and accommodate the stem of the No. 17 tail plug. No transit plug or transit base is fitted.

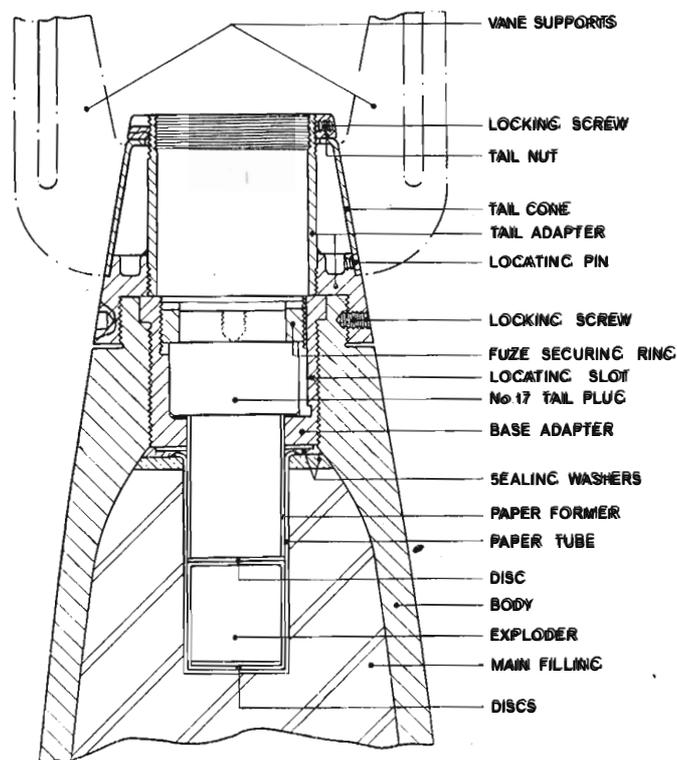


Fig. 6.—Bomb, H.E., aircraft, S.A.P., 500 lb., Mk. II (exploding detail)

INSTRUCTIONS FOR USE

97. The instructions for use given in para. 62 to 65, and 67 to 73 apply also to the Mk. II bombs.

SUPPLY AND STORAGE

Supply

98. The bomb, H.E., aircraft, S.A.P., 250 lb., Mk. II (Stores Ref. 12A/216) is supplied, with tail plug, No. 17, Mk. I in position, in Box, B.237, Mk. I (Stores Ref. 12A/218) which also contains the No. 1, Mk. I tail unit.

99. The bomb, H.E., aircraft, S.A.P., 500 lb., Mk. II (Stores Ref. 12A/220) is supplied with tail plug, No. 17, Mk. I in position, in Box, B.236, Mk. I (Stores Ref. 12A/222) which also contains the No. 1, Mk. I tail unit.

100. The No. 1, Mk. I fuze covers are supplied packed either ten in Box, B.297, Mk. I (Stores Ref. 12G/347) or five in Box, B.298, Mk. I (Stores Ref. 12G/348).

Storage

101. The bombs are classified, for storage purposes, in Group VII, and tail units may be stored in the same explosives storehouse as the filled bombs, but the crates containing them must be stacked well away from the filled stores.

BOMBS, H.E., AIRCRAFT, S.A.P., 250 lb., Mk. II C, and 500 lb., Mk. II C

GENERAL DESCRIPTION

Comparison with the Mk. II bombs

102. These bombs are conversions of the corresponding Mk. II bombs to adapt them for use with clip-on tails. The conversion is as described, with reference to the Mk. III C bombs, in para. 87, the No. 1, Mk. I tails being converted to 250 lb., S.A.P., No. 3, Mk. I and the 500 lb., S.A.P., No. 4, Mk. I, as described in para. 88.

INSTRUCTIONS FOR USE

103. The instructions for use of the Mk. II C bombs are as given in para. 33, 34, 62 to 65, and 68 to 73.

SUPPLY AND STORAGE

Supply

104. The bomb, H.E., aircraft, S.A.P., 250 lb., Mk. II C (Stores Ref. 12A/320), and bomb, H.E., aircraft, S.A.P., 500 lb., Mk. II C (Stores Ref. 12A/323) are supplied as described in para. 90 and 92 respectively, for the corresponding Mk. III C bombs.

105. The No. 3, Mk. I and No. 4, Mk. I tails are supplied as described in para. 91 and 93 respectively.

106. The supply of No. 1, Mk. I fuze covers is as described in para. 100.

Storage

107. The classification and instructions for storage are as described in para. 101.

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Relevant amendments up to A.L. 72
incorporated in this reprint
January, 1944

CHAPTER 3

BOMBS, H.E., AIRCRAFT, S.A.P., 250 lb., Mk. V, and 500 lb., Mk. V

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 3. Base, transit, aircraft bomb, No. 22, Mk. I

Note.—Bomb, H.E., aircraft, S.A.P., 250 lb., Mk. V has been declared obsolete by A.M.O.
(N) 1242/45. (A.L. 130)

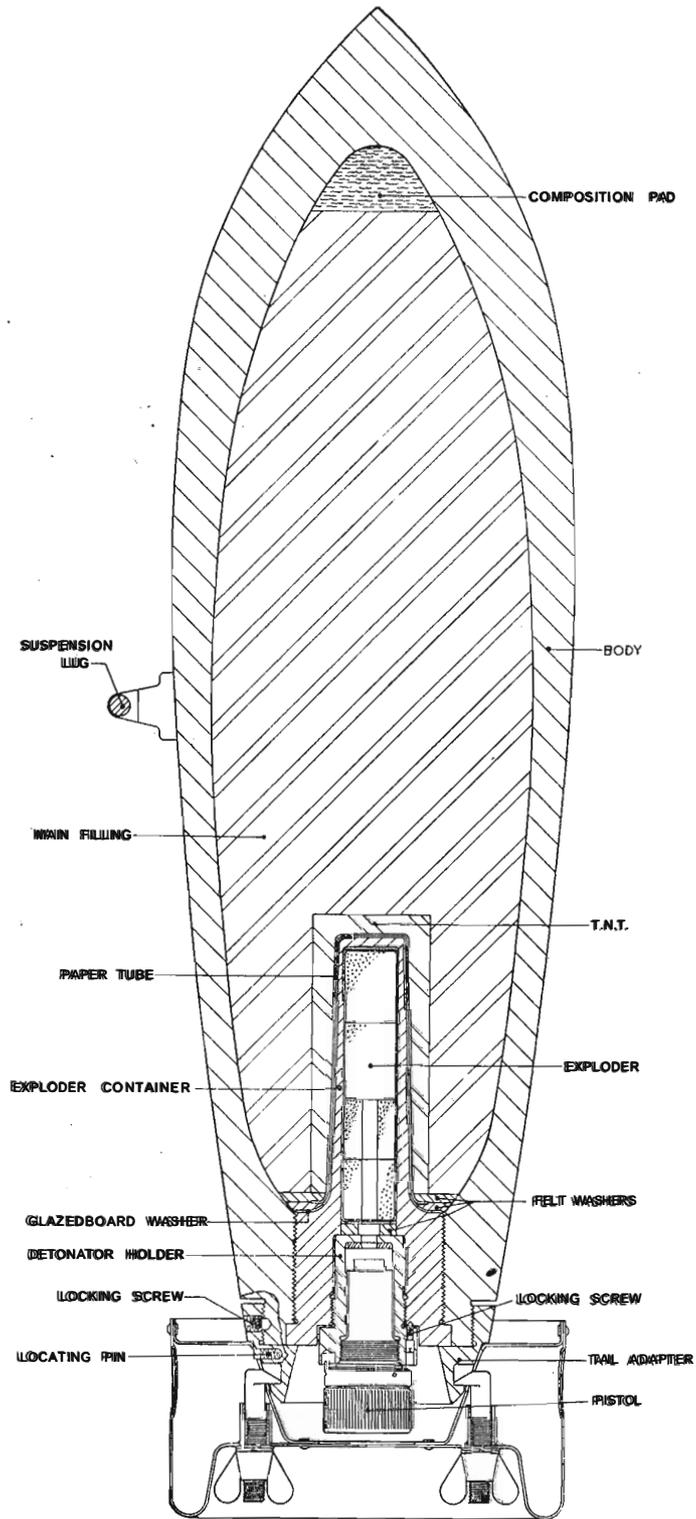


Fig. 11.—Bomb, H.E., aircraft, S.A.P., 250 lb., Mk. V, with transit base in position

CHAPTER 3

BOMBS, H.E., AIRCRAFT, S.A.P., 250 lb., Mk. V, and 500 lb., Mk. V

Introduction

1. The 250 lb., Mk. V, and 500 lb., Mk. V, S.A.P. bombs are intended for use against standard targets, such as reinforced concrete structures, and have greater penetrative power than the corresponding G.P. bombs. They may also be used against lightly armoured ships. They are fuzeed at the tail only, and they differ from the earlier marks of S.A.P. bombs in that they are used with a pistol in the tail, instead of fuze, No. 30, and in that the tail unit is secured to the tail adapter by four spring clips.

BOMB, H.E., AIRCRAFT, S.A.P., 250 lb., Mk. V

Leading particulars

Body, bomb, H.E., aircraft, S.A.P., 250 lb., Mk. V

| | |
|------------------------------|------------------------|
| 2. Stores Ref. | 12A/497 |
| Length, with tail | 4 ft. 1 in., approx. |
| Maximum diameter | 9.2 in., approx. |
| Weight of body | 177 lb. 8 oz., approx. |
| Weight and nature of filling | 40.5 lb. T.N.T./Beesw |
| Terminal velocity | 1,440 ft. per sec. |

Tail, bomb, H.E., aircraft, S.A.P., 250 lb., No. 10, Mk. 1

| | |
|----------------|-------------|
| 3. Stores Ref. | 12A/498 |
| Length | 1 ft. 6 in. |

GENERAL DESCRIPTION

Bomb body, fig. 1 and 2

4. The bomb body, which is made of cast or forged steel, has a pointed nose and an open base which is threaded internally to receive an exploder container, this being screwed and cemented in position. The head of the exploder container is threaded internally to take a detonator holder, which, when screwed home in the exploder container, is secured in position by a locking screw. The detonator holder is threaded internally at its rear end to take a tail pistol or a transit plug. The base of the bomb body is threaded externally to receive a tail adapter which is in the form of a coned ring with four equi-spaced slots on the circumference to receive the spring clips of the tail.

5. The tail adapter is screwed on to the bomb body and is locked in position by a locking screw. It is fitted with a locating pin, at 45 deg. to the suspension lug on the bomb body, this pin engaging with a slot in the forward end of the tail cone.

Filling

6. The main filling consists of T.N.T./Beeswax, 93/7, with a pad of approved composition in the nose end of the bomb, and waxed felt washers and a glazed board washer for sealing purposes at the rear end of the bomb body. A layer of T.N.T. surrounds the stem of the exploder container, from which it is separated by a waxed paper tube.

7. An exploder, H.E., bomb, 6 oz. 6 dr., Mk. I, covered by a felt washer, is housed in the exploder container and held in position by the detonator holder, the threaded joint being sealed with luting.

Tail, fig. 2

8. The tail consists of a tail cone with a cylindrical vane attached to it by four vane supports. The tail cone is fitted, at its apex, with a cone bush which locates the rear end of an arming spindle. Approximately half-way along the length of the tail cone is fitted a diaphragm which locates the forward end of the arming spindle. Four equi-spaced spring clips are fitted to the forward end of the tail cone, and the forward edge of the tail cone is slotted, at a position in alignment with one of the four vane supports, for engagement with the locating pin on the tail adapter when the tail is assembled to the bomb. Two of the spring clips are provided with channel-section locking clips which swivel about a rivet. These lock the spring clips in position when the tail is assembled to the bomb.

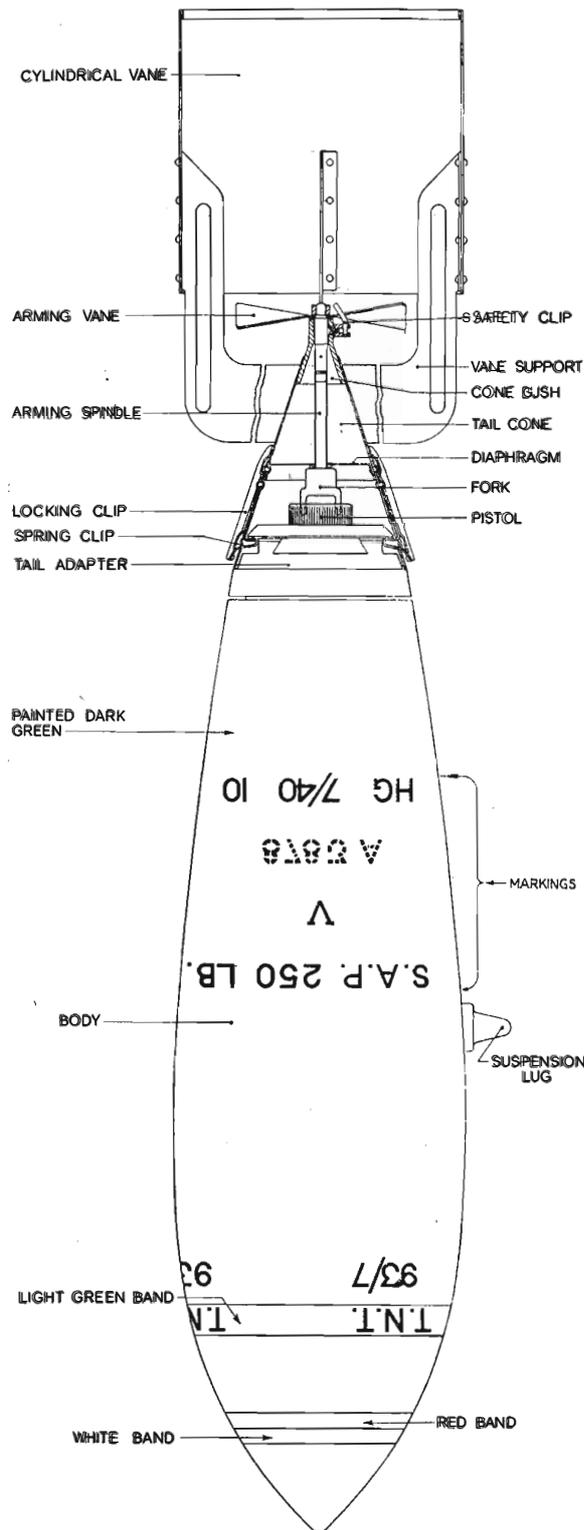


Fig. 2.—Bomb, H.E., aircraft, S.A.P., 250 lb., Mk. V, with tail in position

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9. The arming spindle in the tail is fitted at its forward end with a fork which, when the tail is assembled to the bomb, engages with a fork in the No. 28 or other tail pistol. The rear end of the arming spindle is threaded and is fitted with a four-bladed arming vane which is secured by a locking nut and tab washer. The arming vane is prevented from rotating by a safety clip which fits over the cone bush.

Note.—If the bomb is to be carried on fighter-bomber aircraft, the tail must be modified as described in para. 62 to 65.

Transit base, fig. 3

110. The bomb is supplied fitted with base, transit, aircraft bomb, No. 22, Mk. I (Stores Ref. 112A/505), which consists of two metal pressings secured together, the inner pressing being tapered to accommodate the base of the bomb body with the tail adapter and pistol or transit plug. The transit base is secured to the tail adapter on the bomb body by two claw bolts which pass through guide ferrules in the outer pressing, and have their claw ends projecting through bayonet slots in the wall of the inner pressing so that they can be engaged with two diametrically opposed slots in the tail adapter. The opposite ends of the claw bolts are threaded and fitted with wing nuts and spring washers.

Identification colouring and markings

Colouring

111. The bomb body and the flange of the tail adapter are painted dark green. A light green band, 1 in. wide, is painted round the bomb body, $6\frac{1}{2}$ in. from the nose end. A red band, $\frac{1}{2}$ in. wide, is painted round the bomb body, $3\frac{1}{2}$ in. from the nose end, and a white band, $\frac{1}{4}$ in. wide, is painted round the bomb body 3 in. from the nose end. The tail and the transit base are painted dark green.

Markings on the bomb body

112. The letters T.N.T. are stencilled, in black, on the light green band in three places equally spaced, and the ratio figures 93/7 are stencilled, in black, in corresponding positions immediately to the rear of the light green band.

113. To the rear of the suspension lug are stencilled, in black, the following particulars:—

- (i) S.A.P., 250 lb., V.
- (ii) The monogram of the filling station or initials or recognized trade mark of the filling contractor.
- (iii) The date of filling, month and year.
- (iv) The lot number of the filling.

On the reverse side of the bomb body the design number of the method of filling is stencilled, in black.

114. The manufacturer's serial number is stamped on the bomb body, and is also stencilled in registering positions on both the tail end of the bomb body and the flange of the tail adapter.

115. Stamped on the bomb body, on the same side as the suspension lug and towards the tail end are the following markings:—

- (i) V, S.A.P., 250 lb.
- (ii) The manufacturers' initials, or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the tail

116. The following markings are stencilled in black on the cylindrical vane:—

- (i) No. 110 I.
- (ii) S.A.P., 250 lb., V.

117. Stamped on the cylindrical vane are the following markings:—

- (i) No. 110 I.
- (ii) The manufacturer's initials, or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the transit base

118. The following markings are stencilled in black on the top of the transit base:—

- (i) No. 22, Mk. I, S.A.P., 250 lb.

119. Stamped on the top are the manufacturer's markings, as follows:—

- (i) The manufacturer's initials, or recognized trade mark.
- (ii) 22. I.

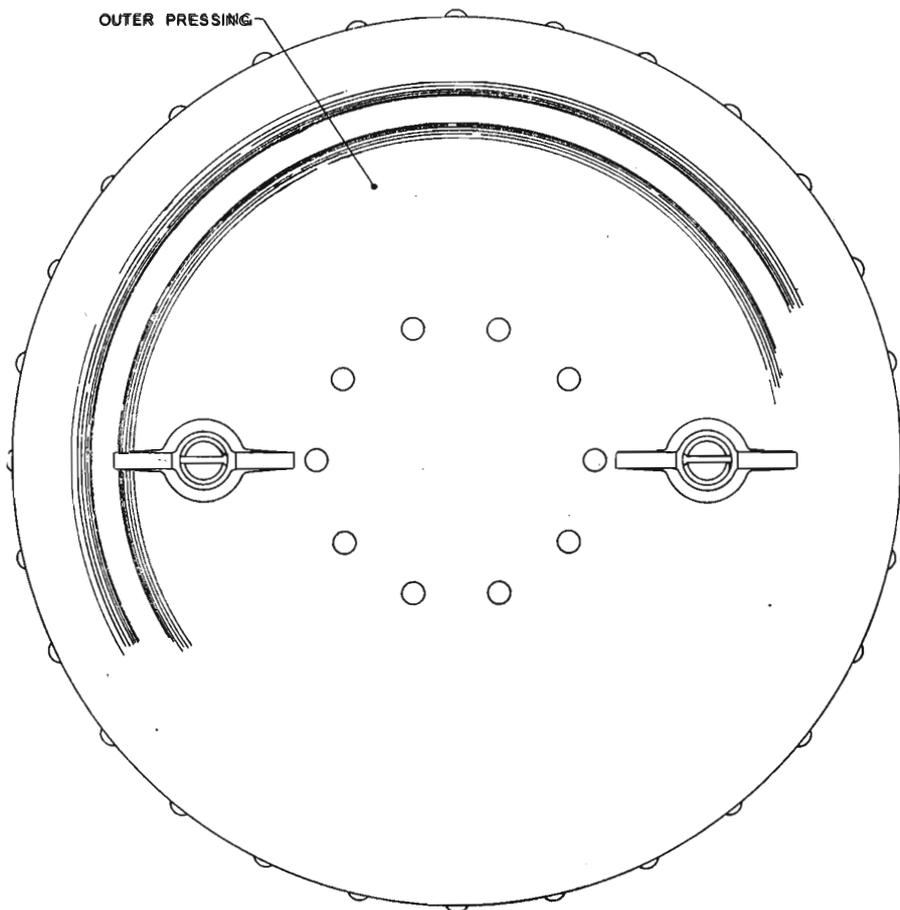
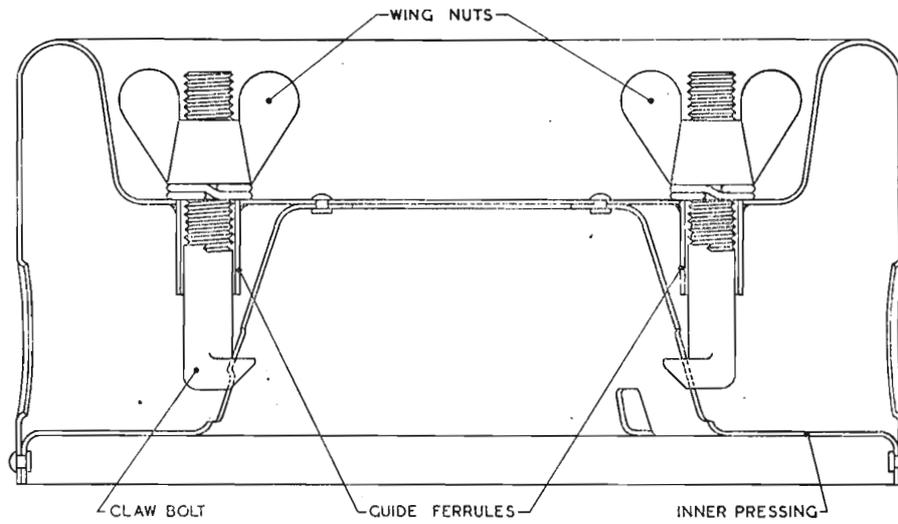


Fig. 3.—Base, transit, aircraft bomb, No. 22, Mk. I

A.P. 11661B, Vol. I, Sect. 3, Chap. 3

Markings on the transit plug

20. The following markings are stamped on the head of the transit-plug:—■
- (i) TAIL NO. 27 IM (or IZ).
 - (ii) The manufacturer's initials, or recognized trade mark.
 - (iii) The date of manufacture, month and year.

Functioning

21. When the bomb is released from the bomb carrier, the safety clip is first removed from the tail unit by the fuze-setting control link so as to free the arming vane.
22. During the fall of the bomb, the arming vane is rotated by the air stream so as to unscrew the pistol arming fork and arm the pistol.
23. On impact of the bomb with the target, the striker of the pistol fires the detonator, the detonator fires the exploder, and the exploder detonates the main filling.

INSTRUCTIONS FOR USE

Fuzing the bomb and assembling the tail

Fuzing the bomb

24. Remove the transit base from the bomb body as follows:—
- (i) Unscrew the wing nuts on the claw bolts until they bind.
 - (ii) Turn the claw bolts by the wing nuts to bring the claw ends out of engagement with the slots in the tail adapter, and remove the transit base.
25. Unscrew and remove the pistol No. 28, or transit plug No. 27.
26. Ensure that the detonator cavity is clear, using gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 12A/349). Bombs which fail to pass this test must be set aside for A.I.D. inspection. Insert the required detonator.
27. Remove the press-cap and safety plate from the No. 28 pistol and test the arming fork for freedom of movement, finally screwing the fork lightly home against the pistol body. If the tail is not to be assembled to the bomb immediately, replace the safety plate and press-cap.
28. Insert the pistol into the detonator holder and screw it home by hand until it is well seated on its washer and locked in position by the locking spring.

Assembling the tail

29. Offer up the tail to the tail adapter, making sure that the slot in the tail cone is in alignment with the locating pin on the tail adapter and that the fork in the pistol is not fouled by the arming mechanism. Press the tail home on to the tail adapter so as to engage the locating pin in the slot and so as to cause the spring clips to snap into the four slots in the tail adapter. Pressure must be applied to each of the four spring clips to ensure that they are fully engaged. Turn the locking clips so as to lock the two associated spring clips.
30. Test the arming vane for freedom of movement by removing the safety clip from the cone bush and rotating the arming vane two complete turns in an anti-clockwise direction. If the rotation is not free, the tightness must be investigated and rectified if possible. If the tightness cannot be rectified, the tail must not be used. Replace the safety clip, making sure that the head of its screw is engaged in the hole in the cone bush.
31. If the tail is subsequently removed, the safety plate and press-cap must be replaced on the pistol. In the unlikely event of the pistol arming fork standing proud of the top of the pistol body, no attempt must be made to replace the safety plate and press-cap whilst the pistol is in position in the detonator holder. In that event, the pistol must be removed from the detonator holder before screwing the fork lightly home against the pistol body, as described in para. 27, and replacing the safety plate and press-cap.

Loading the bomb on the aircraft bomb carrier

32. Load the bomb on the bomb carrier as described in the relevant chapter of A.P. 11664, Vol. I.

Unloading the bomb from the aircraft bomb carrier

33. Disconnect the safety clip from the fuze-setting control link of the bomb carrier, and unload the bomb as described in the relevant chapter of A.P. 11664, Vol. I.

Unfuzing the bomb

34. If it is necessary to unfuze the bomb, unlock the two locking clips and remove the tail. Replace the safety plate and press-cap on the pistol (see, however, para. 31), remove the pistol from the bomb, extract the detonator, using extractor, detonator, No. 2, Mk. I (Stores Ref. 12A/348), and then replace the pistol or the transit plug in the bomb.

SUPPLY AND STORAGE

Supply

35. The bomb, H.E., aircraft, S.A.P., 250 lb., Mk. V, is supplied fitted with base, transit, aircraft bomb, No. 22, Mk. I, and either with pistol, bomb, tail, No. 28, serving as a transit plug, or with transit plug No. 27 in position. Where the bomb is fitted with transit plug No. 27, the pistol No. 28 is packed with the tail unit.

36. The tail, bomb, H.E., aircraft, S.A.P., 250 lb., No. 10, Mk. I, is supplied with pistol No. 28 in Container, B.302, Mk. I (Stores Ref. 12A/501), or without the pistol in Container, B.312, Mk. I (Stores Ref. 12A/503).

Storage

37. The bombs are classified, for storage purposes, in Group VII. Tail units may be stored in the same explosives storehouse as the filled bombs, but packages containing them must be stacked well away from the filled stores.

BOMB, H.E., AIRCRAFT, S.A.P., 500 lb., Mk. V

Leading particulars

Body, bomb, H.E., aircraft, S.A.P., 500 lb., Mk. V

| | | | | | | | |
|------------------------------|-----|-----|-----|-----|-----|-----|-------------------------|
| 38. Stores Ref. | ... | ... | ... | ... | ... | ... | 12A/499 |
| Length, with tail | ... | ... | ... | ... | ... | ... | 5 ft. 2 in., approx. |
| Maximum diameter | ... | ... | ... | ... | ... | ... | 11.5 in., approx. |
| Weight of body | ... | ... | ... | ... | ... | ... | 385 lb. 12 oz., approx. |
| Weight and nature of filling | ... | ... | ... | ... | ... | ... | 89 lb. T.N.T. |
| Terminal velocity | ... | ... | ... | ... | ... | ... | 1,880 ft. per sec. |

Tail, bomb, H.E., aircraft, S.A.P., 500 lb., No. 11, Mk. I

| | | | | | | | |
|-----------------|-----|-----|-----|-----|-----|-----|-----------------|
| 39. Stores Ref. | ... | ... | ... | ... | ... | ... | 12A/500 |
| Length | ... | ... | ... | ... | ... | ... | 11 ft. 8.84 in. |

GENERAL DESCRIPTION

Bomb body

40. The body of the 500 lb., Mk. V, S.A.P. bomb is similar to that of the 250 lb., Mk. V, bomb, differing only in weight and dimensions and in that the tail adapter is formed with a complete annular groove, instead of with four slots, to accommodate the spring clips of the tail, and is provided with four key slots which are used when screwing the tail adapter into the bomb body after filling.

Filling

41. The filling of the 500 lb., S.A.P., Mk. V, bomb is similar to that of the 250 lb., Mk. V, S.A.P. bomb, except for quantity, for the omission of beeswax from the main filling, and for the omission also of the separate layer of T.N.T. around the exploder container.

Tail

42. The tail, bomb, H.E., aircraft, S.A.P., 500 lb., No. 11, Mk. I, is similar to the tail, bomb, H.E., aircraft, S.A.P., 250 lb., No. 10, Mk. I, differing only in weight and dimensions.

Transit base

43. The bomb is supplied fitted with base, transit, aircraft bomb, No. 23, Mk. I (Stores Ref. 12A/506), which is similar to the base, transit, aircraft bomb, No. 22, Mk. I, differing only in weight and dimensions.

Identification colouring and markings

Colouring

44. The colouring of the bomb body, tail, and transit base is the same as that of the 250 lb., Mk. V, S.A.P., bomb, see para. 11, except that the light green band is 8 in. from the nose end.

Markings on the bomb body

45. The letters T.N.T. are stencilled, in black, on the light green band in three places equally spaced. If G.D. 2 is also stencilled on this band, the bomb is unsuitable for storage in hot climates.

46. To the rear of the suspension lug are stencilled, in black, the following particulars:—

- (i) S.A.P., 500 lb., V.
- (ii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iii) The date of filling, month and year.
- (iv) The lot number of the filling.

On the reverse side of the bomb body the design number of the method of filling is stencilled, in black.

47. The manufacturer's serial number is stamped on the bomb body, and is also stencilled in registering positions on both the tail end of the bomb-body and the flange of the tail adapter.

48. Stamped on the bomb body, on the same side as the suspension lug and towards the tail end are the following markings:—

- (i) V. S.A.P., 500 lb.
- (ii) The manufacturer's initials, or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the tail

49. The following markings are stencilled in black on the cylindrical vane:—

- (i) No. 11 L.
- (ii) S.A.P., 500 lb., V.

50. Stamped on the cylindrical vane are the following markings:—

- (i) No. 11 L.
- (ii) The manufacturer's initials, or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the transit base

51. The following markings are stencilled in black on the top of the transit base:—

- (i) No. 23, Mk. I, S.A.P., 500 lb. ,

52. Stamped on the top are the manufacturer's markings, as follows:—

- (i) The manufacturer's initials, or recognized trade mark.
- (ii) 23. L.

Markings on the transit plug

53. The markings on the transit plug are as described in para. 20.

Functioning

54. The bomb functions as described in para. 21 to 23.

INSTRUCTIONS FOR USE**Fuzing the bomb and assembling the tail**

55. The 500 lb., Mk. V, S.A.P., bomb, is fuzed and the tail assembled as described in para. 24 to 31, it being noted that the tail adapter has a complete annular groove, instead of four slots, to accommodate the spring clips of the tail.

Loading the bomb on the aircraft bomb carrier

56. The bomb is loaded on the bomb carrier as described in the relevant chapter of A.P. 1664, Vol. I.

Unloading the bomb from the aircraft bomb carrier

57. The bomb is unloaded from the bomb carrier as described in para. 33.

Unfuzing the bomb

58. Unfuzing the bomb as described in para. 34.

SUPPLY AND STORAGE**Supply**

59. The bomb, H.E., aircraft, S.A.P., 500 lb., Mk. V, is supplied fitted with base, transit, aircraft bomb, No. 23, Mk. I, and either with pistol, bomb, tail, No. 28, serving as a transit plug, or with transit plug No. 27, in position. When the bomb is fitted with transit plug No. 27, the pistol No. 28 is packed with the tail unit.

60. The tail, bomb, H.E., aircraft, S.A.P., 500 lb., No. 11, Mk. I, is supplied with pistol No. 28 in Container, B.303, Mk. I (Stores Ref. 12A/502), or without the pistol in Container, B.313, Mk. I (Stores Ref. 12A/504).

Storage

61. The bombs are classified, for storage purposes, in Group VII. Tail units may be stored in the same explosives storehouse as the filled bombs, but packages containing them must be stacked well away from the filled stores. Bombs marked G.D. 2 must not be stored in hot climates.

Modification to the No. 10 Mk. I tail for carriage on fighter-bomber aircraft

62. The No. 10 Mk. I tail is to be modified as follows if the 250 lb. Mk. V.S.A.P. bomb is to be carried on fighter-bomber aircraft:—

- (i) Carefully straighten the tab of the tab washer which secures the locking nut, and unscrew and remove the nut and tab washer.
- (ii) Remove one pair of arming vane blades, and replace the tab washer and locking nut.
- (iii) Bend up the tab of the tab washer to lock the locking nut in position.

63. Alternatively, the tail may be modified by cutting off two diametrically opposite blades of the arming vane.

64. Ensure that the screw in the safety clip engages securely in the hole in the cone bush. If the safety clip is not secure, it is to be removed and a clip, safety, arming vane (Stores Ref. 12A/982), fitted. Tails of recent manufacture are fitted with safety clips giving the necessary secure engagement.

65. If tail units are not fitted with swivel locking clips (the earlier ones were not so fitted), a clip, locking, spring-on type (Stores Ref. 12A/842) is to be fitted over each of the four spring clips on the tail cone.

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*Relevant amendments up to A.L. 72
incorporated in this reprint
January, 1944*

APPENDIX 1

COMPONENTS USED WITH S.A.P. BOMBS

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APPENDIX 1

COMPONENTS USED WITH S.A.P. BOMBS

TABLE 1
BOMBS, H.E., AIRCRAFT, S.A.P., 250 lb., Mk. H, IIC, HI, IHC, and IV

| <i>Tail fuuzing</i> | |
|-------------------------------|-------------------------------|
| <i>Fuze</i> | <i>Exploder</i> |
| No. 30, Mk. I, I*, II, or III | Special, supplied in position |

TABLE 2
BOMB, H.E., AIRCRAFT, S.A.P., 250 lb., Mk. V

| <i>Tail fuuzing</i> | | |
|----------------------------------|---|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 28, Mk. I, II, II*, or III | No. 47, Mk. I or III (0-12 sec.) No. 44, Mk. I, II, or III (1 sec.) No. 35, Mk. II, III, or V (11 sec.) | Special, supplied in position |
| No. 30, Mk. II, III, III*, or IV | No. 51, Mk. I (0-025 sec.) No. 48, Mk. I (0-04 sec.) No. 50, Mk. I (0-14 sec.) | |

TABLE 3
BOMBS, H.E., AIRCRAFT, S.A.P., 500 lb., Mk. H, HC, HI, HIC, and IV

| <i>Tail fuuzing</i> | |
|-------------------------------|-------------------------------|
| <i>Fuze</i> | <i>Exploder</i> |
| No. 30, Mk. I, I*, II, or III | Special, supplied in position |

TABLE 4
BOMB, H.E., AIRCRAFT, S.A.P., 500 lb., Mk. V

| <i>Tail fuuzing</i> | | |
|----------------------------------|---|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 28, Mk. I, II, II*, or III | No. 47, Mk. I or III (0-12 sec.) No. 44, Mk. I, II, or III (1 sec.) No. 35, Mk. II, III, or V (11 sec.) | Special, supplied in position |
| No. 30, Mk. II, III, III*, or IV | No. 51, Mk. I (0-025 sec.) No. 48, Mk. I (0-04 sec.) No. 50, Mk. I (0-14 sec.) | |

AIR PUBLICATION 1661B
Volume I

Section 4

R.L. BOMBS

*Relevant amendments up to A.L. 72
incorporated in this reprint
January, 1944*

A.P.1661B, Vol. I

SECTION 4

R.L. BOMBS

GENERAL CONTENTS LIST

Note.—A detailed contents list appears at the beginning of each chapter.

CHAPTER 1—General notes on R.L. bombs

CHAPTER 2—Bombs, H.E., aircraft, R.L., 112 lb., Mk. VII and VIIC

APPENDIX 1—Components used with R.L. bombs

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September, 1942
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A.P.1661B, Vol. I, Sect. 4

CHAPTER 1

General notes on R.L. bombs

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CHAPTER 1

General notes on R.L. bombs

Introduction

1. A small number of 112 lb. Mk. VII and VIIC R.L. bombs remain in the Service. They are fuzed at the nose and tail and are provided with a central tube. They may be used for general bombardment purposes or as anti-personnel bombs.

Precautions to be observed when fuzing or unfuzing bombs

2. Attention is directed to the precautions detailed in Sect. 1, Chap. 1, which apply also to R.L. bombs.

Repair and examination

3. Only such repair and examination of bombs as is detailed in Sect. 20, Chap. 1, is to be done by armament personnel. Any bomb found having major damage or defects is to be set aside for A.I.D. inspection.

4. Fuzed bombs, whether loaded on to aircraft, or stored in the fuzed bomb area, must be examined at the intervals stated in Sect. 20, Chap. 2.

Supply

5. R.L. bombs are supplied, without tail units, in boxes, the tail units being supplied separately.

Storage

6. The regulations governing the storage of R.L. bombs are given in A.P.1245, Chap. 3. Tail units, in their packages, may be stored in the same explosives storehouse as the filled bombs, but the packages containing them must be stacked well clear of the filled stores.

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CHAPTER 2

BOMBS, H.E., AIRCRAFT, R.L., 112 lb., Mk. VII and VIII

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1. Bomb, H.E., aircraft, R.L., 112 lb., Mk. VIII, with transit plugs in position
2. Bomb, H.E., aircraft, R.L., 112 lb., Mk. VIII, with fuzing components in position

CHAPTER 2

BOMBS, H.E., AIRCRAFT, R.L., 112 lb., Mk. VII and VIIC

Introduction

1. The 112 lb., R.L., Mk. VII and VIIC bombs are intended for general bombardment purposes, and they are provided with a central tube for exploding and fuzing at both the nose and tail. An instantaneous detonator and a direct acting pistol are employed in the nose end, and a delay detonator and tail pistol in the rear end of the central tube, in combination with appropriate exploders. When operating against soft targets, a short-delay detonator may be employed at the tail end.

BOMB, H.E., AIRCRAFT, R.L., 112 lb., Mk. VII

Leading particulars

| | |
|-------------------------------------|-----------------------|
| 2. Stores Ref. | 122A/22 |
| Overall length | 22 ft. 5 in., approx. |
| Maximum diameter | 9 in., approx. |
| Weight of empty bomb | 80 lb., approx. |
| Weight and nature of filling | 27 lb., amatol 80/20 |
| Terminal velocity | 7200 ft. per sec. |

GENERAL DESCRIPTION

3. The bomb consists of a cast or forged steel body fitted with a central tube, a suspension band, and a sheet metal tail.

Bomb body, fig. 1 and 2

4. The forward portion of the hollow bomb body is of approximately hemispherical form and the rear portion has a conical taper.

5. The nose has a filling hole closed by a flanged adapter plug which has a plain locating hole for the central tube, and the tail end of the bomb body also has a plain locating hole for the central tube.

6. The central tube extends axially through the bomb body and beyond the nose and tail ends, and is located and held in position by an internally threaded collar screwed on to its rear end, so as to bear upon the rear end of the bomb body, and by a nose nut screwed on to its forward end. The collar is fixed to the rear end of the bomb body by diametrically opposed set-screws passing through plain holes in the collar and screwing into tapped holes in the bomb body, whilst the collar and the nose nut are both locked to the central tube by grub screws.

7. The ends of the central tube of the unfuzed bomb are closed by screwed transit plugs, one plug being screwed into the rear end of the tube, which is internally threaded, and the other plug being screwed into the nose nut which is similarly threaded. Any of the plugs, bomb, nose or tail, No. 5, Mk. I; No. 5A, Mk. I; No. 7, Mk. I; or No. 7A, Mk. II, may be fitted at either or both ends.

8. The bomb body is supplied fitted with band, suspending No. 3, Mk. I (Stores Ref. 12A/270).

Filling

9. The interior space around the central tube is filled with amatol 80/20, sealed at the tail end with approved sealing material and topped at the nose end with approved composition and a waxed felt washer.

Tail

10. The tail consists of four equi-spaced vanes secured to a tail cone which fits over the conical rear portion of the bomb body, and it is secured in position by a flanged washer and an internally threaded coupling sleeve. The four vanes are interconnected by three sets of stiffening stays so as to leave an unobstructed space between two adjacent vanes. The flanged washer seats upon the rear face of the internally threaded collar, which is fixed to the rear end of the bomb body by set-screws, and its flange encircles the rear end of the tail cone, whilst the coupling sleeve is screwed on to the rear end of the central tube to retain the tail assembly, as a whole, in position with the free inter-vane space aligned with the lug on the suspension band, and the vanes at 45 deg. to the radial plane through the suspension lug.

A.P.1661B, Vol. I, Sect. 4, Chap. 2

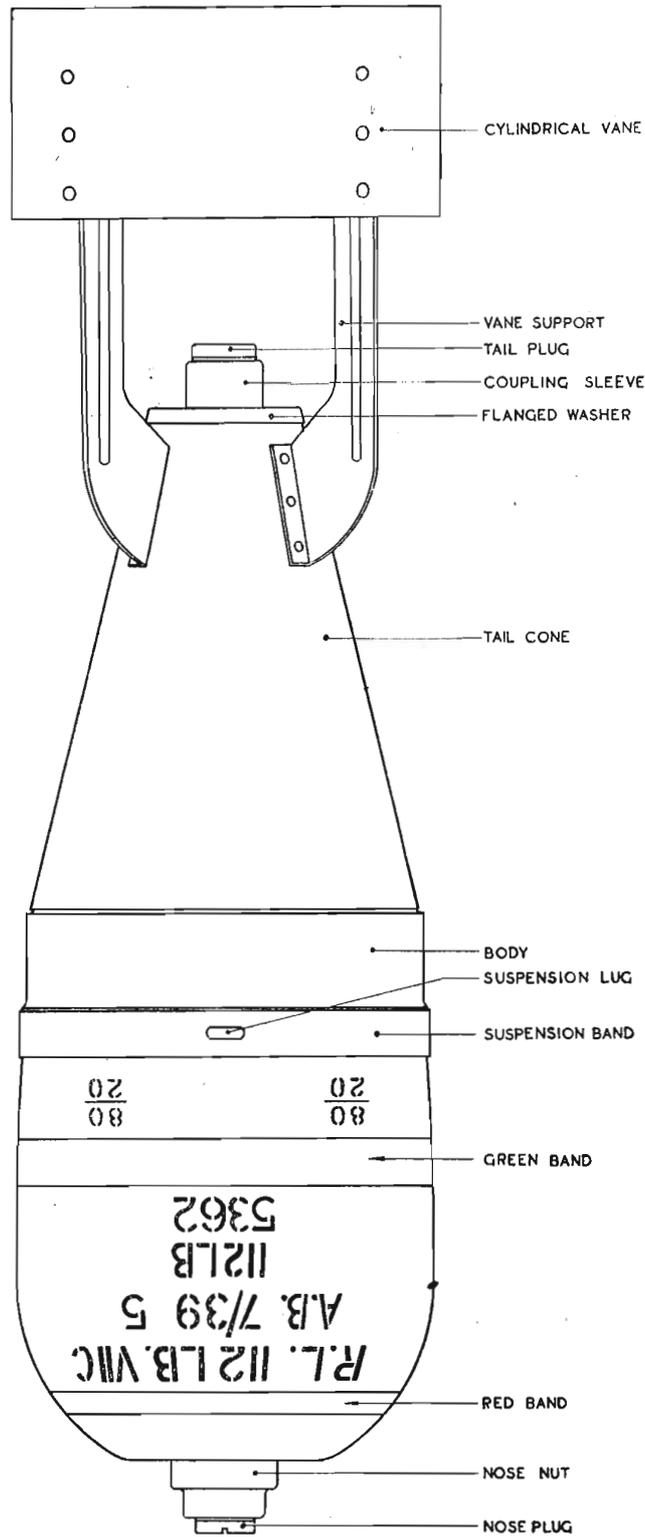


Fig. 1.—Bomb, H.E., aircraft, R.L., 112 lb., Mk. VIIC, with transit plugs in position (Mk. VII bomb similar except for tail and markings)

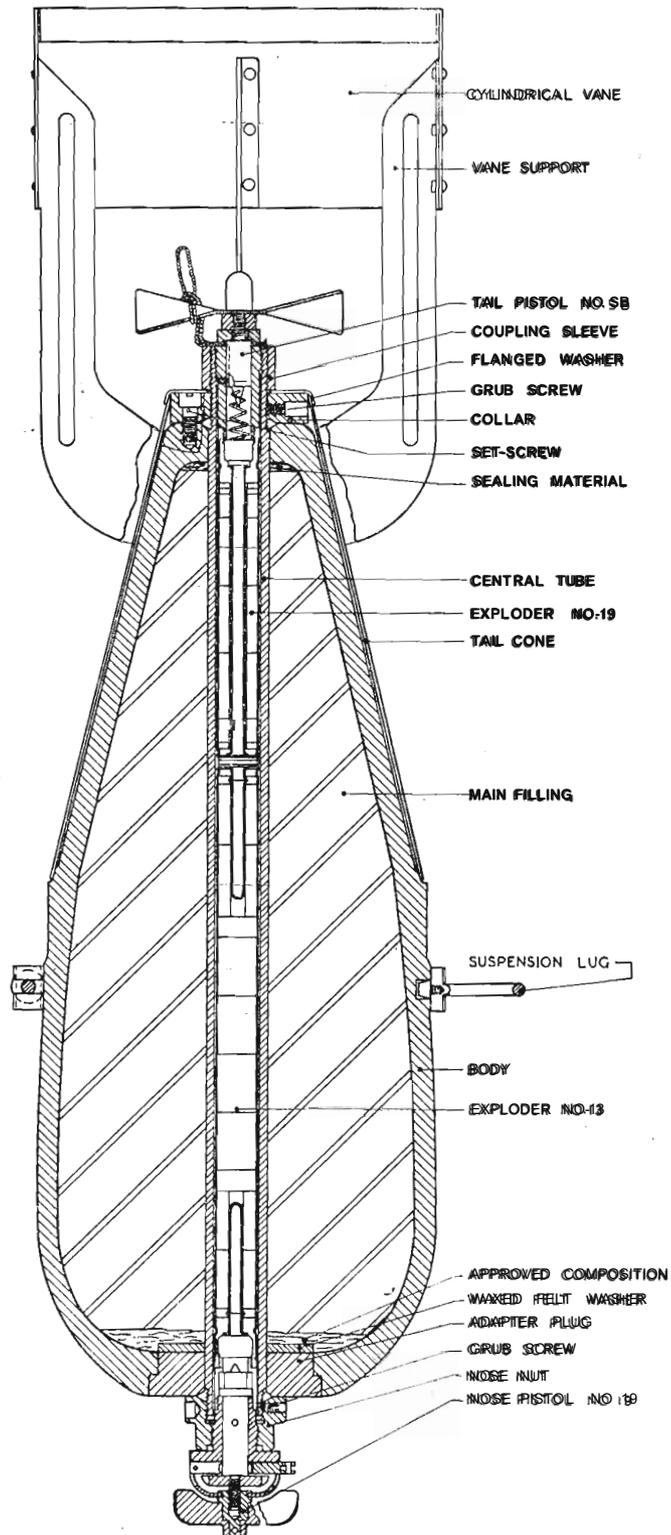


Fig. 2.—Bomb, H.E., aircraft, R.L., 1112 lb., Mk VIIC, with fuizing components in position (Mk. VII bomb similar except for tail and markings)

Identification colouring and markings*Colouring*

11. The bomb body, suspension band, tail cone, and vanes are coloured yellow. A red band, $\frac{1}{2}$ in. wide, is painted round the bomb body 1 in. from the nose end, and a green band, 1 in. wide, is painted round the bomb body 6 in. from the nose end.

Markings

12. Between the red and green bands on the bomb body are stencilled, in black, the following particulars:—

- (i) R.L., 112 lb., VII.
- (ii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor; the date of filling, month and year, and the lot number of the filling.
- (iii) The actual weight of the filled bomb, without plugs.
- (iv) The design number of the method of filling.

13. Immediately to the rear of the green band is stencilled, in black, in three places equi-spaced around the bomb body, the filling ratio figures 80/20.

14. Cast on the bomb body, in raised characters, between the nose end and the suspension band, are the following markings:—

- (i) R.L., 112 lb.
- (ii) The initials or recognized trade mark of the manufacturers.
- (iii) VII.
- (iv) The date of manufacture, month and year.
- (v) C.S.

Functioning

15. The bomb may be dropped with both pistols "live", the safety clips being withdrawn from both pistols by the fuze-setting control links when the bomb is released; or the bomb may be dropped with only one pistol "live", its safety clip being withdrawn by the appropriate fuze-setting control link upon release, and the other fuze-setting control link being freed from the carrier; or the bomb may be dropped "safe" by freeing both fuze-setting control links from the carrier.

16. When the bomb is released from the bomb carrier with one or both pistols "live", the arming vane or vanes are unscrewed and expended so as to arm one or both pistols.

17. Upon impact of the bomb with the target, one or other of the pistol strikers is actuated, either directly or through inertia, to detonate the main fuze through the associated detonator and exploder system.

INSTRUCTIONS FOR USE**Fuzing the bomb**

18. Remove the nose and tail plugs. Ensure that the central tube is clean and dry internally, cleaning it with a soft dry cloth if necessary. Also examine the internal screw-threads of the central tube and the nose nut, and clean them if necessary.

Note.—A metal scraper, knife, or other tool must not be used for cleaning the central tube or the threads.

19. Lay out the nose and tail components on a clean bench in the order in which they will be assembled in the central tube. Pistol, bomb, D.A., No. 8, Mk. I, or No. 19, Mk. I or II, is to be used in the nose, and pistol, bomb, No. 5B, Mk. I is to be used at the tail end. Exploder No. 13, Mk. I is to be used with the nose pistol, and exploder No. 19, Mk. III is to be used with the tail pistol.

20. Test the pistols for freedom of movement of their arming vanes, screwing the vanes fully home on the striker spindles and replacing the safety pins after testing and before screwing the pistols into their respective exploders.

21. Fit the exploders with their detonators, screw the nose and tail pistols into the respective exploders, measure the overall length of the components, and compare it with the available length of the central tube, measuring the latter with a suitable non-ferrous metal gauge.

22. If the overall length of the components is short of the available length of the central tube, it must be made up by inserting, between the exploders, felt adjusting washers, allowing for compression of these to one-fifth of their thickness. If the overall length of the components is greater

than the available length of the central tube, a fresh set of components, if available, should be assembled and measured up; failing this, or in the event of the second set being too long, the bomb should be set aside for A.I.D. inspection.

23. Insert the components, with adjusting washers as necessary, into the central tube, screwing the nose pistol fully into the nose nut, and screwing the tail pistol into the rear end of the central tube, making sure that at least four complete screw-threads are engaged in the tube.

Loading the bomb on to the aircraft bomb carrier

24. Load the bomb on the aircraft bomb carrier as described in the relevant chapter of A.P. 1664, Vol. I. Connect the safety clip of the nose pistol to the fuze-setting control link of the bomb carrier, and connect another fuze-setting control link, having a spring clip and stop pin, to the body of the tail pistol, so that the stop pin will prevent the arming vane from rotating. Remove the cap from the tail pistol. The safety pins of both the nose and tail pistols must be removed and handed to the pilot, or the bomb aimer, immediately before the aeroplane is ready to take off.

Unloading a bomb from the aircraft bomb carrier

25. Replace the safety pins of the nose and tail pistols, and disconnect the fuze-setting control links respectively from the safety clip of the nose pistol and the body of the tail pistol. Unload the unexpended bomb from the aircraft bomb carrier as described in the relevant Chapter of A.P. 1664, Vol. I.

Unfuzing the bomb

26. Unscrew the tail pistol and withdraw it, together with its associated exploder, from the central tube. Unscrew the nose pistol from the nose nut and withdraw it with its exploder.

27. Remove the pistols from the exploders.

28. Remove the detonators from the exploders.

29. Remove the felt washer or washers, if any, from the central tube, using a wooden stick to push them out. Replace the transit plugs, with washers.

SUPPLY AND STORAGE

Supply

30. The bomb, H.E., aircraft, R.L., 112 lb., Mk. VII, with tail, and fitted with a No. 3, Mk. I suspending band is supplied in Box, B.98, Mk. I (Stores Ref. 12A/140).

Storage

31. The boxed bombs are classified, for storage purposes, in Group VII.

BOMB, H.E., AIRCRAFT, R.L., 112 lb., Mk. VHC

Leading particulars

| | | | | | | |
|------------------------------|-----|-----|-----|-----|-----|----------------------|
| 32. Stores Ref. | ... | ... | ... | ... | ... | 12A/242 |
| Overall length | ... | ... | ... | ... | ... | 2 ft. 8 in., approx. |
| Maximum diameter | ... | ... | ... | ... | ... | 9 in., approx. |
| Weight of empty bomb | ... | ... | ... | ... | ... | 82 lb., approx. |
| Weight and nature of filling | ... | ... | ... | ... | ... | 27 lb., amatol 80/20 |
| Terminal velocity | ... | ... | ... | ... | ... | 720 ft. per sec. |

GENERAL DESCRIPTION

33. The 112 lb., R.L., Mk. VHC bomb, see fig. 1 and 2, is a conversion of the 112 lb., R.L., Mk. VII bomb, a different tail having been introduced to facilitate internal stowage of the bombs on aeroplanes.

Bomb body

34. The bomb body construction is as described in para. 4 to 8.

Filling

35. The filling of the bomb is as described in para. 9.

Tail

36. The vane, tail, No. 1, Mk. I (Stores Ref. 12A/277) which is substituted for the four-vaned tail of the 112 lb., R.L., Mk. VII bomb to convert the bomb to Mk. VIIC, consists of a cylindrical vane attached, by four equi-spaced vane supports, to a tail cone which fits over the rear portion of the bomb body, and it is secured thereto by a flanged washer and an internally threaded coupling sleeve in the same way as the tail of the Mk. VII bomb, see para. 10. The tail is assembled to the bomb body with the vane supports at 45 deg. to the radial plane through the lug on the suspension band.

Identification colouring and markings*Colouring*

37. The bomb body, suspension band, and tail are coloured yellow, with red and green bands painted round the body as described in para. 11.

Markings

38. The stencilled markings on the bomb body are as described in para. 12 and 13, except that the mark number "VII" is followed by the letter "C".

39. The manufacturer's markings on the bomb body, see para. 14, are barred out, where not applicable, and replaced by the converting contractor's markings so as to read as follows:—

- (i) VIIC.
- (ii) R.L., 112 lb.
- (iii) The initials or recognized trade mark of the converting contractor.
- (iv) The date of conversion, month and year.
- (v) C.S.

40. The same serial number is stencilled, in black, on both the bomb body and the tail cone, near its forward edge, in corresponding positions.

Functioning

41. The bomb functions as described in para. 15 to 17.

INSTRUCTIONS FOR USE**Fuzing the bomb**

42. The bomb is fuzed as described in para. 18 to 23.

Loading the bomb on to the aircraft bomb carrier

43. Load the fuzed bomb on to the aircraft bomb carrier as described in para. 24.

Unloading a bomb from the aircraft bomb carrier

44. Unload the bomb from the aircraft bomb carrier as described in para. 25.

Unfuzing the bomb

45. Unfuzed the bomb as described in para. 26 to 29.

SUPPLY AND STORAGE**Supply**

46. The bomb, H.E., aircraft, R.L., 112 lb., Mk. VIIC, with tail, and fitted with a No. 3, Mk. I suspending band is supplied in Box, B.253, Mk. I (Stores Ref. 12A/243).

Storage

47. The boxed bombs are classified, for storage purposes, in Group VIII.

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APPENDIX 1

COMPONENTS USED WITH R.L. BOMBS

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APPENDIX 1
COMPONENTS USED WITH R.L. BOMBS

TABLE 1
BOMBS, H.E., AIRCRAFT, R.L., 112 lb., Mk. VH and VHC

| <i>Nose fuzeing</i> | | | <i>Tail fuzeing</i> | | |
|--|------------------|---|---------------------|--------------------|--|
| <i>Pistol</i> | <i>Exploder</i> | <i>Detonator</i> | <i>Pistol</i> | <i>Exploder</i> | <i>Detonator</i> |
| No. 8, Mk. I or No. 19, Mk. I or II | No. 13, Mk. I | No. 4, Mk. I (inst.) and 45 gram, No. 1, Mk. I | No. 5B, Mk. I | No. 19, Mk. III | No. 13, Mk. I (12 sec), or No. 21, Mk. I (1 sec.), or No. 4, Mk. I (inst.) |

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Section 5

A.S. BOMBS

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A.P.1661B, Vol. I

SECTION 5

A.S. BOMBS

GENERAL CONTENTS LIST

Note.—A detailed contents list appears at the beginning of each chapter.

CHAPTER 1—General notes on A.S. bombs

CHAPTER 2—Bombs, H.E., aircraft, A.S., 250 lb., Mk. I, II, and III, and 500 lb., Mk. I, II, and III

CHAPTER 3—Bombs, H.E., aircraft, A.S., 100 lb., Mk. IV, 250 lb., Mk. IV, and 500 lb., Mk. IV

APPENDIX 1—Components used with A.S. bombs

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A.P.1661B, Vol. I, Sect. 5

CHAPTER 1

General notes on A.S. bombs

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| Repair and examination | 4 |
| Supply | 6 |
| Storage | 7 |

CHAPTER 1

General notes on A.S. bombs

Introduction

1. A.S. bombs, ranging in weight from 100 lb. to 500 lb., are at present in use in the Service. They are thin-walled bombs, having a high charge/weight ratio, to give the maximum blast effect on or under water.

2. Earlier marks of A.S. bombs are fuzed at the nose only with a No. 32 fuze; later marks of the bombs employ a pistol/detonator combination at the tail end only. Ballistic caps may be fitted to bombs employing a fuze, to improve the underwater trajectory.

Precautions to be observed when fuzing or unfuzing bombs

3. Attention is called to the precautions detailed in Sect. 11, Chap. 11, which apply also to A.S. bombs.

Repair and examination

4. Only such repair and examination of bombs as is detailed in Sect. 20, Chap. 11, is to be done by armament personnel. Any bomb found having major damage or defects is to be set aside for A.I.D. inspection.

5. Fuzed bombs, whether loaded on to aircraft, or stored in the fuzed bomb area, must be examined at the intervals stated in Sect. 20, Chap. 2, particular attention being paid to the examination of the No. 32 fuze.

Supply

6. Earlier marks of A.S. bombs are supplied, with or without tails, in boxes. Later marks of the bombs are supplied fitted with transit bases, the tail units being supplied separately in packages.

Storage

7. The regulations regarding the storage of A.S. bombs are given in A.P.1245, Chap. 3. Tail units, when supplied separately, may be stored in the same explosives storehouse as the filled bombs, but the packages containing them must be stacked well clear of filled stores.

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CHAPTER 2

BOMBS, H.E., AIRCRAFT, A.S., 250 lb., Mk. I, H, and HI, and 500 lb., Mk. I, H, and HI

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1. Bomb, H.E., aircraft, A.S., 250 lb., Mk. III

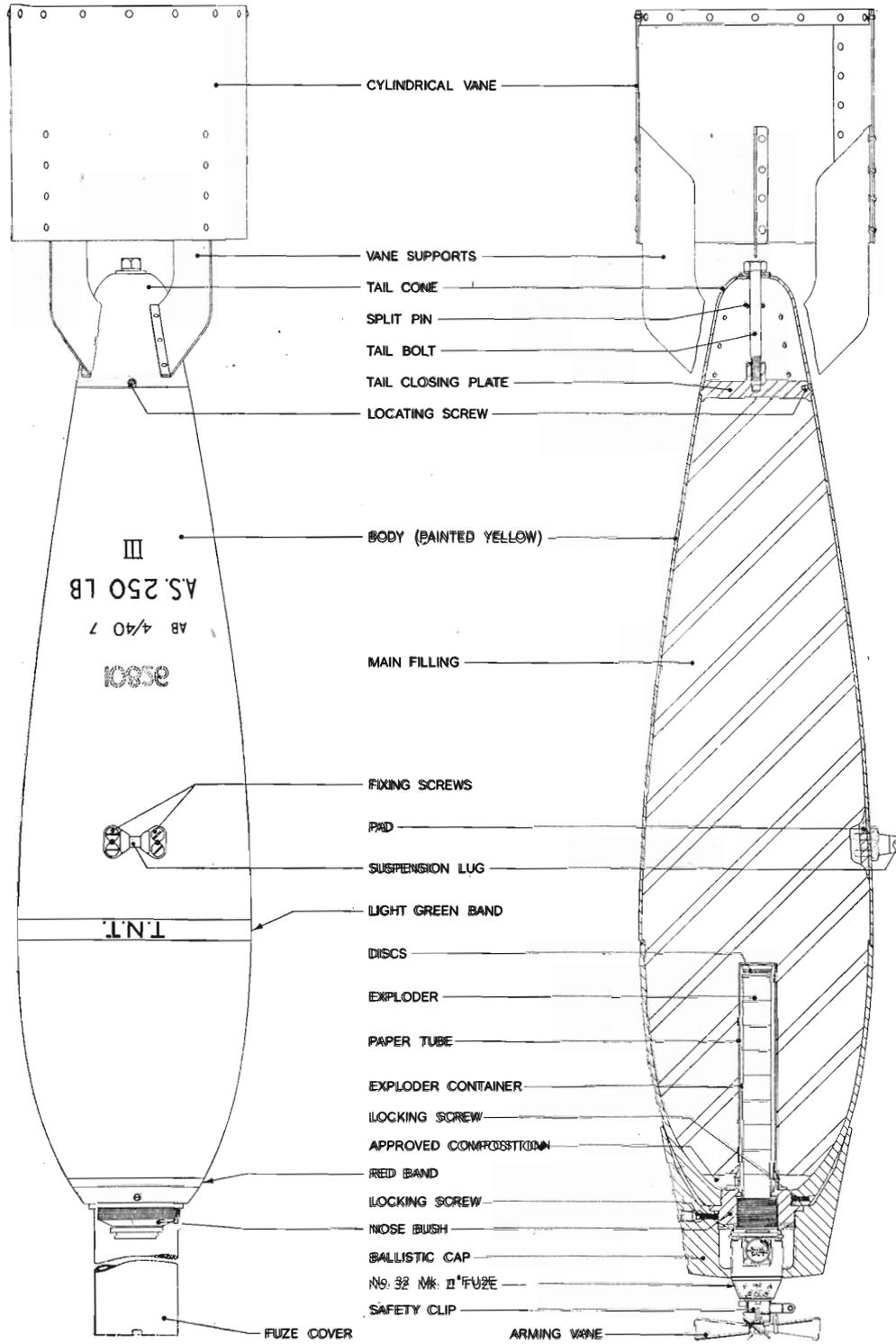


Fig. 1.—Bomb, H.E., aircraft, A.S., 250 lb., Mk. III

CHAPTER 2

BOMBS, H.E., AIRCRAFT, A.S., 250 lb., Mk. I, H, and III, and 500 lb., Mk. I, II, and III

Introduction

1. The 250 lb. and 500 lb. Mk. I, II, and III A.S. bombs are used for attacking submarines. They differ from the corresponding Mk. IV A.S. bombs in that they employ a nose fuze, instead of a tail pistol/detonator combination, and in that the tail is secured to the bomb body by a bolt instead of by spring clips.

2. In this chapter the 250 lb. Mk. III bomb is first fully described, and the others are then dealt with by comparison.

BOMB, H.E., AIRCRAFT, A.S., 250 lb., Mk. III

Leading particulars

| | |
|---|---|
| 3. Stress Ref. | 12A/306 |
| Length, with tail and transit plug | 4 ft. 11 5/8 in. |
| Maximum diameter | 11 1/2 in. |
| Weight of body | 83 lb. 13 oz., approx. |
| Weight and nature of filling | 126.7 lb., T.N.T., or 131.7 lb., baratol 10/90 |
| Terminal velocity of bomb fitted with cap, ballistic, No. 2, Mk. I | 1,150 ft. per sec. |

GENERAL DESCRIPTION

4. The bomb, see fig. 1, consists of a body, containing the high explosive filling, and a tail secured to the bomb body by a tail bolt. The nose fuzeing position of the bomb, as supplied, is fitted with a transit plug.

Bomb body

5. The bomb body consists of a hollow nose forging or casting and a sheet steel casing which is closed by a tail closing plate, the three parts being welded together.

6. The nose is closed by a screwed-in nose bush which is locked in position by a locking screw. The nose bush has an exploder container screwed into it and welded in position, and the forward portion of the nose bush is threaded to receive the transit plug or the fuze. The forward portion of the nose bush is also threaded externally to receive a ballistic cap, or (for Fleet Air Arm use only) a fuze cover.

7. The sheet metal casing is made in two parts secured together by longitudinal welds. A suspension lug pad is welded to the inside of the casing and the suspension lug is secured to the bomb body by fixing screws which pass through the casing into tapped holes in the suspension lug pad and are locked by locking screws screwed into holes in the suspension lug.

8. The tail closing plate is a disc, shaped externally to fit into the tail and also into the rear portion of the bomb body. A locating screw for the tail is screwed into the side of the tail closing plate at a position in line with the suspension lug, and there is a threaded central boss on the rear face of the plate to receive the tail securing bolt.

Filling

9. The main filling consists of T.N.T., or baratol 10/90, with a topping of approved composition at the nose end for sealing purposes.

10. The exploder container is enclosed in a paper tube which protects it from the main filling, and it houses a 11 1/2 oz. C.E., or C.E./T.N.T., exploder, with a felt disc and glazeboard discs, as necessary, in the inner end, and a cloth covering disc at the outer end.

Tail

11. The tail consists of a tail cone with a cylindrical vane attached to it by four equi-spaced vane supports which are riveted to the cone and to the vane. The forward edge of the tail cone has a slot which engages the locating screw on the tail closing plate, see para. 8, to ensure that the

vane supports are at 45 deg. to the suspension lug. The tail securing bolt is passed through a hole in the top of the tail cone, where it seats on a spring washer, and a split pin through the shank of the bolt prevents its loss when the tail is off the bomb.

Ballistic cap

12. The ballistic cap, when assembled to the fuzed bomb, surrounds the fuze and forms a nose extension of the bomb body to improve the underwater trajectory of the bomb. It screws on to the nose bush, and is provided with a locking screw for securing it in position.

Fuze cover

13. The fuze cover, which is for Fleet Air Arm use only, consists of a hollow metal cylinder closed at one end and internally threaded at the other end to screw on to the nose bush of the fuzed bomb so as to enclose and protect the fuze during storage.

Identification colouring and markings

Colouring

14. The bomb body and the tail are painted yellow. A red band, $\frac{1}{2}$ in. wide is painted round the bomb body 2 in. from the forward face of the nose bush, and a light green band, 1 in. wide, is painted round the greatest diameter of the bomb body.

Markings

15. The letters T.N.T., or BAR, are stencilled in black in three places on the light green band round the body to indicate the nature of the main filling. The letters G.D.2 are stencilled in one place only on the light green band, in addition to the three T.N.T. markings, when the bomb is filled with Grade 2 T.N.T.; bombs so marked are unsuitable for storage in hot climates. A baratol filled bomb has the ratio figures 10/90 stencilled in black immediately to the rear of the light green band in positions corresponding to the three BAR markings on the band.

16. The following particulars are stencilled in black on the upper side of the bomb body, to the rear of the suspension lug:—

- (i) The type and nominal weight of the bomb.
- (ii) The mark number of the bomb.
- (iii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iv) The date of filling, month and year.
- (v) The lot number of the filling.

17. The design number of the method of filling is stencilled in black on the reverse side of the bomb to the rear of the suspension lug.

18. The following markings are stamped on the nose portion of the body:—

- (i) The mark, type, and nominal weight of the bomb.
- (ii) The manufacturer's initials, or recognized trade mark.
- (iii) The date of manufacture, month and year.

19. The manufacturer's serial number is stamped on the rear portion of the bomb body, near the tail closing plate, and also upon the tail cone in a corresponding position near the forward edge.

Functioning

20. When the fuzed bomb is released from the bomb carrier, the safety clip is withdrawn from the fuze by the fuze-setting control link so as to free the arming vane.

21. During the fall of the bomb, the arming vane is rotated by the airstream to arm the fuze, the delay ring of which is pre-set before the aircraft takes off.

22. Upon impact of the bomb with the water from an altitude of 500 ft. or more, or on striking a target offering a slight resistance to penetration, the delay mechanism of the fuze functions to fire the magazine charge after the predetermined delay. The firing of the magazine charge initiates the exploder, which detonates the main filling of the bomb. If the bomb strikes a hard target, the fuze functions by direct action to fire the magazine charge and detonate the main filling through the exploder.

INSTRUCTIONS FOR USE

Assembling the tail

23. Offer up the tail cone to the tail closing plate, making sure that the slot in the tail cone is in register with the locating screw in the closing plate, and press the tail home. Screw the tail securing bolt tightly into the boss on the tail closing plate to secure the tail firmly in position.

Fuzing the bomb

24. Obtain a fuze, D.A., impact and delay, aircraft bomb, nose, No. 32, Mk. II* (Stores Ref. 12G/351), or Mk. III (Stores Ref. 12G/352), from its cylinder, and prepare it for use as described in A.P.1661C, Vol. I, Sect. 2, Chap. 3, making sure that the tips of the arming vane have a set of 60 deg. to the plane of rotation.

25. Remove the plug from the nose bush of the bomb, take the leather washer from the plug and fit it on the fuze, and then screw the securing ring back against the shoulder on the fuze body after rolling the rubber ring clear.

26. Screw the prepared fuze fully home into the nose bush of the bomb and adjust its position as necessary, to bring the locating slot for the safety clip in line with the suspension lug on the bomb body. Hold the fuze from turning, using Key No. 104, Mk. I (Stores Ref. 12G/256), and screw the securing ring hard down against the nose bush, using Key No. 89, Mk. I (Stores Ref. 12G/255), or Mk. II (Stores Ref. 12G/267). Replace the rubber ring between the securing ring and the shoulder on the fuze body.

27. Set the fuze to function for the delay required by removing the cover on the side of the fuze and rotating the delay ring spindle, using Key No. 126, Mk. I (Stores Ref. 12G/266) until the graduation which is provided on the key registers with the setting required. The final movement in setting the spindle must be in the direction of increased delay, otherwise a backlash error will be introduced. If it becomes necessary, therefore, to reduce a setting, the spindle must first be turned back past the new setting required and then forward again to the new setting. After setting, replace the cover, making sure that an effective seal with the leather washers is obtained.

Fitting the ballistic cap

28. If the ballistic cap is to be fitted, the bomb must first be fuzed, as described in para. 24 to 27, and the threads of the cap and nose bush must be wiped clean and be liberally coated with mineral jelly.

29. To fit the ballistic cap, pass it over the fuze and screw it, by hand, fully home on to the nose bush, and then secure it by its locking screw. After fitting and securing the ballistic cap, the space between the forward portion of the cap and the body of the fuze is to be sealed with thick luting.

Loading the bomb on to the aircraft bomb carrier

30. Load the fuzed bomb on the aircraft bomb carrier as described in the relevant chapter of A.P.1664, Vol. I.

31. Mount the arming vane on the arming vane hub spigot of the fuze, securing it with the split pin provided, and fit the safety clip to the fuze so that the spigot on the clip engages the locating slot in the top cap of the fuze and the stop pin is in the path of rotation of the arming vane. It may be necessary to depress the vane assembly by finger pressure to ensure that the wings of the clip correctly engage the upper surface of the arming vane hub and that the locating ledges on the clip engage the slots in the top cap of the fuze. Connect the safety clip to the fuze-setting control link on the carrier.

32. Unscrew and remove the safety pillar from the fuze just before the aircraft is ready to take off, and hand the pillar to the pilot or bomb aimer.

Unloading the bomb from the aircraft bomb carrier

33. Replace the safety pillar in the fuze, disconnect the safety clip from the fuze-setting control link, and proceed to unload the bomb from the bomb carrier as described in the relevant chapter of A.P.1664, Vol. I. Before transporting the bomb, the ballistic cap, if fitted, should be removed, the fuze should be set to BRIDGE and be removed, see para. 35, and the transit plug replaced in the nose bush. Removal of the ballistic cap entails first removing the arming vane and the safety clip from the fuze.

Unfuzing the bomb

34. To unfuze the bomb, proceed as follows:—

- (i) Ensure that the fuze has been set to BRIDGE.
- (ii) Slacken the securing ring on the fuze body, and unscrew and remove the fuze from the nose bush of the bomb. Remove the leather washer from the fuze and fit it on the transit plug. Replace the transit plug in the nose bush, and treat the fuze as described in A.P. 1661C, Vol. I, Sect. 2, Chap. 3.

SUPPLY AND STORAGE**Supply**

35. The bomb, H.E., aircraft, A.S., 250 lb., Mk. III is supplied under Stores Ref. 12A/306, with tail unattached and with the transit plug in position, in Box B.262, Mk. I (Stores Ref. 12A/309), which holds one bomb and one tail.

36. The caps, ballistic, aircraft bomb, No. 2, Mk. I (Stores Ref. 12A/473) are supplied packed five in a Crate B.292, Mk. I (Stores Ref. 12A/480).

Storage

37. The bombs are classified, for storage purposes, in Group VII.

BOMB, H.E., AIRCRAFT, A.S., 500 lb., Mk. III**Leading particulars**

| | | | | | |
|---|-------|-------|-------|-------|---|
| 38. Stores Ref. | ... | ... | ... | ... | 12A/307 |
| Length, with tail and transit plug | ... | ... | ... | ... | 6 ft. 4.5 in. |
| Maximum diameter | ... | ... | ... | ... | 1 ft. 2.3 in. |
| Weight of body | ... | ... | ... | ... | 148 lb. 3 oz., approx. |
| Weight and nature of filling | ... | ... | ... | ... | 256 lb. T.N.T., or 265 lb. baratol 10/90 |
| Terminal velocity of bomb fitted with cap, ballistic, No. 3, Mk. I | ..... | ..... | ..... | ..... | 1,320 ft. per sec. |

GENERAL DESCRIPTION**Comparison with the 250 lb., Mk. III bomb**

39. The bomb differs from the 250 lb. Mk. III bomb mainly in weight and dimensions and in the quantity of the main filling. Para. 4 to 34 apply to the bomb except for the abovementioned differences.

SUPPLY AND STORAGE**Supply**

40. The bomb, H.E., aircraft, A.S., 500 lb., Mk. III is supplied under Stores Ref. 12A/307, with tail unattached and with the transit plug in position, in Box B.261, Mk. I (Stores Ref. 12A/310), which holds one bomb and one tail.

41. The caps, ballistic, aircraft bomb, No. 3, Mk. I (Stores Ref. 12A/474) are supplied packed five in a Crate B.294, Mk. I (Stores Ref. 12A/482).

Storage

42. The bombs are classified, for storage purposes, in Group VII.

BOMBS, H.E., AIRCRAFT, A.S., 250 lb., Mk. II, and 500 lb., Mk. III**Leading particulars****Bomb, H.E., aircraft, A.S., 250 lb., Mk. II**

| | | | | | |
|------------------------------------|-------|-------|-------|-------|---|
| 43. Stores Ref. | ..... | ..... | ..... | ..... | 12A/249 |
| Length, with tail and transit plug | ... | ... | ... | ... | 4 ft. 10.45 in. |
| Maximum diameter | ..... | ..... | ..... | ..... | 11.1 in. |
| Weight of body | ... | ... | ... | ... | 98 lb. 4 oz., approx. |
| Weight and nature of filling | ... | ... | ... | ... | 130.7 lb. T.N.T., or 137.7 lb. baratol 10/90 |
| Terminal velocity | ... | ... | ... | ... | 970 ft. per sec. |

*A.P.1661B, Vol. I, Sect. 5, Chap. 2**Bomb, H.E., aircraft, A.S., 500 lb., Mk. II*

| | |
|---|---|
| 44. Stores Ref. | 12A/250 |
| Length, with tail and transit plug | 6 ft. 2-5 in. |
| Maximum diameter | 1 ft. 2-1 in. |
| Weight of body | 179 lb. 9 oz. approx. |
| Weight and nature of filling | 267-7 lb. T.N.T., or 283-7 lb. baratol 10/90 |
| Terminal velocity of bomb fitted with cap, ballistic, No. 6, Mk. I | 1,320 ft. per sec. |

GENERAL DESCRIPTION

45. The 250 lb. and 500 lb. Mk. II A.S. bombs differ from each other mainly in weight and dimensions and in the quantity of the main filling. A ballistic cap is not provided for the 250 lb. Mk. II A.S. bomb. Para. 4 to 34 apply to the 500 lb. Mk. II A.S. bomb, and, with the exception of para. 12, 28, and 29, also to the 250 lb. Mk. II, A.S. bomb.

Comparison with the corresponding Mk. III bombs

46. The Mk. II bombs differ from the corresponding Mk. III bombs in weight and dimensions; in quantity of the main filling; and in certain constructional details. The constructional differences are the provision in the Mk. II bombs of angle-section strengthening rings welded round the inside of the bomb body casing, one near the joint between the casing and the nose portion and the other approximately half-way along the casing, and the attachment of the vane supports to the tail cone by welding instead of riveting.

SUPPLY AND STORAGE

Supply

47. The bomb, H.E., aircraft, A.S., 250 lb., Mk. II is supplied under Stores Ref. 12A/249, with tail unattached and with the transit plug in position, in Box B.239, Mk. I (Stores Ref. 12A/233), which holds one bomb and one tail.

48. The bomb, H.E., aircraft, A.S., 500 lb., Mk. II is supplied under Stores Ref. 12A/250, with tail unattached, and with the transit plug in position, in Box B.238, Mk. I (Stores Ref. 12A/232), which holds one bomb and one tail.

49. The caps, ballistic, aircraft bomb, No. 6, Mk. I (Stores Ref. 12A/477) are supplied packed five in Crate, B.295, Mk. I (Stores Ref. 12A/483).

Storage

50. The bombs are classified, for storage purposes, in Group VII.

BOMBS, H.E., AIRCRAFT, A.S., 250 lb., Mk. I, and 500 lb., Mk. I

Leading particulars

Bomb, H.E., aircraft, A.S., 250 lb., Mk. I

| | |
|------------------------------------|---|
| 51. Stores Ref. | 12A/230 |
| Length, with tail and transit plug | 4 ft. 10-45 in. |
| Maximum diameter | 11-1 in. |
| Weight of body | 91 lb. 6 oz. approx. |
| Weight and nature of filling | 130-7 lb. T.N.T., or 137-7 lb. baratol 10/90 |
| Terminal velocity | 970 ft. per sec. |

Bomb, H.E., aircraft, A.S., 500 lb., Mk. I

| | |
|------------------------------------|---|
| 52. Stores Ref. | 12A/231 |
| Length, with tail and transit plug | 6 ft. 2-5 in. |
| Maximum diameter | 1 ft. 2-1 in. |
| Weight of body | 182 lb. 10 oz. approx. |
| Weight and nature of filling | 267-7 lb. T.N.T., or 283-7 lb. baratol 10/90 |
| Terminal velocity | 1,240 ft. per sec. |

GENERAL DESCRIPTION

Comparison with the corresponding Mk. III bombs

53. Except for minor constructional differences, the Mk. I A.S. bombs are similar to the corresponding Mk. III A.S. bombs. The constructional differences are the provision of an internal strengthening band and strengthening angle rings welded to the bomb body casing; the welding of the suspension lug pad to the strengthening band, instead of directly to the rear portion of the body; and the welding of the suspension lug, which is not so strong as that on later mark bombs, to the bomb body casing in addition to its being secured by fixing screws. Ballistic caps are not provided for the Mk. I A.S. bombs. Except for the differences stated, para. 4 to 11, 13 to 27, and 30 to 34 apply to the Mk. I A.S. bombs.

SUPPLY AND STORAGE

Supply

54. The bomb, H.E., aircraft, A.S., 250 lb., Mk. I is supplied under Stores Ref. 12A/230, with tail unattached and with the transit plug in position; in Box B.239, Mk. I (Stores Ref. 12A/233), which holds one bomb and one tail.

55. The bomb, H.E., aircraft, A.S., 500 lb., Mk. I is supplied under Stores Ref. 12A/231, with tail unattached and with the transit plug in position, in Box B.238, Mk. I (Stores Ref. 12A/232), which holds one bomb and one tail.

Storage

56. The bombs are classified, for storage purposes, in Group VII.

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CHAPTER 3

BOMBS, H.E., AIRCRAFT, A.S., 100 lb., Mk. IV, 250 lb., Mk. IV, and 500 lb., Mk. IV

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CHAPTER 3

BOMBS, H.E., AIRCRAFT, A.S., 100 lb., Mk. IV, 250 lb., Mk. IV, and 500 lb., Mk. IV

Introduction

1. The 100 lb., 250 lb., and 500 lb., Mk. IV, A.S. bombs are thin walled bombs intended for use against submarines. They are designed to give a maximum blast effect on or under water, and they differ from the earlier marks of A.S. bombs principally in that (a) they are fuzed by a pistol/detonator combination at the tail, instead of by a fuze in the nose, (b) the bomb body has a tail adapter to receive a clip-on tail, and (c) the bomb body is fitted with a nose plug and is designed to have an improved under-water trajectory.

BOMB, H.E., AIRCRAFT, A.S., 100 lb., Mk. IV

Leading particulars

Body, bomb, H.E., aircraft, A.S., 100 lb., Mk. IV

2. Stores Ref. ... 12A/484
 Length, with tail 3 ft. 5 in., approx.
 Maximum diameter ... 8.05 in.
 Weight of body 43 lb. 5 oz., approx.
 Weight and nature of filling
 45 lb. 8 oz. R.D.X./T.N.T. 60/40
 or 44 lb. T.N.T.
 Terminal velocity ... 800 ft. per sec.

Tail, bomb, aircraft, 100 lb., A.S., No. 7, Mk. I

3. Stores Ref. ... 12A/485
 Length ... 1 ft. 5.9 in., approx.

GENERAL DESCRIPTION

Bomb body, fig. 1 and 2

4. The built-up body consists of a hollow nose forging or casting, a sheet steel casing, and a cast or forged tail adapter, the three parts being welded together.

5. The hollow nose is threaded to accommodate a solid nose plug which, when screwed tightly home, is locked by a locking screw in the nose. The nose plug has a rounded front surface with a chamfered edge which conforms to the streamlined exterior of the nose, and is provided with two diametrically opposed holes for a turn key.

6. The sheet steel casing, which constitutes the major portion of the bomb body, is made in two parts secured together by longitudinal welds. A pad is welded to the inner face of the casing, at a position approximately central, and holes are drilled and tapped through the sheet steel casing into this pad for fixing screws which secure the suspension lug in position.

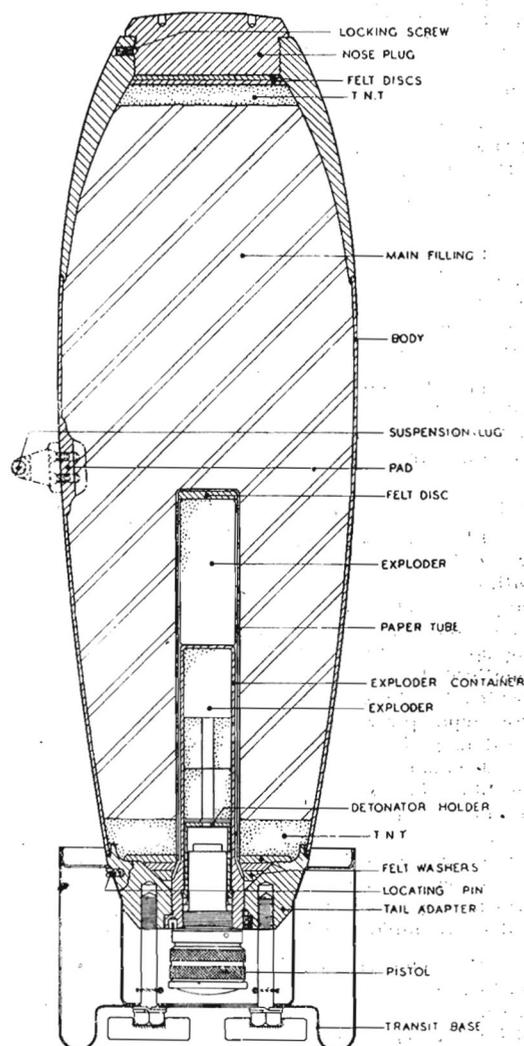


Fig. 1.—Bomb, H.E., aircraft, A.S., 100 lb., Mk. IV with transit base in position

7. The tail adapter is coned to suit the cone of the clip-on tail and has four equi-spaced slots for the spring clips on the tail cone. A locating pin for the tail is screwed into the coned face of the tail adapter at a position half-way between two of the slots, and the tail adapter is welded to the rear end of the sheet steel casing so that the locating pin is at 45 degrees to the suspension lug in an anti-clockwise direction when viewed from the rear end of the bomb body.

8. The tail adapter is bored and counterbored axially, the bore being threaded to receive an exploder container. The threaded joint is sealed with approved sealing materials and the exploder container is secured in position by a locking screw. The rear end of the exploder container is threaded internally to receive the detonator holder and the tail pistol. Two diametrically opposed holes in the tail adapter accommodate the transit base securing screws.

Filling

9. The main filling consists of T.N.T. or R.D.X./T.N.T., 60/40, topped at both ends with T.N.T. It is sealed at the rear end by three waxed felt washers, and at the nose end by two waxed discs.

10. An exploder, C.E., 4 oz. 6 dr., covered by glazedboard packing washers, is housed in the exploder container and held in position by the detonator holder, in the inner end of which is a box-cloth washer secured by shellac.

11. An exploder T.N.T., 5½ oz., is housed between the inner end of the exploder container, and a felt disc. This exploder and the exploder container are surrounded by a paper tube.

Tail

12. The tail, bomb, aircraft, 1100 lb., A.S., No. 7, Mk. I, consists of a sheet metal tail cone with a cylindrical vane attached to it by four vane supports. The tail cone is fitted, at its apex, with a cone bush which locates the rear end of an arming spindle. Approximately half-way along the length of the tail cone is fitted a diaphragm which locates the forward end of the arming spindle. Four equi-spaced spring clips are fitted to the forward end of the tail cone, the forward edge of which is slotted, at a position in alignment with one of the four vane supports, for engagement with the locating pin on the tail adapter when the tail is assembled to the bomb. Two of the spring clips are provided with channel-section locking clips which swivel about a rivet and serve to lock the two spring clips against displacement when the tail is assembled to the bomb.

13. The arming spindle in the tail is fitted at its forward end with a fork which, when the tail is assembled to the bomb, engages the arming fork of the No. 30 pistol. The rear end of the arming spindle is threaded to take a four-bladed arming vane which is secured by a locking nut and tab washer. The arming spindle is prevented from rotating by a safety clip which fits over the cone bush.

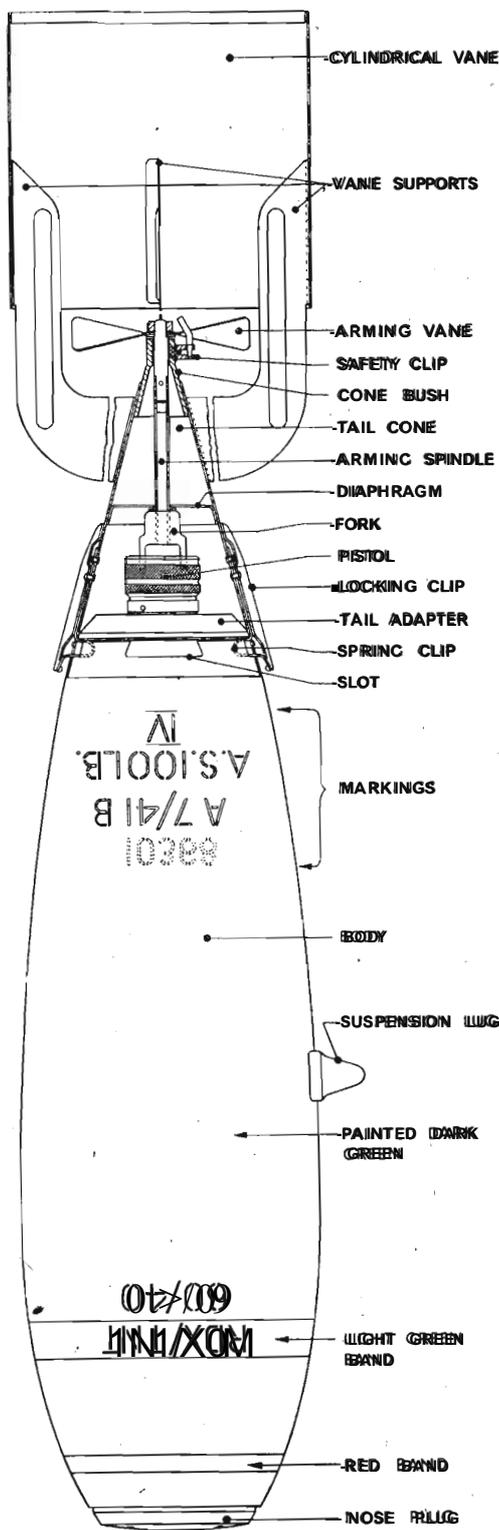


Fig. 2.—Bomb, H.E., aircraft, A.S., 1100 lb., Mk. IV, with tail in position

Transit base, fig. 3

14. The base, transit, aircraft bomb, No. 18, Mk. I (Stores Ref. 12A/494), used for this bomb, consists of two metal pressings secured together, the inner pressing being shaped to accommodate the tail adapter and pistol or tail plug No. 27. The outer pressing is dished to accommodate the heads of two wing bolts which pass through diametrically opposed holes in the pressings and are fitted with spring washers and retaining split pins. The threaded ends of the bolts are engaged with the diametrically opposed holes in the tail adapter and screwed home to assemble the transit base to the bomb. A slot is provided in the transit base to accommodate the locating pin on the tail adapter.

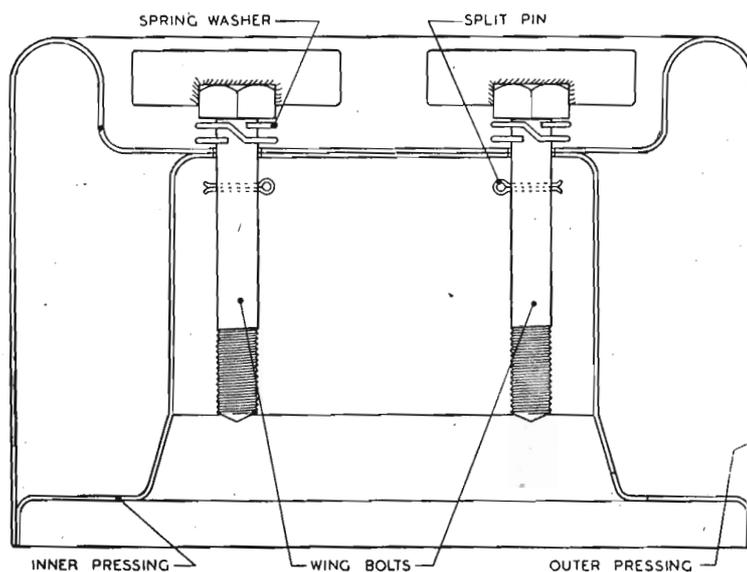


Fig. 3.—Base, transit, aircraft bomb, No. 18, Mk. I

Identification colouring and markings*Colouring*

15. The bomb body, with the exception of the tail adapter, is painted dark green. A red band, $\frac{1}{2}$ in. wide, is painted round the bomb body, 1 in. from the nose end, and a light green band, 1 in. wide, 4 in. from the nose end. The tail and the transit base are also painted dark green.

Markings on the bomb body

16. The following are the markings on the bomb body:—

- (i) The letters T.N.T., or R.D.X./T.N.T., are stencilled, in black, on the light green band in three places equally spaced. When the bomb is filled with R.D.X./T.N.T., the ratio figures 60/40 are stencilled, in black, in corresponding positions to the three letter groups, immediately to the rear of the light green band. When the bomb is filled with Grade 2 T.N.T., the letters G.D.2 are stencilled, in black, on the light green band, in one place only, between two of the T.N.T. letter groups.

Note.—Bombs filled with Grade 2 T.N.T. are unsuitable for storage in hot climates.

- (ii) The following particulars are stencilled, in black, on the suspension lug side of the bomb body towards its rear end:—

(a) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor; the date of filling, month and year; and the lot number of the filling.

(b) A.S. 100 LB. IV.

- (iii) On the reverse side of the bomb body, toward its rear end, is stencilled, in black, the design number of the method of filling.

- (iv) The following markings are stamped on the nose forging or casting:—
- (a) IV A.S. 100 LB.
 - (b) The manufacturer's initials, or recognized trade mark.
 - (c) The date of manufacture, month and year.

Markings on the tail

17. The cylindrical vane has the following markings:—
- (i) Stencilled, in black, is No. 7 I.
 - (ii) Stamped are:—
 - (a) No. 7 I.
 - (b) The manufacturer's initials, or recognized trade mark.
 - (c) The date of manufacture, month and year.

Markings on the transit base

18. The transit base has the following markings:—
- (i) Stencilled, in black, on the flange of the inner pressing is No. 18, Mk. I, 100 LB.
 - (ii) Stamped on the outer pressing of the transit base are the manufacturer's initials, or recognized trade mark, and the date of manufacture, month and year.

Markings on the transit plug

19. The following markings are stamped on the head of the transit plug:—
- (i) TAIL. No. 27. IM (or IZ).
 - (ii) The contractor's initials, or recognized trade mark.
 - (iii) The date of manufacture, month and year.

Functioning

20. When the bomb is released from the bomb carrier, the safety clip is removed by the fuze-setting control link so as to free the arming vane.
21. During the fall of the bomb the arming vane is rotated by the air stream so as to unscrew the arming fork and arm the pistol.
22. On impact of the bomb, the pistol fires the detonator, the detonator fires the exploder, and the exploder detonates the main filling.

INSTRUCTIONS FOR USE

Fuzing the bomb and assembling the tail

23. Detach the transit base, remove pistol No. 30, or transit plug No. 27, by hand, and proceed as follows:—
- (i) Ensure that the detonator cavity is clear, using gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 12A/349), and insert the required detonator. If the detonator cavity is obstructed, the bomb must be set aside for A.I.D. inspection. Force must not be used when inserting the detonator.
 - (ii) Remove the press-cap and safety plate from the pistol No. 30 and test the arming fork for freedom of movement, finally screwing the fork lightly home against the pistol body. If the tail is not to be assembled to the bomb immediately, replace the safety plate and press-cap.
 - (iii) Insert the pistol No. 30 into the detonator holder and screw it home by hand until it is well seated on its washer and locked by its locking spring.
 - (iv) Offer up the tail to the tail adapter, making sure that the slot in the tail cone will register with the locating pin and that the pistol arming fork is not fouled by the fork of the arming spindle in the tail cone. Press the tail home on to the tail adapter so as to cause the spring clips to snap into the four slots. Pressure must be applied to each of the four spring clips to ensure that they are fully engaged. Lock the two spring clips by turning their associated locking clips to cover them fully.
 - (v) Test the arming vane for freedom of movement by removing the safety clip from the cone bush and rotating the arming vane two complete turns in an anti-clockwise direction. If the rotation is not free, the tightness must be investigated and rectified if possible. If the tightness cannot be rectified, the tail must not be used. Replace the safety clip, making sure that the head of its screw is engaged in the hole in the cone bush.

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- (vi) If the tail is subsequently removed, the safety plate and press-cap must be replaced on the pistol. In the unlikely event of the pistol arming fork standing proud of the top of the pistol body, no attempt must be made to replace the safety plate and press-cap whilst the pistol is in position in the detonator holder. In that event, the pistol must be removed from the detonator holder before screwing the arming fork lightly home against the pistol body and replacing the safety plate and press-cap.

Loading the bomb on to the aircraft bomb carrier

24. Load the bomb on to the bomb carrier as described in the relevant chapter of A.P. 1664, Vol. I, and connect the safety clip to the fuze-setting control link of the carrier.

Unloading the bomb from the aircraft bomb carrier

25. Disconnect the safety clip from the fuze-setting control link of the bomb carrier, and unload the bomb as described in the relevant chapter of A.P. 1664, Vol. I.

Unfuzing the bomb

26. If it is necessary to unfuze the bomb, unlock the two locking clips and remove the tail. Replace the safety plate and press-cap on the pistol (see, however, para. 23 (vi)), remove the pistol, extract the detonator, using extractor, detonator, No. 2, Mk. I (Stores Ref. 112A/348), and then replace the pistol, or the transit plug.

SUPPLY AND STORAGE**Supply**

27. The bomb is supplied fitted with base, transit, aircraft bomb, No. 188 Mk. I, and either with pistol, bomb, tail, No. 30, serving as a transit plug, or with transit plug No. 27 in position. Where the bomb is fitted with transit plug No. 27, the pistol No. 30 is packed with the tail.

28. The tail No. 7, Mk. I is supplied with pistol No. 30 in container, B.301, Mk. I (Stores Ref. 112A/490), or without pistol, in container, B.309, Mk. I (Stores Ref. 112A/491).

Storage

29. The bombs are classified for storage purposes in Group VII. Tail units, in containers, may be stored in the same explosives storehouse as the filled bombs, the containers being stacked well away from the filled stores, or they may be stored under any other dry protective conditions.

BOMB, H.E., AIRCRAFT, A.S., 250 lb., Mk. IV**Leading particulars***Body, bomb, H.E., aircraft, A.S., 250 lb., Mk. IV*

| | | |
|-----|----------------------------------|---|
| 30. | Stores Ref. | 112A/486 |
| | Length, with tail ... | 4 ft. 9.65 in., approx. |
| | Maximum diameter ... | 11.35 in. |
| | Weight of body ... | 96 lb. 12 oz., approx. |
| | Weight and nature of filling ... | 137 lb. R.D.X./T.N.T., or 132 lb. T.N.T. |
| | Terminal velocity ... | 970 ft. per sec. |

Tail bomb, aircraft, 250 lb., A.S., No. 8, Mk. I

| | | |
|-----|------------------|--------------------------|
| 31. | Stores Ref. | 112A/487 |
| | Length ... | 1 ft. 11.35 in., approx. |

GENERAL DESCRIPTION**Bomb body**

32. The body of the 250 lb. Mk. IV A.S. bomb is similar to that of the 1100 lb. Mk. IV A.S. bomb, see para. 4 to 8, differing only in weight and dimensions.

Filling

33. The filling of the 250 lb. Mk. IV A.S. bomb is similar to that of the 1100 lb. Mk. IV A.S. bomb, see para. 9 to 11, differing only in quantity of the main filling.

Tail

34. The tail, bomb, aircraft, 250 lb., A.S., No. 8, Mk. I, is similar to the tail, bomb, aircraft, 1100 lb., A.S., No. 7, Mk. I, see para. 112 and 113, differing only in weight and dimensions.

Note.—If the bomb is to be carried on fighter-bomber aircraft, the tail must be modified as described in para. 66 to 69.

Transit base

35. The base, transit, aircraft bomb, No. 19, Mk. I (Stores Ref. 12/495), used for this bomb, is similar, except in weight and dimensions, to base, transit, aircraft bomb, No. 18, Mk. I, see para. 14

Identification colouring and markings*Colouring*

36. The colouring of the bomb body, tail, and transit base is the same as described in para. 15, except that the light green band is 4½ in. from the nose end.

Markings on the bomb body

37. The markings on the bomb body are as detailed in para. 16, except that the appropriate figures "250", indicating weight, are substituted for "100".

Markings on the tail

38. The markings on the cylindrical vane are as detailed in para. 17, except that the appropriate number "8" is substituted for "7".

Markings on the transit base

39. The markings on the transit base are detailed in para. 18, except that the number "19" is substituted for "18".

Functioning

40. The bomb functions as described in para. 20 to 22.

INSTRUCTIONS FOR USE**Fuzing the bomb and assembling the tail**

41. The 250 lb. Mk. IV A.S. bomb is fuzed and the tail assembled as described in para. 23.

Loading the bomb on to the aircraft bomb carrier

42. Load the bomb on to the bomb carrier as described in the relevant chapter of A.P. 1664, Vol. I, and connect the safety clip to the fuze-setting control link of the carrier.

Unloading the bomb from the aircraft bomb carrier

43. Disconnect the safety clip from the fuze-setting control link of the bomb carrier, and unload the bomb as described in the relevant chapter of A.P. 1664, Vol. I.

Unfuzing the bomb

44. Unfuzed the bomb as described in para. 26.

SUPPLY AND STORAGE**Supply**

45. The exploded bomb is supplied fitted with base, transit, aircraft bomb, No. 19, Mk. I, and with pistol, bomb, tail, No. 30, serving as a transit plug.

46. The tail, No. 8, Mk. I is supplied in container, B.310, Mk. I (Stores Ref. 12A/492).

Storage

47. The bombs are classified for storage purposes in Group VII, and tail units may be stored as described in para. 29.

BOMB, H.E., AIRCRAFT, A.S., 500 lb., Mk. IV**Leading particulars**

Body, bomb, H.E., aircraft, A.S., 500 lb., Mk. IV

| | |
|-------------------------------------|-------------------------|
| 48. Stores Ref..... | 12A/488 |
| Length, with tail | 6 ft. 0.46 in., approx. |
| Maximum diameter | 1 ft. 2.3 in. |
| Weight of body | 148 lb. 3 oz., approx. |
| Weight and nature of filling | 279 lb. T.N.T. |
| Terminal velocity | 1,320 ft. per sec. |

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Tail, bomb, aircraft, 500 lb., A.S., No. 9, Mk. I

| | |
|----------------------|-------------------------|
| 49. Stores Ref. | 112A/489 |
| Length | 2 ft. 0-18 in., approx. |

GENERAL DESCRIPTION**Bomb body**

50. The body of the 500 lb. Mk. IV A.S. bomb is similar to that of the 100 lb. Mk. IV A.S. bomb, see para. 4 to 8, differing only in weight and dimensions.

Filling

51. The filling of the 500 lb. Mk. IV A.S. bomb is similar to that of the 100 lb. Mk. IV A.S. bomb, except for quantity of the main filling and restriction of the main filling to T.N.T.

Tail

52. The tail, bomb, aircraft, 500 lb., A.S., No. 9, Mk. I, is similar to the tail, bomb, aircraft, 100 lb., A.S., No. 7, Mk. I, see para. 12 and 13, differing only in weight and dimensions.

Transit base

53. The base, transit, aircraft bomb, No. 20, Mk. I (Stores Ref. 112A/496), used for this bomb is similar, except in weight and dimensions, to base, transit, aircraft bomb, No. 18, Mk. I, see para. 14

Identification colouring and markings*Colouring*

54. The colouring of the bomb body, tail and transit base is as described in para. 15, except that the light green band is 6 in. from the nose.

Markings on the bomb body

55. The markings on the bomb body are as detailed in para. 16, except that the appropriate figures "500", indicating weight, are substituted for "100".

Markings on the tail

56. The markings on the cylindrical vane are as detailed in para. 17, except that the appropriate number "9" is substituted for "7".

Markings on the transit base

57. The markings on the transit base are as detailed in para. 18, except that the number "20" is substituted for "18".

Functioning

58. The bomb functions as described in para. 20 to 22.

INSTRUCTIONS FOR USE**Fuzing the bomb and assembling the tail**

59. The 500 lb. Mk. IV A.S. bomb is fuzed and the tail assembled as described in para. 23.

Loading the bomb on to the aircraft bomb carrier

60. Load the bomb on to the bomb carrier as described in the relevant chapter of A.P.1664, Vol. I, Chap. 1, and connect the safety clip to the fuze-setting control link of the carrier.

Unloading the bomb from the aircraft bomb carrier

61. Disconnect the safety clip from the fuze-setting control link of the bomb carrier, and unload the bomb as described in the relevant chapter of A.P.1664, Vol. I.

Unfuzing the bomb

62. Unfuze the bomb as described in para. 26.

SUPPLY AND STORAGE**Supply**

63. The bomb is supplied fitted with base, transit, aircraft bomb, No. 20, Mk. I, and with pistol, bomb, tail, No. 30 serving as a transit plug

64. The tail, No. 9, Mk. I is supplied in container, B.311, Mk. I (Stores Ref. 12A/493).

Storage

65. The bombs are classified for storage purposes in Group VII, and tail units may be stored as described in para. 29.

Modification to the No. 8 Mk. I tail for carriage on fighter-bomber aircraft

66. The No. 8 Mk. I tail is to be modified as follows if the 250 lb. Mk. IV A.S. bomb is to be carried on fighter-bomber aircraft:—

- (i) Carefully straighten the tab of the tab washer which secures the locking nut, and unscrew and remove the nut and tab washer.
- (ii) Remove one pair of arming vane blades, and replace the tab washer and locking nut.
- (iii) Bend up the tab of the tab washer to lock the locking nut in position.

67. Alternatively, the tail may be modified by cutting off two diametrically opposite blades of the arming vane.

68. Ensure that the screw in the safety clip engages securely in the hole in the cone bush. If the safety clip is not secure, it is to be removed, and a clip, safety, arming vane (Stores Ref. 12A/982) fitted. Tails of recent manufacture are fitted with safety clips giving the necessary secure engagement.

69. If tail units are not fitted with swivel locking clips (the earlier ones were not so fitted), a clip, locking, spring-on type (Stores Ref. 12A/842) is to be fitted over each of the four spring clips on the tail cone.

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COMPONENTS USED WITH A.S. BOMBS

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APPENDIX 1
COMPONENTS USED WITH A.S. BOMBS

TABLE 1
BOMBS, H.E., AIRCRAFT, A.S., 100 lb., Mk. I, II, and III

| <i>Nose fuzeing</i> | |
|-----------------------------|-------------------------------|
| <i>Fuze</i> | <i>Exploder</i> |
| No. 32, Mk. II*, III, or IV | Special, supplied in position |

TABLE 2
BOMB, H.E., AIRCRAFT, A.S., 100 lb., Mk. IV

| <i>Tail fuzeing</i> | | |
|-------------------------------------|----------------------------|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 30, Mk. II, III, III*, IV, or V | No. 51, Mk. I (0.025 sec.) | Special, supplied in position |

TABLE 3
BOMBS, H.E., AIRCRAFT, A.S., 250 lb., Mk. I, II, and III

| <i>Nose fuzeing</i> | |
|-----------------------------|-------------------------------|
| <i>Fuze</i> | <i>Exploder</i> |
| No. 32, Mk. II*, III, or IV | Special, supplied in position |

TABLE 4
BOMB, H.E., AIRCRAFT, A.S., 250 lb., Mk. IV

| <i>Tail fuzeing</i> | | |
|-------------------------------------|--|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 30, Mk. II, III, III*, IV, or V | No. 52, Mk. I or II (inst.) No. 51, Mk. I (0.025 sec.) No. 53, Mk. I (0.5 sec.) No. 54, Mk. I (3 sec.) No. 55, Mk. I (11 sec.) | Special, supplied in position |

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TABLE 5

BOMBS, H.E., AIRCRAFT, A.S., 500 lb., Mk. I, II, and III

| <i>Nose fuzeing</i> | |
|-----------------------------|-------------------------------|
| <i>Fuze</i> | <i>Exploder</i> |
| No. 32, Mk. II*, III, or IV | Special, supplied in position |

TABLE 6

BOMB, H.E., AIRCRAFT, A.S., 500 lb., Mk. IV

| <i>Tail fuzeing</i> | | |
|-------------------------------------|---|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 30, Mk. II, III, III*, IV, or V | No. 52, Mk. I or II (inst.) No. 51, Mk. I (0-025 sec.) No. 50, Mk. I (0-14 sec.) No. 53, Mk. I (0-5 sec.) No. 54, Mk. I (3 sec.) No. 55, Mk. I (11 sec.) | Special, supplied in position |

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Section 6

F. BOMBS

*Relevant amendments up to A.L. 72
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A.P.1661B, Vol I

SECTION 6

F. BOMBS

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Note.—A detailed contents list appears at the beginning of each chapter.

CHAPTER 1—General notes on F. bombs

CHAPTER 2—Bombs, H.E., aircraft, F., 20 lb., Mk. I, II, and III

CHAPTER 3—Bombs, parachute, H.E., aircraft, F., 20' lb., Mk. I, II, and III

APPENDIX 1—Components used with F. bombs

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CHAPTER 1

General notes on F. bombs

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CHAPTER 1

General notes on F. bombs

Introduction

1. At the present time there is only one type of F. bomb in use in the Service, namely, the 20 lb. F. bomb. It is a thick-walled bomb, fuzed at the nose only, and is similar in construction to the 40 lb. G.P. bomb. It is used as an anti-personnel weapon, and may be fitted with a parachute attachment to reduce the terminal velocity, and so prevent the bomb burying itself in the ground before exploding.

Precautions to be observed when fuzing or unfuzing bombs

2. Attention is directed to the precautions detailed in Sect. 1, Chap. 1, which apply also to F. bombs.

Repair and examination

3. Only such repair and examination of bombs as is detailed in Sect. 20, Chap. 1, is to be done by armament personnel. Any bomb found having major damage or defects is to be set aside for A.I.D. inspection.

4. Fuzed bombs, whether loaded on to aircraft, or stored in the fuzed bomb area, must be examined at the intervals stated in Sect. 20, Chap. 2.

Supply

5. F. bombs are supplied in boxes, with tail units and nose pistols in position, the nose pistol acting as a transit plug.

Storage

6. The regulations governing the storage of F. bombs are given in A.P. 1245, Chap. 3.

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A.P.1661B, Vol. I, Sect. 6

CHAPTER 2

BOMBS, H.E., AIRCRAFT, F., 20 lb., Mk. I, II, and III

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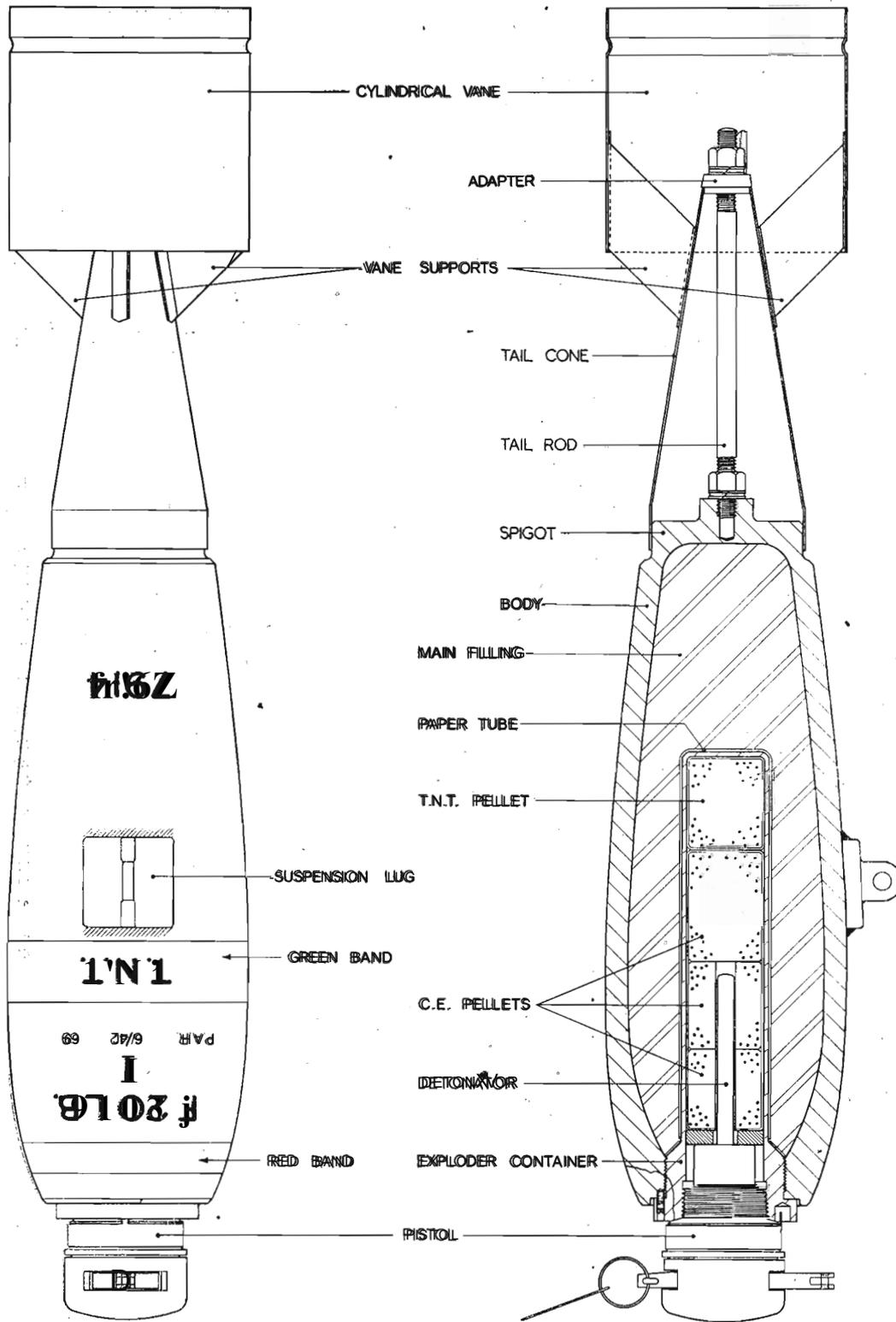


Fig. 1.—Bomb, H.E., aircraft, F., 20 lb., Mk. I, fuze, with No. 34 pistol stowed

CHAPTER 2

BOMBS, H.E., AIRCRAFT, F., 20 lb., Mk. I, H, and HI

Introduction

1. The 20 lb. F. bomb is an anti-personnel bomb for carriage in either the 250 lb. or 160 lb. Small Bomb Container or on the Light Series bomb carrier. It is fuzeed at the nose only, and is issued complete with pistol, exploder, and tail unit in position. Pistol No. 29, 34, or 38 may be supplied in the bomb, which is issued adjusted to the correct overall length for the Small Bomb Containers.

2. The alternative pistols mentioned in para. 1 may be substituted, by Units, for the pistols supplied in the bombs, to suit operational requirements, in which event the bombs with substitute pistols will require gauging, and adjusting if necessary, to the correct overall length before loading into the Small Bomb Container, see para. 17 and 18.

BOMB, H.E., AIRCRAFT, F., 20 lb., Mk. I

Leading particulars

| | |
|--|-------------------------|
| 3. Stores Ref..... | 112A/311 |
| Length, pistol and tail in position | 21.88 in. |
| Maximum diameter | 3.95 in. |
| Weight of body | 12.1 lb. 12.0 oz. |
| Weight of filling, including exploder | 3.3 lb., approx. |
| Nature of main filling | T.N.T. or R.D.X./T.N.T. |
| Terminal velocity | 990 ft. per sec. |

GENERAL DESCRIPTION

Bomb body, fig. 1

4. The bomb body is made of steel, the nose end being open and internally threaded to take an exploder container which is screwed and cemented in position and locked by a locking screw, whilst the closed rear end is reduced in diameter to form a spigot. The open nose end of the exploder container is threaded internally to take the pistol.

5. Mk. I bombs are not normally fitted with suspension lugs, although a limited number were so fitted.

Filling

6. The bomb body is filled with T.N.T. or R.D.X./T.N.T.

7. The exploder, which is housed in the exploder container, consists of paper-wrapped C.E. and T.N.T. pellets; two of the C.E. pellets are perforated to form a detonator cavity.

Tail

8. The tail consists of a cylindrical vane attached to a tail cone by four vane supports. The tail is secured to the bomb body by a tail rod screwed into a boss on the spigot on the bomb body and passing through a threaded adapter on the narrow end of the tail cone. A nut and a spring washer on the outer end of the tail rod hold the tail in position, and a locking nut and a spring washer on the inner end of the tail rod lock the rod in position in the spigot of the bomb body.

Identification colouring and markings

9. The exterior of the bomb body and of the tail is painted yellow. A red band, $\frac{1}{2}$ in. wide, is painted round the bomb body $\frac{1}{2}$ in. from the nose, and a green band, 1 in. wide, is painted round the bomb body approximately 4 in. from the nose. The red band indicates that the bomb is filled with high explosive, and the green band denotes the type of explosive used. Stencilled in black at three equi-distant places on the green band are the letters T.N.T. or R.D.X./T.N.T.

Note.—If the letters T.N.T. are followed by G.D.2, the bomb is filled with Grade 2 T.N.T. Bombs so marked are unsuitable for storage in hot climates.

10. Stencilled in black letters between the red and green bands are the following particulars;—

- (i) The type, nominal weight, and mark number of the bomb.
- (ii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iii) The date of filling, month and year.
- (iv) The lot number of the filling.

11. Near the tail end of the bomb body is stencilled in black the design number of the method of filling.

12. Stamped on the bomb body, near the nose, are the body manufacturer's markings, consisting of:—

- (i) The type of the bomb, including the mark number.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Functioning

13. When the bomb fitted with a No. 29 or 34 pistol is released from the Light Series bomb carrier, or from either of the Small Bomb Containers, the safety cap is immediately removed by the action of its spring.

14. When the bomb is fitted with a No. 38 pistol, the action of the air stream on the arming vanes during the fall of the bomb causes them to rotate and screw off the safety cap, which is expended.

15. On impact of the bomb with the target, the striker of the No. 29, 34, or 38 pistol is driven inwards so as to shear the shear wire and fire the detonator; the detonator fires the exploder, and the exploder detonates the main filling.

INSTRUCTIONS FOR USE

Fuzing the bomb

16. The following procedure is to be adopted for fuzing the bomb:—

- (i) Unscrew and remove the pistol by hand.
- (ii) Ensure that the detonator cavity is clear, using gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 12A/349) for testing, and also ensure that the exploder is in the correct position. Bombs which fail to pass this gauge test are to be set aside for A.I.D. inspection.
- (iii) Insert the detonator into the detonator cavity, taking care not to use force.
- (iv) Replace the pistol, screwing it home by hand, and ensure that it is well seated on its washer and locked by its locking spring.

Gauging and adjusting bombs fitted with substitute pistols

17. If the bomb is fitted with a substitute pistol, see para. 2, it must be gauged, and adjusted if necessary, to an overall length of 21.8 in. before loading into the Small Bomb Container. If the substitute pistol is a No. 38 pistol, the safety pin must be removed and the bomb gauged with the safety cap screwed on so that the anti-locking stops are in engagement.

18. To adjust the overall length, hold the bomb tail so that it cannot rotate, and slacken the nut securing it to the tail rod; then rotate the tail, with its adapter, either clockwise or anti-clockwise, as necessary, until the correct overall length is obtained, and finally tighten the securing nut. Care must be taken that the tail is not distorted during these operations, and if any difficulty is experienced in unscrewing the tail securing nut the bomb concerned is to be set aside for A.I.D. inspection.

Loading the bomb into the 250 lb. Small Bomb Container

19. Load the bomb into the 250 lb. Small Bomb Container as described in A.P. 1664, Vol. I, Chap. 3. Care should be taken not to load any bomb which is a tight fit in the container. Any such bomb may be adjusted, see para. 18, although this should not be necessary if substitute pistols are not used.

20. When each bomb is finally positioned in the container, remove the safety pin, if in position, from the pistol, and when each container compartment has been loaded with its full complement of bombs, position its drop bar.

Note.—If the pistol is a substitute No. 38 pistol the safety pin will have been removed during gauging, see para. 17.

21. When the three compartments of the container have been filled, ensure that the bombs cannot leave the container except under normal conditions of release. After all container tests have been made ensure that the selector switches on the aircraft are in the OFF position, load the container on to the aircraft, and remove the safety forks of No. 29 or 34 pistols, if these are fitted. The safety caps of the No. 34 pistols can be rotated as required to facilitate withdrawal of the safety forks. The safety forks, if any, and the safety pins, should be handed to the pilot or the bomb aimer when the aircraft is ready to take off.

Loading the bomb into the 160 lb. Small Bomb Container

22. Load the bomb into the 160 lb. Small Bomb Container as described in A.P. 1664, Vol. I, Chap. 14. Bombs which are found to be a tight fit in the container may be adjusted as described

A.P.1661B, Vol. I, Sect. 6, Chap. 2

in para. 18. Before placing the bomb in the container, the safety pin must be removed from the pistol (but see Note to para. 20); if a No. 29 or 34 pistol is fitted, the safety fork also must be removed before placing the bomb in the container, and the safety cap must be retained in position by hand, against displacement by its spring, until the bomb is finally positioned in the container. The safety forks, if any, and the safety pins, should be handed to the pilot or the bomb aimer when the aircraft is ready to take off.

Loading the bomb on to the Light Series bomb carrier

23. The bombs, if fitted with suspension lugs, can be loaded on to the Light Series bomb carrier as described in A.P.1664, Vol. I, Chap. 2, using the No. 1A attachment to retain the safety cap in position.

24. Remove the safety pin and the safety fork when the bomb is finally positioned on the carrier.

Unloading the bomb from the 250 lb. or 160 lb. Small Bomb Container

25. Unload the bomb from the 250 lb. or 160 lb. Small Bomb Container as described in the relevant chapter of A.P.1664, Vol. I. If a No. 29 or 34 pistol is fitted, the safety cap must be held in position by hand during the unloading and the safety fork must be replaced before releasing hand pressure on the safety cap. Finally replace the safety pin in the pistol.

Unloading the bomb from the Light Series bomb carrier

26. Replace the safety fork, if any, and/or the safety pin of the pistol, and unload the bomb as described in A.P.1664, Vol. I, Chap. 2.

Unfuzing the bomb

27. If it is necessary to unfuze the bomb, remove the pistol by hand and extract the detonator, using extractor, detonator, No. 2, Mk. I (Stores Ref. 12A/348). Replace the pistol in the bomb.

SUPPLY AND STORAGE**Supply**

28. Four bombs, H.E., aircraft, F., 20 lb., Mk. I, packed together with one drop bar for use with the 250 lb. Small Bomb Container, are supplied under Stores Ref. 12A/311 in Box, B.271, Mk. I (Stores Ref. 12A/315).

Storage

29. The bombs are classified, for storage purposes, in Group VII.

BOMB, H.E., AIRCRAFT, F., 20 lb., Mk. I

30. Attention is directed to para. 1 and 2.

Leading particulars

| | | | | | | |
|-----|---------------------------------------|-----|-----|-----|-----|-------------------------|
| 31. | Stores Ref. | ... | ... | ... | ... | 12A/312 |
| | Length, pistol and tail in position | ... | ... | ... | ... | 21.8 in. |
| | Maximum diameter | ... | ... | ... | ... | 3.9 in. |
| | Weight of body | ... | ... | ... | ... | 12 lb. 12 oz. |
| | Weight of filling, including exploder | ... | ... | ... | ... | 2.9 lb., approx. |
| | Nature of main filling | ... | ... | ... | ... | T.N.T. or R.D.X./T.N.T. |
| | Terminal velocity | ... | ... | ... | ... | 990 ft. per sec. |

GENERAL DESCRIPTION

32. The Mk. II bomb is similar in dimensions and construction to the Mk. I bomb, except that the maximum diameter is slightly smaller. The Mk. II bomb is not normally fitted with a suspension lug, although a limited number of these bombs were so fitted. The bombs without suspension lugs may be fitted with Bands, suspending, No. 8, Mk. I (Stores Ref. 12A/328), which, in addition to having a suspension lug, is provided with a strap for correctly locating the band on the bomb body.

INSTRUCTIONS FOR USE

33. The instructions for use detailed in para. 16 to 27 apply to the Mk. II bomb, except that the No. 8, Mk. I suspending band has to be fitted to the bomb, before fuzing, when it is desired to carry it on the Light Series bomb carrier.

Fitting the No. 8, Mk. I suspending band

34. The No. 8, Mk. I suspending band is fitted to the bomb as follows:—
- (i) Remove the pistol by hand.
 - (ii) Slacken off the clamping bolt of the suspending band.
 - (iii) Fit the suspending band over the bomb body, ensure that the ring of the strap on the suspending band rests upon the face of the exploder container.
 - (iv) Tighten the clamping bolt so as to secure the suspending band on the bomb body, taking care not to overstrain the bolt.
 - (v) Replace the pistol, screwing it home by hand. The bomb may be fuzed after fitting the suspending band and before replacing the pistol, if the bomb is required immediately for operations.

SUPPLY AND STORAGE**Supply**

35. The bombs are supplied, under Stores Ref. 12A/312, similarly to the Mk. I bombs, see para. 28.

Storage

36. The bombs are classified, for storage purposes, in Group VII.

BOMB, H.E., AIRCRAFT, F., 20 lb., Mk. III

37. Attention is directed to para. 1 and 2.

Leading particulars

| | |
|--|------------------|
| 38. Stores Ref. | 12A/469 |
| Length, pistol and tail in position | 21'8 in. |
| Maximum diameter | 3'9 in. |
| Weight of body | 12 lb. 12 oz. |
| Weight of filling, including exploder | 3 lb., approx. |
| Nature of main filling | R.D.X./T.N.T. |
| Terminal velocity | 990 ft. per sec. |

GENERAL DESCRIPTION

39. The Mk. III bomb is similar in construction and dimensions to the Mk. I bomb, except for the slightly smaller maximum diameter and the provision of a suspension lug welded on to the bomb body. The filling is always T.N.T.

INSTRUCTIONS FOR USE

40. The instructions for use detailed in para. 16 to 27 apply to the Mk. III bomb.

SUPPLY AND STORAGE**Supply**

41. The bombs are supplied, under Stores Ref. 12A/469, similarly to the Mk. I bombs see para. 28.

Storage

42. The bombs are classified, for storage purposes, in Group VII.

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CHAPTER 3

BOMBS, PARACHUTE, H.E., AIRCRAFT, F., 20 lb., Mk. I, II, and III

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CHAPTER 3

BOMBS, PARACHUTE, H.E., AIRCRAFT, F., 20 lb., Mk. I, II, and III

Introduction

1. The 20 lb. F. parachute bombs, Mk. I, II, and III, are similar to the corresponding standard 20 lb. F. bombs, except that they are fitted with parachute tail units.
2. The bombs are fuzed at the nose only, and are issued complete with tail unit, exploder, and nose pistol in position. The pistol serves as a nose plug during transit and storage of the bomb.
3. Mk. III bombs, and also a limited number of Mk. I bombs, are fitted with suspension lugs for carriage on the Light Series bomb carrier; the Mk. II bombs are not fitted with suspension lugs. All three marks of bombs may be carried in the 250 lb. Small Bomb Container, or in the 160 lb. Small Bomb Container.

BOMB, PARACHUTE, H.E., AIRCRAFT, F., 20 lb., Mk. III

Leading particulars

| | | | | | |
|----|--|-----|-----|-----|------------------------------|
| 4. | Stores Ref. | ... | ... | ... | 12A/465 |
| | Overall length (pistol and tail in position) | ... | ... | ... | 21.8 in. |
| | Maximum diameter | ... | ... | ... | 3.9 in. |
| | Weight of body | ... | ... | ... | 122 lb. 12 oz. |
| | Weight and nature of filling | ... | ... | ... | 33 lb. approx., RDX/TNNT. |
| | Terminal velocity | ... | ... | ... | 885 ft. per sec. (estimated) |

GENERAL DESCRIPTION

Bomb body, fig. 1

5. The bomb body, which is made of steel, has its nose end internally threaded and fitted with an exploder container which is screwed and cemented in position and secured by a locking screw. The closed rear end of the bomb body is reduced in diameter and has an internally threaded boss at the centre to receive the eye-bolt of the parachute tail unit.

6. The forward end of the exploder container is internally threaded to receive the nose pistol.
7. A suspension lug is welded to the bomb body.

Filling

8. The bomb is filled with R.D.X./T.N.T., which is topped by a layer of T.N.T. and sealed by a pad of approved composition and a glazed board washer at the nose end. The exploder container, which is protected from the main filling by a paper tube, contains an exploder consisting of one solid T.N.T. pellet, a solid C.E. pellet, and two perforated G.E. pellets which afford a central cavity for the detonator stem. The exploder pellets are paper-wrapped and are retained in position by a waxed felt washer.

Tail unit

9. The parachute unit consists of a tail tube with a cylindrical vane connected to its rear portion by four vane supports.

10. A recessed tail adapter is secured in the tail tube at a short distance from its forward end by four securing screws and has a central hole to accommodate the eye-bolt. The tail adapter accommodates the central boss on the tail end of the bomb body and the eye-bolt is screwed into the threaded hole in the boss to secure the tail unit in position.

11. The tail tube houses a fabric cylinder in which the folded parachute is packed with its peak connected by a cord to the closed rear end of the fabric cylinder. The rear end of the fabric cylinder is connected by three lanyards to a flanged metal cover which fits loosely in the cylindrical vane to close the rear end of the tail tube, and which is retained in position, during transit and storage, by a wire transit clip having its ends engaged in holes in the cylindrical vane.

12. The shroud cords of the parachute are knotted together and connected to the rear end of a wire rope which has its other end connected to the eye-bolt.

13. A wire arming link, also connected to the rear end of the wire rope, passes through a longitudinal slot in the forward portion of the tail tube, and has a split pin attached to its free end. This arming link is pulled taut over the bomb body and secured to it by three bands of insulating tape around the bomb body, and the split pin engages registering holes in the ends of the circlip on the nose pistol, the ends of the split pin being opened slightly to prevent its accidental withdrawal.

Identification colouring and markings

14. The bomb body and the tail are painted yellow. A red band, $\frac{1}{2}$ in. wide, is painted round the bomb body $\frac{1}{2}$ in. from the nose, and a light green band, 1 in. wide, is painted round the bomb body approximately 4 in. from the nose.

15. Stencilled in black at three equi-spaced positions on the light green band are the letters R.D.X./T.N.T.

16. Stencilled, in black letters between the red and light green bands are the following particulars:—

- (i) The type, nominal weight, and the mark number of the bomb.
- (ii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iii) The date of filling, month and year.
- (iv) The lot number of the filling.

17. The design number of the method of filling is stencilled in black on the bomb body near the rear end.

18. Stamped on the bomb body, near the nose, are the body manufacturer's markings, consisting of:—

- (i) The type of bomb, including the mark number.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Functioning

19. When the bomb is released from the Small Bomb Container or from the Light Series bomb carrier, the air stream through the cylindrical vane displaces the cover from the tail unit, and the drag exerted by the cover on the lanyards withdraws the fabric cylinder and parachute from the tail tube. As the shroud cords and the wire rope become taut and the load is taken by the eye-bolt, the fabric cylinder is drawn off the parachute, which then opens; at the same time the tightening of the wire rope causes the arming link to remove the split pin from the pistol circlip, which is then automatically expended, with the safety cap, to leave the pistol armed.

20. Upon impact of the bomb with the target, the pistol fires the detonator, the detonator fires the exploder, and the exploder detonates the main filling.

INSTRUCTIONS FOR USE

Fuzing the bomb

21. The following procedure is to be adopted for fuzing the bomb:—

- (i) Remove the split pin on the arming link from the circlip on the No. 33, Mk. I nose pistol.
- (ii) Remove the pistol by hand, engaging the stop pins in the pistol body with the slots in the safety cap.
- (iii) Ensure that the detonator cavity is clear, using gauge, cavity, detonator No. 2, Mk. I (Stores Ref. 12A/349) for testing, and ensure also that the exploder is in the correct position. If the waxed felt washer has become loose, or has shifted, it is to be pushed back into place with the gauge. Bombs which fail to pass this gauge test are to be set aside for A.I.D. inspection.
- (iv) Insert the required detonator in the detonator cavity. Force must not be used in inserting the detonator.
- (v) Replace the pistol, screwing it home by hand until it is well seated on its washer and locked.
- (vi) Rotate the circlip about the pistol, as necessary, to bring its registering holes in line with the arming link, pass the split pin on the arming link through the holes, and open the split pin ends slightly to prevent accidental withdrawal.

A.P. 1661B, Vol. I, Sect. 6, Chap. 3

Loading the bomb into the 250 lb. Small Bomb Container

22. Remove the transit clip from the cylindrical vane, and the safety pin from the circlip of the pistol, and load the bomb into the 250 lb. Small Bomb Container as described in A.P. 1664, Vol. I, Chap. 3, retaining the cover in the cylindrical vane by hand until loading is completed. Hand the transit clips and the safety pins to the pilot or bomb aimer, or place the clips and pins in the aircraft.

Note.—The bombs are issued correctly adjusted for length, and no attempt is to be made to alter the length of any bomb which is found to be a tight fit in the container; any such incorrectly adjusted bomb should be set aside for A.I.D. inspection, after first replacing the safety pin in the circlip of the nose pistol and the transit clip on the cylindrical vane.

Loading the bomb into the 160 lb. Small Bomb Container

23. Remove the transit clip from the cylindrical vane and the safety pin from the circlip of the nose pistol, and proceed to load the bomb into the 160 lb. Small Bomb Container as described in A.P. 1664, Vol. I, Chap. 14, retaining the cover in the cylindrical vane by hand until loading is completed; see, however, the note in para. 22.

Loading the bomb on to the Light Series bomb carrier

24. Remove the transit clip from the cylindrical vane, retaining the cover in position by hand, and load the bomb on to the Light Series bomb carrier as described in A.P. 1664, Vol. I, Chap. 2, using the No. 1A attachment on the carrier adjusted to bear lightly on the cap of the pistol and the No. 7 attachment to retain the cover in the cylindrical vane. Remove the safety pin from the circlip on the pistol when the aircraft is ready to take off, and hand the safety pin and the transit clip to the pilot, or to the bomb aimer, or place the pin and clip in the aircraft.

Unloading the bomb from the 250 lb. Small Bomb Container

25. Unload the bomb from the 250 lb. Small Bomb Container as described in A.P. 1664, Vol. I, Chap. 3, retaining the cover in the cylindrical vane by hand. Replace the safety pin in the circlip on the pistol, and replace the transit clip on the cylindrical vane.

Unloading the bomb from the 160 lb. Small Bomb Container

26. Unload the bomb from the 160 lb. Small Bomb Container as described in A.P. 1664, Vol. I, Chap. 14, retaining the cover in the cylindrical vane by hand. Replace the safety pin in the circlip on the pistol, and replace the transit clip on the cylindrical vane.

Unloading the bomb from the Light Series bomb carrier

27. Replace the safety pin in the circlip on the pistol, and proceed to unload the bomb from the Light Series bomb carrier as described in A.P. 1664, Vol. I, Chap. 2, holding the cover in position in the cylindrical vane by hand. Replace the transit clip on the cylindrical vane.

Unfuzing the bomb

28. Should it be necessary to unfuze the bomb, remove the split pin on the arming link from the circlip of the pistol, remove the pistol by hand, extract the detonator, using extractor, detonator, No. 2, Mk. I (Stores Ref. 12A/348), and replace the pistol and the split pin, rotating the circlip, as necessary, about the pistol to bring the holes for the pin in line with the arming link.

SUPPLY AND STORAGE

Supply

29. Four bombs, and one drop bar for use with the 250 lb. Small Bomb Container, are supplied, under Stores Ref. 12A/465, packed in Box B.271, Mk. I (Stores Ref. 12A/315), as for the corresponding standard 20 lb. F. bombs, the markings on the box being suitably modified to indicate that the bombs are of the parachute type.

Storage

30. The bombs are classified, for storage purposes, in Group VII.

N (1661B)

BOMB, PARACHUTE, H.E., AIRCRAFT, F., 20 lb., Mk. II**Leading particulars**

| | | | | | | |
|-----|--|-----|-----|-----|-----|-----------------------------|
| 31. | Stores Ref. | ... | ... | ... | ... | 12A/464 |
| | Overall length (pistol and tail in position) | ... | ... | ... | ... | 21-8 in. |
| | Maximum diameter | ... | ... | ... | ... | 3-9 in. |
| | Weight of body | ... | ... | ... | ... | 12 lb. 12 oz. |
| | Weight and nature of filling | ... | ... | ... | ... | 2-9 lb. approx., T.N.T. |
| | Terminal velocity | ... | ... | ... | ... | 85 ft. per sec. (estimated) |

GENERAL DESCRIPTION

32. The Mk. II bomb is similar to the Mk. III bomb, except that it is filled with T.N.T. and is not fitted with a suspension lug. The nature of the filling is indicated by the letters T.N.T. stencilled in black in three places on the light green band; if G.D.2 is also stencilled on the light green band, the bomb is filled with Grade 2 T.N.T. and is unsuitable for storage in hot climates.

33. The Mk. II bomb may be adapted for carriage on the Light Series bomb carrier by fitting it with band, suspending, No. 8, Mk. I (Stores Ref. 12A/528) which in addition to having a suspension lug, and a knuckle joint assembly with a clamping bolt for tightening the band upon the bomb body, is provided with a strap for correctly locating the band on the bomb body.

INSTRUCTIONS FOR USE

34. The instructions for use detailed in para. 21 to 28 apply to the Mk. II bomb, except that the No. 8 Mk. I suspending band has to be fitted to the bomb, before fuizing, for loading on to the Light Series bomb carrier.

Fitting the No. 8 Mk. I suspending band

35. The No. 8 Mk. I suspending band is fitted to the bomb as follows:—
- (i) Remove the arming link split pin from the circlip of the pistol.
 - (ii) Remove, as necessary, the insulating tape which secures the arming link to the bomb body.
 - (iii) Remove the pistol by hand, engaging the stop pins in the pistol body with the slots in the safety cap.
 - (iv) Slacken of the clamping bolt of the suspending band.
 - (v) Fit the suspending band over the bomb body with the suspension lug diametrically opposite the slot in the tail tube from which the arming link protrudes, ensuring that the ring of the strap on the suspending band rests upon the face of the exploder container.
 - (vi) Tighten the clamping bolt so as to secure the suspending band on the bomb body, taking care not to overstrain the bolt, and then replace and screw home the pistol by hand, or fuze the bomb at this stage if immediately required for operations.
 - (vii) Rotate the circlip on the pistol, if necessary, to bring the holes for the split pin into alignment with the arming link.
 - (viii) Insert the arming link split pin in the circlip holes, open up the ends of the split pin slightly to prevent its accidental withdrawal, and then secure the arming link to the bomb body with bands of insulating tape, using at least one and a half complete turns of tape for each band.

SUPPLY AND STORAGE**Supply**

36. The bombs are supplied as stated in para. 29, but under Stores Ref. 12A/464.
37. Bands, suspending, aircraft bomb, No. 8, Mk. I (Stores Ref. 12A/528) are supplied separately as required.

Storage

38. The bombs are classified, for storage purposes, in Group VII.

BOMB, PARACHUTE, H.E., AIRCRAFT, F., 20 lb., Mk. I**Leading particulars**

| | | |
|-----|--|-----------------------------|
| 39. | Stores Ref. | 12A/463 |
| | Overall length (pistol and tail in position) ... | 21.8 in. |
| | Maximum diameter | 3.95 in. |
| | Weight of body | 12 lb. 12 oz. |
| | Weight and nature of filling | 3.3 lb. approx. T.N.T. |
| | Terminal velocity | 85 ft. per sec. (estimated) |

GENERAL DESCRIPTION

40. The Mk. I bomb is similar to the Mk. III bomb, except for the slight difference in maximum diameter and that it is filled with T.N.T. The nature of the filling is indicated by the letters T.N.T. stencilled in black in three places on the light green band; if G.D.2 is also stencilled on the light green band, the bomb is filled with Grade 2 T.N.T. and is unsuitable for storage in hot climates.

41. The Mk. I bombs are not normally fitted with a suspension lug, although a limited number have been so fitted and may thus be carried either on the Light Series bomb carrier or in the Small Bomb Container.

INSTRUCTIONS FOR USE

42. The instructions for use detailed in para. 21 to 23, 25, 26, and 28 apply to all Mk. I bombs, and, in addition, para. 24 and 27 apply to Mk. I bombs fitted with suspension lugs.

SUPPLY AND STORAGE**Supply**

43. The bombs are supplied as stated in para. 29, but under Stores Ref. 12A/463.

Storage

44. The bombs are classified, for storage purposes, in Group VII.

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A.P.1661B, Vol. I, Sect. 6

APPENDIX 1

COMPONENTS USED WITH F. BOMBS

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APPENDIX 1
COMPONENTS USED WITH F. BOMBS

TABLE 1
BOMBS, H.E., AIRCRAFT, F., 20 lb., Mk. I, H, and HI

| <i>Nose fuuzing</i> | | |
|--|------------------------|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 29, Mk. I or II No. 38, Mk. IM, II, IIM, III, or IV | No. 43, Mk. I (inst.) | Special, supplied in position |
| No. 45, Mk. I | No. 52, Mk. II (inst.) | |

TABLE 2
BOMBS, PARACHUTE, H.E., AIRCRAFT, F., 20 lb., Mk. I, H, and HL

| <i>Nose fuuzing</i> | | |
|---------------------|-----------------------|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 33, Mk. I | No. 43, Mk. I (inst.) | Special, supplied in position |

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Section 7

INCENDIARY BOMBS

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A.P.1661B, Vol I

SECTION 7

INCENDIARY BOMBS

LIST OF CHAPTERS

Note.—A list of contents appears at the beginning of each chapter

- CHAPTER 1—General notes on incendiary bombs
 CHAPTER 2—
 CHAPTER 3—Bombs, incendiary, aircraft, 4 lb., Mk. I, IE, II, IIE, III, and IIIE
 CHAPTER 4—Bombs, incendiary, aircraft, 4 lb., Mk. IV, IVE, V, and VE
 CHAPTER 5—
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 CHAPTER 7—Bomb, incendiary, aircraft, 25 lb., Mk. I; attachments, parachute, aircraft bomb, No. 1, Mk. I and II; and strikers, aircraft bomb, No. 1, Mk. I and II
 CHAPTER 8—Bombs, incendiary, aircraft, 30 lb., Mk. I, II, IIM, III, and IIIM

Note.—Information on Bomb, incendiary, aircraft, 1½ lb., Mk. I (being a stone used as an aircraft destructor), is given in A.P.1661G, Vol. I, Sect. 5, Chap. 1.

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A.P.1661B, Vol. I, Sect. 7

CHAPTER 1

General notes on incendiary bombs

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CHAPTER 1

General notes on incendiary bombs

Introduction

1. Incendiary bombs of various types, ranging in weight from 4 lb. to 250 lb., are in use in the Service for operations against differing types of targets. There is also a special purpose 1½ lb. incendiary bomb. The construction and filling of the bombs differ with individual types and no general description can be given here to cover the complete range. The types of targets which can be successfully attacked with each type of bomb are given in the chapter describing the bomb.

2. Some bombs, such as the 4 lb. series, have bodies composed mainly of incendiary material, such as magnesium alloy, and are filled with solid incendiary compositions. Other bombs, such as the 30 lb. bomb, have steel tubular bodies and are liquid-filled with a rubber/benzole solution and may also be partially filled with cast white phosphorus. Liquid-filled bombs are provided with an ejection charge for ejecting the filling. The 25 lb. bomb has a faired steel tubular body containing incendiary fire-pots which are ejected successively by small gunpowder charges.

3. A small percentage of 4 lb. incendiary bombs contain an explosive charge, the object of which is to render approach to the burning bombs dangerous, due to the risk of flying splinters, and thereby to discourage attempts to extinguish these and the standard non-explosive bombs which are dropped simultaneously. Parachutes, for retarding purposes, thereby preventing burying when dropped on to soft targets, are fitted to 25 lb. incendiary bombs when used for special operations.

4. Incendiary bombs may be used in conjunction with H.E. bombs, depending on operational requirements.

Supply

5. All the incendiary bombs, with the exception of the 250 lb. bomb, are at present supplied in boxes, with tails in position. The 4 lb. bombs are packed in a tinplate case which is loaded into the Small Bomb Container, the correct proportion of non-explosive and explosive bombs being contained in the case. The 250 lb. incendiary bomb is supplied fitted with a transit base, the tail for the bomb being supplied in a container.

6. Liquid-filled bombs may be supplied with or without fuzes and ejection charges in position.

Storage

7. Details of the storage of incendiary bombs are given in A.P. 1245, Chap. 3; attention is called to the regulations governing the storage of stores containing white phosphorus. Liquid-filled incendiary bombs may be stored with fuzes and ejection charges in position.

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CHAPTER 3

BOMBS, INCENDIARY, AIRCRAFT, 4 lb., Mk. I, IE, II, IIE, III, and IIIE

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 3. Case, bomb, incendiary, 4 lb., Mk. IV

Note.—Bombs, incendiary, aircraft, 4 lb., Mk. I, IE, II and IIE have been declared obsolete
by A.M.O. (N) 1242/45. (A.L.130)

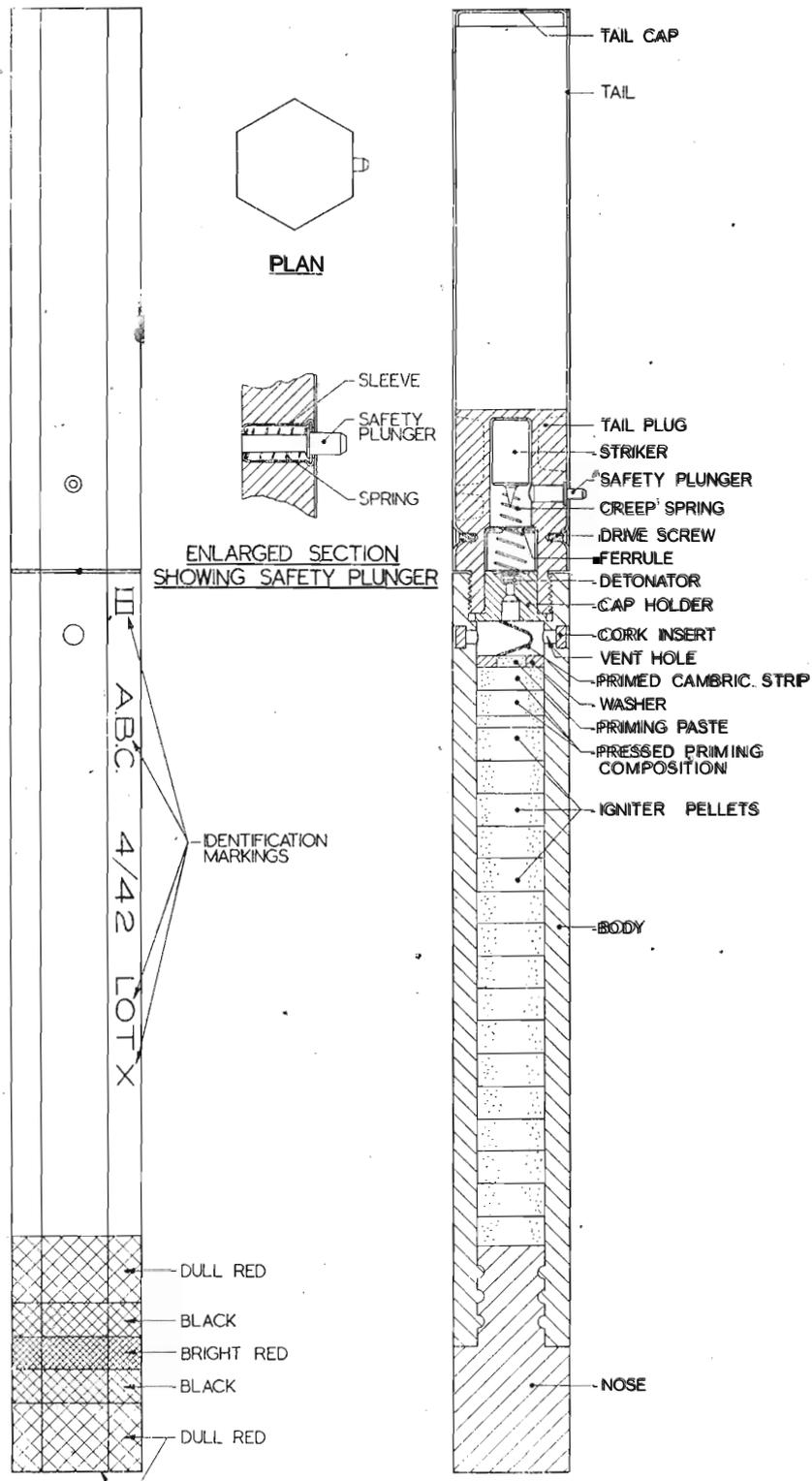


Fig. 1.—Bomb, incendiary, aircraft, 4 lb., Mk. II

CHAPTER 3

BOMBS, INCENDIARY, AIRCRAFT, 4 lb., Mk. I, IE, II, IIE, III, and HIE

Introduction

1. These bombs are similarly constructed, but the IE type bombs contain, at the nose end, a small explosive charge of gunpowder the purpose of which is to render approach to the burning bombs dangerous and so to discourage attempts to extinguish both these bombs and the externally similar non-explosive incendiary bombs which are released simultaneously. The bombs function on impact and are released in clutches from a Small Bomb Container. The bombs are not released from any altitude below 350 ft. Release from this height permits bombs which jostle one another on release from the Small Bomb Container to straighten up before hitting the target. The bombs have a terminal velocity of 420 ft. per sec.

BOMBS, INCENDIARY, AIRCRAFT, 4 lb., Mk. III and HIE

GENERAL DESCRIPTION

Mk. III bomb, fig. 1

2. This bomb (Stores Ref. 12A/S68), which is 21.4 in. long, is hexagonal in cross-section and measures 1.67 in. across the flats. It has a hollow magnesium-alloy body at one end of which is a cast iron or a steel nose, the body being cast on to the nose during manufacture. A magnesium-alloy tail plug, which may be of solid or open construction, is screwed into the other end of the body. Fixed to the tail plug by two drive-screws is a template tail closed by a tail cap.

3. The tail plug houses a striker, a creep spring, a ferrule having four tags, and a brass cap holder containing a J-7 grain detonator. When the bomb is packed in its case, see para. 15, movement of the striker towards the detonator is prevented by a spring-loaded safety plunger housed in a sleeve fitted into the tail plug.

4. Two vent holes, plugged by cork inserts, are provided in the body to communicate with the space between the cap holder and the filling of the bomb. A strip of primed cambric is located in this space.

Filling

5. The filling consists of a cardboard washer filled with gunpowder-shellac priming paste, a quantity of pressed priming composition, and a number of igniter pellets.

Identification colouring and markings

6. The end face of the nose and the forward portion of the bomb for a distance of $3\frac{1}{4}$ in. from the end face of the nose are painted dull red to indicate that the bomb is an incendiary bomb. At a distance of $\frac{3}{4}$ in. from the end face of the nose is a black band, $1\frac{1}{2}$ in. wide, painted on the dull red. In the centre of the black band is a bright red band, $\frac{1}{2}$ in. wide, to indicate that the bomb is filled.

7. The following information is stencilled, in black, on the body:—

- (i) The mark number of the bomb.
- (ii) The monogram of the filling station, or the filling contractor's initials or recognized trade mark.
- (iii) The date of filling, month and year.
- (iv) The filled lot number.

8. The following information is stamped on the body, the tail plug, and the nose:—

- (i) The date of manufacture, month and year, of the empty bomb.
- (ii) The initials or recognized trade mark of the manufacturer of the empty bomb.

Mk. IIIE bomb, fig. 2

9. This bomb (Stores Ref. 12A/869) is similar to the Mk. III bomb except that a burster, consisting of 210 grains of gunpowder in a tinplate container, replaces some of the igniter pellets at the nose end of the bomb.

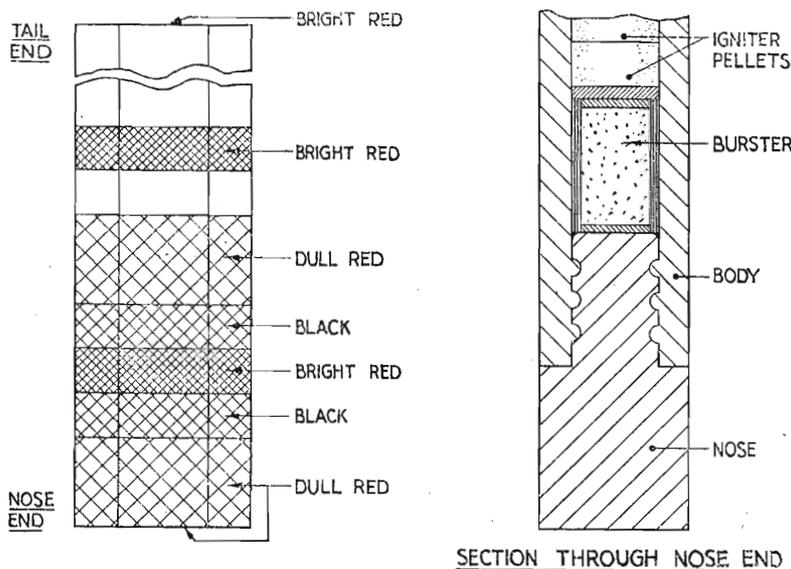


Fig. 2.—Nose and tail ends of the Mk. IIIE bomb

Identification colouring and markings

10. The colouring is as stated in para. 6 but, in addition, the end face of the tail cap is painted bright red and there is a second bright red band, $\frac{1}{2}$ in. wide, at a distance of $\frac{1}{2}$ in. from the dull red, to indicate that the bomb contains an explosive charge.

11. The markings are as stated in para. 7 and 8.

Case, bomb, incendiary, 4 lb., Mk. IV, fig. 3

12. This is a tinplate case (Stores Ref. 12A/937) to contain thirty 4 lb. incendiary bombs and fits into a Small Bomb Container. It has a lid secured in position by two tinplate tear-off bands soldered to the lid and the body of the case. Each tear-off band has a link which serves as a handle when ripping off the band to open the case. Secured to the inside of the lid are strips of felt which press against the top row of bombs when the case is closed.

13. The bombs are retained in position in the case by side and bottom fittings, as shown in fig. 3, and one of the side fittings provides a stowage for a drop bar which is to be used for securing the filled case in a Small Bomb Container. The drop bar is supplied wrapped in greaseproof paper.

14. On the outside of each of the longer sides of the case is a link plate having a handle and a hook portion. The link plate is attached to a handle bracket by a removable hinge pin. When the case is inserted into a Small Bomb Container the link plate is removed and replaced as described in A.P. 1664, Vol. I, Chap. 3, to ensure that the case remains in the container when the bombs are released. Some earlier issues of tinplate cases containing 30 bombs may have stop brackets as indicated by chain line, see fig. 3, but later issues will have no stop brackets, because the Mk. IV cases rest against the bottom of the small Bomb Container.

15. The bombs are so packed in the case that when the case is in the Small Bomb Container the noses of the bombs are directed forwards, that is, the noses should all lie at the end of the case which is furthest from the side fittings. The method of packing ensures that the safety plungers of all the bombs are depressed. The safety plungers of the bombs in the top row will be depressed if they are not visible when the case is open. Care should be taken to ensure that none of the safety plungers of the top row of bombs is visible, see para. 28.

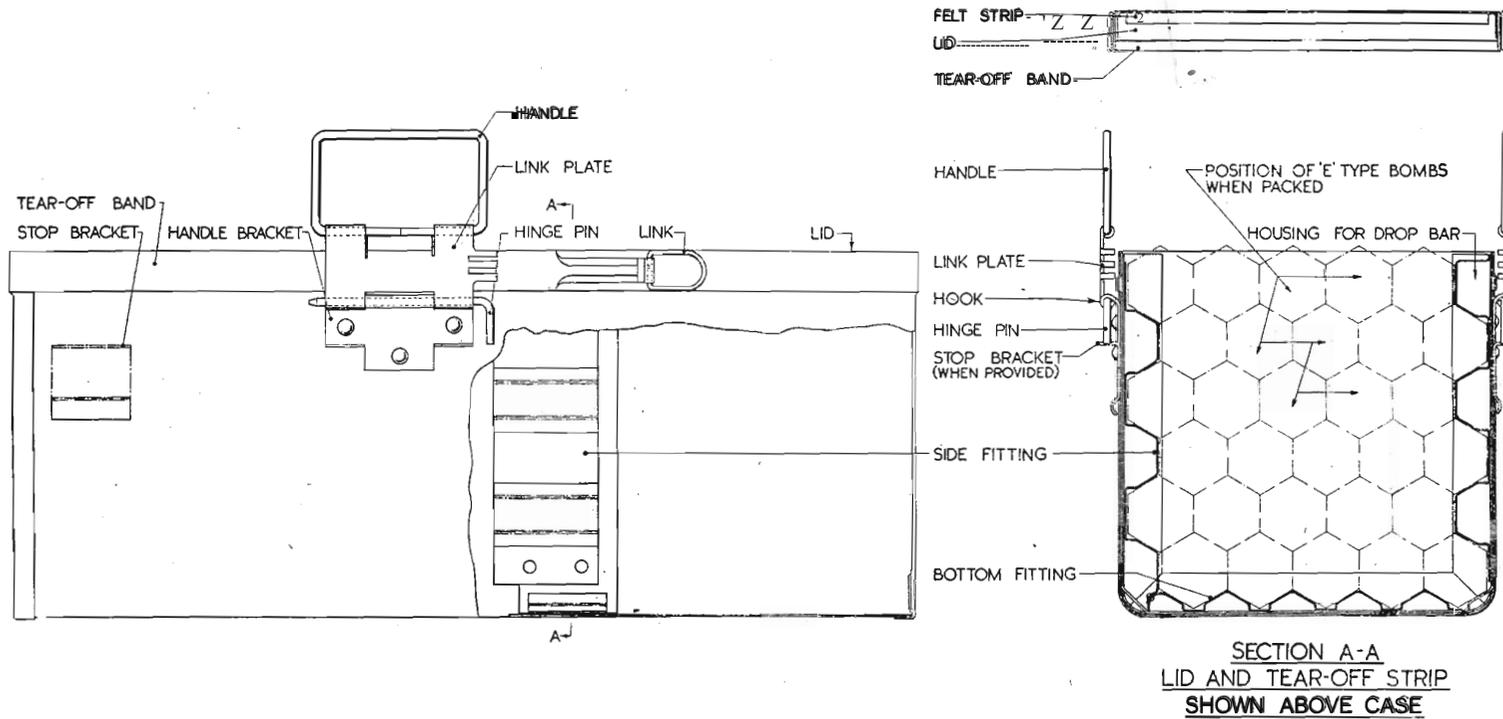


Fig. 3.—Case, bomb, incendiary, 4 lb., Mk. IV

A.P. 1661B, Vol. I, Sect. 7, Chap. 3

Identification colouring and markings

16. The case and lid are painted black and on the top of the lid, at the end of the case which is furthest from the side fittings, is a 1 in. bright red band.

17. The following information is stamped on one side of the case:—

- (i) The mark number of the case.
- (ii) The initials or recognized trade mark of the manufacturer.
- (iii) The date of manufacture, month and year.

18. If the case contains 30 Mk. III bombs, label No. H.1514, reading as follows, will be affixed to the outside of the lid of the case:—

H.1514
30 BOMBS,
INCENDIARY, A/C.,
4 LB., MARK III
& 1 RELEASE BAR

19. If the case contains 24 Mk. III and 6 Mk. HIE bombs, label No. H.1515, reading as follows, will be affixed to the outside lid of the case:—

H.1515
30 BOMBS,
INCENDIARY, A/C.,
4 LB.,
24—MARK III
6—MARK HIE
& 1 RELEASE BAR

Case, bomb, incendiary, 4 lb., Mk. III

20. This case (Stores Ref. 12A/867) is similar to the Mk. IV case described in para. 12 to 19, but the side fitting in the case is not quite so wide as that in the Mk. IV case and it is located slightly nearer the tail end of the case. Mk. III cases may be provided with the stop brackets mentioned in para. 14.

21. The labels mentioned in para. 18 and 19 may, as applicable, be affixed to the lids of Mk. III cases, or the information may be stencilled, in white letters, on the lid.

Case, bomb, incendiary, 4 lb., Mk. II

22. This case (Stores Ref. 12A/596) is similar to the Mk. IV case described in para. 12 to 19, but it is not so deep as it is constructed to contain only twenty 4 lb. incendiary bombs. The lid has no bright red band, but two 1 in. dull red bands, $\frac{1}{2}$ in. apart, are painted on it. The case is provided with stop brackets and the end of the case at which the stop brackets are located is painted dull red on the inside. The side fitting in the case is not quite as wide as that in the Mk. IV case and it is located slightly nearer the tail end of the case. The information regarding the contents of the case is stencilled, in white letters, on the lid.

FUNCTIONING**Mk. HI bomb**

23. When the bomb is released from its case in the Small Bomb Container carried by the aeroplane the safety plunger, which has been kept depressed, springs out to the position shown in fig. 1. On impact of the bomb with the target, the striker, overcoming the resistance of the creep spring, bends the tags on the ferrule and strikes and fires the detonator, the products of combustion from the detonator blowing the cork inserts out of the vent holes. The flash from the detonator is conveyed by the primed cambric strip to the gunpowder-shellac paste which ignites the pressed priming composition which, in turn, ignites the igniter pellets. The magnesium-alloy body starts to melt about 25 sec. after the bomb is ignited, and burns for about 10 min.

Mk. HIE bomb

24. This bomb is initiated and burns as described in para. 23, but, after $7\frac{1}{2}$ to 4 min., the gunpowder in the burster is ignited and explodes.

A.P. 1661B, Vol. I, Sect. 7, Chap. 3

INSTRUCTIONS FOR USE

Loading bombs on to an aeroplane

25. The bombs, in their cases, are carried in the 250 lb. Small Bomb Container, or, if they are packed in Mk. II cases, they may be carried in the 160 lb. Small Bomb Container. The container is to be filled and loaded on to the aeroplane as described in A.P. 1664, Vol. I.

26. Before placing a case into the Small Bomb Container, remove the soldered tear-off bands holding the lid in position and remove the lid.

27. If, when the lid is removed, any safety plunger is visible in the top row of bombs, the bomb concerned should be removed and replaced so that the plunger is not visible and is thus depressed.

28. The bombs should be found packed in the case as described in para. 15. Should the bombs not be so arranged they must be repacked in the correct direction, care being taken when repacking to ensure that no safety plungers are visible in the top row.

Operational instruction

29. The bombs are not to be released from any altitude below 350 ft.

Unloading bombs

30. The Small Bomb Container is to be unloaded from the aeroplane and the cases of bombs removed from it as described in A.P. 1664, Vol. I. The drop bars are to be oiled or greased and returned to their stowages in the cases, and the lids replaced on the cases and secured by adhesive tape. The cases, so sealed, are to be inserted in their boxes, see para. 32 and 33, and returned to store for use at the first opportunity.

SUPPLY AND STORAGE

Supply

31. The bombs may be supplied packed 24 Mk. III and 6 Mk. IIIE in Case, bomb, incendiary, 4 lb., Mk. III or IV, together with one drop bar; or 16 Mk. III and 4 Mk. IIIE in Case, bomb, incendiary, 4 lb., Mk. II, together with one drop bar. It may, however, be found desirable to vary the proportion of Mk. IIIE to Mk. III bombs in a case. A Mk. III or IV case, as supplied, may contain 30 Mk. III bombs together with one drop bar, and a Mk. II case may contain 20 Mk. III bombs together with one drop bar.

32. Each Mk. III or IV case will be contained in wooden Box, B.268, Mk. II, painted green to lessen the possibility of its being seen from the air. To distinguish this box from other green-painted boxes, a bright red band 1½ in. wide is painted round the box at one end.

33. Each Mk. II case will be contained in wooden Box, B.268, Mk. I.

Storage

34. Bombs, incendiary, aircraft, 4 lb., Mk. III and IIIE are classified, for storage purposes, in Group XI.

BOMBS, INCENDIARY, AIRCRAFT, 4 lb., Mk. II and HE

35. Attention is directed to para. 1.

Comparison with the Mk. III and IIIE bombs

36. The Mk. II and IIE bombs are, respectively, similar to the Mk. III and IIIE bombs, but differ from them as follows:—

- (i) The Stores Ref. numbers are, Mk. II bomb (12A/595), Mk. IIE bomb (12A/597).
- (ii) The bomb bodies have a smaller bore, with the result that, when the bombs function, the interval of time between ignition of the bombs and the melting through of their magnesium-alloy bodies at any point is about 10 sec. longer than for the Mk. III and IIIE bombs.
- (iii) The cap holders are of magnesium-alloy.
- (iv) The bomb bodies have four cork-plugged vent holes.
- (v) The tail plugs are of solid magnesium-alloy.
- (vi) The noses are of steel.

- (vii) The burster in the Mk. HE bomb consists of a hard grey wrapping-paper tube, closed at each end by millboard discs and contains 154 to 170 grains of gunpowder.
- (viii) The burster in the Mk. IIE bomb explodes 1 to 5 min. after ignition of the bomb.

37. The instructions for use, para. 25 to 30 apply also to the Mk. III and IIE bombs.

Supply

38. The bombs may be supplied packed 16 Mk. II and 4 Mk. IIE in Case, bomb, incendiary, 4 lb., Mk. II, together with one drop bar. It may, however, be found desirable to vary the proportion of Mk. IIE to Mk. II bombs in a case. A Mk. II case as supplied may contain 20 Mk. II bombs together with one drop bar.

39. The case will be contained in wooden box, B.268, Mk. I.

Storage

40. Bombs, incendiary, aircraft, 4 lb., Mk. II and IIE are classified, for storage purposes, in Group XI.

BOMBS, INCENDIARY, AIRCRAFT, 4 lb., Mk. I and IE

41. Attention is directed to para. 11.

Comparison with the Mk. HI and HIE bombs

42. The Mk. I and IE bombs are, respectively, similar to the Mk. III and HIE bombs, but differ from them as follows:—

- (i) The Stores Ref. numbers are, Mk. I bomb (12A/267); Mk. IE bomb (12A/430).
- (ii) The length of the bomb is 21.5 in.
- (iii) The bomb bodies have a smaller bore, with the result that, when the bombs function, the interval of time between ignition of the bombs and the melting through of their magnesium-alloy bodies at any point is about 10 sec. longer than for the Mk. III and HIE bombs.
- (iv) The cap holders are of magnesium-alloy.
- (v) The bombs have a 1.6Ω grain detonator.
- (vi) The bomb bodies have four cork-plugged vent holes.
- (vii) The tail plugs are of solid magnesium-alloy.
- (viii) The noses are of steel.
- (ix) The burster in the Mk. IE bomb consists of a hard grey wrapping-paper tube closed at each end by millboard discs and contains 154 to 170 grains of gunpowder.
- (x) The burster in the Mk. IE bomb explodes 1 to 5 min. after ignition of the bomb.
- (xi) The Mk. I and IE bombs are packed in Case, bomb, incendiary, 4 lb., Mk. I (Stores Ref. 12A/269). This case is similar to the Mk. IV case described in para. 12 to 19, but it is not so deep, as it is constructed to contain only twenty 4 lb. incendiary bombs. The lid has no bright red band, but two 1 in. dull red bands, 1.4 in. apart, are painted on it. The case is provided with stop brackets and the end of the case at which the stop brackets are located is painted dull red on the inside. The side fitting in the case is not quite so wide as that in the Mk. IV case and it is located slightly nearer the tail end of the case. The information regarding the contents of the case is stencilled, in white letters, on the lid.

Note.—Mk. I and IE bombs must not be packed in any case other than the Mk. I case, because they are longer than the succeeding Marks of bombs and may jam in cases other than the Mk. I case.

43. The instructions for use, para. 25 to 30 apply also to the Mk. I and IE bombs.

Supply

44. Normally the bombs will be supplied packed 16 Mk. I and 4 Mk. IE, together with one drop bar, in Case, bomb, incendiary, 4 lb., Mk. I. It may, however, be found desirable to vary the proportion of Mk. IE to Mk. I bombs in a case. The case, as supplied, may contain 20 Mk. I bombs, together with one drop bar.

45. The case will be contained in wooden Box, B.268, Mk. I.

Storage

46. Bombs, incendiary, aircraft, 4 lb., Mk. I and IE are classified, for storage purposes, in Group XI.

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CHAPTER 4

BOMBS, INCENDIARY, AIRCRAFT, 4 lb., Mk. IV, IVE, V, and VE

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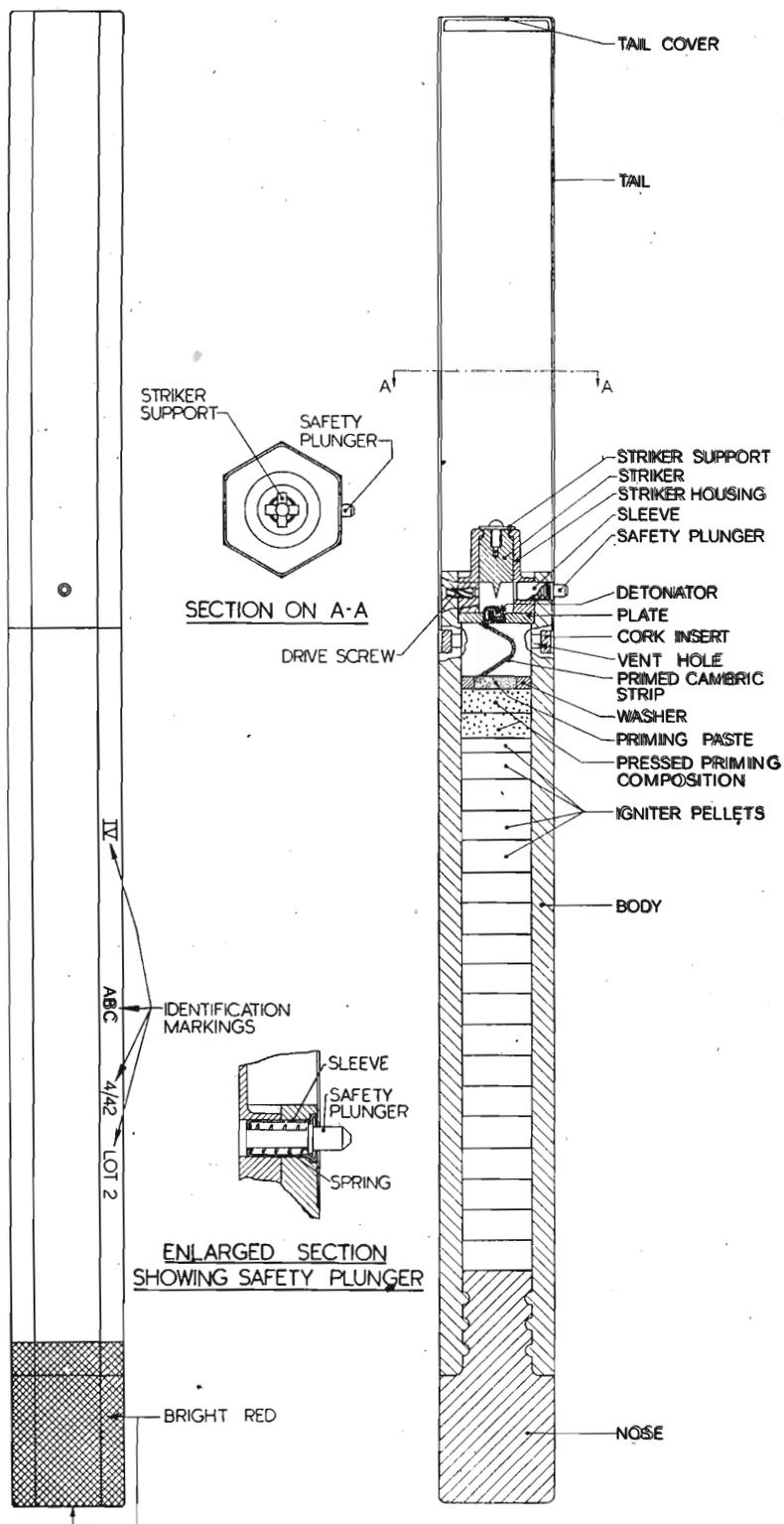


Fig. 11.—Bomb, incendiary, aircraft, 4 lb., Mk. IV

CHAPTER 4

BOMBS, INCENDIARY, AIRCRAFT, 4 lb., Mk. IV, IVE, V, and VE

Introduction

1. These bombs are similarly constructed, but the E type bombs contain, at the nose end, a small explosive charge of gunpowder, the purpose of which is to render approach to the burning bombs dangerous and so to discourage attempts to extinguish them and the externally similar non-explosive incendiary bombs which are released simultaneously. The bombs function on impact and are released in clutches from a Small Bomb Container. The bombs are not released from any altitude below 350 ft. Release from this height permits bombs which jostle one another on release from the Small Bomb Container to straighten up before hitting the target. The bombs have a terminal velocity of 420 ft. per sec.

BOMBS, INCENDIARY, AIRCRAFT, 4 lb., Mk. IV and IVE

GENERAL DESCRIPTION

Mk. IV bomb, fig. 1

2. This bomb (Stores Ref. 12A/872), which is 21.4 in. long, is hexagonal in cross-section and measures 1.67 in. across the flats. It has a hollow magnesium-alloy body, at one end of which is a cast iron nose, the body being cast on to the nose in manufacture. A tinplate tail, closed by a tail cover, is secured to the other end of the body by three drive-screws, which also hold a steel striker housing in position in the body.

3. At the tail end, the body is counterbored to accommodate an igniting mechanism consisting of a striker, located in the striker housing, and a steel plate seated at the bottom of the counterbore and containing a 1.7 grain detonator.

4. One end of the stiker is pointed, and the other end projects through a hole in the striker housing. The edge of this hole is chamfered to permit a thin brass cross, see section on A—A, fig. 1, secured to the striker, to be bent and pulled through the hole when the bomb functions. This cross forms a striker support during transit and storage. Movement of the striker towards the detonator is, when the bomb is packed in its case, see para. 16, further prevented by a spring-loaded safety plunger housed in a sleeve.

5. Two vent holes, plugged by cork inserts, are provided in the tail end of the body and communicate with the space between the igniter mechanism and the bomb filling. A strip of primed cambric is located in this space.

Filling

6. The filling consists of a cardboard washer filled with gunpowder-shellac priming paste, a quantity of pressed priming composition, and a number of igniter pellets.

Identification colouring and markings

7. The end face of the nose, and the forward portion of the bomb for a distance of 2 in. from the end face of the nose, are painted bright red to indicate that the bomb is filled.

8. The following information is stencilled, in black, on the body:—

- (i) The mark number of the bomb.
- (ii) The monogram of the filling station, or the filling contractor's initials or recognized trade mark.
- (iii) The date of filling, month and year.
- (iv) The filled lot number.

9. The following information is stamped on the body, the nose, and the tail cover:—

- (i) The date of manufacture, month and year, of the empty bomb.
- (ii) The initials or recognized trade mark of the manufacturer of the empty bomb.

Mk. IVE bomb, fig. 2

10. This bomb (Stores Ref. 12A/873) is similar to the Mk. IV bomb except that a burster consisting of 12 grammes of gunpowder in a tinsplate container replaces some of the igniter pellets at the nose end of the bomb.

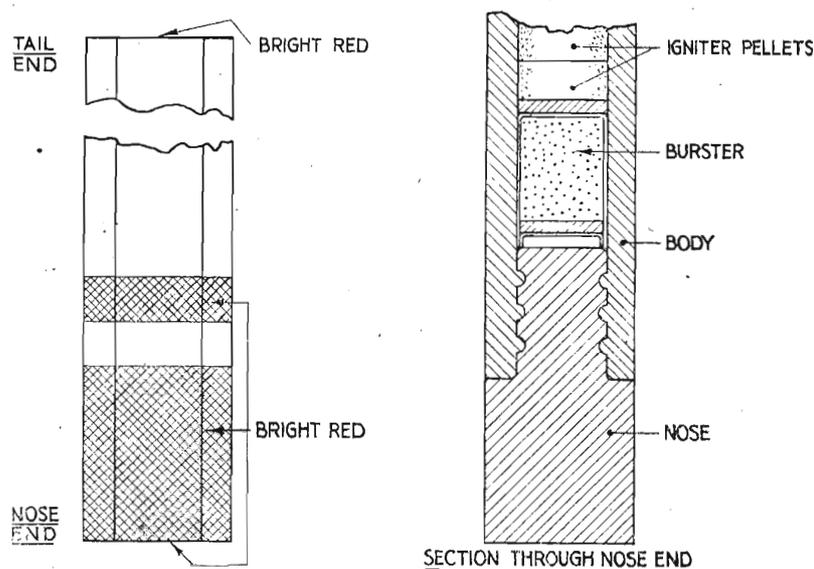


Fig. 2.—Nose and tail ends of the Mk. IVE bomb

Identification colouring and markings

11. The colouring is as stated in para. 7 but, in addition, the end face of the tail cover is painted bright red and a $\frac{1}{2}$ in. bright red band is painted round the bomb at a distance of $\frac{1}{2}$ in. from the bright red nose end portion of the bomb.

12. The markings are as stated in para. 8 and 9.

Case, bomb, incendiary, 4 lb., Mk. IV, fig. 3

13. This is a tinsplate case (Stores Ref. 12A/937) to contain thirty 4 lb. incendiary bombs and fits into a Small Bomb Container. It has a lid secured in position by two tinsplate tear-off bands soldered to the lid and the body of the case. Each tear-off band has a link which serves as a handle when ripping off the band to open the case. Secured to the inside of the lid are strips of felt which press against the top row of bombs when the case is closed.

14. The bombs are retained in position in the case by side and bottom fittings as shown in fig. 3, and one of the side fittings provides a stowage for a drop bar which is to be used for securing the filled case in a Small Bomb Container. The drop bar is supplied wrapped in greaseproof paper.

15. On the outside of each of the longer sides of the case is a link plate having a handle and a hook portion. The link plate is attached to a handle bracket by a removable hinge pin. When the case is inserted into a Small Bomb Container the link plate is removed and replaced as described in A.P. 1664, Vol. I, Chap. 3, to ensure that the case remains in the container when the bombs are released. Some earlier issues of tinsplate cases containing 30 bombs may have stop brackets as indicated by chain line, see fig. 3, but later issues will have no stop brackets, because the Mk. IV cases rest against the bottom of the Small Bomb Container.

16. The bombs are so packed in the case that when the case is in the Small Bomb Container the noses of the bombs are directed forwards, that is, the noses of the bombs should all lie at the end of the case which is furthest from the side fittings. The method of packing ensures that the safety plungers of all the bombs are depressed. The safety plungers of the bombs in the top row will be depressed if they are not visible when the case is open. Care should be taken to ensure that none of the safety plungers of the top row of bombs is visible, see para. 26.

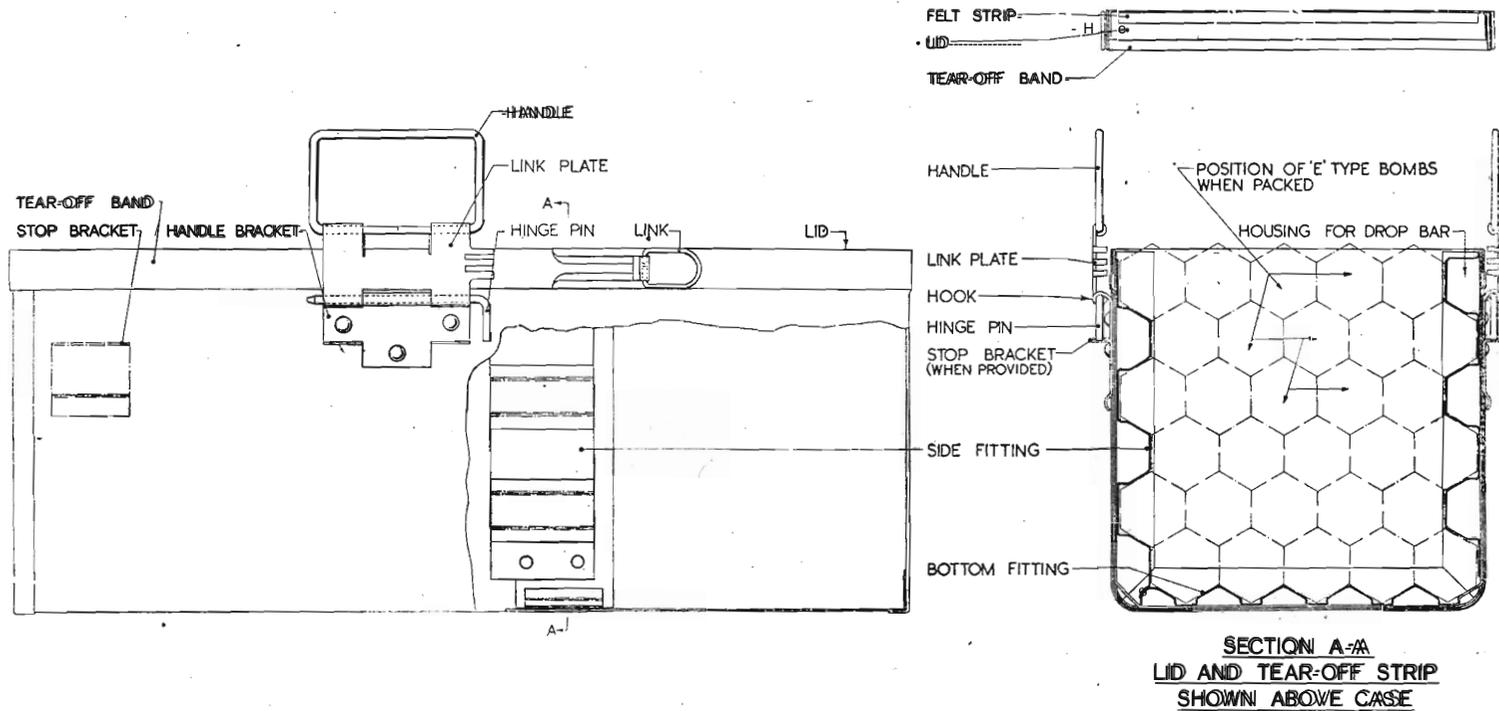


Fig. 3.—Case, bomb, incendiary, 4 lb., Mk. IV

A.P. 1661B, Vol. I, Sect. 7, Chap. 4

Identification colouring and markings

17. The case and lid are painted black and on the top of the lid, at the end of the case which is furthest from the side fittings, is a 1 in. bright red band.

18. The following information is stamped on one side of the case:—

- (i) The mark number of the case.
- (ii) The initials or recognized trade mark of the manufacturer.
- (iii) The date of manufacture, month and year.

19. If the case contains 30 Mk. IV bombs, label No. H.1514, reading as follows, will be affixed to the outside of the lid of the case:—

H.1514
30 BOMBS,
INCENDIARY, A/C.,
4 LB., MARK IV
& 1 RELEASE BAR

20. If the case contains 24 Mk. IV and 6 Mk. IVE bombs, label No. H.1515, reading as follows, will be affixed to the outside of the lid of the case:—

H.1515
30 BOMBS,
INCENDIARY, A/C.,
4 LB.,
24—MARK IV
6—MARK IVE
& 1 RELEASE BAR

FUNCTIONING

Mk. IV bomb

21. When the bomb is released from its case in the Small Bomb Container carried by the aeroplane, the safety plunger, which has been kept depressed, springs out to the position shown in fig. 11. On impact of the bomb with the target, the striker moves toward the detonator and fires it. The flash from the detonator ignites the primed cambric strip and the gunpowder-shellac paste, and the products of combustion blow the cork inserts out of the vent holes. The paste ignites the pressed priming composition which, in turn, ignites the igniter pellets. The magnesium-alloy body starts to melt about 25 sec. after the bomb has ignited, and burns for about 110 min.

Mk. IVE bomb

22. This bomb is initiated and burns as described in para. 21, but, after 1½ to 4 min., the gunpowder in the burster is ignited and explodes.

INSTRUCTIONS FOR USE

Loading bombs on to an aeroplane

23. The bombs, in their cases, are carried in the 250 lb. Small Bomb Container. The container is to be filled and loaded on to the aeroplane as described in A.P.11664, Vol. I.

24. Before placing a case into the Small Bomb Container, remove the soldered tear-off bands holding the lid in position and remove the lid.

25. If, when the lid is removed, any safety plunger is visible in the top row of bombs, the bomb concerned should be removed and replaced so that the plunger is not visible and is thus depressed.

26. The bombs should be found packed in the case as described in para. 16. Should the bombs not be so arranged, they must be repacked in the correct direction, care being taken when repacking to ensure that no safety plungers are visible in the top row.

Operational instruction

27. The bombs are not to be released from any altitude below 350 ft.

Unloading bombs

28. The Small Bomb Container is to be unloaded from the aeroplane and the cases of bombs removed from it as described in A.P.1664, Vol. I. The drop bars are to be oiled or greased and returned to their stowages in the cases, and the lids replaced on the cases and secured by adhesive tape. The cases, so sealed, are to be inserted in their boxes, see para. 30, and returned to store for use at the first opportunity.

SUPPLY AND STORAGE**Supply**

29. Normally the bombs will be supplied packed 30 Mk. IV in Case, incendiary, 4 lb., Mk. IV, together with one drop bar. If, however, any Mk. IVE bombs are supplied the bombs may be packed 24 Mk. IV and 6 Mk. IVE in a case, together with one drop bar.

30. Each case is contained in wooden Box, B.268, Mk. II, painted green to lessen the possibility of its being seen from the air. To distinguish this box from other green-painted boxes, a bright red band 1½ in. wide is painted round the box at one end.

Storage

31. Bombs, incendiary, aircraft, 4 lb., Mk. IV and IVE, are classified, for storage purposes, in Group XI.

BOMBS, INCENDIARY, AIRCRAFT, 4 lb., Mk. V and VE

32. Attention is directed to para. 1.

Comparison with the Mk. IV and IVE bombs

33. The Mk. V and VE bombs are, respectively, similar to the Mk. IV and IVE bombs, but are manufactured in America and differ from them as follows:—

- (i) The Stores Ref. numbers are Mk. V (12A/1020), Mk. VE (12A/1021).
- (ii) The bomb is initiated by a cap and-anvil being struck by the striker. The striker has a blunt point.
- (iii) The cap is supported by an aluminium plate.
- (iv) The striker housing is made of aluminium.
- (v) A different kind of pressed priming composition is used. It is more violent than the priming compositions used in the Mk. IV bombs, and causes some of the magnesium-alloy to scatter when the bombs are ignited.
- (vi) Cardboard packing strips are located between the ends of the bombs and the ends of the case containing them.

34. The information contained in para. 23 to 28 applies also to the Mk. V and VE bombs, but when a case is loaded into the small bomb container the cardboard packing strips must be removed.

Identification of bombs, cases, and boxes

35. Early issues of these stores will bear American identification markings and the following markings are characteristic of those which will be seen:—

- (i) On bombs—THL. N.F. Mk.V Lot 1. 50-A.L. 3/42.
- (ii) On boxes, which will be painted grey—BAN. BSC. 4230. AIR27/17. 6720.

36. Later issues of these stores will bear identification markings similar to those described in para. 7 to 9, and 17 to 20, and the boxes will be painted buff.

Supply

37. The bombs will be supplied 30 in a case as described in para. 29.

Storage

38. Bombs, incendiary, aircraft, 4 lb., Mk. V and VE, are classified, for storage purposes, in Group XI.

*This leaf issued with A.L. No. 119
July, 1945*

A.P.1661B, Vol. I, Sect. 7

CHAPTER 5

BOMBS, INCENDIARY, AIRCRAFT, X, 4 lb., WITH DELAY, Mk. I, II, and III

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Bombs, incendiary, aircraft, X, 4 lb., with delay, Mk. I, II, and III

(A.L.119)

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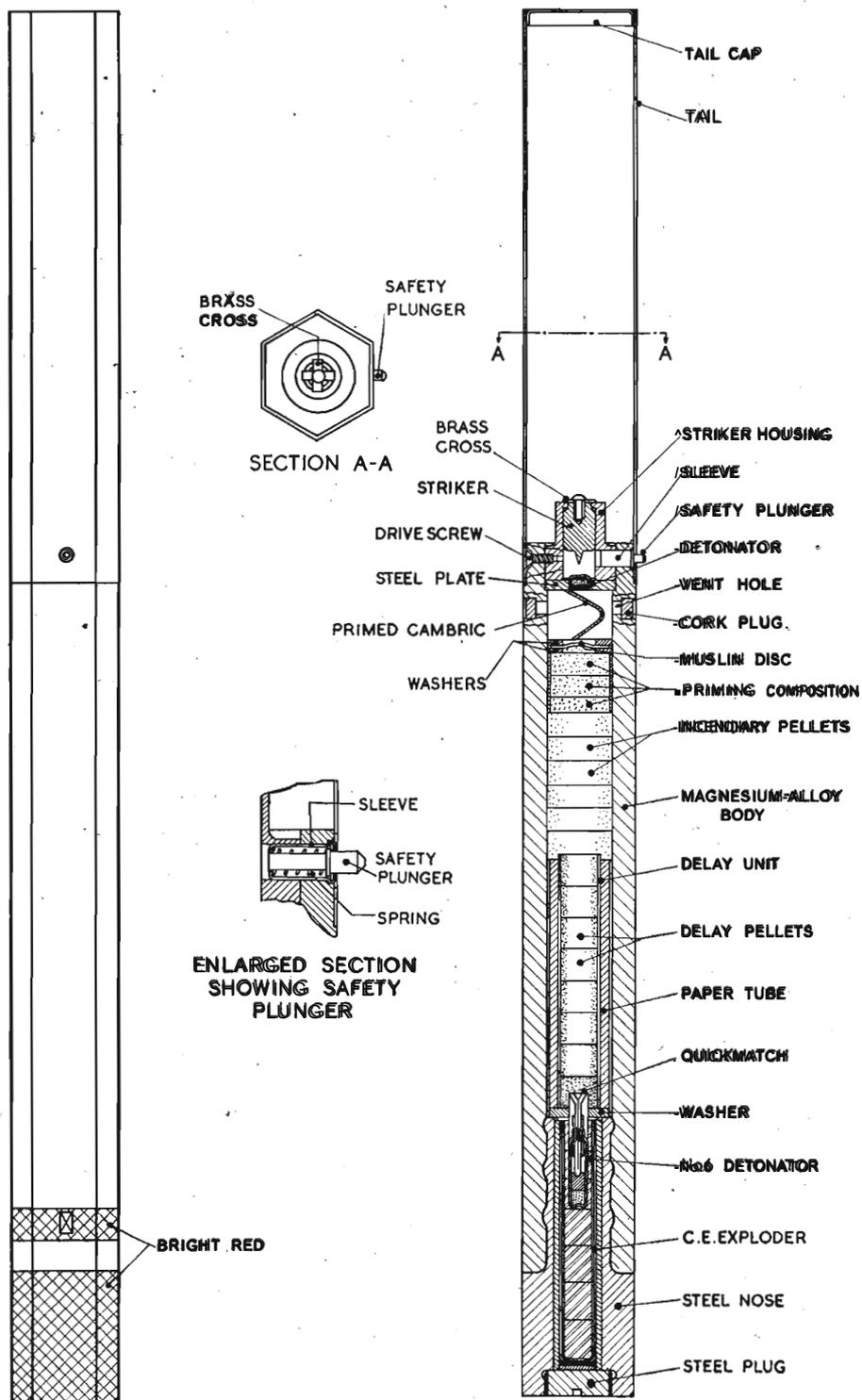


Fig. 1.—Details of the Mk. III X bomb

*This leaf issued with A.L. No. 119
July, 1945*

A.P. 1661B, Vol. I, Sect. 7

CHAPTER 5

BOMBS, INCENDIARY, AIRCRAFT, X, 4 lb., WITH DELAY, Mk. I, II, and III

Introduction

1. Except for their identification markings and the fact that they are fitted with nose plugs, these bombs are externally similar to the 4 lb. incendiary bombs described in Sect. 7, Chap. 4. The X bombs, however, have steel noses containing a charge of high explosive which, after a period of delay, is detonated and bursts the nose, the fragmentation being such as to render the bombs lethal, so that when they are dropped together with bombs of the non-explosive type they act as a deterrent to anti-fire personnel.

2. Mk. III X bombs have a 2, 4, or 10 min. delay before explosion occurs, but the Mk. I and II bombs have only a 2 or 4 min. delay. Mk. III X bombs will normally be supplied only in clustered form, but Mk. I and II bombs are normally supplied packed 30 in a metal case for carriage in a Small Bomb Container.

BOMB, INCENDIARY, AIRCRAFT, X, 4 lb., WITH DELAY, Mk. III

General description, fig. 1

Bomb with 10 min. delay

3. This bomb, which is 21.4 in. long, is hexagonal in cross-section and 1.67 in. across the flats. It has a hollow magnesium-alloy body which is cast on to a steel nose, and which contains the initiating mechanism, priming composition and incendiary composition pellets, and the delay unit. The steel nose contains an explosive charge consisting of C.E. pellets. A tinplate tail, closed at one end by a tail cap, is secured to the tail end of the bomb body by three drive-screws which also hold the striker housing of the initiating mechanism in position.

4. The initiating mechanism includes a pointed striker located in the striker housing and retained against premature setting forward by a brass cross, see section A-A, fig. 1. On impact of the bomb with the target, the arms of the cross, due to inertia, pull through the striker housing and the striker sets forward to fire a 1.7 grain detonator partly housed in a steel plate. This detonator blows the cork plugs out of two vent holes in the bomb body and ignites a piece of primed cambric. This, in turn, burns through a muslin disc held between two millboard washers and ignites the priming composition. The muslin disc, due to its close contact with the priming, is impregnated with the priming composition and the composition, in turn, ignites the incendiary composition pellets. These pellets ignite the magnesium-alloy body and the delay unit. This unit consists of a number of 0.55 in. diameter delay composition pellets housed in a rolled paper tube closed at the nose end by a millboard washer. The end pellet has a hole into which extends a piece of quick-match forming part of a No. 6 detonator which is housed in perforated pellets forming part of the C.E. exploder which bursts the nose of the bomb. The delay pellets burn for approximately 10 min. and then ignite the quick match thus initiating the No. 6 detonator which detonates the exploder and so bursts the nose.

5. During storage or transit in the cluster, or metal case, see para. 2, a spring-loaded safety plunger, housed in a sleeve, extends into the path of the striker to prevent the striker moving forward and firing the detonator of the initiating mechanism. When the bomb is released or removed from the cluster or case, the plunger moves out of the path of the striker, see fig. 1, so that the striker is then held in position only by the brass cross. The bomb is now armed and, if dropped nose first on to concrete from a height of 5 ft., will probably function.

Bomb with 4 min. delay

6. This bomb is similar to the 10 min. delay bomb described in para. 3 to 5, but the delay unit contains pellets which are of slightly greater diameter and contain a different delay composition.

Bomb with 2 min. delay

7. This bomb is similar to the 4 min. delay bomb, but its delay unit is approximately one-half the length of that contained in the 4 min. delay bomb.

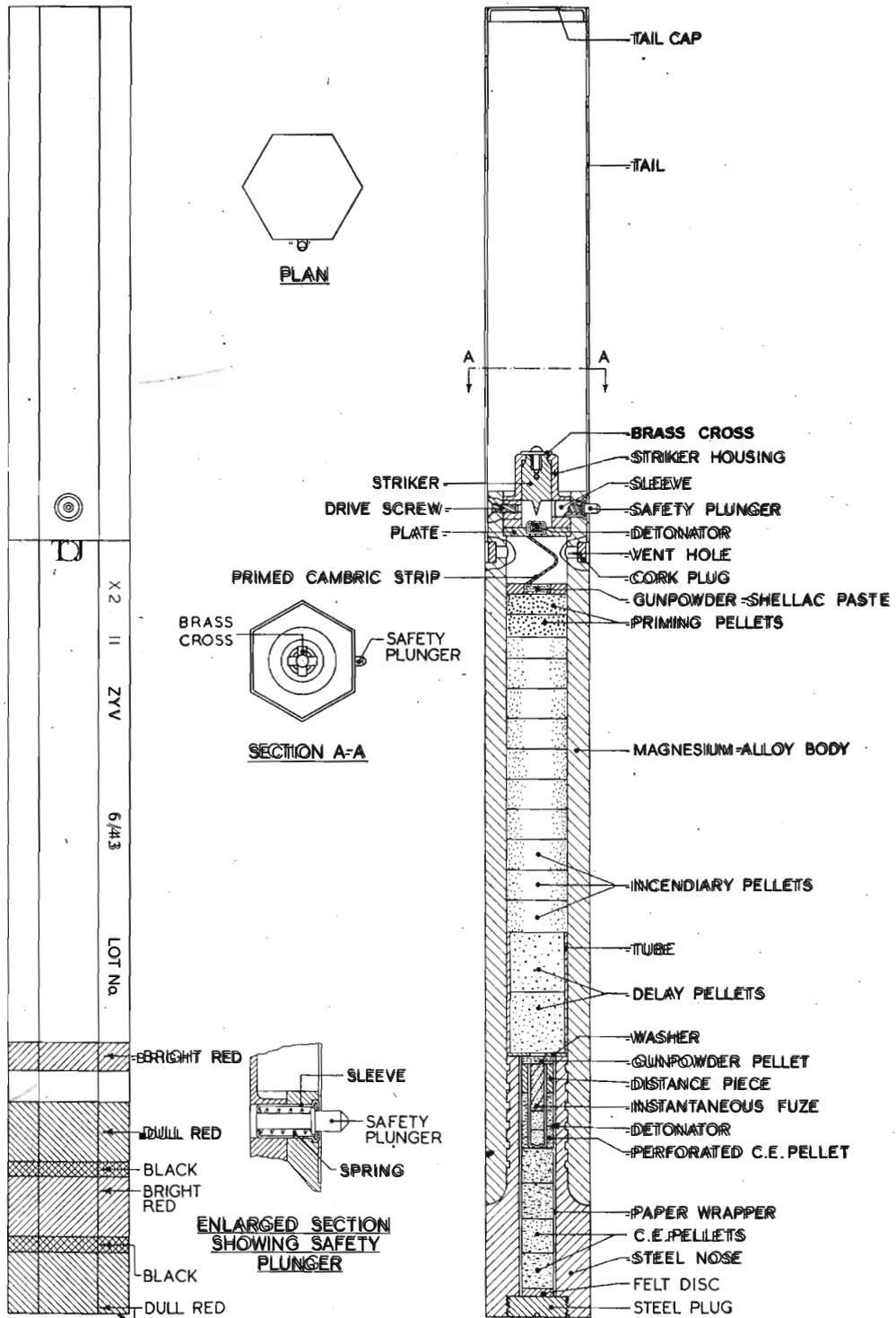


Fig. 2.—Details of the Mk. H X bomb

*This leaf issued with A.L. No. 119
July, 1946 ■*

A.P.1661B, Vol. I, Sect. 7, Chap. 5

Identification colouring and markings

8. The nose of the bomb (but not the end) is painted bright red for a distance of about 2 in. At a distance of about $\frac{1}{2}$ in. from the painted portion is a bright red band about $\frac{1}{2}$ in. wide.

9. On the $\frac{1}{2}$ in. bright red band is stencilled, in black, the type of bomb and the period of delay it contains, for example "TO X". Also on the bomb body, in black, is the following information:—

- (i) The mark number of the bomb.
- (ii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iii) The date of filling, month and year.
- (iv) The filled lot number.

Supply

10. When the bombs are not supplied clustered, they are supplied packed thirty in Case, tinplate, Mk. V, each case containing one drop bar and being packed in Box B.268, Mk. IV. The case has a bright red band, 1 in. wide, on its lid, to indicate that it contains explosive bombs and, at a distance of 1 in. from the bright red band, is a 1 in. yellow band to indicate that the bombs are X bombs and not E-type explosive bombs (see Sect. 7, Chap. 4). Except for these bands, the exterior of the case is black in colour. Instead of the stencilled markings usually found on the lid of a case containing 4 lb. incendiary bombs, a label stating the contents is affixed to the outside of the lid of cases containing X bombs.

11. The box is painted green to lessen the possibility of its being seen from the air, and a bright red band, 1 $\frac{1}{2}$ in. wide, is painted round it at a distance of 1 $\frac{1}{2}$ in. from one end and the lid batten adjacent to the red band is painted yellow to draw attention to the special nature of the contents of the box. A label affixed to the box states the contents of the box.

Storage

12. The 4 lb. X bombs are classified, for storage purposes, in Group 11, Category W.

BOMB, INCENDIARY, AIRCRAFT, X, 4 lb., WITH DELAY, Mk. II

13. Attention is directed to para. 1 and 2.

Comparison with the Mk. III bomb, fig. 2

14. The Mk. II bomb is similar to the Mk. III bomb but exists only in 2 min. or 4 min. delay versions. The detonator for the explosive charge is fired by a short length of instantaneous fuze and a gunpowder pellet. The method of initiation of the bomb is also slightly different in that the piece of primed cambric ignites some gunpowder-shellac paste contained in a washer abutting the priming pellets.

15. The identification colouring of the Mk. II bomb is different from that of the Mk. III bomb. The end face of the nose of the Mk. II bomb, and the nose end of the bomb for a distance of 3 $\frac{1}{2}$ in., are painted a dull red. At a distance of 1 in. from the end of the nose a black band, 1 $\frac{1}{2}$ in. wide, is painted over the dull red, and at the centre of this band a bright red band, 1 in. wide, is painted over the black. At a distance of 4 in. from the end of the nose is a second bright red band, $\frac{1}{2}$ in. wide.

16. The details as to supply and storage are as stated in para. 10 to 12.

BOMB, INCENDIARY, AIRCRAFT, X, 4 lb., WITH DELAY, Mk. I

17. Attention is directed to para. 1 and 2.

Comparison with the Mk. III bomb, fig. 3

18. The Mk. I bomb is similar to the Mk. III bomb but exists only in 2 min. or 4 min. delay versions. The detonator for the explosive charge is fired by a piece of instantaneous fuze and a gunpowder pellet as in the Mk. II bomb.

19. The initiating mechanism is different from that of the Mk. III bomb, see fig. 3, in that the striker is contained in a tail plug which is screwed into the tail end of the bomb body and, when the bomb is armed, the striker is held away from the detonator by a creep spring. On impact of this bomb with the target, the striker has to overcome the resistance of the creep spring and to bend down the tags of a ferrule before firing the detonator.

20. The identification colouring of the Mk. I bomb is different from that of the Mk. III bomb, but is the same as that of the Mk. II bomb, see para. 15. The details as to supply and storage are as stated in para. 10 to 12, except that Mk. I bombs are supplied in a Mk. III timplate case contained in Box B.268, Mk. II. The stop brackets at the nose end of the Mk. III case are painted yellow.

INSTRUCTIONS FOR USE

Note.—The instructions contained in the succeeding paragraphs apply only to bombs supplied in timplate cases for carriage in a Small Bomb Container.

Safety precaution

21. The timplate case in which the bombs are supplied is fitted with packing pieces which retain the safety plungers in the bombs in the depressed or safe position. The top layer of bombs is packed with the safety plungers facing inwards. If, when the lid of the case is removed, a safety plunger is visible in the top layer, the bomb concerned must be removed and repacked so that the plunger is depressed.

Loading the bombs on to an aircraft

22. The bombs, in their cases, are carried in the 250 lb. Small Bomb Container, which is to be filled and loaded on to the aircraft as described in A.P. 1664, Vol. I, Chap. 3.

23. Before loading a case into the small Bomb Container, remove the straps (or the soldered strips if the case is of earlier mark than Mk. V) holding the lid in position, take off the lid, and remove the drop bar from its stowage in the case. The bombs are so packed that when the case is correctly inserted into the Small Bomb Container the bombs are nose forward. Should occasion arise in which the bombs are found to be tail forward when the case is properly fitted into the Small Bomb Container, the bombs must be repacked in the opposite direction, care being taken when repacking to ensure that no safety plungers are visible in the top row of bombs.

Unloading, and removing bombs from the Small Bomb Container

24. The Small Bomb Container is to be unloaded from the aircraft and the cases of bombs removed from the container as described in A.P. 1664, Vol. I, Chap. 3. When the case has been removed from the container, oil or grease the drop bar and place it in its stowage position in the case. Check that the lid bears the correct label indicating the contents of the case, and place the lid on the case. Secure the lid in position with the straps if it is a Mk. V case, or if it is an earlier mark secure with adhesive tape.

25. The sealed case is then to be inserted into its wooden box, care being taken to ensure that the box bears a label identical with that on the case. Clearly mark the box "FOR FIRST ISSUE" and return the bombs to storage for use at the first opportunity.

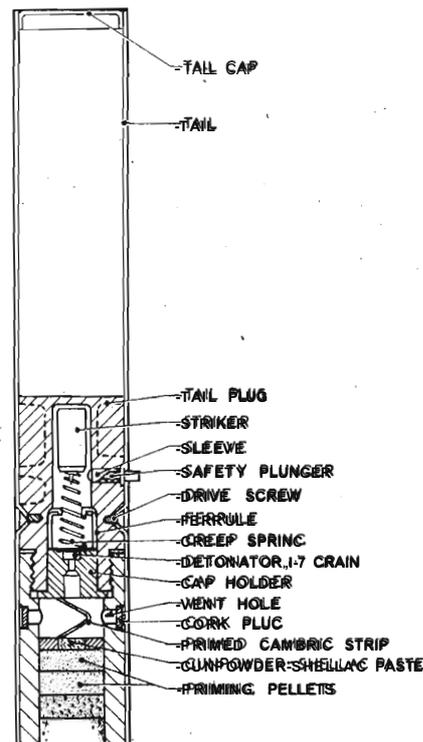


Fig. 3.—Initiating mechanism of the Mk. I X bomb

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A.P.1661B, Vol. I, Sect. 7

CHAPTER 7

BOMB, INCENDIARY, AIRCRAFT, 25 lb., Mk. I; ATTACHMENTS, PARACHUTE, AIRCRAFT BOMB, No. 1, Mk. I and II; and STRIKERS, AIRCRAFT BOMB, No. 1, Mk. I and II

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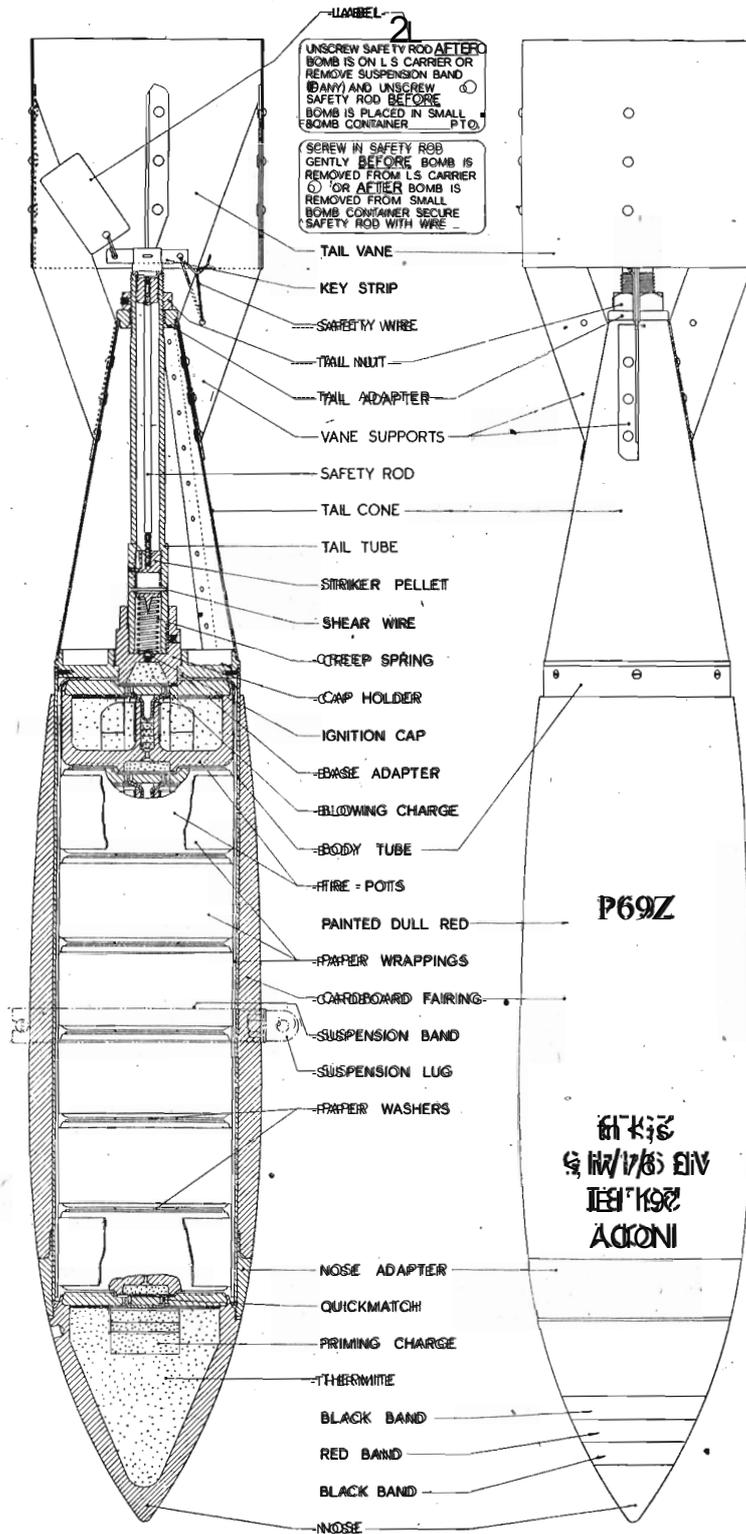


Fig. 1.—Bomb, incendiary, aircraft, 25 lb., Mk. I

CHAPTER 7

**BOMB, INCENDIARY, AIRCRAFT, 25 lb., Mk. I; ATTACHMENTS, PARACHUTE, AIRCRAFT
BOMB, No. 1, Mk. I and H; and STRIKERS, AIRCRAFT BOMB, No. 1, Mk. I and H**

Introduction

1. The 25 lb. Mk. I incendiary bomb which is used fitted with the No. 1, Mk. I parachute attachment and the No. 1, Mk. I striker, or with the No. 1, Mk. II parachute attachment and the No. 1, Mk. II striker, is primarily intended for attacking forests and similar targets. The object of fitting the parachute attachment is to reduce the terminal velocity of the bomb sufficiently to prevent it from penetrating too deeply into the ground and thereby being rendered less effective. The striker, which is assembled to the parachute attachment and fitted with it into the tail of the bomb, is an auxiliary to the striker pellet to provide the necessary increased inertia to ensure the operation of the firing mechanism of the bomb upon impact with the target at the reduced terminal velocity.

2. The bomb is fuzed at the tail only and on functioning provides a number of active sources of fire spread over a considerable area. It is supplied either with suspension lug and band, for dropping from the Light Series bomb carrier, or without the lug and band, for dropping from the 250 lb. Small Bomb Container. Each mark of parachute attachment is supplied, together with its associated striker, as a separate store.

BOMB, INCENDIARY, AIRCRAFT, 25 lb., Mk. I

Leading particulars

| | |
|---|---|
| 3. Stores Ref. (with suspension lug and band) | 12A/255 |
| Stores Ref. (without suspension lug and band) | 12A/258 |
| Length | 32-6 in. |
| Maximum diameter | 5-03 in. |
| Weight of filled bomb | 25 lb. approx. |
| Weight of empty bomb | 17 lb. approx. |
| Weight and nature of incendiary composition filling | 6 lb. 4 oz. approx. (1 lb. Thermite and 5 lb. 4 oz. magnesium) |

Note.—Approximately half of the total weight of the filled bomb is made up by incendiary material of different kinds.

GENERAL DESCRIPTION

4. The bomb, see fig. 1, consists of a cylindrical steel body tube secured to a hollow sharp-pointed nose by a nose adapter and built up externally to streamline form by a cardboard fairing, a column of seven closed containers, termed fire-pots, accommodated in the body tube, a flanged base adapter which affords a mounting for a cap holder, a tail cone with a cylindrical tail vane secured to it by four vane supports, and a tail tube which accommodates a striker pellet, with a shear wire and creep spring, and a safety rod.

Bomb body

5. The body tube is closed at its rear end by the base adapter, which is secured in position by screws and has a central boss into which the cap holder is screwed. The forward end of the body tube fits into the nose adapter, to which it is welded, and is closed by the hollow nose which is screwed into the nose adapter and secured by stabbing.

6. The cardboard fairing overlaps the rear end of the nose adapter so as to cover the welded joint between the adapter and the body tube; and when the bomb is to be fitted with a suspension lug and band the fairing is provided with a hole in which the suspension lug securing nut engages to locate the lug at 45 deg. to the vane supports of the tail.

7. Each of the seven fire-pots, see fig. 2, consists of a cylindrical container made of magnesium alloy and formed with a central tube which communicates, through a fire hole, with a recess in a central boss on the base of the container. The container is closed by a magnesium alloy lid which has a shallow central recess in its outer side, and holes through the lid place this recess in communication with the interior of the container. A container lid also closes the hollow nose of the bomb.

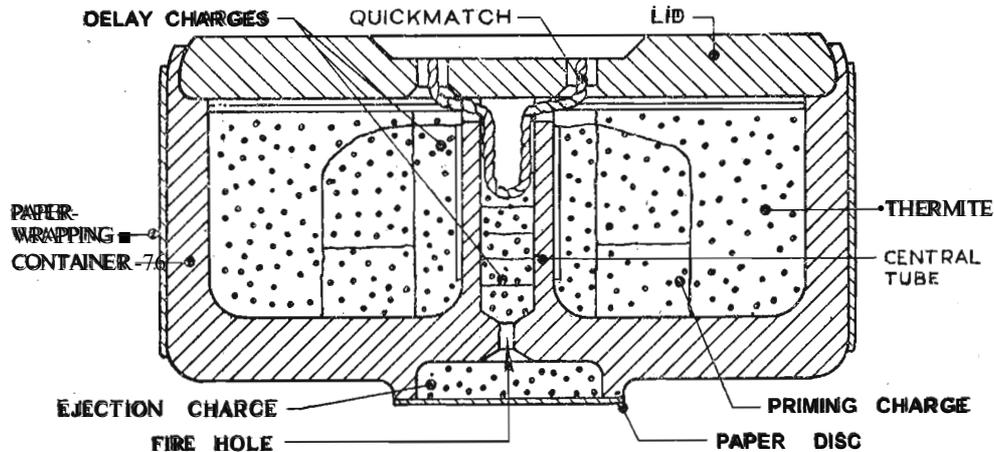


Fig. 2.—Fire-pot for bomb, incendiary, aircraft, 25 lb., Mk. I

8. Each container is wrapped round with a strip of fine white paper, and the seven containers are arranged in a column, so that the boss on the base of one container projects into the recess in the lid of the adjacent container. The column of containers almost completely fills the body tube and is wrapped round with two thicknesses of brown paper secured with adhesive. The cap holder in the base adapter projects into the recess in the lid of the rear container, and the boss on the base of the container at the forward end of the column projects into the recess in the lid which closes the nose chamber.

9. The cap holder is bored through axially to accommodate an igniter cap and a blowing charge, the rear portion of the bore being threaded to receive the forward threaded end of the tail tube.

Filling

10. The ignition cap contains a layer of gunpowder and a layer of detonating composition, whilst the blowing charge in the forward end of the cap holder consists of gunpowder retained by a paper disc.

11. The central tube of each of the seven fire-pots houses a delay charge, and is surrounded by a delay charge and a priming charge for the thermite and magnesium filling which occupies the remainder of the annular chamber in the fire-pot. A loop of quickmatch extends into the bore of the central tube and has its two ends carried out through the slots in the tube and through two of the holes in the lid. An ejection charge of gunpowder is retained in the recess in the central boss of each fire-pot by a paper disc which is secured in position by shellac.

12. The lid which closes the nose chamber has a length of quickmatch extending through two of its holes and across the priming charge of the thermite which fills the remainder of the nose chamber.

Tail

13. The tail cone fits over the flange of the base adapter and is held assembled to the bomb body by a tail nut which screws on to the rear end of the tail tube against a tail adapter which fits into the rear end of the tail cone. The tail tube is screwed into the rear end of the cap holder, to which it is secured by a grub screw, and the tail nut is locked to the tail tube by a grub screw.

Striker pellet and safety mechanism

14. The striker pellet, which has a sharp point at the forward end, is held in the safe position by a shear wire passed through holes in the striker pellet and tail tube and having

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its ends soldered over to prevent removal. The rear end of the striker pellet receives the forward threaded end of the safety rod, and has a longitudinal guide slot which is engaged by a guide screw in the tail tube. The creep spring is housed in the forward end of the tail tube and bears against the cap holder and the striker pellet.

15. The safety rod passes through the tail tube and is screwed into the threaded bore of the striker pellet. Its rear end is provided with a head, the forward spigot portion of which fits loosely into the rear end of the tail tube, and carries a washer which closes the tube end. The rear portion of the safety rod head has a slot for a key strip which is secured in position by a split pin. Holes are formed through opposite ends of the key strip and a safety wire is passed through one of these holes and through a hole in one of the vane supports and has its ends twisted together to prevent the safety rod being unscrewed from the striker pellet. An instruction label (relevant only to the dropping of the bomb without attachments) is secured to the opposite end of the key strip by a split ring.

Identification colouring and markings

16. The bomb, except for the lug of the suspension band when fitted, is painted dull red. A black band 1.5 in. wide, is painted round the nose, and when the bomb is filled, a red band, 0.5 in. wide, is painted centrally on the black band.

17. Stencilled in black on the bomb body are the following markings:—

- (i) INCDY.
- (ii) 25 LB. I.
- (iii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iv) The date of filling, day, month, and year.
- (v) The lot number of the filling.
- (vi) The actual weight of the filled bomb.
- (vii) The design number of the method of filling.

18. The manufacturers' initials, or recognized trade mark, and the date of manufacture, are stamped on the nose, nose adapter, body fairing, base adapter, cap holder, each of the magnesium alloy fire-pots and lids, tail tube, one of the tail vane supports, and on the suspension band, when fitted. In addition the nose has the following markings stamped on it:—

- (i) INCDY.
- (ii) 25 LB. I.

SUPPLY AND STORAGE

Supply

19. Four bombs, with or without suspension lugs and bands, are supplied packed, together with one drop bar for use with the 250 lb. Small Bomb Container, in Box, bomb, incendiary, aircraft, 25 lb., B.258, Mk. I or II.

Storage

20. The bombs are classified, for storage purposes, in Group XI.

ATTACHMENT, PARACHUTE, AIRCRAFT BOMB, No. 1, Mk. I, and STRIKER, AIRCRAFT BOMB, No. 1, Mk. I

GENERAL DESCRIPTION

Parachute attachment

21. The attachment, parachute, aircraft bomb, No. 1, Mk. I (Stores Ref. 12A/459), see para. 1 and fig. 3, consists of a small parachute housed in a container. It is fitted with a striker, aircraft bomb, No. 1, Mk. I, with which it is assembled into the tail of the bomb, from which the safety rod has been removed.

22. The container is of sheet metal and consists of a cylindrical housing plate and a cover. It fits loosely in the cylindrical vane of the bomb tail.

23. The parachute, which is 15 in. in diameter and vented at the peak, has eight gores with rigging lines passed through and secured in the gore seams, the lower ends of the rigging lines being brought together and knotted to form an eye which is passed through a central hole in the housing plate and between a pair of bearing lugs stamped out of, and bent outward at right angles to, the housing plate, one at each side of the central hole.

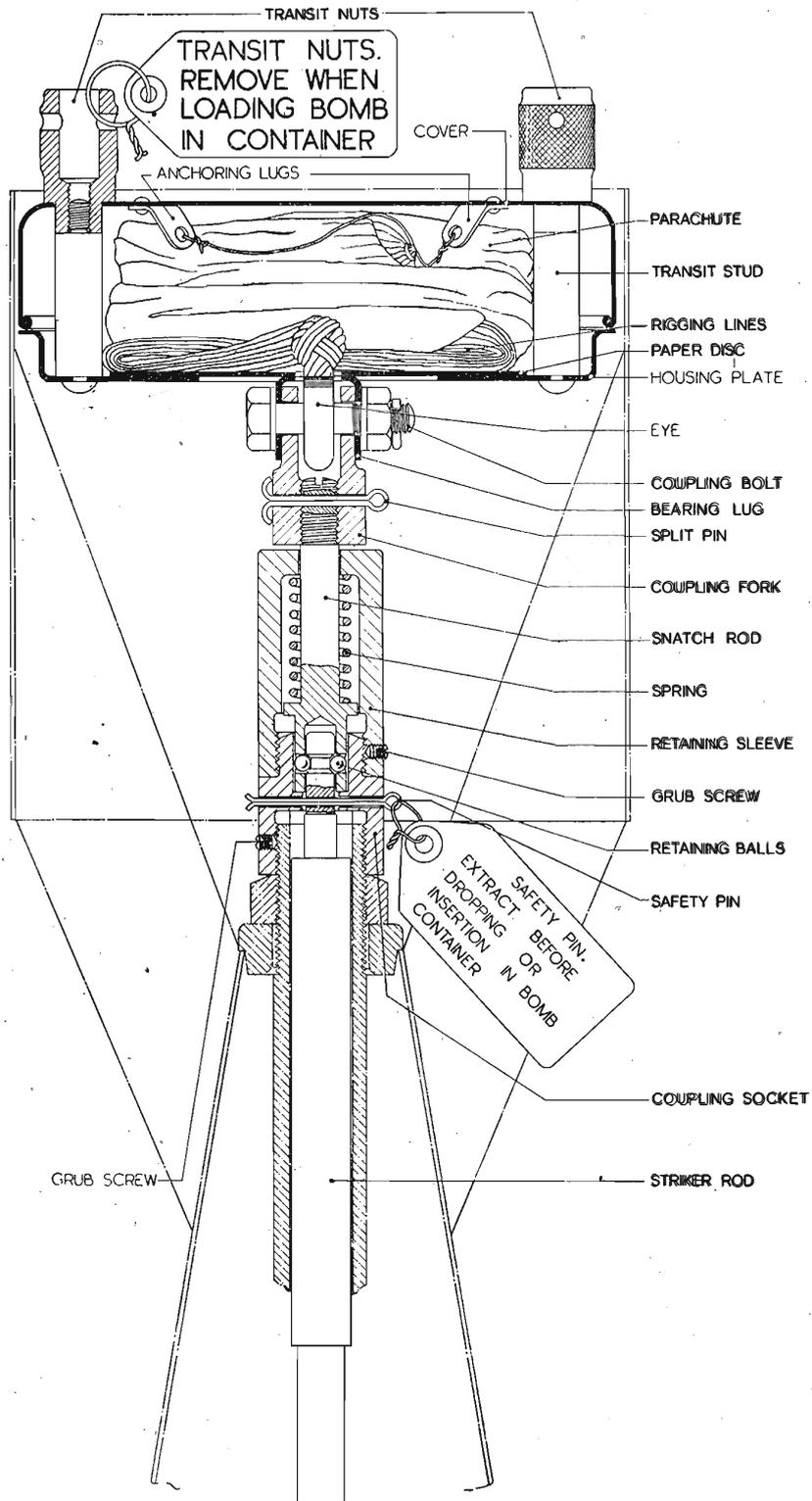


Fig. 3.—Attachment, parachute, aircraft bomb, No. 1, Mk I, and Striker, aircraft bomb, No. 1, Mk I

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24. The upper portions of the rigging lines cross one another at the centre of the vent, where they are sewn together and knotted to cords which connect the apex to the cover of the parachute container, the cover being provided with three equi-spaced anchoring lugs for the attachment of the cords.

25. The housing plate of the parachute container has riveted to it two transit studs which receive transit nuts for securing the cover in position on the housing plate. Four holes are formed in the housing plate to permit inflow of air to the interior of the container as the bomb falls; these holes are covered on the inside by a paper disc which is placed in position before the folded parachute is packed into the container, the paper disc having a central hole to register with the central hole in the housing plate.

26. An instruction tablet is wired to one of the transit nuts.

Striker

27. The striker, aircraft bomb, No. 1, Mk. I (Stores Ref. 12A/460), see fig. 3, consists of a coupling fork, a snatch rod, a striker rod, a coupling socket, and a retaining sleeve which houses a spring.

28. The coupling fork is screwed on to the rear end of the snatch rod and is prevented from unscrewing by a split pin. Holes are drilled through both limbs of the coupling fork to house a coupling bolt.

29. The forward end of the snatch rod is enlarged and bored axially to receive the rear end of the striker rod, and is provided with diametrically opposed holes which accommodate retaining balls for retaining the striker rod in the safe position. The snatch rod is also provided with a flange which forms an abutment for the forward end of the spring.

30. The striker rod extends into the tail tube of the bomb when the parachute attachment and striker are assembled to the bomb. Its forward end is reduced in diameter for striking the striker pellet in the tail tube on impact of the bomb with the target, and its rear end, which is also reduced in diameter, has a neck which registers with the retaining ball holes in the forward end of the snatch rod. A diametrical hole is provided in the rear end of the striker rod for a safety pin, which secures the striker rod to the coupling socket.

31. The coupling socket screws on to the threaded rear end of the tail tube, to which it is locked, on assembly to the bomb, by a grub screw in one of a pair of tapped radial holes through the socket wall. It is bored axially to accommodate the rear end of the striker rod and the forward portion of the snatch rod, so as to serve as a ball-retaining sleeve. It is threaded externally to receive the forward end of the retaining sleeve, and the bearing portion for the end of the striker rod is bored through for the safety pin. The safety pin has an instruction tablet, see fig. 3, attached to its head.

32. The retaining sleeve is in the form of a hexagonal nut, internally threaded at one end, which screws on to the end of the coupling socket, to which it is locked by a grub screw. It accommodates the spring, the forward end of which bears upon the rear face of the flange on the snatch rod. Immediately to the rear of the internally threaded portion, the retaining sleeve has an annular recess into which the striker rod retaining balls can escape from the radial holes in the snatch rod when this is withdrawn from the rear end of the coupling socket.

Identification markings

33. Stamped on the retaining sleeve of the striker are the following markings:—

- (i) STRIKER AIRCRAFT BOMB, No. 1, Mk. I.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

**FUNCTIONING OF BOMB, INCENDIARY, AIRCRAFT, 25 lb., Mk. I, FIITED WITH
No. 1, Mk. I PARACHUTE ATTACHMENT and No. 1, Mk. I STRIKER**

34. When the parachute bomb is released from the Small Bomb Container or from the Light Series bomb carrier, the cover of the parachute container is blown aft and draws the parachute out, this operation being assisted by the air flow through the holes in the housing plate. The parachute then opens and pulls the snatch rod against the action of the spring until the striker rod retaining balls escape into the annular recess in the retaining sleeve. The striker rod is then free to move

down the tail tube on to the striker pellet of the bomb. The combination of striker rod and striker pellet provides the necessary increased inertia to ensure the operation of the firing mechanism of the bomb upon impact with the target at the reduced terminal velocity due to the parachute attachment.

Note.—The terminal velocity of the bomb fitted with parachute attachment, No. 1, Mk. I, is 110 ft. per sec., approximately.

35. Upon impact of the parachute bomb with the target, the pellet breaks the shear wire, due to the inertia of the striker pellet and striker rod, overcomes the resistance of the creep spring, and its point pierces the ignition cap. The resulting flash ignites the blowing charge, which blows the base adapter and complete tail and parachute assembly from the body tube, and also ignites the quickmatch which passes through the lid and into the central tube of the rearmost magnesium alloy fire-pot.

36. The burning quickmatch ignites the delay charges in and around the central tube of the fire-pot and, whilst the central tube delay charge is burning through, the outer delay charge initiates the surrounding priming charge which, in turn, ignites the incendiary composition around it. Meanwhile the central delay charge burns through and fires the ejection charge in the base of the fire-pot; this has the effect of ejecting the active fire-pot from the bomb and also igniting the quickmatch of the second fire-pot so as to cause this, in turn, to become active and be ejected after a predetermined delay; and so on through the series of fire-pots until the last one is ejected.

37. The successive ejections take place at intervals of approximately four seconds, and the body tube of the bomb serves the function of a gun barrel the effective length of which is increased with each ejection, so that the distance of projection or range will increase progressively.

38. Each ejected fire-pot will continue to burn for approximately 10 minutes, the magnesium alloy container and its lid being consumed.

39. Finally, the quickmatch in the lid closing the nose of the bomb, ignited by the last ejection charge, initiates the priming charge which, in turn, ignites the incendiary composition in the nose and so provides an additional fire source.

40. The bomb, fitted with parachute attachment, will function when dropped from a height above 500 feet on to soft targets. With parachute control, the scatter of bombs released in salvos will exhibit considerable variation, being largely dependent upon wind conditions prevailing at the time.

INSTRUCTIONS FOR USE

Assembling the No. 1, Mk. I parachute attachment to its striker

41. The following procedure should be adopted in assembling the No. 1, Mk. I parachute attachment to the No. 1, Mk. I striker:—

- (i) Remove the coupling bolt from the bearing lugs on the housing plate of the parachute container, taking care not to push the eye on the rigging lines through the central hole in the housing plate.
- (ii) Insert the coupling fork of the auxiliary striker between the bearing lugs on the housing plate so that the holes in these parts register, and ensure that the rigging line eye is between the limbs of the fork.
- (iii) Pass the coupling bolt through the bearing lugs, coupling fork limbs, and rigging line eye, and replace the washer, nut, and split pin to secure the bolt.

Fitting the No. 1, Mk. I parachute assembly to the tail of the bomb

42. The parachute assembly should be fitted to the bomb immediately before loading it into the Small Bomb Container or on to the Light Series bomb carrier. The procedure is as follows:—

- (i) Remove the grub screw from the coupling socket.
Warning.—The following operations must be done with the bomb in the horizontal position, care being taken that the bomb is not dropped or subjected to rough usage.
- (ii) Remove the safety rod from the tail tube of the bomb by rotating it in an anti-clockwise direction so as to unscrew it from the striker pellet, and then withdrawing it axially from the tail tube. With the safety rod removed, safety is dependent only upon the creep spring and shear wire.
- (iii) Insert the striker rod of the parachute assembly into the tail tube of the bomb, guiding it by holding the retaining sleeve. Screw the coupling socket on to the end of the tail tube and tighten it, using the spanner provided.
- (iv) Replace the grub screw, into whichever of the two tapped radial holes in the coupling socket is most accessible, and tighten it.

Loading the bomb with parachute assembly No. 1, Mk. I into the 250 lb. Small Bomb Container

43. The following is the procedure for loading the parachute bomb, without suspension lug and band, into the Small Bomb Container.

Warning.—The following operations must be done with the bomb in the horizontal position care being taken that the bomb is not dropped or subjected to rough usage.

- (i) Remove the safety pin.
- (ii) Remove the transit nuts which secure the cover of the parachute container to the housing plate, retaining the cover in position by hand until the bomb is loaded into the Small Bomb Container.
- (iii) Load the bomb into the Small Bomb Container as described in A.P.1664, Vol. I, Chap. 3. The transit studs of bombs loaded into the Small Bomb Container should be aligned horizontally.

Loading the bomb with parachute assembly No. 1, Mk. I on to the Light Series bomb carrier

44. The following is the procedure for loading the parachute bomb, with suspension lug and band, on the Light Series bomb carrier.

Warning.—The following operations must be done with the bomb in the horizontal position, care being taken that the bomb is not dropped or subjected to rough usage.

- (i) Load the bomb on the Light Series bomb carrier as described in A.P.1664, Vol. I, Chap. 2, using the No. 7 attachment fitted and adjusted to retain the parachute container in position in the tail of the bomb until release.
- (ii) Remove the transit nuts from the parachute container.
- (iii) Remove the safety pin.

Unloading the bomb with parachute assembly No. 1, Mk. I from the 250 lb. Small Bomb Container

45. When an unexpended parachute bomb is to be unloaded from the Small Bomb Container proceed as follows:—

Warning.—The following operations (i) to (iv) must be done with the bomb in the horizontal position, care being taken that the bomb is not dropped or subjected to rough usage.

- (i) Remove the bomb from the Small Bomb Container as described in A.P.1664, Vol. I, Chap. 3, retaining the cover of the parachute container in position on the housing plate by hand.
- (ii) Replace and screw home the transit nuts to secure the cover in position.
- (iii) Remove the grub screw from the coupling socket and remove the complete parachute assembly from the bomb by unscrewing the coupling socket from the tail tube, using the spanner provided, and withdrawing the assembly axially from the tail of the bomb.
- (iv) Replace the grub screw in one of the tapped holes in the coupling socket.
- (v) Render the bomb safe by replacing the safety rod in the tail tube, gently screwing it home into the striker pellet, and finally securing it, with suitable wire, to one of the tail vane supports, see para. 15.
- (vi) Insert the safety pin, rotating the striker rod, if necessary, to align the hole therein with the holes in the coupling socket.

Unloading the bomb with parachute assembly No. 1, Mk. I from the Light Series bomb carrier

46. The following procedure should be adopted in unloading an unexpended parachute bomb from the Light Series bomb carrier:—

- (i) Replace the transit nuts to secure the cover of the parachute container in position.

Warning.—The following operations must be done with the bomb in the horizontal position, care being taken that the bomb is not dropped or subjected to rough usage.

- (ii) Unload the bomb from the Light Series bomb carrier as described in A.P.1664, Vol. I, Chap. 2.
- (iii) Remove the complete parachute assembly from the bomb, render the bomb safe, and insert the safety pin, as described in para. 45 (iii) to (vi).

Folding and packing the parachute of the No. 1, Mk. I attachment

47. Should the parachute of the No. 1, Mk. I attachment accidentally come adrift from its container, it is to be folded and repacked as follows:—

- (i) Remove the complete parachute assembly from the bomb as described in para. 45 (iii).
- (ii) Spread out the parachute on a table and ensure that the rigging lines are not twisted or tangled together at this or any subsequent stage of the folding.
- (iii) Starting from an outside gore seam, lay the next seam on it by folding the enclosed panel or gore outwards, continuing with each gore in turn, until all the seams are grouped together.
- (iv) Fold the rigging lines by placing the skirt of the parachute on the eye passing through the housing plate. Coil the bight in the rigging lines so that the coil lies flat on the housing plate, and hold the lines in position by hand.
Note.—A paper disc is to be laid over the housing plate before the parachute is folded on to the plate.
- (v) Fold back the upper two-thirds of the folded parachute so that the vent of the parachute is uppermost.
- (vi) Place the cover over the parachute so that the holes register with the transit studs. Ascertain that no rigging lines are trapped between the rim of the cover and the housing plate, and secure the cover in position with the two transit nuts.

SUPPLY

48. Sixteen attachments, parachute, aircraft bomb, No. 1, Mk. I, sixteen strikers, aircraft bomb, No. 1, Mk. I, and three spanners, 1 in., No. 1, Mk. I (Stores Ref. 12A/461), are supplied in Box, B.323, Mk. II, the strikers being housed vertically in wooden cross-pieces, and the attachments packed vertically, in wooden packing pieces, in four banks of four. The spanners are housed in the centre of the wooden cross-pieces and are held in position by a wooden wedge.

ATTACHMENT, PARACHUTE, AIRCRAFT BOMB, No. 1, Mk. II, and STRIKER, AIRCRAFT BOMB, No. 1, Mk. II

GENERAL DESCRIPTION

Parachute attachment

49. The attachment, parachute, aircraft bomb, No. 1, Mk. II (Stores Ref. 12A/592), see para. 1 and fig. 4, differs from the No. 1, Mk. I parachute attachment in that the folded parachute is housed in a collapsible cardboard container between cardboard packing discs. The upper portion of the parachute is made of net material. The parachute container, see fig. 5, is divided diametrically into two halves held together by gummed paper strips secured over a rip cord which extends across the top and down the sides of the container on the line of division. The two ends of the rip cord are tied together over the top of the container and then tied together again to form a loop to which an instruction tablet is attached.

50. The lower packing disc, upon which the folded parachute rests, is divided diametrically at 90 deg. to the plane of division of the container, and has a central hole which registers with a corresponding hole in the divided base of the container.

51. The eye on the rigging lines rests on the lower packing disc and has attached to it a wire link which passes through the registering holes in the lower packing disc and base of the parachute container and which is secured to the base by gummed paper strips. The wire link has an eye at its free end for connection to a quick-release pin in the coupling fork on the auxiliary striker.

Striker

52. The striker, aircraft bomb, No. 1, Mk. II (Stores Ref. 12A/593), is similar to the No. 1, Mk. I striker, except that the coupling fork is fitted with a quick-release pin.

Identification markings

53. The following markings are stencilled on the parachute container in black lettering:—
- (i) ATTACHMENT, PARACHUTE, AIRCRAFT BOMB, No. 1, Mk. II.
 - (ii) The manufacturer's initials or recognized trade mark.
 - (iii) The date of assembly, month and year.

54. The markings stamped on the retaining sleeve of striker No. 1, Mk. II are the same as detailed in para. 33, except for the mark number.

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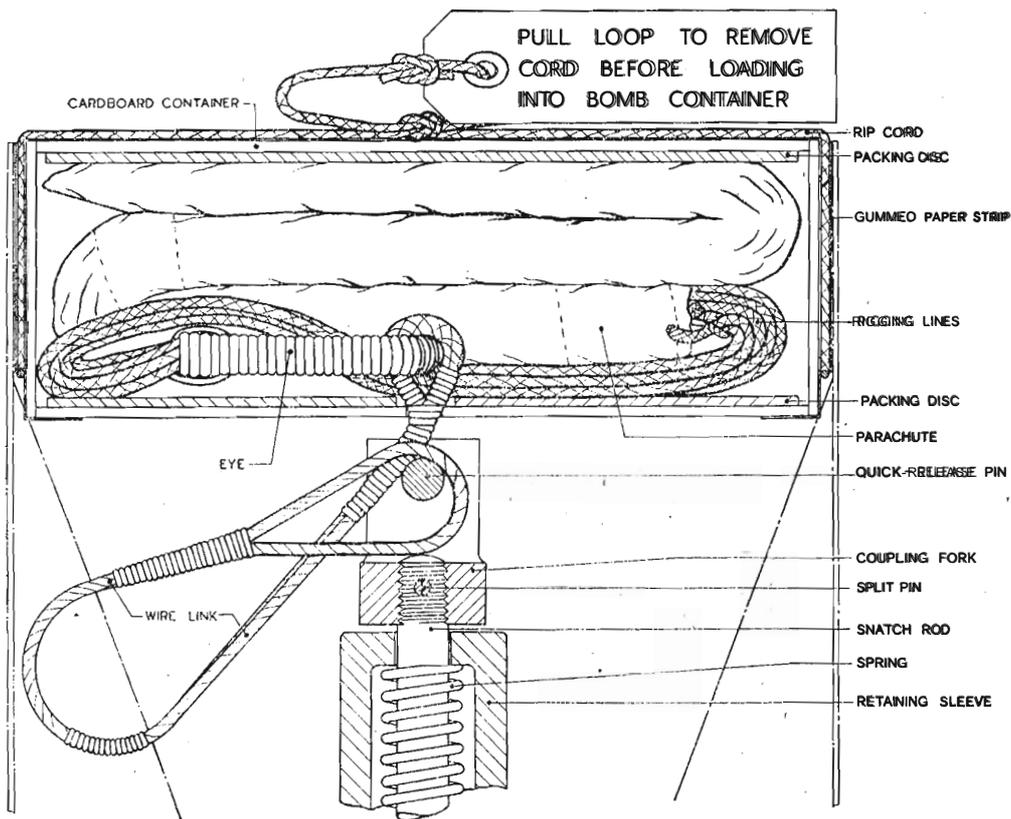


Fig. 4.—Attachment, parachute, aircraft bomb, No. 1, Mk. II and Striker, aircraft bomb, No. 1, Mk. II

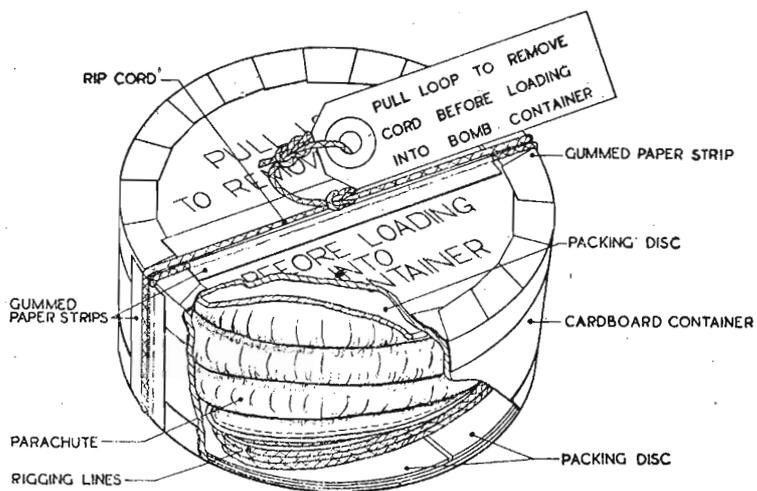


Fig. 5.—Attachment, parachute, aircraft bomb, No. 1, Mk. III

**FUNCTIONING OF BOMB, INCENDIARY, AIRCRAFT, 25 lb., Mk. I, FITTED WITH
No. 1, Mk. II PARACHUTE ATTACHMENT and No. 1, Mk. II STRIKER**

55. When the parachute bomb is released from the Small Bomb Container or from the Light Series bomb carrier, the parachute container is blown aft out of the cylindrical vane on the tail and falls apart so as to allow the parachute to open, thereby freeing the striker mechanism as described in para. 34. The bomb functions on impact with the target as described in para. 35 to 39.

Note.—The terminal velocity of the bomb fitted with the No. 1, Mk. II parachute attachment is 200 ft. per sec., approximately, and the bomb will function when dropped from a height above 500 feet on to soft targets.

INSTRUCTIONS FOR USE

Assembling the No. 1, Mk. II parachute attachment to its striker

56. The No. 1, Mk. II parachute attachment is assembled to the No. 1, Mk. II striker as follows:—

- (i) Remove the quick-release pin from the coupling fork of the striker.
- (ii) Release the wire link of the parachute attachment by pulling it away from the paper strips, and secure the eye on its free end to the coupling fork with the quick-release pin.

Fitting the No. 1, Mk. II parachute assembly to the tail of the bomb

57. To attach the No. 1, Mk. II parachute assembly to the tail of the bomb, proceed as described in para. 42, finally inserting the parachute container into the cylindrical tail vane and making sure that the wire link connecting the parachute to the quick-release pin is not trapped.

Loading the bomb with parachute assembly No. 1, Mk. II into the 250 lb. Small Bomb Container

58. The following is the procedure for loading the parachute bomb, without suspension lug and band, into the Small Bomb Container.

Warning.—The following operations must be done with the bomb in the horizontal position, care being taken that the bomb is not dropped or subjected to rough usage.

- (i) Remove the safety pin.
- (ii) Take hold of the rip cord loop and, whilst holding the parachute container against withdrawal from position in the cylindrical tail vane, pull off the rip cord so as to break through the gummed paper strips and free the two halves of the container.
- (iii) Load the bomb into the Small Bomb Container as described in A.P. 11664, Vol. I, Chap. 3, retaining the parachute container in position, by hand, throughout the loading operation. The division in the parachute container should be arranged vertically.

Loading the bomb with parachute assembly No. 1, Mk. II on to the Light Series bomb carrier

59. The following is the procedure for loading the parachute bomb, with suspension lug and band, on to the Light Series bomb carrier.

Warning.—The following operations must be done with the bomb in the horizontal position, care being taken that the bomb is not dropped or subjected to rough usage.

- (i) Pull off the rip cord as described in para. 58 (ii).
- (ii) Whilst retaining the parachute container in the cylindrical tail vane by hand, load the bomb on to the Light Series bomb carrier as described in A.P. 11664, Vol. I, Chap. 2, using the No. 7 attachment fitted and adjusted to retain the parachute container in position in the tail of the bomb until release. Ensure that the division in the parachute container is arranged vertically.
- (iii) Remove the safety pin.

Unloading the bomb with parachute assembly No. 1, Mk. II from the 250 lb. Small Bomb Container

Warning.—The following operations must be done with the bomb in the horizontal position, care being taken that the bomb is not dropped or subjected to rough usage.

60. An unexpended bomb should be unloaded from the Small Bomb Container as described in A.P. 11664, Vol. I, Chap. 3, the parachute container being retained in position in the cylindrical tail vane by hand so that it cannot fall apart and allow the parachute to become unfolded.

61. With the bomb in the horizontal position, the parachute container should then be withdrawn from the cylindrical tail vane to the extent which the wire link will permit, the container parts being held together by hand.

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62. The container should then be bound with two turns of adhesive tape, 1 in. wide, so as to hold the two halves together.

63. The wire link should next be freed from the coupling fork by withdrawing the quick-release pin, and the parachute attachment completely removed from the cylindrical tail vane. Replace the quick-release pin in the coupling fork.

64. Remove the grub screw from the coupling socket, unscrew the coupling socket from the tail tube of the bomb, using the spanner provided, withdraw the auxiliary striker assembly from the tail tube, and replace the grub screw in the coupling socket.

65. Finally replace the safety rod to render the bomb safe, as described in para. 45 (v), and replace the safety pin in the striker, see para. 45 (vi).

Unloading the bomb with parachute assembly No. 1, Mk. II from the Light Series bomb carrier

Warning.—The following operations must be done with the bomb in the horizontal position, care being taken that the bomb is not dropped or subjected to rough usage.

66. Remove the unexpended parachute bomb from the Light Series bomb carrier as described in A.P.1664, Vol. I, Chap. 2, holding the parachute container in the cylindrical tail vane by hand, and then proceed to withdraw and bind the container, see para. 61 and 62. Detach the parachute attachment from the auxiliary striker, remove the parachute attachment and the auxiliary striker from the bomb, and render the bomb safe, as described in para. 63 to 65.

Loading a bomb fitted with a parachute assembly No. 1, Mk. II which has been removed from an unexpended bomb

67. Remove the adhesive tape from the parachute container, see para. 62, taking care that the two halves of the container do not fall apart, and proceed to load in the Small Bomb Container or on the Light Series bomb carrier as described in para. 58 (ii) and (iii) or 59 (iii) and (iii).

Folding and packing the parachute of the No. 1, Mk. II attachment

68. Should the halves of the parachute container accidentally fall apart and the parachute become unfolded, detach the parachute from the quick-release pin and proceed to fold and repack it as follows:—

- (ii) Spread the parachute out flat upon a table and, starting with an outside seam, fold each gore or panel outwardly in turn, so as to lay the seams one upon another, and group the rigging lines together. Take care that the rigging lines are not twisted or tangled together.
- (iii) Fold the upper part of the parachute over on to the lower part, and then coil the rigging lines so that the coil lies on the under part of the folded parachute.
- (iii) Place the undivided packing disc on top of the folded parachute and then place the folded parachute with its coiled rigging lines and the packing disc into one half of the container so that the disc is toward the top.

Note.—The top of the container can be identified by the printed instructions on its face.

- (iv) Insert the two halves of the divided packing disc between the folded parachute and the base of the half container holding it, taking care that the wire link connected to the eye on the rigging lines passes through the central hole in the divided packing disc and that the line of division of the two part disc lies approximately at right angles to the diametrical edge of the half container.
- (v) Assemble the other half of the container to enclose the projecting portions of the packing discs and the folded parachute between them, and bind the two halves of the container together with two turns of 1/2 in. adhesive tape.

SUPPLY

69. Twenty-four attachments, parachute, aircraft bomb, No. 1, Mk. II, twenty-four strikers, aircraft bomb, No. 1, Mk. II, and two spanners, 1/2 in., No. 1, Mk. I (Stores Ref. 12A/46V), are supplied in Box, B.323, Mk. III. The strikers are supported vertically, six on each side of the box, and the attachments are packed in two tiers in a rectangular cardboard packing piece in the centre of the box, each tier comprising twelve attachments, in two horizontal rows of six attachments. The spanners are packed loose, between the two tiers of attachments.

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CHAPTER 8

BOMBS, INCENDIARY, AIRCRAFT, 30 lb., Mk. I, H, H M, HI, and HI M

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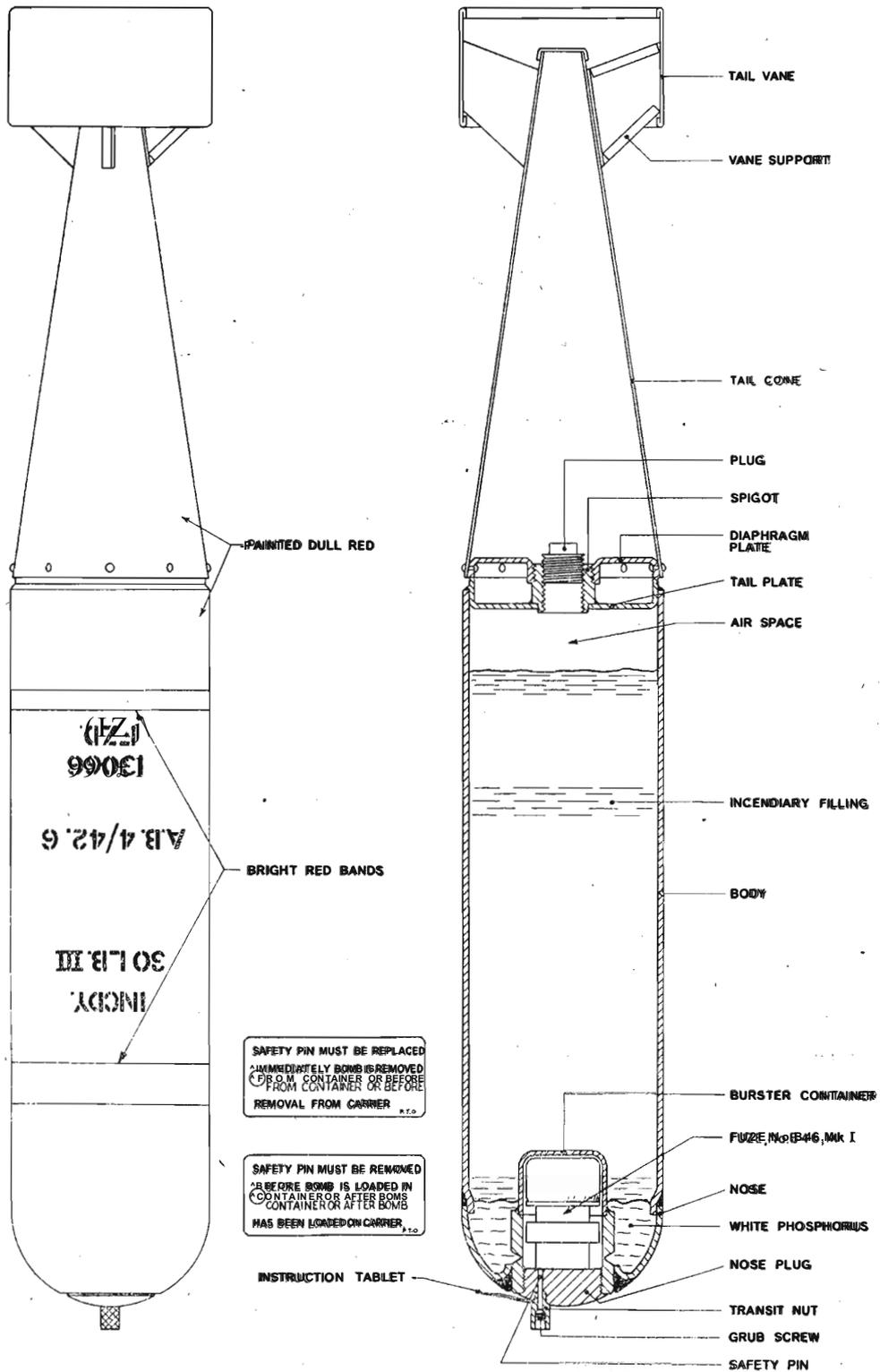


Fig. 11.—Bomb, incendiary, aircraft, 30 lb., Mk. III

CHAPTER 8

BOMBS, INCENDIARY, AIRCRAFT, 30 lb., Mk. I, II, II M, III, and III M

Introduction

1. These bombs are thin-cased and, on impact with the target, function so as to scatter a filling of incendiary material, which ignites spontaneously on contact with air, to produce a large number of sources of fire distributed over a considerable area.

2. The bombs are fuzed at the nose only, and are effective when released at a height above 150 ft. Against soft targets the height of release must not exceed 500 ft., or the bomb will bury and the incendiary material will not be ejected above the ground.

3. In this chapter the Mk. III bomb is fully described, and the other marks are then dealt with by comparison with the Mk. III bomb.

BOMB, INCENDIARY, AIRCRAFT, 30 lb., Mk. III

Leading particulars

| | | | | |
|------------------------------|-----|-----|-----|---|
| 4. Stores Ref. | ... | ... | ... | 12A/942 |
| Length | ... | ... | ... | 2 ft. 8-7 in. approx. |
| Diameter of tail vane | ... | ... | ... | 4-7 in., approx. |
| Weight of bomb, fuzed | ... | ... | ... | 25 lb. approx. |
| Weight and nature of filling | ... | ... | ... | 1 lb. white phosphorus and 7 lb. approx., of rubber-benzole or Perspex-benzole solution |
| Terminal velocity | ... | ... | ... | 850 ft. per sec. |

GENERAL DESCRIPTION

5. The bomb, see fig. 1, consists of a cylindrical body with a hemispherical nose at one end and a tail at the other end, the cylindrical tail vane being connected by four equi-spaced vane supports to the rear end of the tail cone.

6. The cylindrical body is made from welded tube, the forward end being reduced slightly in diameter to fit in the rim of the hemispherical steel plate nose, to which it is welded. The nose is pierced centrally and has welded into it a burster container closed by a screwed plug, the outer surface of which conforms with the shape of the bomb nose.

7. A flanged tail plate is welded in the rear end of the body and has in the centre a hollow spigot through which the bomb is charged. This spigot is closed by a screwed plug, and it is threaded externally for the attachment of the tail.

8. Riveted in the forward end of the tail cone is a diaphragm plate having a threaded boss which screws on to the tail plate spigot to secure the tail to the bomb body.

9. Normally the bomb is supplied fuzed, see fig. 2, a fuze, percussion, aircraft bomb, nose, No. 84 Mk. I (Stores Ref. 12G/589) being retained in position in the burster container by the nose plug. The inner face of the nose plug is provided with two pins which engage holes in the outer end of the fuze body to locate the fuze with its safety pin hole in register with a hole through the nose plug. The safety pin passes through these holes to retain a ball in the fuze in its safe position, in which it locks the inertia pellet of the fuze against displacement on to the striker. The safety pin is retained by a grub screw in a transit nut which is screwed into the outer end of the safety pin hole in the nose plug. Should the bomb be supplied unfuzed, the safety pin hole in the nose plug will be closed by the transit nut with the grub screw retaining the safety pin in position. The transit nut carries an instruction tablet.

Filling

10. The main filling consists of 1 lb of white phosphorus cast in the nose and approximately 7 lb. of a 5 per cent solution of rubber or Perspex in benzole in the body of the bomb, a 10 per cent air space being left in the body when the bomb is filled.

Identification colouring and markings

11. The bomb is painted dull red and has two bright red bands painted round the body, one towards the tail end to indicate that the bomb is fuzed, and the other towards the nose end to indicate that the bomb is filled.

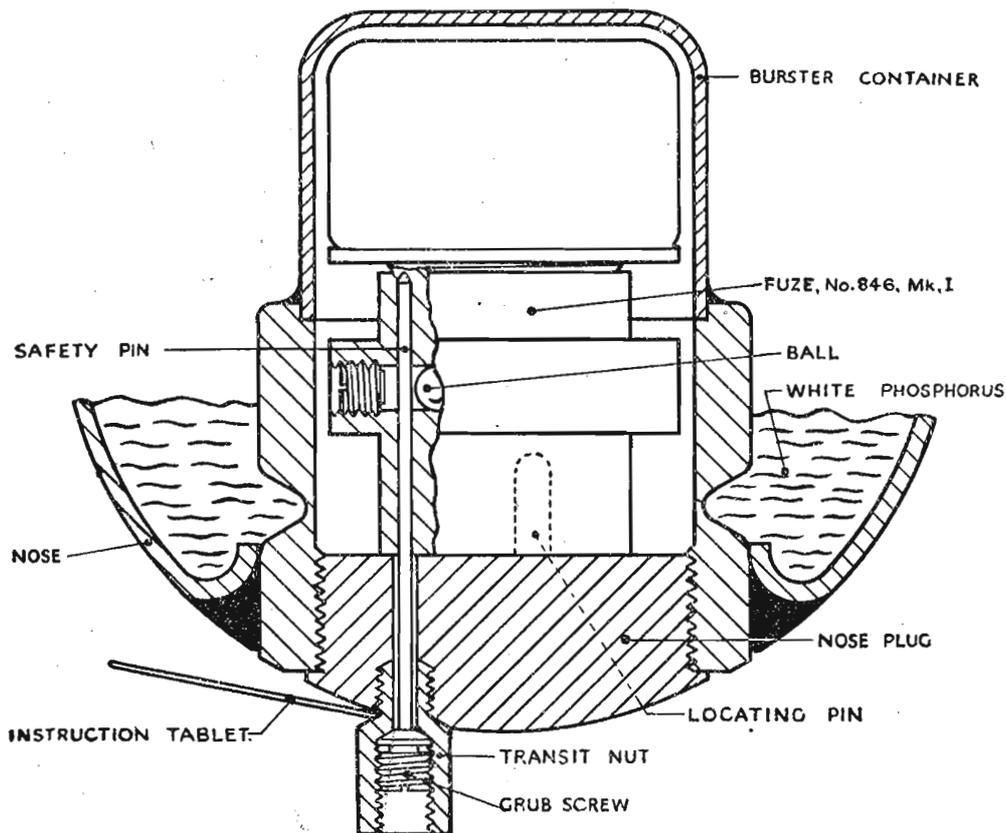


Fig. 2.—Bomb, incendiary, aircraft, 30 lb., Mk. III (fuzeing detail)

12. Between the bright red bands on the body are the following identification markings in ink lettering:—

- (i) The type, nominal weight, and mark number of the bomb.
- (ii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iii) The date of filling, month and year.
- (iv) The filled lot number.
- (v) The design number of the method of filling.
- (vi) "FZD", if the bomb is supplied fuzed.

Functioning

13. On impact of the bomb with the target, the firing of the gunpowder in the magazine of the fuze disrupts the bomb body along the weld, and scatters the filling over a considerable area (approximately 50 yds. \times 30 yds.) to produce a large number of sources of fire.

14. A salvo of eight bombs released from the 250 lb. Small Bomb Container at a height of 6,000 ft. will scatter over an area approximately 73 yds. \times 39 yds. A similar salvo released at a height of 10,000 ft. will scatter over an area approximately 83 yds. \times 48 yds.

INSTRUCTIONS FOR USE

Fuzing the bomb

15. If the bombs are supplied unfuzed, they should be fuzed as follows:—

- (i) Obtain a fuze, percussion, aircraft bomb, nose, No. 846, Mk. I from a Mk. I cylinder, using opener, tin, small (Stores Ref. 21C/364) to open the cylinder if it has not already been opened, or from a Mk. II cylinder by removing the lid.
- (ii) Remove the nose plug from the bomb, complete with transit nut and safety pin,
- (iii) Withdraw the transit safety pin from the fuze.

Warning.—The fuze is now live and should be handled with great care whilst performing operations (iv) and (v)

- (iv) Pass the safety pin and locating pins on the nose plug into the appropriate holes in the fuze body.
- (v) Screw the nose plug, complete with the fuze, firmly into the burster container.

Preparing a fuzed bomb for loading

16. To prepare the fuzed bomb for loading proceed as follows:—

- (i) Unscrew and remove the transit nut, complete with grub screw and safety pin, from the nose plug of the bomb.

Warning.—Great care must be exercised in handling the bomb after the safety pin has been removed, as the bomb is then live and rough treatment may cause the fuze to function and explode the bomb. The bomb should be handled in a horizontal or nose-up position.

- (ii) Unscrew and remove the grub screw from the transit nut.
- (iii) Screw the grub screw firmly home into the hole from which the transit nut was removed.
- (iv) Return the transit nut and safety pin to store ready for use again, if necessary.

Loading the bombs into the 250 lb. Small Bomb Container

17. Bombs which have been prepared for loading as detailed in para. 16 are to be loaded into the 250 lb. Small Bomb Container as described in the relevant chapter of A.P. 1664, Vol. I, observing the Warning given in para. 16 (i) above.

Unloading the bombs from the 250 lb. Small Bomb Container

18. Unload the bomb from the 250 lb. Small Bomb Container as described in the relevant chapter of A.P. 1664, Vol. I, observing the Warning given in para. 16 (i) above, and then render the bomb safe as follows:—

- (i) Draw the transit nut and safety pin from store.
- (ii) With the bomb in the horizontal or nose-up position (see Warning, para. 16 (i)), unscrew and remove the grub screw from the nose plug and screw it firmly into the transit nut to hold the safety pin in position.
- (iii) Keeping the bomb in the horizontal or nose-up position, and avoiding rough handling, pass the safety pin through the hole in the nose plug and into the fuze body, and screw the transit nut firmly home into the nose plug.

Note.—If the safety pin does not easily push fully home into the fuze body, the bomb should be rotated about its axis until the hole for the safety pin is uppermost; this will allow the locking ball in the fuze, see para. 9 and fig. 2, to fall by gravity, or to be pushed by the safety pin, into its safe position.

19. Having rendered the bomb safe as described in para. 18 (i) to (iii), return the fuzed bomb to its crate, see para. 21, taking care, when packing it, to ensure that the rubber pads on the bearer plate are in contact with the tail cone before tightening up the wing nut. This precaution avoids damage to the bomb tail if the packed crate is subsequently subjected to rough usage.

Unfuzing the bomb

20. Should it be necessary to unfuze the bomb, proceed as follows:—

- (i) Ensure that the bomb has been rendered safe, see para. 18, then unscrew and remove the nose plug, complete with fuze, from the burster container, using a suitable key spanner.

- (iii) Remove the fuze axially from the nose plug so as to withdraw the safety pin from the fuze body.

Warning.—The fuze is now live and should be handled with great care whilst performing the following operation.

- (iii) Replace the transit safety pin in the fuze, so as to render the fuze safe.
- (iv) Replace the nose plug, complete with transit nut, grub screw, and safety pin, in the nose of the bomb, replace the fuze in its cylinder, and seal the cylinder with adhesive tape.

SUPPLY AND STORAGE

Supply

21. The bombs are supplied packed four in Crate B.377, Mk. I (Stores Ref. 12A/943) together with one drop bar which is wired to the central rod of the crate. The bombs can be removed from the crate after unscrewing a wing nut and removing a bearer plate.

22. Fuzes, percussion, aircraft bomb, nose, No. 846, Mk. I, when issued as separate stores, are supplied packed seven in Cylinder B.375, Mk. I (Stores Ref. 12G/590), or Mk. II (Stores Ref. 12G/663).

Storage

23. The bombs, fuzed and unfuzed, are classified, for storage purposes, in Group XII.

24. Fuzes, No. 846, Mk. I, if supplied separately from the bombs, are classified, for storage purposes, in Group VI.

BOMB, INCENDIARY, AIRCRAFT, 30 lb., Mk. II

Comparison with the Mk. III bomb

25. The bomb, incendiary, aircraft, 30 lb., Mk. II (Stores Ref. 12A/938) differs from the 30 lb., Mk. III incendiary bomb, see para. 1 and 2, and 4 to 24, in the following respects:—

- (i) The body is made from drawn tube instead of being a welded tube, so that the bomb functions by tail ejection of the filling, the tail plate and tail being blown off by the firing of the magazine charge in the fuze.
- (ii) The weight of white phosphorus cast in the nose is 1½ lb. instead of 1 lb.

BOMB, INCENDIARY, AIRCRAFT, 30 lb., Mk. II M

Comparison with the Mk. III bomb

26. The bomb, incendiary, aircraft, 30 lb., Mk. II M (Stores Ref. 12A/1056) differs from the Mk. III bomb, see para. 1 and 2, and 4 to 24, in that the body cylinder has two pads welded on which locate a band, suspending, No. 9, Mk. I (Stores Ref. 12A/620), with lug. With the suspending band in position, the bomb can be carried on the Light Series bomb carrier. After removing the band it can be carried in the 250 lb. Small Bomb Container, as described in the relevant Chapters of A.P.1664, Vol. I.

BOMB, INCENDIARY, AIRCRAFT, 30 lb., Mk. II M

Comparison with the Mk. III bomb

27. The bomb, incendiary, aircraft, 30 lb., Mk. II M (Stores Ref. 12A/1055) differs from the Mk. III bomb, see para. 1 and 2, and 4 to 24, as follows:—

- (i) The body is made from drawn tube instead of being a welded tube, so that the bomb functions by tail ejection of the filling, the tail plate and tail being blown off by the firing of the magazine charge in the fuze.
- (ii) The body cylinder has two pads which locate a No. 9 Mk. I suspending band with lugs, as described, with reference to the Mk. III M bomb, in para. 26.
- (iii) The weight of white phosphorus cast in the nose is 1½ lb. instead of 1 lb.

BOMB, INCENDIARY, AIRCRAFT, 30 lb., Mk. I

Comparison with the Mk. III bomb

28. The bomb, incendiary, aircraft, 30 lb., Mk. I (Stores Ref. 12A/870), see fig. 3, differs from the Mk. III bomb, see para. 1 and 2, and 4 to 24, in weight, being 27 lb. approx, instead of 25 lb., and also in the following respects:—

- (i) The burster container is screwed and welded into a flat nose plug which is welded in the end of the body, and a hemispherical nose fairing fits on to the nose plug.

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- (ii) Fuze, percussion, non-delay, aircraft bomb, nose, No. 38, N.D., Mk. II (Stores Ref. 122G/538), described in A.P.1661C, Vol. I, Sect. 2, Chap. 5, is employed, instead of the No. 846, Mk. I fuze. The No. 38, N.D., Mk. II fuze screws into the burster container, and the nose fairing is held in position on the nose plug by a circlip on the cap of the fuze.

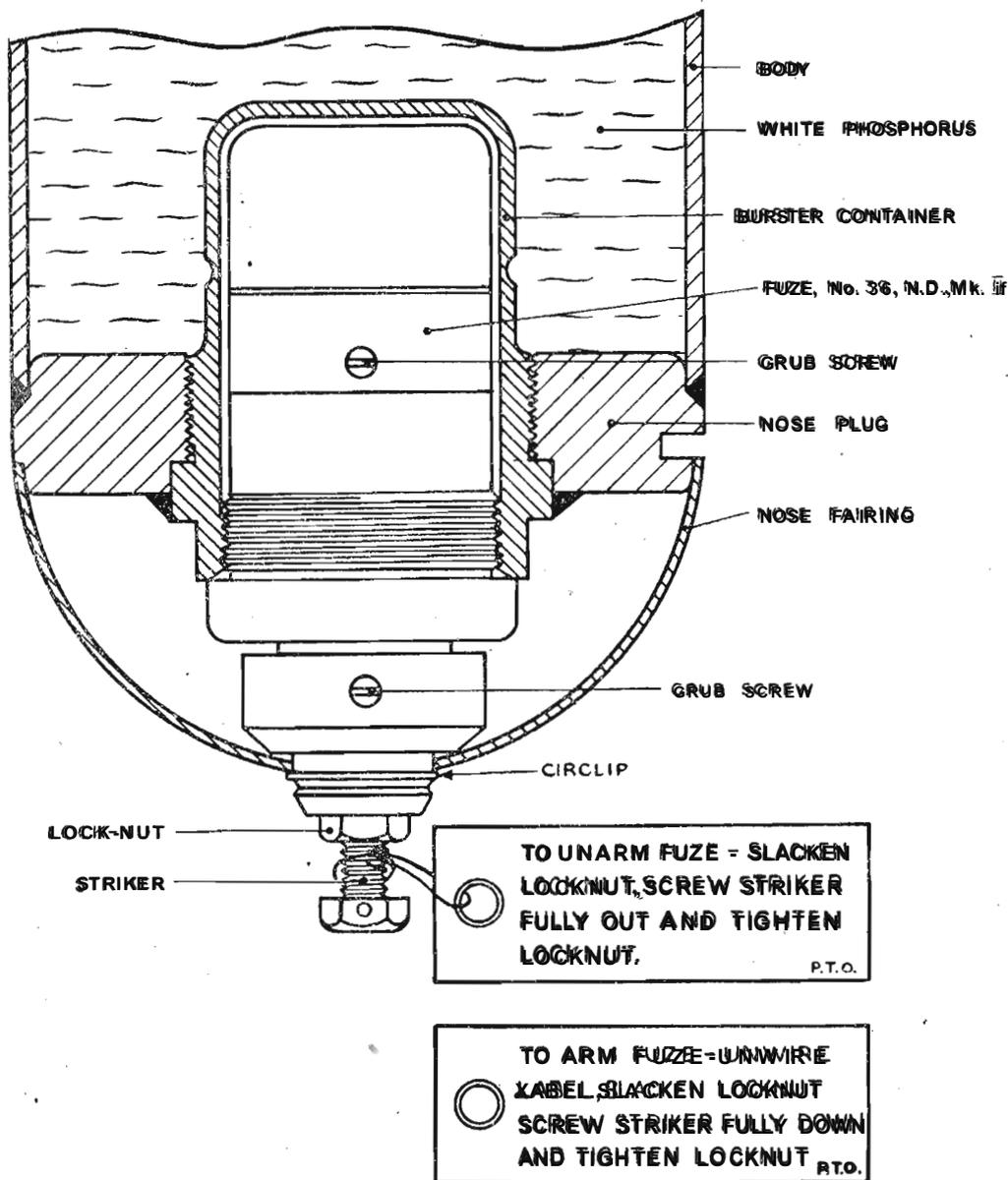


Fig. 3.—Bomb, incendiary, aircraft, 30 lb., Mk. I (fuzing detail)

- (iii) The filling of the bomb consists of 1½ lb. of white phosphorus cast in the nose end of the body cylinder (some of the early issues had phosphorus sesquisulphide mixture instead), and approximately 6 lb. of a 5 per cent, solution of rubber (or Perspex in later bombs) in benzole.

INSTRUCTIONS FOR USE OF THE Mk. I BOMB

Fuzing the bomb

29. If the bombs are supplied unfuzed, the burster container is closed by a transit plug. The following is the procedure for fuzing the bomb:—

- (i) Obtain a fuze, percussion, non-delay, aircraft bomb, nose, No. 38, N.D., Mk. IT from its cylinder, using opener, tin, small (Stores Ref. 21C/364) to open the cylinder if it has not already been opened.
- (ii) Ensure that the striker of the fuze is fully screwed out and that it is secured in that position by the lock-nut.
- (iii) Ensure that the grub screws holding the cap and base piece of the fuze in position are firmly screwed home.
- (iv) Remove the transit plug from the burster container of the bomb after slackening the set-screw.
- (v) Screw the fuze, by hand, into the burster container, tighten it up with Key No. 104, Mk. I (Stores Ref. 12G/256) or an appropriate spanner, finally locking it in position with the set-screw which was slackened to enable the transit plug to be removed.
- (vi) Remove the circlip from the cap of the fuze, pass the nose fairing over the fuze on to the nose plug, and secure the nose fairing in position by replacing the circlip in the appropriate groove in the cap of the fuze. Ensure that the circlip is definitely located all round in the groove.

Preparing a fuzed bomb for loading

30. To prepare the fuzed bomb for loading, proceed as follows:—

- (i) Slacken the lock-nut on the fuze and screw the striker down until pressure is felt against the body washer in the fuze.

Warning.—The fuze is now armed and great care must be taken in handling the bomb, which is now live, as any rough treatment may cause it to explode. After the fuze has been armed, the bomb should always be handled in a horizontal or nose-up position.

- (ii) Tighten the lock-nut against the cap of the fuze, using the spanners (Stores Ref. 12G/370) provided with the fuzed bombs.

Loading the bomb into the 250 lb. Small Bomb Container

31. Bombs prepared for loading as described in para. 30, are to be loaded into the Small Bomb Container as described in the relevant chapter of A.P. 1664, Vol. I, observing the Warning given in para. 30 above.

Unloading the bomb from the 250 lb. Small Bomb Container

32. Observing the Warning given in para. 30 above, unload the bomb from the 250 lb. Small Bomb Container as described in the relevant chapter of A.P. 1664, Vol. I, and render the bomb safe as follows:—

- (i) Slacken the lock-nut on the fuze and screw the striker outwards until it binds against the under surface of the cap of the fuze.
- (ii) Tighten the lock-nut against the cap of the fuze, using the spanners (Stores Ref. 12G/370) provided with the fuzed bombs.

Unfuzing the bomb

33. Should it be necessary to unfuze the bomb, proceed as follows:—

- (i) Ensure that the fuze is unarmed, see para. 32, observing the Warning given in para. 30 until this has been done.
- (ii) Remove the circlip from the fuze and remove the nose fairing from the bomb.
- (iii) Slacken the set-screw securing the fuze in the burster container, then remove the fuze, using Key, No. 104, Mk. I, or any suitable spanner.
- (iv) Replace the transit plug in the burster container and tighten the set-screw to secure it in position.
- (v) Replace the circlip on the fuze, place the fuze in its cylinder, if one is provided, seal the cylinder with adhesive tape, and return the fuze, bomb, and nose fairing, to store.

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SUPPLY AND STORAGE OF THE Mk. I BOMB

Supply

34. The bombs are supplied packed four in Box, B.304, Mk. I (Stores Ref. 12A/346) together with one drop bar. Two spanners (Stores Ref. 12G/370) are supplied with the fuzed bombs.

35. Where unfuzed bombs and fuzes are supplied separately, the fuzes are packed singly in Cylinder, No. 308, Mk. I (Stores Ref. 12G/357), ten cylinders being packed in Box, B.305, Mk. I (Stores Ref. 12G/356).

Storage

36. The bombs, fuzed and unfuzed, are classified, for storage purposes, in Group XII.

37. Fuzes, No. 38, N.D., Mk. II, if supplied separately from the bombs, are classified, for storage purposes, in Group VI.

Section 8

PRACTICE BOMBS

MINISTRY
June, 1946

This is A.L. No. 134 to A.F. 1161B, Vol. I and concerns Sect. 8
(1) Remove and dispose of the existing List of Chapters and substitute
the attached List of Chapters.
(2) Insert the attached Chapter 10 to follow Chapter 9.
Make an entry in the Amendment Record Sheet.

RESTRICTED

This leaf issued with A.L. No. 134
June, 1946

A.F.1661B, Vol. I

SECTION 8

PRACTICE BOMBS

LIST OF CHAPTERS

Note.—A list of contents appears at the beginning of each chapter

- CHAPTER 1—General notes on practice bombs
- CHAPTER 2—Bombs, practice, aircraft, smoke, 11½ lb., Mk. I, and flash, 11½ lb., Mk. I
- CHAPTER 3—Apparatus, charging, practice smoke bombs, No. 2, Mk. I
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- CHAPTER 5—
- CHAPTER 6—Bombs, practice, aircraft, smoke, 10 lb., Mk. I, flash, 10 lb., Mk. I and III, and brown smoke, 10 lb., Mk. III
- CHAPTER 7—Bomb, practice, aircraft, smoke, break-up, 8 lb., Mk. I
- CHAPTER 8—Bombs, practice, aircraft, smoke, 25 lb., Mk. I, and flash, 25 lb., Mk. III
- CHAPTER 9—Bombs, practice, aircraft, smoke, 10 lb., Mk. I; flash, 10 lb., Mk. III; and smoke, 11½ lb., Mk. I (South African Manufacture)
- CHAPTER 10—Bombs, practice, aircraft, smoke, 25 lb., Mk. I*** and IV, and flash, 25 lb., Mk. IIP** and V

*This leaf issued with A.L. No. 105
February, 1945*

A.P.1661B, Vol. I, Sect. 8

CHAPTER 1

General notes on practice bombs

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| | (A.L.140) |

CHAPTER 1

General notes on practice bombs

Introduction

1. Practice bombs, which must not be confused with bombs used for drill purposes or with inert-filled H.E. type bombs, are used for day or night practice bombing against various types of targets. An indication of the point of impact is given by a cloud of white or brown smoke, a brilliant white flash, or by a flaming mass of charging, depending on the type of bomb.

2. The range of practice bombs available includes bombs of different weights and marks some of which are designed for special purposes. The uses to which any particular type of practice bomb is to be limited are to be found in the Introduction of the Chapter of this Section relevant to the bomb.

3. Practice bombs are normally carried on the Light Series bomb carrier, special attachments not normally being required.

Practice bomb fillings

Smoke fillings

4. Practice white smoke bombs are normally filled with titanium tetrachloride, which evolves white smoke on contact with moist air. Bombs manufactured and filled in South Africa contain chlorosulphonic acid mixture instead of titanium tetrachloride. Brown smoke bombs contain an S.R. composition.

Flash fillings

5. Practice flash bombs are filled with flash producing mixtures such as gunpowder and magnesium turnings or gunpowder and calcium silicide; alternatively, an S.R. composition may be used.

Flame fillings

6. Practice flame bombs are filled with a flame producing material, for example, sodium phosphide soaked in heavy oil.

Identification colouring and markings

7. The bodies and tails of all practice bombs are painted white, except the tails of flame bombs, which are painted red. The bombs have various markings stencilled on them to denote their weight, mark number, etc., and particulars of the markings for each type of bomb are given in the Chapter of this Section Relevant to the bomb. The filled bombs may have one or other of the following schemes of colour banding to indicate the nature of their filling:—

- (i) Two $\frac{1}{2}$ in. green bands, $\frac{1}{4}$ in. apart, painted centrally round the tail cone, denote a white smoke filling.
- (ii) A red ring painted round the nose and two green bands, $\frac{1}{2}$ in. wide and $\frac{1}{4}$ in. apart, painted round the tail cone, denote a brown smoke filling.
- (iii) A red ring painted round the nose and two $\frac{1}{2}$ in. black bands, $\frac{1}{4}$ in. apart, round the tail cone, denote a flash filling.
- (iv) A red ring painted round the nose, and a red painted tail, denote a flame filling.

Functioning

8. All types of practice bombs function on impact with the target to give, according to the nature of their filling, the appropriate indication at the point of impact, see para. 1.

9. Certain types of practice bombs break up and release their filling merely due to the force of impact, whilst other types are disrupted, and their charging scattered, by a detonator-burster which is exploded on impact.

General precautions

Bombs containing titanium tetrachloride

10. Titanium tetrachloride is not classed as a toxic substance, but it evolves smoke and fumes which are injurious and extremely corrosive in character.

11. The fumes, if breathed in quantity, cause violent coughing, nausea and severe headache. All operations, therefore, involving the filling of practice bombs or storage drums, or the handling of leaking bombs, should always be done in the open with the personnel concerned standing upwind of the bombs. The personnel are to wear eyeshields (Stores Ref. 23B/3), rubber gloves (Stores Ref. 23B/16), boots, rubber, knee (Stores Ref. 22D/367 to 379), and suits, combination (Stores Ref. 22G/720 to 733). If working in enclosed spaces is, however, necessitated, respirators, instead of eyeshields, are to be worn; complete protection against the fumes will then be obtained.

Note.—The filling of practice bombs is to be done by Maintenance Units only.

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12. Splashes of the liquid falling on the skin will cause immediate stinging to be felt, but normally will not cause burns. As frequent contact with the filling, however, will cause the skin to become hard, cracked, and sore, splashes of the liquid should be removed as soon as possible using a liberal quantity of water. *Splashes in the eyes may cause total blindness*; hence first-aid treatment, consisting of washing the eyes for at least five minutes with water (warm if possible), or preferably with a 2 per cent sodium bicarbonate solution, *must be immediate*. This first-aid treatment must be followed by medical attention as soon as possible.

13. Small splashes of the liquid charging on non-protective clothing must be removed as soon as possible with a damp cloth or swab. In the event of a large splash occurring, the affected garments should be removed immediately, soaked in water, and subsequently washed in water rendered alkaline with washing soda. In no circumstances should any attempt be made to wash off a large splash of the charging whilst the garment is being worn, as a severe skin burn may result due to the development of heat when a relatively small quantity of water is brought into contact with the liquid charging. Rubber gloves and boots should be cleaned by dipping into water as soon as they become splashed.

14. Operations involving leaking bombs, etc., should be done downwind of aircraft, machinery and other plant liable to damage by corrosion, but where this condition cannot be obtained, then the operations must be done as far away as possible from these items of equipment.

Bombs containing chlorosulphonic acid mixture

15. Bombs filled with chlorosulphonic acid mixture must be handled with great care since the acid can cause severe burns and is dangerous to the eyes. When handling leaking bombs, the precautions to be observed and the first-aid treatment to be given in the event of contamination are the same as stated for bombs containing titanium tetrachloride, see para. 110 to 114.

Removal of detonator-bursters from unexpended practice bombs

116. Detonator-bursters are to be removed as soon as possible from unexpended practice bombs, and the bombs must not be stored with detonator-bursters in position. It may be required, however, to hold some fuzed bombs for "ready-use"; this may be done provided that:—

- (ii) The bombs are held in a fuzed bomb area, away from other stores, and are given a safety distance of 50 yds.
- (iii) The number of "ready-use" bombs is kept to the minimum compatible with training efficiency.

117. If difficulty is experienced in removing a detonator-burster from a bomb, the bomb is to be considered unserviceable and must be destroyed as described in A.P.2608A, Chap. 19. As soon as a detonator-burster is removed from a bomb having a liquid filling, it is to be carefully examined for contamination by the filling. Any detonator-burster found to be contaminated is to be destroyed as described in A.P.2608A, Chap. 19.

Safety devices

118. If certain bombs, *even with safety devices in position*, are dropped from a height of three feet or over, they may function on impact. These bombs, listed in para. 119, must, therefore, be handled with special care when they are fuzed. Since large stocks of these bombs are held in the Service, and as production of them has ceased, it is impracticable to replace them with bombs having a greater safety factor.

119. The danger heights of fall of the bombs referred to in para. 118 are as follows:—

| | |
|--|--------|
| 8½ lb., Break-up (All marks) | 3 ft. |
| 110 lb., British type (All marks) | 3 ft. |
| 110 lb., South African type (All marks) | 10 ft. |
| 25 lb., Smoke, Mk. I*** and IV, and Flash, Mk. III** and V | 20 ft. |

Supply

20. All practice bombs are supplied in boxes. Great care must be taken not to subject the boxes containing filled bombs to rough usage, otherwise the bomb bodies may be fractured, and with liquid filled bombs leakage will then occur.

21. Special precautions and care are necessary when handling "break-up" type bombs containing flame filling (sodium phosphide/oil), since if a bomb is fractured, the filling, on coming into contact with the air, will burst into flame. On receipt of the filled bombs, the boxes containing them are to be stacked side by side in double rows, two tiers high, and with sufficient space between the rows to allow a person to pass between and remove any particular box. The rows are to be watched for signs of smoke or flame for a period of seven days. Should smoke or flame be observed, the affected box is to be *immediately* removed to a site where the risk of fire is acceptable and which has a danger area of radius 50 yds. The bombs are then to be removed from the box and arrangements are to be made for them to be destroyed by a qualified explosives officer (Q.X.O.) in the manner detailed in A.P.2608A, Chap. 19. If the bombs cannot be destroyed immediately, they are to be covered with dry sand or earth, their position flagged, and a notice board erected displaying the words: "DANGER—DAMAGED FLAME BOMBS".

Storage

22. The storage conditions laid down for practice bombs vary with the nature of the filling, and are as follows:—

- (i) Bombs containing a white smoke filling are classified for storage and transport purposes as "DANGEROUS GOODS". The bombs should be stored in their boxes, in open-sided sheds; if such accommodation is not available, the boxed bombs must be stored in the open under tarpaulins, the boxes being raised clear of the ground on battens. The bombs are to be examined periodically for leakage, see Sect. 20, Chap. 11, para. 23 and 24. As the likelihood of leakage increases with age, arrangements should be made for bombs to be stored so that those that have been longest filled are used first.
- (ii) Bombs containing a brown smoke filling are classified in Group 11, see A.P.2608A, Chap. 7.
- (iii) Bombs having a flash filling are classified in Group 9, see A.P.2608A, Chap. 7.
- (iv) Bombs containing a flame filling are classified for storage and transport purposes as "DANGEROUS GOODS". The bombs must be stored in their boxes under cover; if roofed storage is not available, the boxed bombs may be stored in the open under tarpaulins. Battens are to be used in all instances to raise the boxes clear of the ground and dry storage is essential. The bombs are to be examined periodically for leakage.

Note.—Where practice bombs are stored under tarpaulins in hot climates, the tarpaulins must be raised off the stacks of bombs by the use of a suitable framework, and adequate attention must be paid to ventilation of the stacks.

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CHAPTER 2

BOMBS, PRACTICE, AIRCRAFT, SMOKE, 11½ lb., Mk. I, and FLASH, 11½ lb., Mk. I

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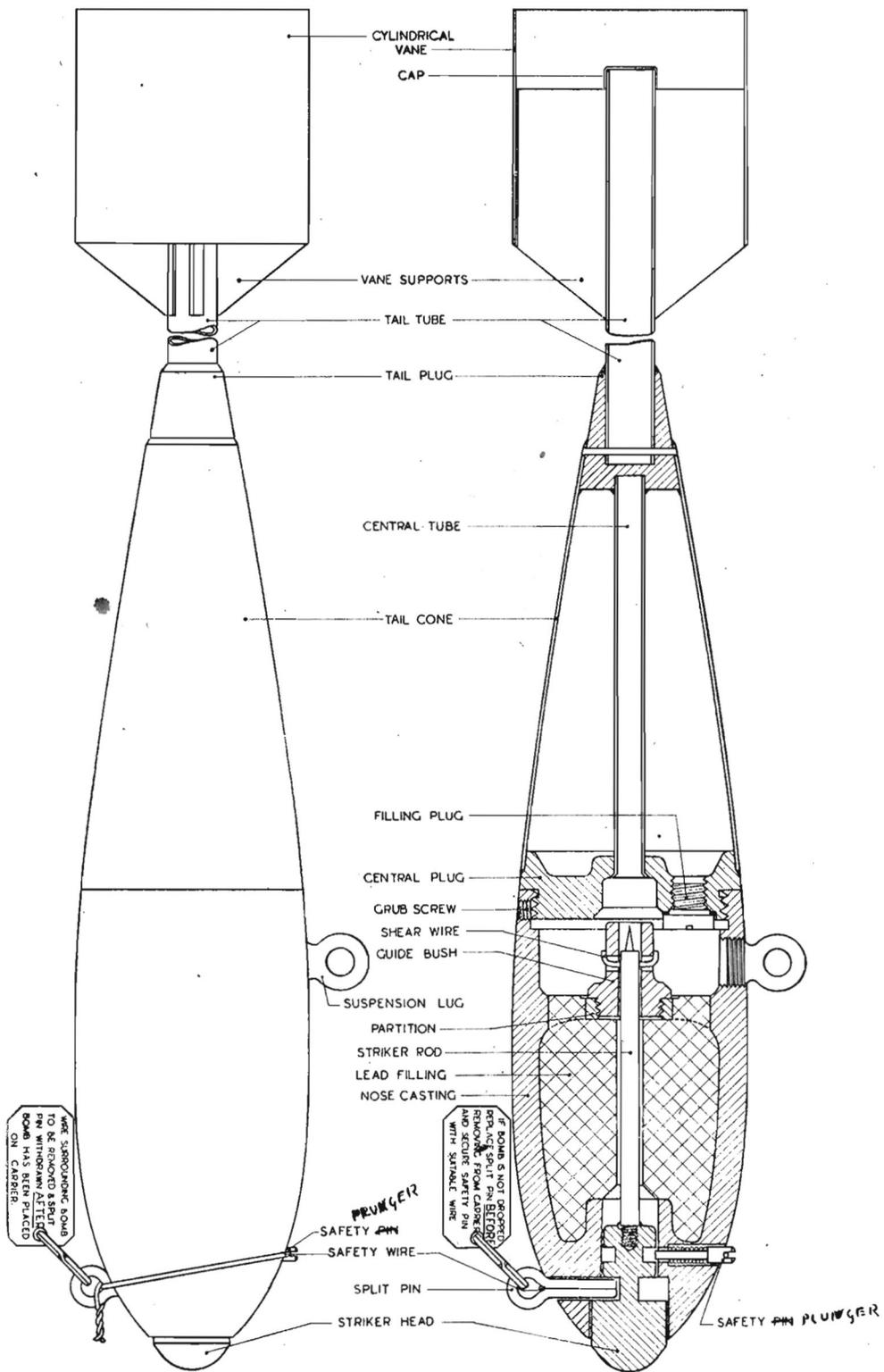


Fig. 1.—Bomb, practice, aircraft, smoke, or flash, 11½ lb., Mk. I (empty)

CHAPTER 2

BOMBS, PRACTICE, AIRCRAFT, SMOKE, 11½ lb., Mk. I, and
FLASH, 11½ lb., Mk. I

Introduction

1. The 11½ lb., Mk. I practice bombs, smoke and flash, are identical except for the filling, and are intended for general bombing practice. The smoke bomb is for use by day, and explodes on impact with the target and scatters the filling which, on exposure to the atmosphere, forms a cloud of white smoke. The flash bomb is intended for night bombing practice, and explodes on impact with the target and produces a brilliant white flash. Against armoured motor boats the height of release of the bombs must not exceed 10,000 ft.

BOMB, PRACTICE, AIRCRAFT, SMOKE, 11½ lb., Mk. I

Leading particulars

| | | | | | |
|------------------------------|-----|-----|-----|-----|------------------------------|
| 2. Stress Ref., empty bomb | ... | ... | ... | ... | 12B/197 |
| Stress Ref., filled bomb | ... | ... | ... | ... | 12B/198 |
| Weight of bomb, empty | ... | ... | ... | ... | 10 lb. 5 oz., approx. |
| Length | ... | ... | ... | ... | 1 ft. 6 in. |
| Maximum diameter | ... | ... | ... | ... | 3 in. |
| Weight and nature of filling | ... | ... | ... | ... | 1 lb. titanium tetrachloride |
| Terminal velocity | ... | ... | ... | ... | 955 ft. per sec. |

GENERAL DESCRIPTION

3. The bomb, see fig. 11, consists of two main parts, namely, a nose casting, which is fitted with a striker assembly and safety mechanism, and a tail cone which constitutes a container for the filling and is fitted with a central tube, for a detonator burster, and with a tail plug carrying a cylindrical vane at the rear end.

Nose casting

For "safety pin" and "split pin" read "safety plunger" and "transit safety pin", respectively, throughout this chapter. (A.P. 113)

5. The rear end of the nose casting is threaded internally to receive the spigot portion of a central plug which closes the forward end of the tail cone, and an integrally formed transverse partition is provided in the nose casting.

6. The partition has a central threaded bore fitted with a guide bush, and equi-spaced around the central screwed bore are four holes.

7. The interior space between the partition and the forward end of the nose casting, with the exception of an axial clearance hole for a striker rod, is filled with lead, poured in through the four holes in the partition.

8. The nose casting is fitted, near its rear end, with a suspension lug, whilst a tapped radial hole, fitted with a grub screw, is provided for locking the tail cone when assembled to the nose casting.

Striker assembly and safety mechanism

9. The striker assembly consists of a striker head, and a striker rod which is pointed at the rear end. The forward end of the striker head is streamlined and the rear end is reduced in diameter. Two annular grooves, one in the forward portion of the striker head and the other in the reduced portion, register with the radial holes which accommodate the split pin and spring-loaded safety pin, respectively.

10. The split pin, which has an instruction tablet attached to its eye by a split ring, engages in its groove in the striker head to retain the striker in the safe position. The spring-loaded safety pin is held out of engagement with its groove in the striker head by the loading spring, and is secured by a safety wire which engages in the forked protruding end of the safety pin, passes round the nose casting and through the eye of the split pin, and has its ends twisted together.

11. The striker rod is screwed into the rear end of the striker head and extends, through the axial clearance hole in the lead, into the bore of the guide bush in which it is retained in the safe position by a shear wire.

Tail cone

12. The sheet metal tail cone, which constitutes the container for the titanium tetrachloride, is closed at the rear end by a conical steel tail plug and at the forward end by the central plug which screws into the rear end of the nose casting.

13. The central plug is bored and counterbored to accommodate a central tube, which extends axially from this bore, through the tail cone, and has its rear end accommodated in the tail plug. The counterbore in the central plug, and the central tube, constitute a holder for a detonator-burster, No. 28, Mk. I (Stores Ref. 12G/207).

14. A tapped hole, fitted with a filling plug, is provided in the central plug for filling purposes.

15. Secured to the tail plug is a tail tube having four vane supports which carry a cylindrical vane. The tail tube is closed at its rear end by a cap.

Identification colouring and markings

16. Filled bombs are painted white and have two $\frac{1}{2}$ in. green bands, $\frac{1}{2}$ in. apart, painted centrally round the tail cone.

17. Empty bombs are painted white, and have no coloured bands.

18. The following markings are stamped on the nose casting, in front of the suspension lug, and on the forward face of the central plug:—

- (i) "11 $\frac{1}{2}$ lb. I".
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The year of manufacture.

Functioning

19. When the bomb is released from the bomb carrier, the safety pin is ejected by its spring so as to leave the striker held in the safe position by the shear wire only, the split pin having been removed, see para. 25.

20. On impact of the bomb with the target, the striker head and striker rod are forced into the bomb so as to break the shear wire and fire the detonator-burster, which disrupts the tail cone and scatters the filling. The filling, on contact with the atmosphere, creates a white smoke cloud at the point of impact.

INSTRUCTIONS FOR USE

Fuzing the bomb

21. Slacken the grub screw and unscrew the nose casting from the tail cone, holding the tail unit by the tail cone and not by the cylindrical vane. Examine the filling plug and the detonator-burster holder for signs of corrosion due to leakage of the filling. If there are signs of corrosion, the bomb must not be used.

22. Clean the detonator-burster holder with a clean dry cloth. Gauge the holder, using a No. 17, Mk. I detonator cavity gauge; if gauge does not enter freely, set bomb aside for A.I.S. inspection. (A.L. 140)

23. Insert a fitted detonator-burster, attached to a bomb, No. 28, Mk. I into the detonator-burster holder, and replace the nose casting, screwing it fully home and locking it with the grub screw.

Loading the bomb on to the Light Series bomb carrier

24. The bomb should be loaded on to the Light Series bomb carrier as described in A.P. 1664, Vol. I, Chap. 2. The front crutch fitted to the Light Series bomb carrier presses the spring-loaded safety pin into engagement with the groove in the striker head.

25. When the bomb is finally in position on the bomb carrier, and immediately before the aeroplane takes off, remove the safety wire and split pin and hand the latter either to the pilot or the bomb aimer for insertion if the bomb is brought back unexpended.

Unloading the bomb from the Light Series bomb carrier

26. Before unloading the bomb, replace the split pin in the nose end of the bomb. Then engage a length of 20 s.w.g. copper wire in the slotted end of the safety pin, pass each end of the wire through the eye of the split pin and twist the two ends of the wire together so as to retain the safety pin in position, taking care that the wire is tight enough to prevent the split pin being withdrawn from its groove in the striker head. Then unload the bomb from the carrier as described in A.P. 1664, Vol. I, Chap. 2.

Note.—The split pin and retaining wire are to be fitted to all practice bombs loaded on the aircraft before any bomb is unloaded.

Warning.—Unexpended bombs must be unfuzed as soon as possible, and must not be stored with detonator-bursters in position. Should it be required, however, to hold bombs for "ready-use", the instructions given in Chap. 1 of this Section must be followed. (A.L. 124)

A.P.1661B, Vol. I, Sect. 8, Chap. 2

Unfuzing the bomb

27. Ensure that the bomb has been rendered safe, see para. 26. Unlock and remove the nose casting, see para. 21, and remove the detonator. Replace and lock the nose casting.

SUPPLY AND STORAGE**Supply**

28. The bombs are supplied packed ten in Box, B.252, Mk. I (Stores Ref. 12B/199).

Storage

29. Bombs, practice, aircraft, smoke, 11½ lb., Mk. I must be stored in their boxes, preferably in open-sided sheds; if this accommodation is not available, the boxed bombs should be stored under tarpaulins, and be raised from the ground on battens.

30. As the likelihood of leakage increases with age, bombs which have been in store longest should be used first, and storage arrangements to facilitate this should be made.

BOMB, PRACTICE, AIRCRAFT, FLASH, 11½ lb., Mk. I**Leading particulars**

| | |
|------------------------------|--|
| 31. Stores Ref., empty bomb | 12B/197 |
| Stores Ref., filled bomb | 12B/201 |
| Weight of bomb, empty | 10 lb. 5.5 oz. approx. |
| Length | 1 ft. 6 in. |
| Maximum diameter | 33 in. |
| Weight and nature of filling | 11 lb. mixture of gunpowder and magnesium turnings |
| Terminal velocity | 955 ft. per sec. |

GENERAL DESCRIPTION

32. The bomb, practice, aircraft, flash, 11½ lb., Mk. I, is identical in construction with the 11½ lb., Mk. I practice smoke bomb. It differs only in that it is filled with a mixture of gunpowder and magnesium turnings instead of with titanium tetrachloride.

Identification colouring and markings

33. Filled bombs are painted white, and have a red ring round the nose and two ½ in. black rings, ½ in. apart, round the tail cone.

34. The markings on the bomb are as described in para. 18.

Functioning

35. The bomb functions as described in para. 19 and 20, except that, on impact, a brilliant white flash is produced.

INSTRUCTIONS FOR USE**Fuzing the bomb**

36. The bomb is fuzed, as described in para. 21 to 23. Leakage and corrosion will not occur with this bomb.

Loading the bomb on to the Light Series bomb carrier

37. Load the bomb on the bomb carrier as described in para. 24 and 25.

Unloading the bomb from the Light Series bomb carrier

38. Unload the bomb as described in para. 26.

Unfuzing the bomb

39. Ensure that the bomb has been rendered safe, see para. 26, and then unfuze the bomb as described in para. 27.

SUPPLY AND STORAGE**Supply**

40. The bombs are supplied packed ten in Box, B.252, Mk. I (Stores Ref. 12B/199).

Storage

41. The bombs are classified, for storage purposes, in Group IX.

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incorporated in this reprint
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CHAPTER 3

APPARATUS, CHARGING, PRACTICE SMOKE BOMBS, No. 2, Mk. I

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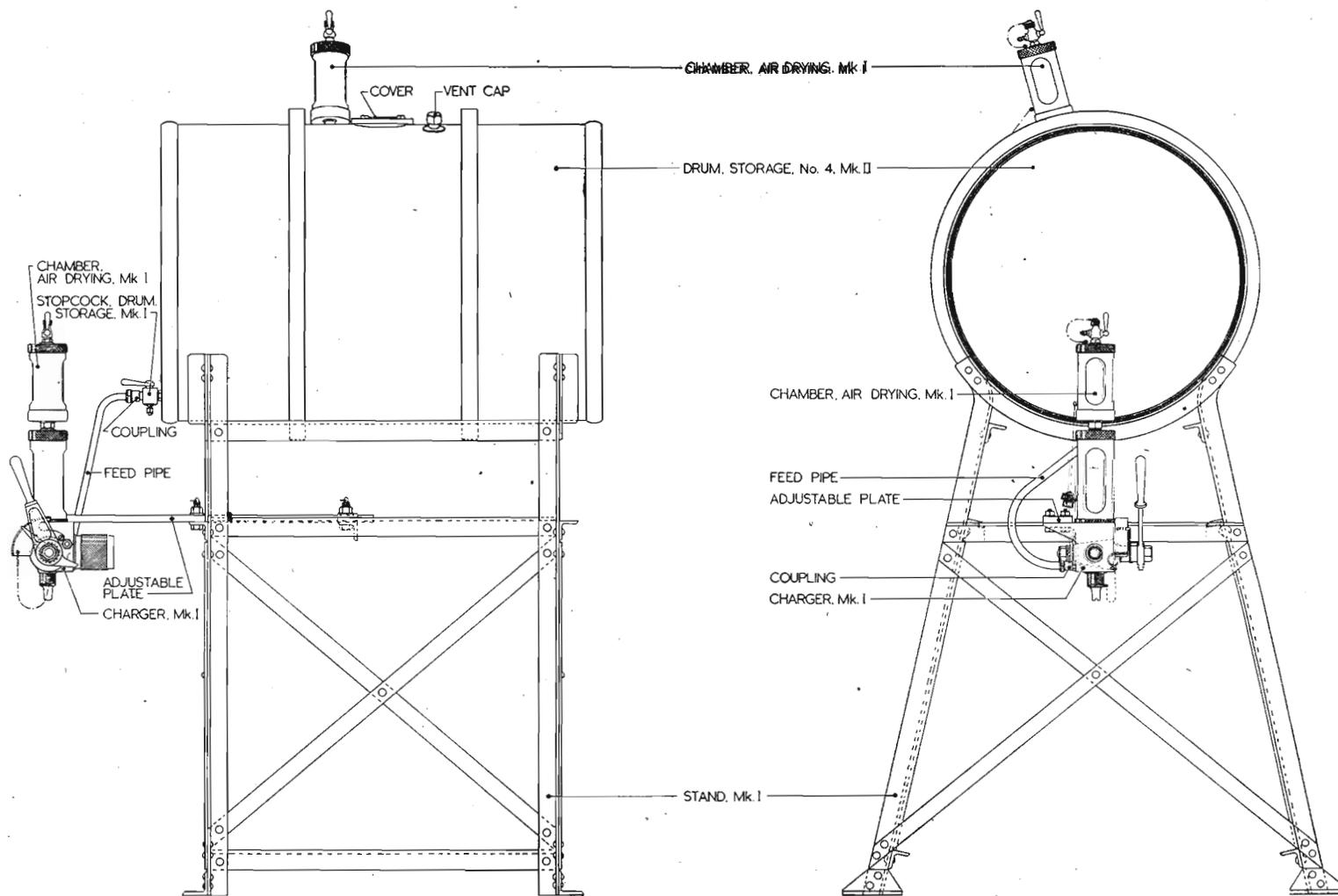


Fig. 1.—Apparatus, changing, practice smoke bombs, No. 2, Mk. I

CHAPTER 3

APPARATUS, CHARGING, PRACTICE SMOKE BOMBS, No. 2, Mk. I

Introduction

1. The No. 2, Mk. I charging apparatus for practice smoke bombs is for use by Maintenance Units only, to expedite and facilitate the charging of smoke bombs with the correct quantity of titanium tetrachloride or other liquid so as to leave approximately a ten per cent air space in the containers of the bombs.

2. The charging apparatus consists of the following stores, which are supplied separately and require to be assembled as detailed in para. 22:—

| <i>Nomenclature</i> | <i>Stores Ref.</i> |
|---|--------------------|
| Charger, Mk. I | 12B/202 |
| Chamber, air drying, Mk. I (2 required per apparatus) | 12B/203 |
| Stopcock, drum, storage, Mk. I | 12B/205 |
| Stand, Mk. I | 12B/204 |
| Drum, storage, No. 4, Mk. II | 12F/86 |

3. In addition to the items detailed in para. 2, the following stores will be required to enable the apparatus to be assembled:—

| <i>Nomenclature</i> | <i>Stores Ref.</i> |
|--|--------------------|
| Two couplings to A.G.S.708D, each consisting of:— | |
| Coupling, brass, collar, pipe... .. | 28/3562 |
| Coupling, brass, sleeve, outer | 28/3632 |
| Coupling, nipple, adapter | 28/3582 |
| $\frac{1}{2}$ in. o/d x 20 S.W.G. copper tube (length as required) | 30B/409 |

A tool, tube expanding, Type B, small (Stores Ref. 1C/5506) will also be required for flaring the ends of the copper tube to suit the couplings, and, if the stand is to be bolted down, a number of bolts and nuts will be needed.

4. The air drying chambers employ the following materials:—

| <i>Nomenclature</i> | <i>Stores Ref.</i> |
|------------------------|--------------------|
| Calcium chloride | 33C/561 |
| Glass wool | 33C/562 |

Each air drying chamber requires to be filled with calcium chloride, between layers of glass wool, before assembly on the apparatus, and the filling requires to be renewed. Instructions for filling and maintenance of the air drying chambers are given at para. 20, 21, and 30.

5. After the apparatus has been assembled, the No. 4, Mk. II storage drum requires to be filled with titanium tetrachloride by siphonage from another drum. Instructions for performing this operation and the precautions to be observed are detailed in para. 23 to 27.

6. Instructions for charging practice smoke bombs from the apparatus are given in detail in para. 28.

7. The apparatus requires periodic cleaning and maintenance, and these points are dealt with in para. 29 and para. 30 to 34 respectively.

GENERAL DESCRIPTION

8. The assembled apparatus is illustrated in fig. 1, the empty storage drum being mounted in the cradle of the stand and connected, through the stopcock and the copper tube which constitutes a feed pipe, to the valve body of the charger which is carried by an adjustable plate on the stand. One of the air drying chambers is mounted on the upper end of the charger measuring chamber, and the other is mounted in one of the vent openings in the drum.

Stand, Mk. I, fig. 1

9. The stand consists of a cross-braced angle-iron framework, with curved cradle members for supporting the drum, and drilled feet for bolting firmly to the floor. A slotted plate, which projects beyond the front of the stand, is mounted to slide on locating bolts on the stand framework, the forward end of the plate being drilled for fitting the charger.

Drum, storage, No. 4, Mk. II, fig. 1

10. The No. 4, Mk. II, storage drum has in its cylindrical wall a centrally positioned filling opening which is closed by a cover bolted down on to a seating. Two vents fitted with screw-on caps are provided, one at each side of the filling opening, and one end plate of the drum has an outlet opening, fitted with an internally threaded drain boss closed by a screw-in flanged drain plug.

11. The drum is painted black and bears on its side a brass plate with the following markings stamped on it:—

- (i) No. 4 II.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Note.—In addition to use with this charging apparatus, the drum may be used for the storage or transport of titanium tetrachloride, stannic chloride, or carbon tetrachloride. When so used the drum bears other distinctive markings, in the form of coloured bands, painted around the shell and across the ends, and appropriate lettering.

Stopcock, drum, storage, Mk. I, fig. 2

12. The stopcock for connection to the storage drum is flanged and threaded to screw into the drain boss on the drum, and the outlet end of its bore is flared to receive the adapter nipple of the coupling to the feed pipe.

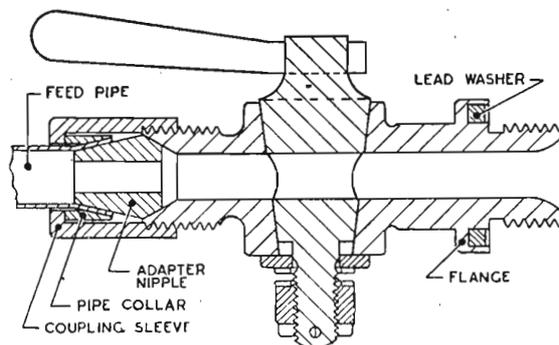


Fig. 2.—Stopcock, drum, storage, Mk. I, with coupling to feed pipe

Charger, Mk. I, fig. 3 and 4

13. The charger consists of a charger body, fitted with a rotary valve, an inlet connection, a filter enclosed by a knurled screw-on cover, a measuring chamber, and a discharge nozzle also fitted with a knurled screw-on cover.

14. The charger body has a transverse taper bore in which is housed the rotary valve, of the taper plug type, which controls passages leading from this bore to the filter, the measuring chamber, and the nozzle, respectively; the arrangement being such that in the OFF position of the valve all three passages are cut off from one another, in the REFILL position the passages leading to the filter and the measuring chamber are connected and that to the nozzle is closed, and in the CHARGE position the passages leading to the measuring chamber and the nozzle are connected and that to the filter is cut off. A fourth passage in the charger body, and which is also controlled by the valve, is aligned with the passage leading to the filter and is normally closed by a cleaning plug fitted with a sealing washer. A drilled flange is provided on the charger body for connecting it to the stand.

15. The filter cover is screwed on to a spigot on the rear end of the charger body, whilst the filter, which is in the form of a finely perforated cylinder with a closed end, fits on to a plain boss on the spigot. This boss includes the entrance to the passage leading from the filter to the valve, and a passage leading from an inlet connection on the left-hand side of the charger body, when viewed from the front, leads into the space afforded between the filter cover and the filter. The inlet connection is adapted to be connected to the feed pipe by a coupling similar to that for connecting the feed pipe to the stopcock.

16. The measuring chamber consists of a graduated glass cylinder surrounded by a metal guard cylinder which has inspection windows or openings. The guard cylinder screws into a recess in the top of the charger body and is locked by a ring nut, whilst the glass cylinder rests upon a washer in a groove in the base of the recess. A metal cap, with a washer, fits in the top of the guard cylinder

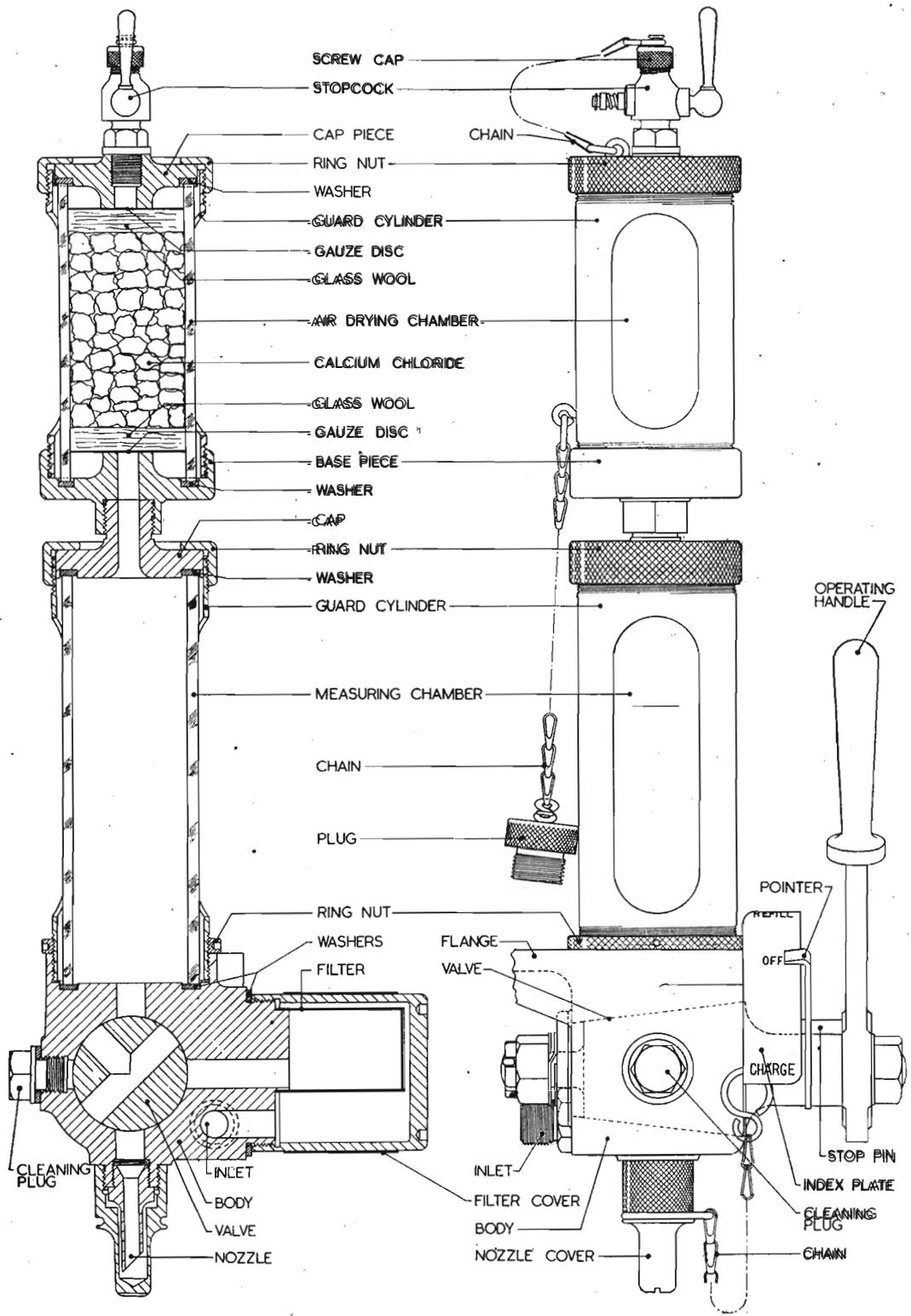


Fig. 3.—Charger, Mk. 1, with chamber, air drying, Mk. I, connected

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and rests with its washer on the upper end of the glass measuring cylinder, whilst a ring nut is screwed on to the upper end of the guard cylinder so as to clamp the measuring chamber assembly together as a whole and ensure liquid-tight joints at the ends of the measuring cylinder. The metal cap has a central bore which extends through a screwed spigot on its upper side for connection to an air drying chamber.

17. The discharge nozzle is screwed into a spigot on the underside of the charger body, and the nozzle cover, which has a keeper chain attached to it, screws on to the spigot.

18. The spindle of the rotary valve has an operating handle attached to it, and also a pointer which rides over an index plate on the right-hand side of the charger body. This index plate bears inscriptions REFILL, OFF, and CHARGE to indicate the settings of the valve. Extreme positions of the valve, i.e. REFILL and CHARGE, are determined by a stop pin on the charger body; in the REFILL position the rear face of the operating handle engages the stop pin, and in the CHARGE position a spur extension of the operating handle engages the stop pin. The nozzle cover keeper chain is attached to the index plate.

Chamber, air drying, Mk. I, fig. 3

19. Each air drying chamber consists of a glass cylinder surrounded by a metal guard cylinder which has inspection openings and screws into a base piece. The glass cylinder rests upon a washer in a groove in the base piece, and its upper end is engaged by a washer carried in a groove in a cap piece which fits within the top of the guard cylinder, the air drying chamber assembly being clamped together as a whole by a ring nut which screws on to the upper end of the guard cylinder. Two fine wire gauze discs are fitted in the glass cylinder, and both the base piece and the cap piece each have a through central bore which is threaded for some distance from the outer end. A threaded plug, with a washer, is screwed into the bore of the base piece before assembly of the apparatus, and a small stopcock is screwed into the bore of the cap piece. This small stopcock has a screw cap connected by a keeper chain to the cap piece of the air drying chamber.

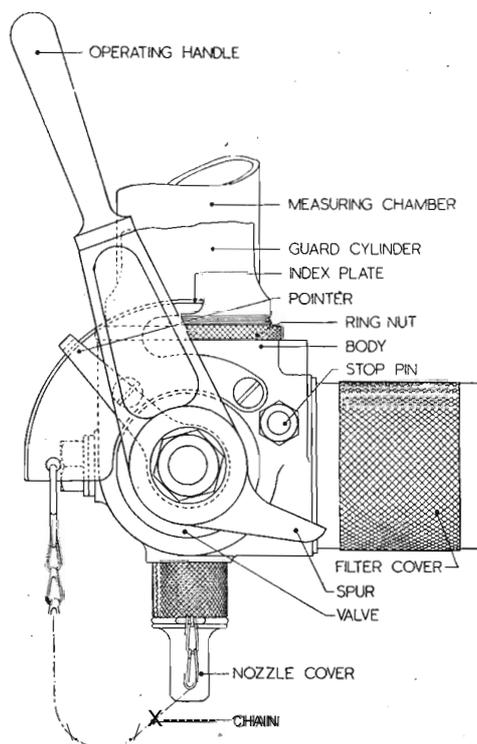


Fig. 4.—Charger, Mk. I (fragmentary side elevation)

FILLING THE AIR DRYING CHAMBERS

20. Each of the air drying chambers requires filling with a charge of calcium chloride between pads of glass wool, see fig. 3. The calcium chloride supplied under Stores Ref. 33C/561 is of the quality known as commercial, fused, lump, and, as it is a very hygroscopic substance, it must not be left needlessly exposed to the air. The lumps used as a charge should be capable of being passed through a 1 in. diameter opening, but not through one of $\frac{1}{2}$ in. diameter. The glass wool is of ordinary commercial quality.

21. The procedure for filling an air drying chamber is as follows:—

- (i) Unscrew the ring nut from the guard cylinder and remove the cap piece. Also remove the upper gauze disc from the glass cylinder.
- (ii) Cover the lower gauze disc in the glass cylinder with a layer of glass wool to a depth of about $\frac{1}{2}$ in., then pack the cylinder with calcium chloride, shaking it down lightly to ensure a compact arrangement of the lumps, until the cylinder is charged to about 1 in. from the top, and cover the calcium chloride with another $\frac{1}{2}$ in. layer of glass wool. Replace the upper gauze disc to cover the upper layer of glass wool.

- (iii) Replace the cap piece and the ring nut, making sure that the glass cylinder is correctly seated on its washers at both ends. Tighten the ring nut only sufficiently to ensure good air-tight joints between the glass cylinder and its sealing washers, as over-tightening may break the glass cylinder.

Note.—Throughout the above operations the plug, in the base piece, and the stopcock cap should not be removed, and the stopcock should be kept closed.

ASSEMBLING THE APPARATUS

22. The charging apparatus should be assembled as follows:—

- (i) Stand the empty No. 4, Mk. II drum on end, drain plug uppermost, remove the drain plug, and screw in its place the storage drum stopcock, making sure that an efficient seal is obtained by compression of the lead washer, in the flange of the stopcock, against the drain boss. Set the handle of the stopcock to the OFF position.
- (ii) Mount the stand in position on the charging site, and ensure that it is firm, securing it with bolts to a wooden base if necessary. If the site is outdoors, the front end of the stand, see para. 9, should be directed into the wind, so as to ensure that any fumes given off by the apparatus will be carried away from the operator when charging practice bombs. Hoist the empty No. 4, Mk. II drum on to the stand with the stopcock directed beyond the front of the stand and the filling opening cover and vent plugs uppermost.
- (iii) Secure the charger, Mk. I to the adjustable plate on the stand by suitable bolts and nuts.
- (iv) Assemble the outer sleeves of the two couplings, with their coned pipe collars, on the opposite ends of the feed pipe and flare the ends of the feed pipe, with the tube expanding tool, on to the coned inner surfaces of the pipe-collars, see fig. 2, and, with the adapter nipples in position, screw the outer sleeves of the couplings respectively on to the spigot portion of the storage drum stopcock and the inlet connection of the charger body.
- Note.*—Such a length of copper tube is to be used for the feed pipe as will ensure easy bending without distortion of the bore and will admit of the sliding plate on the stand being in a position to enable the couplings to be easily and conveniently broken and re-made when necessary.
- (v) Lock the adjustable plate in position.
- (vi) Remove the plugs from the base pieces of the charged air drying chambers, and screw one air drying chamber on to the top of the measuring chamber of the charger, see fig. 3. Remove one of the vent caps from the empty storage drum on the stand and screw the other air drying chamber on to the vent. Undue force is not to be used.
- (vii) Confirm that the storage drum stopcock and the small stopcocks on the air drying chambers are all closed, that the nozzle cover and the caps of the small stopcocks are all in position and screwed home, and that the rotary valve of the charger is in the OFF position.

Precautions

23. Fumes given off by titanium tetrachloride on contact with the air can, if breathed in quantity, cause lung irritation, headache and nausea. Splashes of titanium tetrachloride in the eye may cause total blindness. First-aid treatment, which is to be given immediately, consists of washing out the eye for at least five minutes with water or a 2 per cent. bicarbonate of soda solution. This treatment should be followed by medical attention as soon as possible.

Note.—The general precautions to be observed when handling titanium tetrachloride are detailed in A.P.2608A, App. XX.

INSTRUCTIONS FOR USE

(A.L.137)

24. Personnel engaged in filling storage drums, or filling practice bombs, with titanium tetrachloride, must wear protective equipment consisting of rubber goggles (Stores Ref. 22G/73), a service respirator, a rubber apron (Stores Ref. 22G/395), rubber gloves (Stores Ref. 22G/866-869), clogs (Stores Ref. 22D/414-424), and overalls (Stores Ref. 22G/722-733). Should any exposed part of the body, or unprotected clothing, become contaminated by the liquid, it must immediately be thoroughly rinsed in clean water. Grossly contaminated clothing should be removed from the body before being rinsed, otherwise the heat developed may result in skin burns.

Filling the storage drum on the stand

25. The storage drum on the stand is, firstly, to be filled with titanium tetrachloride by siphonage, either from a horizontal type storage drum, such as a No. 4, Mk. I or II, or from a vertical type storage drum, such as a No. 2, Mk. I or II.

Filling from a horizontal type drum

26. To fill the drum on the stand from a No. 4, Mk. I or II horizontal type storage drum, the procedure is as follows:—

- (i) With the full drum in the horizontal position, vents uppermost, remove one of the vent caps to release any pressure from the interior of the drum, and then replace the vent cap. As a considerable gas pressure may accumulate in storage drums containing titanium tetrachloride, care must be exercised, in opening them, to avoid being splashed with the liquid, and the operator should stand on the windward side of the drum on which he is working.
- (ii) Place the full drum in a horizontal position, between chocks, on the platform of a Slingsby stacker, position the stacker as near as possible to the stand, and raise the stacker platform so as to support the drum wholly above the level of the filling opening of the drum on the stand.
- (iii) Remove the covers from the filling openings of both drums and place in position a siphon pipe shaped to connect both filling openings. The siphon pipe should consist of a length of steel tubing, 1 in. i/d, bent to a U-shape with unequal limbs, and the shorter limb, or inlet leg, of the siphon should have a cover, in the form of a metal disc, soldered on in such a position that, when the cover is bolted down to the filling opening boss of the full drum to close the opening, the inlet-leg will reach almost to the bottom of the liquid in the full drum.
- (iv) Remove one of the vent caps from the drum on the stacker, connect an air pump to the vent, using a suitable adapter, and create sufficient air pressure in the full drum to force the liquid over the bend of the siphon and so set up the siphonic action. Remove the air pump as soon as siphonage has commenced. The siphonic action will continue automatically until the drum on the stacker is almost empty, and smoky fumes will be emitted from the filling opening of the drum on the stand throughout this period. Immediately the end of the inlet leg of the siphon is uncovered by the falling liquid level, the siphon will suck air, and this will cause a pronounced puff of smoke to be ejected from the drum on the stand. This smoke puff serves as a signal that siphonage is completed.
- (v) When siphonage is completed, remove the siphon pipe, and replace the covers on the filling opening bosses of both drums. Also replace the vent cap on the drum which has been emptied.

Filling from a vertical type drum

27. To fill the drum on the stand from a No. 2, Mk. I or II vertical type drum, the procedure is as follows:—

- (i) Drill a hole centrally through a filling cap from an unserviceable No. 2 drum, so that the cap can be passed on to a length of steel tube, of about $\frac{3}{4}$ in. i/d, and sweat the cap on to the tube in such a position that when screwed on to the filling neck of a No. 2 drum the end of the tube will be within about $\frac{1}{4}$ in. of the bottom of the liquid in the drum. Drill another hole through the cap and sweat into this hole a short length of copper tubing, of about $\frac{1}{4}$ in. o/d, to serve as a pump connection.
- (ii) Place the full drum on end centrally upon a small turntable which must be mounted on the platform of a staging erected alongside the stand so that the full drum is supported above the level of the filling opening of the drum on the stand.
- (iii) Shape the steel tube as a siphon bend to connect the two drums, remove the filling opening cover from the drum on the stand, and the filling cap slowly and carefully from the drum on the turntable, observing the precautions against release of pressure detailed in para. 26 (i). Place the steel tube in position and rotate the turntable and vertical drum slowly, so as to cause the cap, which is sweated on the steel tube, to be screwed on to the filling neck of the drum.
- (iv) Connect an air pump to the copper tube, sweated in the cap now on the vertical drum, and pump in sufficient air to start the siphon. As soon as siphonage commences disconnect the air pump. Siphonage will continue and its completion will be indicated as described in para. 26 (iv).
- (v) When siphonage is completed, rotate the turntable to unscrew the filling cap from the filling neck of the vertical drum, and remove the steel pipe. Replace the cover of the drum on the stand and the original cap on the vertical drum.

Charging operations

28. The apparatus is used for charging the containers of practice smoke bombs as follows:—

- (i) Ensure that the operating handle of the charger is in the OFF position.
- (ii) Remove the caps from the small stopcocks on the air drying chambers, set these stopcocks to the open position, and remove the cover from the discharge nozzle.

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- (iii) Turn the storage drum stopcock to the ON position.
- (iv) Move the operating handle of the charger to the REFILL position to allow the liquid to flow from the drum on the stand, by way of the filter and valve, into the measuring chamber. Turn the operating handle to the OFF position when the rising level of liquid in the measuring chamber reaches the graduation mark.
- (v) Place a practice bomb container under the charger so that the discharge nozzle is well inside its filling hole, and turn the operating handle of the charger to the CHARGE position. Ensure that the charger is empty before removing the practice bomb container.
- (vi) To charge further practice bomb containers, repeat the operations detailed in para. 28 (iv) and (v).
- (vii) If charging operations are suspended, the operating handle must be turned OFF, the nozzle cover must be replaced, and the stopcocks on the air drying chambers closed and capped. If suspension of charging operations is for other than only a short period the apparatus must be cleaned, see para. 29.

CLEANING AND MAINTENANCE

Warning.—The liquid which is used for cleaning the charging apparatus is carbon tetrachloride, and as it has properties similar to those of titanium tetrachloride, the precautions detailed in para. 23, 24, and 26, must be observed when performing cleaning operations with this liquid.

Cleaning

29. To clean the apparatus, perform the following operations:—
- (i) Turn the storage drum stopcock to the OFF position.
 - (ii) Remove the air drying chamber from the charger and replace its plug in the base piece, see para. 19.
 - (iii) Disconnect the coupling at the storage drum stopcock and, by freeing and sliding the adjustable plate on the stand, draw the charger forward a short distance.
 - (iv) Remove the cover from the discharge nozzle, turn the operating handle to the REFILL position, and then to the CHARGE position, repeating these handle operations several times, to ensure that as much residual titanium tetrachloride is drained away as is possible.
 - (v) Connect a suitable funnel to the free end of the feed pipe by a short rubber tube. Using carbon tetrachloride (Stores Ref. 12F/40) in the funnel, operate the handle on the charger, as described in para. 28 (iv) and (v), several times, ignoring the graduation mark and allowing the measuring chamber to fill to capacity each time the valve is in the REFILL position. Collect the discharge from the nozzle in a suitable receptacle.
 - (vi) Remove the filter cover and filter and wash the filter in carbon tetrachloride.
 - (vii) It should not be necessary to dismantle the apparatus any further at every cleaning, but periodically the valve in the charger should be cleaned out. This can be effected by removing the cleaning plug from the front of the charger and using a suitable brush dipped in carbon tetrachloride. Replace the cleaning plug.
 - (viii) The No. 4, Mk. II storage drum and its stopcock should be washed out as necessary with carbon tetrachloride.
 - (ix) After cleaning, the apparatus should be re-assembled as described in para. 22 (iv) to (vii) so far as is applicable.

Maintenance

30. The calcium chloride in the air drying chambers will not require to be renewed until half of it appears to be wet. Providing the air drying chambers are kept correctly closed when not in use, the calcium chloride charges should serve until the contents of a number of drums have been decanted through the charger.

31. Two spare graduated glass measuring cylinders are supplied with the charger, and two spare glass cylinders are supplied with each of the air drying chambers. When fitting any of these cylinders undue force must not be used in clamping them in position, and when fitting a measuring cylinder care must be taken to ensure that it is mounted with the graduation mark in the correct position.

32. The sealing washers for the charger and for the air drying chambers may require renewal from time to time. Spare rubber washers, for this purpose, should be obtained locally.

33. To facilitate removal of screw caps and plugs, the threads should be treated periodically with a lubricant consisting of:—

| | | | |
|-------------------------------|--------|----------------------|------------------------|
| Graphite, powdered | ... .. | (Stores Ref. 33C/81) | 33 per cent. by weight |
| Oil, lubricating, M.T. medium | ... .. | (Stores Ref. 34A/36) | 66 per cent. by weight |

34. Complete dismantling of the charger should not be undertaken unless this is absolutely necessary.

SUPPLY

35. The apparatus, charging, practice smoke bombs, No. 2, Mk. I, is issued to Maintenance Units charging practice smoke bombs, with supplies of calcium chloride and glass wool, and the necessary spares and ancillary stores, as detailed in para. 2 and 3.

This leaf issued with A.L. No. 80
May, 1944

A.P.1661B, Vol. I, Sect. 8

AIR MINISTRY
May, 1944

CHAPTER 4

BOMBS, PRACTICE, AIRCRAFT, SMOKE, BREAK-UP, 8½ lb., Mk. I and II, and
FLAME, BREAK-UP, 8½ lb., Mk. III

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1. Sectional view of Mk. I smoke bomb
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LIST OF APPENDICES

Note.—A list of contents appears at the beginning of each appendix

APPENDIX II—Instructions for use

(1) Remove and dispose of the existing Chapters 4 and 6. Insert the attached new Chapter 4 to follow Chapter 3.

(2) Remove and dispose of the existing Chapter 3. Insert the attached new Chapter 4 to follow Chapter 3.

(3) When you have done this, make an entry in the Appendix Record Sheet.

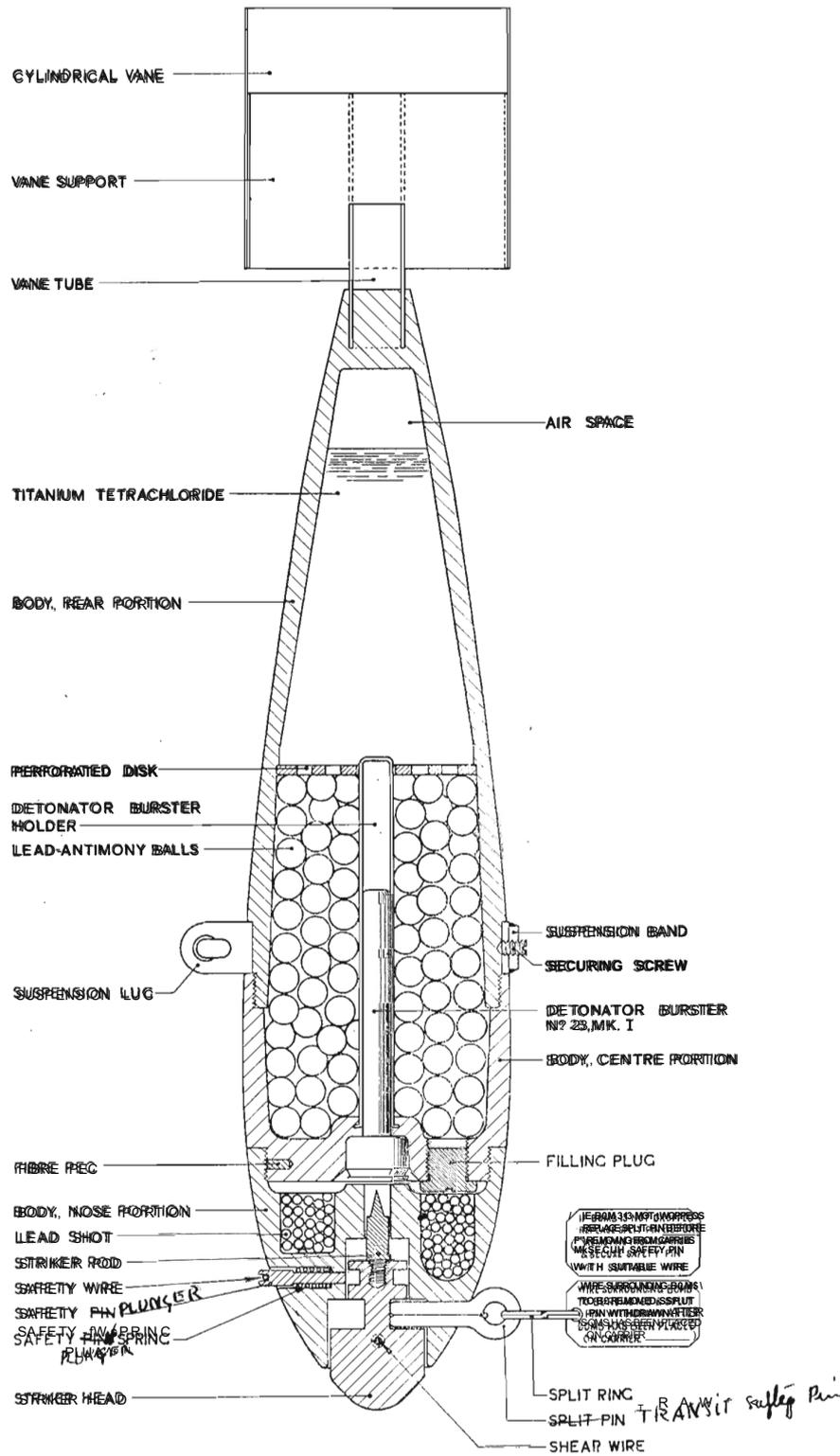


Fig. 1—Sectional view of Mk. I smoke bomb

This leaf issued with A.L. No. 131
December, 1945

A.P.1661B, Vol. I, Sect. 8

CHAPTER 4

BOMBS, PRACTICE, AIRCRAFT, SMOKE, BREAK-UP, 8½ lb., Mk. I and II, and FLAME, BREAK-UP, 8½ lb., Mk. III

Introduction

1. The 8½ lb. break-up practice bombs are to be used for low altitude practice bombing against armoured motor boats, submarines, and similar targets where a bomb is required to break up on impact, without causing damage to the target.

2. The smoke bombs are for use by day; on "break-up" of a smoke bomb, the filling produces a white smoke cloud, indicating the point of impact of the bomb. The flame bomb is intended for night practice bombing, and on "break-up" the filling ignites on contact with water to give a flame lasting about 15 sec. which is sufficient to indicate the point of impact.

BOMB, PRACTICE, AIRCRAFT, SMOKE, BREAK-UP, 8½ lb., Mk. I

Leading particulars

| | | | |
|------------------------------|-----|-----|------------------------------|
| 3. Stores Ref., empty bomb | ... | ... | 12B/327 |
| Stores Ref., filled bomb | ... | ... | 12B/328 |
| Overall length | ... | ... | 1 ft. 4 in. |
| Maximum diameter | ... | ... | 3-0 in. |
| Weight, empty | ... | ... | 7 lb., approx. |
| Weight and nature of filling | ... | ... | 1 lb. titanium tetrachloride |
| Terminal velocity | ... | ... | 784 ft. per sec. |

General description, fig. 1

4. The bomb consists of three main parts, namely, a nose portion housing a striker assembly and safety devices, a centre portion, and a rear portion. The rear portion carries the tail assembly. The bomb body is made of moulded plastic material and the tail of steel.

Nose

5. The nose of the bomb is threaded internally for screwing on to the centre portion. An annular groove is formed on the inside of the nose portion and is filled with lead shot, secured in position with wax.

Striker assembly and safety devices

6. The striker assembly consists of a striker head to which is attached a pointed striker rod.

7. The striker head is accommodated in a counterbore in the nose portion of the bomb body. Two grooves are machined on the striker head, one to accommodate a spring-loaded safety pin* and the other for a split pin.* A phosphor-bronze shear wire passes through the striker head and the nose portion of the body and retains the striker assembly in the "safe" position after withdrawal of the split pin.

8. The safety devices consist of the shear wire, split pin and spring-loaded safety pin.

9. Both the split pin and the safety pin are kept in position by a safety wire, the split pin being held so as to engage with its groove in the striker head to retain the striker assembly in the "safe" position. The safety pin does not engage with its groove in the striker head until after the bomb has been loaded on to the aircraft, when the plunger is depressed by contact with the underside of the front crutch of the carrier. An instruction tablet is attached to the split pin by a split ring.

Centre and rear body portions

10. The centre portion is hollow for most of its length. The closed forward end is bored to receive the head of a detonator-burster, and a metal detonator-burster holder is moulded into a boss formed on the inside of the closed end. The closed end is also drilled and tapped to receive a filling plug, which is screwed firmly into position after the bomb has been filled. This end of the centre portion is threaded externally for attachment to the nose portion which, when assembled, is held against loosening, due to vibration, by a fibre peg, which is inserted in the centre portion flush with the top of the threads. The other end of the centre portion is threaded internally for screwing on to the rear portion of the body, the joint being sealed with cement.

* For "safety pin" and "split pin" read "safety plunger" and "transit safety pin", respectively, throughout this chapter.

AIR
MINISTRY
December, 1945

This is A.L. No. 131 to A.P.1661B, Vol. I, and concerns Sect. 8
(1) Chapter 4. Remove and dispose of the leaf bearing para. 1 to 21
and substitute the attached new leaf bearing para. 1 to 21.
When you have done this, make an entry in the Amendment
Record Sheet.

RESTRICTED

11. The rear portion of the body is hollow and is closed at the tail end, the tail of the bomb being moulded into the closed end. The other end of the rear portion is threaded externally for screwing in to the centre portion, and a groove is formed on the outside to take the suspension band and lug, which is locked in position by a securing screw. Approximately half-way along the inside of the rear portion, is a perforated disc located on a shoulder formed in the body. This disc supports the end of the detonator-burster holder. The space in the centre and rear portions of the body, between the closed end of the centre portion and the perforated disc, is filled with lead-antimony balls. The interstices between the balls, and the remainder of the space in the rear portion of the body, are filled with titanium tetrachloride, with the exception of a 10 per cent, air space.

12. The tail assembly consists of a vane tube which is moulded into the rear portion of the bomb body, and a cylindrical vane which is attached to the vane tube by vane supports.

Identification colouring and markings

13. The exterior of the bomb body is painted white and, when the bomb is filled, two green bands, $\frac{1}{2}$ in. wide, are painted round the rear portion.

14. The following markings are stencilled on the bomb body, in front of the suspension band:—

- (i) "8½ lb. I".
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The year of manufacture.

15. On the bomb body, behind the suspension band, the marking "BREAK-UP" and the following information is stencilled:—

- (i) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (ii) The date of filling, month and year.
- (iii) The lot number.

Functioning

16. When a bomb is released from its carrier, the safety pin is ejected by its spring, leaving the striker assembly held in the "safe" position by the shear wire only, the split pin having already been removed.

17. On impact of the bomb with the target, the striker head and striker rod are forced into the bomb so as, successively, to break the shear wire, fire the detonator-burster, and thus disrupt the bomb body, scattering the filling. As soon as the filling comes into contact with the atmosphere, a white smoke cloud is produced.

Supply

18. The bombs are supplied packed four in Box B.427, Mk. I.

Storage

19. The storage instructions and handling precautions applicable to these bombs are contained in Chap. 1 of this Section. In addition, due to the corrosive action of titanium tetrachloride on the compound used for sealing the joints between the nose, centre, and tail portions of the bomb, the following conditions restricting the life of a filled bomb are to be observed:—

- (i) In temperate climates, the *maximum* life of a filled bomb is three months. Since the date of filling, which is stencilled on the bomb box, quotes only the month and year, the date of redundancy of a filled bomb is to be taken as the last day of the second month after the month of filling; for example, a bomb filled in April 1945 is marked "Filled 4/45" and is to be considered unserviceable after 30th June 1945. Over-age bombs are to be emptied and disposed of as salvage.
- (ii) In tropical climates, bombs are to be filled only for immediate use, owing to the accelerated action of titanium tetrachloride on the jointing compound when the bombs are stored under tropical conditions.

BOMB, PRACTICE, AIRCRAFT, SMOKE, "BREAK-UP, 8½ lb., Mk. II

Comparison with the Mk. I smoke bomb

20. The Mk. II smoke bomb is identical in construction with the Mk. I bomb except for a difference in the striker mechanism, an aluminium instead of a phosphor-bronze shear wire, and that the filling plug is provided with a lead sealing washer. With these exceptions, the information contained in para. 1 and 2, and para. 4 to 12, applies equally to this bomb. The difference in the design of the striker mechanism necessitates the fitting of a striker attachment into the striker head, which is bored and threaded to receive it. For transit purposes, the striker attachment is not assembled, and the striker head is plugged by a transit screw.

21. *Striker attachment*, fig. 2. The attachment consists of a rod, fitted at one end with a ball nose. The opposite end is threaded, for screwing the attachment into the striker head, and is provided with a lock-nut.

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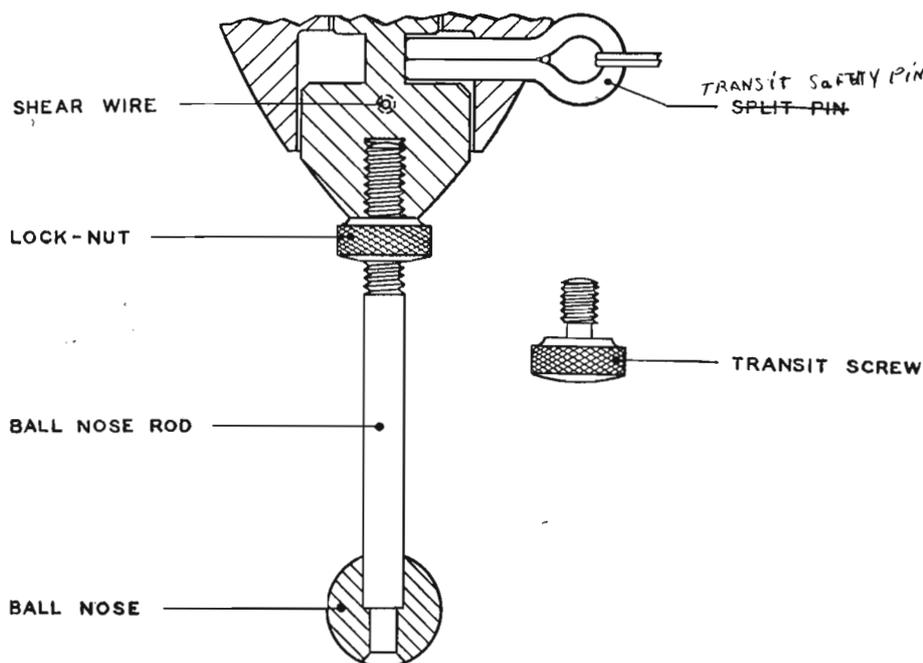


Fig. 2—Nose of Mk. II smoke or Mk. III flame bomb fitted with striker attachment

22. The leading particulars for this bomb which differ from those given for the Mk. I smoke bomb in para. 3, are as follows —

| | | | | |
|---|-----|-----|-----|----------------------|
| Stores Ref., empty bomb | ... | ... | ... | 12B4880 |
| Stores Ref., filled bomb | ... | ... | ... | 12B4881 |
| Overall length, with striker attachment | ... | ... | ... | 1 ft. 7 in., approx. |

23. For particulars of identification colouring and markings, functioning, supply and storage, reference should be made to para. 13 to 19, which also apply to this bomb except for the following differences:—

- (i) The appropriate mark number is stencilled on the bomb body.
- (ii) The bomb functions as described in para. 16 and 17 except that the striker attachment is designed to produce detonation, and disruption of the bomb body, before impact of the body with the target.
- (iii) The bombs are supplied with a transit screw in position in the striker head, and are packed four in Box B.427 Mk. III. Four striker attachments are provisioned separately in the box in the special compartments provided.

BOMB, PRACTICE, AIRCRAFT, FLAME, BREAK-UP, 8½ lb., Mk. III

Comparison with the Mk. I smoke bomb

24. The information contained in para. 1 and 2, and para. 4 to 12, applies equally to the Mk. III flame bomb, which has the same construction as the Mk. I smoke bomb, except for a difference in the striker mechanism, an aluminium instead of a phosphor-bronze shear wire, and that the filling plug is provided with a lead sealing washer. These differences are the same as those already mentioned for the Mk. II smoke bomb and attention is, therefore, also directed to para. 20 and 21. In addition, the Mk. III flame bomb differs from the Mk. I smoke bomb in the following respects:—

- (i) The flame bomb is filled with sodium phosphide soaked in heavy oil, instead of with titanium tetrachloride.
- (ii) The screw-threads and faces of the joint between the centre and rear body portions are sealed with mineral jelly instead of cement.

25. The leading particulars for this bomb which are different from those listed for the Mk. I smoke bomb in para. 3, are as follows —

| | | | |
|---|-----|-----|----------------------------|
| Stores Ref., empty bomb | ... | ... | 12B34822 |
| Stores Ref., filled bomb | ... | ... | 12B34833 |
| Overall length, with striker attachment | ... | ... | 1 ft. 7 in., approx. |
| Weight and nature of filling | ... | ... | ½ lb. sodium phosphide/oil |

26. The particulars of identification colouring and markings, functioning and supply given in para. 13 to 18 also apply to this bomb with the following exceptions:—

- (i) The exterior of the bomb body is painted white, with a red band, ½ in. in width, painted round the nose, whilst the tail is painted red and has the word "FLAME" stencilled on it.
- (ii) The appropriate mark number is stencilled on the bomb body.
- (iii) The bomb functions as described in para. 16 and 17, except that the striker attachment is designed to produce detonation, and disruption of the bomb body, before impact of the body with the target. Also, the sodium phosphide/oil filling, on contact with water, ignites.
- (iv) Clean the detonator-burster holder with a clean dry cloth. Gauge the holder, using a No. 17 Mk. I detonator cavity gauge; if gauge does not enter freely, set bomb aside for A.I.S. inspection.
- (v) Insert detonator-burster, aircraft bomb, No. 28, Mk. I into detonator-burster holder. (A.I. 140)

27. The bombs must be stored in their boxes under cover; if roofed storage is not available, the boxed bombs may be stored in the open under tarpaulins. Battens are to be used in all instances to raise the boxes clear of the ground and dry storage is essential. The bombs are to be examined periodically for leakage.

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APPENDIX 1

INSTRUCTIONS FOR USE

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Fuzing a bomb

1. To fuze an 8½ lb. practice bomb, proceed as follows:—
 - (i) The nose portion of the bomb is to be examined visually to ensure that all the safety devices are present.
 - (ii) Unscrew the nose portion.
Note.—When fuzing a smoke or flame bomb, the filling plug and detonator-burster holder must be examined for signs of corrosion and/or leakage of the filling. If there are any signs of corrosion or leakage, the bomb must not be used.
 - (iii) Clean the detonator-burster holder with a clean dry cloth.
 - (iv) Insert a detonator-burster, aircraft bomb, No. 28, Mk. I (Stores Ref. 12G/207), into the detonator-burster holder.
 - (v) Replace the nose, positioning it so that the safety pin is in alignment with the suspension lug on the suspension band of the bomb.
Note.—After fuzing the Mk. II smoke or Mk. III flame bomb, fit the striker attachment by first removing the transit screw and then screwing the attachment into the striker head, locking it in position with its lock-nut. During this assembly, care must be taken not to break the shear wire, the attachment being screwed in finger-tight only.

Loading a bomb on to the Light Series bomb carrier

2. A bomb is to be loaded on to the Light Series bomb carrier as described in A.P. 1664, Vol. I, Chap. 2, so that the spring-loaded safety pin is depressed by contact with the underside of the front crutch of the carrier. The safety pin is thus engaged with the groove in the striker head, maintaining the striker rod in the "safe" position while the bomb is being carried on the aircraft.
3. When the bomb is finally in position on the bomb carrier, and immediately before the aircraft takes off, remove the safety wire and split pin and hand the latter either to the pilot or bomb-aimer. The split pin is then available for insertion into the bomb, should it be necessary to unload the bomb from the aircraft.

Unloading a bomb from the Light Series bomb carrier

4. Before unloading a bomb, replace the split pin in the nose end of the bomb. Then engage a length of 20 S.W.G. copper wire in the slotted end of the safety pin. Pass each end of the wire through the eye of the split pin and twist the two ends of the wire together so as to retain the safety pin and split pin in position, taking care that the wire is tight enough to prevent the split pin being withdrawn from its groove in the striker head.

Note.—The above procedure is to be followed for all practice bombs on the aircraft and is to be completed before any one bomb is unloaded. On no account is a bomb to be rendered safe and

5. Unload the bomb from the bomb carrier as described in A.P. 1664, Vol. I, Chap. 2.
Warning.—Unexpended bombs must be unfuzed as soon as possible, and must not be stored with detonator-bursters in position. Should it be required, however, to hold bombs for "ready-use", the instructions given in Chap. 1 of this Section must be followed. (A.L. 124)

Unfuzing a bomb

6. Before unfuzing a bomb, ensure that it has been rendered safe, as described in para. 4, then proceed as follows:—
 - (i) Unscrew the nose portion.

- (ii) Remove the detonator-burster. *Force must not be used in removing the detonator-burster.* If difficulty is experienced in so doing, the bomb must be treated as unserviceable and must be destroyed as described in A.P.2608A, Chap. 19.
Note.—When unfuzing a smoke or flame bomb, the detonator-burster after removal must be examined for contamination by the filling; if contaminated, it is to be destroyed as described in A.P.2608A, Chap. 19.
- (iii) Replace the nose after removing the striker attachment if unfuzing Mk. II smoke and Mk. III flame bombs.
- (iv) After replacing the nose of the Mk. II smoke and Mk. III flame bombs, screw the transit screw into the striker head. In doing this, care must be taken not to break the shear wire and the screw is to be finger-tight only.

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Relevant amendments up to A.L. 72
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CHAPTER 5

BOMB, PRACTICE, AIRCRAFT, A.T., 9 lb., Mk. I

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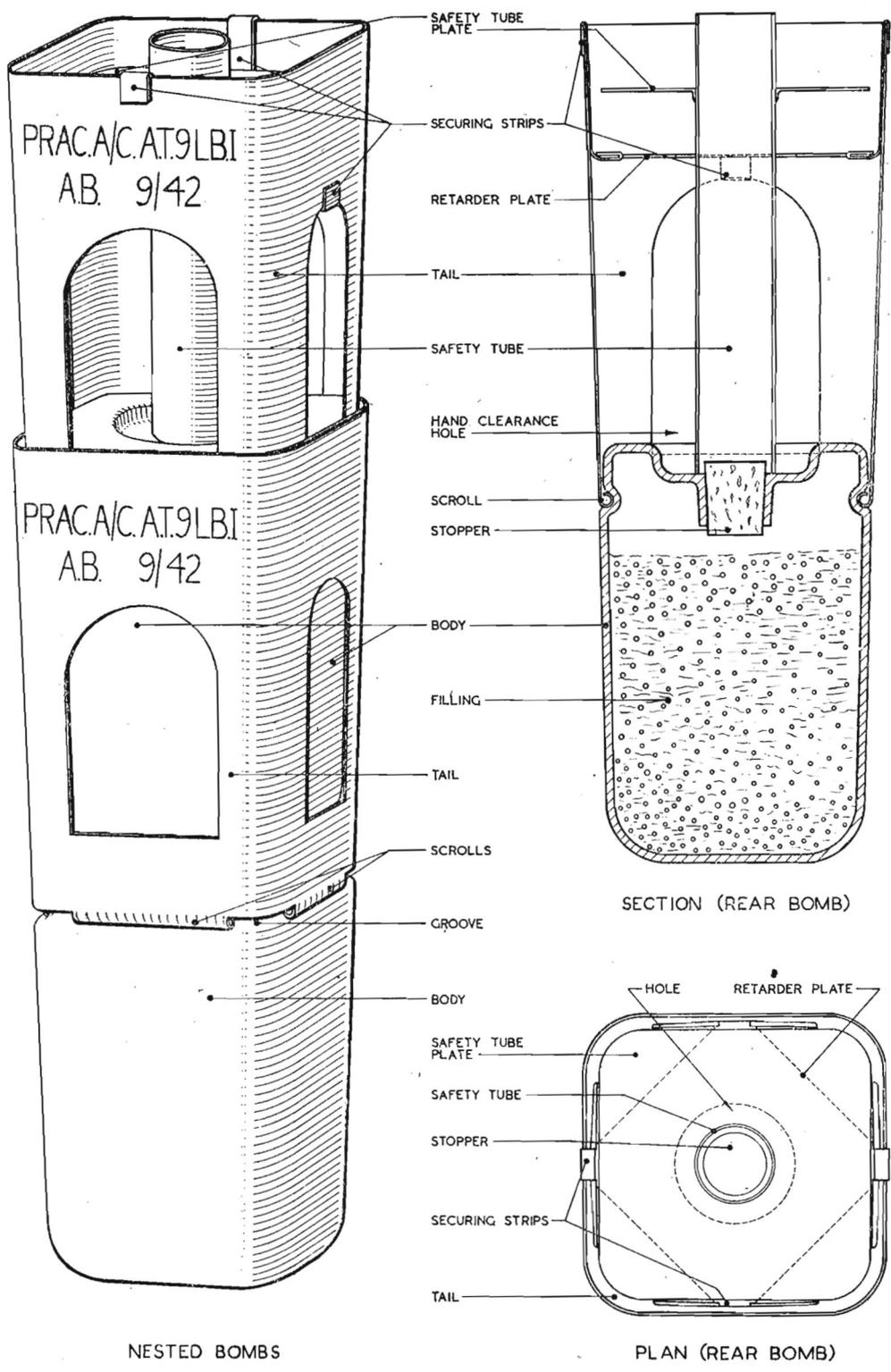


Fig. 1.—Bomb, practice, aircraft, A.T., 9 lb., Mk. I

CHAPTER 5

BOMB, PRACTICE, AIRCRAFT, A.T., 9 lb., Mk. I

Introduction

1. This store is a simulator, for daytime bombing practice, of the bomb, H.E., aircraft, A.T., 9 lb., Mk. I described in Sect. 11, Chap. 2. It is approximately of the same shape, size, and filled weight, and has approximately the same ballistic characteristics. It is dropped from the 250 lb. Small Bomb Container, divided into three compartments, each of which holds eight bombs arranged in pairs, the bombs of each pair being nested together with the nose of one fitting freely into the tail of the other, so that they commence to fall together. The rear bomb of each pair is fitted with means for retarding its fall, so that the nested bombs, released together, will separate during their descent.

2. A load of 24 bombs, when released simultaneously from a height of 250 ft. at 190 m.p.h., will scatter to cover an area approximately 60 yds. long and 30 yds. wide.

3. The practice bomb has neither exploder nor detonator, but its body breaks up on impact with the target to release a white filling which spreads around the point of impact to serve as a marker which will be clearly visible from the aircraft.

Leading particulars

| | | | | |
|----------------------------|-----|-----|-----|-----------------------|
| 4. Stores Ref. (bomb only) | ... | ... | ... | 12B/340 |
| Overall length | ... | ... | ... | 11 ft. 2 in., approx. |
| Weight of bomb, filled | ... | ... | ... | 88½ lb., approx. |

GENERAL DESCRIPTION

5. The bomb consists of a body, which is the container for the filling material, and a permanently attached sheet-metal tail.

Bomb body

6. The hollow bomb body, see fig. 1, is made of earthenware, and is of square cross-section, with rounded corners; it tapers slightly from rear to front. Its rear end has a depression with a filling opening at the centre in the form of a neck extending a short distance into the interior. The filling opening is fitted with a plug-type stopper which, when pushed fully home, has its outer portion completely accommodated in the depression in the rear end of the body.

Filling

7. The body contains a filling of white powder with a quantity of lead shot, as necessary, to make up the weight. A suitable white powder is set plaster of Paris which has been ground, but any other appropriate inert white powder may be used.

Tail

8. The sheet metal tail is in the form of a tube of square cross-section, with rounded corners, and has a taper toward the forward end, such that the tail and bomb body have flush outer surfaces. The forward end of the tail is cut away at the rounded corners and the remaining portions between the cut-outs, are curled inwardly to form scrolls which engage grooves in the sides of the bomb body so as to secure the tail permanently in position. Each side of the tubular tail has a hand-clearance hole to give access to the interior of the tail.

Retarder and safety tube

9. The rear bomb of a pair of bombs nested together is fitted with a plate, retarder (Stores Ref. 12A/885) and with a Tube, safety, practice bomb (Stores Ref. 12B/342).

10. The retarder plate is a square flat plate which is secured diamond-wise in the rear portion of the bomb tail. It has two short securing strips formed integrally with it, one at each of two diagonally opposite corners, and two longer securing strips attached one to each of the other corners. The ends of the longer strips are bent over the rear edge of the bomb tail, and the short strips are bent over the rear edges of two of the hand-clearance holes in opposite sides of the tail. A hole is formed through the centre of the retarder plate for the passage of the safety tube.

11. The safety tube is made of thin sheet metal and its diameter is such that the forward end fits freely over the rear end of the stopper in the filling opening of the bomb body. The length of the safety tube is such that, when it is correctly assembled in the tail end of the bomb, its rear end extends a short distance beyond the bomb tail. The safety tube has permanently attached to it, at a short distance from the rear end, a square safety tube plate, with rounded corners, which lies within the tail with a small clearance all round.

Identification colouring and markings

12. The bomb body, tail, retarder plate, and safety tube are white.
13. The tail has the following markings stencilled, in black lettering, on one of its sides:—
- (i) PRAC. A/C. A.T. 9-LB. I.
 - (ii) The initials or recognized trade mark of the assembling contractor.
 - (iii) The date of assembly, month and year.
14. The following markings are stamped on the tail, safety tube plate, retarder plate, and the body:—
- (i) PRAC. A/C. A.T. 9-LB. I.
 - (ii) The initials or recognized trade mark of the manufacturer.
 - (iii) The date of manufacture, month and year.

Functioning

15. When the bombs are released from the 250 lb. Small Bomb Container, they commence their fall in nested pairs, see para. 1, but the action of the air on the retarder plate fitted in the tail of the rear bomb causes this bomb to lag so that the bombs separate. Also, the air stream passing through the tail of the rear bomb blows the safety tube, with its plate, out of the tail, so as to uncover the stopper, in the same way as the safety tube of the corresponding H.E. bomb is expended to uncover the tail fuze.

16. Upon impact of the bomb with the target, the earthenware body breaks up and the white powder filling is spread around the point of impact so as to serve as a marker which will be readily visible from the aircraft.

INSTRUCTIONS FOR USE

Loading the bombs into the 250 lb. Small Bomb Container

17. Remove the bombs in nested pairs from their boxes, ascertain that the bombs of each pair can fall apart readily and that the safety tube in the tail of each rear bomb is a loose fit over the stopper, and then load the nested pairs of bombs into the 250 lb. Small Bomb Container as described in A.P. 1664, Vol. I, Chap. 3 with reference to the corresponding H.E. bomb. The safety tube should be retained in position in the rear bomb by hand as each pair of bombs is loaded nose forward into the Container.

18. Four pairs of bombs are loaded into each of the three compartments of the Container, and when loading is complete an examination is to be made to ensure that the expendable platforms and drop bars have not distorted the bomb tails, as any such distortion may interfere with or prevent the separation of the bombs, or the expending of the safety tubes, after release. If the tail of a bomb is found to be bent, it should, if possible, be straightened at the Unit; if this is impossible the bomb should not be used.

Unloading the bombs from the 250 lb. Small Bomb Container

19. Unload the bombs as described, with reference to the corresponding H.E. bombs, in A.P. 1664, Vol. I, Chap. 3, and pack the bombs, in nested pairs as removed from the container, into their boxes.

SUPPLY AND STORAGE

Supply

20. Eight bombs are supplied packed in Box, B.373, Mk. I. (Stores Ref. 12A/887). The bombs are nested in pairs in the box, with a retarder plate and a safety tube fitted in the tail of each rear bomb.

21. The drop bars and expendable platforms for retaining the bombs in the Small Bomb Container are supplied separately packed in expendable cardboard boxes.

Storage

22. The bombs should be stored in their boxes in any convenient storehouse.

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CHAPTER 6

BOMBS, PRACTICE, AIRCRAFT, SMOKE, 10 lb., Mk. I, FLASH, 10 lb., Mk. I and III, BROWN SMOKE, 10 lb., Mk. III, and FLAME, 10 lb., Mk. IV

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Fig. 1.—View of Mk. I smoke bomb in section and elevation

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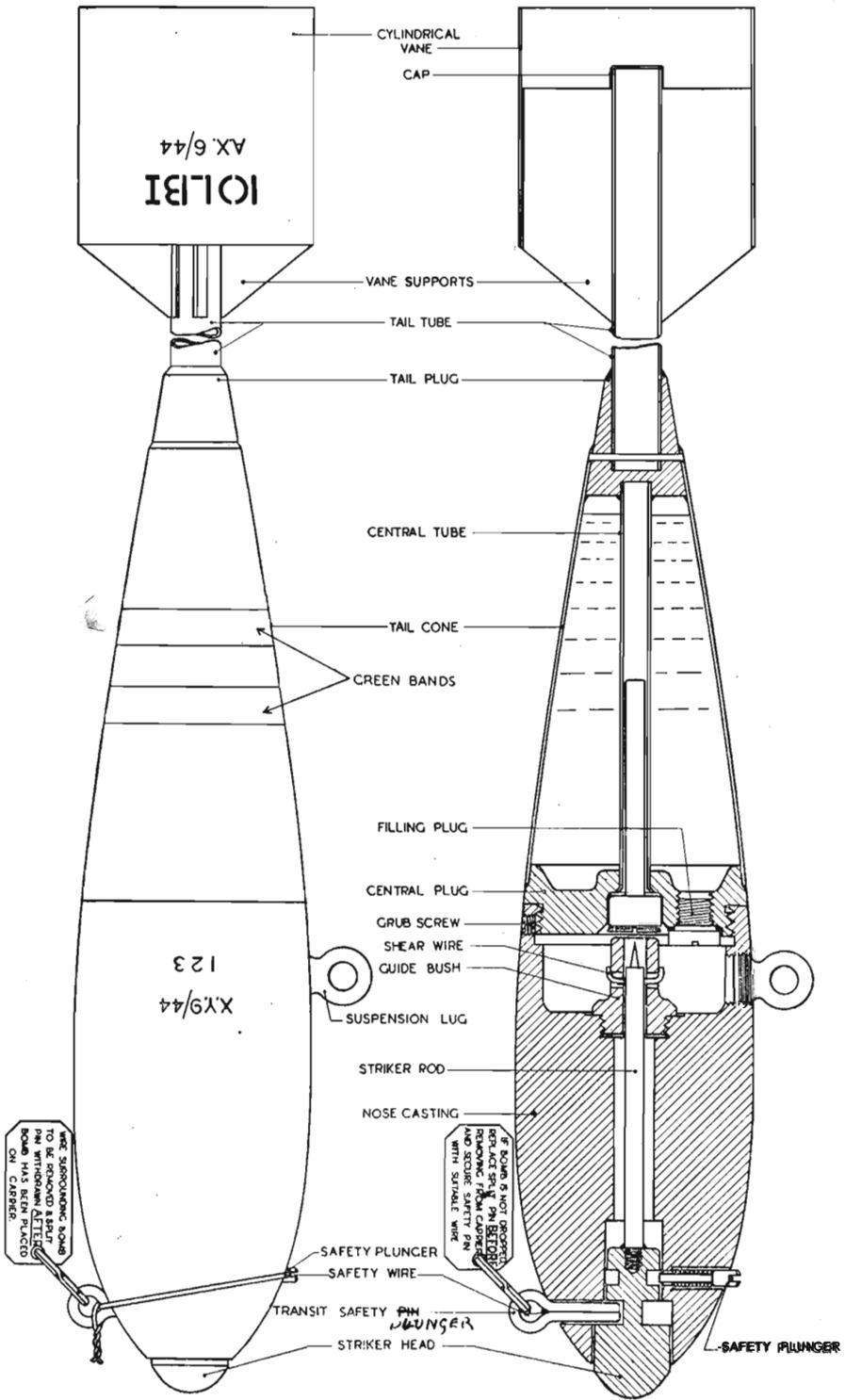


Fig. 1.—View of Mk. I smoke bomb in section and elevation

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CHAPTER 6

BOMBS, PRACTICE, AIRCRAFT, SMOKE, 10 lb., Mk. I, FLASH, 10 lb., Mk. I and III, BROWN SMOKE, 10 lb., Mk. III, and FLAME, 10 lb., Mk. IV

Introduction

1. The 10 lb. practice bombs supersede, for certain purposes, the 11½ lb. practice bombs, which they resemble in construction except for a solid cast-iron nose, instead of the lead weighted nose.

2. The smoke bomb is for use by day, the point of impact with the target being indicated by a cloud of white smoke. The flash bomb is intended for night bombing practice, and on impact with the target produces a brilliant white flash. The Mk. I flash bomb is to be used until all supplies are exhausted, when it will be superseded by the Mk. III flash bomb. The brown smoke bomb, which produces a brown smoke cloud at the point of impact, is for Admiralty purposes only. The flame bomb, also designed for use by the Admiralty, is intended for night bombing practice; on impact with the target, the filling ignites on contact with water to give a flame lasting about 1½ sec. which is sufficient to indicate the point of impact.

Warning.—The 10 lb. practice bombs must not be used against armoured motor boats, or other lightly armoured targets where penetration, by the solid cast-iron nose, might cause injury to personnel, or other damage. Against such targets the 8½ lb. break-up practice bombs should be used for low altitude practice bombing, and 11½ lb. practice bombs should be conserved for high altitude practice bombing, noting, however, the restriction given in Chap. 2 of this Section.

BOMB, PRACTICE, AIRCRAFT, SMOKE, 10 lb., Mk. I

Leading particulars

| | | | | | |
|------------------------------|-----|-----|-----|-----|------------------------------|
| 3. Overall length | ... | ... | ... | ... | 1 ft. 6 in. |
| Maximum diameter | ... | ... | ... | ... | 3 in. |
| Weight and nature of filling | ... | ... | ... | ... | 1 lb. titanium tetrachloride |
| Weight of filled bomb... | ... | ... | ... | ... | 10 lb., approx. |
| Terminal velocity | ... | ... | ... | ... | 920 ft. per sec. |

General description, fig. 1

4. This bomb consists of two main parts, namely, a cast-iron nose portion fitted with a striker assembly and safety devices, and a tail cone, which constitutes a container for the filling. A central tube in the tail cone provides a housing for a detonator-burster, and a tail plug carries the tail assembly.

Nose portion

5. The nose portion is bored to accommodate the striker assembly and safety devices, and is threaded at its rear end to receive the tail cone, which is locked in position by a grub screw. A suspension lug is screwed into the rear end of the nose portion.

Striker assembly and safety devices

6. The striker assembly consists of a striker head and a striker rod. One end of the striker rod is screwed into the rear end of the striker head while the opposite and pointed end of the rod is housed in a guide bush, which is screwed into the rear end of the nose portion. A shear wire passes through the guide bush and striker rod.

7. The safety devices consist of a safety wire, a transit safety pin, a spring-loaded safety plunger and the shear wire. During transit, storage, and handling of the bomb, the safety wire retains the transit safety pin and safety plunger in position in the nose portion of the bomb (see fig. 1), the safety pin being held so as to engage one of two grooves cut in the striker head, thus maintaining the striker assembly in the "safe" position. When the bomb is loaded on to the bomb carrier and after the safety wire and transit safety pin have been withdrawn, the function of the safety pin is taken over by the safety plunger, which is depressed by the front crutch of the bomb carrier so that the plunger is brought into engagement with the other groove in the striker head. An instruction tablet, the wording on which is shown in fig. 1, is attached to the transit safety pin by a split ring.

Tail cone

8. The tail cone is made of steel, and is closed at its rear end by a conical tail plug and at its forward end by a central plug which is screwed and locked into the rear end of the nose portion of the bomb.

9. The cast-iron or steel central plug is bored to accommodate the central tube, which extends through the tail cone to the tail plug. The central tube and central plug together constitute a holder for a No. 28 Mk. I or II detonator-burster when the bomb is fuzed. A tapped hole, fitted with a steel plug and lead sealing washer, is provided in the central plug for filling purposes.

10. The tail assembly projects from the tail plug. It consists of a tail tube which has four vane supports carrying a cylindrical vane. The tube is closed at its rear end by a cap.

Identification colouring and markings

11. The exterior of the bomb is painted white and, when the bomb is filled, two green bands, $\frac{1}{2}$ in. wide, are painted round the tail cone.

12. The marking "10 LB." may be stencilled on the cylindrical vane, together with the following information:—

- (i) "I", indicating the mark.
- (ii) The initials or recognized trade mark of the contractor who assembled the tail unit.
- (iii) The date of assembly (month and year).

13. The following markings are stencilled on the nose portion:—

- (i) The monogram of the filling station or the initials or recognized trade mark of the filling contractor.
- (ii) The date of filling (month and year).
- (iii) The lot number.

Functioning

14. When a bomb is released from its carrier, the safety plunger is ejected by its spring, leaving the striker held in the "safe" position by the shear wire only, the safety wire and transit safety pin having been removed before take-off.

15. On impact of the bomb with the target, the striker head and striker rod are forced inwards breaking the shear wire and firing the detonator-burster. The firing of the detonator-burster disrupts the tail cone and scatters the filling which, on contact with the atmosphere, produces a white smoke cloud at the point of impact.

Supply

16. The bombs are supplied packed ten in Box B.252 or six in Box B.428.

Storage

17. The bombs are classified, for transport and storage purposes, as "Dangerous Goods". They must be stored in their boxes, preferably in open-sided sheds. If this accommodation is not available, the boxed bombs should be stored under tarpaulins, the boxes being raised from the ground on battens. As the likelihood of leakage of the filling increases with the age of the filled bomb, bombs which have been the longest in store should be used first, and storage arrangements to facilitate this should be made. All bombs should be used within a year of filling.

BOMB, PRACTICE, AIRCRAFT, FLASH, 10 lb., Mk. I

Comparison with the Mk. I smoke bomb

18. The information contained in para. 3 to 10 applies equally to this bomb, which is identical in construction with the Mk. I smoke bomb, but has a different filling. It is filled with a mixture of magnesium turnings and gunpowder or calcium silicide and gunpowder instead of titanium tetrachloride, the weight of the filling being 11 oz.

19. The particulars of identification colouring and markings, functioning, and supply, given in para. 11 to 16, are also applicable to this bomb with the following exceptions:—

- (i) The filled bombs have a red ring painted round the nose and two $\frac{1}{2}$ in. black bands painted round the tail cone.
- (ii) The bomb functions as described in para. 14 and 15 except that the flash from the detonator-burster ignites the filling and a brilliant white flash is produced.

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Storage

20. The bombs are classified, for the purpose of storage, in Group 9, Category Y (see A.P.2608A, Chap. 7).

BOMB, PRACTICE, AIRCRAFT, FLASH, 10 lb., Mk. III

Comparison with the Mk. I smoke bomb

21. This bomb is similar in construction to the Mk. I smoke bomb and the information given in para. 3 to 10 for the Mk. I bomb applies equally to this bomb except for the following differences:—

- (i) The central plug used is always made of steel.
- (ii) The filling plug is of moulded plastic material and is provided with a leather sealing washer.

Note.—Early issues of these bombs are fitted with cork filling plugs sealed with shellacked linen tape.

- (iii) The bomb is filled with an S.R. composition, the weight of the filling being 9 oz.

22. The particulars of identification colouring and markings, functioning, and supply, given in para. 11 to 16, also apply to this bomb except for the following differences:—

- (i) The filled bombs have a red ring painted round the nose and two $\frac{1}{2}$ in. black bands painted round the tail cone. The marking "S.R.541B" is stencilled on the bomb body behind the suspension lug.
- (ii) The appropriate mark number is indicated on the bomb.
- (iii) The bomb functions as described in para. 14 and 15 except that the flash from the detonator-burster ignites the filling to produce a brilliant white flash.

Storage

23. The bombs are classified, for the purpose of storage, in Group 9, Category Y (see A.P.2608A, Chap. 7).

BOMB, PRACTICE, AIRCRAFT, BROWN SMOKE, 10 lb., Mk. III

Comparison with the Mk. I smoke bomb

24. This bomb is similar in construction to the Mk. I smoke bomb and the information given in para. 3 to 10 for the Mk. I bomb applies equally to this bomb except as follows:—

- (i) The central plug used is always made of steel.
- (ii) The filling plug is of moulded plastic material and is provided with a leather sealing washer.

Note.—Early issues of these bombs are fitted with cork filling plugs sealed with shellacked linen tape.

- (iii) The bomb is filled with an S.R. composition, the weight of the filling being 10½ oz.

25. The particulars of identification colouring and markings, functioning, and supply, given in para. 11 to 16, also apply to this bomb with the following exceptions:—

- (i) The filled bombs have a red ring painted round the nose and two green rings, $\frac{1}{2}$ in. wide round the tail cone. A "worm-like" marking, 2 in. in length, is painted in dark brown on the bomb body behind the suspension lug.
- (ii) The appropriate mark number is indicated on the bomb.
- (iii) The bomb functions as described in para. 14 and 15 except that the filling, on contact with the atmosphere, produces a brown smoke cloud.

Storage

26. The bombs are classified, for the purpose of storage, in Group 11, Category X (see A.P.2608A, Chap. 7).

BOMB, PRACTICE, AIRCRAFT, FLAME, 10 lb., Mk. IV

Comparison with the Mk. I smoke bomb

27. This bomb is similar in construction to the Mk. I smoke bomb and the information contained in para. 3 to 10 for the Mk. I bomb applies equally to this bomb except in the following respects:—

- (i) The tail cone is closed at one end, with elimination of the tail plug, and a tail adapter welded to the tail cone and tail tube secures the tail assembly to the bomb. The steel central plug is bored centrally to accommodate a large filling plug, which is screwed in position and held secure by a locking ring. The filling plug is provided with a leather sealing washer.
- (ii) The central tube, which does not extend the whole length of the tail cone, is mounted in a hole in the filling plug. The tube, with the recessed portion of the filling plug, accommodates the detonator-burster when the bomb is fuzed.
- (iii) The bomb is filled with sodium phosphide soaked in heavy oil, the weight of the filling being 12-13 oz.

28. The particulars of identification colouring and markings, functioning, and supply, given in para. 11 to 16, also apply to this bomb except for the following differences:—

- (i) The exterior of the bomb body is painted white, with a red band $\frac{1}{2}$ in. wide painted round the nose, whilst the tail is painted red and has the word "FLAME" stencilled on it.
- (ii) The appropriate mark number is indicated on the bomb.
- (iii) The bomb functions as described in para. 14 and 15 except that the sodium phosphide/oil filling, on contact with water, ignites to produce a flame of short duration (about 15 sec.).

Storage

29. The bombs are classified, for storage and transport purposes, as "Dangerous Goods". They must be stored in their boxes under cover; if roofed storage is not available, the boxed bombs may be stored in the open under tarpaulins. Battens are to be used in all instances to raise the boxes clear of the ground, and dry storage is essential. The bombs are to be examined periodically for leakage.

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A.P.1661B, Vol. I, Sect. 8, Chap. 8

APPENDIX 1

INSTRUCTIONS FOR USE

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Fuzing a bomb

1. To fuz a 10 lb. practice bomb, proceed as follows:—
 - (i) The nose portion of the bomb is to be examined visually to ensure that all safety devices are present, and correctly positioned.
 - (ii) Slacken the grub screw and unscrew the nose from the tail cone, holding the rear portion of the bomb by the tail cone and *not* by the cylindrical vane.

Note.—When fuzing a smoke or flame bomb, the filling plug and detonator-burster holder must be examined for signs of corrosion and/or leakage of the filling. If there are any signs of corrosion or leakage, the bomb must not be used, but set aside for A.I.S. inspection.
 - (iii) Ensure that the shear wire is present, and that the point of the striker does not protrude beyond the guide bush.
 - (iv) Clean the detonator-burster holder with a clean dry cloth.
 - (v) Gauge the detonator-burster holder, using a No. 17, Mk. I detonator cavity gauge; if the gauge will not enter freely, the bomb is to be set aside for A.I.S. inspection.
 - (vi) Insert a No. 28, Mk. I or II detonator-burster into the detonator-burster holder. Due to the possibility of over-size detonator-bursters occurring, force must not be used when inserting the detonator-burster; if any difficulty is found, the bomb and detonator-burster are to be set aside for A.I.S. inspection.
 - (vii) Replace the nose by screwing it fully home and locking it with the grub screw.

Loading the bomb on to a Light Series bomb carrier

2. The fuzed bomb is to be loaded on to the Light Series bomb carrier as described in A.P. 1664, Vol. I, Chap. 2, so that the safety plunger is depressed by contact with the underside of the front crutch of the carrier. The safety plunger is thus engaged with the groove in the striker head, maintaining the striker assembly in the "safe" position while the bomb is being carried on the aircraft.

3. When the bomb is securely in position on the bomb carrier, and immediately before the aircraft takes off, remove the safety wire and transit safety pin and hand the latter either to the pilot or the air bomber. The transit safety pin is then available for insertion into the bomb should the bomb not be expended.

Unloading the bomb from the Light Series bomb carrier

4. Before unloading the bomb, replace the transit safety pin in the nose end of the bomb. Then engage a length of 20 S.W.G. copper wire in the slotted end of the safety plunger, pass each end of the wire through the eye of the transit safety pin, and twist the two ends of the wire together so as to retain the safety plunger in position, taking care that the wire is tight enough to prevent the transit safety pin being withdrawn from its groove in the striker head.

Note.—This procedure is to be followed for all practice bombs on the aircraft before any bomb is unloaded. On no account is a bomb to be rendered safe and unloaded individually.

5. Unload the bomb from the bomb carrier as described in A.P.1664, Vol. I, Chap. 2.

Warning.—Unexpended bombs must be unfuzed as soon as possible, and must not be stored with detonator-bursters in position. Should it be required, however, to hold bombs for "ready-use", the instructions given in Chap. 1 of this Section must be followed. (A.L.124)
must be followed.

Unfuzing the bomb

6. Before unfuzing the bomb, ensure that it has been rendered safe, as described in para. 4, then proceed as follows:—

- (i) Slacken the grub screw and unscrew the nose from the tail cone, holding the rear portion of the bomb by the tail cone and *not* by the cylindrical vane.
- (ii) Without using undue force, carefully remove the detonator-burster. If difficulty is experienced, the bomb must be treated as unserviceable and must be destroyed as described in A.P.2608A, Chap. 19.
- (iii) Replace the nose by screwing it fully home and locking with the grub screw.

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A.P.1661B, Vol. I, Sect. 8

CHAPTER 7

BOMB, PRACTICE, AIRCRAFT, SMOKE, BREAK-UP, 8 lb., Mk. I

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Fig.

1. Broken perspective view of Mk. I bomb

CHAPTER 8—Bombs, practice, aircraft, smoke, 25 lb., Mk. I, and flash, 25 lb., Mk. III.
(A.L.108)

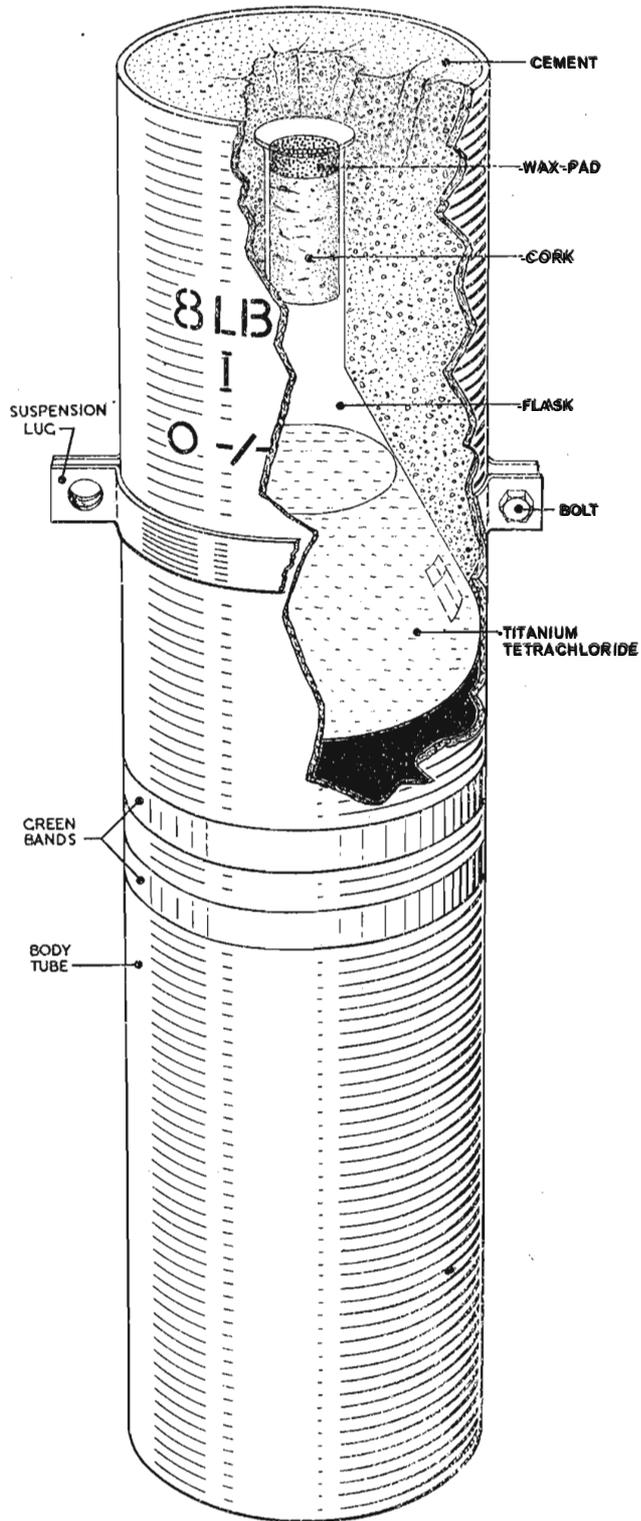


Fig. 1.—Broken perspective view of Mk. I bomb

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A.P.1661B, Vol. I, Sect. 8

CHAPTER 7

BOMB, PRACTICE, AIRCRAFT, SMOKE, BREAK-UP, 8 lb., Mk. I

Introduction

1. This bomb is for use for low level training purposes, up to heights of 2,000 ft., against airfield targets, and is not for use as an alternative to other types of break-up practice bombs used for general training purposes. The design of the bomb is such that on break-up no debris is left which might be injurious to the tyres of taxiing aircraft.

2. The bomb is ready for use as issued, and no fuze components are required.

General precautions

3. Because of the fragile nature of the bomb, particular care must be taken to avoid rough usage during transport, storage, and handling.

4. The liquid charging (titanium tetrachloride) in the bomb is not classed as toxic, but it evolves fumes and smoke which are injurious and extremely corrosive in character. As a result certain general precautions are to be observed when handling the bombs. Attention is directed, therefore, to the general precautions detailed in Chap. 1 of this Section.

Leading particulars

| | | | | | |
|--|-----|-----|-----|-----|--|
| 5. Stores Ref. of filled bomb | ... | ... | ... | ... | 12B/486 |
| Overall length | ... | ... | ... | ... | 16.5 in. |
| Maximum diameter (excluding suspension band) | ... | ... | ... | ... | 4.2 in. |
| Volume and nature of filling | ... | ... | ... | ... | 300 c.c. Titanium tetrachloride (F.M.) |

General description, fig. 1

6. The bomb consists of two main parts, namely, the body, which consists of an asbestos-cement tube, and a glass flask containing the titanium tetrachloride. The flask is sealed by a cork and a wax pad, and is cemented into the nose end of the body tube. The rear portion of the body is hollow, and acts as a tail unit to the bomb. A suspension band is secured to the body tube by a nut and bolt.

Identification colouring and markings

7. The exterior of the bomb is painted white, and two green bands, $\frac{1}{2}$ in. wide, are painted round the rear portion of the body tube. In front of the suspension band the following markings are stencilled in black:—

- (i) "8 lb. I", denoting the weight, and the mark of the bomb.
- (ii) Monogram, initials or recognized trade mark of manufacturer.
- (iii) Date of filling (month and year).

Functioning

8. On impact of the bomb with its target, the bomb body and glass flask break up, releasing the filling which, on contact with the air, forms a smoke cloud. The fragments of bomb remaining after impact are easily crushed, and are not, therefore, injurious to aircraft tyres.

Instructions for use

9. The bomb is attached to the Light Series carrier in the normal manner, as detailed in the relevant Chapter of A.P. 1664, Vol. I. No special attachments are required, and four bombs may be loaded on to one carrier.

Supply

10. The bombs are supplied filled, and are packed four in Box B.533. The stowage dimensions of this box are 25 in. x 18.5 in. x 6 in., and the filled weight is approximately 50 lb. The bombs are not suitable for supply overseas and, pending further instructions, all issues will be restricted to Home Units.

Warning.—The bombs are not suitable for transport by rail, and transport must be restricted to road vehicles. (A.L.117)

Storage

11. The bombs are to be stored in their boxes, preferably in open-sided sheds. If this accommodation is not available, the boxed bombs should be stored under tarpaulins, the boxes being raised from the ground on battens.

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A.P.1661B, Vol. I, Sect. 8

CHAPTER 8

BOMBS, PRACTICE, AIRCRAFT, SMOKE, 25 lb., Mk. I, and FLASH, 25 lb., Mk. III

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smoke 1½ lb., Mk. I (South African Manufacture). (A.L.109)

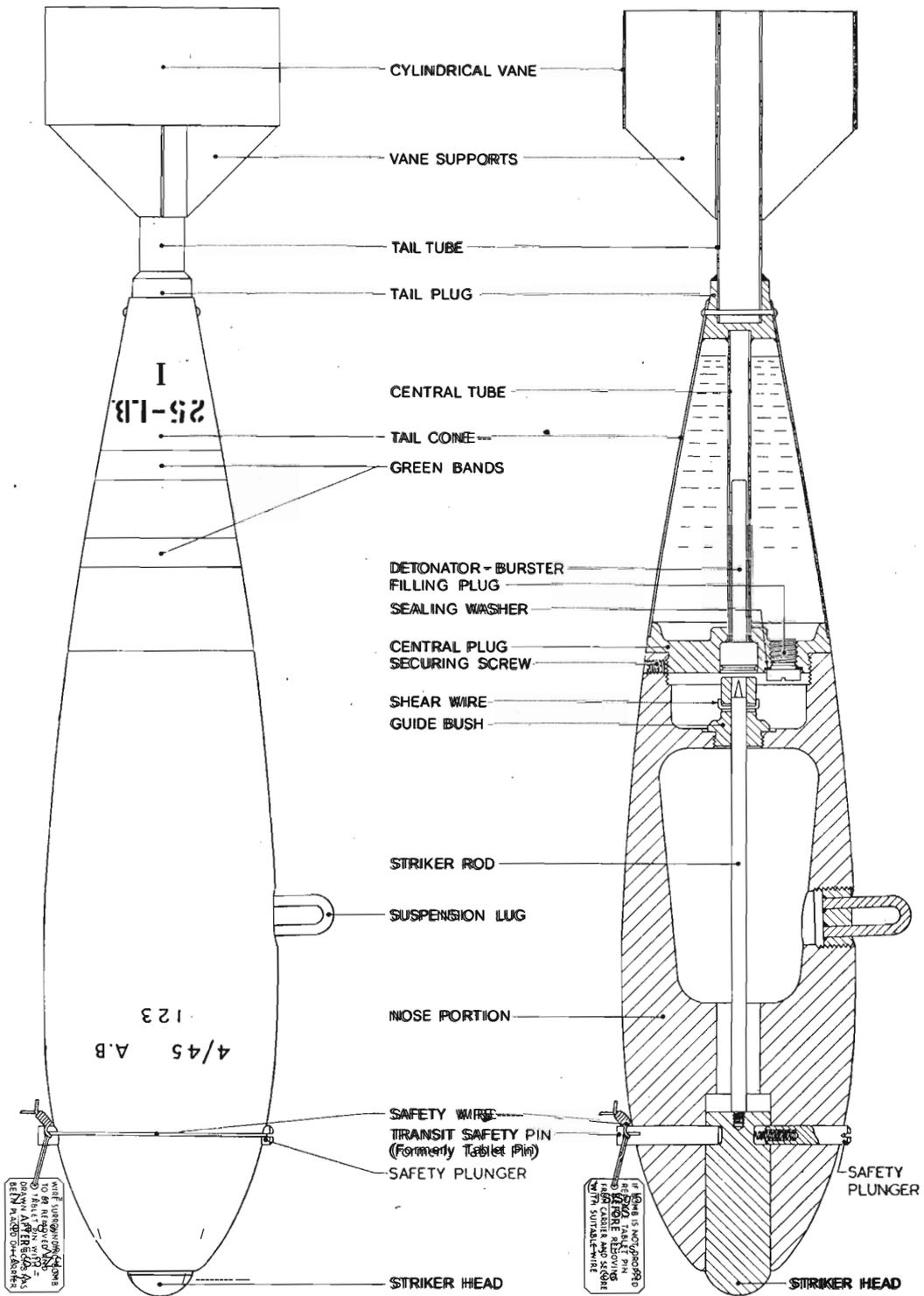


Fig. 1.—Bomb, practice, aircraft, smoke, 25 lb., Mk. I

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CHAPTER 8

BOMBS, PRACTICE, AIRCRAFT, SMOKE, 25 lb., Mk. I, and FLASH, 25 lb., Mk. HI

Introduction

1. Attention is directed to Chap. 1 of this Section in which some general information, including precautions, applicable to these bombs is given.

2. These bombs are for use in high level practice bombing with the Mk. XIV bombsight, both bombs having a terminal velocity of over 1,000 ft. per sec.

3. The smoke bomb is for use by day, the point of impact with the target being indicated by a cloud of white smoke. The flash bomb is intended for night bombing practice, and on impact with the target produces a brilliant white flash.

Warning.—The bombs must not be used against armoured motor boats, or other lightly armoured targets, where penetration, by the cast-iron nose, may cause injury to personnel, or other damage. Against such targets, the 8½ lb. break-up practice bomb should be used for low altitude practice bombing, and the 11½ lb. practice bomb for high altitude practice bombing, noting however the restriction given in Chap. 2 of this Section.

BOMB, PRACTICE, AIRCRAFT, SMOKE, 25 lb., Mk. I

Leading particulars

| | | | | | |
|------------------------------|-----|-----|-----|-----|------------------------------|
| 4. Stores Ref. of empty bomb | ... | ... | ... | ... | 12B/487 |
| Stores Ref. of filled bomb | ... | ... | ... | ... | 12B/488 |
| Overall length | ... | ... | ... | ... | 22 in. |
| Maximum diameter | ... | ... | ... | ... | 4 in. |
| Weight of filled bomb | ... | ... | ... | ... | 25 lb. |
| Weight and nature of filling | ... | ... | ... | ... | 1 lb. Titanium tetrachloride |
| Terminal velocity | ... | ... | ... | ... | 1,085 ft. per sec. |

General description, fig. 11

5. The bomb consists of two main parts, namely, a cast-iron nose portion, which is fitted with a striker assembly and safety devices, and a steel tail cone, tinned internally to prevent corrosion by the filling. The tail cone constitutes a container for the filling. A central tube in the tail cone provides a housing for a detonator-burster.

Nose portion

6. The cast-iron nose portion has an axial bore which houses the striker assembly. Radial holes, leading into the bore, accommodate a safety plunger and a transit safety pin.

7. The rear end of the nose portion is internally threaded to receive the tail cone, which is locked in position by a securing screw. A suspension lug is screwed into the nose portion.

Striker assembly and safety devices

8. The striker assembly consists of a striker rod and striker head. The forward end of the head conforms with the contour of the nose, and at the rear end of the head is an annular groove with which the transit safety pin and safety plunger engage.

9. The striker rod is screwed into the rear end of the striker head, and extends through the nose portion into a guide bush, screwed into the rear end of the nose portion. A shear wire passes through the guide bush and striker rod.

10. The safety devices consist of the transit safety pin, the safety plunger, and the shear wire.

11. Both the transit safety pin and the safety plunger are retained in position in the nose portion by a safety wire, see fig. 11, the transit safety pin engaging with the groove in the striker head to retain the striker assembly in the "safe" position. The safety plunger engages with the groove in the striker head only after the bomb has been loaded on to an aircraft, the pin then being depressed into the groove by contact with the underside of the front crutch of the bomb carrier. An instruction tablet is attached to the transit safety pin by a split ring.

Tail cone

12. The tail cone is of steel construction and is closed at its rear end by a tail plug and at its forward end by a central plug which is screwed and locked into the rear end of the nose portion of the bomb.

13. The cast-iron or steel central plug is bored to accommodate a central tube, which extends through the tail cone to the tail plug. The central tube forms a holder for a detonator-burster No. 28, Mk. I or II, when the bomb is fuzed.

14. A tapped hole, fitted with a steel plug and lead sealing washer, is provided in the central plug for filling purposes.

15. The tail assembly projects from the tail plug and consists of a tail tube which has four vane supports carrying a cylindrical vane.

Identification colouring and markings

16. The exterior of the bomb, except the lug, is painted white and, when the bomb is filled, two green bands, $\frac{1}{2}$ in. wide, are painted round the tail cone. On the nose portion, in front of the suspension lug, are stamped the following markings:—

- (i) "25 lb. I".
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture (month and year).

17. The following markings are stencilled on the nose portion:—

- (i) The monogram of the filling station or the initials or recognized trade mark of the filling contractor.
- (ii) The date of filling (month and year).
- (iii) The lot number.

18. The marking "25 lb." is stencilled on the tail cone, together with the following information:—

- (i) "I", indicating the mark number of the bomb.

Functioning

19. When the bomb is released from the bomb carrier, the safety plunger is ejected by its spring, leaving the striker held in the "safe" position by the shear wire only, the transit safety pin and safety wire having been removed before take-off.

20. On impact of the bomb with the target, the striker head and the striker rod are forced inwards so as to break the shear wire and fire the detonator-burster. The explosion of the detonator-burster disrupts the tail cone and scatters the filling which, on contact with the atmosphere, produces a white smoke cloud at the point of impact.

Supply

21. The bombs are supplied packed four in box B.537, Mk. I (Stores Ref. 12S/820). The stowage dimensions of the box are 26 $\frac{1}{2}$ in. x 21 in. x 7 $\frac{1}{2}$ in., and its filled weight is 128 lb.

Storage

22. The bombs are classified, for storage and transport purposes, as "Dangerous Stores." They must be stored in their boxes, preferably in open-sided sheds. If this accommodation is not available, the boxes should be stored on battens under tarpaulins. As the likelihood of leakage of the filling increases with the age of the filled bomb, bombs which have been longest in store should be used first, and storage arrangements to facilitate this should be made. All bombs should be used within a year of filling.

BOMB, PRACTICE, AIRCRAFT, FLASH, 25 lb., Mk. III**Comparison with the Mk. I smoke bomb**

23. The information contained in paraa. 1 to 3, and paraa. 5 to 15, applies equally to this bomb, except that this bomb always has a moulded plastic filling plug, with leather washer, and a flash filling.

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24. The leading particulars for this bomb are the same as those given in para. 4 for the Mk. I smoke bomb, except as follows:—

| | | |
|------------------------------|--------|------------------------|
| Stores Ref. of empty bomb | ... .. | 12B/492 |
| Stores Ref. of filled bomb | ... .. | 12B/489 (A.L.133) |
| Weight and nature of filling | ... .. | 9 oz. S.R. Composition |

25. The particulars of nomenclature, colouring and markings, functioning and supply given in para. 16 to 21 also apply to this bomb except for the following differences:—

- (i) The filled bombs have a red ring painted round the nose and two $\frac{1}{2}$ in. black bands painted round the tail cone.
- (ii) The appropriate mark number is indicated on the bomb.
- (iii) The bomb functions as described in para. 19 and 20, except that the flash from the detonator-burster ignites the filling to produce a brilliant white flash.

Storage

26. The bombs are classified, for the purpose of storage, in Group 9, Category Y, see A.P. 2608A Chap. 7.

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APPENDIX 1

INSTRUCTIONS FOR USE

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Fuzing a bomb

1. To fuze a 25 lb. practice bomb, proceed as follows:—
 - (i) Visually examine the nose portion of the bomb to ensure that both the safety plunger and the transit safety pin are present, and correctly positioned.
 - (ii) Slacken the securing screw and unscrew the nose portion from the tail cone, holding the rear portion of the bomb by the tail cone and NOT by the cylindrical vane.

Note.—When fuzing a smoke bomb, the filling plug and detonator-burster holder must be examined for signs of corrosion and/or leakage of the filling. If there are any signs of leakage or corrosion, the bomb must not be used, but set aside for A.I.D./A.I.S. inspection.
 - (iii) Ensure that the shear wire is present, and that the point of the striker does not protrude beyond the guide bush.
 - (iv) Clean the detonator-burster holder with a dry clean cloth.
 - (v) Insert a detonator-burster, aircraft bomb, No. 28, Mk. I (Stores Ref. 12G/848 or 12G/207), or Mk. II (Stores Ref. 12G/1145 or 12G/1146), into the detonator-burster holder.
 - (vi) Re-assemble the bomb by screwing the nose portion fully home on to the tail cone and locking with the securing screw.

Loading the bomb on to the Light Series bomb carrier

2. The fuzed bomb is to be loaded on to the Light Series bomb carrier as described in A.P. 1664, Vol. I, Chap. 2, so that the safety plunger is depressed by contact with the underside of the front crutch of the carrier. The safety plunger is thus engaged with the groove in the striker head, maintaining the striker rod in the "safe" position whilst the bomb is being carried on the aircraft.
3. When the bomb is finally in position on the bomb carrier, and immediately before the aircraft takes off, remove the safety wire and transit safety pin and hand the latter either to the pilot or the air bomber. The transit safety pin is then available for insertion into the bomb should it not be expended.

Unloading the bomb from the Light Series bomb carrier

4. Before unloading the bomb, replace the transit safety pin in the nose portion of the bomb. Then engage a length of 20 S.W.G. copper wire in the slotted end of the safety plunger, pass each end of the wire through the eye of the transit safety pin, and twist the ends of the wire together so as to retain the transit safety pin in position, taking care that the wire is tight enough to prevent the transit safety pin from being withdrawn from its groove in the striker head.

Note.—This procedure is to be followed for all practice bombs loaded on the aircraft before any bomb is unloaded.

5. Unload the bomb from the bomb carrier as described in APP 1664, Vol. I, Chap. 12.
Warning.—Unexpended bombs must be unfuzed as soon as possible, and must not be stored with detonator-bursters in position. Should it be required, however, to hold bombs for "ready-use", the instructions given in Chap. 1 of this Section must be followed. (A.L. 124)

Unfuzing the bomb

6. Before unfuzing the bomb, ensure that it has been rendered safe, as described in para. 4, then proceed as follows:—
 - (i) Slacken the securing screw and unscrew the nose portion from the tail cone, holding the rear portion of the bomb by the tail cone and NOT by the cylindrical vane.

- (ii) Remove the detonator-burster. Force must not be used in removing the detonator-burster. If difficulty is experienced in so doing, the bomb must be treated as unserviceable and must be destroyed as described in A.P. 2608 A, Chap. 19.
- (iii) Re-assemble the bomb by screwing the nose portion fully home on to the tail cone and locking with the securing screw.

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CHAPTER 9

BOMBS, PRACTICE, AIRCRAFT, SMOKE, 10 lb., Mk. I; FLASH, 10 lb., Mk. III; and SMOKE, 11½ lb., Mk. I (South African Manufacture)

1. Attention is directed to Chapter 1 of this Section in which some general information applicable to these bombs is given.

2. These practice bombs, of South African manufacture, are issued under the same Stores Reference numbers as, and concurrently with, the corresponding practice bombs of British manufacture. For a description of the latter, reference should be made to Chapters 2 and 6 of this Section.

3. Externally, the South African bombs are similar to the British bombs, except that they are *not* provided with a grub screw for securing the tail cone portion to the nose casting. Due to this difference, particular care must be taken when fuzing these bombs to ensure that, after inserting the detonator-burster, the nose casting and tail cone are screwed tightly together. There are also minor internal constructional differences between the South African and British bombs, but these in no way affect the instructions for their use.

4. The smoke filling of bombs manufactured and filled in South Africa is chlorosulphonic acid, but for empty bombs supplied to, and filled in, the United Kingdom titanium tetrachloride is used. It should be noted that the smoke cloud produced by a bomb filled with chlorosulphonic acid takes longer to form and is slightly less dense than that obtained by using a bomb containing titanium tetrachloride. The flash filling of bombs manufactured and filled in South Africa is barium nitrate, zinc dust, and gunpowder.

5. The bombs bear the same markings as the British equivalents, except that South African flash filled bombs have, in addition, "S.A." stencilled on the tail vane after the mark number, and these letters also appear on the Box in which the bombs are packed. The South African flash filled bombs are specially marked in this way to distinguish them from flash bombs of British manufacture, which contain a flash filling of much more sensitive composition.

Note.—Early issues of 10 lb. "S.A." flash filled bombs were stencilled Mk. I.

6. The terminal velocities of the bombs, and the bomb sight settings to be used, are the same as for the corresponding British types.

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CHAPTER 10

BOMBS, PRACTICE, AIRCRAFT, SMOKE, 25 lb., Mk. I*** and IV, and FLASH, 25 lb., Mk. III** and V

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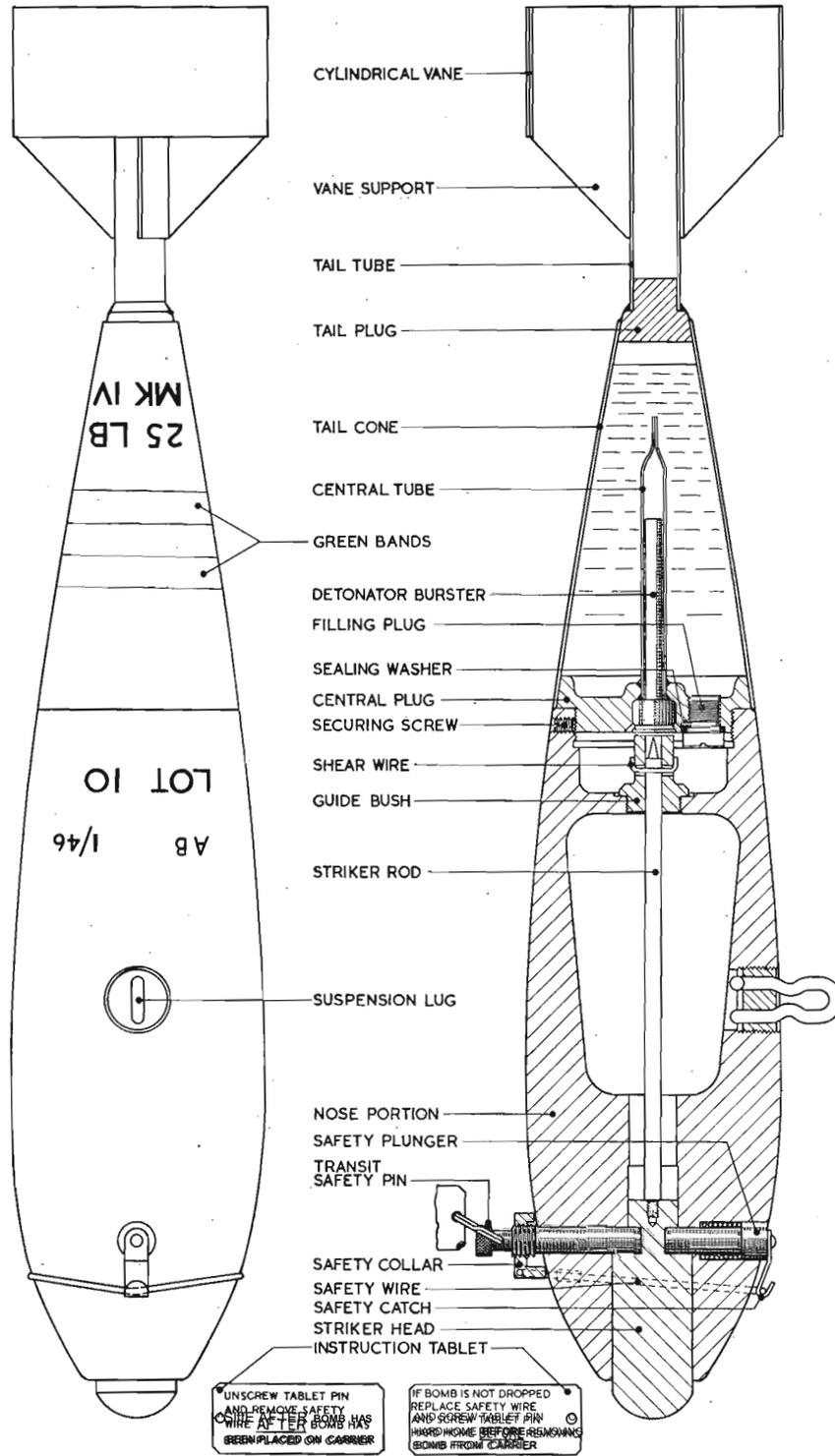


Fig. 1.—External and sectional views of Mk. IV bomb

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CHAPTER 10

BOMBS, PRACTICE, AIRCRAFT, SMOKE, 25 lb., Mk. I*** and IV, and FLASH, 25 lb., Mk. III*** and V

Introduction

1. Attention is directed to Chapter V of this section for general information, including precautions, applicable to these bombs.

2. These bombs are similar to the 25 lb. Mk. I and III practice bombs, described in Chapter 8 of this section, but differ in that they incorporate improved safety devices, which render the bombs safer to handle and which are more easily replaced should it be necessary to unload a bomb from the bomb carrier. The Mk. I*** and III*** bombs are converted Mk. I and III bombs, respectively, whereas the Mk. IV and V bombs are manufactured to the modified design. Like the earlier marks of 25 lb. practice bomb, these bombs are for use in high level practice bombing with the Mk. XIV bomb sight.

3. The smoke bombs are for use by day, the point of impact with the target being indicated by a cloud of white smoke. The flash bombs are intended for night bombing practice, and on impact with the target produce a brilliant white flash.

Warning.—The bombs must not be used against armoured motor boats, or other lightly armoured targets where penetration, by the cast-iron nose, may cause injury to personnel, or other damage. Against such targets the 8½ lb. break-up practice bomb should be used for low altitude practice bombing, and the 11½ lb. practice bomb for high altitude practice bombing, noting however the restriction given in Chap. 2 of this Section.

BOMBS, PRACTICE, AIRCRAFT, SMOKE, 25 lb., Mk. I*** and IV

Leading particulars

| | | |
|------------------------------|--------|----------------------------------|
| 4. Overall length | ... .. | ... 1 ft. 10 in. |
| Maximum diameter | ... .. | ... 4 in. |
| Weight and nature of filling | ... .. | ... 1 lb. titanium tetrachloride |
| Weight of filled bomb | ... .. | ... 25 lb. |
| Terminal velocity | ... .. | ... 1,085 ft. per sec. |

General description, fig. 1

5. The bombs consist of two main parts, namely, a cast-iron nose portion, fitted with a striker assembly and safety devices, and a tail cone, which constitutes a container for the filling. A central tube in the tail cone provides a housing for a detonator-burster and a tail plug carries the tail assembly.

Nose portion

6. The nose portion is bored to accommodate the striker assembly and safety devices, and is threaded at its rear end to receive the tail cone, which is locked in position by a securing screw. A suspension lug is screwed into the nose portion.

Striker assembly and safety devices

7. The striker assembly consists of a striker head and a striker rod. The striker head, made of steel, is reduced in diameter at its rear end, and has a single groove, which registers with two radial holes in the nose portion of the bomb. One end of the striker rod is screwed into the rear end of the striker head while the opposite and pointed end of the rod is housed in a guide bush screwed into the rear end of the nose portion. A shear wire passes through the guide bush and striker rod.

8. The safety devices consist of a safety wire, which is a loop of flexible steel wire to which a tapped safety collar is attached, a screwed transit safety pin, a spring-loaded safety plunger and the shear wire. During transit, storage, and handling, these safety devices remain fitted to the bomb, as shown in fig. 1; the safety wire passes over a hooked safety catch secured to one end of the safety plunger and the safety collar receives the transit safety pin. In this way, the safety plunger and transit safety pin are held so as to register with the groove in the striker head thus maintaining the striker assembly in the "safe" position. When the bomb is loaded on to the aircraft, the safety wire

and transit safety pin are removed prior to "Take-off", but the safety plunger continues to engage with the striker head, due to contact with the front crutch of the carrier, until the bomb is released from the aircraft. An instruction tablet, the wording on which is shown in fig. 1, is attached to the transit safety pin by a split ring.

Tail cone

9. The tail cone is of steel construction and is tinned internally to prevent corrosion by the filling. It is closed at its rear end by a tail plug and at its forward end by a central plug, screwed and locked into the rear end of the nose portion of the bomb. The tail and central plugs are made either of cast-iron or steel.

10. The central plug is bored to accommodate a central tube, which, with the recessed portion of the plug, forms a holder for a No. 28, Mk. I or II detonator-burster when the bomb is fuzeed. A tapped hole, fitted with a steel plug and lead sealing washer, is provided in the central plug for filling purposes.

11. The tail assembly projects from the tail plug and consists of a tail tube which has four vane supports carrying a cylindrical vane.

Identification colouring and markings

12. The exterior of the bomb, except the lug, is painted white and, when the bomb is filled, two green bands, $\frac{1}{2}$ in. wide, are painted round the tail cone.

13. The marking "25 I****" or "25 IV", indicating the weight and mark number, is stencilled on the tail cone. In addition, the following information is stencilled on the nose portion behind the suspension lug:—

- (i) The monogram of the filling station or the initials or recognized trade mark of the filling contractor.
- (ii) The date of filling (month and year),
- (iii) The Lot number.

Functioning

14. When the bomb is released from the bomb carrier, the safety plunger is ejected by its spring, leaving the striker held in the "safe" position by the shear wire only, the transit safety pin and safety wire having been removed before "Take-off".

15. On impact of the bomb with the target, the striker head and the striker rod are forced inwards breaking the shear wire and firing the detonator-burster. The explosion of the detonator-burster disrupts the tail cone and scatters the filling which, on contact with the atmosphere, produces a white smoke cloud at the point of impact.

Supply

16. The bombs are supplied packed four in Box B.537, Mk. I. The stowage dimensions of the box are 26 $\frac{1}{2}$ in. x 21 in. x 7 $\frac{1}{2}$ in., and its filled weight is 128 lb.

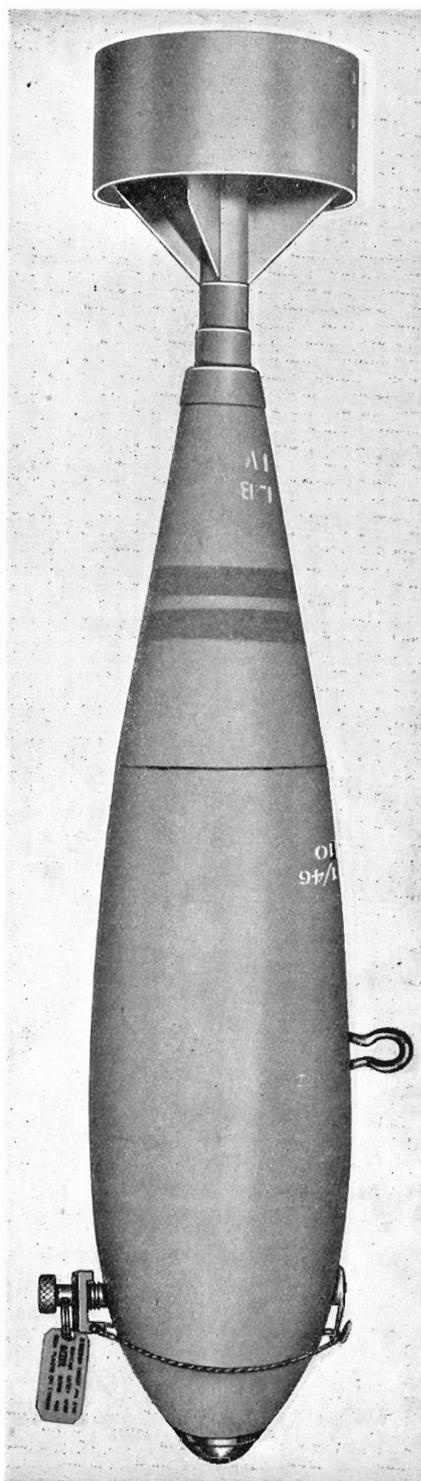


Fig. 2.—Bomb, practice, aircraft, smoke, 25 lb., Mk. IV

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A.P.P. 6611B, Vol. II, Sect. 5, Chap. 110

Storage

17. The bombs are classified, for storage and transport purposes, as "Dangerous Goods". They must be stored in their boxes, preferably in open-sided sheds. If this accommodation is not available, the boxes should be stored on battens under tarpaulins. As the likelihood of leakage of the filling increases with the age of the filled bomb, bombs which have been longest in store should be used first, and storage arrangements to facilitate this should be made. All bombs should be used within a year of filling.

BOMBS, PRACTICE, AIRCRAFT, FLASH, 25 lb., Mk. III** and V

Comparison with the Mk. I*** and IV smoke bombs

18. The information contained in para. 4 to 16 applies equally to these bombs, which are identical with the corresponding smoke bombs except for the following differences:—

- (i) The bombs are filled with an S.R. composition, the weight of the filling being 9 oz. The bombs function as described in para. 14 and 15, except that the flash from the detonator-burster ignites the filling to produce a brilliant white flash.
- (ii) The filling plug is of moulded plastic material, with a leather washer, and the central and tail plugs are always of steel.
- (iii) The filled bombs have a red ring painted round the nose and two $\frac{1}{2}$ in. black bands painted round the tail cone, and the marking "S.R.541B" is stencilled on the bomb body behind the suspension lug.
- (iv) The appropriate mark number is indicated on the bomb.

Storage

19. The bombs are classified, for the purpose of storage, in Group 9, Category Y. (See A.P.2608A, Chap. 7).

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RESTRICTED

AIR
MINISTRY

APPENDIX 1

INSTRUCTIONS FOR USE

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| Unloading the bomb from the Light Series bomb carrier | 4 |
| Unfuzing the bomb | 6 |

Fuzing a bomb

1. To fuze a bomb, proceed as follows :—

- (1) Visually examine the nose portion of the bomb to ensure that the safety wire, transit safety pin, and safety plunger are present, and correctly positioned.
- (2) Slacken the securing screw and unscrew the nose portion from the tail cone, holding the rear portion of the bomb by the tail cone and *not* by the cylindrical vane.

Note.—When fuzing a smoke bomb, the filling plug and detonator-burster holder must be examined for signs of corrosion and/or leakage of the filling. If there are any signs of leakage or corrosion, the bomb must not be used, but must be set aside for A.I.S. inspection.

- (3) Ensure that the shear wire is present, and that the point of the striker does not protrude beyond the guide bush.
- (4) Clean the detonator-burster holder with a clean dry cloth.
- (5) Gauge the detonator-burster holder, using a No. 17, Mk. I detonator cavity gauge; if the gauge will not enter freely, the bomb is to be set aside for A.I.S. inspection.
- (6) Insert a No. 28, Mk. I or II detonator-burster into the detonator-burster holder. Due to the possibility of over-size detonator-bursters occurring, force must not be used when inserting the detonator-burster and, if any difficulty is found, the bomb and detonator-burster are to be set aside for A.I.S. inspection.
- (7) Re-assemble the bomb by screwing the nose portion fully home on to the tail cone and locking with the securing screw.
- (8) Test the assembly by attempting to unscrew the tail cone, by hand, from the nose portion. If the tail cone can be unscrewed even the smallest amount, the bomb is to be unfuzed, as described in para. 6, and set aside for A.I.S. inspection.

Loading the bomb on to a Light Series bomb carrier

2. The fuzed bomb is to be loaded on to the Light Series bomb carrier as described in A.P. 1664, Vol. I, Chap. 2, so that the front crutch of the carrier bears on the safety plunger and will, therefore, retain the plunger in position when the safety wire is removed. The safety plunger thus remains engaged with the groove in the striker head, maintaining the striker assembly in the "safe" position while the bomb is being carried on the aircraft.

3. When the bomb is securely positioned on the bomb carrier, and immediately before the aircraft takes off, unscrew the transit safety pin and remove the safety wire. Hand the safety pin and wire to the pilot or air bomber.

Unloading the bomb from the Light Series bomb carrier

4. Before unloading the bomb, fit the safety wire over the nose of the bomb so that it engages with the safety catch and so that the collar seats over the hole used to receive the transit safety pin. Then insert the transit safety pin and screw it fully home, ensuring that the safety wire is drawn taut around the nose of the bomb.

Note.—This procedure is to be followed for all practice bombs loaded on the aircraft before any bomb is unloaded. On no account is a bomb to be rendered safe and unloaded individually.

BOMBS
 This is A.L. No. 142 to A.P.1661B, Vol. I
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 and substitute this Appendix 1. When you have done this, make an
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ARMAMENT

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February, 1948

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APPENDIX 1

INSTRUCTIONS FOR USE

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Fuzing a bomb

1. To fuze a bomb, proceed as follows:—

- (1) Visually examine the nose portion of the bomb to ensure that the safety wire, transit safety pin, and safety plunger are present, and correctly positioned.
- (2) Slacken the securing screw and unscrew the nose portion from the tail cone, holding the rear portion of the bomb by the tail cone and *not* by the cylindrical vane.

Note.—When fuzing a smoke bomb, the filling plug and detonator-burster holder must be examined for signs of corrosion and/or leakage of the filling. If there are any signs of leakage or corrosion, the bomb must not be used, but must be set aside for A.I.S. inspection.

- (3) Ensure that the shear wire is present, and that the point of the striker does not protrude beyond the guide bush.
- (4) Clean the detonator-burster holder with a clean dry cloth.
- (5) Gauge the detonator-burster holder, using a No. 17, Mk. I detonator cavity gauge; if the gauge will not enter freely, the bomb is to be set aside for A.I.S. inspection.
- (6) Insert a No. 28, Mk. I or II detonator-burster into the detonator-burster holder. Due to the possibility of over-size detonator-bursters occurring, force must not be used when inserting the detonator-burster and, if any difficulty is found, the bomb and detonator-burster are to be set aside for A.I.S. inspection.
- (7) Re-assemble the bomb by screwing the nose portion fully home on to the tail cone and locking with the securing screw.
- (8) Test the assembly by attempting to unscrew the tail cone, by hand, from the nose portion. If the tail cone can be unscrewed even the smallest amount, the bomb is to be unfuzed, as described in para. 6, and set aside for A.I.S. inspection.

Loading the bomb on to a Light Series bomb carrier

2. The fuzed bomb is to be loaded on to the Light Series bomb carrier as described in A.P. 1664, Vol. I, Chap. 2, so that the front crutch of the carrier bears on the safety plunger and will, therefore, retain the plunger in position when the safety wire is removed. The safety plunger thus remains engaged with the groove in the striker head, maintaining the striker assembly in the "safe" position while the bomb is being carried on the aircraft.

3. When the bomb is securely positioned on the bomb carrier, and immediately before the aircraft takes off, unscrew the transit safety pin and remove the safety wire. Hand the safety pin and wire to the pilot or air bomber.

Unloading the bomb from the Light Series bomb carrier

4. Before unloading the bomb, fit the safety wire over the nose of the bomb so that it engages with the safety catch and so that the collar seats over the hole used to receive the transit safety pin. Then insert the transit safety pin and screw it fully home, ensuring that the safety wire is drawn taut around the nose of the bomb.

Note.—This procedure is to be followed for all practice bombs loaded on the aircraft before any bomb is unloaded. On no account is a bomb to be rendered safe and unloaded individually.

BOMBS

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Section 8, Chapter 10. Remove and dispose of the existing Appendix 1
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ARMAMENT

5. Unload the bomb from the bomb carrier as described in A.P. 1664, Vol. I, Chap. 2.

Warning.—Unexpended bombs must be unfuzed as soon as possible, and must not be stored with detonator-bursters in position. Should it be required, however, to hold bombs for "ready use", the instructions given in Chap. 11 of this section must be followed.

Unfuzing the bomb

6. Before unfuzing the bomb, ensure that it has been rendered safe, as described in para. 4, then proceed as follows:—

- (1) Slacken the securing screw and unscrew the nose portion from the tail cone, holding the rear portion of the bomb by the tail cone and *not* by the cylindrical vane.
- (2) Remove the detonator-burster. *Force must not be used in removing the detonator-burster* and if difficulty is experienced, the bomb must be treated as unserviceable and must be destroyed as described in A.P. 2608A, Chap. 19.
- (3) Re-assemble the bomb by screwing the nose portion fully home on to the tail cone and locking with the securing screw.

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Volume I

Section 9

H.C. BOMBS

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A.P.1661B, Vol. I

SECTION 9

H.C. BOMBS

LIST OF CHAPTERS

Note.—A list of contents appears at the beginning of each chapter.

- CHAPTER 1—General notes on H.C. bombs
- CHAPTER 2—Bomb, H.E., aircraft, H.C., 2,000 lb., Mk. I
- CHAPTER 3—Bomb, H.E., aircraft, H.C., 4,000 lb., Mk. I
- CHAPTER 4—Bomb, H.E., aircraft, H.C., 4,000 lb., Mk. II
- CHAPTER 5—Bomb, H.E., aircraft, H.C., 4,000 lb., Mk. III and IV
- CHAPTER 6—Bombs, H.E., aircraft, H.C., sectional, 8,000 lb., Mk. I and II
- CHAPTER 7—Bombs, H.E., aircraft, H.C., 2,000 lb., Mk. II and III
- CHAPTER 8—Bomb, H.E., aircraft, H.C., sectional, 12,000 lb., Mk. II

APPENDIX 1—Components used with H.C. bombs

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August, 1942
Relevant amendments up to A.L. 72
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January, 1944*

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CHAPTER 1

General notes on H.C. bombs

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CHAPTER 1

General notes on H.C. bombs

Introduction

1. At the present time, two types of H.C. bombs are in use in the Service, namely, the 2,000 lb. and 4,000 lb. bombs. These bombs are thin-walled and have a high charge/weight ratio. They are used for general bombardment purposes on operations where the maximum damage by blast is required.

2. The earlier marks of the bombs are provided with side fuzing positions, which are used only for special operations, the bombs normally being fuzed only at the nose. Later marks of the 4,000 lb. bomb are provided with three nose fuzing positions.

3. All types of H.C. bombs are provided with nose attachments for stabilizing the flight of the bomb. The 4,000 lb. bomb is fitted with a drum tail, and the 2,000 lb. bomb may be fitted with either a drum tail or a parachute attachment.

4. Central tubes are at present fitted in all types of H.C. bombs, and where side fuzing positions, or nose fuzing positions offset from the axis of the bomb are used, exploder tubes are used to connect these fuzing positions to the central tube.

Precautions to be observed when fuzing or unfuzing bombs

5. Attention is directed to the precautions detailed in Sect. 1, Chap. 1, which apply also to H.C. bombs.

Repair and examination

6. Only such repair and examination of bombs as is specified in Sect. 20, Chap. 1, is to be done by armament personnel. Any bomb found having major damage or defects is to be set aside for A.I.D. inspection.

7. Fuzed bombs, whether loaded on to aircraft, or stored in the fuzed bomb area, must be examined at the intervals stated in Sect. 20, Chap. 2.

Supply

8. H.C. bombs are supplied uncrated and are fitted with transit rings. All fuzing positions are plugged with transit plugs. Tails, nose attachments, and parachute attachments are supplied in separate packages.

Storage

9. The regulations governing the storage of H.C. bombs are given in A.P. 1245, Chap. 3. Tail units and nose attachments may be stored in the same explosives storehouse as the filled bombs, but packages containing them must be stacked well clear of the filled stores.

10. Parachute attachments are not to be stored in position on the bombs, but are to be stored in any suitable dry building.

11. The parachute attachment should be carefully handled at all times. If it shows signs of having been roughly handled, or having deteriorated in storage, it is not to be used, and should be returned, complete with all fittings, to the appropriate Maintenance Unit.

*This chapter issued with A.L. No. 48
January, 1943
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CHAPTER 2

BOMB, H.E., AIRCRAFT, H.C., 2,000 lb., Mk. I

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 4. Tail, bomb, aircraft, No. 32, Mk. I
 5. Protecting ring

CHAPTER 2

BOMB; H.E., AIRCRAFT, H.C., 2,000 lb., Mk. I

Introduction

1. The 2,000 lb., Mk. I H.C. bomb is a thin-cased blast bomb which is fitted with a nose attachment and a parachute attachment, or a tail, to stabilize its flight. It has a charge/weight ratio of approximately 70 per cent, and is provided with three fuze positions, one in the nose and two in the side near the rear end of the body.

Leading particulars

| | |
|---|------------------------|
| 2. Stores Ref. | 112A/7800 |
| Length, without parachute attachment, or tail ... | 8 ft. 3½ in. approx. |
| Maximum diameter ... | 11 ft. 6¾ in. approx. |
| Weight and nature of filling ... | 1,340 lb. amatol 60/40 |
| Terminal velocity of bomb fitted with tail ... | 830 ft. per sec. |

GENERAL DESCRIPTION

Bomb body, fig. 1

3. The bomb body consists of a cylindrical shell having a hollow conical nose piece welded to one end and a closing plate bolted to an angle ring welded in position at a short distance within the other end.

4. The cylindrical shell is strengthened circumferentially by a T-section ring welded to its inner surface at an approximately central position, the ends of the ring being welded to the opposite sides of a steel block which is welded to the interior of the shell. Tapped holes, for the securing screws of a locating plate or suspension lug, extend through the shell and into the steel block, and these holes are closed by transit screws which require to be removed when the locating plate or suspension lug is to be fitted.

5. The shell is strengthened longitudinally by two channel-section beams which are welded one to each end of the central steel block and to the interior of the shell.

6. The conical nose-piece has welded in its apex an adapter for an exploder container which is secured to the nose adapter by a locking screw. Over the rear portion of the exploder container is fitted and cemented a central tube which extends axially through the bomb body almost to the closing plate at the rear end.

7. The closing plate has a central adapter fitted with a screw-in plug which requires to be removed to give access to the central tube for exploding. Two drop handles are attached to the closing plate, one at each side of the adapter.

8. Small angle pieces are welded at equi-spaced positions around the inner rear edge of the cylindrical shell; these act in conjunction with correspondingly spaced members on the parachute attachment, or on the tail, to form a bayonet joint. One of these angle pieces carries a stop pin and a locking screw which passes through a tapped hole in the shell and angle piece.

9. Two exploder containers are mounted in adapters welded into the shell toward the rear end. These exploder containers extend radially into the bomb body, one on each side of the stiffening beam, their inner ends being close to the central tube. Their stems are enclosed in waxed paper tubes and the exploder containers are secured in the adapters by locking screws.

10. Each of the three exploder containers is fitted with a detonator holder which is locked in position by a locking screw and closed by a transit plug.

Filling

11. The main filling of the bomb consists of amatol 60/40 which occupies the internal space around the central tube and is sealed at the ends by layers of approved composition.

12. The central tube contains a column of eight 33½ oz. T.N.T. exploders which are held in position end-to-end and against the rear end of the exploder container in the nose. These are secured by a wooden distance piece retained in the rear end of the central tube by the plug in the closing plate adapter, and a felt disc, and millboard discs as necessary, are interposed between the wooden distance piece and the rear exploder to prevent axial movement of the exploders in the tube.

13. Each of the three exploder containers houses a 9 oz. 3 dr. T.N.T. exploder which is covered by a felt washer and retained in position by the detonator holder. Each detonator holder has a boxcloth washer secured in its inner end by shellac.

Nose attachment, No. 4, Mk. I, fig. 2

14. The nose attachment is a cylinder of light-gauge plate which fits over the forward end of the cylindrical shell of the bomb body and projects forwardly beyond it around the conical nose-piece. The ends of a metal strip forming the cylinder are overlapped and interconnected by guide screws, engaged in fixed nuts on one end and passed through slots in the other end. Portions of the ends of the strip near the rear edge are bent round to form bearings for the trunnion bars of a knuckle joint assembly with a clamping bolt whereby the nose attachment can be tightened on to the bomb body. Stops equi-spaced round the inside of the cylinder engage the nose-piece to determine the extent to which the nose attachment can be pushed on to the bomb body.

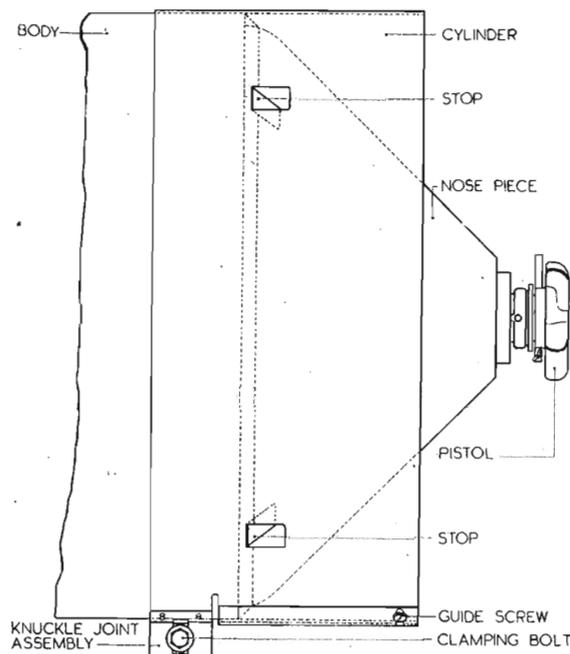


Fig. 2.—Attachment, nose, aircraft bomb, No. 4, Mk. I, fitted to bomb

Parachute attachment, No. 10, Mk. I or II, fig. 3

15. The parachute, which is 5 ft. 6 in. in diameter and is made of hessian, is vented at the peak and has rigging lines made of webbing which are connected, by shackles and pins, to lugs on a metal tray which is flanged and fits on to the rear end of the bomb body.

16. The lugs to which the rigging lines are attached are welded in slots in the tray and pass through the tray to constitute, on the forward side, a series of equi-spaced bayonet dogs which can be engaged with the angle pieces in the rear end of the bomb body to connect the parachute attachment to the bomb body.

17. The rigging lines are rolled up individually and the parachute is folded upon them on the tray and retained by a number of petal-like panels of waterproofed fabric eyeleted to a housing ring which is laced to the flange of the tray, the panels overlapping one another to enclose the folded parachute. The tip of the first panel to be laid over the folded parachute is provided with a wire loop and the tips of all the other panels have eyelets which are passed over the wire loop as the panels are laid over the folded parachute in turn. The panels are retained in their overlapped positions by a retaining pin which is connected to one end of a static cord in a fabric sleeve stitched on the outside of the last panel to be laid over; this end of the static cord is also connected by a fine hemp cord to the peak of the folded parachute. The static cord is coiled in a fabric pocket, combined with the fabric sleeve, and its outer end is fitted with a wire shackle for connection to the bomb carrier, or a convenient strong point on the aircraft. To prevent accidental withdrawal of the retaining pin, its head is connected by a thread to a fabric loop on one of the panels.

18. The Mk. II and III parachute attachments differ only in minor details, and they are enclosed, when in store, by a cover, protecting parachute attachment, No. 1, Mk. I (Stores Ref. 12A/956). This is a cylindrical waterproof cover made of cotton duck and having a cord, with an elastic insertion, in the hem so that it can be tightened upon and tied around the flange of the tray.

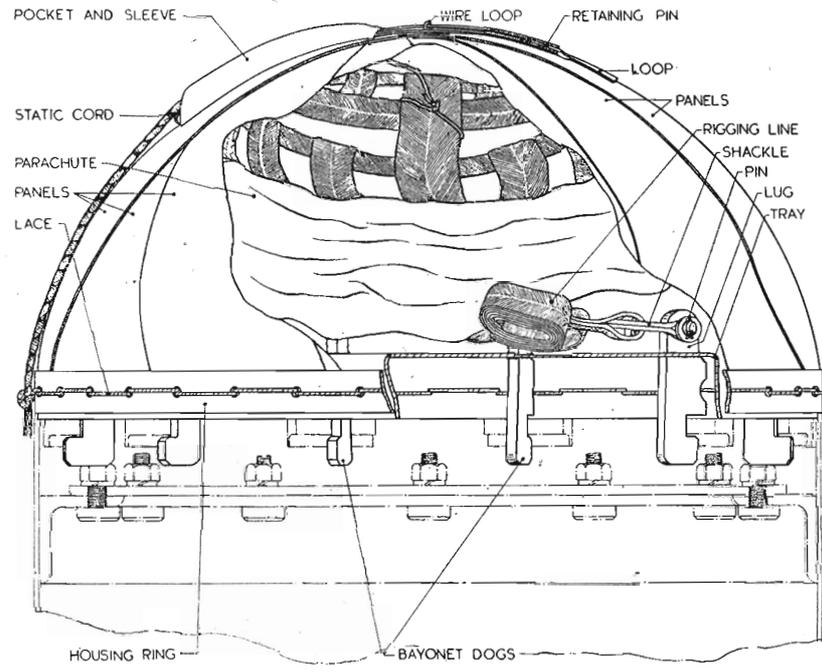


Fig. 3.—Attachment, parachute, aircraft bomb, No. 10, Mk. II

Tail, bomb, aircraft, No. 32, Mk. I, fig. 4

19. The tail, which is 5 ft. long, is a cylinder of light gauge metal with a metal tray secured in its forward end and a strengthening ring secured in its open rear end. The tray has welded on to it a series of equi-spaced bayonet dogs similar to those on the tray of the No. 10 parachute attachment. The tail cylinder has a number of openings in it to give ballistic stability.

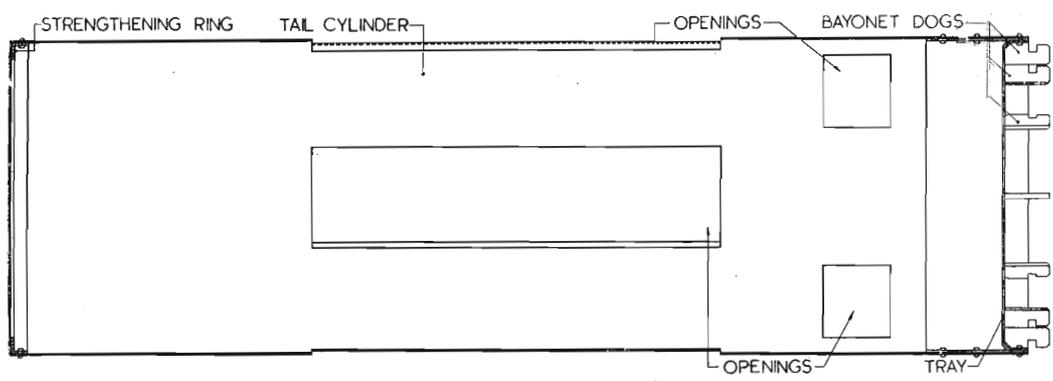


Fig. 4.—Tail, bomb, aircraft, No. 32, Mk. I

Protecting rings, fig. 5

20. For protecting the bomb body during storage and transit, it is fitted with protecting rings, one at each end, see fig. 1. Each protecting ring is of U-shaped cross-section and made in two halves

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with welded-on lugs at the ends for securing bolts. When assembled to the bomb and bolted together tightly, the two halves of the ring encircle the bomb body and grip it to prevent displacement.

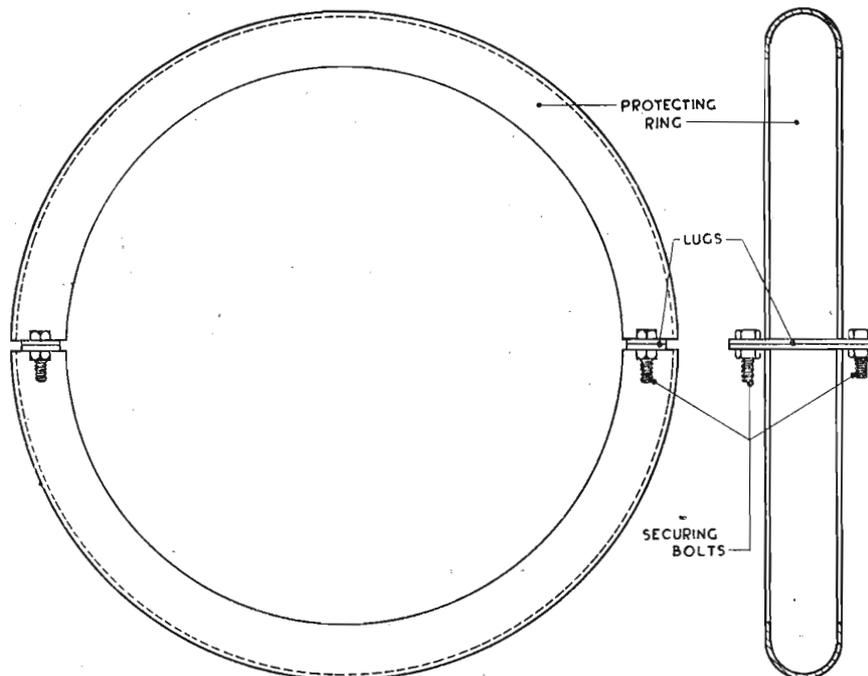


Fig. 5.—Protecting ring

Identification colouring and markings

Colouring

21. The bomb body is painted dark green except for a light green band, 2 in. wide, painted round it 1 ft. 4 in. from the front edge of the cylindrical shell and a $\frac{1}{8}$ in. red band $3\frac{1}{4}$ in. from that edge.

22. The nose attachment, the tray of the parachute attachment, and the tail are painted dark green.

Markings on the bomb body

23. The ratio figures 60/40 are stencilled in black on the body immediately to the rear of the light green band.

24. The following markings are stencilled in black on the body, to the rear of the locating plate or suspension lug transit screws, and also upon the closing plates:—

- (i) H.C. 2,000 lb.
- (ii) "I", denoting the mark number.
- (iii) The design number of the method of filling.
- (iv) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (v) The date of filling, month and year.
- (vi) The lot number of the filling.

25. The following markings are stamped on the body in front of the locating plate or suspension lug transit screws:—

- (i) H.C. 2,000 lb.
- (ii) "I", denoting the mark number.

- (iii) The body manufacturer's initials or recognized trade mark.
- (iv) The date of manufacture, month and year.

Markings on the transit plugs

26. The following markings are stamped on the head of the transit plug in each of the three detonator holders:—

- (i) No. 34 K
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year,

Markings on the nose attachment

27. The following markings are stamped on the cylindrical surface of the nose attachment:—

- (i) No. 4 Mark I.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the parachute attachment

28. The fabric panels have stencilled numbers indicating the order in which they are to be laid over the folded parachute. Also stencilled on the panels are the following particulars:—

- (i) No. 100, and Mk. II (or Mk. III) on two adjacent panels respectively.
- (ii) The date of assembly, month and year, on one panel only.

29. The cylindrical waterproof cover has stencilled on its end the following instruction:—

IMPORTANT, REMOVE THIS COVER IMMEDIATELY BEFORE LOADING STORE ON AIRCRAFT.
STATIC CORD TO BE ATTACHED TO CARRIER, OR AIRCRAFT STRONG POINT, AFTER LOADING.

Functioning

30. Upon release of the bomb from the aircraft the safety clip is withdrawn from the nose pistol by the fuze-setting control link, the pistol arming vane rotates and falls off and, if the bomb is fitted with a parachute attachment, the static cord withdraws the parachute retaining pin, so as to release the fabric panels covering the folded parachute; the hemp cord then draws out the parachute and finally breaks, and the parachute opens. The effect of the open parachute, or the tail, in conjunction with that of the nose attachment, is to stabilize the flight of the bomb.

31. Upon impact of the bomb with the target the pistol in the nose fuze position fires the detonator. The detonator then fires the exploder in the nose exploder container, and this initiates the column of exploders in the central tube to ensure the detonation of the main filling as a whole.

INSTRUCTIONS FOR USE

Removing the protecting rings

32. Place the bomb on planks of sufficient thickness to provide ground clearance, slacken off the bolts securing the two halves of each protecting ring together, and withdraw the rings from the ends of the bomb body.

Assembling the locating plate or suspension lug

33. Remove the appropriate transit screws from the bomb body and attach the locating plate or suspension lug with the bolts provided. These bolts have fibre inserts and great care must be taken to ensure that the fitting is securely assembled to the bomb body.

Fitting the parachute attachment

34. With the bomb placed on planks of sufficient thickness to provide ground clearance for the parachute gear, slacken off the locking screw which passes through one of the angle pieces.

35. Remove the cylindrical waterproof cover from the parachute attachment, and with the panel having the combined pocket and sleeve on it uppermost, assemble the parachute attachment to the rear end of the bomb body, passing the bayonet dogs between the angle pieces and turning the parachute attachment clockwise to engage these parts. The turning movement must be continued until one of the dogs comes into contact with the stop pin on the angle piece.

A.P. 1661B, Vol. I, Sect. 9, Chap. 2

36. Screw home the locking screw so as to ensure that the parachute attachment is locked securely in position. This should be tested by trying to turn the parachute attachment anti-clockwise, which should not be possible. Replace the waterproof cover.

Fitting the tail

37. Slacken off the locking screw which passes through one of the angle pieces in the rear end of the bomb body.

38. Assemble the tail to the rear end of the bomb body, passing the bayonet dogs between the angle pieces and turning the tail clockwise to engage these parts. The turning movement must be continued until one of the dogs comes into contact with the stop pin on the angle piece.

39. Screw home the locking screw so as to ensure that the tail is locked securely in position. This should be tested by trying to turn the tail anti-clockwise, which should not be possible.

Fitting the nose attachment

40. Assemble the cylinder, knuckle joint trunnion bars, and clamping bolt, leaving the bolt slackened off.

41. Pass the rear portion of the cylinder over the nose of the bomb until it overlaps the cylindrical shell of the bomb body by approximately $3\frac{1}{4}$ in. and the stops about the nose-piece. The clamping bolt of the nose attachment must be located on the side of the bomb opposite to the suspension lug or locating plate. Tighten the clamping bolt until the nose attachment is rigid on the bomb.

Fuzing the bomb

42. Pending further instructions, and the issue of special pistols for the side fuzing positions, the bombs are to be fuzed at the nose only, as follows:—

- (i) Ensure that the transit plugs in the side fuzing positions are screwed home tightly.
- (ii) Remove the transit plug from the nose.
- (iii) Ensure that the detonator cavity is clear, using the gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 12A/349) for this purpose. Bombs which fail to pass this gauge test are to be set aside for A.I.D. inspection.
- (iv) Insert the required detonator.
- (v) Insert a No. 27, Mk. I* or II pistol in the detonator holder and screw home by hand until well seated on its washer and securely locked.

Loading the bomb on to the aircraft

43. If the bomb is fitted with a parachute attachment, remove the waterproof cover, see para. 18. The bomb is to be loaded as detailed in the instructions in the Air Publication relevant to the aircraft, or in the chapter of A.P. 1664, Vol. I dealing with the 2,000 lb. Bomb Carriers, Type A, B, or Special, as appropriate, using two Slings (Stores Ref. 11A/992) with the Type A, or the Special, carrier, or two Slings (Stores Ref. 11A/994) with the Type B carrier. Where a parachute attachment is fitted, connect the shackle on the end of the static cord to the carrier, or convenient strong point on the aircraft. Finally, connect the safety clip of the nose pistol to the carrier fuze-setting control link.

Unloading the bomb from the aircraft

44. If the bomb is fitted with a parachute attachment, first disconnect the static cord from the carrier, or aircraft. Disconnect the safety clip from the fuze-setting control link, and unload the bomb as detailed in the instructions in the Air Publication relevant to the aircraft, or in the appropriate chapter of A.P. 1664, Vol. I. If the bomb is fitted with parachute attachment, replace the waterproof cover, see para. 18.

Unfuzing the bomb

45. If it is necessary to unfuze the bomb, remove the pistol by hand, extract the detonator, using extractor, detonator, No. 2, Mk. I (Stores Ref. 12A/348), and then replace the pistol or the transit plug.

Removing the parachute attachment from the bomb

46. If it is necessary to remove the parachute attachment from the bomb, slacken off the locking screw in the rear end of the bomb body, turn the parachute attachment anti-clockwise to free

the bayonet dogs from the angle pieces in the end of the bomb body, and withdraw the parachute attachment from the bomb body. Screw home the locking screw, and then replace the waterproof cover on the parachute attachment.

Removing the tail from the bomb

47. If it is necessary to remove the tail from the bomb, slacken off the locking screw in the rear end of the bomb body, turn the tail anti-clockwise to free the bayonet dogs from the angle pieces, and withdraw the tail from the bomb body. Screw home the locking screw.

SUPPLY AND STORAGE

Supply

48. The filled bomb bodies are supplied unboxed, with the three fuzing points fitted with transit plugs, and with the protecting rings in position.

49. The attachment, parachute, No. 10, Mk. I (Stores Ref. 12A/793) or Mk. II (Stores Ref. 12A/794), is supplied packed with the No. 4, Mk. I nose attachment (Stores Ref. 12A/797) and suspension lug or locating plate, in a cardboard box (Stores Ref. 12A/795).

50. The tail, bomb, aircraft, No. 32, Mk. I (Stores Ref. 12A/1071) is supplied together with the No. 4, Mk. I nose attachment (Stores Ref. 12A/797) and the locating plate and screws.

51. The covers, protecting, parachute attachment, No. 1, Mk. I (Stores Ref. 12A/956) are supplied in cardboard boxes.

52. Pistols No. 27, Mk. I* (Stores Ref. 12G/425) or Mk. II (Stores Ref. 12G/426) are supplied in contractor's packages as required.

Storage

53. The filled bomb bodies are classified, for storage purposes, in Group VII. Parachute attachments, in their waterproof covers, may be stored in any convenient dry place of storage; they should not be left fitted to the bomb for longer than is necessary. If, for any reason, the bombs are stored with their parachute attachments fitted, the parachute attachments are to be protected from moisture by fitting their waterproof covers; this is to be done even though the bombs are also protected by tarpaulins.

54. The No. 32, Mk. I tails may be stored in the same explosives storehouse as the filled bombs, but they must be stacked well away from the filled stores.

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*Relevant amendments up to A.L. 72
incorporated in this reprint
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CHAPTER 3

BOMB, H.E., AIRCRAFT, H.C., 4,000 lb., Mk. I

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CHAPTER 3

BOMB, H.E., AIRCRAFT, H.C., 4,000 lb., Mk. I

Introduction

1. This bomb is a thin-cased blast bomb having a charge/weight ratio of approximately 75 per cent, and is fitted with a nose attachment and a tail to stabilize its flight. It has three fuzeing positions, one in the nose and two in the side near the rear end of the body.

Leading particulars

| | | |
|--|-----|-------------------------|
| 2. <i>Body, bomb, H.E., aircraft, H.C., 4,000 lb., Mk. I</i> | | |
| Stores Ref. | ... | 12A/789 |
| Length... | ... | 7 ft. 4.5 in., approx. |
| Maximum diameter | ... | 2 ft. 6 in., approx. |
| Weight and nature of filling | ... | 2,882 lb. amatol 60/40 |
| <i>Attachment, nose, aircraft bomb, No. 3, Mk. I</i> | | |
| Stores Ref. | ... | 12A/796 |
| Diameter | ... | 2 ft. 6.2 in., approx. |
| Length... | ... | 8.25 in., approx. |
| <i>Tail, bomb, aircraft, No. 24, Mk. I</i> | | |
| Stores Ref. | ... | 12A/791 |
| Diameter | ... | 2 ft. 5.25 in., approx. |
| Length... | ... | 2 ft. 3 in., approx. |
| <i>Plug, aircraft bomb, No. 34, Mk. I</i> | | |
| Stores Ref. | ... | 12A/800 |

GENERAL DESCRIPTION

Bomb body

3. The bomb body, see fig. 1, consists of a cylindrical shell having a conical nose-piece welded to one end and a closing plate bolted to an angle ring welded in position at a short distance within the other end.

4. The cylindrical shell is strengthened by a T-section beam welded to its inner surface. Steel blocks, which constitute pads for a suspension lug and hoisting brackets, are welded in the angles of the beam, and are provided with tapped holes fitted with transit screws which pass through the shell and the head of the beam into these blocks.

5. The rear end of the cylindrical shell has near its edge a series of equi-spaced countersunk holes for tail securing screws, whilst crutch pads are welded to the exterior of the shell towards the front and rear ends. Stop pieces for the nose attachment are welded to the cylindrical shell in equi-spaced positions near its front end.

6. The conical nose-piece is hollow and has welded in its apex an adapter for an exploder container which is secured by a locking screw. A central tube is fitted over and cemented to the stem of this exploder container and extends axially through the bomb body almost to the closing plate.

7. Two drop handles are attached to the rear of the closing plate.

8. Two exploder containers, similar to that in the nose adapter, are fitted, and secured by locking screws, in adapters welded into the shell near the rear end, so that they project into the bomb body at 45 deg. to the strengthening beam.

9. Each of the three exploder containers is fitted with a detonator holder which is locked in position by a locking screw and closed by a transit plug.

Filling

10. The main filling of the bomb consists of amatol 60/40, which occupies the internal space around the central tube and is sealed at the ends by layers of approved composition.

111. The central tube contains a column of four exploders arranged, end-to-end, against the rear end of the exploder container in the nose. These are positioned by a wooden distance piece retained in the rear end of the central tube by the closing plate, and a felt disc, and millboard discs as necessary, are interposed between the rear exploder and the wooden distance piece to prevent movement of the exploders in the tube. Each of the exploders consists of nine pressed T.N.T. pellets in a waxed paper wrapping.

112. Each of the three exploder containers houses an exploder, consisting of one solid C.E. pellet and two perforated C.E. pellets, covered by a felt washer and held in position by the detonator holder, which has a boxcloth washer secured in its inner end by shellac. The exploder containers in the two side fuze positions have their stems enclosed in waxed paper tubes each of which contains an exploder consisting of two solid T.N.T. pellets separated by a felt washer. The closed inner ends of these two paper tubes are almost in contact with the central tube.

Nose attachment

113. The nose attachment is a cylinder of light-gauge plate which fits over the forward end of the cylindrical shell of the bomb body and projects beyond it around the conical nose-piece. The rear portion of the cylinder is split and provided at opposite sides of the split with bearings for the trunnion bars of a knuckle-joint assembly having a clamping bolt whereby the nose attachment can be tightened on to the bomb body.

Tail

114. The tail consists of a cylinder, of light-gauge plate, closed at its rear end by a diaphragm plate welded in position, the diameter of the tail cylinder being slightly less than that of the cylindrical shell of the bomb body. The forward portion of the tail cylinder has, near the edge, a series of screw clearance holes equi-spaced around it, and, on the inside, a corresponding series of fixed nuts. The forward portion of the tail cylinder is also provided with saw cuts, between the holes, so that it is weakened and can be sprung into the rear end of the cylindrical shell of the bomb body.

Identification colouring and markings

Colouring

115. The bomb body is painted dark green, and has a light green band, 2 in. wide, painted round it 11 ft. 4 in. from the front edge of the cylindrical shell and a $\frac{1}{2}$ in. red band 11 in. from that edge. The nose attachment and the tail are also painted dark green.

Markings on the bomb body

116. The amatol ratio figures 60/40 are stencilled in black on the top of the bomb body immediately to the rear of the light green band.

117. The following markings are stencilled in black to the rear of the suspension lug position:—

- (i) H.C. 4,000 LB.
- (ii) "I", denoting the mark number.
- (iii) The design number of the method of filling.
- (iv) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (v) The date of filling, month and year.
- (vi) The lot number of the filling.

118. The following markings are stamped in front of the suspension lug position:—

- (i) H.C. 4,000 LB.
- (ii) "I", denoting the mark number.
- (iii) The manufacturer's initials or recognized trade mark.
- (iv) The date of manufacture, month and year.

Markings on the transit plugs

119. The following markings are stamped on the head of each transit plug:—

- (i) No. 34. I.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the tail

20. The tail has the marking "No. 24. I" stencilled on it in yellow.
21. The following markings are stamped on the tail:—
- (i) No. 24. I.
 - (ii) H.C. 4,000 LB.
 - (iii) The manufacturer's initials or recognized trade mark.
 - (iv) The date of manufacture, month and year.

Functioning

22. Upon release of the fuzed bomb from the aircraft the safety clip is withdrawn from the pistol in the nose fuzeing position by the fuze-setting control link, and the arming vane is expended to arm the pistol during the fall of the bomb. The flight of the bomb is stabilized by the effect of the nose attachment and the tail.

23. Upon impact of the bomb with the target the pistol in the nose fuzeing position fires the detonator. The detonator then fires the exploder in the nose exploder container, and this initiates the column of exploders in the central tube to ensure detonation of the main filling as a whole.

Note.—The minimum safe height of release for this bomb is 1,500 ft. Owing to the light structure of the body the nose will crush when the bomb is dropped "safe" on anything other than water or very soft ground, resulting in detonation. It is therefore essential that enforced jettisoning should be done well away from friendly built-up areas and with the aircraft at a height of at least 1,500 ft.

24. The terminal velocity of the bomb is approximately 750 ft. per sec. and the height scale for the 100 lb. A.S. bomb is to be used (No. 3 or 4 for the Mk. IX course setting bomb sight).

INSTRUCTIONS FOR USE**Assembling the suspension lug and hoisting brackets**

25. Remove the transit screws from the bomb body and attach the suspension lug and hoisting brackets in the appropriate positions, using the bolts provided. These bolts have fibre inserts and great care must be taken to ensure that the fittings are securely assembled to the bomb body.

Fitting the nose attachment

26. Assemble the cylinder, knuckle-joint trunnion bars, and clamping bolt, leaving the bolt slackened off.

27. Pass the rear portion of the attachment over the nose of the bomb and on to the forward end of the cylindrical shell until it engages the stops. Ensure that the clamping bolt is positioned on the underside of the bomb, that is on the opposite side to the suspension lug and hoisting brackets, and then tighten up the clamping bolt until the nose attachment is rigid on the bomb.

Fitting the tail

28. Present the forward end of the tail to the rear end of the bomb body, so that the screw holes and nuts will register with the countersunk screw bores, press the tail into the rear end of the bomb body and secure it in position with the countersunk screws provided. To facilitate fitting the tail, the bomb should be supported on planks so that it can be rolled as necessary, the planks being of sufficient thickness to provide ground clearance for the suspension lug and hoisting brackets.

Fuzing the bomb

29. Pending further instructions, the bombs are to be fuzed in the nose only, as follows:—
- (i) Ensure that the transit plugs in the side fuzeing positions are screwed tightly home.
 - (ii) Remove the transit plug from the nose.
 - (iii) Ensure that the nose detonator cavity is clear, using the gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 112A/349), for the purpose. Bombs which fail to pass this gauge test are to be set aside for A.I.D. inspection.
 - (iv) Insert the required detonator.

- (v) Insert an appropriate nose pistol in the detonator holder and screw it home by hand until it is well seated on its washer and securely locked in position.

Note.—The side fuzing positions are provided for special pistols which are only likely to be used with a few Mk. I bombs which incorporate a strengthened closing plate. This strengthened plate can be identified by its being secured by 24 bolts instead of the usual 12 bolts for an ordinary closing plate.

Loading the bomb on to the aircraft

30. Load the bomb on to the aircraft as described in the appropriate chapter of A.P. 1664, Vol. I, or in the Air Publication relevant to the aircraft, finally connecting the safety clip of the nose pistol to a fuze-setting control link and removing the safety pin from the pistol safety clip. Hand the safety pin to the pilot or bomb aimer, or place it in the aircraft.

Unloading the bomb from the aircraft

31. Replace the safety pin of the pistol, disconnect the fuze-setting control link from the safety clip of the pistol, and unload the bomb as described in the appropriate chapter of A.P. 1664, Vol. I, or in the Air Publication relevant to the aircraft.

1

Unfuzing the bomb

32. If it is necessary to unfuze the bomb, remove the pistol by hand, extract the detonator, using extractor, detonator, No. 2, Mk. I (Stores Ref. 12A/348), and then replace the pistol or the transit plug.

SUPPLY AND STORAGE

Supply

33. The filled bomb bodies are supplied unboxed, with the three fuzing positions fitted with transit plugs.

34. The No. 24, Mk. I tail is supplied with the nose attachment No. 3, Mk. I, inside it and with the suspension and hoisting fittings, contained in a bag, also packed inside it, the whole being secured with a wooden protective framework.

Storage

35. The filled bomb bodies are classified, for storage purposes, in Group VII.

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CHAPTER 4

BOMB, H.E., AIRCRAFT, H.C., 4,000 lb., Mk. H

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CHAPTER 4

BOMB, H.E., AIRCRAFT, H.C., 4,000 lb., Mk. H

Introduction

1. This bomb is a high-capacity blast bomb, having a thin case and a charge/weight ratio of approximately 75 per cent., and is fitted with a nose attachment and a tail to stabilize its flight. It is provided with five fuze positions, three in the nose and two in the side near the rear end of the body.

Leading particulars

2. *Body, bomb, H.E., aircraft, H.C., 4,000 lb., Mk. II*

| | |
|------------------------------|-------------------------|
| Stores Ref. | 12A/931 |
| Length | 6 ft. 9.75 in., approx. |
| Maximum diameter | 2 ft. 6 in., approx. |
| Weight and nature of filling | 2,954 lb. amatol 60/40 |

Attachment, nose, aircraft bomb, No. 3, Mk. II

| | |
|-------------|------------------------|
| Stores Ref. | 12A/932 |
| Diameter | 2 ft. 6.2 in., approx. |
| Length | 4.5 in., approx. |

Tail, bomb, aircraft, No. 24, Mk. I

| | |
|-------------|-------------------------|
| Stores Ref. | 12A/791 |
| Diameter | 2 ft. 5.25 in., approx. |
| Length | 2 ft. 3 in., approx. |

Plug, aircraft bomb, No. 34, Mk. I

| | |
|-------------|---------|
| Stores Ref. | 12A/800 |
|-------------|---------|

GENERAL DESCRIPTION

Bomb body

3. The bomb body, see fig. 11, consists of a cylindrical shell with a domed plate welded to the nose end and a closing plate bolted to an angle ring welded in position at a short distance within the tail end.

4. A T-section strengthening beam is welded to the interior surface of the cylindrical shell. Steel blocks welded in the angles of the beam constitute pads for a suspension lug and hoisting brackets, and are provided with tapped holes, which pass through the shell into these blocks. During transit and storage these holes are covered by protecting shields, each held in position by a single securing screw.

Note.—Early issues of this bomb were supplied with the tapped holes plugged by transit screws, as illustrated in fig. 11.

5. A series of equi-spaced countersunk holes, to receive tail securing screws, is provided in the rear end of the cylindrical shell beyond the angle ring, whilst crutch pads are welded to the exterior of the shell towards the front and rear ends.

6. The domed nose plate has welded in it three adapters for exploder containers which are secured in position by locking screws. One of these exploder containers extends axially into the bomb body, and has fitted over and cemented to its stem a central tube which extends through the bomb body almost to the closing plate. The other exploder containers in the domed nose plate are located, one at each side of the central exploder container, and paper tubes cemented to the stems of these two exploder containers extend into the bomb body almost into contact with the central tube.

7. The closing plate has a central adapter for a screw-in plug, and two drop handles are fitted, one at each side of the adapter, on the rear of the closing plate.

8. Two further exploder containers, similar to those in the nose, and having waxed paper tubes cemented to their stems, are secured by locking screws in adapters welded into the shell near the rear end, so that they project into the bomb body at 45 deg. to the strengthening beam and the closed inner ends of the waxed paper tubes are close to the central tube.

9. The five exploder containers are each fitted with a detonator holder which is secured in position by a locking screw, and are closed by a transit plug. A boxcloth washer is secured by shellac in the inner end of each of the five detonator holders.

Filling

10. The main filling consists of amatol 60/40, which occupies the internal space around the central tube and is sealed at the rear end by a layer of approved composition.

11. The central tube houses a column of six T.N.T. exploders held in position by a wooden distance piece retained in the rear end of the central tube by the plug in the closing plate adapter; a felt disc, and millboard discs, as necessary, are employed between the distance piece and the rear exploder to prevent movement of the exploders in the tube.

12. Each of the five exploder containers houses an exploder consisting of one solid C.E. pellet and two perforated C.E. pellets, covered by a felt washer and held in position by the detonator holder.

13. Two solid T.N.T. exploders, separated by a felt disc, are housed in each of the paper tubes on the stems of the exploder containers in the side fuzeing positions, and also in each of the paper tubes on the stems of the exploder containers at either side of the central fuzeing position in the nose.

Nose attachment

14. The nose attachment is a cylinder, made from a strip of light-gauge plate, which fits over the forward end of the cylindrical shell of the bomb body and projects beyond it for a short distance so as to surround the domed nose. The ends of the strip have portions bent over and secured upon themselves to form bearings for trunnion bars of a knuckle joint assembly, see fig. 2, with a clamping bolt for tightening the nose attachment on the bomb body. The remaining portions of the ends of the strip are overlapped and connected by a screw passed through a slot in the outer portion and engaged with a nut fixed to the inner portion. Stop pieces are punched out of the strip at equi-spaced positions and bent inwards to determine the location of the nose attachment on the bomb body.

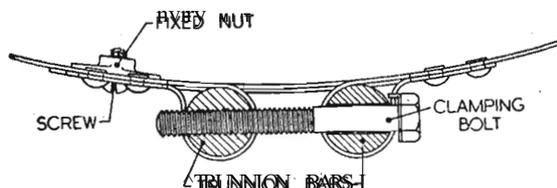


Fig. 2.—Knuckle joint assembly of nose attachment

Tail

15. The tail consists of a cylinder of light-gauge plate, closed at its rear end by a diaphragm plate welded in position. The diameter of the tail cylinder is slightly less than that of the cylindrical shell of the bomb body, and the forward portion is weakened by a series of equi-spaced slots so that it can be sprung into the rear end of the body shell. A series of equi-spaced screw clearance holes is drilled through the forward portion of the tail cylinder to correspond with the countersunk screw holes in the rear end of the bomb body, see para. 5, and nuts are fixed on the inside of the tail cylinder to receive the tail securing screws.

Identification colouring and markings

Colouring

16. The bomb body is painted dark green, and has a light green band, 2 in. wide, painted round it 2 ft. from the nose end, and a 1 in. red band painted round it 3 in. from that end. The tail and the nose attachment are also painted dark green.

Markings on the bomb body

17. The ratio figures 60/40 are stencilled in black on the top of the bomb body immediately to the rear of the light green band.

18. The following markings are stencilled in black on the bomb body to the rear of the suspension lug position:—

- (i) H.C. 4,000 LB.
- (ii) "II", denoting the mark number.
- (iii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iv) The date of filling, month and year.
- (v) The lot number of the filling.

19. The design number of the method of filling is stencilled in black on the underside of the bomb body toward its rear end.

20. The following markings are stamped on the bomb body in front of the suspension lug position:—

- (i) H.C. 4,000 LB.
- (ii) "II", denoting the mark number.
- (iii) The manufacturer's initials or recognized trade mark.
- (iv) The date of manufacture, month and year.

Markings on the transit plugs

21. The following markings are stamped on the head of each transit plug:—

- (i) No. 34. I.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the nose attachment

22. The following markings are stamped on the side of the nose attachment:—

- (i) No. 3. II.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the tail

23. The tail has the marking "No. 24. I." stencilled on it in yellow.

24. The following markings are stamped on the tail:—

- (i) No. 24. I.
- (ii) H.C. 4000 LB.
- (iii) The manufacturer's initials or recognized trade mark.
- (iv) The date of manufacture, month and year.

Functioning

25. Upon release of the fuzed bomb from the aircraft, the safety clips are withdrawn from the pistols in the nose fuzing positions by the fuze setting control links, and the arming vanes are expended to arm the pistols during the fall of the bomb. The flight of the bomb is stabilized by the effect of the nose attachment and the tail.

26. Upon impact of the bomb with the target, at least one of the pistols in the nose fuzing positions fires its detonator which in turn fires the exploders in the nose exploder containers and central tube so as to ensure detonation of the main filling as a whole.

Note.—The minimum safe height of release for this bomb is 1,500 feet. Owing to the light structure of the bomb the nose will crush when the bomb is dropped "safe" on anything other than water or very soft ground, resulting in detonation. It is therefore essential that enforced jettisoning should be done well away from friendly built-up areas and with the aircraft at a height of at least 1,500 feet.

27. The terminal velocity of the bomb is approximately 750 ft. per sec., and height scale for the 100 lb. A.S. bomb is to be used (No. 3 or 4 for the Mk. IX course setting bomb sight).

INSTRUCTIONS FOR USE

Assembling the suspension lug and hoisting brackets

28. Remove the transit screws from the bomb body and attach the suspension lug and hoisting brackets in the appropriate positions, using the bolts provided. These bolts have fibre inserts and great care must be taken to ensure that the fittings are securely assembled to the bomb body.

Fitting the nose attachment

29. Assemble the cylinder knuckle joint trunnion bars and clamping bolt, leaving the clamping bolt and also the securing screw for the overlapped end portions slackened off.

30. Pass the rear portion of the attachment over the nose of the bomb to the limit permitted by the punched-out stop pieces on the attachment. Ensure that the clamping bolt is positioned on the underside of the bomb, that is, on the side opposite to the suspension lug and hoisting brackets, and tighten up the clamping bolt until the nose attachment is rigid on the bomb. Finally align the overlapping end portions of the nose attachment cylinder, if necessary, and tighten the securing screw.

Fitting the tail

31. Present the forward end of the tail to the rear end of the bomb body, so that the screw clearance holes and fixed nuts will register with the countersunk screw holes, press the tail into the rear end of the bomb body and secure it in position with the screws provided. To facilitate fitting the tail, the bomb should be supported on planks so that it can be rolled as necessary, the planks being of sufficient thickness to provide ground clearance for the suspension lug and hoisting brackets.

Fuzing the bomb

32. Pending further instructions, the bombs are to be fuzed in the three nose-fuzing positions only, as follows:—

- (i) Ensure that the transit plugs in the side fuzing positions are screwed tightly home.
- (ii) Remove the transit plugs from the three nose-fuzing positions.
- (iii) Ensure that the three detonator cavities in the nose are clear, using the gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 112A/349) for this purpose. Bombs which fail to pass this gauge test are to be set aside for A.I.D. inspection.
- (iv) Insert the required detonators one in each of the three nose-fuzing positions.
- (v) Insert an appropriate nose pistol in each of the three detonator holders in the nose-fuzing positions, screwing the pistols home by hand until they are well seated on their washers and locked in position.

Loading the bomb on to the aircraft

33. Load the bomb on to the aircraft as described in the appropriate chapter of A.P.1664, Vol. I, or in the Air Publication relevant to the aircraft, finally connecting the safety clips of the nose pistols to fuze-setting control links, and removing the safety pins from the pistols. Hand the safety pins to the pilot or bomb aimer, or place them in the aircraft.

Unloading the bomb from the aircraft

34. Replace the pistol safety pins, disconnect the fuze-setting control links from the safety clips of the nose pistols, and unload the bomb as described in the appropriate chapter of A.P.1664, Vol. I, or in the Air Publication relevant to the aircraft.

Unfuzing the bomb

35. If it is necessary to unfuze the bomb, first remove one of the nose pistols by hand, and extract the detonator, using extractor, detonator, No. 2, Mk. I (Stores Ref. 112A/348). Replace the pistol or the transit plug. Repeat these operations at the other two nose-fuzing positions in turn, completing the operations at one position before dealing with the other position.

SUPPLY AND STORAGE**Supply**

36. The filled bomb bodies are supplied unboxed, with the five fuzing positions fitted with transit plugs.

37. The No. 24, Mk. I tail is supplied with the nose attachment No. 3, Mk. II, inside it, and with the suspension and hoisting fittings, contained in a bag, also packed inside it, the whole being secured in a wooden protective framework which has "Mk. II" stencilled on its external battens for identification purposes.

Storage

38. The filled bomb bodies are classified, for storage purposes, in Group VII.

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CHAPTER 5

BOMBS, H.E., AIRCRAFT, H.C., 4,000 lb., Mk. III, IV, V, and VI

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1. Bomb, H.E., aircraft, H.C., 4,000 lb., Mk. III or IV, with transit fittings
2. Bomb, H.E., aircraft, H.C., 4,000 lb., Mk. III or IV
3. Knuckle joint assembly of nose attachment

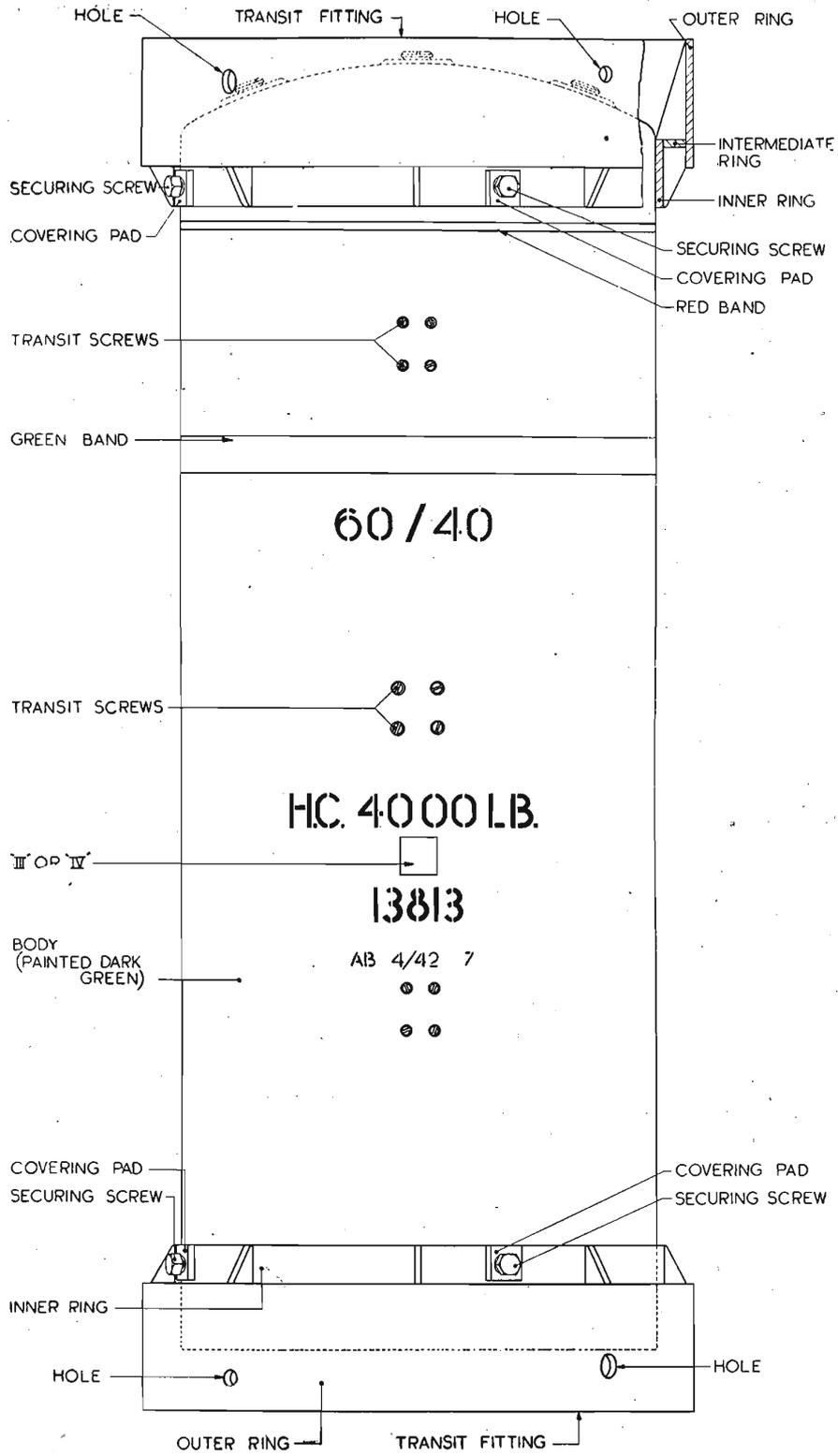
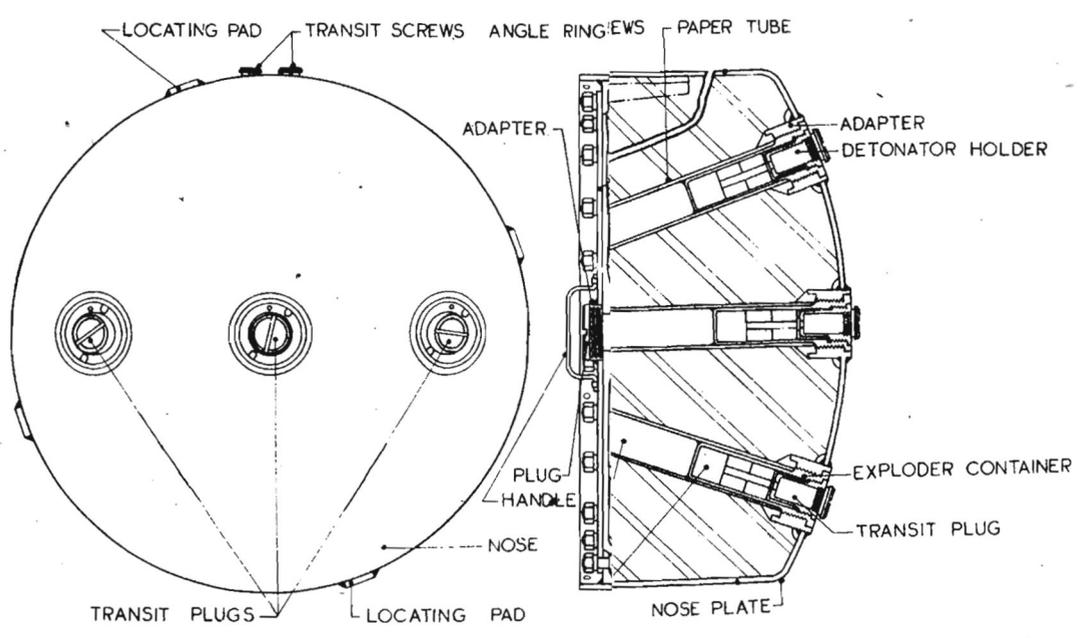
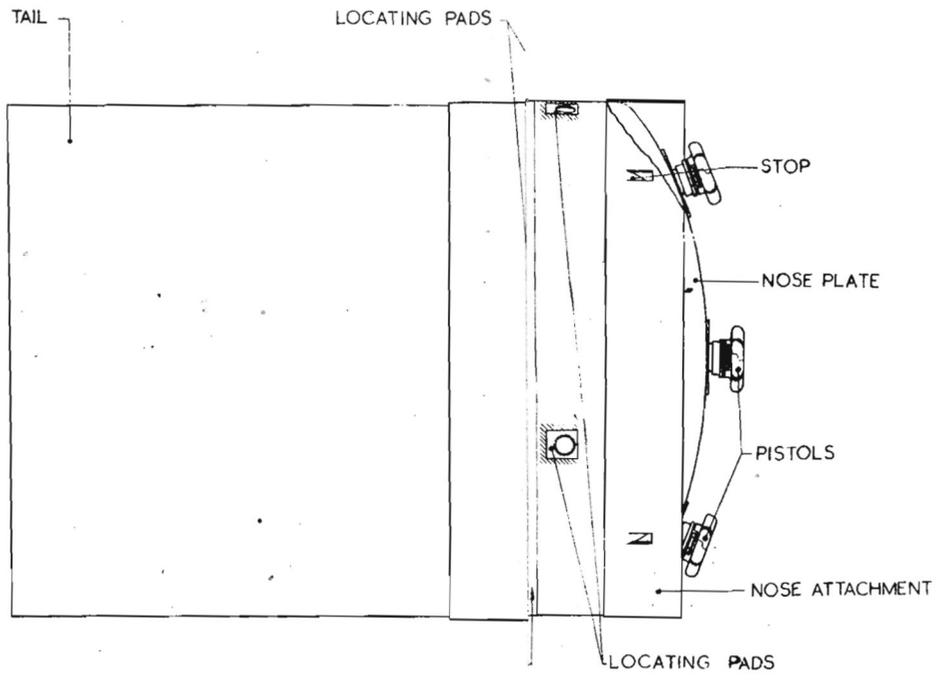


Fig. 1.—Bomb, H.E., aircraft, H.C., 4,000 lb., Mk. III or IV, with transit fittings

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CHAPTER 5

BOMBS, H.E., AIRCRAFT, H.C., 4,000 lb., Mk. III, IV, V, and VI

Introduction

1. These bombs are thin-cased blast bombs having a charge/weight ratio of approximately 75 per cent. They have three fuzeing positions in the nose, and are fitted with a tail and a nose attachment which stabilize the bomb in its flight.

BOMB, H.E., AIRCRAFT, H.C., 4,000 lb., Mk. IV

Leading particulars

2. Body, bomb, H.E., aircraft, H.C., 4,000 lb., Mk. IV

| | |
|------------------------------|--|
| Length | 6 ft. 9.75 in., approx. |
| Maximum diameter | 2 ft. 6 in., approx. |
| Weight and nature of filling | 2,900 lb. approx., amatol 60/40 or 50/50 or 3,070 lb. approx., R.D.X./T.N.T. 60/40 or 3,187 lb. Minol 2 |

Attachment, nose, aircraft bomb, No. 3, Mk. 11

| | |
|----------|----------------------|
| Diameter | 2 ft. 6 in., approx. |
| Length | 4.5 in., approx. |

Tail, bomb, aircraft, No. 24, Mk. 1

| | |
|----------|-------------------------|
| Diameter | 2 ft. 5.25 in., approx. |
| Length | 2 ft. 3 in., approx. |

GENERAL DESCRIPTION

Bomb body

3. The bomb body, see fig. 1 and 2, is a cylindrical shell with a domed nose plate welded to one end, and a closing plate bolted to an angle ring welded in position at a short distance within the other end.

4. Steel blocks, constituting pads for a suspension lug and hoisting brackets, are welded to the inner surface of the bomb body. Holes drilled and tapped into the steel blocks receive the suspension lug and hoisting bracket securing screws. During transit and storage these holes are covered by protecting shields, each held in position by a single screw.

Note.—Early issues of this bomb were supplied with the tapped holes plugged by transit screws, as illustrated in fig. 1 and 2.

5. Equi-spaced countersunk holes are provided at the rear end of the cylindrical shell to receive tail securing screws, whilst four locating pads for the attachment of transit fittings are welded to the cylindrical shell, at equi-spaced positions around the circumference, near each end.

6. The domed nose plate is fitted with three adapters for exploder containers. These adapters are welded in position on the same diametrical plane, one centrally and the others one on each side of the central adapter. The exploder containers are secured in the adapters by locking screws. A central tube is fitted over and cemented to the stem of the central exploder container and extends through the bomb body almost to the closing plate.

7. Each of the exploder containers in the nose is fitted with a detonator holder which is secured in position by a locking screw and closed by a No. 34 transit plug.

8. The closing plate has a central adapter with a screw-in plug, and two drop handles are fitted to the rear of the closing plate one at each side of the adapter.

Filling

9. The main filling of the bomb consists of Amatol 60/40 or 50/50, R.D.X./T.N.T. 60/40, or Minol 2, which occupies the space around the central tube and is sealed by a layer of approved composition at the rear end. Bombs filled R.D.X./T.N.T. 60/40 also have a layer of T.N.T. at each end of the main filling.

Note.—Bombs filled Minol 2 have a restricted service life of one year from the date of filling. These bombs are identified by a 3 in. diameter white circle enclosing the expiry date stencilled on the nose of the bomb. Bombs bearing this marking are not supplied to Overseas Units.

110. A column of T.N.T. exploders is held in position in the central tube by a wooden distance piece which is retained in the rear end of the tube by the plug in the closing plate adapter, and axial movement of the exploders in the tube is prevented by a felt disc and millboard discs, as necessary, interposed between the rear of the column and the wooden distance piece.

111. An exploder, consisting of one solid C.E. pellet and two perforated C.E. pellets covered by a felt washer, is held in position in each of the exploder containers by the detonator holder. Each detonator holder has a boxcloth washer secured in its inner end by shellac. The two exploder containers which are inclined toward the axis of the bomb have their stems enclosed in waxed paper tubes, and each of these waxed paper tubes houses an exploder consisting of two T.N.T. pellets separated by a felt washer.

Nose attachment

112. The nose attachment, see fig. 2 and 3, is a cylinder which fits round the forward end of the bomb. It is constructed from a light-gauge metal strip, 4-5 in. wide, the ends of which have portions which overlap and are interconnected by a screw passed through a slot in the outer one into engagement with a fixed nut on the inner one. The strip ends are bent over to afford bearings for the trunnion bars of a knuckle joint assembly with a clamping bolt for tightening the nose attachment on to the body. Stop pieces are punched inwardly from the strip at equi-spaced positions around it for locating the nose attachment against the nose of the bomb.

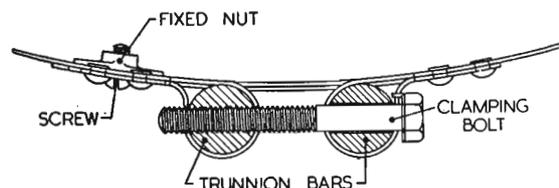


Fig. 3.—Knuckle joint assembly of nose attachment

Transit fittings

113. The filled bombs, when consigned overseas, are supplied with transit fittings assembled one at each end, see fig. 11. These fittings, which are identical, serve as protecting bands, and as bases when the bomb is placed on end, and they are also adapted for connection to the hook of a lifting chain when the bomb is to be hoisted and transported by a crane or other lifting gear.

114. Each transit fitting consists of an inner and an outer ring connected by an intermediate ring with radial strengthening webs, all the parts being welded together. The inner ring has slots for accommodating the locating pads on the bomb body, and welded-on covering pads fitted with securing screws for screwing into the tapped holes in the locating pads when the transit fitting is assembled to the bomb body. The outer ring has holes for the engagement of lifting hooks.

Tail

115. The tail is a cylinder of light-gauge sheet metal, having its rear end closed by a diaphragm plate which is welded in position. Near the forward edge of the tail cylinder are screw clearance holes spaced to correspond with the securing screw holes at the rear end of the bomb body, and a nut is riveted to the inner face of the cylinder to register over each screw clearance hole. The forward portion of the cylinder has saw cuts between adjacent screw clearance holes, so that the tail can be sprung into the rear end of the bomb body.

Identification colouring and markings

Colouring

116. The bomb body is painted dark green, and has a light green band, 2 in. wide, painted round it 2 ft. from the nose end, and a red band, $\frac{1}{2}$ in. wide, 8 in. from the nose end. The nose attachment and the tail are also painted dark green.

Markings on the bomb body

117. If the bomb is filled Ammatol, the ratio figures 60/40 or 50/50, as applicable, are stencilled in black behind the light green band. If the filling is R.D.X./T.N.T. 60/40 or Mimol 2, the marking "R.D.X./T.N.T." or "MIN 2" is applied in three places on the light green band. Bombs filled Mimol 2 have an additional marking denoting restricted life, see para. 9.

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18. The following markings are stencilled in black to the rear of the suspension lug position on the upper side of the bomb body:—

- (i) The type, weight, and mark of the bomb.
- (ii) The design number of the method of filling.
- (iii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iv) The date of filling, month and year.
- (v) The lot number of the filling.

19. The following markings are stamped on the upper side of the bomb body in front of the suspension lug position:—

- (i) The type, weight, and mark of the bomb.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the transit plugs

20. The heads of the transit plugs in the detonator holders are stamped each with the following markings:—

- (i) No. 34. I.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the nose attachment

21. The following markings are stamped on the nose attachment:—

- (i) No. 3. II.
- (ii) The manufacturer's initials, or recognized trade mark.
- (iii) The date of manufacture, month and year.

Markings on the tail

22. The tail has the marking "No. 24. I" stencilled on it in yellow.

23. The following markings are stamped on the tail:—

- (i) No. 24. I.
- (ii) H.C. 4,000 lb.
- (iii) The manufacturer's initials or recognized trade mark.
- (iv) The date of manufacture, month and year.

Functioning

24. When the fuzed bomb is released from the aircraft, the safety clips of the pistols in the three nose fuze positions are withdrawn by their fuze-setting control links, and during the fall of the bomb the arming vanes on the pistols rotate and are expended so as to arm the pistols.

25. Upon impact of the bomb with the target, one at least of the pistols is operated to fire its detonator. The detonator fires its associated exploders which, in conjunction with the central tube exploders, detonate the main filling as a whole.

Note.—The minimum safe height of release for this bomb is 1,500 ft. Owing to the light structure of the body the nose will crush in when the bomb is dropped "safe" on to any target other than water or very soft ground, and this may result in detonation. It is, therefore, essential that enforced jettisoning should be done well away from built-up areas in friendly territory and with the aircraft at a safe height.

26. The terminal velocity of the bomb is approximately 750 ft. per sec., and when using the Course Setting Bomb Sight a Height Scale appropriate to the 100 lb. A.S. bomb is to be employed (No. 3 or 4 for the Mk. IX Course Setting Bomb Sight).

INSTRUCTIONS FOR USE

Removing the transit fittings

27. Slacken the four securing screws on the inner ring of each transit fitting, sufficiently to disengage them from the location pads on the bomb body, and withdraw the fittings from the ends of the bomb body.

Assembling the suspension lug and hoisting brackets

28. Remove the protecting shields or, as applicable, the transit screws from the bomb body

and attach the suspension lug and hoisting brackets in their appropriate positions using the screws supplied in Assembly No. 5 and detailed as follows:—

- (i) The four screws to be used for affixing the British suspension lug are $\frac{1}{2}$ in. B.S.W. high tensile steel screws.
- (ii) The eight screws to be used for affixing the two hoisting brackets are $\frac{7}{16}$ in. B.S.F. steel screws.

Note.—Care must be taken to ensure that the correct screws are used in each instance, and as the screws have fibre inserts they must be screwed down tightly so that the fittings are securely assembled to the bomb body.

Fitting the nose attachment

29. Assemble the nose attachment cylinder, knuckle joint trunnion bars and clamping bolt, leaving the bolt and also the securing screw for the overlapped portions of the cylinder slackened off.

30. Pass the nose attachment on to the nose of the bomb until the stop pieces engage the shoulder of the dome. Ensure that the clamping bolt is on the underside of the bomb, that is on the side opposite to the suspension lug. Tighten the clamping bolt until the nose attachment grips the bomb body tightly, aligning the overlapped end portions of the cylinder if necessary, and tighten the securing screw.

Fitting the tail

31. Offer up the forward end of the tail cylinder to the rear end of the bomb body so that the screw clearance holes in the tail will register with the countersunk securing screw holes in the bomb body. Press the tail into the rear end of the bomb body, and secure it in position with the screws provided. To facilitate fitting the tail, the bomb should be supported on planks of sufficient thickness to provide clearance for the suspension lug and hoisting brackets when the bomb is rolled.

Fuzing the bomb

32. The bomb is to be fuzed in the three nose-fuzing positions as follows:—

- (i) Remove the transit plugs from the three nose fuzing positions.
- (ii) Ensure that the detonator cavities are clear, using the gauge, cavity, detonator, No. 2, Mk. I for this purpose. Bombs which fail to pass this gauge test are to be set aside for A.I.D./A.I.S. inspection.
- (iii) Insert the required detonators one in each of the three nose fuzing positions.
- (iv) Insert an appropriate nose pistol in each of the three detonator holders, screwing the pistols home by hand until they are well seated on their washers and locked.

Loading the bomb on to the aircraft

33. Load the bomb on to the aircraft as described in the appropriate chapter of A.P. 1664, Vol. I, or in the Air Publication relevant to the aircraft, finally connecting the nose pistol safety clips to the fuze-setting control links and removing the safety pins. Hand the safety pins to the pilot or air bomber.

Unloading the bomb from the aircraft

34. Replace the safety pins, disconnect the fuze-setting control links from the pistol safety clips, and unload the bomb in the normal manner.

Unfuzing the bomb

35. If it is necessary to unfuze the bomb, first remove any one of the nose pistols by hand, and extract the detonator, using extractor, detonator, No. 2, Mk. I. Then replace the pistol or the transit plug. Repeat these operations on the other two nose fuzing positions in turn, completing the operations on one position before dealing with the other.

Supply

SUPPLY AND STORAGE

36. The filled bomb bodies are supplied, unboxed, with each detonator holder closed by a No. 34 transit plug. When the bomb is consigned overseas, it is supplied with transit fittings assembled.

37. The No. 24 Mk. I tail is supplied with the nose attachment No. 3, Mk. II inside it, the whole being secured in a strong wooden protective framework which has "Mk. II" stencilled on its external battens for identification purposes. Additional components are supplied in Box B.449, Mk. I, containing five Assemblies No. 5, Mk. I. Each assembly consists of one lug, suspension, No. 4, Mk. I with four screws, two brackets, hoisting, No. 1, Mk. I, with eight screws, two screws, securing nose attachment No. 3, Mk. II, and twelve screws, securing tail unit No. 24.

Storage

38. The filled bombs are classified, for the purpose of storage, in Group 7, Category Z, see A.P. 2608A, Chap. 7.

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BOMB, H.E., AIRCRAFT, H.C., 4,000 lb., Mk. III

Comparison with the Mk. IV bomb

39. The Mk. III bomb is similar to the Mk. IV bomb, only differing from it in certain constructional details. The information given for the Mk. IV bomb in para. 2 to 38, therefore, applies equally to the Mk. III bomb, except that the Mk. III bomb body has a T-section steel beam welded to its inner surface and the pads for the suspension lug and hoisting bracket screws are welded in the angles of this beam.

Note.—A limited number of Mk. III bombs have been issued without locating pads for transit fittings, see para. 5, and with welded-on crutch pads, toward the front and rear ends, for engagement by the crutch arms on the bomb carrier.

BOMB, H.E., AIRCRAFT, H.C., 4,000 lb., Mk. V

Comparison with the Mk. IV bomb

40. The Mk. V bomb is of American manufacture and differs from the Mk. IV bomb, described in para. 2 to 26, in that the Mk. V bomb body is drilled and tapped to accommodate two American type suspension lugs so that the bomb may also be carried in American aircraft. During transit and storage these holes are covered by protecting shields. In addition, the following differences should be noted:—

- (i) The bomb body is filled with T.N.T. or Tritonal, the weight of the filling being 2,903 lb. or 3,144 lb., respectively. To indicate the nature of the filling, the letters T.N.T. or TRITONAL, as appropriate, are stencilled on the light green band in three places, equi-spaced.
- (ii) A blue band painted round the centre of the bomb body serves to distinguish these bombs from those of British manufacture.

41. The information given in para. 27 to 35 and para. 38 applies equally to this bomb. If it is required to fit American type suspension lugs, hoisting brackets need not be fitted and the lugs are to be secured to the bomb body, after removal of the protecting shields, by using the hoisting bracket screws.

Note.—The $\frac{1}{8}$ in. B.S.W. high tensile steel screws used for attaching the British type suspension lug and the $\frac{1}{16}$ in. B.S.F. steel screws used for securing the American type suspension lugs, or hoisting brackets, are of American manufacture and do not bear British identification marks. Special care must, therefore, be taken not to confuse the two types of screws.

42. The filled bomb body is supplied similarly to the Mk. IV bomb body, see para. 36. In addition the following components are required and are separately supplied:—

- (i) Assembly No. 5 Mk. II, consisting of one British type suspension lug No. 4 Mk. I, with four screws, two American type suspension lugs, two hoisting brackets No. 1 Mk. I, with eight screws, and twelve screws for securing tail unit No. 24. Five No. 5 Mk. II assemblies are supplied in Box B.449 Mk. I.
- (ii) Assembly No. 6 Mk. II, consisting of one No. 24 Mk. I tail unit and one No. 3 Mk. II nose attachment (with two screws) which is fitted inside the tail unit.

BOMB, H.E., AIRCRAFT, H.C., 4,000 lb., Mk. VI

Comparison with the Mk. IV bomb

43. The Mk. VI bomb is of American manufacture and differs from the Mk. IV bomb, described in para. 2 to 26, in that the Mk. VI bomb body is drilled and tapped to accommodate two American type suspension lugs so that the bomb may also be carried in American aircraft. During transit and storage these holes are covered by protecting shields. In addition, the following differences should be noted:—

- (i) The bomb body is filled with T.N.T. or Tritonal, the weight of the filling being 2,903 lb. or 3,144 lb., respectively. To indicate the nature of the filling, the letters T.N.T. or TRITONAL, as appropriate, are stencilled on the light green band in three places, equi-spaced.
- (ii) A blue band painted round the centre of the bomb body serves to distinguish these bombs from those of British manufacture.

44. The information given in para. 27 to 35 and para. 38 applies equally to this bomb. If it is required to fit American type suspension lugs, hoisting brackets need not be fitted and the lugs are to be secured to the bomb body, after removal of the protecting shields, by using the hoisting bracket screws.

Note.—The $\frac{1}{2}$ in. B.S.W. high tensile steel screws used for attaching the British type suspension lug and the $\frac{7}{16}$ in. B.S.F. steel screws used for securing the American type suspension lugs, or hoisting brackets, are of American manufacture and do not bear British identification marks. Special care must, therefore, be taken not to confuse the two types of screws.

45. The filled bomb body is supplied similarly to the Mk. IV bomb body, see para. 36, together with one set of components (as supplied for the Mk. V bomb in Assembly No. 5 Mk. II) which is packed in a metal container secured to the closing plate of the bomb body. These components are one British type suspension lug No. 4 Mk. I, with four screws, two American type suspension lugs, two hoisting brackets No. 1 Mk. I, with eight screws, and twelve screws for securing tail unit No. 24. Also required, and supplied separately from the bomb body, is Assembly No. 6 Mk. II, consisting of one No. 24 Mk. I tail unit and one No. 3 Mk. II nose attachment (with two screws) which is fitted inside the tail unit.

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ALR
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CHAPTER 6

BOMBS, H.E., AIRCRAFT, H.C., SECTIONAL, 8,000 lb., Mk. I and II

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REPRODUCED
(For official
use only)

ARMAMENT

CHAPTER 6

BOMBS, H.E., AIRCRAFT, H.C., SECTIONAL, 8,000 lb., Mk. I and II

Introduction

1. These bombs are high capacity blast bombs consisting of sections which require to be connected together end to end and the assembled bomb bodies fitted with nose attachments and tails prior to loading on to the aircraft.

2. The bomb body sections, each of which is fitted during transit and storage with a No. 6 Mk. I protecting ring at its rear end, are thin cased and the bombs have a high charge/weight ratio. The front section is provided with three nose fuze positions. The tail, the nose attachment, the suspension lug, the hoisting brackets, and their screws, are issued separately from the bomb body sections.

Note.—Early issues of these bombs and supplies for Overseas Commands are fitted with No. 3 Mk. I or No. 4 Mk. I protecting rings at the front and rear ends of each body section. These bombs also have hoisting brackets ready fitted.

BOMB, H.E., AIRCRAFT, H.C., SECTIONAL, 8,000 lb., Mk. I

Leading particulars

3. *Body, bomb, H.E., aircraft, H.C., sectional, 8,000 lb., Mk. I*

| | |
|--|---------------------------|
| Stores Ref. of front section | 12A/1236 |
| Stores Ref. of rear section | 12A/1237 |
| Length of front section | 3 ft. 11-15 in., approx. |
| Length of rear section | 3 ft. 11-75 in., approx. |
| Diameter of each section | 3 ft. 2 in., approx. |
| Weight and nature of filling:— | |
| Front section | 2,635 lb., Amatex 51/40/9 |
| Rear section | 2,726 lb., Amatex 51/40/9 |
| <i>Plug, aircraft bomb, No. 34, Mk. I</i> | |
| Stores Ref. | 12A/800 |
| <i>Attachment, nose, aircraft bomb, No. 6, Mk. I</i> | |
| Stores Ref. | 12A/1151 |
| Diameter | 3 ft. 2-13 in., approx. |
| Length | 5-75 in., approx. |
| <i>Tail, aircraft bomb, No. 33, Mk. I</i> | |
| Stores Ref. | 12A/1150 |
| Diameter | 3 ft. 1-85 in., approx. |
| Length | 3 ft. 0-5 in., approx. |
| <i>Ring, protecting, aircraft bomb, No. 6, Mk. I</i> | |
| Stores Ref. | 12S/613 |
| Diameter | 3 ft. 2 in., approx. |
| Length | 2-5 in., approx. |
| <i>Lug, suspension, No. 5, Mk. I, with securing screws</i> | |
| Stores Ref. | 12A/1152 |
| <i>Bracket, hoisting, No. 2, Mk. I, with securing screws</i> | |
| Stores Ref. | 12A/1642 |

GENERAL DESCRIPTION

Bomb body

Front section, fig. 1

4. The front section of the bomb body consists of a cylindrical steel casing having its forward end closed by a domed nose plate, welded in position, and its rear end closed by a flat closing plate which is bolted to a built-up end ring. The end ring is welded to the cylindrical shell and is fitted with assembly bolts for connecting the front and rear bomb body sections together.

5. The domed nose plate is fitted with three adapters for exploder containers, one located centrally and one at each side of the central adapter, inclined as shown in fig. 1. The exploder containers screw into the adapters and are secured in position by locking screws. A detonator holder is screwed into each exploder container and secured by a locking screw. Each of the three detonator holders is closed during transit and storage by a No. 34, Mk. I plug.

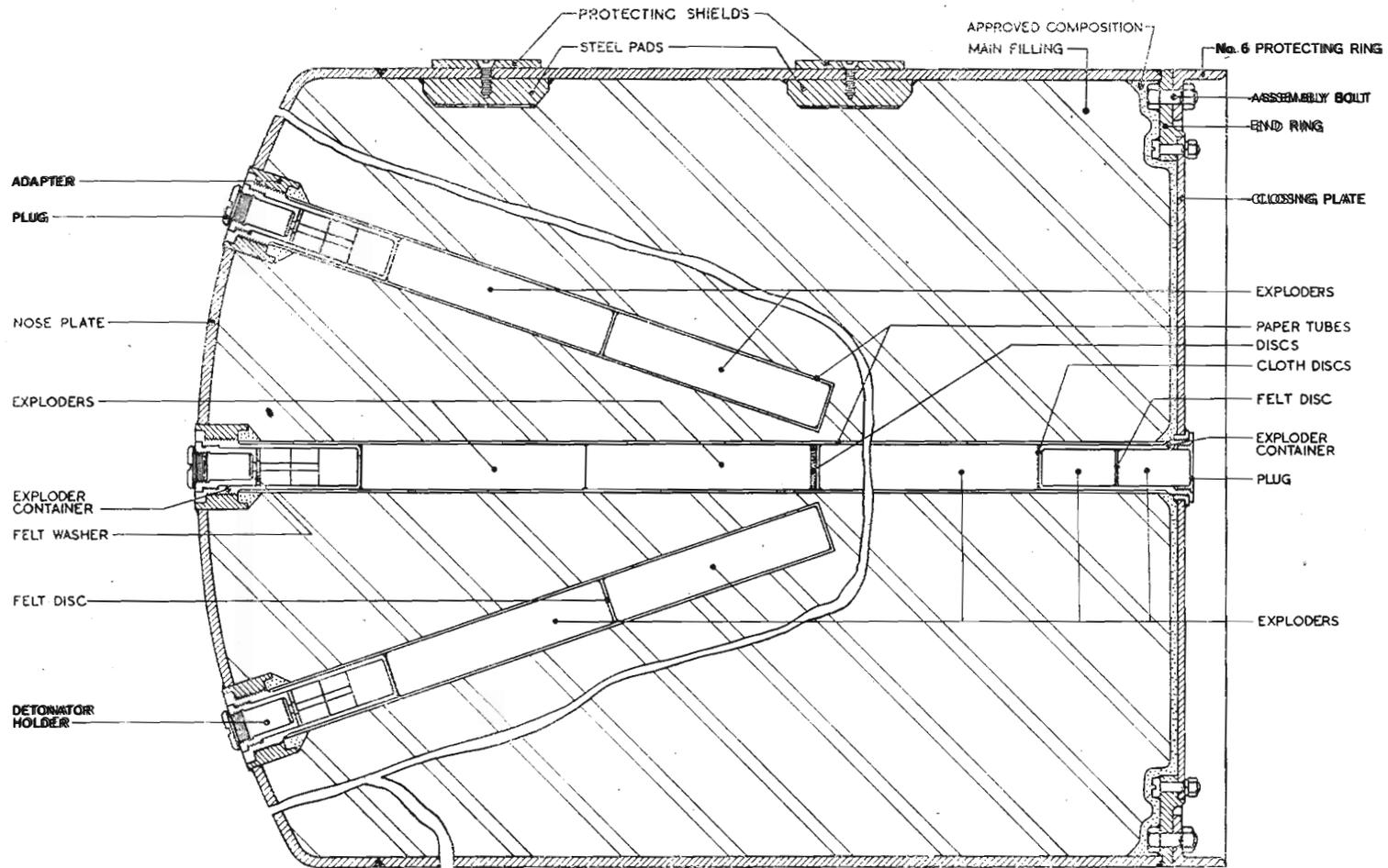


Fig. 1.—Mk. II bomb body front section fitted with protecting ring

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6. The rear end closing plate is fitted with a central bush for a further exploder container which is closed by a screw-in plug. Two drop handles are fitted to the closing plate, one at each side of the central bush.

7. This section of the bomb body is provided with tapped holes to receive the screws for the attachment of two hoisting brackets. These holes, which pass into steel blocks, are covered during transit and storage by protecting shields, each held in position by a single screw.

Rear section, fig. 2

8. The rear section of the bomb body consists of a cylindrical steel shell closed at both ends by flat plates. The forward closing plate is welded to a channel ring which is welded to the shell, and the rear closing plate is bolted to a built-up end ring which is welded to the shell and fitted with assembly bolts, for connecting the tail to the bomb body. The rear closing plate is fitted with drop handles, one at each side of a central adapter which is closed by a plug.

9. The channel ring is provided with holes to take the assembly bolts on the front section, and is strengthened by gussets, welded in position across the channel, the recesses between these gussets giving access to the assembly bolts used for assembling together the front and rear sections of the bomb body.

10. The forward closing plate is fitted with a central bush to accommodate an exploder container which is closed by a screw-in plug.

11. The rear section of the bomb body is provided with three positions to which hoisting brackets may be attached. The forward hoisting bracket when assembled is secured by four screws which pass into steel blocks, welded in position, one in the channel ring and the other immediately behind it, and these blocks also have tapped holes for the suspension lug securing screws. An alternative mounting for a hoisting bracket is provided further back by a steel pad, welded to the cylindrical shell and having tapped securing screw holes. The rear hoisting bracket is mounted still further back, and on assembly is secured by screws which pass through the shell and into tapped holes in another steel pad welded to the internal surface of the shell. The tapped holes which receive the screws securing the suspension lug and hoisting brackets to the bomb body are covered during transit and storage by protecting shields, each held in position by a single screw.

Note.—Early issues of the bomb have the tapped holes for the screws securing the suspension lug and centre hoisting bracket plugged by transit screws.

Filling

Bomb body front section, fig. 1

12. The three exploder containers in the nose each contain a 9 oz. 3 dr. exploder consisting of a solid C.E. pellet and two perforated C.E. pellets, covered by a felt washer and retained by the detonator holder.

13. A paper central tube extends through the front section and is cemented, at its ends, to the stems of the central exploder container in the nose and the exploder container on the rear end closing plate. This central tube contains three 33½ oz. C.E. exploders, with cloth discs at the rear end of the column, and a felt disc and millboard discs, as necessary, between the second and third exploders to make up the length and prevent displacement of the exploders.

14. The exploder container on the rear end closing plate contains two 7 oz. C.E. exploders which are retained by the closing plug and have a felt disc between them.

15. The two nose exploder containers which are inclined to the axis of the bomb body have their stems enclosed in paper tubes which extend almost to the central tube, and each of these paper tubes houses two 33½ oz. C.E. exploders separated by a felt disc and covered by cloth discs.

16. The main filling consists of Amatex 51/40/9 which, except for a layer of approved sealing composition at the rear end and pads of similar composition sealing the ends of the paper tubes to the nose adapters, occupies the whole interior space around the central tube.

Bomb body rear section, fig. 2

17. The exploder container houses two 7 oz. C.E. exploders, with a felt disc between them, covered by a cloth disc and retained by the closing plug.

18. A paper central tube has its forward end cemented to the exploder container and extends through the rear section almost to the rear closing plate. This tube houses three 33½ oz. C.E. exploders and one 10 oz. C.E. exploder covered by millboard discs and a felt disc, the column of exploders being retained in position by a wooden distance piece which fits in the rear end of the tube and is held in by the plug in the central adapter.

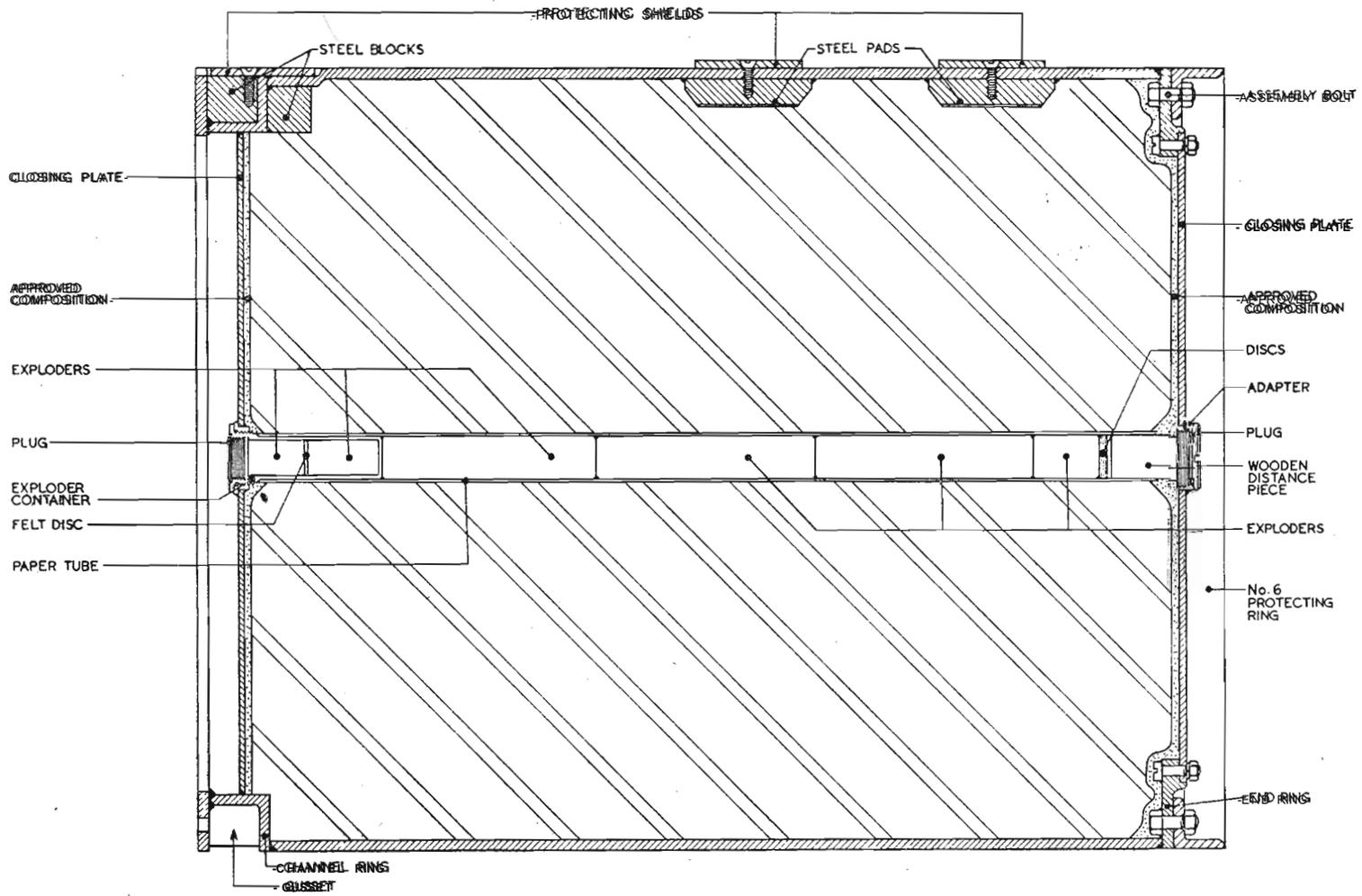


Fig. 2.—Mk. II bomb body rear section fitted with protecting ring

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19. The main filling consists of Amatex 51/40/9 and fills the whole interior space around the central tube with the exception of that taken up by layers of approved sealing composition at the ends.

Nose attachment, fig. 3

20. The nose attachment consists of a metal strip formed into a cylinder with its ends overlapped and connected by a guide screw passed through a slot in the outer end and into engagement with a nut fixed to the inner end near the forward edge. Portions of the overlapped ends are curled back to form bearings for the trunnion bars of a knuckle joint assembly, the trunnion bars being connected by a clamping bolt for tightening the attachment on to the nose end of the bomb. Locating stops are punched inwardly from the strip for locating the attachment correctly on the bomb.

Tail, fig. 3

21. The tail consists of a steel plate cylinder with an angle ring welded or riveted in its forward end. The angle ring is drilled to take the assembly bolts carried by the end ring of the rear section of the bomb body. Hand holes give access to the assembly bolts when assembling the tail to the bomb.

Protecting rings

22. The No. 6 Mk. I protecting ring, which is fitted to the rear end of each section of the bomb body during transit and storage, is of the same diameter as the bomb body sections, and has an inner rim drilled to take the assembly bolts on these sections.

Note.—Early issues of these bombs have a No. 3 Mk. I protecting ring fitted to the forward end of the front section of the bomb body, and a No. 4 Mk. I protecting ring fitted to the rear end of that section and to both ends of the rear section of the bomb body. The No. 3 Mk. I ring is secured by screws to locating pads at the forward end of the front section, and the No. 4 Mk. I rings to the rear end of each section by the assembly bolts and to the forward end of the rear section by ring securing bolts. Both types of rings have holes for lifting purposes when fitting the rings to or removing them from the bomb body sections.

Identification colouring and markings

Colouring

23. The bomb body sections, the nose attachment and the tail are painted dark green. A light green band, 2 in. wide, and a bright red band, 1 in. wide, are painted round each of the bomb body sections.

Markings on the bomb body front section

24. The following markings are stencilled, in yellow, on the bomb body front section:—

- (i) "AMATEX 51/40/9", in three equi-spaced positions round the body and immediately to the rear of the light green band.
- (ii) "H.C. SECTIONAL II NOSE".
- (iii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iv) The date of filling, month and year.
- (v) The lot number of the filled store.
- (vi) The design number of the method of filling.

Items (ii) to (vi) are behind the rear hoisting bracket position.

Markings on the bomb body rear section

25. The following markings are stencilled, in yellow, on the bomb body rear section:—

- (i) "AMATEX 51/40/9", in three equi-spaced positions round the body and immediately to the rear of the light green band.
- (ii) "H.C. SECTIONAL II REAR".
- (iii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iv) The date of filling, month and year.
- (v) The lot number of the filled store.
- (vi) The design number of the method of filling.

Items (ii) to (vi) are behind the rear hoisting bracket position.

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Markings on the nose attachment

26. The following markings are stamped on the nose attachment:—
- (i) "No. 6. I".
 - (ii) The manufacturer's initials, or recognized trade mark.
 - (iii) The date of manufacture, month and year.

Markings on the tail

27. The tail has the marking "No. 33. I" stencilled on it in yellow.
28. The following markings are stamped on the tail:—
- (i) "No. 33. I".
 - (ii) "H.C. SECTIONAL".
 - (iii) The manufacturer's initials, or recognized trade mark.
 - (iv) The date of manufacture, month and year.

Markings on the No. 6 Mk. I protecting ring

29. The following markings are stencilled on the inside of the rim:—
- (i) R.P. No. 6-I.
 - (ii) The manufacturer's initials or recognized trade mark.
 - (iii) The date of manufacture, month and year.

Note.—The No. 3 Mk. I and No. 4 Mk. I protecting rings have similar markings stencilled or stamped on their rims.

Markings on the No. 34 Mk. I transit plugs

30. The heads of the transit plugs are stamped with the following markings:—
- (i) The type number and the mark of the plug.
 - (ii) The manufacturer's initials, or recognized trade mark.
 - (iii) The date of manufacture, month and year.

Functioning

31. When the bomb is released from the aircraft, the safety forks or safety wires, as applicable, of the pistols in the three nose fuzeing positions are withdrawn by the fuze-setting control links, and during the fall of the bomb the pistols become armed.

32. The nose attachment and the tail stabilize the bomb in its flight, and upon impact of the bomb with the target the pistols are operated and fire the detonators. The detonators fire the associated exploders which detonate the main filling of the front section, whilst the main filling in the rear section is detonated through the firing of the associated exploders by sympathetic detonation.

Note.—The minimum height of release for this bomb as regards aircraft safety is 5,000 ft. Owing to the light structure of the body the nose will crush if the bomb is dropped "safe" on anything other than water or very soft ground, resulting in detonation. It is, therefore, essential that enforced jettisoning should be done well away from built-up areas and with the aircraft at a safe height.

33. The terminal velocity of the bomb is 850 ft. per sec.

INSTRUCTIONS FOR USE

Removing the protecting rings

34. Remove the nuts from the assembly bolts, or securing bolts, or slacken back the securing screws, as appropriate, depending on whether the No. 6 Mk. I or both the No. 3 Mk. I and No. 4 Mk. I protecting rings are fitted. Then withdraw the protecting rings from the bomb sections.

Assembling the bomb sections

35. The bomb sections are normally stored on two rows of battens of sufficient depth to allow ground clearance for the hoisting brackets, if already fitted. The assembly of the bomb body is to be done on an assembly platform, the method being detailed in the following para. 36 to 40.

36. Having removed the protecting rings from both the front and rear sections, roll the front section on to the roller conveyor, then push it along the roller conveyor on to the assembly platform. The centre of the front section should be positioned approximately above the centre of the assembly platform.

37. Similarly roll the rear section on to the roller conveyor and push it along the roller conveyor until it nearly comes into contact with the rear end of the front section.

38. Having thus positioned the two sections of the bomb ready for assembly, lower the roller portion of the assembly platform from under the front section so that the weight of this section is now taken by the screw jacks and the serrated rollers. Operate the screw jacks until the front section of the bomb is brought to the same level as the rear section, and by using the ratchet handles, which rotate the serrated rollers, rotate the front section of the bomb until the positions for the hoisting brackets on the two sections are in line and so that the assembly bolts on the front section align with the corresponding holes in the channel ring of the rear section.

39. With the aid of a crow-bar, push the rear section of the bomb on to the front section, taking care not to damage the threads of the assembly bolts. Replace the nuts on the assembly bolts and tighten using a suitable spanner (a ring spanner, for preference).

Note.—When tightening these assembly bolts do not work in rotation round the circumference of the bomb, but tighten, in turn, each pair of diametrically opposed nuts. This is to ensure that the two sections pull up together satisfactorily.

40. Ensure that all the assembly bolts have been tightened, then lower the screw jacks and roll the assembled bomb body off the assembly platform on to three rows of battens of sufficient depth to allow ground clearance for the hoisting brackets, if these are already fitted.

Fitting the hoisting brackets and suspension lug

41. It will be necessary to fit the hoisting brackets, where required (see sub-para. (i) and (ii)), to all bombs except those of early issue, which are supplied with brackets already assembled. The location of the brackets on the bomb body depends on the type of aircraft into which the bomb is to be loaded, as follows:—

(i) If the bomb is to be loaded on to a Halifax aircraft, hoisting brackets are not to be fitted.
Note.—The hoisting brackets are to be removed from bombs supplied with hoisting brackets fitted.

(ii) If the bomb is to be loaded on to a Lancaster aircraft, attach a hoisting bracket to the rear position on the front section of the bomb body and to the centre position on the rear section.
Note.—Make the necessary adjustments in position where hoisting brackets are supplied fitted to the bomb body.

To fit a hoisting bracket, first remove the protecting shield from the appropriate position on the bomb body. Ensure that the hoisting bracket holes and the threads on the securing screws are clean, and then securely attach the hoisting bracket in position.

42. To fit the suspension lug, first remove the protecting shield or transit screws, as appropriate, from the suspension lug holes. Check that these holes and the threads on the securing screws are clean, then attach the suspension lug, ensuring that the securing screws are effectively tightened.

Fitting the tail unit and nose attachment

43. Offer up the tail unit so that the clearance holes in the tail register with the assembly bolts in the rear of the bomb body. Push the tail unit on to the rear of the bomb body and replace the nuts, tightening them with a suitable spanner used through the hand holes in the side of the tail unit.

44. The nose attachment is to be fitted to the bomb by passing it over the nose of the bomb until the stops abut the nose plate and so that the knuckle joint assembly is positioned at an angle of 45 deg. to the suspension lug. Then secure the nose attachment in position by tightening the clamping bolt and guide screw.

45. After fitting the hoisting brackets, suspension lug, tail unit and nose attachment, load the bomb on to a Type E or Type F bomb trolley, as described in the relevant chapters of A.P.1664D, Vol. I (*to be issued later*), for conveyance to the fuzeing shed and later to the aircraft.

Fuzing the bomb

46. The bomb is to be fuzed at each of the three nose fuzeing positions with either a No. 27 or No. 42 pistol or with a No. 55 pistol. The arming of the No. 27 and No. 42 pistols is initiated by the

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vertical withdrawal of the safety fork, whereas the design of the No. 55 pistol is such that the "horizontal" system of fuizing is utilized, this system employing the pull-off of a safety wire to initiate arming of the pistol. The procedure for fuizing at each nose position is as follows:—

- (i) Unscrew and remove the No. 34 transit plug.
- (ii) Gauge the detonator cavity in the normal way, using a gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 12G/1001). The engraved line for the 250/500 lb. bombs is applicable. Bombs which fail to pass this test must be set aside for A.I.D./A.I.S. inspection.
- (iii) If a No. 55 pistol is to be used, fit the small conical spring supplied with this pistol over the stem of the appropriate sensitive type detonator so that the small end of the spring abuts the underside of the detonator head. *This spring must always be fitted when using a No. 55 pistol*, as it ensures that the detonator is in contact with the end of the striker guide when the pistol is screwed into the bomb.
- (iv) Insert the appropriate sensitive type detonator (for use with the No. 55 and No. 42 pistols) or anvil type detonator (for use with the No. 27 pistol) into the detonator cavity.
- (v) Screw a No. 27 or No. 42 pistol, by hand, into each nose fuizing position until it is well seated on its washer and locked in position. When using a No. 55 pistol, screw the pistol locking nut forward a few turns, then screw the pistol by hand into the nose of the bomb as far as it will go and lock it in this position by screwing the locking nut hard on to the bomb body.

Loading the bomb on to the bomb carrier

47. The fuized bomb is to be loaded from a Type E or Type F bomb trolley on to the bomb carrier as described in the chapter of A.P. 1664, Vol. I relevant to the carrier used.

48. When the bomb is securely loaded on the bomb carrier, the subsequent procedure to be followed at each nose fuizing position is described in the following para. 49 and 50, depending on the type of pistol fitted.

49. *Nose position fuized with pistol No. 27 or No. 42.* Proceed as follows:—

- (i) Attach the necessary fuze-setting control link(s) to the safety fork of the pistol. Insert the loop end of the link into the appropriate E.M. fuizing unit in the normal manner.
- (ii) Immediately before the aircraft takes off, remove the safety pin from the nose pistol.
Note.—The safety pin is to be handled to the pilot or air bomber.

50. *Nose position fuized with pistol No. 55.* Proceed as follows:—

- (i) Remove the safety pin from the pistol and rotate the safety cap assembly just sufficiently to align the hole in one of the lugs projecting from the safety cap with the hole in the uppermost lug of the pistol locking nut.
Note.—The safety pin is to be handled to the pilot or air bomber.
- (ii) Insert the plain end of a No. 1 Mk. I safety wire first through the hole in the locking nut and then through the hole in the projecting lug until the end protrudes approximately 3 in. Slip two No. 1 Mk. I safety clips over the end of the wire so that the inner clip is in light contact with the safety cap lug.
Note.—It is not essential that the pull-off of the safety wire should be exactly in line with the bomb suspension lug.
- (iii) Attach the required fuze-setting control link(s) to the loop end of the safety wire and then insert the loop end of the link into the appropriate E.M. fuizing unit in the normal manner.
Note.—As a satisfactory pull on the safety wire is obtained in this instance with the E.M. fuizing units in their normal vertical positions above the nose pistols, they are not to be moved inward towards the bomb suspension lug.

Unloading the bomb from the bomb carrier

51. Before unloading the bomb from the bomb carrier, replace the safety pins in the safety forks of the No. 27 and No. 42 pistols, if fitted. Disconnect the fuze-setting control links from the E.M. fuizing units and from the safety forks or safety wires of the pistols. Then unload the bomb on to a Type E or Type F bomb trolley as described in the chapter of A.P. 1664, Vol. I, relevant to the bomb carrier used.

52. Having unloaded the bomb, where a No. 55 pistol is fitted proceed to remove the two safety clips from the end of the safety wire and then withdraw this wire from the pistol. Screw up the safety

cap assembly until the stop pins are engaged and then unscrew the cap just sufficiently to bring its safety pin hole into line with the groove in the pistol body. Re-fit the safety pin.

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must not be used again.

Unfuzing the bomb

53. To unfuze the bomb, proceed at each nose fuzing position in turn as follows:—
- (ii) Unscrew and remove the pistol by hand, having first slackened back the locking nut of a No. 55 pistol.
 - (iii) Extract the detonator using an extractor, detonator, No. 2, Mk. I (Stores Ref. 12G/998). Where a conical spring has been fitted, in conjunction with the No. 55 pistol, remove this spring from the detonator stem, or from the bomb, and return it to its linen bag.
 - (iii) Replace the No. 34 transit plug.

Removing the tail unit and nose attachment

54. Detach the tail unit by removing the nuts on the assembly bolts securing the tail to the bomb body. Replace the nuts on the bolts.

55. Remove the nose attachment by slackening its clamping bolt and guide screw and withdrawing it from the nose of the bomb.

Removing the hoisting brackets and suspension lug

56. Except where the bomb is supplied with No. 3 and No. 4 protecting rings, remove all hoisting brackets and return them to the box provided (see para. 61). Replace the protecting shields. Also remove the suspension lug and return it to its box (see para. 61) replacing the protecting shield or transit screws, as appropriate, to close the suspension lug holes.

Dismantling the bomb body

57. If it is necessary to dismantle the assembled bomb body, the operation is to be done on a Type E bomb trolley, the procedure being as follows:—

- (i) Remove the nuts from the assembly bolts securing the front and rear sections together.
- (ii) Fit the rope complete with fittings to one of the bearer bases and by pulling the complete assembly, that is, jockey saddle, bearer base and bearers, separate the two sections.
- (iii) Unload each section from the trolley as described in the relevant chapter of A.P. 1364D, Vol. I (*to be issued later*) on to two rows of battens of sufficient depth to allow clearance room for the hoisting brackets if these are to remain fitted.

Pitting the protecting rings

58. To fit a No. 6 Mk. I protecting ring to the rear end of either section, push the ring on to the assembly bolts, and replace and tighten the nuts on these bolts. To fit a No. 3 Mk. I protecting ring to the forward end of the front section, pass the ring on to the nose of the bomb until the locating pads on the bomb body engage the locating slots in the ring and then screw up the securing screws to engage the holes in the pads. To fit a No. 4 Mk. I protecting ring to the rear end of either bomb body section, push the ring on to the assembly bolts and replace and tighten the nuts on these bolts. A similar procedure is used to assemble a No. 4 Mk. I protecting ring to the forward end of the rear section except that the ring securing bolts are employed.

SUPPLY AND STORAGE

Supply

59. The body, bomb, H.E., aircraft, H.C., 8,000 lb., Mk. II, front section (Stores Ref. 12A/1638), is supplied fitted with a ring, protecting, aircraft bomb, No. 6, Mk. I (Stores Ref. 12S/613) at its rear end. When the section is supplied fitted with No. 3 and No. 4 protecting rings, see para. 2, it is issued under Stores Ref. 12A/1236.

60. The body, bomb, H.E., aircraft, H.C., 8,000 lb., Mk. II, rear section (Stores Ref. 12A/1640), is also supplied fitted with a ring, protecting, aircraft bomb, No. 6, Mk. I (Stores Ref. 12S/613) at its rear end. When the section is supplied fitted with No. 4 protecting rings, see para. 2, it is issued under Stores Ref. 12A/1237.

61. The tail, aircraft bomb, No. 33, Mk. I (Stores Ref. 12A/1150) is supplied separately from the bomb. Ten attachments, nose, aircraft bomb, No. 6, Mk. I (Stores Ref. 12A/1151) are supplied

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in Box B.461 Mk. I. Five lugs, suspension, No. 5, Mk. I, together with twenty securing screws (Stores Ref. 12A/1152), are provisioned in Box B.458 Mk. I, and ten brackets, hoisting, No. 2, Mk. I, with forty securing screws (Stores Ref. 12A/1642), are packed in Box B.457 Mk. I.

Storage

62. The filled bomb body sections are classified, for storage purposes, in Group 7, see A.P.2608A, Chap. 7.

BOMB, H.E., AIRCRAFT, H.C., SECTIONAL, 8,000 lb., Mk. I

63. Attention is directed to para. 1 and 2.

Leading particulars

| | |
|--|--------------------------|
| 64. <i>Body, bomb, H.E., aircraft, H.C., sectional, 8,000 lb., Mk. I</i> | |
| Stores Ref. of front section | 12A/1148 |
| Stores Ref. of rear section | 12A/1149 |
| <i>Ring, protecting, aircraft bomb, No. 3, Mk. I</i> | |
| Stores Ref. | 12A/1153 |
| Maximum diameter | 3 ft. 9-375 in., approx. |
| Length | 11-5 in., approx. |
| <i>Ring, protecting, aircraft bomb, No. 4, Mk. I</i> | |
| Stores Ref. | 12A/1154 |
| Maximum diameter | 3 ft. 9-375 in., approx. |
| Length | 3 in., approx. |

The other leading particulars are the same as for the Mk. II bomb, see para. 3.

GENERAL DESCRIPTION

65. The Mk. I bomb is similar to the Mk. III bomb described in para. 4 to 33, except that cast steel end rings are provided, instead of the built-up end rings of the Mk. II construction, and the rear section has in its rear end a central exploder container housing an exploder consisting of two solid C.E. pellets, and extending into the rear end of the central tube, which is cemented to it.

INSTRUCTIONS FOR USE

66. The instructions for use given in para. 34 to 58 for the Mk. III bomb apply also to the Mk. I bomb.

SUPPLY AND STORAGE

Supply

67. The body, bomb, H.E., aircraft, H.C., 8,000 lb., Mk. I, front section (Stores Ref. 12A/1148), is supplied fitted with two hoisting brackets and a ring, protecting, aircraft bomb, No. 3, Mk. I (Stores Ref. 12A/1153) at its forward end and a ring, protecting, aircraft bomb, No. 4, Mk. I (Stores Ref. 12A/1154) at its rear end.

68. The body, bomb, H.E., aircraft, H.C., 8,000 lb., Mk. I, rear section (Stores Ref. 12A/1149), is supplied fitted with two hoisting brackets and a ring, protecting, aircraft bomb, No. 4, Mk. I (Stores Ref. 12A/1154) at each end.

69. The tail, aircraft bomb, No. 33, Mk. I (Stores Ref. 12A/1150), the attachments, nose, aircraft bomb, No. 6, Mk. I (Stores Ref. 12A/1151), in boxes of ten, and the suspension lugs, in boxes of six, with securing screws, are supplied separately from the bomb body sections.

Storage

70. The filled bomb body sections are classified, for storage purposes, in Group 7, see A.P.2608A, Chap. 7.

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Relevant amendments up to A.L. 72
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CHAPTER 7

BOMBS, H.E., AIRCRAFT, H.C., 2,000 lb., Mk. II and III

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CHAPTER 7

BOMBS, H.E., AIRCRAFT, H.C., 2,000 lb., Mk. II and III

Introduction

1. The 2,000 lb. Mk. II and III H.C. bombs are thin-cased blast bombs having a charge/weight ratio of approximately 70 per cent. They are fuzed at the nose only, and are fitted with a nose attachment and a tail to stabilize the flight of the bomb after release from the aircraft.

BOMB, H.E., AIRCRAFT, H.C., 2,000 lb., Mk. III

Leading particulars

2. *Body, bomb, H.E., aircraft, H.C., 2,000 lb., Mk. III*

| | | | | | | |
|--|-----|-----|-----|-----|-----|---|
| Stores Ref. | ... | ... | ... | ... | ... | 12A/1388 |
| Length | ... | ... | ... | ... | ... | 7 ft. 5-25 in., approx. |
| Maximum diameter | ... | ... | ... | ... | ... | 1 ft. 6-5 in., approx. |
| Weight and nature of filling | ... | ... | ... | ... | ... | 1210 lb., approx., amatol 60/40 or 50/50 |
| Terminal velocity of bomb fitted with nose attachment and No. 39 Mk. I tail | ... | ... | ... | ... | ... | 800 ft. per sec. (estimated) |

Attachment, nose, aircraft bomb, No. 8, Mk. I

| | | | | | | |
|-------------|-----|-----|-----|-----|-----|------------------------|
| Stores Ref. | ... | ... | ... | ... | ... | 12A/1123 |
| Diameter | ... | ... | ... | ... | ... | 1 ft. 6-7 in., approx. |
| Length | ... | ... | ... | ... | ... | 3-5 in., approx. |

Tail, bomb, aircraft, No. 39, Mk. I

| | | | | | | |
|-------------|-----|-----|-----|-----|-----|------------------------|
| Stores Ref. | ... | ... | ... | ... | ... | 12A/1124 |
| Diameter | ... | ... | ... | ... | ... | 1 ft. 5-5 in., approx. |
| Length | ... | ... | ... | ... | ... | 3 ft. 4 in., approx. |

Ring, protecting, aircraft bomb, No. 1, Mk. I

| | | | | | | |
|-------------|-----|-----|-----|-----|-----|----------|
| Stores Ref. | ... | ... | ... | ... | ... | 12A/1072 |
|-------------|-----|-----|-----|-----|-----|----------|

Ring, protecting, aircraft bomb, No. 1, Mk. II

| | | | | | | |
|-------------|-----|-----|-----|-----|-----|----------|
| Stores Ref. | ... | ... | ... | ... | ... | 12A/1389 |
|-------------|-----|-----|-----|-----|-----|----------|

Ring, protecting, aircraft bomb, No. 1, Mk. III

| | | | | | | |
|-------------|-----|-----|-----|-----|-----|----------|
| Stores Ref. | ... | ... | ... | ... | ... | 12A/1390 |
|-------------|-----|-----|-----|-----|-----|----------|

Plug, aircraft bomb, No. 34, Mk. I

| | | | | | | |
|-------------|-----|-----|-----|-----|-----|---------|
| Stores Ref. | ... | ... | ... | ... | ... | 12A/800 |
|-------------|-----|-----|-----|-----|-----|---------|

GENERAL DESCRIPTION

Bomb body, fig. 1 and 2

3. The bomb body is a fabricated cylinder having a dome-shaped nose and closed by a flat plate bolted to a flange at a short distance within the rear end.

4. The dome-shaped nose is fitted with three adapters housing exploder containers, each fitted with a detonator holder closed by a transit plug.

5. The flange is fitted with locating pins for the tail, and holes to receive tail securing bolts are drilled through the flange and tapped into blocks secured to it.

6. Holes closed by transit screws are provided in the bomb body for the attachment of a locating plate.

7. A central tube is cemented to the stem of the central exploder container in the nose and extends through the bomb body almost to the closing plate.

Filling

8. A C.E. exploder is housed in each of the three exploder containers in the nose, and a column of C.E. exploders is contained in the central tube. Each of the two outer exploder containers has a small solid C.E. exploder held in position by an enclosing paper tube.

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-9. The main filling of the bomb consists of approximately 1,210 lb. of amatol 60/40 or 50/50, which occupies the interior space around the central tube.

Nose attachment, fig. 2

10. The No. 8 Mk. I nose attachment is a light-gauge metal cylinder made from a strip $3\frac{1}{4}$ in. wide, the ends of the strip being connected by a knuckle joint assembly for securing the attachment to the bomb body. Portions of the ends are overlapped and interconnected by securing screws, and stops punched inwardly from the strip are provided to locate the nose attachment on the bomb body.

Tail, fig. 3

11. The No. 39 Mk. I tail is a metal cylinder, having an angle ring secured in each end. The angle ring in the forward end has holes to engage the locating pins, see para. 5, and tapped bosses fitted with bolts for securing the tail to the bomb body. Hand holes in the tail cylinder give access to the tail securing bolts, and further holes in the tail cylinder are provided to give ballistic stability in flight.

Protecting rings, fig. 1

12. For protecting the bomb body during transit and storage, it is fitted with a No. 1 Mk. I protecting ring at each end. The No. 1 Mk. I protecting ring is of U-shaped cross-section and made in two halves with lugs at the ends for securing bolts. When assembled to the bomb and bolted together tightly, the two halves of the ring encircle the bomb body and grip it to prevent displacement, and the rings serve as rolling hoops. Alternative types of protecting rings which may be fitted are the No. 1 Mk. II, which is of fabricated lattice construction, and the No. 1 Mk. III which is of tubular form.

Identification colouring and markings*Colouring*

13. The bomb body, the nose attachment, and the tail are painted dark green. A light green band 2 in. wide is painted round the bomb body 1 ft. 4 in. from the nose end, and a red band, $\frac{1}{2}$ in. wide, is painted round the bomb body 6 in. from the nose end.

Markings

14. The ratio "60/40" or "50/50", as appropriate, is stencilled, in yellow, immediately to the rear of the light green band on the bomb body.

15. The following markings are stencilled, in yellow, on the bomb body to the rear of the locating plate position:—

- (i) The type, nominal weight, and mark of the bomb.
- (ii) The design number of the method of filling.
- (iii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iv) The date of filling, month and year.
- (v) The lot number of the filling.

16. The marking "No. 39 MARK II" is stencilled, in black, on the tail cylinder near its rear end.

Functioning

17. Upon release of the bomb from the aircraft, the safety clips are withdrawn from the nose pistols by the fuze-setting control links, and the pistol arming vanes are unscrewed by the air stream and fall off so as to leave the pistols armed.

18. On impact of the bomb with the target, one at least of the pistols fires its detonator. The detonator fires its associated exploder which, in conjunction with the central tube exploders, detonates the main filling as a whole.

INSTRUCTIONS FOR USE

Removing the protecting rings

19. Slacken off the securing bolts and withdraw the protecting rings from the ends of the bomb body. To facilitate this operation the bomb body should be supported on planks of sufficient thickness to afford ground clearance.

Assembling the locating plate

20. Remove the transit screws from the bomb body and attach the locating plate with the bolts provided. These bolts have fibre inserts, and great care must be taken to ensure that they are tightened down fully so as to secure the locating plate firmly to the bomb body.

Fitting the tail

21. Pass the forward end of the tail into the rear end of the bomb body so that the locating holes and pins on these parts engage, and secure the tail in position by fully tightening up the tail securing bolts.

Fitting the nose attachment

22. Assemble the nose attachment and pass it over the nose of the bomb so that the clamping bolt of the nose attachment is on the underside. Ensure that the stops on the nose attachment are engaged with the domed nose of the bomb, secure the nose attachment in position by tightening the clamping bolt of the knuckle joint assembly, and finally tighten the screws on the overlapped portions.

Fuzing the bomb

23. Remove the transit plugs from the nose of the bomb, and ensure that the detonator cavities are clear, using the gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 112A/349) for this purpose. Bombs which fail to pass this gauge test are to be set aside for A.H.D. inspection.

24. Insert the required detonator into each detonator holder and insert a No. 27 Mk. I* or II or other pistol, screwing it home by hand until it is well seated on its washer and locked.

Loading the bomb on to the aircraft

25. Load the bomb on to the aircraft as instructed in the Air Publication relevant to the aircraft, or in the chapter of A.P. 11664, Vol. I, dealing with the 2,000 lb. Bomb Carriers, Type A, B, or Special, as appropriate, using two Slings (Stores Ref. 111A/992) with the Type A or the Special carrier, or two Slings (Stores Ref. 11A/994) with the Type B carrier. Finally connect the safety clip of each nose pistol to a fuze-setting control link on the carrier, remove the pistol safety pins and hand them to the pilot or the bomb aimer, or place the safety pins in the aircraft.

Unloading the bomb from the aircraft

26. Replace the pistol safety pins, disconnect the fuze-setting control links from the safety clips of the pistols, and unload the bomb as instructed in the Air Publication relevant to the aircraft, or in the appropriate chapter of A.P. 11664, Vol. I.

Unfuzing the bomb

27. Remove one of the pistols by hand, extract the detonator, using extractor, detonator, No. 2, Mk. I (Stores Ref. 112A/348), and then replace the pistol or insert the transit plug. Repeat these operations on the other two fuze positions in turn.

Removing the tail from the bomb

28. Unscrew the tail securing bolts to free the tail, and then withdraw the tail from the rear end of the bomb body.

Removing the nose attachment from the bomb

29. Slacken the securing screws in the overlapped portions of the attachment, slacken the clamping bolt of the knuckle joint assembly, and withdraw the attachment from the nose end of the bomb body.

Fitting the protecting rings

30. Pass the protecting rings on to the opposite ends of the bomb body and secure them in position by tightening their securing bolts until the rings grip the bomb body.

Removing the locating plate

31. Remove the bolts which secure the locating plate to the bomb body, remove the locating plate, and insert the transit screws into the bolt holes in the bomb body.

SUPPLY AND STORAGE**Supply**

32. The filled body, bomb, H.E., aircraft, H.C., 2,000 lb., Mk. III is supplied under Stores Ref. 12A/1388, fitted with transit screws in the bolt holes for the location plate, a plug, aircraft bomb, No. 34, Mk. I (Stores Ref. 12A/800) in each of the three nose fuze positions, and a ring, protecting, aircraft bomb, No. 1, Mk. I (Stores Ref. 12A/1072), Mk. II (Stores Ref. 12A/1389), or Mk. III (Stores Ref. 12A/1390) on each end.

33. The tail, bomb, aircraft, No. 39, Mk. I is supplied separately under Stores Ref. 12A/1124, and ten attachments, nose, aircraft bomb, No. 8, Mk. I (Stores Ref. 12A/1123) and ten locating plates (Stores Ref. 12A/1385), with securing bolts are supplied as Assembly No. 2 (Stores Ref. 12A/1387), packed together in a box.

Storage

34. The filled bomb bodies are classified, for storage purposes, in Group VII.

35. The No. 39 Mk. I tails may be stored in the same explosives storehouse as the filled bombs but they must be stacked well away from the filled stores.

BOMB, H.E., AIRCRAFT, H.C., 2,000 lb., Mk. II**Comparison with the Mk. III bomb**

36. The Mk. II bomb (Stores Ref. 12A/1122) is identical with the Mk. III bomb except that only the central nose fuze position can be used, the two outer ones being sealed by welded plugs or plates, their exploder containers left empty, and their paper tubes and end exploders being omitted. Except for obvious alterations entailed by this limitation to only one effective nose fuze position, the whole of the foregoing information relating to the Mk. III bomb applies equally to the Mk. II bomb.

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CHAPTER 8

BOMB, H.E., AIRCRAFT, H.C., SECTIONAL, 12,000 lb., Mk. II

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CHAPTER 8

BOMB, H.E., AIRCRAFT, H.C., SECTIONAL, 12,000 lb., Mk. II

Introduction

1. This bomb is a high capacity blast bomb consisting of three thin-cased body sections which require to be connected end to end. The bomb body, after assembly, is fitted with a suspension lug, hoisting brackets, and tail unit.

2. The front and rear sections of the bomb body are identical with those comprising the Mk. II 8,000 lb. H.C. sectional bomb body, and in addition there is a mid-section interposed. The bomb is fuzeed at the nose only, the nose section of the bomb body being provided with three nose fuzeing positions. Except for bombs issued to Overseas Commands, each section is fitted during transit and storage with a No. 6.Mk. I protecting ring at its rear end.

Note.—Supplies of these bombs for Overseas Commands are fitted with No. 3 Mk. I or No. 4 Mk. I protecting rings at the front and rear ends of each body section.

3. The terminal velocity of the bomb is 1,850 ft. per sec.

Leading particulars

Bomb body

| | | | | | |
|---|-----|-----|-----|-----|--------------------------|
| 4. Stores Ref. of front section | ... | ... | ... | ... | 12A/1638 |
| Stores Ref. of mid section | ... | ... | ... | ... | 12A/1693 |
| Stores Ref. of rear section | ... | ... | ... | ... | 12A/1640 |
| Length of front section (excluding protecting ring) | ... | ... | ... | ... | 3 ft. 11 in., approx. |
| Length of mid section (excluding protecting ring) | ... | ... | ... | ... | 3 ft. 11-75 in., approx. |
| Length of rear section (excluding protecting ring) | ... | ... | ... | ... | 3 ft. 11-75 in., approx. |
| Diameter of each section | ... | ... | ... | ... | 3 ft. 2 in., approx. |
| Weight and nature of filling— | | | | | |
| Front section | ... | ... | ... | ... | 2,793 lb. Minol 2 |
| Mid section | ... | ... | ... | ... | 2,840 lb. Minol 2 |
| Rear section | ... | ... | ... | ... | 2,890 lb. Minol 2 |
| Charge/weight ratio | ... | ... | ... | ... | 68 per cent. |

Tail unit, No. 52, Mk. I

| | | | | | |
|----------------|-----|-----|-----|-----|-------------|
| 5. Stores Ref. | ... | ... | ... | ... | 12A/1695 |
| Length | ... | ... | ... | ... | 5 ft. 4 in. |
| Weight | ... | ... | ... | ... | 250 lb. |

Protecting ring, No. 6, Mk. I

| | | | | | |
|----------------|-----|-----|-----|-----|----------------------|
| 6. Stores Ref. | ... | ... | ... | ... | 12S/613 |
| Length | ... | ... | ... | ... | 2-5 in., approx. |
| Diameter | ... | ... | ... | ... | 3 ft. 2 in., approx. |

GENERAL DESCRIPTION

Bomb body*Front section*

7. The front section of the bomb body consists of a cylindrical steel casing closed at its forward end by a domed nose plate and at its rear end by a closing plate bolted to a built-up end ring. This end ring is provided with assembly bolts for connecting together the front and mid body sections.

8. This section of the bomb body is provided with tapped holes to receive the screws for the attachment of two hoisting brackets. These holes, which pass into steel blocks, are covered during transit and storage by protecting shields, each held in position by a single screw.

9. The domed nose plate is fitted with three adapters each of which accommodates an exploder container and its detonator holder. The exploder containers and detonator holders are locked in position by set-screws. Located in each exploder container is a 9 oz. 3 dr. C.E. exploder covered by a felt washer. Each of the three detonator holders is closed during transit and storage by a No. 34 Mk. I plug (Stores Ref. 12S/592).

10. The closing plate is fitted with two drop handles and a central bush which accommodates a further exploder container closed by a screw-in plug. This exploder container houses two 7 oz. C.E. exploders, separated by a felt disc.

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January, 1945*

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11. Paper tubes, which fit over the side exploder containers, and a paper central tube, which extends along the axis of the bomb body section, contain 33½ oz. C.E. exploders with felt and cloth discs positioned between them, as shown in fig. 3.

12. The main filling of high explosive occupies the remaining space within this section of the bomb body and is sealed at the rear end by a layer of approved composition. Pads of similar composition seal the ends of the paper tubes to the nose adapters.

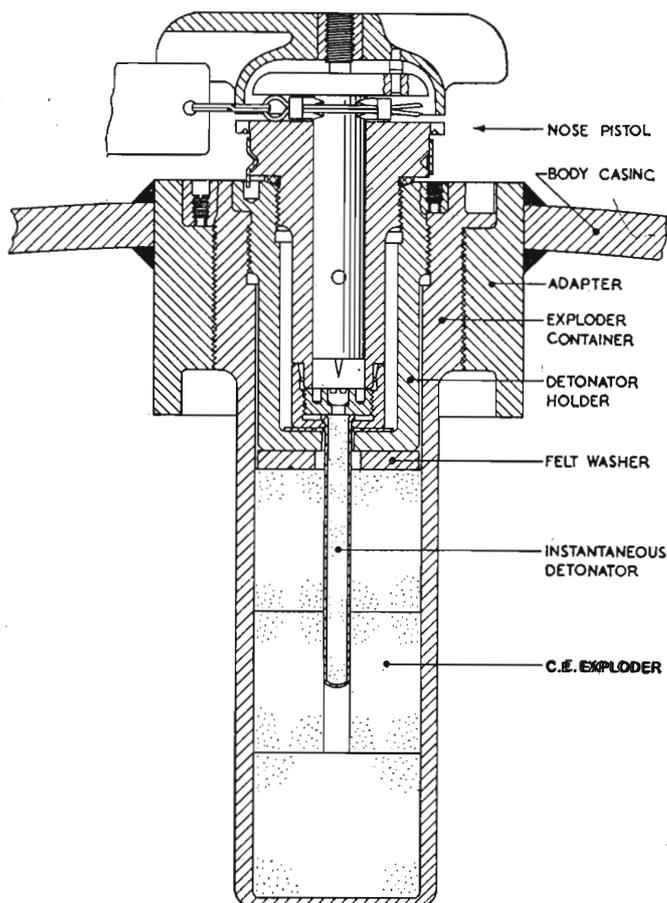


Fig. 1.—Section through nose fuze position

Mid section

13. The mid section of the bomb body consists of a cylindrical steel shell closed at both ends by flat plates, the forward plate being welded to a channel ring and the rear plate bolted to a built-up end ring. The channel ring is strengthened by gussets and is provided with holes to take the assembly bolts on the front section. Assembly bolts are fitted to the end ring for use in connecting together the mid and rear sections.

14. Tapped holes are provided in the body casing for the attachment of one suspension lug and two hoisting brackets. These holes, covered during transit and storage by protecting shields, pass into steel blocks and the suspension lug position is further strengthened by a steel pad. Two crutch pads are fitted to the forward end of this bomb body section and cover parts of the channel ring; they are attached by screws to brackets carried by transverse plates in the channel ring.

Beneath each crutch pad is a wooden plug which blocks one of the holes in the channel ring intended to receive an assembly bolt. Near one end of the wooden plug is inserted a split pin, with cord bucket attached, this pin preventing withdrawal of the plug through the bolt hole. Until the wooden plug is removed, the mid and nose sections of the bomb body cannot be fitted together.

15. The rear closing plate is fitted with two drop handles. The front and rear plates are each provided with a central bush which accommodates an exploder container, permanently closed by a flat-topped plug. Located in each exploder container are two 7 oz. C.E. exploders.

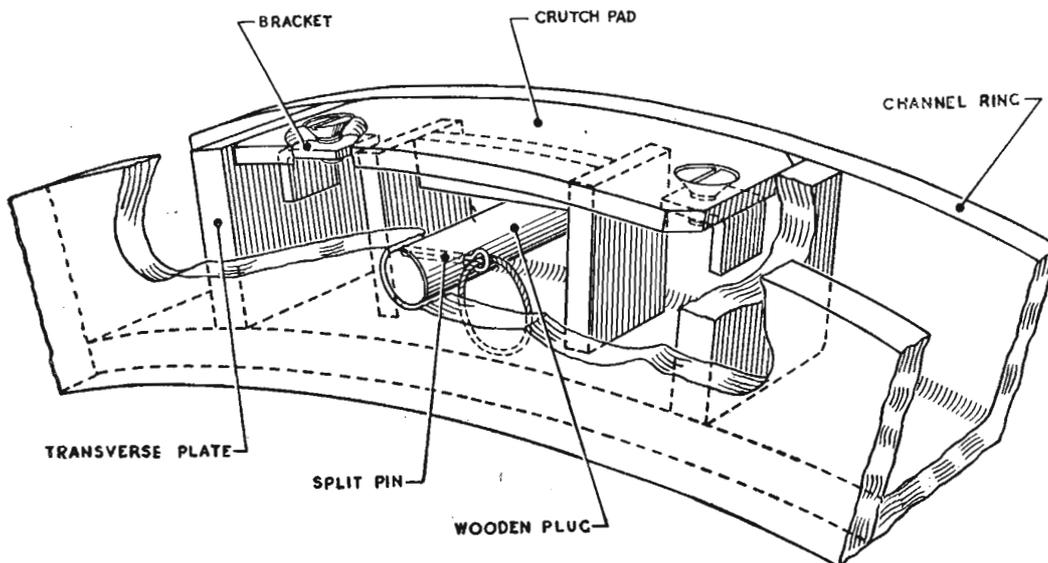


Fig. 2.—Broken perspective view showing attachment of crutch pad to channel ring

16. Three 33½ oz. C.E. exploders, together with felt discs, as shown in fig. 3, are contained in a paper central tube which extends axially along this section. The remaining space is filled by high explosive which is sealed at the ends by approved composition.

Rear section

17. The rear section of the bomb body has a similar construction to that of the mid section, as described in para. 13, the eight assembly bolts provided being used for securing the tail unit to the bomb body.

18. This section of the bomb body has three sets of tapped holes to receive screws for attaching hoisting brackets, the forward bracket position also having an alternative set of holes for the attachment of a suspension lug. These holes pass into steel blocks or pads, and are covered during transit and storage by protecting shields, each held in position by a single screw.

19. The forward closing plate is fitted with a central bush to accommodate an exploder container, which houses two 7 oz. C.E. exploders and is closed by a screw-in plug. The rear closing plate is fitted with two drop handles, one at each side of a central adapter which is closed by a plug.

20. A paper central tube is cemented at its forward end to the exploder container and extends almost to the rear closing plate. This tube houses three 33½ oz. exploders and one 10 oz. C. E. exploder covered at the rear end by millboard discs and a felt disc, and retained in position by a wooden distance piece seated under the rear plug. The main filling of high explosive is sealed at the ends by approved composition.

Tail unit

21. The No. 52 Mk. I tail unit consists of a tail cone with a cylindrical vane attached to it by six vane supports. A ring, drilled to take the assembly bolts on the rear section of the bomb body, is welded to the forward end of the tail cone. Hand holes give access to the assembly bolts when assembling the tail unit to the bomb body.

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A.P.11661B, Vol. II, Sect. 9, Chap. 8

Protecting rings

22. The No. 6 Mk. I protecting ring, which, except for bombs issued to Overseas Commands, is fitted to the rear end of each section of the bomb body during transit and storage, is of the same diameter as the bomb body sections; it has an inner rim drilled to take the assembly bolts on these sections.

Note.—Supplies of these bombs for Overseas Commands have a No. 3 Mk. I protecting ring fitted to the forward end of the front section of the bomb body, and a No. 4 Mk. I protecting ring fitted to the rear end of that section and to both ends of the mid and rear sections of the bomb body. The No. 3 Mk. I ring is secured by screws to locating pads at the forward end of the front section, and the No. 4 Mk. I rings to the rear end of each section by the assembly bolts, and to the forward end of the mid and rear sections by ring securing bolts. Both types of rings have holes for lifting purposes when fitting the rings to or removing them from the bomb body sections.

Identification colouring and markings

23. The sections of the bomb body, and the tail unit, are painted dark green. A light green band, 2 in. wide, and a bright red band, 1 in. wide, are painted round each of the body sections.

24. Each section bears one of the following markings, denoting the nature of the filling, stencilled in three places behind the light green band, thus:—"MIN 2", "AMATEX 51/40/9", "R.D.X./T.N.T.", or "TORPEX 2".

- Notes.*—(i) Only early supplies of bomb sections are filled Amatex 51/40/9, R.D.X./T.N.T., and Torpex 2.
(ii) Certain sections filled Minol 2 bear, in addition to the above marking, a white circle, enclosing the storage expiry date, stencilled on the forward end of the section. Such sections must be expended before the expiry date, which is one year from the date of filling.

In addition, the following information is also stencilled on each section of the bomb body:—

- (i) H.C. SECTIONAL, II, NOSE, MID, or REAR, as appropriate.
- (ii) The monogram of the filling station, or the initials, or recognized trade mark of the filling contractor.
- (iii) The date of filling, month and year.
- (iv) The Lot number.
- (v) The design number of the method of filling.

25. The number and mark, together with the manufacturer's markings are indicated on the tail unit, protecting rings, and transit plugs.

Functioning

26. When the bomb is released "live" from an aircraft, the safety forks or safety wires, as applicable, of the pistols in the three nose fuizing positions are withdrawn by the fuize-setting control links, and during the fall of the bomb the pistols become armed.

27. On impact of the bomb with the target one, at least, of the pistols is operated and fires its detonator. The detonator fires the associated exploders which detonate the main filling of the front section, the exploding system ensuring uniform detonation throughout the filling. Detonation of the main filling in the mid and rear sections is induced through the firing of the exploders by sympathetic detonation.

Note.—The minimum height of release for this bomb, as regards aircraft safety, is 5,500 ft. Owing to the light structure of the body, the nose will crush if the bomb is dropped "safe" on anything other than water or very soft ground, resulting in detonation. It is, therefore, essential that enforced jettisoning should be done well away from built-up areas and with the aircraft at a safe height.

INSTRUCTIONS FOR USE

Assembly of bomb

28. The bomb body sections, which are normally stored in the bomb dump on two rows of battens, are to be assembled together, and have the hoisting brackets, suspension lug and tail unit fitted prior to fuizing. Assembly of the bomb body is to be done on an assembly platform, which is normally positioned adjacent to the end of the battens on which the sections are stored. The method of assembly of the bomb sections is detailed in the following para. 29 to 35.

Assembling the bomb sections

29. Before transferring the bomb sections to the assembly platform, remove the protecting rings from the nose and mid sections after having unscrewed the nuts from the assembly bolts.

Note.—If the larger No. 3 or No. 4 protecting rings are fitted, these are to be removed from all three bomb sections, before assembly, by removing the nuts from the assembly bolts, or securing bolts, or unscrewing the securing screws, as appropriate.

30. Having removed the protecting rings from the appropriate sections of the bomb body, roll the mid section on to the roller conveyor and push it along the conveyor on to the rollers of the assembly platform. The centre of the bomb section should be positioned approximately above the centre of the assembly platform with the rear end facing the end of the roller conveyor.

31. Similarly roll the rear section on to the roller conveyor and push it along until it nearly comes in contact with the rear end of the mid section.

32. Having positioned the mid and rear sections of the bomb ready for assembly, lower the roller portion of the assembly platform from under the mid section so that the weight of this section is now taken by the screw jacks and the serrated rollers. Operate the screw jacks until the mid section of the bomb is brought to exactly the same level as the rear section, and by using the ratchet handles, which operate the serrated rollers, rotate the mid section of the bomb until the positions for the hoisting brackets on the two sections are in line and so that the assembly bolts on the mid section align with the corresponding holes in the channel ring of the rear section.

33. With the aid of a crowbar, push the rear section of the bomb body on to the mid section, care being taken not to damage the threads of the assembly bolts. Replace the nuts on the assembly bolts to secure the two sections together and tighten, using a suitable spanner (a ring spanner, for preference).

Note.—When tightening, do not work in rotation round the circumference of the bomb section, but tighten, in turn, each pair of diametrically opposite nuts. This ensures that the sections pull up together satisfactorily.

34. Raise the roller portion of the assembly platform and lower the screw jacks so that the partly assembled bomb may then be moved along the roller conveyor well clear of the assembly platform. Then, using the roller conveyor, transfer the nose section from its storage battens on to the roller portion of the assembly platform, as described in para. 30 for the mid section. Bring back the assembled mid and rear sections until the forward end of the mid section is nearly in contact with the rear end of the nose section. Remove the two crutch pads from the channel ring by unscrewing the securing screws. Withdraw the split pins and remove the wooden plugs; replace the split pins in the wooden plugs to prevent loss of the pins. Then, using the procedure already detailed for the mid and rear sections in para. 32 and 33, bolt the nose section to the mid section. Replace the two crutch pads.

35. When all the nuts on the assembly bolts have been tightened, raise the roller portion of the assembly platform and lower the screw jacks. Then roll the assembled bomb body off the assembly platform on to three rows of battens for the subsequent fitting of hoisting brackets, suspension lug and tail unit.

Fitting the hoisting brackets and suspension lug

36. For loading into the Lancaster aircraft, the bomb body is to be fitted with a suspension lug and two hoisting brackets. Attach the suspension lug to the centre position on the mid section and a hoisting bracket to the forward position on the mid and rear sections.

37. To fit a hoisting bracket, first remove the protecting shield from the appropriate position on the bomb body. Ensure that the hoisting bracket holes and the threads on the securing screws are clear, and then securely attach the hoisting bracket in position.

38. To fit the suspension lug, first remove the protecting shield from the suspension lug holes. Check that these holes and the threads on the securing screws are clear, then attach the suspension lug, ensuring that the securing screws are effectively tightened.

Fitting the tail unit

39. To fit the tail unit, where appropriate remove the nuts from the assembly bolts at the rear end of the bomb body and then withdraw the protecting ring. Offer up the tail unit so that the clearance holes in the tail cone ring register with the assembly bolts on the rear of the bomb body. Push the tail unit on to the rear of the bomb body and replace the nuts, tightening them with a suitable spanner used through the hand holes in the side of the tail unit.

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A.P.1661B, Vol. I, Sect. 9, Chap. 8

40. Transfer the completely assembled bomb on to a Type E or Type F bomb trolley, as described in the relevant chapter of A.P.1664D, Vol. I (*to be issued later*), for conveyance to the fuzeing shed and, after fuzeing operations are completed, to the aircraft.

Fuizing the bomb

41. The bomb is to be fuized, whilst on the trolley, at each of the three nose fuizing positions. Pistols No. 27, No. 42, or pistols No. 55 are to be used; in no circumstances is a No. 55 pistol to be used in conjunction with a No. 27 or No. 42 pistol. The design of the No. 55 pistol is such that the "horizontal" system of fuizing is required, whereby the pull-off of a safety wire initiates arming of the pistol. The No. 27 and No. 42 pistols are not adapted to take a safety wire and the "horizontal" system of fuizing cannot be employed with these pistols. The procedure for fuizing at each nose fuizing position is as follows:—

- (i) Unscrew and remove the No. 34 transit plug.
- (ii) Gauge the detonator cavity in the normal way, using a gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 12G/1001). The engraved line for 250/500 lb. bombs is applicable. Bombs which fail to pass this test must be set aside for A.I.D./A.I.S. inspection.
- (iii) If a No. 55 pistol is to be used, fit the small conical spring supplied with this pistol over the stem of the appropriate sensitive type detonator so that the small end of the spring abuts the underside of the detonator head. *This spring must always be fitted when using a No. 55 pistol* as it ensures that the detonator is in contact with the end of the striker guide when the pistol is screwed into the bomb.
- (iv) Insert the appropriate sensitive type detonator (for use with the No. 55 and No. 42 pistols) or anvil type detonator (for use with the No. 27 pistol) into the detonator cavity.
Note.—Instantaneous detonators *only* must be used.
- (v) If using a No. 27 or No. 42 pistol, screw the pistol, by hand, into the detonator holder until it is well seated on its washer and locked in position. When using a No. 55 pistol, screw the pistol locking nut forward a few turns, then screw the pistol by hand into the detonator holder as far as it will go, taking care not to distort the arming vane, and lock it in this position by screwing the locking nut hard on to the bomb body.

Loading the bomb on to the bomb carrier

42. The fuized bomb is to be loaded from a Type E or Type F bomb trolley on to the bomb carrier, as described in the relevant chapter of A.P.1664, Vol. I.

43. The procedure to be followed at each nose fuizing position, after the bomb is securely loaded on the carrier, is described in the following para. 44 or 45, depending on the type of pistol fitted.

44. *Pistol No. 27 or No. 42.* Proceed as follows:—

- (i) Attach one or more flexible fuze-setting control links, as required, to the safety fork of the pistol. Insert the loop end of the link into the appropriate E.M. fuizing unit in the normal manner.
- (ii) Immediately before the aircraft takes off, remove the safety pin from the safety fork.

Note.—The safety pin is to be handed to the pilot or air bomber.

45. *Pistol No. 55.* Proceed as follows:—

- (i) Remove the safety pin from the pistol and rotate the safety cap assembly just sufficiently to align the hole in one of the lugs projecting from the safety cap with the hole in the uppermost lug of the pistol locking nut.

Note.—The safety pin is to be handed to the pilot or air bomber.

- (ii) Insert the plain end of a No. 1 Mk. I safety wire first through the hole in the locking nut and then through the hole in the lug until the end protrudes approximately 3 in. Slip two No. 1 Mk. I safety clips over the end of the wire so that the inner clip is in light contact with the safety cap lug.

Note.—It is not essential that the pull-off of the safety wire should be exactly in line with the bomb suspension lug.

- (iii) Attach one or more flexible fuze-setting control links, as required, to the loop end of the safety wire and then insert the loop end of the link into the appropriate E.M. fuizing unit in the normal manner.

Note.—As a satisfactory pull on the safety wire is obtained in this instance with the E.M. fuizing units in their normal vertical positions above the nose pistols, they are *not* to be moved inward towards the bomb suspension lug.

Unloading and unfuzing a bomb

46. Before unloading the bomb from the bomb carrier, replace the safety pins in the safety forks of the No. 27 or No. 42 pistols, if fitted. Disconnect the fuze-setting control links from the E.M. fuzing units and from the safety forks or safety wires of the pistols. Then unload the bomb from the carrier on to a Type E or Type F bomb trolley, as described in the relevant chapter of A.P.1664, Vol. I.

47. Having unloaded the bomb, where a No. 55 pistol is fitted, remove the two safety clips from the end of the safety wire and then withdraw this wire from the pistol. Screw up the safety cap assembly until the stop pins prevent further movement, then engage the U-shaped end of the safety pin with the arming vane hole, which is opposite to the hole in the safety cap. Insert the plain end of the safety pin in its hole in the safety cap and then slowly unscrew the cap until this end of the pin drops into the groove in the pistol body.

Notes.—(i) Should the safety wire be kinked, bent, or otherwise distorted or damaged, it should be discarded, as it must not be used again.

(ii) If the pistol safety pin does not engage with the groove in the pistol body within one complete revolution of the safety cap, the cause must be ascertained, for example, the plain end of the safety pin may be burred or bent.

48. To unfuze the bomb, proceed at each nose fuzing position in turn as follows:—

(i) Unscrew and remove the pistol by hand, having first slackened back the locking nut of a No. 55 pistol.

(ii) Extract the detonator, using an extractor, detonator, No. 2, Mk. I (Stores Ref. 12G/998). Where a conical spring has been fitted, in conjunction with the No. 55 pistol, remove the spring from the detonator stem, or from the bomb, and return it to its linen bag.

(iii) Replace the No. 34 transit plug.

Dismantling the bomb

49. Having unfuzed the bomb, unscrew the nuts securing the tail unit to the bomb body, and then detach the tail unit. Replace the nuts on the assembly bolts.

50. Remove all hoisting brackets and the suspension lug and return them to their respective boxes (see para. 54). Replace the protecting shields.

51. If it is necessary to dismantle the assembled bomb body, this is to be done on a Type E bomb trolley, the procedure being as follows:—

(i) To separate the front and mid sections, first remove the two crutch pads from the channel ring of the mid section by unscrewing the securing screws. Then remove the nuts from the assembly bolts which connect the two sections together.

(ii) Fit the rope, complete with fittings, to one of the bearer bases, and by pulling the complete assembly, that is, jockey saddle, bearer base, and bearers, separate the front and mid sections. Re-fit the wooden plugs, together with the split pins, in the appropriate positions of the channel ring of the mid section so that the split pins prevent withdrawal of the plugs through the assembly bolt holes. Replace the crutch pads. Then unload the front section from the trolley, as described in the relevant chapter of A.P.1664D, Vol. I (*to be issued later*), on to two rows of battens.

(iii) To separate the mid and rear sections, remove the nuts from the assembly bolts connecting the two sections and then, proceeding as described in sub-para. (ii), separate and unload the mid and rear sections.

52. After transferring the bomb sections on to the storage battens, fit a No. 6 Mk. I protecting ring to the rear end of each section. To do this (having first removed the nuts from the assembly bolts), push the ring on to the assembly bolts, and replace and tighten the nuts on these bolts.

Notes.—(i) To fit a No. 3 Mk. I protecting ring to the forward end of the front section, pass the ring on to the nose of the bomb until the locating pads on the bomb body engage the locating slots in the ring and then screw up the securing screws to engage the holes in the pads.

(ii) To fit a No. 4 Mk. I protecting ring to the rear end of each bomb section, push the ring on to the assembly bolts and replace and tighten the nuts on these bolts. A similar procedure is used to assemble a No. 4 Mk. I protecting ring to the front end of the mid and rear sections except that the ring securing bolts are employed.

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SUPPLY AND STORAGE

Supply

53. The bodies, bomb, H.E., aircraft, H.C., sectional 12,000 lb., Mk. II, front, mid, and rear sections (Stores Ref. 12A/1638, 12A/1693, 12A/1640, respectively) are each supplied fitted with a ring, protecting, aircraft bomb, No. 6, Mk. I (Stores Ref. 12S/613), at the rear end. When supplied to Overseas Commands the sections are fitted with No. 3 and No. 4 protecting rings and issued respectively under Stores Ref. 12A/1236, 12A/1694, and 12A/1237.

54. The tail, bomb, aircraft, No. 52, Mk. I (Stores Ref. 12A/1695), is supplied packed in Crate B.467, Mk. I (wooden). Five lugs, suspension, No. 5, Mk. I, together with twenty securing screws (Stores Ref. 12A/1152), are provisioned in Box B.458, Mk. I, and ten brackets, hoisting, No. 2, Mk. I, with forty securing screws (Stores Ref. 12A/1642) are packed in Box B.457, Mk. I.

Storage

55. The filled bomb body sections are classified, for the purpose of storage, in Group 7, see A.P.2608A, Chap. 7.

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A.P.1661B, Vol. I, Sect. 9

APPENDIX 1

COMPONENTS USED WITH H.C. BOMBS

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APPENDIX 1

COMPONENTS USED WITH H.C. BOMBS

TABLE 1
BOMBS, H.E., AIRCRAFT, H.C., 2,000 lb., Mk. I and II

| <i>Nose fuuzing</i> | | |
|--------------------------|-----------------------------|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| One No. 27, Mk. I* or II | No. 43, Mk. I (inst.) | Special, supplied in position |
| One No. 42, Mk. I or II | No. 52, Mk. I or II (inst.) | |

TABLE 2
BOMB, H.E., AIRCRAFT, H.C., 2,000 lb., Mk. III

| <i>Nose fuuzing</i> | | |
|----------------------------|-----------------------------|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| Three No. 27, Mk. I* or II | No. 43, Mk. I (inst.) | Special, supplied in position |
| Three No. 42, Mk. I or II | No. 52, Mk. I or II (inst.) | |

TABLE 3
BOMB, H.E., AIRCRAFT, H.C., 4,000 lb., Mk. I

| <i>Nose fuuzing</i> | | |
|--------------------------|-----------------------------|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| One No. 27, Mk. I* or II | No. 43, Mk. I (inst.) | Special, supplied in position |
| One No. 42, Mk. I or II | No. 52, Mk. I or II (inst.) | |

TABLE 4
BOMBS, H.E., AIRCRAFT, H.C., 4,000 lb., Mk. II, III, and IV

| <i>Nose fuuzing</i> | | |
|----------------------------|-----------------------------|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| Three No. 27, Mk. I* or II | No. 43, Mk. I (inst.) | Special, supplied in position |
| Three No. 42, Mk. I or II | No. 52, Mk. I or II (inst.) | |

TABLE 5
BOMBS, H.E., AIRCRAFT, H.C., SECTIONAL, 8,000 lb., Mk. I and II

| <i>Nose fuuzing</i> | | |
|----------------------------|-----------------------------|-------------------------------|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| Three No. 27, Mk. I* or II | No. 43, Mk. I (inst.) | Special, supplied in position |
| Three No. 42, Mk. I or II | No. 52, Mk. I or II (inst.) | |

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Section 10

M.C. BOMBS

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A.P.1661B, Vol. I, Sect. 10

CHAPTER 1

General notes on M.C. bombs

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CHAPTER 1

General notes on M.C. bombs

Introduction

1. These bombs have a similar charge/weight ratio throughout their range, the general ratio being higher than that of G.P. bombs. Generally speaking, M.C. bombs are for general operational use as alternatives to the corresponding G.P. bombs, but certain bombs are designed for special operational use against resistant targets where deep penetration into sub-soil strata is required. Some bombs are provided with nose and tail fuzeing, others with nose or tail fuzeing only.

2. A general description of each weight and mark of M.C. bomb, and any instructions specific to that bomb, are given in the chapter of this section relevant to the particular bomb. The fuzeing components for use with M.C. bombs and the instructions for fuzeing them with the appropriate components are given in the appendices to this chapter.

Identification colouring and markings

3. The bomb body, tail, and transit fittings of all M.C. bombs are painted dark green. A red band is painted round the bomb body, near the nose, to denote that the bomb is filled, and a light green band is also painted round the body, towards the nose end, to denote that the bomb is an H.E. bomb.

4. The nature of the filling is indicated on the bomb body by stencilled markings, as follows:—

- (i) If the bomb is filled R.D.X./T.N.T., 60/40, the marking "R.D.X./T.N.T." is applied at three places on the light green band, with the ratio figures below the letters.
- (ii) If the filling is T.N.T., the marking "T.N.T." is applied in three places on the light green band.
- (iii) If the filling is Amatol 60/40 or 50/50, the appropriate ratio figures are applied at three places behind the light green band. If the bomb is filled Amatol 80/20, no markings appear on or near the light green band.
- (iv) If the bomb is filled Amatex 51/40/9, the marking "AMATEX" appears at one place on the light green band with the ratio figures below it.
- (v) If the filling is Desensitised Pentolite, Grade I, the marking "PEN./D.1" is stencilled in three places on the light green band.
- (vi) If the bomb is filled with Torpex 2, the marking "TORPEX 2" is applied in three places on the light green band.
- (vii) If the bomb is filled with American R.D.X./T.N.T. having a residual acidity content between 0.035 per cent and 0.1 per cent, the red band near the nose of the bomb is barred, and a red circle enclosing the expiry date is stencilled near the nose end of the bomb.
- (viii) If the filling is either 70/30 hot mixed Amatol, or 60/40, or 70/30, cold milled Amatol, each filling incorporating Grade 3 T.N.T., the red band near the nose end is barred in red.

Note.—The fillings listed in sub-para. (vii) and (viii) are not suitable for supply to, and use in, hot climates.

5. The following markings are also stencilled on the bomb body:—

- (i) The design number of the method of filling.
- (ii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iii) The date of filling, month and year.
- (iv) The lot number of the filling.
- (v) The type, nominal weight, and mark number of the bomb, for example "M.C. 500 lb. I".

6. If a tail pistol is supplied fitted in the bomb body, normally the number and mark of the pistol are stencilled on the bomb body near the tail end, for example, "PISTOL No. 65 I" would indicate that a No. 65 Mk. I pistol has been fitted to the bomb.

Note.—Bombs fitted with early marks of No. 30 pistol are stencilled "PISTOL No. 30", the mark number of the pistol not being specified.

7. The number and mark of M.C. bomb tails are stencilled on the cylindrical vane, or on one vane support.

8. Transit bases and protecting rings for M.C. bombs bear the following stencil markings:—

- (i) The number and mark of the transit base or protecting rings, for example, "No. 29, MARK I".
- (ii) The type and weight of the bomb to which the transit base or rings are fitted, for example, "M.C. 500 lb.".

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General precautions when fuzing or unfuzing an M.C. bomb

9. The following precautions must be taken when fuzing and unfuzing M.C. bombs:—
- (i) Only the smallest number of bombs compatible with the circumstances must be worked on at one time in the fuzing area. Bombs, whether plugged or fuzed, are not to be stored in fuzing areas when fuzing is in progress.
 - (ii) Components must not be inserted in, or withdrawn from, bombs whilst they are loaded in or on aircraft.
 - (iii) Fuzing or unfuzing must not be done within 75 yds. of any aircraft, petrol store, or building other than one which has been specially erected and/or sited for the purpose, nor must fuzing or unfuzing be done in the open to the rear of an aircraft having its engines running, owing to the dust disturbed by the slipstream.
 - (iv) Bombs must not be fuzed or unfuzed in or near an explosives storehouse or a bomb dump.
 - (v) Bombs, when being fuzed or unfuzed in the open, must always be worked on over soft ground.
 - (vi) The screw-threads of exploder containers, detonator holders, pistols and fuzes, must be clean and dry.
 - (vii) Fuzing components must not be left exposed to the sun.
 - (viii) When a bomb has been fuzed with a direct action pistol, the bomb body is to be stencilled "FZD" together with the number of the detonator used. When a bomb has been fuzed with a long delay pistol, special identification markings, details of which are given in the appropriate appendix to this chapter, are stencilled on the bomb body. If a bomb, fuzed direct action or long delay, is subsequently unfuzed, the markings are to be deleted.
 - (ix) If a bomb is to be fuzed at the tail only, the nose transit plug, if fitted, is not to be removed. When a bomb is to be fuzed at the nose only, the tail unit is to be fitted in the normal manner.

Functioning

10. On "live" release of a fuzed bomb from its bomb carrier or shackle, the safety device or safety wire is withdrawn from the nose pistol and/or from the tail arming mechanism or tail pistol, thus allowing the fuzing components to become armed.

Note.—Where a cartridge, delayed arming, aircraft bomb, Mk. I is utilized to provide a delay period before rotation of the tail arming mechanism can commence, it is fitted to the bomb tail unit. In this instance, the safety wire is threaded through the cartridge; on "live" release of the fuzed bomb, the wire is withdrawn thus initiating functioning of the cartridge which, after the delay period has elapsed, allows the tail arming vanes to rotate with consequent arming of the tail pistol.

11. On impact of the bomb with the target, the nose and/or tail pistol initiates the explosive train in the bomb, thus detonating the main filling.

■ *Note.*—If the bomb is fuzed with instantaneous detonators in both the nose and tail positions, the nose assembly will function first.

Examination and repair

12. Only such examination and repair of bombs as is specified in Sect. 20, Chap. 1, is to be done by armament personnel. Any bombs found to have major damage or defects are to be set aside for A.I.D./A.I.S. inspection.

13. Fuzed bombs, whether loaded on to aircraft, or stored in the fuzed bomb area, must be examined at the intervals stated in Sect. 20, Chap. 2.

Supply

14. M.C. bomb bodies are supplied plugged at the nose and/or tail, as appropriate, a transit plug being fitted in the nose position and either a pistol or transit plug at the tail. Where a tail pistol is supplied in position to serve as a transit plug during transit and storage, a transit base is normally fitted to the bomb body. Protecting rings may be fitted around the bomb body to protect the suspension lugs.

15. The tail units used with these bombs are normally supplied in cardboard containers, one tail per container, or in wooden crates. A fairing, which is a component of certain bombs, is supplied packed with the appropriate tail unit. One No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips are secured by adhesive tape to those tail units used in conjunction with the "horizontal" system of fuzing.

Storage

16. For the purpose of storage M.C. bombs are classified in Group 7. The regulations governing the storage of all H.E. bombs are given in A.P.2608A. Tail units and pistols may be stored in the same explosive storehouse as the filled bombs, but packages containing them must be stacked well clear of the filled stores.

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APPENDIX 6

INSTRUCTIONS FOR USE—USING THE No. 47 PISTOL

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2. View showing fairing in position on bomb body prior to fitting tail unit
3. View showing rear end of bomb body after completion of fuzing operations

Introduction

1. The No. 47 pistol is a long delay pistol for use in 12,000 lb. and 22,000 lb. M.C. bombs; these bombs have three fuzing positions in the tail, all of which are to be used. The pistol, which is fully described in A.P.1661C, Vol. I, Sect. 1, provides a nominal delay time of $\frac{1}{4}$ hr. (the No. 47 pistol) or 1 hr. (the No. 47A pistol).

Warning.—The No. 47 Mk. II and III pistols are not to be used.

2. A No. 78 tail unit is to be fitted to the 12,000 lb. bomb body, and a No. 82 tail to the 22,000 lb. bomb body, prior to fuzing. A fairing, supplied with the tail unit, is also required.

3. The fuzing operations must only be undertaken by selected and fully instructed armament personnel working under the supervision of a qualified armament N.C.O. conversant with the design and handling of these pistols. The attention of the fuzing party must be directed to the instructions on the label fixed to the underside of the lid of the box in which the pistols are supplied.

General precautions

4. If a No. 47 pistol is dropped from a height of 12 in. or more on to a hard surface, or is accidentally knocked, the pistol must be treated as if armed (due to possible fracture of the ampoule), and must be set aside for A.I.D./A.I.S. inspection.

5. Great care must be taken when loading, unloading and transporting the fuzed bombs not to subject them to rough treatment which might cause breakage of the ampoule. If a bomb fitted with No. 47 pistols be dropped accidentally or receive a severe shock in any other way, the three pistols must be removed immediately.

Assembling a bomb

6. The tail unit and fairing are normally to be fitted to the bomb body at the bomb storage area. The bomb body must be positioned on battens or on a cradle so that the dowel hole is uppermost and so that the tail end of the bomb body overhangs the end batten or the rear of the cradle by approximately two feet. The method of assembly is detailed in the following para. 7 to 10.

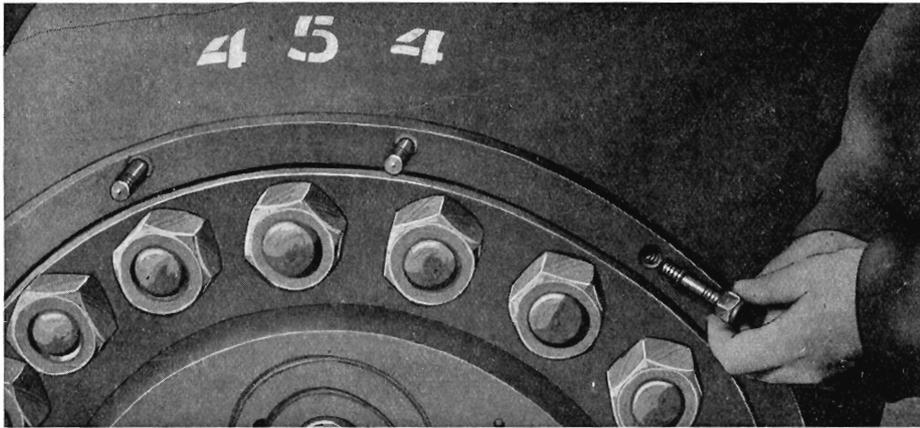


Fig. 1.—Fitting the tail assembly studs

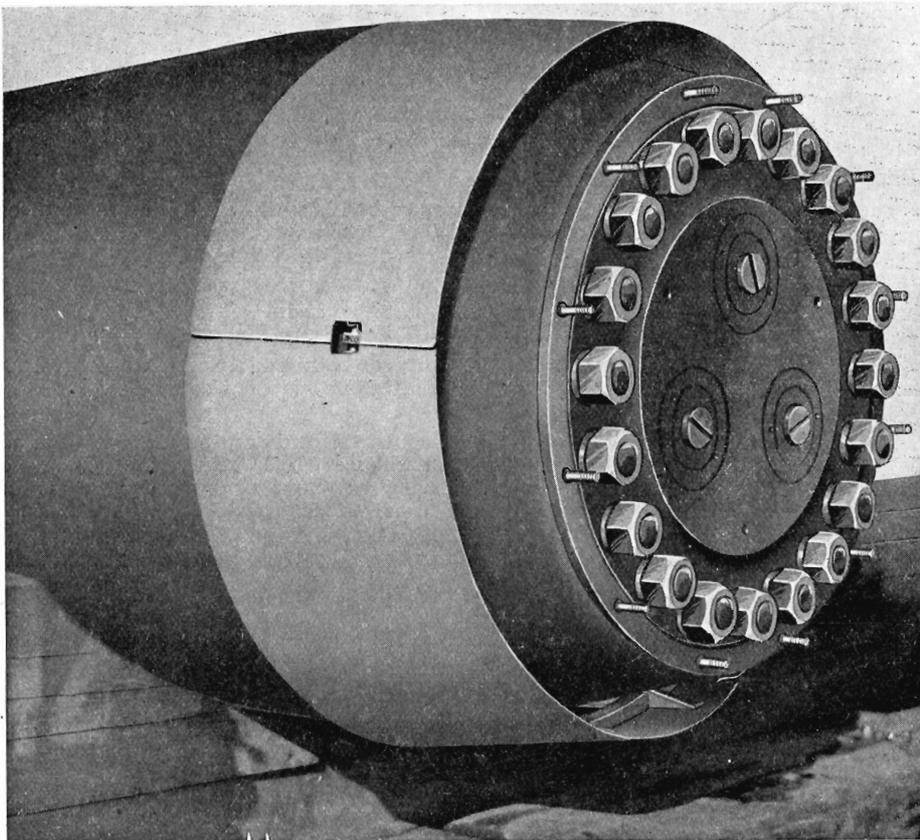


Fig. 2.—View showing fairing in position on bomb body prior to fitting tail unit

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A.P.11661B, Vol. I, Sect. 10, Chap. 1, App. 6

Preparing the bomb body

7. Before fitting the tail assembly studs, which are supplied in a small box built into the bomb transit cradle, examine the assembly stud holes in the rear of the bomb body and remove any particles of dirt and grease. Also examine the studs to ensure that the threads at each end of the studs are clear and that a nut is screwed on to the longer threaded end of each stud. Then screw the shorter threaded end of a stud into a hole in the rear of the bomb body, see fig. 1, and when the stud is securely in position remove the nut from the opposite end. Continue round the circumference of the bomb body until twelve studs have been fitted.

Note.—The flange on these tail assembly studs when correctly positioned must be well seated in the countersunk stud hole and must not be standing proud of the rear surface of the bomb body.

Preparing the tail unit and fairing

8. Carefully remove the tail unit and fairing from the wooden crate in which they are supplied and examine for damage.

9. Before fitting the tail unit to the bomb body, the assembly hand holes are to be uncovered as follows:—

- (i) Remove four of the five securing screws from each of the assembly hand hole panels, leaving the fifth screw slackened but in position.
- (ii) Swing the panels clear of the assembly hand holes.
- (iii) Replace the four securing screws to prevent their loss.

Note.—The assembly hand hole panels are not replaced until after the fuzed bomb has been loaded on to the aircraft and prior to "Take-off".

Fitting the tail unit and fairing

10. Proceed as follows:—

- (i) Slacken the three tumblers on the fairing and loosely position the fairing over the rear end of the bomb body so as not to obstruct the fitting of the tail unit, see fig. 2.
- (ii) Offer up the tail unit to the bomb body so that the arrow painted on the base of the tail cone is in alignment with the dowel hole on the bomb body, and ensure that the tail assembly studs projecting from the rear end of the bomb body register with the corresponding holes in the attachment ring of the tail unit.
- (iii) Position a fuze-setting control link shield on the top two tail assembly studs and then replace the nuts on all the studs. Using a suitable spanner through the assembly hand holes in the tail unit, tighten each of the nuts until three threads of the stud protrude.
Note.—When tightening, do not work in rotation round the circumference of the bomb but tighten, in turn, each pair of diametrically opposite nuts. This is to ensure that the tail unit is pulled evenly on to the rear of the bomb body.
- (iv) The fairing, which is already loosely resting on the rear of the bomb body, is now to be moved back till it abuts against the edge of the plating at the base of the tail cone. Using a small tommy bar, secure the fairing by tightening the three tumblers.

Fuzing a bomb

11. The bomb, with tail unit assembled, is to be fuzed while on a trolley in the long delay fuzing shed. The actual fuzing operations are to be completed through the assembly hand holes provided in the tail unit.

12. Remove three No. 47 pistols from the packing box and examine each as follows:—

- (i) Examine the arming screw threads adjacent to the pistol head for signs of coloured acetone stains which will be green for a No. 47 pistol or violet for a No. 47A pistol. These stains, if present, indicate breakage of the ampoule. In addition to this visual examination, the presence of acetone can sometimes be detected by its characteristic odour. If a broken ampoule is suspected, the pistol must not be used, but must be set aside for A.I.D./A.I.S. inspection.
- (ii) Ensure that the safety clip and safety pin are correctly positioned and that the linen thread has not unwound from the pulley.

- (iii) Ensure that the body threads of the pistol are free from dirt and grease.
- (iv) Check that the leather washer is fitted to the pistol body and that the tab is present on the locking spring.
- (v) Check that the point of the striker is not damaged.

Note.—If a pistol is suspected of being damaged or defective in any way, it is not to be used, but is to be set aside for A.I.D./A.I.S. inspection.

13. Check that the assembly hand holes have been uncovered as described in para. 9 and then proceed as follows:—

- (i) Remove the three transit plugs.
- (ii) Gauge each detonator cavity in the normal way, using a No. 2 Mk. I detonator cavity gauge. The engraved line for 250/500 lb. bombs is applicable. A bomb which fails to pass this test must not be used but must be set aside for A.I.D./A.I.S. inspection.
Note.—The following operations described in sub-para. (iii) to (v) are to be completed for each fuzeing position before passing on to the next.
- (iii) Insert the appropriate sensitive type detonator into the detonator cavity.

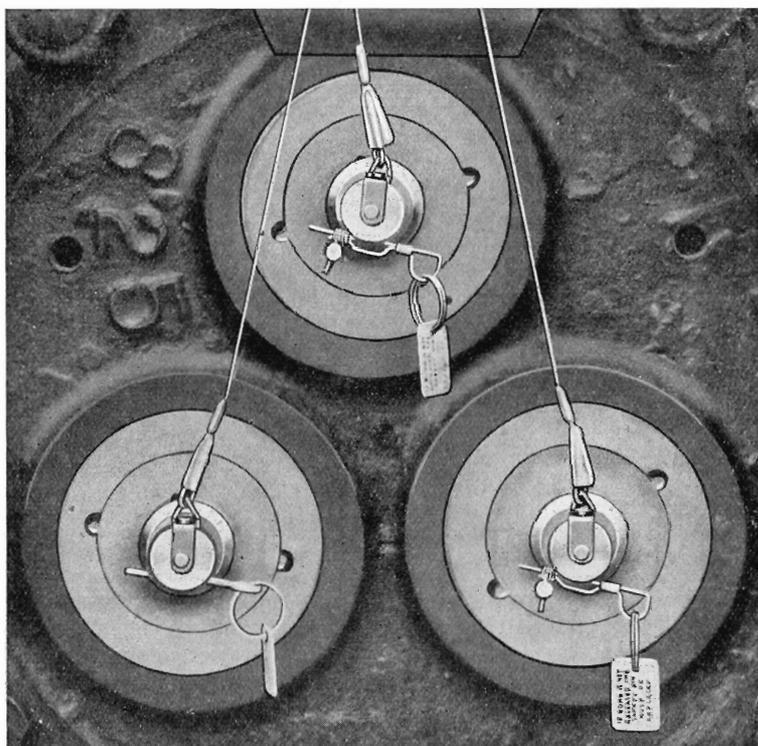


Fig. 3.—View showing rear end of bomb body after completion of fuzeing operations

- (iv) Screw a pistol (previously examined as described in para. 12), by hand, into the bomb until it is well seated on its washer and locked in position.
- (v) Attach the hook end of a fuze-setting control link to one arm of the pistol safety clip.
Notes.— (i) When preparing a 12,000 lb. bomb, a single fuze-setting control link is sufficient to reach from the uppermost pistol to the E.M. fuzeing unit, but two links, attached end to end, are required for the two lower pistols. When preparing a 22,000 lb. bomb, two links attached end to end are required for each of the three pistols.
- (ii) The end of the pistol safety clip must be inserted, by rotating the clip, into the hole in the pistol head which will give the most direct pull-off of the fuze-setting control link when the link is connected to the E.M. fuzeing unit.

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14. After completing the foregoing operations for each of the three fuzeing positions, see fig. 3, collect the looped ends of the three fuze-setting control links and pass them up through the fuzeing link hole in the top of the tail unit. Then insert a suitable piece of wood (6 in. x $\frac{1}{2}$ in., approximately) through the three loops to prevent them falling back into the tail unit during transportation of the bomb to the aircraft and bombing-up.

15. The fuzeed bomb is to be stencilled, in red dope, "L.D.47", "L.D.47A", as appropriate, together with the number of the detonator used.

Loading a fuzeed bomb

16. Load the fuzeed bomb on to the aircraft as described in A.P.2852A, Vol. I, Sect. 14.

17. When the bomb is securely in position in the aircraft, withdraw the piece of wood from the three end fuze-setting control links and insert the looped end of each link into the appropriate E.M. fuzeing unit in the normal manner.

18. Immediately before the aircraft takes off, remove the copper wire from the safety pin and withdraw the pin from the safety clip of each of the three pistols. Place the safety pins and copper wires in a conspicuous position at the Air Bomber's station. The panels are now to be replaced over the assembly hand holes. To do this, first remove the screws, which were temporarily screwed back into the tail unit, and then swing the panels to cover the assembly hand holes. Screw the panel securing screws firmly in their original position.

Unloading and unfuzeing a bomb

19. Disconnect the three end fuze-setting control links from the E.M. fuzeing units. Before the bomb is unloaded from the aircraft, the assembly hand holes in the tail unit are to be uncovered as described in para. 9.

Note.—The assembly hand hole panels are normally replaced after unfuzeing the bomb, but should it be necessary to remove the tail unit and fairing, the panels are not replaced until after this operation has been completed.

20. Due to the possibility of a broken ampoule, coupled with the short delay time provided by a No. 47 pistol, immediately the operations referred to in para. 19 have been completed, examine the three No. 47 pistols to check whether the safety clip is securely in position and whether the linen thread attached to it has unwound from the arming pulley. If the safety clip is not securely in position or the linen thread is unwound, or if there is any sign of green or violet acetone stains on the arming screw threads the ampoule may have been broken. Should breakage of the ampoule of any one pistol be suspected, the bomb must be unfuzeed immediately. Set the pistols aside pending A.I.D./A.I.S. inspection.

21. If a broken ampoule is not suspected, replace the safety pin in the safety clip of each of the three pistols and secure the end of the pin with copper wire. Then unload the bomb from the aircraft as described in A.P.2852A, Vol. I, Sect. 15.

22. Immediately on arrival of a fuzeed bomb at the long delay fuzeing shed, again examine for a broken ampoule, and if such be suspected proceed as already described in para. 20. If there is no sign of a broken ampoule unfuze the bomb as soon as practicable according to the instructions given in para. 23.

Note.—Bombs should not be stored with a No. 47 pistol in position.

23. The bomb is to be unfuzeed while on a trolley in the long delay fuzeing shed. Using the assembly hand holes in the tail unit, proceed as follows:—

(i) Remove the fuze-setting control link or links from the safety clip of each of the three pistols.

Note.—The following operations described in sub-para. (ii) to (iv) are to be completed for each fuzeing position before passing on to the next.

(ii) Unscrew the pistol, by hand, and return it to its box.

(iii) Using a No. 2 Mk. I detonator extractor, remove the detonator and return it to its tin.

(iv) Replace the transit plug.

24. After completing the foregoing operations for each of the three fuzeing positions, the stencil markings referred to in para. 15 denoting that the bomb has been fuzeed with a No. 47 pistol are to be obliterated.

Removing the tail unit and fairing

25. Where it is necessary to remove the tail unit and fairing the operation is normally to be done at the bomb storage area. The bomb must be positioned on battens or on a cradle so that only the bomb body rests on the battens or cradle. Then proceed as follows:—

- (i) Slacken the three tumbuckles on the fairing and move it just clear of the tail unit.
- (ii) With a suitable spanner used through the assembly hand holes in the tail unit remove the nuts from the tail assembly studs. Withdraw the fuze-setting control link shield from the top two studs.
- (iii) Detach the tail unit from the bomb body and remove the fairing.
- (iv) Replace the nuts on the tail assembly studs and unscrew the studs from the rear end of the bomb body.

26. Having removed the tail unit, replace the panels over the assembly hand holes. To do this, first remove the screws, which were temporarily screwed back into the tail unit, and then swing the panels to cover the assembly hand holes. Screw the panel securing screws firmly in their original position.

27. Return the tail unit and fairing to the wooden crate in which they were supplied.

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APPENDIX 7

INSTRUCTIONS FOR USE—USING THE No. 58 TAIL PISTOL

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Fig.

1. Fitting the tail assembly studs.
2. View showing fairing in position on bomb body prior to fitting tail unit
3. View showing rear end of bomb body after completion of fuzing operations

Introduction

1. The No. 58 pistol is a tail pistol for use in 12,000 lb. and 22,000 lb. M.C. bombs; these bombs have three fuzing positions in the tail, all of which are to be used. The pistol is fully described in A.P.1661C, Vol. I, Sect. 1.

2. A No. 78 tail unit is to be fitted to the 12,000 lb. bomb body, and a No. 82 tail to the 22,000 lb. bomb body, prior to fuzing. A fairing, supplied with the tail unit, is also required.

Assembling a bomb

3. The tail unit and fairing are normally to be fitted to the bomb body at the bomb storage area. The bomb body must be positioned on battens or on a cradle so that the dowel hole is uppermost and so that the tail end of the bomb body overhangs the end batten or the rear of the cradle by approximately two feet. The method of assembly is detailed in the following para. 4 to 7.

Preparing the bomb body

4. Before fitting the tail assembly studs, which are supplied in a small box built into the bomb transit cradle, examine the assembly stud holes in the rear of the bomb body and remove any particle, of dirt and grease. Also examine the studs to ensure that the threads at each end of the studs are clear and that a nut is screwed on to the longer threaded end of each stud. Then screw the shorter threaded end of a stud into a hole in the rear of the bomb body, see fig. 1, and when the stud is securely in position remove the nut from the opposite end. Continue round the circumference of the bomb body until twelve studs have been fitted.

Note.—The flange on these tail assembly studs when correctly positioned must be well seated in the countersunk stud hole and must not be standing proud of the rear surface of the bomb body.

Preparing the tail unit and fairing

5. Carefully remove the tail unit and fairing from the wooden crate in which they are supplied and examine for damage.

6. Before fitting the tail unit to the bomb body, the assembly hand holes are to be uncovered as follows:—

- (i) Remove four of the five securing screws from each of the assembly hand hole panels, leaving the fifth screw slackened but in position.

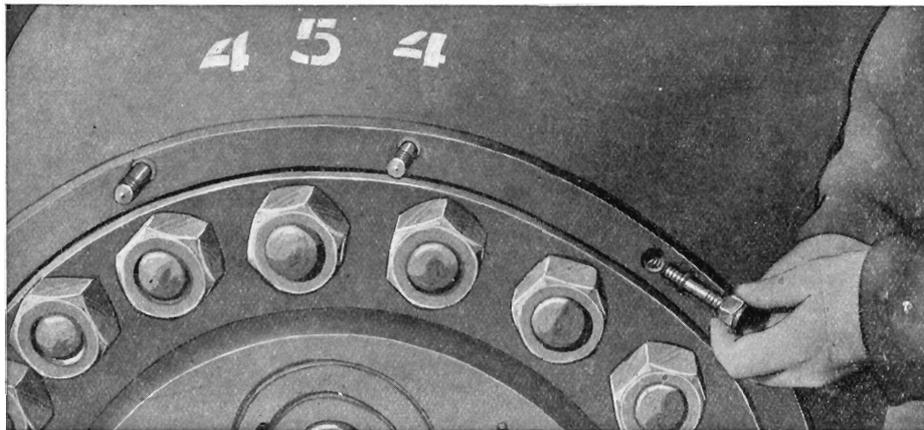


Fig. 1.—Fitting the tail assembly studs

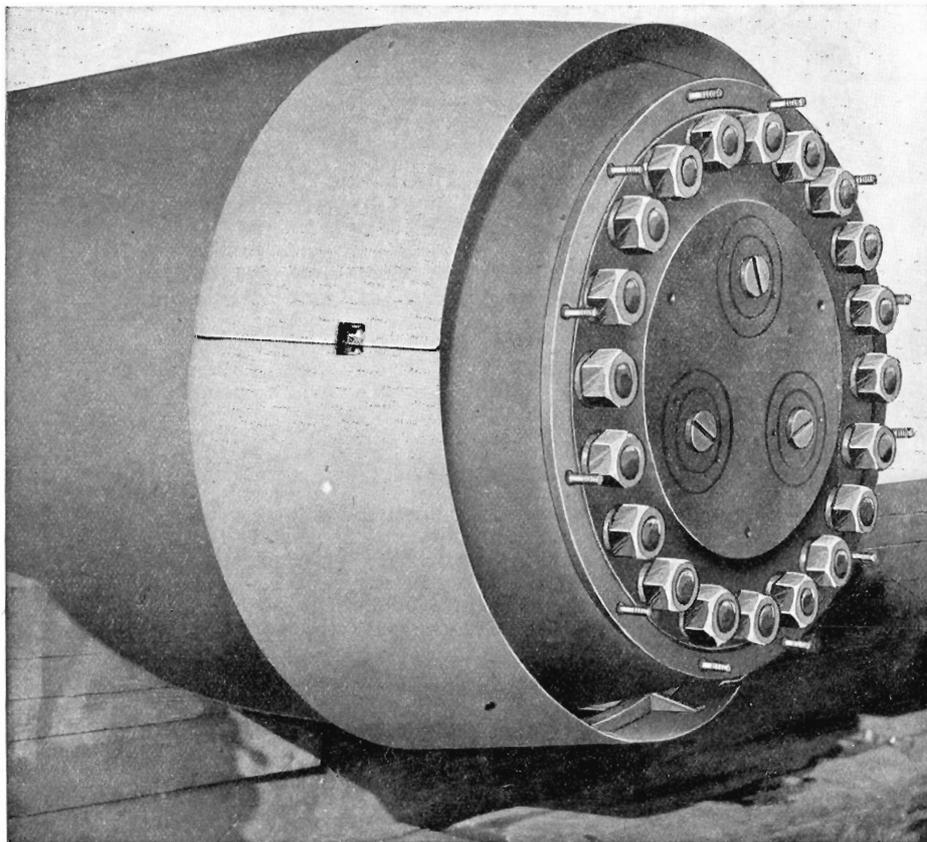


Fig. 2.—View showing fairing in position on bomb body prior to fitting tail unit

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A.P.1661/B, Vol. 1, Sect. 10, Chap. 1, App. 7

- (ii) Swing the panels clear of the assembly hand holes.
- (iii) Replace the four securing screws to prevent their loss.

Note.—The assembly hand hole panels are not replaced until after the fuzed bomb has been loaded on to the aircraft and prior to "Take-off".

Fitting the tail unit and fairing

7. Proceed as follows:—

- (i) Slacken the three turnbuckles on the fairing and loosely position the fairing over the rear end of the bomb body so as not to obstruct the fitting of the tail unit, see fig. 2.
- (ii) Offer up the tail unit to the bomb body so that the arrow painted on the base of the tail cone is in alignment with the dowel hole on the bomb body, and ensure that the tail assembly studs projecting from the rear end of the bomb body register with the corresponding holes in the attachment ring of the tail unit.
- (iii) Position a fuze-setting control link shield on the top two tail assembly studs and then replace the nuts on all the studs. Using a suitable spanner through the assembly hand holes in the tail unit tighten each of the nuts until three threads of the stud protrude.
Note.—When tightening, do not work in rotation round the circumference of the bomb but tighten, in turn, each pair of diametrically opposite nuts. This is to ensure that the tail unit is pulled evenly on to the rear of the bomb body.
- (iv) The fairing, which is already loosely resting on the rear of the bomb body, is now to be moved back till it abuts against the edge of the plating at the base of the tail cone. Using a small tommy bar, secure the fairing by tightening the three turnbuckles.

Fuzing a bomb

8. The bomb, with tail unit assembled, is to be fuzed while on a trolley in the fuzing shed. The actual fuzing operations are to be completed through the assembly hand holes provided in the tail unit.

9. Remove three No. 58 pistols from the packing box and examine each as follows:—

- (i) Verify that the safety pin is in position and that the overseal and press-cap have not been removed.
Note.—The overseal and press-cap must never be removed from the pistol.
- (ii) Ensure that the body threads of the pistol are free from dirt and grease.
- (iii) Check that the leather washer is fitted to the pistol body and that the tab is present on the locking spring.
- (iv) Check that the point of the striker is not damaged.
Note.—If a pistol is suspected of being damaged or defective in any way, it is not to be used, but is to be set aside for A.I.D./A.I.S. inspection.

10. Check that the assembly hand holes have been uncovered as described in para. 6, and then proceed as follows:—

- (i) Remove the three transit plugs.
- (ii) Gauge each detonator cavity in the normal way, using a No. 2 Mk. I detonator cavity gauge. The engraved line for 250/500 lb. bombs is applicable. A bomb which fails to pass this test must not be used, but must be set aside for A.I.D./A.I.S. inspection.
Note.—The following operations described in sub-para. (iii) to (v) are to be completed for each fuzing position before passing on to the next.
- (iii) Insert the appropriate sensitive type detonator into the detonator cavity.
- (iv) Screw a pistol (previously examined as described in para. 9), by hand, into the bomb until it is well seated on its washer and locked in position.
- (v) Thread the plain end of a No. 10 flexible safety wire through one of the two holes in the pistol head not occupied by the safety pin. Adjust the safety wire to protrude approximately 3 in., where practicable, and then slip two No. 1 Mk. I safety clips over the end of the wire so that the inner clip is in light contact with the pistol head.
Note.—The wire must be inserted through the hole in the pistol head which will give the more direct pull-off of the wire when the latter is connected to the E.M. fuzing unit.

11. After completing the foregoing operations for each of the three fuzing positions, see fig. 3, collect the looped ends of the three safety wires and pass them up through the fuzing link hole in the top of the tail unit. Then insert a suitable piece of wood (6 in. x $\frac{1}{2}$ in., approximately) through the three loops to prevent them falling back into the tail unit during transportation of the bomb to the aircraft and bombing-up.

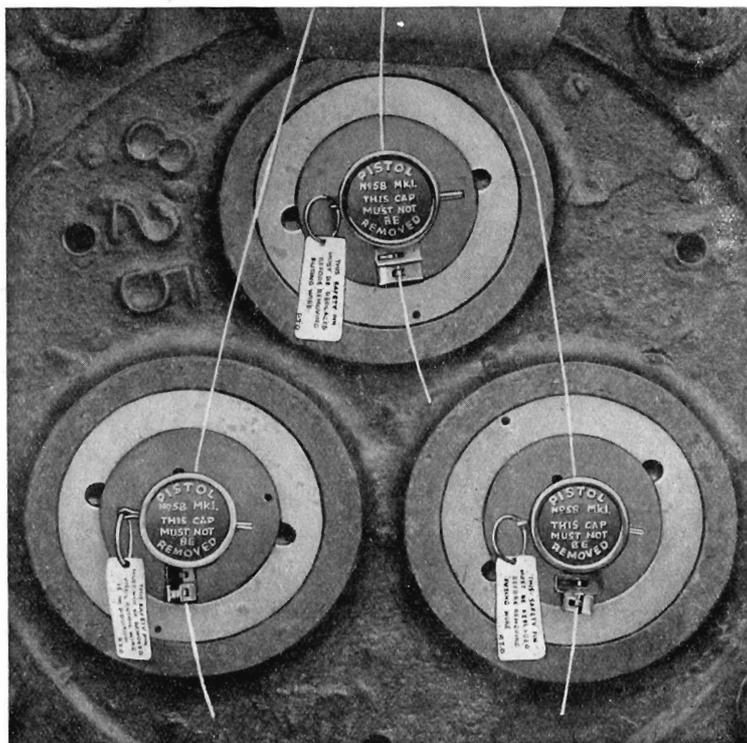


Fig. 3.—View showing rear end of bomb body after completion of fuzing operations

Loading a fuzed bomb

12. Load the fuzed bomb on to the aircraft as described in A.P.2852A, Vol. I, Sect. 144

13. When the bomb is securely in position in the aircraft, withdraw the piece of wood from the three safety wires and insert the looped end of each wire into the appropriate E.M. fuzing unit in the normal manner.

14. Immediately before the aircraft takes off, remove the safety pin from each of the three pistols and place the pins in a conspicuous position at the Air Bomber's station. The panels are now to be replaced over the assembly hand holes. To do this, first remove the screws, which were temporarily screwed back into the tail unit, and then swing the panels to cover the assembly hand holes. Screw the panel securing screws firmly in their original position.

Unloading and unfuzing a bomb

15. Disconnect the three safety wires from the E.M. fuzing units. Before the bomb is unloaded from the aircraft, the assembly hand holes in the tail unit are to be uncovered as described in para. 6.

Note.—The assembly hand hole panels are normally replaced after unfuzing the bomb, but should it be necessary to remove the tail unit and fairing, the panels are not replaced until after this operation has been completed.

16. Replace the safety pin in each of the three pistols and then unload the bomb from the aircraft as described in A.P.2852A, Vol. I, Sect. 145

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17. The bomb is to be unfuzed whilst on a trolley in the fuzing shed. Using the assembly hand holes in the tail unit, proceed as follows:—

- (i) Check that the safety pin is securely in position. Then, after removing the two safety clips, withdraw the safety wire from each of the three pistols.

Note.—Should the safety wire be kinked, frayed, or otherwise damaged, it must not be used again. Such a wire is to be discarded and not returned to its box.

Note.—The following operations described in sub-para, (ii) to (iv) are to be completed for each fuzing position before passing on to the next.

- (ii) Unscrew the pistol, by hand, and return it to its box.
- (iii) Using a No. 2 Mk. I detonator extractor, remove the detonator and return it to its tin.
- (iv) Replace the transit plug.

Removing the tail unit and fairing

18. Where it is necessary to remove the tail unit and fairing the operation is normally to be done at the bomb storage area. The bomb must be positioned on battens or on a cradle so that only the bomb body rests on the battens or cradle. Then proceed as follows:—

- (i) Slacken the three tumbuckles on the fairing and move it just clear of the tail unit.
- (ii) With a suitable spanner used through the assembly hand holes in the tail unit, remove the nuts from the tail assembly studs. Withdraw the fuze-setting control link shield from the top two studs.
- (iii) Detach the tail unit from the bomb body and remove the fairing.
- (iv) Replace the nuts on the tail assembly studs and unscrew the studs from the rear end of the bomb body.

19. Having removed the tail unit, replace the panels over the assembly hand holes. To do this, first remove the screws, which were temporarily screwed back into the tail unit, and then swing the panels to cover the assembly hand holes. Screw the panel securing screws firmly in their original position.

- 20. Return the tail unit and fairing to the wooden cradle in which they were supplied.

AIR
MINISTRY
July, 1944

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A.P.1661B, Vol. I, Sect 10

CHAPTER 2

BOMBS, H.E., AIRCRAFT, M.C., 250 lb., Mk. I and II

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1. Sectional view of Mk. I bomb fitted with No. 8 transit base and No. 24 nose plug
 2. Mk. I bomb fitted with nose pistol and No. 2 Mk. III tail unit

This is A.L. No. 84 to A.P.1661B, Vol. I and concerns Sect. 10
To the title of Chap. 2 on the List of Chapters, after "Mk. I" add "and
II" delete "(to British Coler)" and delete "A.L. 84" in the outer margin
of the list. Insert this chapter, and make an entry in the Amendment
Record Sheet.

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ARMAMENT

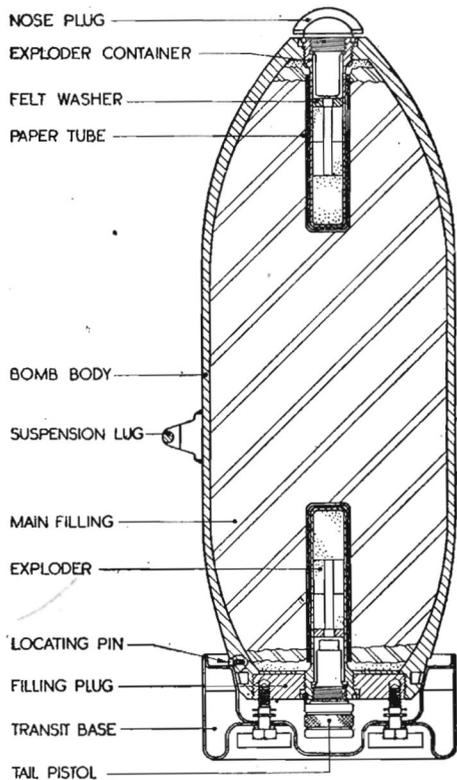
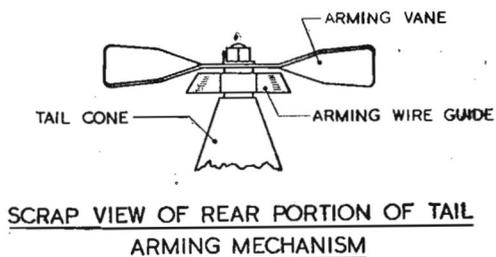


Fig. 1.—Sectional view of Mk. I bomb fitted with No. 8 transit base and No. 24 nose plug

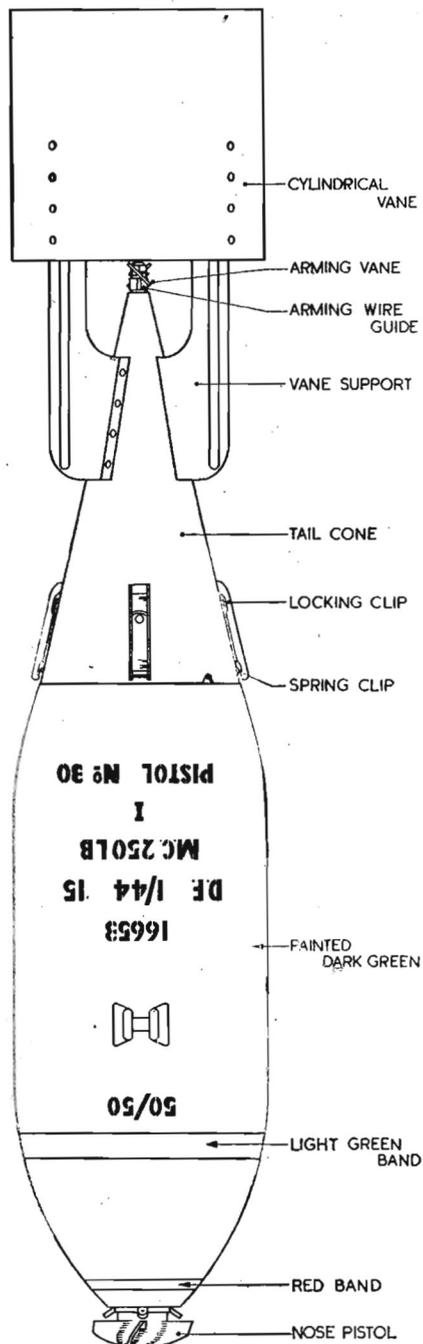


Fig. 2.—Mk. I bomb fitted with nose pistol and No. 2 Mk. III tail unit

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CHAPTER 2

BOMBS, H.E., AIRCRAFT, M.C., 250 lb., Mk. I and II

Introduction

1. These bombs are for general operational use as an alternative to the 250 lb. Mk. IV G.P. bomb.

2. The bombs are supplied with a No. 30 pistol in position in the tail and are fitted with a No. 8 transit base which is secured to the bomb body by two wing bolts. The nose end of the bomb body is plugged for transit and storage by a No. 24 transit plug, the threaded portion of which is provided with a fibre insert for locking it in position.

3. The No. 2 Mk. I, II, and III tail units are for use with these bombs, but the No. 2 Mk. I tail is not to be fitted when the bombs are to be carried in fighter-bomber aircraft. The No. 2 Mk. III tail unit is only to be used in conjunction with the "horizontal" system of fuzeing which utilizes a "horizontal" pull-off of a safety wire threaded through the tail arming mechanism.

4. Attention is directed to Chapter 1 of this Section which contains general information including particulars of markings, functioning, supply and storage of the bombs. Appendix 1 to Chapter 1 of this Section gives particulars of the components to be used with these bombs. The succeeding Appendices to Chapter 1 contain instructions for fuzeing, loading, unloading and unfuzeing appropriate to the type of pistol and system of fuzeing.

BOMB, H.E., AIRCRAFT, M.C., 250lb., Mk. I

Leading particulars

5. The Stores Reference numbers of the bomb body are as follows:—

| Filled Amatol | Pistol No. 30 | Mk. II | Mk. III | Mk. III* or IV | Mk. V | | |
|----------------------|---------------|-----------|-----------|----------------|-----------|--|--|
| | | 112A/1517 | 112A/1519 | 112A/1521 | 112A/1523 | | |
| Filled Pentolite D.1 | Pistol No. 30 | Mk. II | Mk. III | Mk. III* or IV | Mk. V | | |
| | | 112A/1518 | 112A/1520 | 112A/1522 | 112A/1524 | | |
| | | | | | | | |
| | | | | | | | |

| | |
|---|---|
| Stores Ref. of tail No. 2, Mk. I | 112A/288 |
| Stores Ref. of tail No. 2, Mk. II | 112A/902 |
| Stores Ref. of tail No. 2, Mk. III | 112A/1654 |
| Length of bomb with tail and nose pistol fitted | 4 ft. 7.6 in., approx. |
| Maximum diameter of bomb, excluding suspension lugs | 10.2 in. |
| Weight and nature of filling | 82½ lb. amatol 50/50 or 60/40 of 79½ lb. pentolite D.1 |
| Charge/weight ratio | 42.44 per cent. |
| Terminal velocity | 1,330 ft. per sec. |

General description

Bomb body

6. The 250 lb. Mk. I M.C. bomb body is of cast steel construction, open at both the nose and tail ends. The nose opening is threaded internally to house an exploder container. The tail opening is closed by a filling plug, which carries an exploder container. The filling plug is provided with two tapped holes to receive the securing bolts of the transit base.

7. A suspension lug is welded to the bomb body. The tail end of the body is shaped to take the tail cone, and is provided with four equally spaced slots which receive the spring clips securing the tail. A locating pin is also fitted to the rear end of the body to engage with a notch in the forward end of the tail cone to position the tail on its assembly to the bomb body.

8. The nose and tail exploder containers, which are locked in position by locking screws, are internally screw threaded to take respectively a nose plug or nose pistol, and a tail pistol.

9. The bomb body is filled with high explosive as specified in para. 5. The filling is sealed into the body at nose and tail ends with glazedboard washers and pads of approved composition.

10. Each exploder container is protected against the filling by a paper tube and located in each container, by a waxed felt washer, is a 4 oz. 6 dr. C.E. exploder.

Tail units

11. The No. 2 Mk. I, II, and III tail units consist of a tail cone with a cylindrical vane attached to it by four vane supports. The forward end of the tail cone is notched to engage with the locating pin in the bomb body. Four spring clips, provided with rotatable locking clips, are attached to the forward end of the tail cone to engage with the slots on the bomb body.

Note.—Early issues of the No. 2 Mk. II tail are fitted with two locking clips only. The No. 2 Mk. I tail units are not provided with locking clips fitted, but clips, locking (Stores Ref. 12A/842) are issued separately for use with this tail.

12. The No. 2 Mk. I and II are safety clip type tail units and as such must not be assembled to the bomb body when the "horizontal" system of fuzing is required. The No. 2 Mk. III tail unit, as stated in para. 3, must always be used in conjunction with this system of fuzing. The respective arming mechanisms of these two types of tail unit are described in para. 13 and 14.

Note.—If the "horizontal" system of fuzing is required and only the No. 2 Mk. I or II tail unit is available it may be converted for use as described in Sect. 10, Chap. 1, App. 5.

13. *Arming mechanism of the No. 2 Mk. I or II tail unit* (not illustrated in the figures).—This mechanism incorporates an arming spindle which is mounted axially in the tail cone and carries an arming fork at the forward end and a two-bladed arming vane at the rear end. A safety clip is provided on a cone bush at the apex of the tail cone to prevent rotation of the arming mechanism until the bomb is released "live".

14. *Arming mechanism of the No. 2 Mk. III tail unit* (see fig. 2).—This mechanism incorporates an arming spindle which is mounted axially in the tail cone and carries an arming fork at the forward end and a two-bladed arming vane at the rear. Each blade of the arming vane has a small hole drilled through it. A small arming wire guide, having two tubular channels, is fitted to the tail cone bush. The appropriate tubular channel and the hole in one of the arming vane blades carry the safety wire when the bomb is tail fuzed.

BOMB, H.E., AIRCRAFT, M.C., 250 lb., Mk. II

Comparison with the Mk. I bomb

15. The Mk. II bomb differs from the Mk. I bomb chiefly in that the Mk. II bomb body is provided with two additional suspension lugs so that the bomb can be carried in American aircraft. The information contained in the preceding para. 1 to 14 applies equally to this bomb except in the following respects:

- (i) Three suspension lugs are welded to the bomb body, two of which are diametrically opposite the third.
- (ii) A filling plug adapter is fitted between the exploder container and the filling plug.
- (iii) The Stores Reference number of the Mk. II bomb body filled Amatol and fitted with tail pistol No. 30 Mk. IV is 12A/1781l.

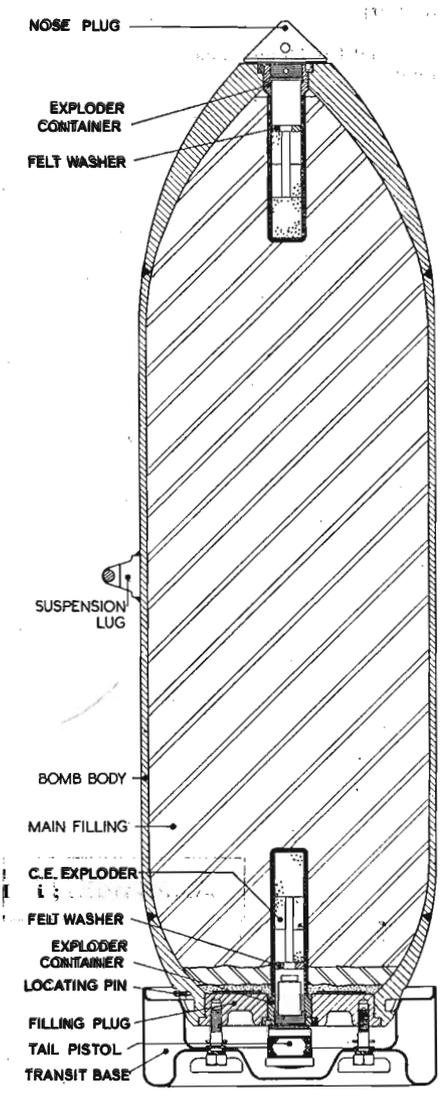
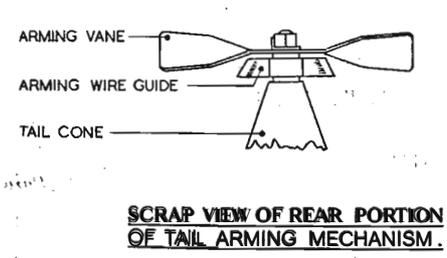


Fig. 1.—Sectional view of Mk. I bomb fitted with No. 29 transit base and No. 36 nose plug

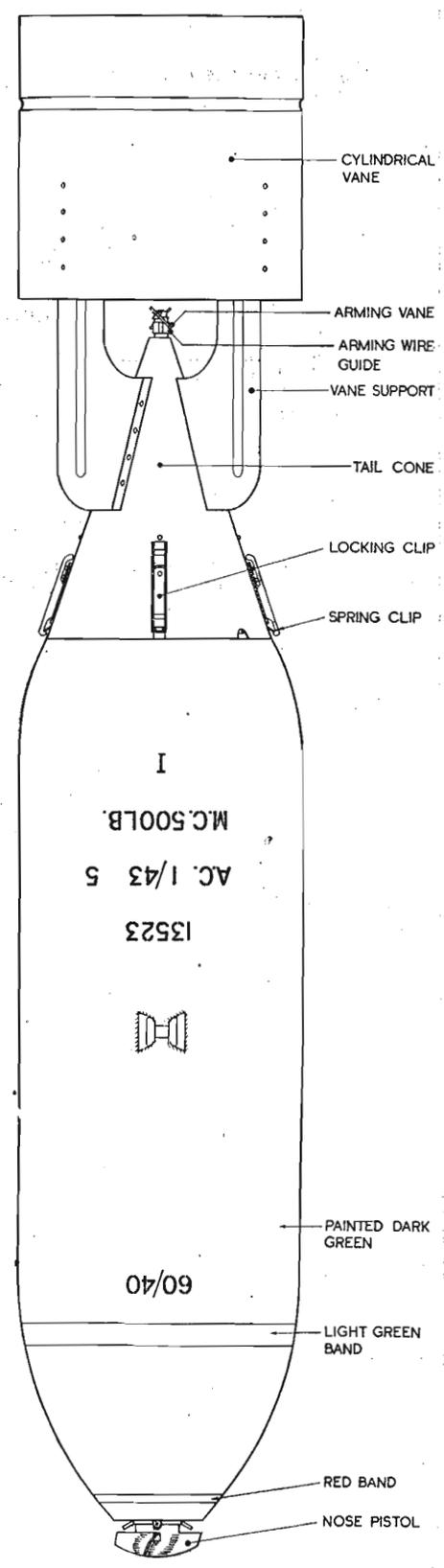


Fig. 2.—Mk. I bomb fitted with nose pistol and No. 28 Mk. II tail unit

This leaf issued with A.L. No. 111
April, 1945

A.P.1661B, Vol. I, Sect. 10

CHAPTER 4

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. I

Introduction

1. This bomb is for general operational use as an alternative to the 500 lb. G.P. bomb.
2. The bomb is supplied with a No. 36 transit plug in the nose and a No. 28 or No. 30 pistol in the tail, and fitted with a No. 29 transit base, which is secured to the bomb body by two wing bolts.
3. The tail units to be used with this bomb are the No. 25 Mk. I, II, and III, and the shorter No. 28 Mk. I and II. The No. 28 Mk. I and II tail units are for use when the bombs are to be carried externally on high-speed aircraft. The No. 25 Mk. III tail unit is of strengthened construction and should be used for external carriage when sufficient clearance is available for the longer type tail. The No. 25 Mk. II, No. 25 Mk. III and No. 28 Mk. II tail units require the "horizontal" system of fuzeing.
4. Attention is directed to Chapter 1 of this Section in which general information, including details of markings, functioning, supply and storage of M.C. bombs, is given. In Appendix 1 to Chapter 1 of this Section are given particulars of the fuzeing components which may be used with this bomb. The succeeding Appendices to Chapter 1 contain instructions for fuzeing, loading, unloading and unfuzeing appropriate to the type of pistol and system of fuzeing.

Leading particulars

| | |
|--|--|
| 5. Length of bomb, with No. 25 tail and nose pistol fitted | 5 ft. 10½ in., approx. |
| Length of bomb, with No. 28 tail and nose pistol fitted | 4 ft. 9 in., approx. |
| Maximum diameter of bomb, excluding suspension lug | 12.9 in. |
| Weight and nature of filling | 224 lb. Amatol 50/50 or 60/40 or 226 lb. Amatex 51/40/9 or 237 lb. R.D.X./T.N.T. 60/40 |
| Charge/weight ratio | 50 per cent., approx. |
| Terminal velocity, with No. 25 tail | 1,460 ft. per sec. |
| Terminal velocity, with No. 28 tail | 1,390 ft. per sec. |

General description, fig. 1 and 2

Bomb body

6. The 500 lb. Mk. I M.C. bomb body is of steel fabricated construction. The nose end is threaded internally to receive an exploder container. At the tail end is another exploder container, carried by a filling plug, which is threaded externally for screwing into the bomb body and has two tapped holes for the transit base securing bolts.
 7. A suspension lug is welded to the bomb body. The rear end of the bomb body is provided with four slots to receive the spring clips which secure the tail, and a locating pin is fitted to this end of the body to engage with a notch in the forward end of the tail cone to position the tail unit correctly.
 8. The nose and tail exploder containers are threaded internally to take, respectively, the nose pistol or transit plug, and the tail pistol.
 9. The bomb body is filled with high explosive as specified in para. 5. The filling is sealed into the body at the nose and tail ends by a pad of approved composition.
- Note.*—The interiors of some 500 lb. Mk. I M.C. bombs are coated with air drying varnish instead of stoved copal varnish, and these bombs have a restricted service life of two years from the date of filling. If the bombs are not expended within this period, arrangements must be made for their inspection with a view to extending their service life. Bombs internally coated with air drying varnish are identified by the letter "A" stencilled in front of the date of filling.

B (AL11)

10. Located in each exploder container is a 4 oz. 6 dr. C.E. exploder, covered by a waxed felt washer.

Tail units

11. The No. 25 and No. 28 tail units are similar in construction, each consisting of a tail cone with a cylindrical vane attached to it by four vane supports. The forward end of the tail cone has a notch for engagement with the locating pin on the bomb body. Four spring clips, backed by a second leaf in the No. 25 Mk. III tail unit, are also provided at the forward end of the tail cone to engage with the slots on the bomb body. These clips are secured in position, when the tail is assembled to the bomb body, by locking clips which are rotatable about rivets.

Note.—Early issues of the No. 25 Mk. I tails are provided with only two locking clips.

12. The No. 25 Mk. I and No. 28 Mk. I tail units are of the safety clip type and may be used only for "vertical" fuzing, unless modified (see *Note* below). The No. 25 Mk. II and III or No. 28 Mk. II tail units, as stated in para. 3, are to be used if "horizontal" fuzing is to be employed. The arming mechanisms of these two types of tail unit are described in para. 13 and 14.

Note.—If the "horizontal" system of fuzing is required and the No. 25 Mk. II and III or No. 28 Mk. II tail units are not available, the safety clip type of tail can be converted for use with this system as described in Sect. 10, Chap. 1, App. 5.

13. *Arming mechanism of No. 25 Mk. I and No. 28 Mk. I tail units* (not illustrated in the figures). An arming spindle is mounted axially in the tail cone and carries an arming fork at the forward end and a two-bladed arming vane at the rear end. The arming fork on the spindle engages with the arming fork of the tail pistol. A safety clip, carried on a bush in the apex of the tail cone, is fitted with a pillar which protrudes between the blades of the arming vane, thus preventing rotation.

Note.—Early issues of the No. 25 Mk. I tails are fitted with a four-bladed arming vane.

14. *Arming mechanism of No. 25 Mk. II, No. 25 Mk. III, and No. 28 Mk. II tail units*, see fig. 2. An arming spindle is mounted axially in the tail cone and carries an arming fork at the forward end and a two-bladed arming vane at the rear end. Each blade of the arming vane has a small hole drilled through it. A bush at the apex of the tail cone is fitted with an arming wire guide, which is provided with two small tubular channels. The arming wire guide carries a safety wire, which protrudes through one of the holes in the arming vane, when the bomb is tail fuzed.

This leaf issued with A.L. No. 86
July, 1944

A.P.1661B, Vol. I, Sect. 10

AIR
MINISTRY
July, 1944

CHAPTER 5

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. II

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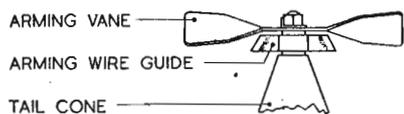
LIST OF ILLUSTRATIONS

- Fig.
1. Sectional view of Mk. II bomb fitted with No. 29 transit base and No. 36 nose plug
 2. Mk. II bomb fitted with nose pistol and No. 25 Mk. II tail unit

This is A.L. No. 86 to A.P.1661B, Vol. I, and concerns Sect. 10
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write "A.L. 86" in the outer margin of the list, ~~insert~~ insert this chapter, and
make an entry in the Amendment Record Sheet.

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only)

ARMAMENT



SCRAP VIEW OF REAR PORTION OF TAIL ARMING MECHANISM

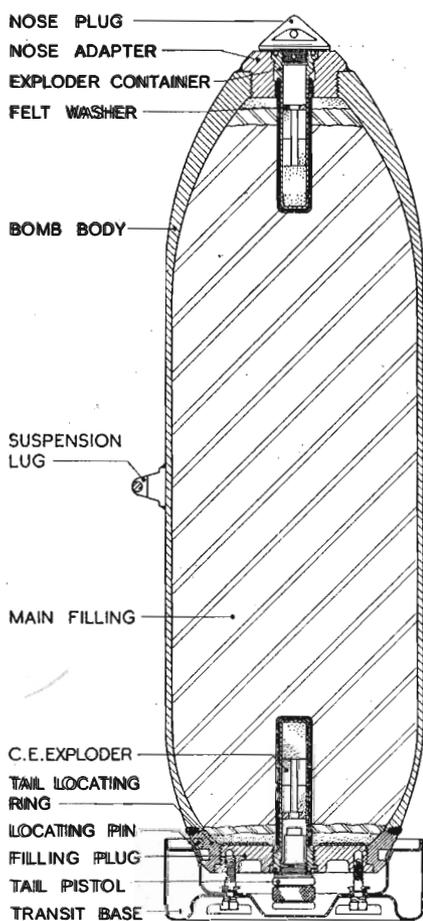


Fig. 1.—Sectional view of Mk. II bomb fitted with No. 30 transit base and No. 36 nose plug

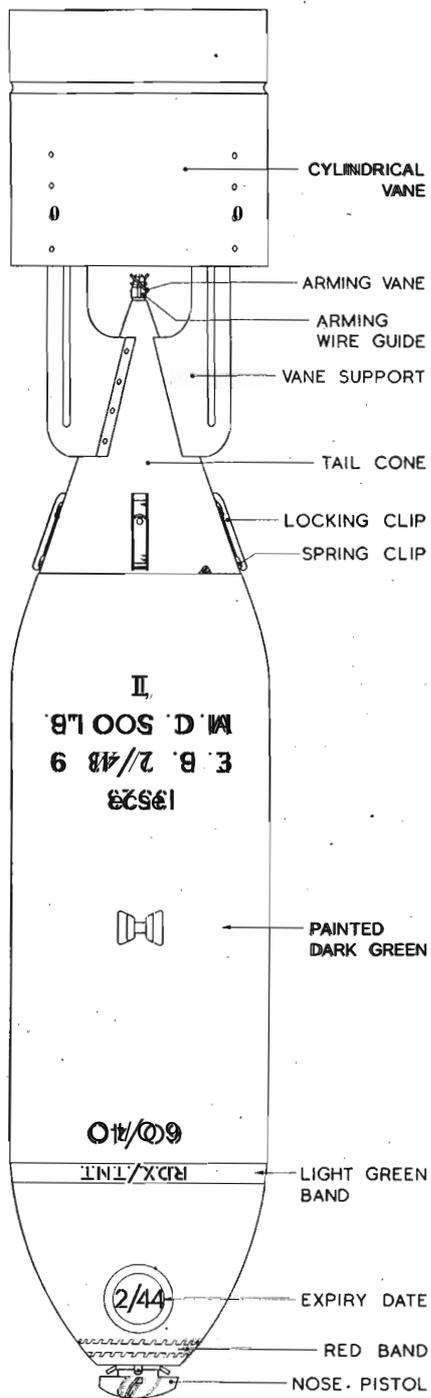


Fig. 2.—Mk. II bomb fitted with nose pistol and No. 25 Mk. II tail unit

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A.P.1661B, Vol. I, Sect. 10

CHAPTER 5

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. II

Introduction

1. This bomb is intended for use against resistant targets, including shipping.
2. The bomb is supplied with a No. 36 transit plug in the nose, and a No. 28 or No. 30 pistol in the tail, and fitted with a No. 29 transit base, which is secured to the bomb body by two wing bolts.
3. The tail units to be used with this bomb are the No. 25 Mk. I, II, and III, and the shorter No. 28 Mk. I and II. The No. 28 Mk. I and II tail units are for use when the bombs are to be carried externally on high-speed aircraft. The No. 25 Mk. III tail unit is of strengthened construction and should be used for external carriage when sufficient clearance is available for the longer type tail. The No. 25 Mk. II, No. 25 Mk. III and No. 28 Mk. II tail units require the "horizontal" system of fuzing.
4. Attention is directed to Chapter 1 of this Section in which general information, including details of markings, functioning, supply and storage of M.C. bombs, is given. In Appendix 1 to Chapter 1 of this Section are given particulars of the fuzing components which may be used with this bomb. The succeeding Appendices to Chapter 1 contain instructions for fuzing, loading, unloading and unfuzing appropriate to the type of pistol and system of fuzing.

Leading particulars

| | |
|--|--|
| 5. Length of bomb, with No. 25 tail and nose pistol fitted | 5 ft. 10½ in., approx. |
| Length of bomb, with No. 28 tail and nose pistol fitted | 4 ft. 9 in., approx. |
| Maximum diameter of bomb, excluding suspension lug | 12.9 in. |
| Weight and nature of filling | 224 lb. Amatol 50/50 or 60/40 or 226 lb. Amatex 51/40/9 or 237 lb. R.D.X./T.N.T. 60/40 |
| Charge/weight ratio | 50 per cent., approx. |
| Terminal velocity, with No. 25 tail | 1,460 ft. per sec. |
| Terminal velocity, with No. 28 tail | 1,390 ft. per sec. |

General description, fig. 1 and 2

Note.—The Mk. II bomb differs from the Mk. I in that the Mk. II bomb body is manufactured from forged steel, the tail locating ring being welded on.

Bomb body

6. The 500 lb. Mk. II M.C. bomb body is of forged steel construction, with a tail locating ring welded on. The nose end is threaded internally to receive an exploder container. At the tail end is another exploder container, carried by a filling plug, which is threaded externally for screwing into the bomb body and has two tapped holes for the transit base securing bolts.
7. A suspension lug is welded to the bomb body. The rear end of the bomb body is provided with four slots to receive the spring clips which secure the tail, and a locating pin is fitted to this end of the body to engage with a notch in the forward end of the tail cone to position the tail unit correctly.
8. The nose and tail exploder containers are threaded internally to take, respectively, the nose pistol or transit plug, and the tail pistol.
9. The bomb body is filled with high explosive as specified in para. 5. The filling is sealed into the body at the nose and tail ends by a pad of approved composition.
10. Located in each exploder container is a 4 oz. 6 dr. C.E. exploder, covered by a waxed felt washer.

Tail units

11. The No. 25 and No. 28 tail units are similar in construction, each consisting of a tail cone with a cylindrical vane attached to it by four vane supports. The forward end of the tail cone has a notch for engagement with the locating pin on the bomb body. Four spring clips, backed by a second leaf in the No. 25 Mk. III tail unit, are also provided at the forward end of the tail cone to engage with the slots on the bomb body. These clips are secured in position, when the tail is assembled to the bomb body, by locking clips which are rotatable about rivets.

Note.—Early issues of the No. 25 Mk. I tails are provided with only two locking clips.

12. The No. 25 Mk. I and No. 28 Mk. I tail units are of the safety clip type and may be used only for "vertical" fuzing, unless modified (see *Note* below). The No. 25 Mk. II and III or No. 28 Mk. II tail units, as stated in para. 3, are to be used if "horizontal" fuzing is to be employed. The arming mechanisms of these two types of tail unit are described in para. 13 and 14.

Note.—If the "horizontal" system of fuzing is required and the No. 25 Mk. II and III or No. 28 Mk. II tail units are not available, the safety clip type of tail can be converted for use with this system as described in Sect. 10, Chap. 1, App. 5.

13. *Arming mechanism of No. 25 Mk. I and No. 28 Mk. I tail units* (not illustrated in the figures).—An arming spindle is mounted axially in the tail cone and carries an arming fork at the forward end and a two-bladed arming vane at the rear end. The arming fork on the spindle engages with the arming fork of the tail pistol. A safety clip, carried on a bush in the apex of the tail cone, is fitted with a pillar which protrudes between the blades of the arming vane, thus preventing rotation.

Note.—Early issues of the No. 25 Mk. I tails are fitted with a four-bladed arming vane.

14. *Arming mechanism of No. 25 Mk. II, No. 25 Mk. III, and No. 28 Mk. II tail units*, see fig. 2.—An arming spindle is mounted axially in the tail cone and carries an arming fork and a two-bladed arming vane at its forward and rear ends, respectively. Each blade of the arming vane has a small hole drilled through it. At the apex of the tail cone is a bush fitted with an arming wire guide which is provided with two small tubular channels. The arming wire guide carries a safety wire, which protrudes through one of the holes in the arming vane, when the bomb is tail fuzed.

*This leaf issued with A.L. No. 87
July, 1944*

A.P. 1661 B, Vol. I, Sect. 10

**AIR
MINISTRY**
July, 1944

CHAPTER 6

BOMB, HUE, AIRCRAFT, M.C., 500 lb., Mk. III

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- Fig.*
1. Sectional view of Mk. III bomb fitted with No. 29 transit base and No. 36 nose plug
 2. Mk. III bomb fitted with nose pistol and No. 28 Mk. II tail unit

~~REPERCUSSIVE~~
 (For official use only)

—BOMBS—
 This is A.L. No. 87 to A.P. 1661 B, Vol. I and concerns Sect. 10
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 and make an entry in the Amendment Record Sheet.

ARMAMENT

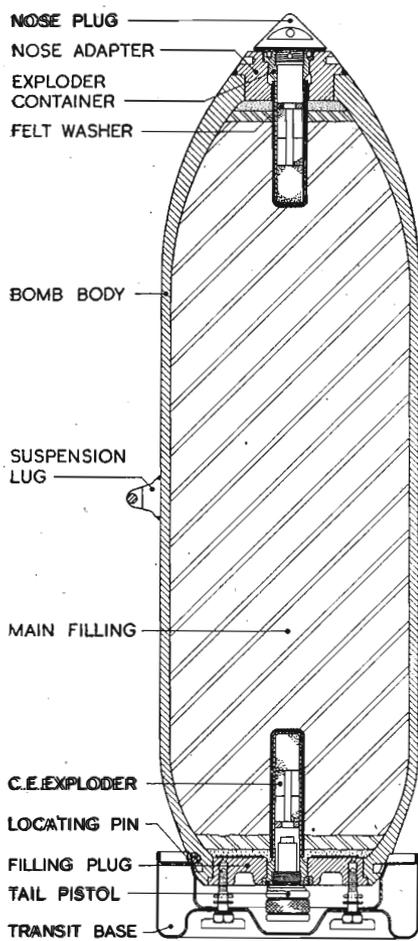


Fig. 1.—Sectional view of Mk. III bomb fitted with No. 29 transit base and No. 36 nose plug

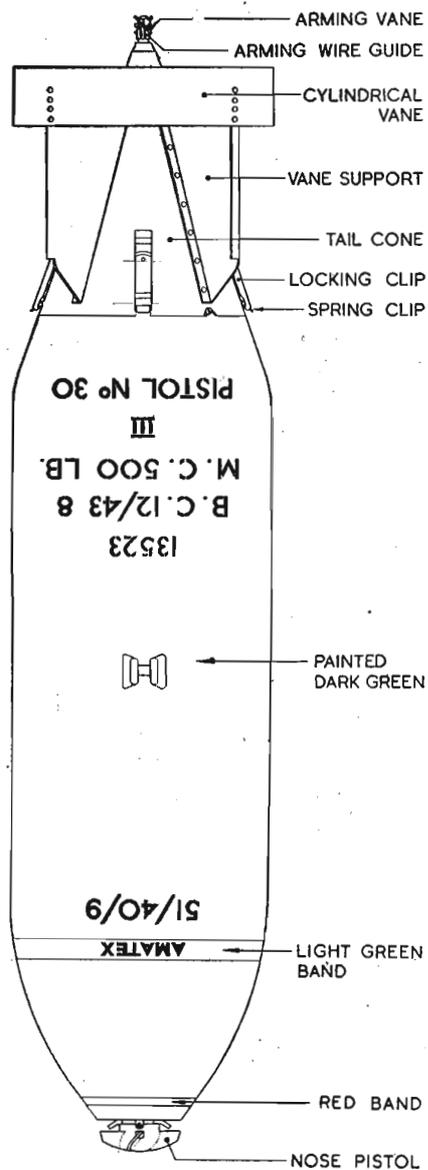


Fig. 2.—Mk. III bomb fitted with nose pistol and No. 28 Mk. II tail unit

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April, 1945

A.P.1661B, Vol. I, Sect. 10

CHAPTER 6

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. III

Introduction

1. This bomb is for general operational use as an alternative to the 500 lb. G.P. bomb.
2. The bomb is supplied with a No. 36 transit plug in the nose and a No. 28 or No. 30 pistol in the tail, and fitted with a No. 29 transit base, which is secured to the bomb body by two wing bolts.
3. The tail units to be used with this bomb are the No. 25 Mk. I, II, and III, and the shorter No. 28 Mk. I and II. The No. 28 Mk. I and II tail units are for use when the bombs are to be carried externally on high-speed aircraft. The No. 25 Mk. III tail unit is of strengthened construction and should be used for external carriage when sufficient clearance is available for the longer type tail. The No. 25 Mk. II, No. 25 Mk. III and No. 28 Mk. II tail units require the "horizontal" system of fuzing.
4. Attention is directed to Chapter 1 of this Section in which general information, including details of markings, functioning, supply and storage of M.C. bombs, is given. In Appendix 1 to Chapter 1 of this Section are given particulars of the fuzing components which may be used with this bomb. The succeeding Appendices to Chapter 1 contain instructions for fuzing, loading, unloading and unfuzing appropriate to the type of pistol and system of fuzing.

Leading particulars

| | |
|--|--|
| 5. Length of bomb, with No. 25 tail and nose pistol fitted | 5 ft. 10½ in., approx. |
| Length of bomb, with No. 28 tail and nose pistol fitted | 4 ft. 9 in., approx. |
| Maximum diameter of bomb, excluding suspension lug | 12.9 in. |
| Weight and nature of filling | 210 lb. Amatol 50/50 or 60/40 or 212 lb. Amatex 51/40/9 or 223 lb. R.D.X./T.N.T. 60/40 |
| Charge/weight ratio | 42 per cent. |
| Terminal velocity, with No. 25 tail | 1,460 ft. per sec. |
| Terminal velocity, with No. 28 tail | 1,390 ft. per sec. |

General description, fig. 1 and 2

Note.—The Mk. III bomb differs from the Mk. I in that the Mk. III bomb body is of one piece cast steel construction, resulting in a slightly increased wall thickness.

Bomb body

6. The 500 lb. Mk. III M.C. bomb body is a hollow steel casting. The nose end is threaded internally to receive an exploder container. At the tail end is another exploder container, carried by a filling plug, which is threaded externally for screwing into the bomb body and has two tapped holes for the transit base securing bolts.
7. A suspension lug is welded to the bomb body. The rear end of the bomb body is provided with four slots to receive the spring clips which secure the tail, and a locating pin is fitted to this end of the body to engage with a notch in the forward end of the tail cone to position the tail unit correctly.
8. The nose and tail exploder containers are threaded internally to take, respectively, the nose pistol or transit plug, and the tail pistol.
9. The bomb body is filled with high explosive as specified in para. 5. The filling is sealed into the body at the nose and tail ends by a pad of approved composition.
10. Located in each exploder container is a 4 oz. 6 dr. C.E. exploder, covered by a waxed felt washer.

Tail units

11. The No. 25 and No. 28 tail units are similar in construction, each consisting of a tail cone with a cylindrical vane attached to it by four vane supports. The forward end of the tail cone has a notch for engagement with the locating pin on the bomb body. Four spring clips, backed by a second leaf in the No. 25 Mk. III tail unit, are also provided at the forward end of the tail cone to engage with the slots on the bomb body. These clips are secured in position, when the tail is assembled to the bomb body, by locking clips which are rotatable about rivets.

Note.—Early issues of the No. 25 Mk. I tails are provided with only two locking clips.

12. The No. 25 Mk. I and No. 28 Mk. I tail units are of the safety clip type and may be used only for "vertical" fuzing, unless modified (see *Note* below). The No. 25 Mk. II and III or No. 28 Mk. II tail units, as stated in para. 3, are to be used if "horizontal" fuzing is to be employed. The arming mechanisms of these two types of tail unit are described in para. 13 and 14.

Note.—If the "horizontal" system of fuzing is required and the No. 25 Mk. II and III or No. 28 Mk. II tail units are not available, the safety clip type of tail can be converted for use with this system as described in Sect. 10, Chap. 1, App. 5.

13. *Arming mechanism of No. 25 Mk. I and No. 28 Mk. I tail units* (not illustrated in the figures).—An arming spindle is mounted axially in the tail cone and carries an arming fork at the forward end and a two-bladed arming vane at the rear end. The arming fork on the spindle engages with the arming fork of the tail pistol. A safety clip, carried on a bush in the apex of the tail cone, is fitted with a pillar which protrudes between the blades of the arming vane, thus preventing rotation.

Note.—Early issues of the No. 25 Mk. I tails are fitted with a four-bladed arming vane.

14. *Arming mechanism of No. 25 Mk. II, No. 25 Mk. III, and No. 28 Mk. II tail units*, see fig. 2. An arming spindle is mounted axially in the tail cone and carries an arming fork and a two-bladed arming vane at its forward and rear ends, respectively. Each blade of the arming vane has a small hole drilled through it. A bush at the apex of the tail cone is fitted with an arming wire guide, which is provided with two small tubular channels. The arming wire guide carries a safety wire, which protrudes through one of the holes in the arming vane, when the bomb is tail fuzed.

This leaf issued with A.L. No. 103
January, 1945

A.P.1661B, Vol. I, Sect. 10

CHAPTER 7

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. IV

Introduction

1. This bomb is for general operational use as an alternative to the 500 lb. G.P. bomb.
2. The bomb, as supplied, is plugged with a No. 24 transit plug at the nose end and a No 28 or No. 30 pistol at the tail end, and is fitted with a No. 7 transit base which is secured to the bomb body by two wing bolts.
3. The tail units used with this bomb are the No. 2 Mk. I, the No. 77 Mk. I, and the shorter No. 26 Mk. I, II, or III. The No. 26 Mk. I, II, or III tail units are for use when the bombs are to be carried externally on high-speed aircraft, or when their use will enable a greater number of bombs to be carried internally on other types of aircraft. The No. 77 Mk. I tail unit is of strengthened construction and replaces the No. 26 tails for use on external stowage when sufficient clearance is available for the longer type tail. For other purposes, the No. 2 Mk. I tail is to be used until stocks are exhausted, when No. 77 tail units are to be substituted. The design of the No. 26 Mk. III and No. 77 Mk. I tail units is such that the "horizontal" system of fuzeing, employing a "horizontal" pull-off of a safety wire, is required.
4. Attention is directed to Chapter 1 of this Section in which general information, including details of markings, functioning, supply and storage of this bomb is given. In Appendix 1 to Chapter 1 of this Section are given particulars of the components to be used with this bomb. The succeeding Appendices to Chapter 1 contain instructions for fuzeing, loading, unloading and unfuzeing appropriate to the type of pistol and system of fuzeing.

Leading particulars

5. The Stores Reference, numbers of the bomb body are as follows:—■

| Filled Amatol or Awattex/9 | Pistol No. 28 | Mk. I | Mk. II | Mk. III* or III | Mk. IV | | | |
|----------------------------|---------------|----------|----------|-----------------|----------|--|--|--|
| | | 12A/1139 | 12A/1318 | 12A/1319 | 12A/1321 | | | |
| Filled R.D.X.I T.N.T. | Pistol No. 30 | Mk. II | Mk. III | Mk. III* or IV | Mk. V | | | |
| | | 12A/1322 | 12A/1323 | 12A/1324 | 12A/1326 | | | |
| Filled Pentolite D.1 | Pistol No. 28 | Mk. I | Mk. II | Mk. III* or III | Mk. IV | | | |
| | | 12A/1327 | 12A/1328 | 12A/1329 | 12A/1331 | | | |
| | Pistol No. 30 | Mk. II | Mk. III | Mk. III* or IV | Mk. V | | | |
| | | 12A/1332 | 12A/1333 | 12A/1334 | 12A/1336 | | | |
| | Pistol No. 28 | Mk. I | Mk. II | Mk. III* or III | Mk. IV | | | |
| | | 12A/1337 | 12A/1338 | 12A/1339 | 12A/1341 | | | |
| | Pistol No. 30 | Mk. II | Mk. III | Mk. III* or IV | Mk. V | | | |
| | | 12A/1342 | 12A/1343 | 12A/1344 | 12A/1346 | | | |

| | | |
|---|-----|--------------------------|
| Stores Ref. of tail, G.P., 500 lb., No. 2, Mk. I | ... | 12A/290 |
| Stores Ref. of tail, No. 77, Mk. I | ... | 12A/1727 |
| Stores Ref. of tail, No. 26, Mk. I | ... | 12A/984 |
| Stores Ref. of tail, No. 26, Mk. II | ... | 12A/1116 |
| Stores Ref. of tail, No. 26, Mk. III | ... | 12A/1656 |
| Length of bomb, with No. 2 tail and nose pistol fitted | | 5 ft. 10 in., approx. |
| Length of bomb, with No. 77 tail and nose pistol fitted | | 5 ft. 9 1/2 in., approx. |

| | |
|---|---|
| Length of bomb, with No. 26 tail and nose pistol fitted | 4 ft. 8½ in., approx. |
| Maximum diameter of bomb, excluding suspension lugs | 12.9 in. |
| Weight and nature of filling | 174 lb. Amatol 50/50 or 60/40 or 175 lb. Amatex 51/40/9 or 184 lb. R.D.X./T.N.T.60/40 or 168 lb. Pentolite D.1 |
| Charge/weight ratio | 40 per cent. |
| Terminal velocity, with No. 2 tail | 1,520 ft. per sec. |
| Terminal velocity, with No. 77 tail | 1,520 ft. per sec. |
| Terminal velocity, with No. 26 tail | 1,670 ft. per sec. |

General description, fig. 1 and 2

Note.—The only difference in body construction between the Mk. I and IV bombs is that the Mk. IV bomb body is a steel casting and is approximately 5 in. shorter than the Mk. I bomb body.

Bomb body

6. The 500 lb. Mk. IV M.C. bomb body is of cast steel construction and is approximately 5 in. shorter in overall length than the 500 lb. Mk. I M.C. bomb. The nose end of the bomb body is threaded internally to accommodate an exploder container. At the tail end, another exploder container is carried by a filling plug, which is threaded externally for screwing into the bomb body and has two tapped holes for the transit base securing bolts.

7. A suspension lug is attached to the bomb body. The rear end of the bomb body is provided with four slots to receive the spring clips securing the tail, and a locating pin is fitted to the side of the body to engage with a notch in the forward end of the tail cone to position the tail unit when it is assembled to the bomb body.

8. The nose and tail exploder containers are threaded internally to take, respectively, the nose pistol or transit plug, and the tail pistol.

9. The bomb body is filled with high explosive as specified in para. 5. The filling is sealed into the body at the nose and tail ends by a pad of approved composition.

10. Located in each exploder container is a 4 oz. 6 dr. C.E. exploder, covered by a waxed felt washer.

Tail units

11. The No. 2 Mk. I, No. 77 Mk. I, and No. 26 Mk. I, II, and III tail units are similar in construction, each consisting of a tail cone with a cylindrical vane attached to it by four vane supports. The forward end of the tail cone has a notch for engagement with the locating pin on the bomb body. Four spring clips, backed by a second leaf in the No. 77 Mk. I tail unit, are also provided at the forward end of the tail cone to engage with the slots on the bomb body. These clips are secured by locking clips which are rotatable about rivets.

Note.—Early issues of some of the above named tail units were supplied without, or with only two, rotatable locking clips in position, and in these instances, four additional small V-shaped locking clips (Stores Ref. 12A/842) are to be fitted. The use of additional V-shaped locking clips is optional with tail units having four rotatable locking clips, except for early issues of No. 77 Mk. I tails, the spring clips of which are not backed by a second leaf, and to which additional locking clips must be fitted; these clips are packed in the container with the tail unit.

12. The No. 26 Mk. I and II and the No. 2 Mk. I tail units are of the safety clip type and must not be used when the "horizontal" system of fuzing is required. As stated in para. 3 the No. 26 Mk. III and No. 77 Mk. I tail units are designed to utilize this method of fuzing. The respective arming mechanisms of these two types of tail unit are described in para. 13 and 14.

Note.—The safety clip type of tail unit can be converted for use in conjunction with the "horizontal" system of fuzing, as described in Sect. 10, Chap. 1, App. 5.

13. *Arming mechanism of the No. 26 Mk. I and II and No. 2 Mk. I tail units* (not illustrated in the figures).—An arming spindle is mounted axially in the tail cone and carries an arming fork at the forward end and a two-bladed arming vane at the rear. The arming fork on the spindle engages with the arming fork of the tail pistol. A safety clip is provided on the bush at the apex of the tail cone to prevent rotation of the arming mechanism.

14. *Arming mechanism of the No. 26 Mk. III and No. 77 Mk. I tail units*, see fig. 2.—An arming spindle is mounted axially in the tail cone and carries an arming fork and two-bladed arming vane at its forward and rear ends, respectively. Each blade of the arming vane has a small hole drilled through it. A bush at the apex of the tail cone is fitted with an arming wire guide, which is provided with two small tubular channels. The appropriate channel and hole in one of the arming vane blades carry the safety wire when the bomb is tail fuzed.

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A.P.1661B, Vol. I, Sect. 10

CHAPTER 8

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. V

Introduction

1. This bomb is for general operational use as an alternative to the 500 lb. G.P. bomb.
2. The bomb is supplied with a No. 36 transit plug in the nose and a No. 28 or No. 30 pistol in the tail, and fitted with a No. 29 transit base, secured to the bomb body by two wing bolts.
3. Due to the special ballistic characteristics of this bomb, only the No. 25 Mk. I, II, and III tail units are to be used with it. The No. 28 Mk. I and II tail units, which are shorter than the No. 25 tails, are *not* to be used. The No. 25 Mk. II and III tail units require the "horizontal" system of fuzing. The No. 25 Mk. III tail unit is of strengthened construction for external carriage on high-speed aircraft.
4. Attention is directed to Chapter 1 of this Section in which general information, including details of markings, functioning, supply and storage of M.C. bombs, is given. In Appendix 1 to Chapter 1 of this Section are given particulars of the fuzing components which may be used with this bomb. The succeeding Appendices to Chapter 1 contain instructions for fuzing, loading, unloading and unfuzing appropriate to the type of pistol and system of fuzing.

Leading particulars

| | |
|--|--|
| 5. Length of bomb, with No. 25 tail and nose pistol fitted | 5 ft. 10½ in., approx. |
| Maximum diameter of bomb, excluding suspension lug | 12.9 in. |
| Weight and nature of filling | 210 lb. Amatex 50/50 or 60/40 or 212 lb. Amatex 51/40/9 |
| Charge/weight ratio | 42 per cent. |
| Terminal velocity, with No. 25 tail | 1,460 ft. per sec. |

General description, fig. 1 and 2

Note.—The Mk. V bomb differs from the Mk. I in that the Mk. V bomb body is of one piece cast steel construction, resulting in a slightly increased wall thickness.

Bomb body

6. The 500 lb. Mk. V M.C. bomb body consists of a hollow steel casting. The nose end is threaded internally to receive an exploder container. At the tail end is another exploder container, carried by a filling plug, which is threaded externally for screwing into the bomb body and has two tapped holes for the transit base securing bolts.
7. A suspension lug is welded to the bomb body. The rear end of the bomb body is provided with four slots to receive the spring clips which secure the tail, and a locating pin is fitted to this end of the body to engage with a notch in the forward end of the tail cone to position the tail unit correctly.
8. The nose and tail exploder containers are threaded internally to take, respectively, the nose pistol or transit plug, and the tail pistol.
9. The bomb body is filled with high explosive as specified in para. 5. The filling is sealed into the body at the nose and tail ends by a pad of approved composition.
10. Located in each exploder container is a 4 oz. 6 dr. C.E. exploder, covered by a waxed felt washer.

Tail units

11. The No. 25 tail unit consists of a tail cone with a cylindrical vane attached to it by four vane supports. The forward end of the tail cone has a notch for engagement with the locating pin

on the bomb body. Four spring clips, backed by a second leaf in the No. 25 Mk. III tail unit, are also provided at the forward end of the tail cone to engage with the slots on the bomb body. These clips are secured in position, when the tail is assembled to the bomb body, by locking clips which are rotatable about rivets.

Note.—Early issues of the No. 25 Mk. I tails are provided with only two locking clips.

12. The No. 25 Mk. I tail unit is of the safety clip type and may be used only for "vertical" fuzeing, unless modified (see *Note* below). The No. 25 Mk. II and III tail units, as stated in para. 3, are to be used if "horizontal" fuzeing is to be employed. The arming mechanisms of these two types of tail unit are described in para. 13 and 14.

Note.—If the "horizontal" system of fuzeing is required and the No. 25 Mk. II and III tail units are not available, the safety clip type of tail can be converted for use with this system as described in Sect. 10, Chap. 1, App. 5.

13. *Arming mechanism of No. 25 Mk. I tail unit* (not illustrated in the figures).—An arming spindle is mounted axially in the tail cone and carries an arming fork at the forward end and a two-bladed arming vane at the rear end. The arming fork on the spindle engages with the arming fork of the tail pistol. A safety clip, carried on a bush in the apex of the tail cone, is fitted with a pillar which protrudes between the blades of the arming vane, thus preventing rotation.

Note.—Early issues of the No. 25 Mk. I tails are fitted with a four-bladed arming vane.

14. *Arming mechanism of No. 25 Mk. II and III tail units*, see fig. 2.—An arming spindle is mounted axially in the tail cone and carries an arming fork and a two-bladed arming vane at its forward and rear ends, respectively. Each blade of the arming vane has a small hole drilled through it. A bush at the apex of the tail cone is fitted with an arming wire guide, which is provided with two small tubular channels. The arming wire guide carries a safety wire, which protrudes through one of the holes in the arming vane, when the bomb is tail fuzeed.

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July, 1944

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CHAPTER 9

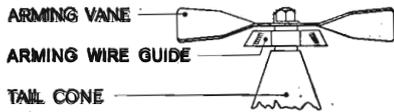
BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. VI

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- Fig.*
1. Sectional view of Mk. VI bomb fitted with No. 29 transit base and No. 36 nose plug
 2. Mk. VI bomb fitted with nose pistol and No. 25 Mk. II tail unit



SCRAP VIEW OF REAR PORTION OF TAIL ARMING MECHANISM .

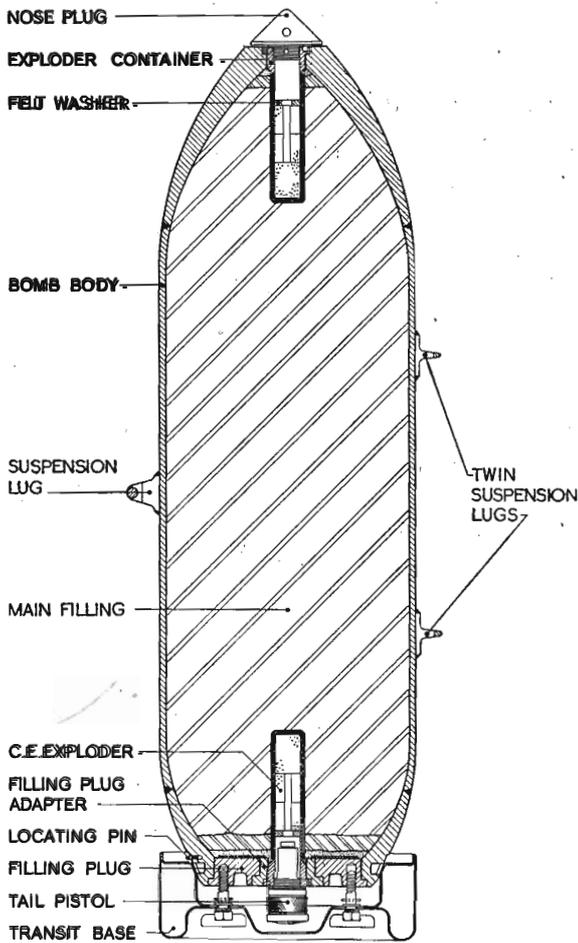


Fig. 1.—Sectional view of Mk. VI bomb fitted with No. 29 transit base and No. 36 nose plug

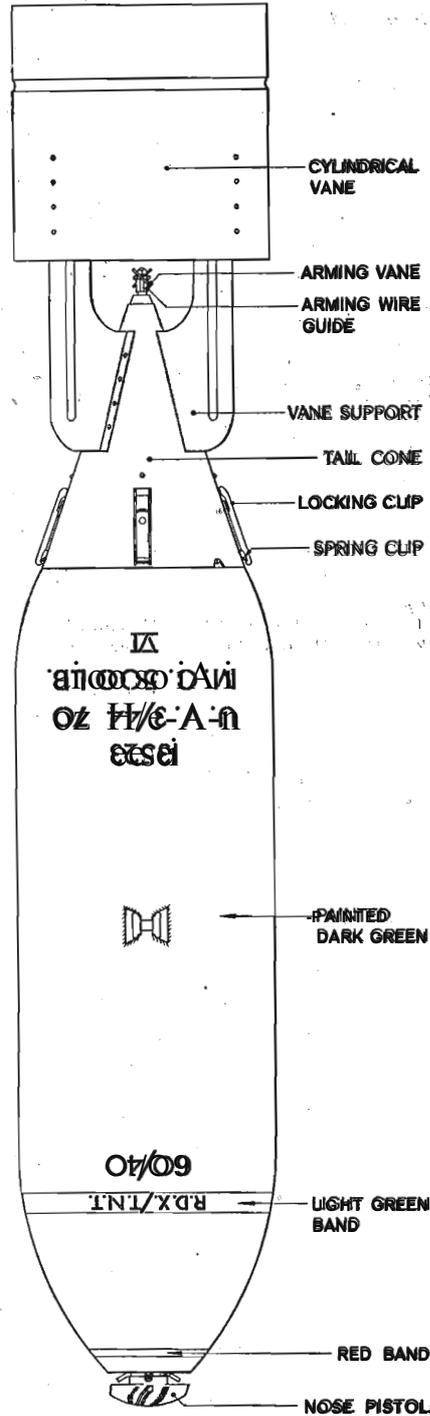


Fig. 2.—Mk. VI bomb fitted with nose pistol and No. 25 Mk. II tail unit

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CHAPTER 9

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. VI

Introduction

1. This bomb is for general operational use as an alternative to the 500 lb. G.P. bomb.
2. The bomb is supplied with a No. 36 transit plug in position in the nose and a No. 30 pistol in position in the tail, and fitted with a No. 29 transit base which is secured to the bomb body by two wing bolts.
3. The standard tail units for use with this bomb are the No. 25 Mk. I and II, but for carriage in fighter-bomber aircraft the No. 28 Mk. I and II tail units are to be used, these being shorter than the No. 25 tails. The design of the No. 25 Mk. II and No. 28 Mk. II tail units is such that the "horizontal" system of fuzeing, employing a "horizontal" pull-off of a safety wire, is utilized to initiate the action of the tail arming mechanism.
4. Attention is directed to Chapter 1 of this Section in which general information, including details of markings, functioning, supply and storage of this bomb, is given. In Appendix 1 to Chapter 1 of this Section are given particulars of the components to be used with this bomb. The succeeding Appendices to Chapter 1 contain instructions for fuzeing, loading, unloading and unfuzeing appropriate to the type of pistol and system of fuzeing.

Leading particulars

5. The Stores Reference numbers of the bomb body are as follows:—

| Filled Amatol or Amatex/9 | Pistol No. 30 | Mk. II | Mk. III | Mk. III* or IV | | | | |
|---------------------------------|------------------|----------|----------|----------------|--|--|--|--|
| | | 12A/1559 | 12A/1561 | 12A/1563 | | | | |
| Filled R.D. X./I.N.II. | Pistol No. 30 | Mk. II | Mk. III | Mk. III* or IV | | | | |
| | | 12A/1560 | 12A/1562 | 12A/1564 | | | | |
| Filled Minol II | Pistol No. 30 | Mk. II | Mk. III | Mk. III* or IV | | | | |
| | | 12A/1746 | 12A/1747 | 12A/1748 | | | | |
| | | | | | | | | |
| | | | | | | | | |

| | |
|---|---|
| Stores Ref. of tail No. 25, Mk. I | 12A/970 |
| Stores Ref. of tail No. 25, Mk. II | 12A/1655 |
| Stores Ref. of tail No. 28, Mk. I | 12A/1111 |
| Stores Ref. of tail No. 28, Mk. II | 12A/1658 |
| Length of bomb, with No. 25 tail and nose pistol fitted | 5 ft. 10½ in., approx. |
| Length of bomb, with No. 28 tail and nose pistol fitted | 4 ft. 9 in., approx. |
| Maximum diameter of bomb, excluding suspension lugs | 12.9 in. |
| Weight and nature of filling | 224 lb. Amatol 50/50 or 60/40 or 237 lb. R.D. X./I.N.II. 60/40 or 240 lb. Minol III |
| Charge/weight ratio | 50 per cent. |
| Terminal velocity, with No. 25 tail | 1,460 ft. per sec. |
| Terminal velocity, with No. 28 tail | 1,390 ft. per sec. |

General description, fig. 1 and 2

Note.—The Mk. VI bomb differs from the Mk. II in that the Mk. VI bomb is provided with two additional suspension lugs so that it may be carried in American aircraft.

Bomb body

6. The 500 lb. Mk. VI M.C. bomb body is of steel fabricated construction. The nose end of the body is threaded internally to accommodate an exploder container. At the tail end is another exploder container carried by a filling plug adapter. A filling plug is housed between the adapter and the bomb body and has two tapped holes for the transit base securing bolts.

7. The bomb body is provided with three suspension lugs, two of which are diametrically opposite the third. The rear end of the bomb body is provided with four slots to receive the spring clips securing the tail, and a locating pin is fitted to the side of the body to engage with a notch in the forward end of the tail cone to position the tail unit when it is assembled to the bomb body.

8. The nose and tail exploder containers are threaded internally to take, respectively, the nose pistol or transit plug, and the tail pistol.

9. The bomb body is filled with high explosive as specified in para. 5. The filling is sealed into the body at the nose and tail ends by pads of approved composition.

• 10. Located in each exploder container is a 4 oz. 6 dr. C.E. exploder, covered by a waxed felt washer.

Tail units

11. The No. 25 and No. 28 tail units are similar in construction, each consisting of a tail cone with a cylindrical vane attached to it by four vane supports. The forward end of the tail cone has a notch for engagement with the locating pin on the bomb body. Four spring clips are also provided at the forward end of the tail cone to engage with the slots on the bomb body. These clips are secured by locking clips which are rotatable about rivets.

12. The No. 25 Mk. I and No. 28 Mk. I tail units are of the safety clip type and must not be used when the "horizontal" system of fuzing is required; the No. 25 Mk. II and No. 28 Mk. II tail units, as stated in para. 3, are for use in conjunction with this system of fuzing. The arming mechanisms of these two types of tail unit are described in para. 13 and 14.

Note.—If the "horizontal" system of fuzing is required and the No. 25 Mk. II and No. 28 Mk. II tail units are not available, the safety clip type of tail can be converted as described in Sect. 10 Chap. 1, App. 5.

13. *Arming mechanism of No. 25 Mk. I and No. 28 Mk. I tail units* (not illustrated in the figures).—An arming spindle is mounted axially in the tail cone and carries an arming fork at the forward end and a two-bladed arming vane at the rear end. The arming fork on the spindle engages with the arming fork of the tail pistol. A safety clip, carried on a bush in the apex of the tail cone, is fitted with a pillar which protrudes between the blades of the arming vane, thus preventing rotation.

Note.—Early issues of the No. 25 Mk. I tails are fitted with a four-bladed arming vane and only two locking clips.

14. *Arming mechanism of No. 25 Mk. II and No. 28 Mk. II tail units*, see fig. 2.—An arming spindle is mounted axially in the tail cone and carries an arming fork at the forward end and a two-bladed arming vane at the rear end. Each blade of the arming vane has a small hole drilled through it. A bush at the apex of the tail cone is fitted with an arming wire guide, which is provided with two small tubular channels. The appropriate channel and hole in one of the arming vane blades carry the safety wire when the bomb is tail fuzed.

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AIR
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July, 1944

CHAPTER 10

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. VII

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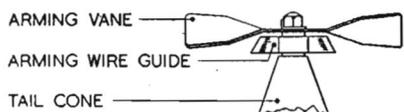
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- Fig.*
1. Sectional view of Mk. VII bomb fitted with No. 29 transit base and No. 36 nose plug
 2. Mk. VII bomb fitted with nose pistol and No. 25 Mk. II tail unit

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ARMAMENT



SCRAP VIEW OF REAR PORTION OF TAIL ARMING MECHANISM.

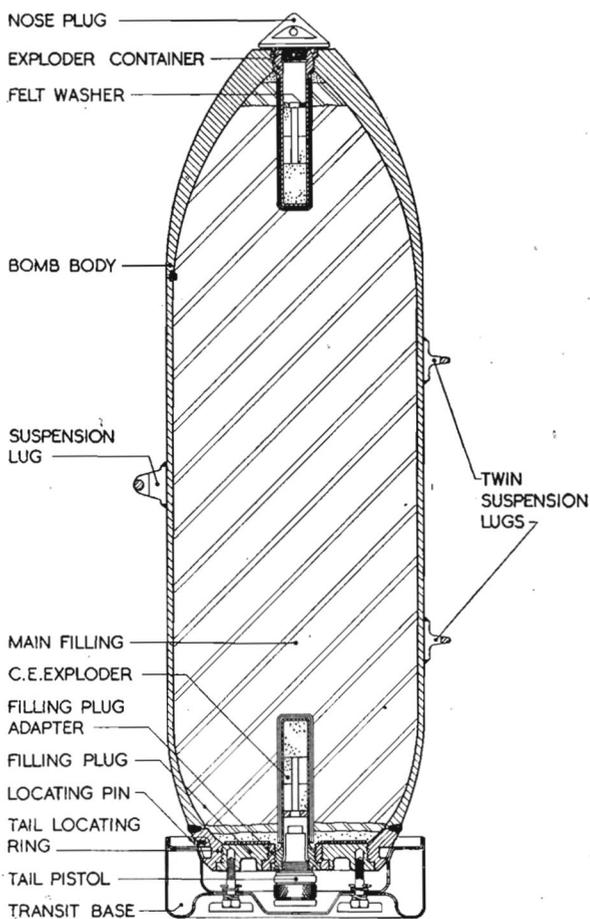


Fig. 1.—Sectional view of Mk. VII bomb fitted with No. 29 transit base and No. 36 nose plug

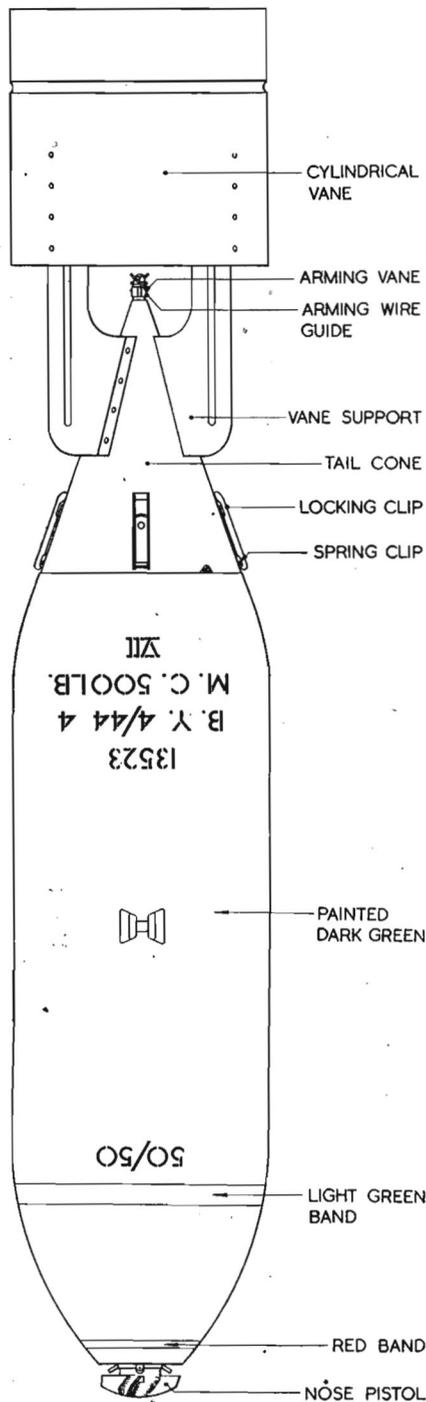


Fig. 2.—Mk. VII bomb fitted with nose pistol and No. 25 Mk. II tail unit

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A.P.1661B, Vol. I, Sect. 10

CHAPTER 10

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. VII

Introduction

1. This bomb is intended for use against resistant targets, including shipping.
2. The bomb is supplied with a No. 36 transit plug in the nose and a No. 30 pistol in the tail, and fitted with a No. 29 transit base which is secured to the bomb body by two wing bolts
3. The tail units to be used with this bomb are the No. 25 Mk. I, II, and III, and the shorter No. 28 Mk. I and II. The No. 28 Mk. I and II tail units are for use when the bombs are to be carried externally on high-speed aircraft. The No. 25 Mk. III tail unit is of strengthened construction and should be used for external carriage when sufficient clearance is available for the longer type tail. The No. 25 Mk. II, No. 25 Mk. III and No. 28 Mk. II tail units require the "horizontal" system of fuzing.
4. Attention is directed to Chapter I of this Section in which general information, including details of markings, functioning, supply and storage of M.C. bombs, is given. In Appendix 1 to Chapter I of this Section are given particulars of the fuzing components which may be used with this bomb. The succeeding Appendices to Chapter I contain instructions for fuzing, loading, unloading and unfuzing appropriate to the type of pistol and system of fuzing.

Leading particulars

| | |
|--|--|
| 5. Length of bomb, with No. 25 tail and nose pistol fitted | 5 ft. 10½ in., approx. |
| Length of bomb, with No. 28 tail and nose pistol fitted | 4 ft. 9 in., approx. |
| Maximum diameter of bomb, excluding suspension lugs | 12.9 in. |
| Weight and nature of filling | 224 lb. Amatol 50/50 or 60/40 or 226 lb. Amatex 51/40/9 or 237 lb. R.D.X./T.N.T. 60/40 or 240 lb. Minol 2 |
| Charge/weight ratio | 50 per cent., approx. |
| Terminal velocity, with No. 25 tail | 1,460 ft. per sec. |
| Terminal velocity, with No. 28 tail | 1,390 ft. per sec. |

General description, fig. 1 and 2

Note.—The Mk. VII bomb differs from the Mk. I in that the Mk. VII bomb body is manufactured from forged steel, the tail locating ring being welded on, and in the provision of two additional suspension lugs so that the bomb can be carried in American aircraft.

Bomb body

6. The 500 lb. Mk. VIII M.C. bomb body is of forged steel construction, with a tail locating ring welded on. The nose end is threaded internally to receive an exploder container. At the tail end is another exploder container, carried by a filling plug adapter. The filling plug has two tapped holes for the transit base securing bolts.
7. The bomb body is provided with three suspension lugs, two of which are diametrically opposite the third. The rear end of the bomb body is provided with four slots to receive the spring clips which secure the tail, and a locating pin is fitted to this end of the body to engage with a notch in the forward end of the tail cone to position the tail unit correctly.
8. The nose and tail exploder containers are threaded internally to take, respectively, the nose pistol or transit plug, and the tail pistol.
9. The bomb body is filled with high explosive as specified in para. 5. The filling is sealed into the body at the nose and tail ends by pads of approved composition.

10. Located in each exploder container is a 4 oz. 6 dr. C.E. exploder, covered by a waxed felt washer.

Tail units

11. The No. 25 and No. 28 tail units are similar in construction, each consisting of a tail cone with a cylindrical vane attached to it by four vane supports. The forward end of the tail cone has a notch for engagement with the locating pin on the bomb body. Four spring clips, backed by a second leaf in the No. 25 Mk. III tail unit, are also provided at the forward end of the tail cone to engage with the slots on the bomb body. These clips are secured in position, when the tail is assembled to the bomb body, by locking clips which are rotatable about rivets.

Note.—Early issues of the No. 25 Mk. I tails are provided with only two locking clips.

12. The No. 25 Mk. I and No. 28 Mk. I tail units are of the safety clip type and may be used only for "vertical" fuzing, unless modified (see *Note* below). The No. 25 Mk. II and III or No. 28 Mk. II tail units, as stated in para. 3, are to be used if "horizontal" fuzing is to be employed. The arming mechanisms of these two types of tail unit are described in para. 13 and 14.

Note.—If the "horizontal" system of fuzing is required and the No. 25 Mk. II and III or No. 28 Mk. II tail units are not available, the safety clip type of tail can be converted for use with this system as described in Sect. 10, Chap. 1, App. 5.

13. *Arming mechanism of No. 25 Mk. I and No. 28 Mk. I tail units* (not illustrated in the figures).—An arming spindle is mounted axially in the tail cone and carries an arming fork at the forward end and a two-bladed arming vane at the rear end. The arming fork on the spindle engages with the arming fork of the tail pistol. A safety clip, carried on a bush in the apex of the tail cone, is fitted with a pillar which protrudes between the blades of the arming vane, thus preventing rotation.

Note.—Early issues of the No. 25 Mk. I tails are fitted with a four-bladed arming vane.

14. *Arming mechanism of No. 25 Mk. II, No. 25 Mk. III, and No. 28 Mk. II tail units*, see fig. 2.—An arming spindle is mounted axially in the tail cone and carries an arming fork and a two-bladed arming vane at its forward and rear ends, respectively. Each blade of the arming vane has a small hole drilled through it. At the apex of the tail cone is a bush fitted with an arming wire guide which is provided with two small tubular channels. The arming wire guide carries a safety wire, which protrudes through one of the holes in the arming vane, when the bomb is tail fuzed.

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AIR
MINISTRY
July, 1944

CHAPTER 11

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. VIII

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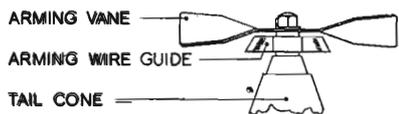
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- Fig.
1. Sectional view of Mk. VIII bomb fitted with No. 29 transit base and No. 36 nose plug
 2. Mk. VIII bomb fitted with nose pistol and No. 28 Mk. II tail unit

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ARMAMENT



SCRAP VIEW OF REAR PORTION OF TAIL ARMING MECHANISM

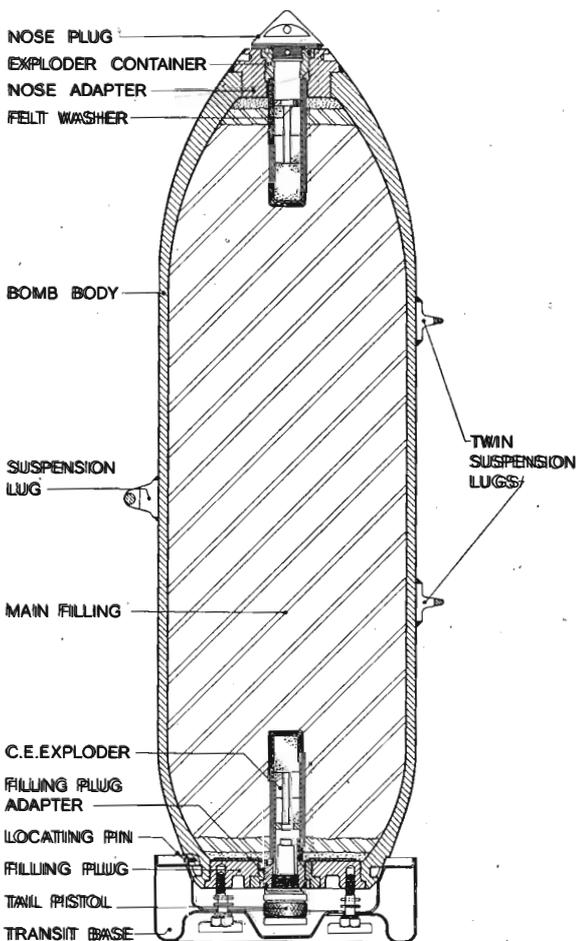


Fig. 1.—Sectional view of Mk. VIII bomb fitted with No. 29 transit base and No. 36 nose plug



Fig. 2.—Mk. VIII bomb fitted with nose pistol and No. 28 Mk. II tail unit

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April, 1945

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CHAPTER 11

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. VIII

Introduction

1. This bomb is for general operational use as an alternative to the 500 lb. G.P. bomb.
2. The bomb is supplied with a No. 36 transit plug in the nose and a No. 30 pistol in the tail, and fitted with a No. 29 transit base, which is secured to the bomb body by two wing bolts.
3. The tail units to be used with this bomb are the No. 25 Mk. I, II, and III, and the shorter No. 28 Mk. I and II. The No. 28 Mk. I and II tail units are for use when the bombs are to be carried externally on high-speed aircraft. The No. 25 Mk. III tail unit is of strengthened construction and should be used for external carriage when sufficient clearance is available for the longer type tail. The No. 25 Mk. II, No. 25 Mk. III and No. 28 Mk. II tail units require the "horizontal" system of fuzeing.
4. Attention is directed to Chapter 1 of this Section in which general information, including details of markings, functioning, supply and storage of M.C. bombs, is given. In Appendix 1 to Chapter 1 of this Section are given particulars of the fuzeing components which may be used with this bomb. The succeeding Appendices to Chapter 1 contain instructions for fuzeing, loading, unloading and unfuzeing appropriate to the type of pistol and system of fuzeing.

Leading particulars

| | |
|--|---|
| 5. Length of bomb, with No. 25 tail and nose pistol fitted | 5 ft. 10½ in., approx. |
| Length of bomb, with No. 28 tail and nose pistol fitted | 4 ft. 9 in., approx. |
| Maximum diameter of bomb, excluding suspension lugs | 12.9 in. |
| Weight and nature of filling | 210 lb. Amatol 50/50 or 60/40 or 223 lb. R.D.X./T.N.T. 60/40 or 225 lb. Minol 2 |
| Charge/weight ratio | 42 per cent. |
| Terminal velocity, with No. 25 tail | 1,460 ft. per sec. |
| Terminal velocity, with No. 28 tail | 1,390 ft. per sec. |

General description, fig. 1 and 2

Note.—The Mk. VIII bomb differs from the Mk. I in that the Mk. VIII bomb body is of one piece cast steel construction, resulting in a slightly increased wall thickness, and in the provision of two additional suspension lugs so that the bomb can be carried in American aircraft.

Bomb body

6. The 500 lb. Mk. VIII M.C. bomb body is a hollow steel casting. The nose end of the body, or alternatively a nose adapter, is threaded internally to receive an exploder container. At the tail end is another exploder container, carried by a filling plug adapter. The filling plug has two tapped holes for the transit base securing bolts.
7. The bomb body is provided with three suspension lugs, two of which are diametrically opposite the third. The rear end of the bomb body is provided with four slots to receive the spring clips which secure the tail, and a locating pin is fitted to this end of the body to engage with a notch in the forward end of the tail cone to position the tail unit correctly.
8. The nose and tail exploder containers are threaded internally to take, respectively, the nose pistol or transit plug, and the tail pistol.
9. The bomb body is filled with high explosive as specified in para. 5. The filling is sealed into the body at the nose and tail ends by a pad of approved composition.

10. Located in each exploder container is a 4 oz. 6 dr. C.E. exploder, covered by a waxed felt washer.

Tail units

11. The No. 25 and No. 28 tail units are similar in construction, each consisting of a tail cone with a cylindrical vane attached to it by four vane supports. The forward end of the tail cone has a notch for engagement with the locating pin on the bomb body. Four spring clips, backed by a second leaf in the No. 25 Mk. III tail unit, are also provided at the forward end of the tail cone to engage with the slots on the bomb body. These clips are secured in position, when the tail is assembled to the bomb body, by locking clips which are rotatable about rivets.

Note.—Early issues of the No. 25 Mk. I tails are provided with only two locking clips.

12. The No. 25 Mk. I and No. 28 Mk. I tail units are of the safety clip type and may be used only for "vertical" fuzing, unless modified (see *Note* below). The No. 25 Mk. II and III or No. 28 Mk. II tail units, as stated in para. 3, are to be used if "horizontal" fuzing is to be employed. The arming mechanisms of these two types of tail unit are described in para. 13 and 14.

Note.—If the "horizontal" system of fuzing is required and the No. 25 Mk. II and III or No. 28 Mk. II tail units are not available, the safety clip type of tail can be converted for use with this system as described in Sect. 10, Chap. 1, App. 5.

13. *Arming mechanism of No. 25 Mk. I and No. 28 Mk. I tail units* (not illustrated in the figures).—An arming spindle is mounted axially in the tail cone and carries an arming fork at the forward end and a two-bladed arming vane at the rear end. The arming fork on the spindle engages with the arming fork of the tail pistol. A safety clip, carried on a bush in the apex of the tail cone, is fitted with a pillar which protrudes between the blades of the arming vane, thus preventing rotation.

Note.—Early issues of the No. 25 Mk. I tails are fitted with a four-bladed arming vane.

14. *Arming mechanism of No. 25 Mk. II, No. 25 Mk. III, and No. 28 Mk. II tail units, see fig. 2.*—An arming spindle is mounted axially in the tail cone and carries an arming fork and a two-bladed arming vane at its forward and rear ends, respectively. Each blade of the arming vane has a small hole drilled through it. A bush at the apex of the tail cone is fitted with an arming wire guide, which is provided with two small tubular channels. The arming wire guide carries a safety wire, which protrudes through one of the holes in the arming vane, when the bomb is tail fuzed.

*This leaf issued with A.L. No. 93
July, 1944*

A.P.1661B, Vol. I, Sect. 10

MINISTRY
July, 1944

CHAPTER 12

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. IX

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- Fig.*
 1. Sectional view of Mk. IX bomb fitted with No. 7 transit base and No. 24 nose plug
 2. Mk. IX bomb fitted with nose pistol and No. 26 Mk. III tail unit

This is A.L. No. 93 to A.P.1661B, Vol. I and concerns Sect. 10
 Delete "(to be issued later)" after title of Chap. 12 in the List of Chapters,
 write "A.L.93" in the outer margin of the list. *insert* this chapter, and
 make an entry in the Amendment Record Sheet.

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ARMAMENT

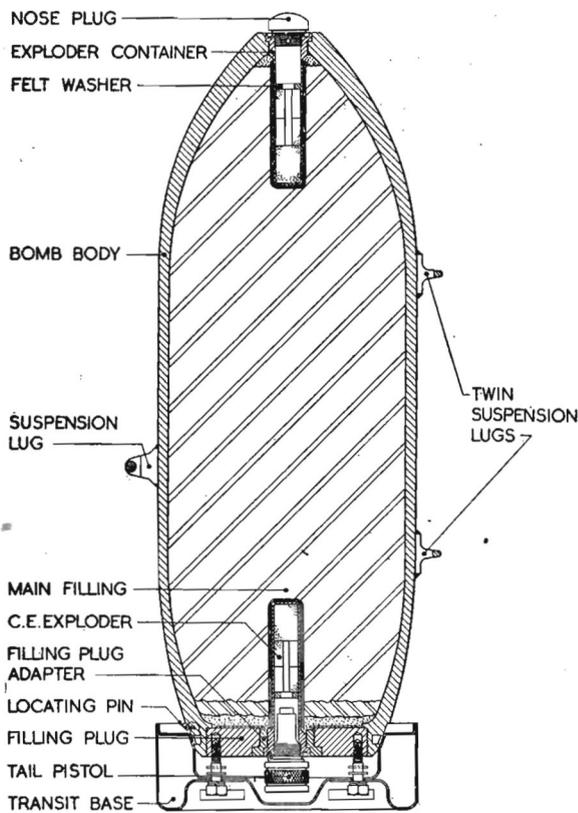
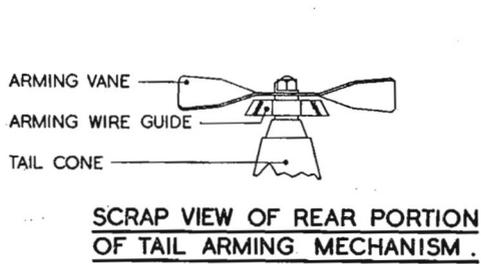


Fig. 1.—Sectional view of Mk. IX bomb fitted with No. 7 transit base and No. 24 nose plug

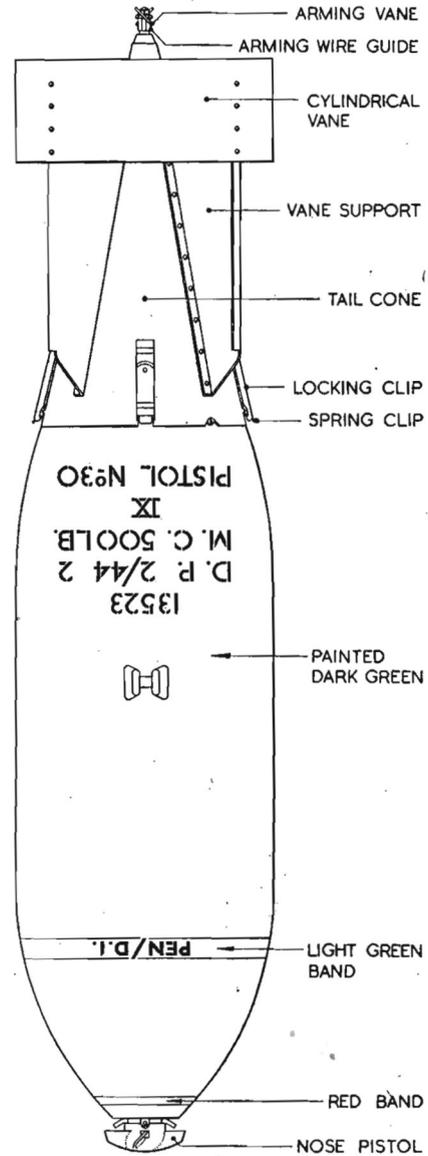


Fig. 2.—Mk. IX bomb fitted with nose pistol and No. 26 Mk. III tail unit

This leaf issued with A.L. No. 103
January, 1945

A.P.1661B, Vol I, Sect. 10

CHAPTER 12

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. IX

Introduction

1. This bomb is for general operational use as an alternative to the 500 lb. G.P. bomb.
2. The bomb, as supplied, is fitted with a No. 24 transit plug at the nose end, a No. 30 pistol at the tail end, and a No. 7 transit base which is secured to the bomb body by two wing bolts.
3. The tail units used with this bomb are the No. 2 Mk. I, the No. 77 Mk. I, and the shorter No. 26 Mk. I, II, or III. The No. 26 Mk. I, II, or III tail units are for use when the bombs are to be carried externally on high-speed aircraft, or when their use will enable a greater number of bombs to be carried internally on other types of aircraft. The No. 77 Mk. I tail unit is of strengthened construction and replaces the No. 26 tails for use on external stowage when sufficient clearance is available for the longer type tail. For other purposes, the No. 2 Mk. I tail is to be used until stocks are exhausted, when No. 77 tail units are to be substituted. The design of the No. 26 Mk. III and No. 77 Mk. I tail units is such that the "horizontal" system of fuzeing, employing a "horizontal" pull-off of a safety wire, is required.
4. Attention is directed to Chapter 1 of this Section in which general information, including details of markings, functioning, supply and storage of this bomb, is given. In Appendix 1 to Chapter 1 of this Section are given particulars of the components to be used with this bomb. The succeeding Appendices to Chapter 1 contain instructions for fuzeing, loading, unloading and unfuzeing appropriate to the type of pistol and system of fuzeing.

Leading particulars

5. The Stores Reference numbers of the bomb body are as follows:—

| Filled Amalol or Amatex/9 | Pistol No. 30 | Mk. II | Mk. III | Mk. III* or IV | | | | |
|---------------------------------|------------------|----------|----------|----------------|--|--|--|--|
| | | 12A/1577 | 12A/1580 | 12A/1583 | | | | |
| Filled R.D. X./T.N.T. | Pistol No. 30 | Mk. II | Mk. III | Mk. III* or IV | | | | |
| | | 12A/1578 | 12A/1581 | 12A/1584 | | | | |
| Filled Pentolite D.1 | Pistol No. 30 | Mk. II | Mk. III | Mk. III* or IV | | | | |
| | | 12A/1579 | 12A/1582 | 12A/1585 | | | | |
| Filled Minol II | Pistol No. 30 | Mk. II | Mk. III | Mk. III* or IV | | | | |
| | | 12A/1755 | 12X/1750 | 12A/1757 | | | | |

| | | | |
|---|-----|-----|--|
| Stores Ref. of tail, G.P., 500 lb., No. 2, Mk. I | ... | ... | 12A/290 |
| Stores Ref. of tail, No. 77, Mk. I | ... | ... | 12A/1727 |
| Stores Ref. of tail, No. 26, Mk. I | ... | ... | 12A/984 |
| Stores Ref. of tail, No. 26, Mk. II | ... | ... | 12A/1116 |
| Stores Ref. of tail, No. 26, Mk. III | ... | ... | 12A/1656 |
| Length of bomb, with No. 2 tail and nose pistol fitted | ... | ... | 5 ft. 10 in., approx. |
| Length of bomb, with No. 77 tail and nose pistol fitted | ... | ... | 5 ft. 9 1/2 in., approx. |
| Length of bomb, with No. 26 tail and nose pistol fitted | ... | ... | 4 ft. 8 1/2 in., approx. |
| Maximum diameter of bomb, excluding suspension lugs | ... | ... | 12.9 in. |
| Weight and nature of filling | ... | ... | 174 lb. Amatol 50/50 or 60/40 or 184 lb. R.D.X./T.N.T. 60/40 or 168 lb. Pentolite D.1 or 195 lb. Minol II |
| Charge/weight ratio | ... | ... | 40 per cent. |
| Terminal velocity, with No. 2 tail | ... | ... | 1,520 ft. per sec. |
| Terminal velocity, with No. 77 tail | ... | ... | 1,520 ft. per sec. |
| Terminal velocity, with No. 26 tail | ... | ... | 1,670 ft. per sec. |

General description, fig. 1 and 2

Note.—The Mk. IX bomb differs from the Mk. I in that the Mk. IX bomb body is a steel casting and is approximately 5 in. shorter than the Mk. I bomb body. The Mk. IX bomb also differs from the Mk. I in that it is provided with two additional suspension lugs which enable it to be carried in American aircraft.

Bomb body

6. As stated above, the 500 lb. Mk. IX M.C. bomb body is of cast steel construction and is approximately 5 in. shorter in overall length than the 500 lb. Mk. I M.C. bomb body. The nose end is threaded internally to accommodate an exploder container. At the tail end is another exploder container carried by a filling plug adapter. A filling plug is housed between the adapter and the bomb body and has two tapped holes for the transit base securing bolts.

7. The bomb body is provided with three suspension lugs, two of which are diametrically opposite the third. The rear end of the bomb body is provided with four slots to receive the spring clips securing the tail, and a locating pin is fitted to the side of the body to engage with a notch in the forward end of the tail cone to position the tail unit when it is assembled to the bomb body.

8. The nose and tail exploder containers are threaded internally to take, respectively, the nose pistol or transit plug, and the tail pistol.

9. The bomb body is filled with high explosive as specified in para. 5. The filling is sealed into the body at the nose and tail ends by pads of approved composition.

10. Located in each exploder container is a 4 oz. 6 dr. C.E. exploder, covered by a waxed felt washer.

Tail units

11. The No. 2 Mk. I, No. 77 Mk. I, and No. 26 Mk. I, II, and III tail units are similar in construction, each consisting of a tail cone with a cylindrical vane attached to it by four vane supports. The forward end of the tail cone has a notch for engagement with the locating pin on the bomb body. Four spring clips, backed by a second leaf in the No. 77 Mk. I tail unit, are also provided at the forward end of the tail cone to engage with the slots on the bomb body. These clips are secured by locking clips which are rotatable about rivets.

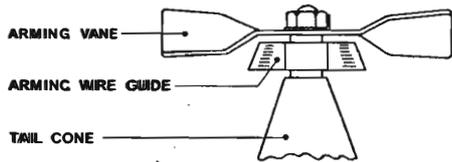
Note.—Early issues of some of the above named tail units were supplied without, or with only two, rotatable locking clips in position, and in these instances, four additional small V-shaped locking clips (Stores Ref. 12A/842) are to be fitted. The use of additional V-shaped locking clips is optional with tail units having four rotatable locking clips, except for early issues of No. 77 Mk. I tails, the spring clips of which are not backed by a second leaf, and to which additional locking clips must be fitted; these clips are packed in the container with the tail unit.

12. The No. 26 Mk. I and II, and the No. 2 Mk. I tail units are of the safety clip type and must not be used when the "horizontal" system of fuzing is required; as stated in para. 3, the No. 26 Mk. III and No. 77 Mk. I tail units are designed to utilize this method of fuzing. The arming mechanisms of these two types of tail unit are described in para. 13 and 14.

Note.—The safety clip type of tail unit can be converted for use in conjunction with the "horizontal" system of fuzing as described in Sect. 10, Chap. 1, App. 5.

13. *Arming mechanism of the No. 26 Mk. I and II, and No. 2 Mk. I tail units* (not illustrated in the figures).—An arming spindle is mounted axially in the tail cone and carries an arming fork at the forward end and a two-bladed arming vane at the rear end. The arming fork on the spindle engages with the arming fork of the tail pistol. A safety clip is provided on the cone bush at the apex of the tail cone to prevent rotation of the arming mechanism.

14. *Arming mechanism of the No. 26 Mk. III and No. 77 Mk. I tail units* (see fig. 2).—An arming spindle is mounted axially in the tail cone and carries an arming fork and a two-bladed arming vane at its forward and rear ends, respectively. Each blade of the arming vane has a small hole drilled through it. A bush at the apex of the tail cone is fitted with an arming wire guide, which is provided with two small tubular channels. The appropriate channel and hole in one of the arming vane blades carry the safety wire when the bomb is tail fuzed.



SCRAP VIEW OF REAR PORTION OF TAIL ARMING MECHANISM

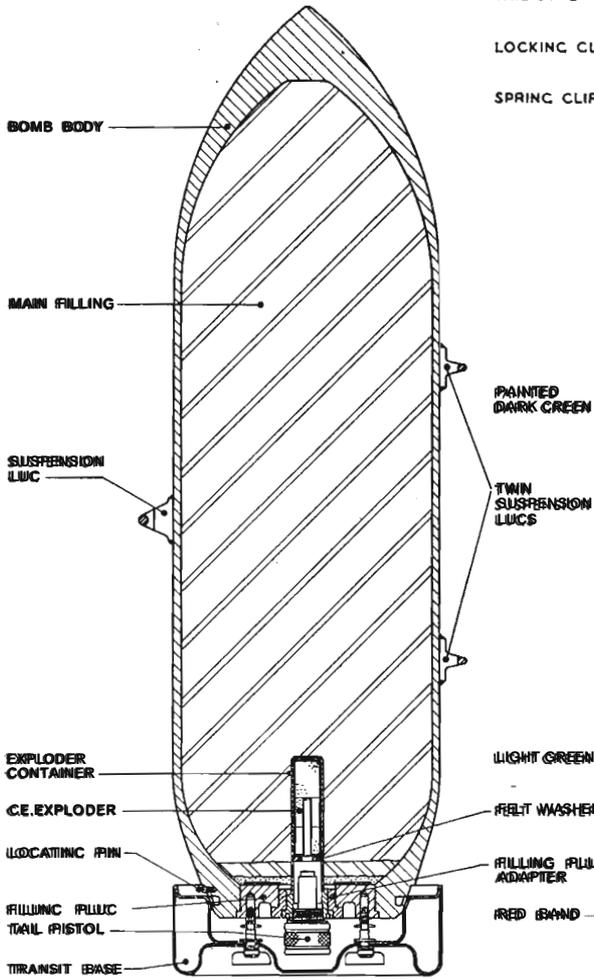


Fig. 1.—Sectional view of Mk. X bomb fitted with No. 36 transit base

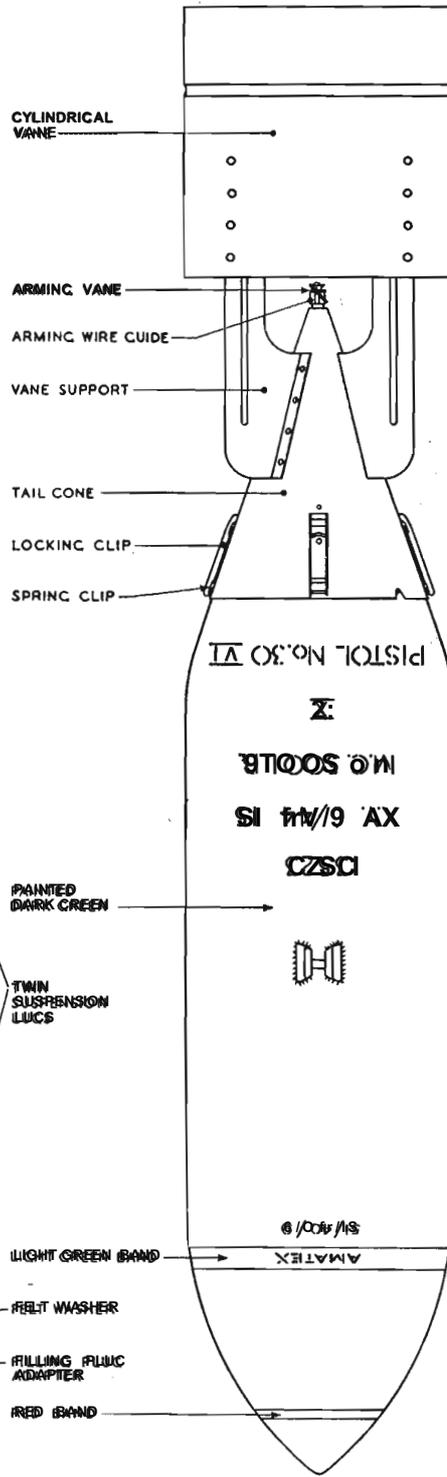


Fig. 2.—Mk. X bomb fitted with No. 25 Mk. II tail unit

This leaf issued with A.L. No. 104
January, 1945

A.P.1661B, Vol. I, Sect. 10

CHAPTER 13

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. X

Introduction

1. This bomb is for attack against resistant targets. It can be fuzed only at the tail, and is normally to be fuzed with a long delay pistol.

2. The bomb is supplied with a No. 30 pistol in position in the tail, and fitted with a No. 36, Mk. I or II transit base (Stores Ref. 12S/806 and 12S/807, respectively), which is secured to the bomb body by two wing bolts.

3. The No. 25 Mk. I and II tail units are to be used with this bomb except when it is to be carried on fighter-bomber aircraft, when the No. 28 Mk. I and II tail units are to be used. The design of the No. 25 Mk. II and No. 28 Mk. II tail units requires the use of the "horizontal" system of fuzing, utilizing a "horizontal" pull-off of a safety wire to initiate the action of the tail arming mechanism.

4. Attention is directed to Chapter 1 of this Section in which general information including details of markings, functioning, supply and storage of M.C. bombs, is given. In Appendix 1 to Chapter 1 of this Section are given particulars of the fuzing components to be used with this bomb. The succeeding Appendices to Chapter 1 contain instructions for fuzing, loading, unloading and unfuzing appropriate to the type of pistol and system of fuzing.

Leading particulars

5. The Stores Reference numbers of the bomb body are as follows:—

| | | | | | | | |
|-------------------------|------------------|----------------|----------------|--|--|--|--|
| Filled R.D.X./T.N.T. | Pistol No. 30 | Mk. III* or IV | Mk. IV** or VI | | | | |
| | | 12A/1780 | 12A/1828 | | | | |
| Filled Mimol 2 | Pistol No. 30 | Mk. III* or IV | Mk. IV** or VI | | | | |
| | | 12A/1772 | 12A/1827 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| | | | | | |
|---|-----|-----|-----|-----|-----------------------------|
| Stores Ref. obftail No. 25, Mk. I | ... | ... | ... | ... | 12A/970 |
| Stores Ref. obftail No. 25, Mk. II | ... | ... | ... | ... | 12A/1655 |
| Stores Ref. obftail No. 28, Mk. I | ... | ... | ... | ... | 12A/1111 |
| Stores Ref. obftail No. 28, Mk. II | ... | ... | ... | ... | 12A/1658 |
| Length of bomb, with No. 25 tail fitted | ... | ... | ... | ... | 5 ft. 10½ in., approx. |
| Length of bomb, with No. 28 tail fitted | ... | ... | ... | ... | 4 ft. 9 in., approx. |
| Maximum diameter, excluding suspension lugs | ... | ... | ... | ... | 12½ in. |
| Weight and nature of filling | ... | ... | ... | ... | 223 lb. R.D.X./T.N.T. 60/40 |
| | | | | | 228 lb. Mimol 2 |
| Charge/weight ratio | ... | ... | ... | ... | 45 per cent. |
| Terminal velocity, with No. 25 tail | ... | ... | ... | ... | 1,550 ft. per sec. |
| Terminal velocity, with No. 28 tail | ... | ... | ... | ... | 1,440 ft. per sec. |

General description, fig. 1 and 2

Note.—The Mk. X bomb differs from the Mk. I bomb in that the Mk. X bomb body is of forged steel construction, with a solid nose, and also in the provision of two additional suspension lugs so that the bomb may be carried in American aircraft.

Bomb body

6. The 500 lb. Mk. X M.C. bomb body is made of forged steel and has a solid nose approximately 3-5 in. long. At the tail end is an exploder container screwed into a filling plug adapter and closed by the tail pistol. A filling plug is screwed into the rear end of the bomb body and has two tapped holes for the transit base securing bolts.

7. The bomb body is provided with three suspension lugs, two of which are diametrically opposite the third. The rear end of the bomb body is provided with four slots to receive the spring clips securing the tail, and a locating pin is fitted to the side of the body to engage with a notch in the forward end of the tail cone to position the tail unit correctly on assembly to the bomb body.

8. The bomb body is filled with high explosive as specified in para. 5. The filling is sealed into the body at the tail end by a pad of approved composition.

9. Located in the tail exploder container is a 4 oz. 6 dr. C.E. exploder, which is covered by a waxed felt washer.

Tail units

10. The No. 25 and No. 28 tail units are similar in construction, each consisting of a tail cone with a cylindrical vane attached to it by four vane supports. The forward end of the tail cone has a notch for engagement with the locating pin on the bomb body. Four spring clips are also provided at the forward end of the tail cone to engage with the slots in the bomb body. These clips are secured in position, when the tail is assembled to the bomb body, by locking clips which are rotatable about rivets.

Note.—Early issues of the No. 25 Mk. I tails are fitted with only two locking clips.

11. The No. 25 Mk. I and No. 28 Mk. I tail units are of the safety clip type and may be used only for "vertical" fuzeing, unless modified (see *Note* below). The No. 25 Mk. II and No. 28 Mk. II tail units, as stated in para. 3, are for use in conjunction with the "horizontal" system of fuzeing. The arming mechanism of these two types of tail unit are described in para. 12 and 13.

Note.—If the "horizontal" system of fuzeing is required and the No. 25 Mk. II or No. 28 Mk. II tail units are not available, the safety clip type of tail can be converted as described in Sect. 10, Chap. 1, App. 5.

12. *Arming mechanism of No. 25 Mk. I and No. 28 Mk. I tail units* (not illustrated in the figures).—An arming spindle is mounted axially in the tail cone and carries an arming fork at the forward end and a two-bladed arming vane at the rear end. The arming fork on the spindle engages with the arming fork of the tail pistol when the tail is assembled to the fuzeed bomb body. A safety clip, carried on a bush in the apex of the tail cone, is fitted with a pillar which protrudes between the blades of the arming vane, thus preventing rotation.

Note.—Early issues of the No. 25 Mk. I tails are fitted with a four-bladed arming vane.

13. *Arming mechanism of No. 25 Mk. II and No. 28 Mk. II tail units*, see fig. 2.—An arming spindle is mounted axially in the tail cone and carries an arming fork and a two-bladed arming vane at its forward and rear ends, respectively. Each blade of the arming vane has a small hole drilled through it. A bush at the apex of the tail cone is fitted with an arming wire guide, which is provided with two small tubular channels. The appropriate channel and hole in one of the arming vane blades carry the safety wire when the bomb is fuzeed.

This leaf issued with A.L. No. 79
April, 1944

A.P.1661B, Vol. I, Sect. 10

AIR
MINISTRY
April, 1944

This is A.L. No. 79 to A.P. 1661B, Vol. I and concerns Sect. 10
 Review and dispose of the existing Chapter 14 and substitute the
 proposed new Chapter 14. When you have done this, make an entry
 in the Appendix Record Sheet.

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CHAPTER 14

BOMB, H.E., AIRCRAFT, M.C., 1,000 lb., Mk. I

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 - Mk. I, 1,000 lb. M.C. bomb fitted with No. 34 transit base, No. 29 transit plug, and No. 5 Mk. I protecting rings

Introduction

1. The 1,000 lb. M.C. bomb is used for general bombardment purposes, as an alternative to the 1,000 lb. G.P. bomb. Attention is directed to Chapter I of this Section in which general information, including details of markings, functioning, supply and storage of this bomb is given. The Appendices to Chapter I of this Section (*to be issued later*) give particulars of the components to be used with this bomb and the instructions for fuzeing, loading, unloading and unfuzeing appropriate to the type of pistol and system of fuzeing.

Leading particulars

| | |
|---|---|
| 2. Length with tail and nose pistol | 6 ft., approx. |
| Maximum diameter | 1 ft. 5½ in., approx. |
| Weight of filling | 475 lb. amatol 60/40 or 50/50, 477 lb. amatex 51/40/9, or 502 lb. RDX/TNT 60/40 |
| Terminal velocity | 1,600 ft. per sec. |
| Tail, No. 37, Mk. I | Stores Ref. 12A/1128 |
| Tail, No. 37, Mk. III | Stores Ref. 12A/1659 |

Stores-Ref. of bomb body:—

Filled amatol 60/40 or 50/50 or with amatex 51/40/9—

| | |
|-----------------------------------|----------|
| With pistol No. 28 Mk. I | 12A/1125 |
| With pistol No. 28 Mk. II | 12A/1367 |
| With pistol No. 28 Mk. II* | 12A/1368 |
| With pistol No. 28 Mk. III | 12A/1369 |
| With pistol No. 30 Mk. II | 12A/1370 |
| With pistol No. 30 Mk. III | 12A/1371 |
| With pistol No. 30 Mk. III* | 12A/1372 |
| With pistol No. 30 Mk. IV | 12A/1373 |

Filled RDX/TNT 60/40—

| | |
|-----------------------------------|----------|
| With pistol No. 28 Mk. I | 12A/1374 |
| With pistol No. 28 Mk. II | 12A/1375 |
| With pistol No. 28 Mk. II* | 12A/1376 |
| With pistol No. 28 Mk. III | 12A/1377 |
| With pistol No. 30 Mk. II | 12A/1378 |
| With pistol No. 30 Mk. III | 12A/1379 |
| With pistol No. 30 Mk. III* | 12A/1380 |
| With pistol No. 30 Mk. IV | 12A/1381 |

ARMAMENT

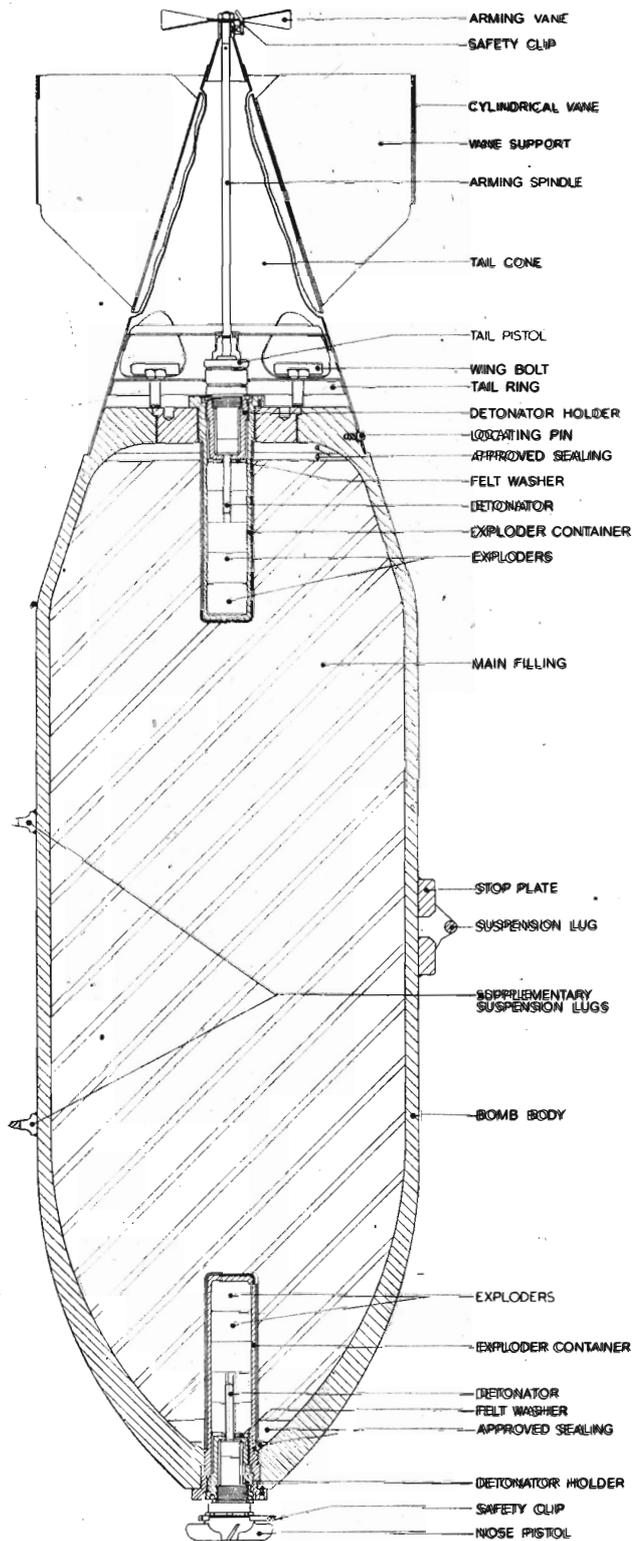


Fig. 1.—Bomb, H.E., aircraft, M.C., 1,000 lb., Mk. I, with tail No. 37, Mk. I, and nose and tail pistols

*This leaf issued with A.L. No. 79
April, 1944*

A.P.11601B, Vol. I, Sect. 10, Chap. 14

General description, fig. 1 and 2

Bomb body

3. The Mk. I 1,000 lb. M.C. bomb body consists of a hollow steel casting filled with high explosive and provided with a detachable tail. About half-way along the body are a suspension lug and two stop plates, welded in position, and diametrically opposite are two welded-on supplementary suspension lugs for American double-point suspension.

4. The nose of the body is provided with an exploder container and a detonator holder, and in the bomb as supplied the detonator holder is closed by a No. 29 transit plug (Stores Ref. 12A/547). An exploder container and detonator holder are similarly provided at the tail end of the bomb body, the detonator holder being threaded to receive a No. 28 or 30 tail pistol which is supplied in position. The rear face of the bomb body has four tapped holes for attaching either a No.-37 Mk. I tail or a No. 34 transit base.

Tail units

5. The No. 37 Mk. I and II tail units are to be used with this bomb. They are secured to the bomb body by four wing bolts. The No. 37 Mk. I tail unit is of the safety clip type and as such must not be assembled to a bomb when the "horizontal" system of fuzing is required. The No. 37 Mk. II tail unit is designed for use in conjunction with the "horizontal" system of fuzing. Both tail units comprise a tail cone, a cylindrical vane attached to the cone by four vane supports, and a tail arming mechanism. This arming mechanism differs in the Mk. I and II tails and is separately described in the following para. 6 and 7.

Note.—Where necessary the No. 37 Mk. I tail unit may be converted for use in conjunction with "horizontal" fuzing as described in Sect. 10, Chap. 1, App. 5 (*to be issued later*).

6. *Arming mechanism of the No. 37 Mk. I tail unit*, see fig. 11—The arming mechanism comprises an arming spindle having an arming vane at the rear end and an arming fork at the front end. The arming spindle is carried in a bush at the apex of the tail cone and in a bearing at the forward end. A safety clip is provided on the cone bush to prevent rotation of the arming mechanism until the bomb is released "live".

7. *Arming mechanism of the No. 37 Mk. II tail unit* (not illustrated in the figures).—The arming mechanism incorporates an arming spindle having an arming vane at the rear end and an arming fork at the front end. The arming spindle is carried in a bush at the apex of the tail cone and in a bearing at the forward end. Each blade of the arming vane has a small hole drilled through it. An arming wire guide, having two small tubular channels, is fitted over the cone bush. The appropriate tubular channel and the hole in one of the arming vane blades carry the safety wire when the bomb is tail fuzed.

Transit fittings, fig. 2

8. To give protection to the tail pistol, a No. 34 transit base (Stores Ref. 12A/1127) is provided, and to protect the suspension lugs, two No. 5 Mk. I (Stores Ref. 12A/1126) or No. 5 Mk. II (Stores Ref. 12A/1249) protecting rings are used. The transit base is of pressed steel and has four welded-on tapped bosses to receive the securing screws by which it is attached to the bomb body. The No. 5 Mk. I and Mk. II protecting rings are each made of two pressed-steel segments which are joined together and clamped on to the bomb body by four bolts with nuts and spring washers. The correct position for the protecting rings is over the supplementary suspension lugs.

Note.—A limited number of the 1,000 lb. M.C. bomb filled with American R.D.X./T.N.T. and having a restricted service life are specially marked. The red band near the nose is barred, and a red circle enclosing the expiry date is stencilled near the nose.

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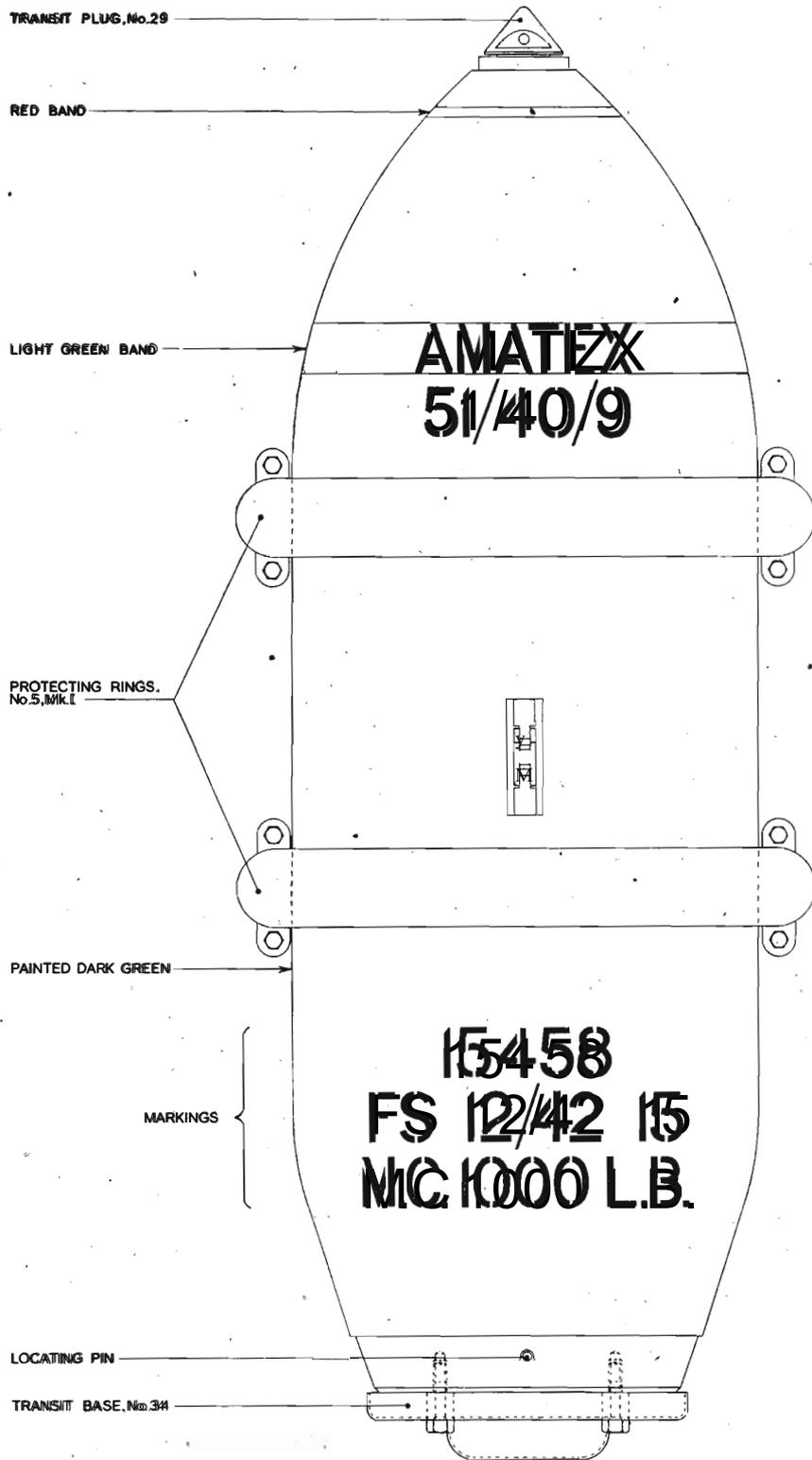


Fig. 2.—Mk. I, 1,000 lb. M.C. bomb fitted with No. 34 transit base, No. 29 transit plug, and No. 5 Mk. I protecting rings

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April 1945**

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April, 1945*

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CHAPTER 16

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. XIII

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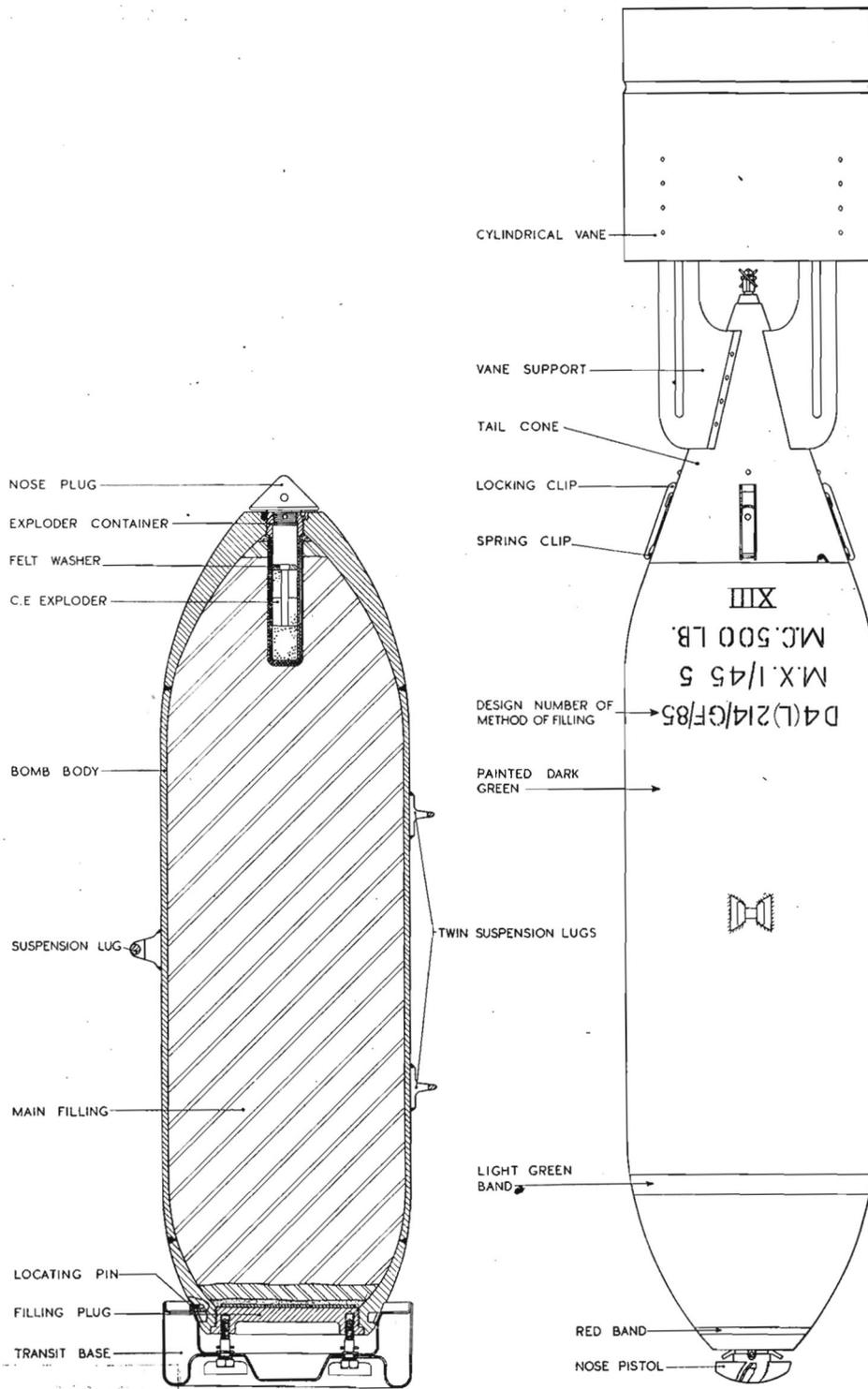


Fig. 1.—Sectional view of Mk. XIII bomb fitted with No. 29 transit base and No. 36 nose plug

Fig. 2.—Mk. XIII bomb fitted with nose pistol and No. 25 Mk. II tail unit

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CHAPTER 16

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. XIII

Introduction

1. This bomb is for use as an alternative to the 500 lb. G.P. bomb when nose fuizing only is required.
2. The bomb is supplied with a No. 36 transit plug in position in the nose and fitted with a No. 29 transit base which is secured to the bomb body by two wing bolts.
3. The tail units to be used with this bomb are the No. 25 Mk. I, II, and III, and the shorter No. 28 Mk. I and II. The No. 28 Mk. I and II tail units are for use when the bombs are to be carried externally on high-speed aircraft. The No. 25 Mk. III tail unit is of strengthened construction and should be used for external carriage when sufficient clearance is available for the longer type tail.
4. Attention is directed to Chapter 1 of this Section in which general information, including details of markings, functioning, supply and storage of M.C. bombs, is given. In Appendix 1 to Chapter 1 of this Section are given particulars of the fuizing components which may be used with this bomb. The succeeding Appendices to Chapter 1 contain instructions for fuizing, loading, unloading, and unfuizing appropriate to the type of pistol and system of fuizing.

Leading particulars

| | |
|--|---|
| 5. Length of bomb, with No. 25 tail and nose pistol fitted | 5 ft. 10½ in., approx. |
| Length of bomb, with No. 28 tail and nose pistol fitted | 4 ft. 9 in., approx. |
| Maximum diameter of bomb, excluding suspension lugs | 12.9 in. |
| Weight and nature of filling | 223 lb. Amatol 50/50 or 219 lb. Amatol 60/40 or 181 lb. Amatol 80/20 or 223 lb. Amatex 51/40/9 or 236 lb. R.D.X./T.N.T. 60/40 or 242 lb. Minol 2 or 217 lb. Pentolite D.1 or 250 lb. Torpex 2 or 227 lb. T.N.T. |
| Charge/weight ratio | 50 per cent. |
| Terminal velocity, with No. 25 tail | 1,460 ft. per sec. |
| Terminal velocity, with No. 28 tail | 1,380 ft. per sec. |

General description, fig. 1 and 2

Note.—The Mk. XIII bomb differs from the Mk. I 500 lb. M.C. bomb in that the Mk. XIII bomb can be fuized only at the nose, the tail end of the bomb body being completely closed by a filling plug. The Mk. XIII bomb also differs from the Mk. I in the provision of two additional suspension lugs so that it may be carried in American aircraft.

Bomb body

6. The 500 lb. Mk. XIII M.C. bomb body is of steel fabricated construction. The nose end of the body is threaded internally to accommodate an exploder container which is itself threaded to take the nose pistol or transit plug. The tail end is closed by a filling plug which has two tapped holes for the transit base securing bolts.
7. The bomb body is provided with three suspension lugs, two of which are diametrically opposite the third. The rear end of the bomb body is provided with four slots to receive the spring clips which secure the tail, and a locating pin is fitted to this end of the body to engage with a notch in the forward end of the tail cone to position the tail unit correctly.
8. The bomb body is filled with high explosive, as specified in para. 5. The filling is sealed into the body at the nose and tail ends by pads of approved composition.
9. Located in the nose exploder container is a 4 oz. 6 dr. C.E. exploder, covered by a waxed felt washer.

Tail units

10. The No. 25 and No. 28 tail units are similar in construction, each consisting of a tail cone with a cylindrical vane attached to it by four vane supports. The forward end of the tail cone has a notch for engagement with the locating pin on the bomb body. Four spring clips, backed by a second leaf in the No. 25 Mk. III tail unit, are also provided at the forward end of the tail cone to engage with the slots on the bomb body. These clips are secured in position, when the tail is assembled to the bomb body, by locking clips which are rotatable about rivets.

Note.—Early issues of the No. 25 Mk. I tails are fitted with only two locking clips.

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CHAPTER 18

BOMBS, H.E., AIRCRAFT, M.C., 1,000 lb., Mk. I and II

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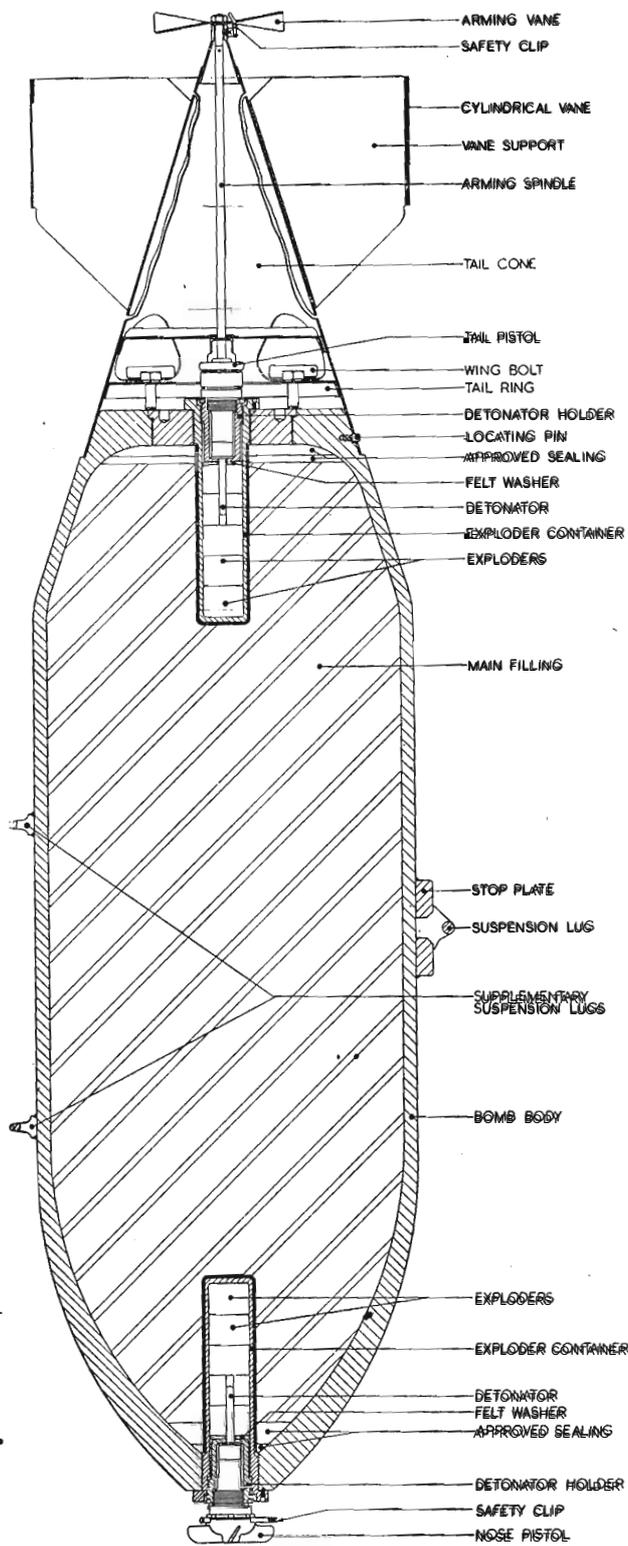


Fig. 1.—1,000 lb. Mk. I M.C. bomb, fitted with tail No. 37 Mk. I, and nose and tail pistols

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CHAPTER 18

BOMBS, H.E., AIRCRAFT, M.C., 1,000 lb., Mk. I and II

Introduction

1. The 1,000 lb. Mk. I and II M.C. bombs are used for general bombardment purposes as alternatives to the 1,000 lb. G.P. bombs. The bombs can be nose and tail fuzed and differ only in that the Mk. II bomb is fitted with stronger supplementary suspension lugs (for carriage in American aircraft) than the Mk. I bomb.

2. The No. 37 Mk. I or II tail unit can be used with these bombs but the Mk. I tail must be modified (see para. 7).

3. Attention is directed to Chapter 1 of this Section in which general information, including details of markings, functioning, supply and storage of these bombs, is given. The Appendices to Chapter 1 of this Section give particulars of the fuzing components which may be used with these bombs, and the instructions for fuzing, loading, unloading and unfuzing appropriate to the type of pistol and system of fuzing to be used.

BOMB, H.E., AIRCRAFT, M.C., 1,000 lb. Mk. I

Leading particulars

| | |
|---|--|
| 4. Length of bomb, with tail and nose pistol fitted | ... 6 ft., approx. |
| Maximum diameter of bomb, excluding suspension lugs | ... 1 ft. 5½ in., approx. |
| Weight and nature of filling | ... 475 lb. Amatol 60/40 or 50/50 or 477 lb. Amatex 51/40/9 or 502 lb. R.D.X./T.N.T. 60/40 |
| Terminal velocity | ... 1,600 ft. per sec. |

General description, fig. 1 and 2

Bomb body

5. The 1,000 lb. Mk. I M.C. bomb body consists of a hollow steel casting filled with high explosive. A suspension lug and two stop plates are welded to one side of the body and diametrically opposite are two welded-on supplementary suspension lugs for American double-point suspension.

6. The nose is provided with an exploder container and a detonator holder, the detonator holder being closed by a No. 29 transit plug. An exploder container and detonator holder are also provided at the tail end of the bomb body, the detonator holder being threaded to receive a tail pistol, a No. 30 pistol being supplied in position. The rear end of the bomb body has four tapped holes for attaching either a No. 37 tail or a No. 34 transit base.

Tail units

7. The No. 37 Mk. I and II tail units are for use with these bombs but, before fitting to a bomb the Mk. I tail must be modified using either of the following methods:—

Either (i) Carefully straighten the tab of the tab washer which secures the locking-nut, unscrew and remove the nut and tab washer. Then remove one pair of arming vane blades and replace the tab washer and locking-nut. Bend up the tab of the tab washer to secure the locking-nut in position.

or (ii) Cut off two diametrically opposite blades of the arming vane.

The No. 37 Mk. I tail unit is of the safety clip type and is for use when the "vertical" system of fuzing is required. The No. 37 Mk. II tail unit is designed for the "horizontal" system of fuzing.

Note.—Where necessary the No. 37 Mk. I tail unit may be converted for use with "horizontal" fuzing as described in Sect. 10, Chap. 1, App. 5.

8. The Mk. I and II tail units are secured to the bomb body by four wing bolts. Both tails comprise a tail cone, a cylindrical vane attached to the cone by four vane supports, and an arming mechanism. This arming mechanism differs in the Mk. I and II tails and is described in the following para. 9 and 10.

9. *Arming mechanism of the No. 37 Mk. I tail unit, see fig. 1.*—The arming mechanism comprises an arming spindle having a four-bladed arming vane at the rear end and an arming fork at the front end. The arming spindle is carried in a bush at the apex of the tail cone and in a bearing at the forward end. A safety clip is provided on the bush to prevent rotation of the arming mechanism until the bomb is released "live".

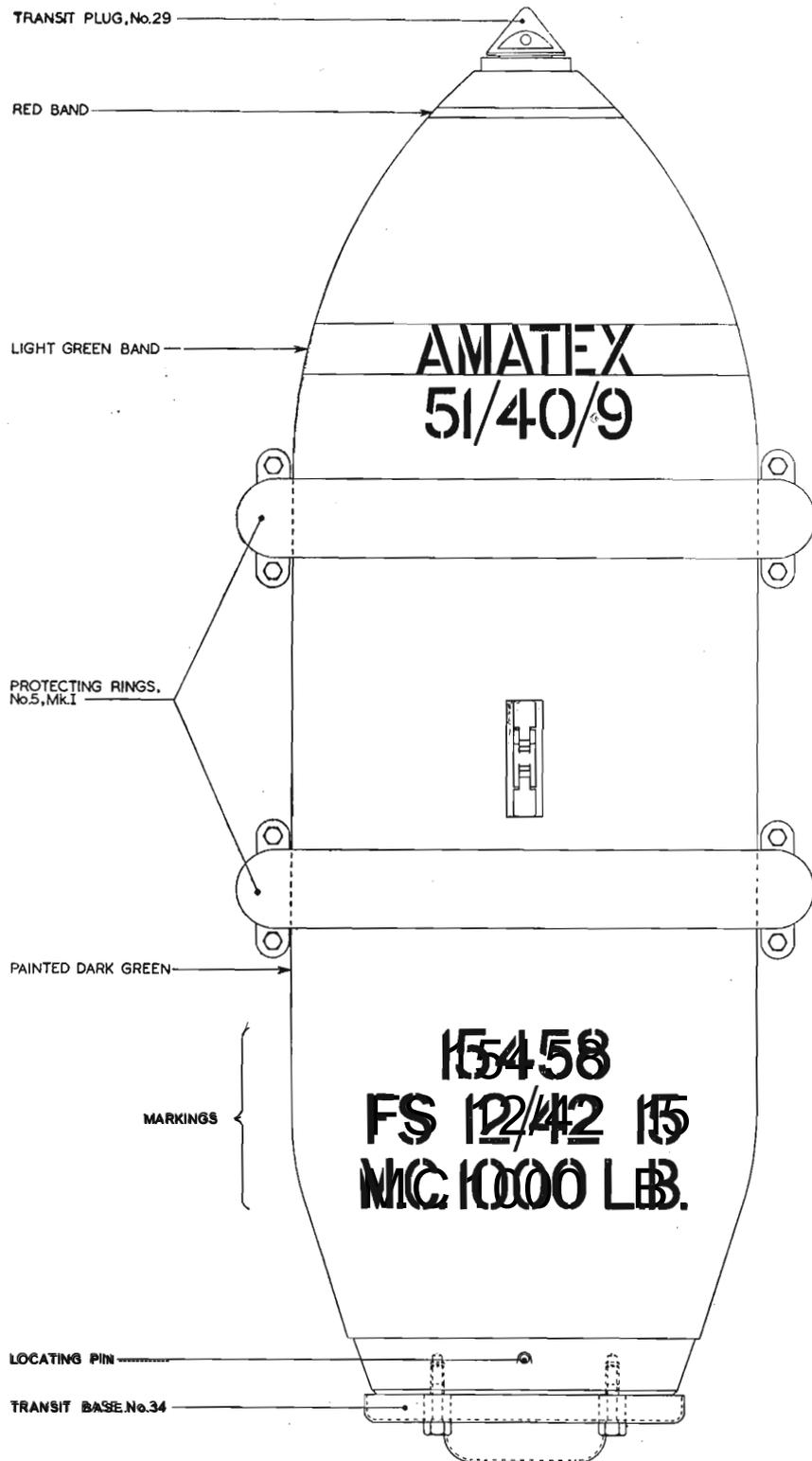


Fig. 2.—1,000 lb. Mk. I M.C. bomb, fitted with No. 34 transit base, No. 29 transit plug, and No. 5 Mk. I protecting rings

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10. *Arming mechanism of the No. 37 Mk. II tail unit (not illustrated in the figures).—*The arming mechanism comprises an arming spindle having a two-bladed arming vane at the rear end and an arming fork at the front end. The arming spindle is carried in a bush at the apex of the tail cone and in a bearing at the forward end. Each blade of the arming vane has a small hole drilled through it. An arming wire guide, having two small tubular channels, is fitted over the cone bush. The arming wire guide and one of the holes in the arming vane blades carry a safety wire when the bomb is tail fuzeed.

Transit fittings, fig. 2

11. To give protection to the tail pistol, a No. 34 transit base is provided, and to protect the suspension lugs, two No. 5 Mk. I or No. 5 Mk. II protecting rings are used. The transit base is of pressed steel and is attached to the bomb body by four bolts. The No. 5 Mk. I and II protecting rings are each made of two pressed steel segments which are joined together and clamped on to the bomb body by four bolts with nuts and spring washers. The correct position for the protecting rings is over the supplementary suspension lugs.

BOMB, H.E., AIRCRAFT, M.C., 1,000 lb., Mk. II

Comparison with the Mk. I bomb

12. As stated in para. 1, the Mk. II bomb is identical with the Mk. I bomb except that the two supplementary suspension lugs fitted to the Mk. II bomb body are of stronger construction. The information in para. 4 to 11 applies equally to this bomb.

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CHAPTER 10

BOMB, H.E., AIRCRAFT, M.C., 1,000 lb., Mk. III

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 2. Mk. III bomb prepared for transit

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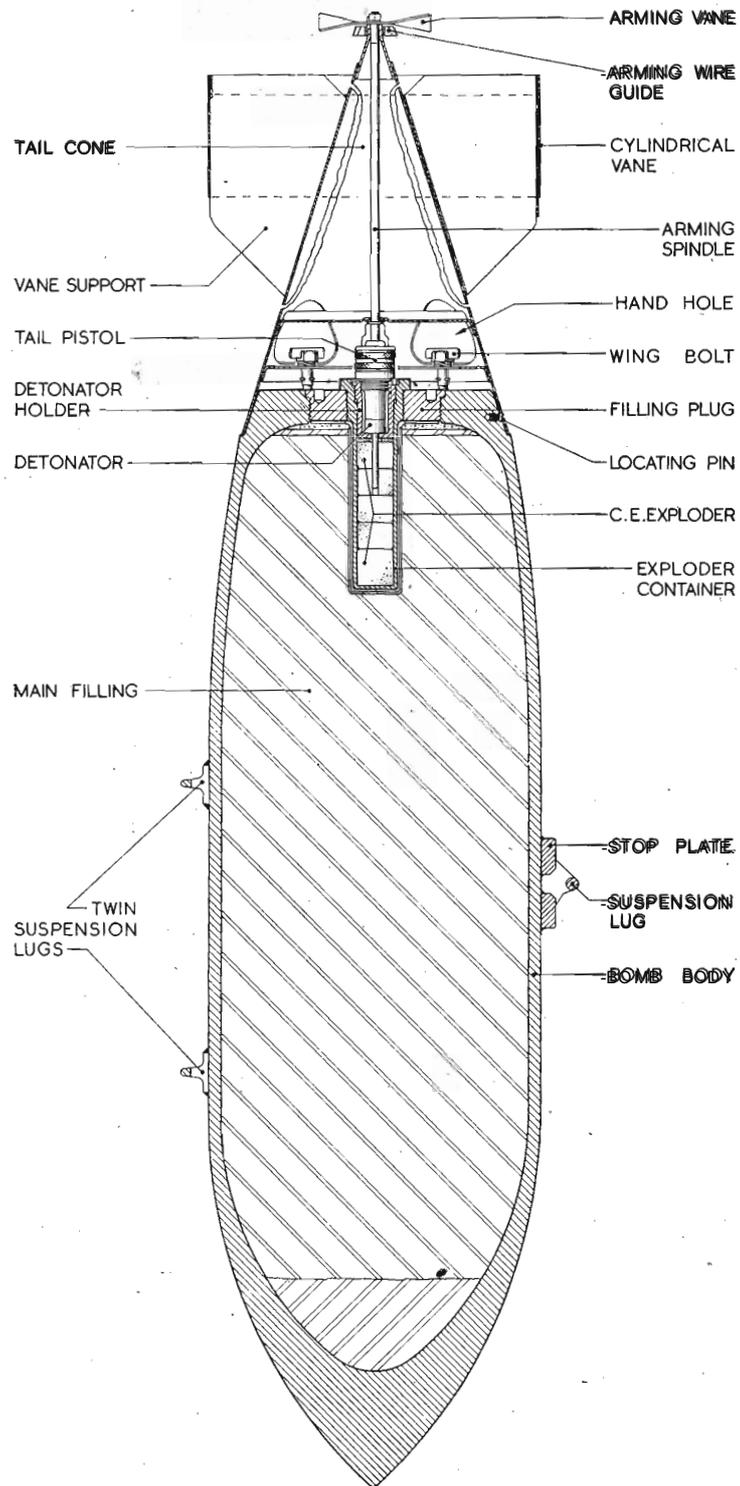


Fig. 1.—Sectional view of Mk. III bomb fitted with tail pistol and No. 29 Mk. II tail unit

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CHAPTER 10

BOMB, H.E. AIRCRAFT, M.C., 1,000 lb., Mk. III

Introduction

1. This bomb is primarily designed for attack against resistant targets and for use with long delay fuzing. The bomb can be fuzed only at the tail.

2. The No. 29 Mk. I or IT tail unit is to be used with this bomb but the Mk. I tail must be modified, as detailed in para. 8.

3. Attention is directed to Chapter 1 of this Section in which general information, including details of markings, functioning, supply and storage of M.C. bombs is given. The Appendices to Chapter 1 of this Section give particulars of the fuzing components which may be used with this bomb, and the instructions for fuzing, loading, unloading and unfuzing appropriate to the type of pistol and system of fuzing used.

Leading particulars

| | |
|---|--|
| 4. Length of bomb, with tail unit fitted | 5 ft. 11 in., approx. |
| Maximum diameter of bomb, excluding suspension lugs ... | 1 ft. 4.15 in. |
| Weight and nature of filling | 401 lb. R.D.X./T.N.T. 60/40 or 366 lb. Pentolite D.1 or 430 lb. Torpex 2 |
| Terminal velocity | 1,600 ft. per sec. |

General description, fig. 1 and 2

Bomb body

5. The bomb body is of forged steel construction and has a solid nose. The tail end of the bomb body is closed by a filling plug screwed in position. Into this plug is screwed an exploder container which houses two C.E. exploders and a detonator holder. The detonator holder is threaded to receive a tail pistol, a No. 30 pistol being supplied in position to serve as a plug during transit and storage. Four tapped holes in the filling plug are provided to receive either the four wing bolts or the four screws used, respectively, for attaching either a No. 29 tail unit or a No. 34 transit base to the bomb body. A locating pin at the rear end of the bomb body ensures correct assembly of the tail unit.

Note.—The No. 30 pistol will, in due course, be replaced by the No. 65 pistol.

6. A suspension lug and two stop plates are welded to the bomb body and diametrically opposite are welded two suspension lugs for American twin-point suspension. During transit and storage, these lugs are protected against damage by two No. 9 protecting rings. Each ring consists of two steel segments which are joined together and clamped on to the bomb body by four bolts with nuts and spring washers.

7. The bomb body is filled with a main filling of high explosive as specified in para. 4; with a pad of T.N.T. at the nose end and a layer of T.N.T., together with a sealing layer of approved composition, at the tail end.

Tail units

8. The No. 29 Mk. I and III tail units are for use with this bomb but, before fitting to a bomb, the Mk. I tail must be modified using either of the following methods:—

Either (i) Carefully straighten the tab of the tab-washer which secures the locking-nut, unscrew and remove the nut and tab-washer. Then remove one pair of arming vane blades and replace the tab-washer and locking-nut. Bend up the tab of the tab-washer to secure the locking-nut in position.

or (ii) Cut off two diametrically opposite blades of the arming vane.

The No. 29 Mk. II tail unit is of the safety clip type and is for use when the "vertical" system of fuzing is required. The No. 29 Mk. III tail unit is designed for the "horizontal" system of fuzing.

Note.—Where necessary, the No. 29 Mk. I tail unit may be converted for use for "horizontal" fuzing, as described in Sect. 10, Chap. 1, App. 5.

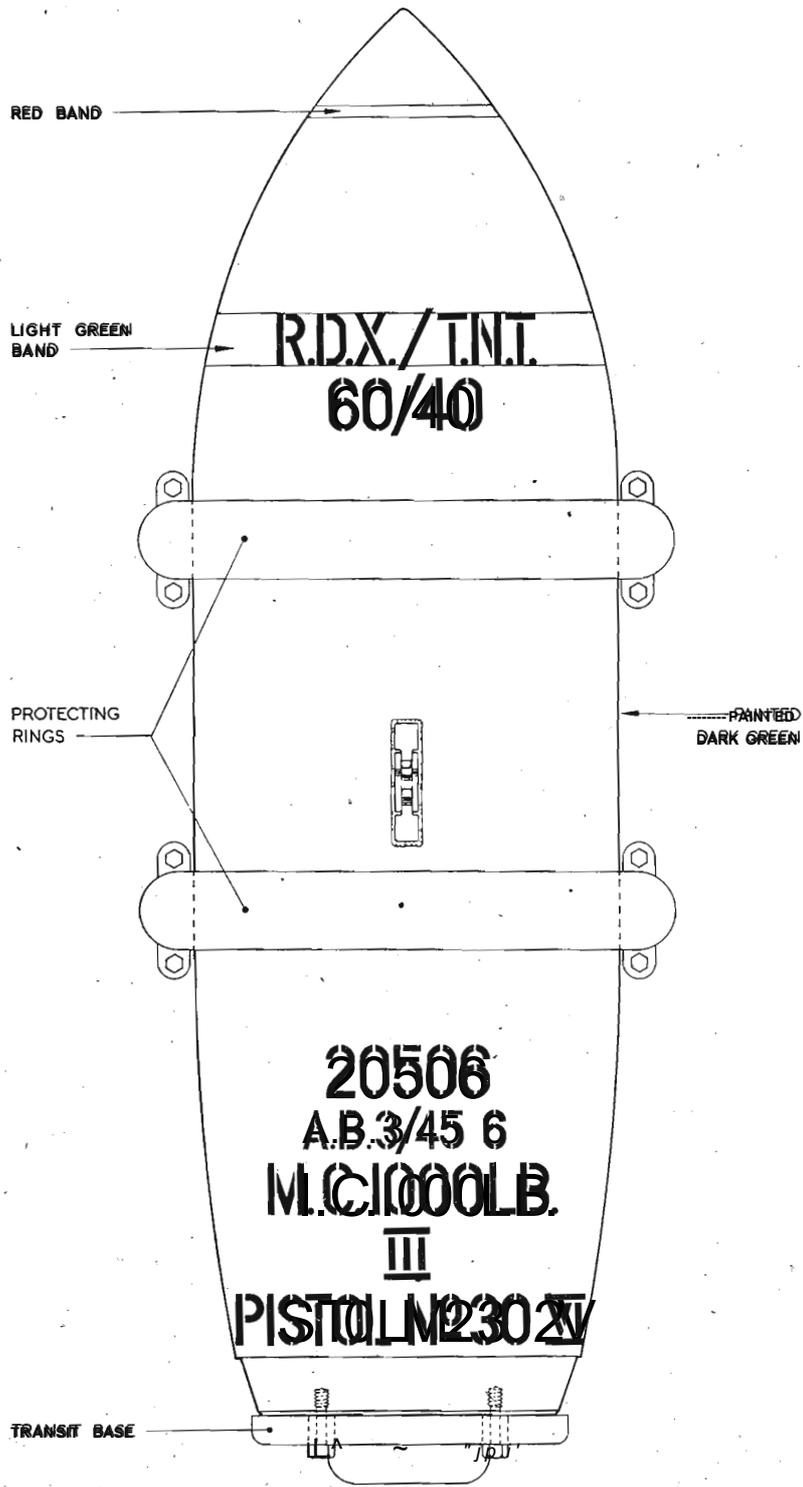


Fig. 2.—Mk. III bomb prepared for transit

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9. The Mk. I and II tail units are secured to the bomb body by four wing bolts, access to which is given by hand holes in the tail cone. Both tails comprise a tail cone, a cylindrical vane attached to the cone by four vane supports, and an arming mechanism. The arming mechanism differs in the Mk. I and II tails and is described in the following para. 10 and 11.

10. *Arming mechanism of the No. 29 Mk. I tail unit* (not illustrated in the figures). This mechanism comprises an arming spindle having a four-bladed arming vane at the rear end and an arming fork at the front end. The arming spindle is carried in a bush at the apex of the tail cone, and in a bearing at the forward end. A safety clip is provided on the bush to prevent rotation of the arming mechanism until the bomb is released "live".

11. *Arming mechanism of the No. 29 Mk. II tail unit*, see fig. 1.—This mechanism comprises an arming spindle having a two-bladed arming vane at the rear end and an arming fork at the front end. The arming spindle is carried in a bush at the apex of the tail cone, and in a bearing at the forward end. Each blade of the arming vane has a small hole drilled through it. An arming wire guide, having two small tubular channels, is fitted over the cone bush. The arming wire guide and one of the holes in the arming vane blades carry a safety wire when the bomb is fuzed.

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CHAPTER 21

BOMBS, H.E., AIRCRAFT, M.C., 4,000 lb., Mk. I and II

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CHAPTER 21

BOMBS, H.E., AIRCRAFT, M.C., 4,000 lb., Mk. I and II

Introduction

1. The 4,000 lb. Mk. I and II M.C. bombs are primarily intended for low altitude bombing operations. Both Mk. I and II bombs are to be fuzed *only* at the tail using a delay detonator.

2. The bombs are drilled to enable either a single British type suspension lug or two American type lugs to be fitted. As, however, there is no current requirement for American lugs, these are not provided.

3. The tail for use with these bombs is the No. 38 Mk. I. The design of this tail is such that the "horizontal" system of fuzing, utilizing a "horizontal" pull-off of a safety wire, is required to initiate the action of the tail arming mechanism.

4. General information, including particulars of identification colouring and markings, supply, and storage of M.C. bombs, is contained in Chap. 1 of this Section. Attention is, therefore, directed to that Chapter and to the Appendices following it. The latter contain details of the components which may be used with the bombs, and the appropriate instructions for fuzing, loading, unloading, and unfuzing according to the type of pistol and system of fuzing used.

BOMB, H.E., AIRCRAFT, M.C., 4,000 lb., Mk. I

Leading particulars

| | | | |
|---|-----|-----|---|
| 5. Length of bomb, with tail and nose plug fitted | ... | ... | 9ft. 2 in., approx. |
| Maximum diameter, without suspension lugs | ... | ... | 22ft. 6 in. |
| Weight and nature of filling | ... | ... | 2,218 lb. Amatol 50/50 or 60/40 or 2,347 lb. R.D.X./T.N.T.* or 2,430 lb. Minol 2 |
| Charge/weight ratio | ... | ... | 55 per cent, approx. |
| Terminal velocity | ... | ... | 2,100 ft. per sec. |

General description

Bomb body

6. The bomb body is a fabricated steel casing, the nose end of which is strengthened by six equi-spaced webs. Tapped holes, covered during transit and storage by protecting shields, each secured by one screw, are provided in the body casing for the attachment of one suspension lug and two hoisting brackets, or twin lugs, as appropriate.

7. The rear end of the casing is closed by a closing plate secured by sixteen nuts and spring washers. This end of the bomb body is provided with four locating pins to position the tail unit correctly, and with four tapped holes to receive the transit base, or tail, securing bolts on assembly of the base or tail unit to the bomb body.

8. The closing plate is fitted with two drop handles and an adapter which houses the tail exploder container and detonator holder. A second adapter, welded to the nose end of the casing, houses the nose exploder container and detonator holder. The exploder containers and detonator holders are locked in position by set-screws. Located in the tail exploder container is a 9 oz. 3 dr. paper wrapped C.E. exploder, retained in position by a felt washer. There may or may not be a C.E. exploder contained in the nose exploder container. The nose detonator holder is closed during transit and storage by a transit plug and the tail detonator holder by the tail pistol, as detailed in para. 15.

9. A central tube, containing a column of five 33½ oz., and one 116 oz. 11 dr., C.E. exploders, extends along the axis of the bomb body and fits around the end of both nose and tail exploder containers. Washers in the tube prevent movement of the exploders.

10. The main filling of high explosive, specified in para. 5, occupies the remaining space within the bomb body and is sealed at the nose and tail ends by pads of approved composition.

Note.—The interior of certain 4,000 lb. Mk. I M.C. bombs are painted with an air drying varnish (in place of stoved copal varnish) and have, therefore, a restricted service life of two years from the date of filling. If the bombs are not expended within this period, arrangements must be

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made for inspection with a view to extending their service life. Such bombs are identified by the letter "A" stencilled in front of the date of filling. It should be noted, however, that all 4,000 lb. Mk. I M.C. bombs which were filled prior to August 1943 were internally coated with air drying varnish but do not bear the identification mark. For these bombs, therefore, Units must ensure that the letter "A" is clearly stencilled in front of the date of filling.

Tail unit

11. The No. 38 Mk. I tail unit consists of a tail cone with a cylindrical vane attached to it by four vane supports. The base of the tail cone is fitted with a tail cone attachment ring. This ring has four holes for engagement with the four locating pins at the rear end of the bomb body, thus ensuring that the tail unit is correctly fitted to the bomb body. Four bolts, accessible through hand holes, secure the tail unit in position.

12. An arming mechanism is fitted into the tail unit. It consists of an arming spindle, which is supported by a cone bush and spider, and which has an arming fork at its forward end and a four-bladed arming vane attached at its rear end. Each blade of the arming vane has a small hole drilled through it.

13. On the side of the tail cone, at the rear end, is fitted a channel bracket which constitutes the arming wire guide. In the ends of the bracket are two holes directly opposite to each other, and these, together with one of the arming vane holes carry the safety wire when the bomb is fuzed.

Instructions for use

14. Attention is directed to the Appendices to Chapter 1 of this Section for the instructions for fuzing, loading, unloading, and unfuzing, appropriate to the type of pistol and the method of fuzing which is required. In addition, the following points must be noted:—

- (i) The bombs are to be fuzed *only* at the tail, using a delay detonator. In addition to the normal fuzing operations, Units must ensure that the nose exploder pellets, if present, are removed under A.I.D./A.I.S. inspection before the bombs are used.
- (ii) If the suspension fittings are not already assembled to the bomb, they are to be fitted before fuzing. To do this remove, as necessary, the protecting shields from the bomb body. Then attach the suspension lug(s) and hoisting brackets to the appropriate positions, using the screws (with fibre inserts) provided. Great care must be taken to ensure that the fittings are securely assembled to the bomb body.

Supply

15. The general information on the supply of M.C. bombs contained in Chapter 1 of this Section is applicable to this bomb, together with the following particulars:—

- (i) The bomb is supplied with a No. 40 transit plug in position in the nose and a No. 30 Mk. IV** or VI pistol in position in the tail. The tail pistol is protected during transit and storage by a No. 33 transit base which is attached to the bomb body by four bolts.
Note.—Early issues of this bomb have a transit plug in position in the tail instead of a tail pistol, in which instance, a transit base is not fitted.
- (ii) The suspension fittings are supplied separately from the bomb body and tail unit, in Box B.449 Mk. I, which contains five Assemblies No. 5 Mk. I. Each assembly consists of one lug, suspension, No. 4, Mk. I with four screws, two brackets, hoisting, No. 1, Mk. I with eight screws, two screws, securing nose attachment No. 3 Mk. II, and twelve screws, securing, tail unit No. 24.

Notes.—(i) Early issues of this bomb were made with suspension lugs and hoisting brackets fitted to the bomb body?

- (ii) The screws, securing, nose attachment No. 3 Mk. II, and the screws, securing, tail unit No. 24 are provisioned for use with H.C. bombs and are not required for this bomb. They are, therefore, to be returned in the box for re-issue.

BOMB, H.E., AIRCRAFT, M.C., 4,000 lb., Mk. II

Comparison with the Mk. I bomb

16. The Mk. II bomb has a similar construction to the Mk. I bomb, as described in para. 6 to 13, except that only a tail fuzing position is provided, the nose end of the Mk. II bomb being closed

by a plug welded in position. The Mk. II bomb body also differs from that of the Mk. I by the incorporation of the following features:—■

- (i) The nose portion of the body casing is strengthened, being manufactured from a one-piece spinning.
- (ii) The closing plate is concave towards its centre; the number of bolts used for securing it to the bomb body is increased to thirty.

17. The Mk. II bomb body is supplied fitted with a No. 30 Mk. IV** or VI pistol and a No. 33 transit base. The suspension fittings are always supplied separately from the bomb body as described in para. 15 (ii).

Instructions for use

18. Attention is directed to the Appendices to Chapter 1 of this Section for the instructions for fuzeing, loading, unloading and unfuzeing appropriate to the type of pistol and method of fuzeing which is required. In addition, instructions for assembling suspension fittings to the bomb body are given in para. 14 (ii).

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CHAPTER 22

BOMBS, H.E., AIRCRAFT, M.C., 12,000 lb., Mk. I and U

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CHAPTER 22

BOMBS, H.E., AIRCRAFT, M.C., 12,000 lb., Mk. I and II

Introduction

1. These bombs are designed for the attack of special targets where deep penetration into sub-soil strata is required.

2. The bombs, when prepared for use, have a streamline contour. They can be fuzed only at the tail, using either three No. 58 pistols or three No. 47 long delay pistols. The detailed instructions for fuzing a bomb with these components, together with the procedure for assembling, loading, unloading and unfuzing a bomb, are given in the Appendices to Chapter 1 of this Section.

3. General information, including details of markings, functioning, supply, and storage of M.C. bombs, is given in Chapter 1 of this Section.

BOMB, H.E., AIRCRAFT, M.C., 12,000 lb., Mk. I**Leading particulars***Bomb body*

| | | | | | |
|------------------------------|-----|-----|-----|-----|----------------------|
| 4. Length | ... | ... | ... | ... | 10 ft. 4 in. |
| Maximum diameter | ... | ... | ... | ... | 3 ft. 2 in. |
| Weight and nature of filling | ... | ... | ... | ... | 5,200 lb. Torpex D.1 |
| Total weight | ... | ... | ... | ... | 11,855 lb. |

Tail unit

| | | | | | |
|--------------------------------|-----|-----|-----|-----|------------------------|
| 5. Length | ... | ... | ... | ... | 11 ft., approx. |
| Maximum width across tail fins | ... | ... | ... | ... | 3 ft. 8.3 in., approx. |
| Weight | ... | ... | ... | ... | 150 lb. |

Fairing

| | | | | | |
|-----------|-----|-----|-----|-----|-------------|
| 6. Length | ... | ... | ... | ... | 1 ft. 1 in. |
| Weight | ... | ... | ... | ... | 25 lb. |

The overall length of the complete bomb is 21 ft.

General description, fig. 4

7. The bomb consists of a bomb body, filled with high explosive and provided with three tail fuze positions, and a No. 78 tail unit, which is secured to the bomb body by twelve assembly studs and Simmonds nuts. A fairing, held in position on the bomb by three turnbuckles, is fitted to maintain continuous streamlining of the assembled bomb.

Bomb body

8. The bomb body is manufactured of cast steel with a solid nose formed by a conical nose piece which is screwed and sealed into the nose of the bomb. The tail opening is covered by a closing plate which has three tapped holes for lifting purposes and which is attached to the bomb body by twenty studs with nuts and spring washers. The rear end of the bomb body has twelve tapped holes to receive the tail assembly studs. These studs are threaded at each end and are provided with flanges which seat in the countersunk stud holes.

Note.—The twelve tail assembly studs and Simmonds nuts are normally supplied separately from the bomb body in a small box built into the bomb transit cradle.

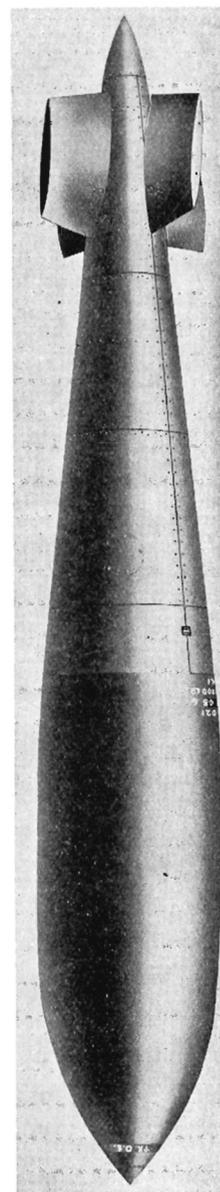


Fig. 1.—The 12,000 lb. Mk. I M.C. bomb

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December, 1945

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9. Into the closing plate are screwed three exploder containers each of which houses an R.D.X./Beeswax exploder, and a C.E. exploder, covered by glazedboard discs and a felt washer, respectively. A detonator holder is screwed into each exploder container and is closed, during transit and storage, by a No. 34 transit plug. Each exploder container is inset in an R.D.X./Beeswax exploder which is itself contained in a bakelised paper or cardboard tube. A felt washer is positioned at one end of the tube while the opposite end is closed by a millboard disc secured by grey paper.

10. The bomb body is filled with Torpex D.1 and is sealed at the nose end with a layer of R.D. composition and T.N.T., and at the rear end by R.D. composition or woodmeal wax and T.N.T. A laminated block composed of alternate layers of plywood and felt, or a plywood washer, is recessed in the sealing composition.

11. A recessed dowel hole is located almost midway along the length of the bomb body and serves to position the bomb correctly in the aircraft.

Tail unit

12. The tail unit consists of a tail cone to which four fins of aerofoil section are attached, the fins being inclined at 5 deg. to the axis of the cone so as to impart a spin to the bomb during its trajectory.

13. The tail cone has a framework of six hoops covered by a metal plating made in sections. Adjoining sections of plating are riveted either to a hoop or to a butt strap, which is a connecting strip of metal between two adjacent hoops.

14. Towards the apex of the cone are four projecting support arms set at right angles, the cone casing being strengthened by a metal plate where each arm passes through it. These projecting arms carry the four fins. Each fin consists essentially of a skin of metal plating supported by four elliptical plates bent over at the edges to form ribs, to which the plating is riveted. The plate nearest the tail cone is drilled with a large hole fitted with a flanged metal collar, which is carried by two plates cast integral with the collar and riveted to the skin metal plating. A securing bolt, which passes through the collar and support arm, is retained in position by two nuts, one at each end.

15. At the base of the tail cone is an attachment ring drilled with twelve holes to take the twelve tail assembly studs on assembly of the tail unit to the bomb body. Two hand holes in the tail cone give access to the assembly studs and to the fuzing positions after the tail unit has been fitted. When not in use, each hand hole is covered by a panel which is secured to the tail cone by five screws. The tail cone is also provided with a fuzing link hole through which pass the fuze-setting control links or safety wires, for insertion in the appropriate E.M. fuzing units in the aircraft.

16. An arrow is painted on the base of the tail cone in line with the fuzing link hole and is to facilitate alignment of the fuzing link hole and dowel hole on assembly of the tail unit to the bomb body.

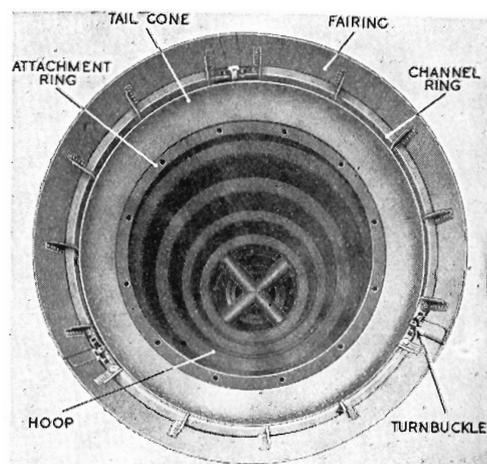


Fig. 2.—View showing inside of fairing and tail cone

Fairing

17. The fairing is formed by three adjoining curved sections of metal plating (see fig. 2). The sections overlap slightly, and on the inside of each runs a channel ring connected to the channel ring of the other two sections by tumblers. Each tumbuckle (see fig. 3) comprises a stud threaded at both ends and on which a knurled nut, provided with four tommy bar holes, is mounted. The threaded ends of the stud are of opposite hand to each other and screw into trunnions, each trunnion being fitted in a coupling link pinned to one end of a channel ring.

18. The fairing is strengthened by wedge-shaped pieces of metal welded to the channel ring and riveted to the inside of the fairing, which is secured in position on the bomb by rotating the knurled nut of each of the three tumblers, and this serves to draw the sections of channel ring (and thus the sections of fairing) together.

BOMB, H.E., AIRCRAFT, M.C., 12,000 lb., Mk. II

Comparison with the Mk. I bomb

19. The Mk. II bomb is of essentially the same construction as the Mk. I bomb, a different mark number being allocated to indicate that the bomb is of American manufacture. Attention is, therefore, directed to para. 1 to 18, which apply equally to the Mk. II bomb.

Note.—The tail assembly studs supplied with the Mk. II bomb are not interchangeable with the studs provisioned for use with the Mk. I bomb.

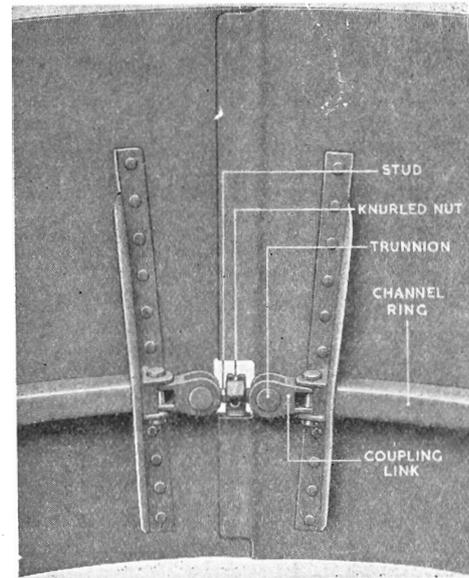


Fig. 3.—Scrap view of inside of fairing showing tumbuckle

*This leaf issued with A.L. No. 132
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CHAPTER 23

BOMBS, H.E., AIRCRAFT, M.C., 22,000 lb., Mk. I and II

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CHAPTER 23

BOMBS, H.E., AIRCRAFT, M.C., 22,000 lb., Mk. I and U

Introduction

1. These bombs are designed for the attack of special targets where deep penetration into sub-soil strata is required.

2. The bombs, when prepared for use, have a streamline contour. They can be fuzed only at the tail, using either three No. 58 pistols or three No. 47 long-delay pistols. The detailed instructions for fuzing a bomb with these components, together with the procedure for assembling, loading, unloading and unfuzing a bomb, are given in the Appendices to Chapter 1 of this Section.

3. General information, including details of markings, functioning, supply and storage of M.C. bombs is given in Chapter 1 of this Section.

BOMB, H.E., AIRCRAFT, M.C., 22,000 lb., Mk. I

Leading particulars

Bomb body

| | |
|----------------------------------|----------------------|
| 4. Length... | 122 ft. 66 in. |
| Maximum diameter ... | 3 ft. 10 in. |
| Weight and nature of filling ... | 9,135 lb. Torpex D.1 |
| Total weight... | 221,500 lb. |

Tail unit

| | |
|------------------------------------|-------------------------|
| 5. Length... | 13 ft. 3-9 in., approx. |
| Maximum width across tail fins ... | 4 ft. 5-6 in., approx. |
| Weight..... | 160 lb. |

Fairing

| | |
|--------------|-------------|
| 6. Length... | 1 ft. 4 in. |
| Weight | 28 lb. |

The overall length of the complete bomb is 25 ft. 5 in.

General description, fig. 3

7. The bomb consists of a bomb body, filled with high explosive and provided with three tail fuze positions, and a No. 82 tail unit, which is secured to the bomb body by twelve assembly studs and Simmonds nuts. A fairing, held in position on the bomb by three turnbuckles, is fitted to maintain continuous streamlining of the assembled bomb.

Bomb body

8. The bomb body is manufactured of cast steel with a solid nose formed by a conical nose piece which is screwed and sealed into the nose of the bomb. The tail-opening is covered by a closing plate which has two tapped holes for lifting purposes and which is attached to the bomb body by twenty studs with nuts and spring washers. The rear end of the bomb body has twelve tapped holes to receive the tail assembly studs. These studs are threaded at each end and provided with a flange which seats in the countersunk stud hole.

Note.—The twelve tail assembly studs and Simmonds nuts are normally supplied separately from the bomb body in a small box built into the bomb transit cradle.

9. Into the closing plate are screwed three exploder containers each of which houses an R.D.X./Beeswax exploder, and a C.I.E. exploder, covered by glazed board discs and a felt washer, respectively. A detonator holder is screwed into each exploder container and is closed, during transit and storage, by a No. 34 transit plug. Each

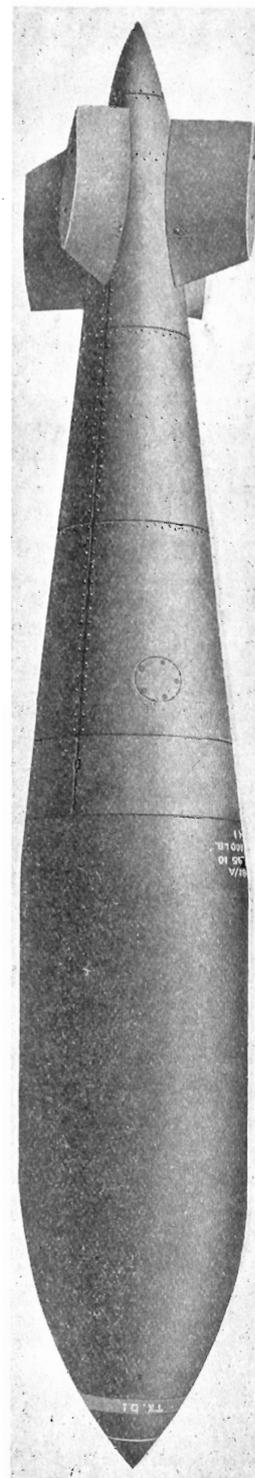


Fig. 1.—The 22,000 lb. Mk. I MLC bomb

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exploder container is inset in an R.D.X./Beeswax exploder which is itself contained in a bakelised paper or a cardboard tube. A felt washer is positioned at one end of the tube while the opposite end is closed by a millboard disc secured by grey paper.

10. The bomb body is filled with Torpex D.1 and is sealed at the nose end with a layer of approved composition and T.N.T., and at the rear end by approved composition or woodmeal wax and T.N.T. A laminated block composed of alternate layers of plywood and felt, or a plywood washer, is recessed in the sealing composition.

11. A recessed dowel hole is located almost midway along the length of the bomb body and serves to position the bomb correctly in the aircraft.

Tail unit

12. The tail unit consists of a tail cone to which four fins of aerofoil section are attached, the fins being inclined at 5 deg. to the axis of the cone so as to impart a spin to the bomb during its trajectory.

13. The tail cone has a framework of six hoops covered by a metal plating made in sections. Adjoining sections of plating are riveted either to a hoop or to a butt strap, which is a connecting strip of metal between two adjacent hoops.

14. Towards the apex of the cone are four projecting support arms set at right angles, the cone casing being strengthened by a metal plate where each arm passes through it. These projecting arms carry the four fins. Each fin consists essentially of a skin of metal plating supported by four elliptical plates bent over at the edges to form ribs, to which the plating is riveted. The transverse plate nearest the tail cone is drilled with a large hole fitted with a flanged metal collar, which is carried by two plates cast integral with the collar and riveted to the skin metal plating. A securing bolt, which passes through the collar and support arm, is retained in position by two nuts, one at each end.

15. At the base of the tail cone is an attachment ring drilled with twenty-four holes, alternate holes being used to take the twelve tail assembly studs on assembly of the tail unit to the bomb body. Three hand holes in the tail cone give access to the assembly studs and to the fuzeing positions after the tail unit has been fitted. When not in use, each hand hole is covered by a panel which is secured to the tail cone by five screws. The tail cone is also provided with a fuzeing link hole through which pass the fuze-setting control links or safety wires for insertion in the appropriate E.M. fuzeing units in the aircraft.

16. An arrow is painted on the base of the tail cone in line with the fuzeing link hole and is to facilitate alignment of the fuzeing link hole and dowel hole on assembly of the tail unit to the bomb body.

Fairing

17. The fairing is formed by three adjoining curved sections of metal plating. The sections overlap slightly, and on the inside of each runs a channel ring, connected to the channel ring of the other two sections by turnbuckles. Each turnbuckle (see fig. 2) comprises a stud threaded at both ends and on which a knurled nut, provided with four tommy bar holes, is mounted. The threaded ends of the stud are of opposite hand to each other and screw into trunnions, each trunnion being fitted in a coupling link pinned to one end of a channel ring.

18. The fairing is strengthened by wedge-shaped pieces of metal welded to the channel ring and riveted to the inside of the fairing, which is secured in position on the bomb by rotating the knurled nut of each of the three turnbuckles, and this serves to draw the sections of channel ring (and thus the sections of fairing) together.

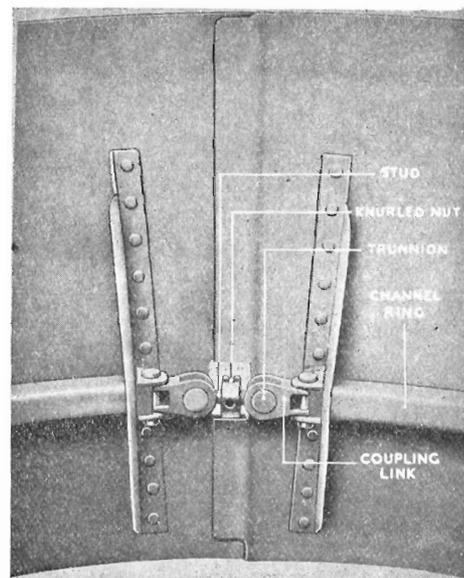


Fig. 2.—Scrap view of inside of fairing showing turnbuckle

BOMB, H.E., AIRCRAFT, M.C., 22,000 lb., Mk. II**Comparison with the Mk. I bomb**

19. The Mk. II bomb is of essentially the same construction as the Mk. I bomb, a different mark number being allocated to indicate that the bomb is of American manufacture. Attention is, therefore, directed to para. 1 to 18, which apply equally to the Mk. II bomb.

Note.—The tail assembly studs supplied with the Mk. II bomb are not interchangeable with the studs provisioned for use with the Mk. I bomb.

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APPENDIX 1

COMPONENTS USED WITH M.C. BOMBS

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APPENDIX 1
COMPONENTS USED WITH M.C. BOMBS

TABLE 2
BOMBS, H.E., AIRCRAFT, M.C., 500 lb., Mk. I, III, IV, and V

| <i>Nose fuzing</i> | | | <i>Tail fuzing</i> | | |
|--------------------------|------------------------------------|--|--|---|--|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 27, Mk. I* or III | No. 43, Mk. I (inst.) | Special, supplied in position | No. 28, Mk. I, III, II*, IIII, or IV | No. 43, Mk. I (inst.) No. 49, Mk. I or IIII (0-025 sec.) No. 47, Mk. I or IIII (0-12 sec.) No. 44, Mk. I, III, or IIII (1 sec.) No. 35, Mk. III, IIII, or V (11 sec.) | Special, supplied in position |
| No. 42, Mk. I or III | No. 52, Mk. I or III (inst.) | | No. 30, Mk. III, IIII, III*, IV, or V | No. 52, Mk. I or III (inst.) No. 51, Mk. I (0-025 sec.) No. 50, Mk. I (0-14 sec.) No. 54, Mk. I (3 sec.) No. 55, Mk. I (11 sec.) | |
| No. 44, Mk. I | No. 52, Mk. III (inst.) | | | | |

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TABLE 3

BOMB, H.E., AIRCRAFT, M.C., 500 lb., Mk. II

| <i>Nose fuuzing</i> | | | <i>Tail fuuzing</i> | | |
|-------------------------|-----------------------------------|--|--|---|--|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 27, Mk. I* or II | No. 43, Mk. I (inst.) | Special, supplied in position | No. 28, Mk. I, II, II*, or III | No. 43, Mk. I (inst.) No. 49, Mk. I or III (0-025 sec.) No. 47, Mk. I or III (0-12 sec.) No. 44, Mk. I, II, or III (1 sec.) No. 35, Mk. II, III, or V (11 sec.) | Special, supplied in position |
| No. 42, Mk. I or II | No. 52, Mk. I or II (inst.) | | No. 30, Mk. II, III, III*, or IV | No. 52, Mk. I or II (inst.) No. 51, Mk. I (0-025 sec.) No. 50, Mk. I (0-14 sec.) No. 54, Mk. I (3 sec.) | |
| No. 44, Mk. I | No. 52, Mk. II (inst.) | | | | |

TABLE 4

BOMB, H.E., AIRCRAFT, M.C., 1,000 lb., Mk. I

| <i>Nose fuuzing</i> | | | <i>Tail fuuzing</i> | | |
|------------------------|-----------------------------------|--|--|---|--|
| <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> | <i>Pistol</i> | <i>Detonator</i> | <i>Exploder</i> |
| No. 42, Mk. I or II | No. 52, Mk. I or II (inst.) | Special, supplied in position | No. 28, Mk. I, II, II*, or III | No. 43, Mk. I (inst.) No. 49, Mk. I or III (0-025 sec.) No. 47, Mk. I or III (0-12 sec.) No. 44, Mk. I, II, or III (1 sec.) No. 35, Mk. II, III, or V (11 sec.) | Special, supplied in position |
| No. 44, Mk. I | No. 52, Mk. II (inst.) | | No. 30, Mk. II, III, III*, or IV | No. 52, Mk. I or II (inst.) No. 51, Mk. I (0-025 sec.) No. 50, Mk. I (0-14 sec.) No. 55, Mk. I (11 sec.) | |

TABLE 5

BOMB, H.E., AIRCRAFT, M.C., 4,000 lb., Mk. I

| <i>Nose fuuzing</i> | | <i>Tail fuuzing</i> | |
|------------------------|------------------------|--|---|
| <i>Pistol</i> | <i>Detonator</i> | <i>Pistol</i> | <i>Detonator</i> |
| No. 42, Mk. I or II | No. 52, Mk. I or II | No. 30, Mk. II, III, III*, or IV | No. 52, Mk. I or II (inst.) No. 51, Mk. I (0-025 sec.) No. 50, Mk. I (0-14 sec.) No. 55, Mk. I (11 sec.) |

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Volume I

Section 11

A.T. BOMBS

*Relevant amendments up to A.L. 72
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A.P.1661B, Vol. I

SECTION 11

A.T. BOMBS

GENERAL CONTENTS LIST

Note.—A detailed contents list appears at the beginning of each chapter.

CHAPTER 1—General notes on A.T. bombs

CHAPTER 2—Bomb, H.E., aircraft, A.T., 9 lb., Mk. I

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A.P.1661B, Vol. I, Sect. 11

CHAPTER 1

General notes on A.T. bombs

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CHAPTER 1

General notes on A.T. bombs

Introduction

1. Only one type of A.T. bomb is at present in general use in the Service, namely, the 9 lb. A.T. bomb. This bomb, which is for use against tanks and armoured fighting vehicles, has a very thin case, giving a charge/weight ratio of approx. 80 per cent. It is fuzed at the tail only.

Precautions to be observed when fuzing or unfuzing bombs

2. Attention is directed to the precautions detailed in Sect. 1, Chap. 1, which apply also to A.T. bombs. The arming tape on the fuze is to be kept dry so as to prevent freezing and consequent failure to arm the fuze when the bomb is dropped.

Repair and examination

3. Only such repair and examination of bombs as is detailed in Sect. 20, Chap. 1, is to be done by armament personnel. Any bomb found having major damage or defects is to be set aside for A.I.D. inspection.

4. Bombs held in store are to be examined for exudation of the filling every six months at home Stations, and every three months at Stations overseas. Exudation is to be dealt with as described in Sect. 20, Chap. 1.

5. Fuzed bombs, whether loaded on to aircraft, or stored in the fuzed bomb area, must be examined at the intervals stated in Sect. 20, Chap. 2.

Supply

6. A.T. bombs are supplied in boxes, together with the necessary retarder plates and safety tubes.

Storage

7. The regulations governing the storage of A.T. bombs are given in A.P.1245, Chap. 3.

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CHAPTER 2

BOMB, H.E., AIRCRAFT, A.T., 9 lb., Mk. I

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Fig. 1. Bomb, H.E., aircraft, A.T., 9 lb., Mk. I, with fuze, retarder plate, and safety tube in position

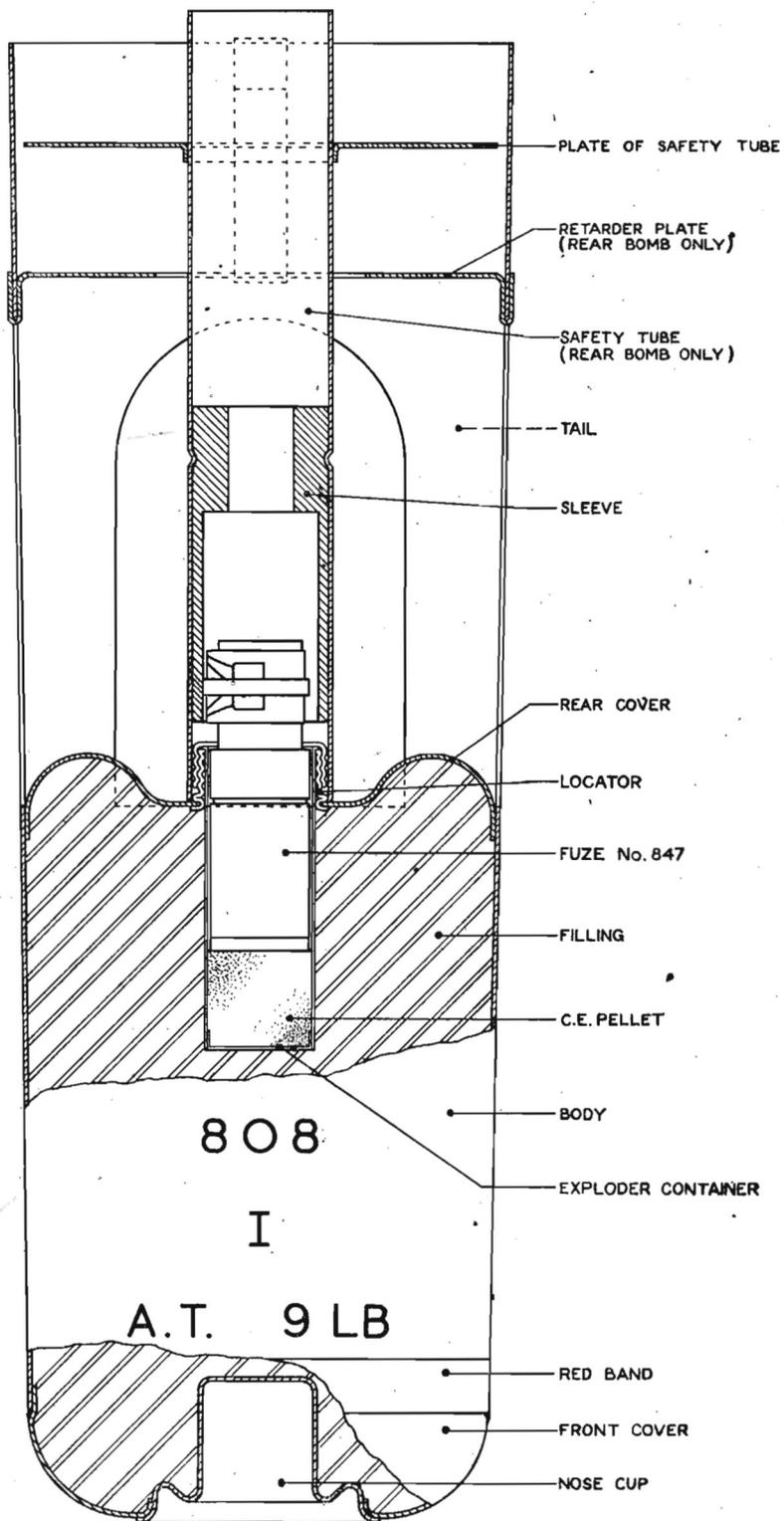


Fig. 1.—Bomb, H.E., aircraft, A.T., 9 lb., Mk. I, with fuze, retarder plate and safety tube in position

CHAPTER 2

BOMB, H.E., AIRCRAFT, A.T., 9 lb., Mk. I

Leading particulars.

| | |
|----------------------------|---------------------------|
| 1. Stores Ref. | 12A/882 |
| Overall length ... | 1 ft. 2 in. approx. |
| Weight of bomb, empty ... | 1½ lb. approx. |
| Weight of bomb, filled ... | 8½ lb. approx. |
| Filling ... | Nobel's explosive No. 808 |

Introduction

- Attention is directed to Sect. 11, Chap. 1.
- The bomb, H.E., aircraft, A.T., 9 lb., Mk. I, is designed for use against tanks and armoured vehicles. It is tail fuze only with a No. 847 fuze, and the minimum height of release to ensure functioning is 250 ft., although the bomb may function when dropped from as low as 90 ft. without causing damage to the attacking aeroplane.
- One 250 lb. Small Bomb Container load of 24 bombs, when dropped from a height of 250 ft. at 190 m.p.h., will cover an area of approximately 60 yds. in range by 30 yds. in line. The bombs are dropped in pairs, the nose of the rear bomb being housed in the tail of the front bomb.
- The bomb will blow a hole approximately nine inches in diameter in armour plating 2 in. thick, and is effective at angles of striking up to 45 deg.

General description, fig. 1

- The bomb is approximately rectangular in shape and has a square cross-section with rounded corners; it tapers slightly from the rear towards the nose.
- The body is made of thin sheet metal, and the tail is formed integral with it. It is closed at the nose end by a front cover which houses a nose cup which is taped and cemented in. The nose cup of the rear bomb forms the safety device for the fuze in the front bomb of a pair. The tail portion of the body has a hand clearance hole in each face.
- Approximately half-way along the inside of the bomb is attached a rear cover, the space between the front and rear covers forming the charge case of the bomb.
- Attached at the centre of the rear cover is a locator which locates the rear end of an exploder container. The locator is pressed into the form of a screw-thread on to which is screwed a cap which retains the exploder container in position. The exploder container houses the No. 847 fuze when the bomb is fuze.
- The rear bomb of a pair is fitted with a plate, retarder (Stores Ref. 12A/885) and a tube, safety (Stores Ref. 12A/886). The retarder plate, which is a square flat plate, has two small securing strips at opposite corners integral with the plate; these two strips clip on to the rear edges of two of the hand clearance holes in the tail portion of the body. Attached to the other two corners of the retarder plate are two long securing strips which are clipped over the edge of the tail when the retarder plate is assembled to the bomb. A hole at the centre of the retarder plate allows of the fitting of the safety tube.
- The safety tube is a light-gauge metal tube, having secured on its inside a cardboard sleeve, which when the bomb is fuze, fits over the head of the No. 847 fuze. Towards the rear end of the safety tube is fitted a plate which locates the tube in the tail of the bomb. The front end of the tube fits loosely over the locator. The safety tube forms the safety device for the fuze of the rear bomb of a pair.

Filling

- The charge case of the bomb is filled with Nobel's explosive No. 808, and a C.E. pellet is housed in the bottom of the exploder container.

Identification colouring and markings

Colouring

- The bomb is painted dark green, and when filled, has a ½ in. red band painted round the nose.

Markings

14. On one face of the bomb is stencilled, in black, the following information:—
- (i) 808, denoting the nature of the filling.
 - (ii) I, A.T., 9 lb., denoting the mark number and the type of bomb.
 - (iii) A code denoting the body manufacturer and the date of manufacture.
15. On the same face is stencilled, in white, the following:—
- (i) The filling contractor's initials or recognized trade mark.
 - (ii) The date of filling, month and year.

Instructions for fuzing

17. Unpack the bombs from their packages, and remove the retarder plate and safety tube from the rear bomb of each pair. The retarder plate is not secured to the rear bomb.

18. Remove the cap from the locator in each bomb, and insert a fuze No. 847 in the exploder container of each bomb. Secure the fuze firmly in position by screwing the fuze cap on to the locator.

Note.—If the fuze cannot be secured firmly in position, it is to be removed and tried in another bomb.

19. Fit a retarder plate in the tail of each rear bomb. The two long securing strips must pass up the inside of the tail, and lie flat on the inside face of the tail.

Note.—The bombs fitted with retarder plates will constitute the rear bombs.

20. Remove the elastic bands, which hold the safety tapes of the No. 847 fuzes, and unwind the safety tapes about one turn. Place the pair of bombs together so that the nose cup of the rear bomb fits over the head of the fuze of the front bomb.

21. Fit a safety tube over the fuze of the rear bomb with the plate of the safety tube toward the rear.

22. Check that the bombs can fall freely apart, and that the safety tube is a loose fit in the rear bomb.

Loading the bombs into the 250 lb. Small Bomb Container

23. Twenty-four bombs are loaded nose forward in the 250 lb. Small Bomb Container, as described in A.P. 1664, Vol. I, Chap. 3. When the bombs have been loaded into the container, an examination is to be made to ensure that the drop bars and expendable platforms have not distorted the tails of the bombs.

Precautions

24. If the safety tape and pin of the fuze are accidentally removed whilst fuzing or loading the bomb, the bomb is "live" and must be treated with great care. The safety pin must be immediately inserted in the fuze and the tape re-wound.

25. If the safety tape is allowed to become damp, there is a possibility of it becoming frozen and failing to unwind when the bomb is dropped. It is therefore extremely important that the fuze be kept dry during the fuzing and loading of the bomb. It is preferable that fuzed bombs should not be kept in fuzed bomb areas overnight, owing to the likelihood of the fuzes becoming damp.

26. Care must be taken not to damage the bomb tails, or the pairs of bombs may fail to separate. If a tail is bent and it cannot be straightened at the Unit, the bomb is not to be used.

Functioning

27. When the bombs are released from the container, the safety tube of the rear bomb of each pair is removed by the air stream, and, owing to the action of the retarder plate in the rear bomb, the two bombs separate.

28. The safety tape of the fuze unwinds in the air stream and withdraws the safety pin from the fuze.

29. On impact of the bomb with the target, the bomb body collapses and allows the explosive to spread over the surface of the target. At the same time the fuze functions, initiates the C.E. pellet, and detonates the filling in close contact with the target.

A.P.1661B, Vol. I, Sect. 11, Chap. 2

Unloading unexpended bombs from the 250 lb. Small Bomb Container

30. Unload the bombs from the 250 lb. Small Bomb Container as described in A.P.1664, Vol. I, Chap. 3.

Unfuzing

31. Separate the bombs, and remove the fuze from the front bomb. Replace the cap on the locator.

32. Remove the retarder plate and the safety tube from the rear bomb, and remove the fuze. Replace the cap on the locator.

33. Pack the bombs, retarder plates, and safety tubes in their boxes.

34. Rewind the safety tape on to each fuze and secure it in position with the elastic band.

Inspection

35. Bombs, H.E., aircraft, A.T., 9 lb., Mk. I, are to be inspected for signs of exudation of the filling every six months at home Stations, and every three months at Stations overseas, particular attention being paid to the nose cup. Exudation of the filling is to be dealt with as stated in Sect. 20, Chap. 1.

Supply

36. Eight bombs, four retarder plates, and four safety tubes, are packed in Box, B.373, Mk. I (Stores Ref. 12A/887).

37. The drop bars and expendable platforms for loading the bombs into the 250 lb. Small Bomb Container are packed separately in expendable cardboard boxes. Four drop bars and four expendable platforms are packed in each box.

Storage

38. The boxed bombs are classified for storage purposes in Group VII.

AIR PUBLICATION 1661B
Volume I

Section 16

MISCELLANEOUS BOMBS

A.P.1661B, Vol. I

SECTION 16

MISCELLANEOUS BOMBS, GRENADES, ETC.

GENERAL CONTENTS LIST

Note.—A detailed contents list appears at the beginning of each chapter.

CHAPTER 1—General notes on miscellaneous bombs, ~~grenades, etc.~~ (to be issued later) A.L.4

CHAPTER 2—Bomb, H.E., aircraft, 20 lb., Mk. I (~~to be issued later~~) A.L.12

CHAPTER 3—Bomb, H.E., aircraft, I.T., 6 lb., Mk. I (A.L.72)

CHAPTER 4—Bombs, aircraft, nickle, No. 2, Mk. I and II (A.L.97)

CHAPTER 5 BOMBS AIRCRAFT NICKLE NO 1 MK I

APPENDIX 1—Components used with miscellaneous bombs,

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CHAPTER 2

BOMB, H.E., AIRCRAFT, 20 lb., Mk. I

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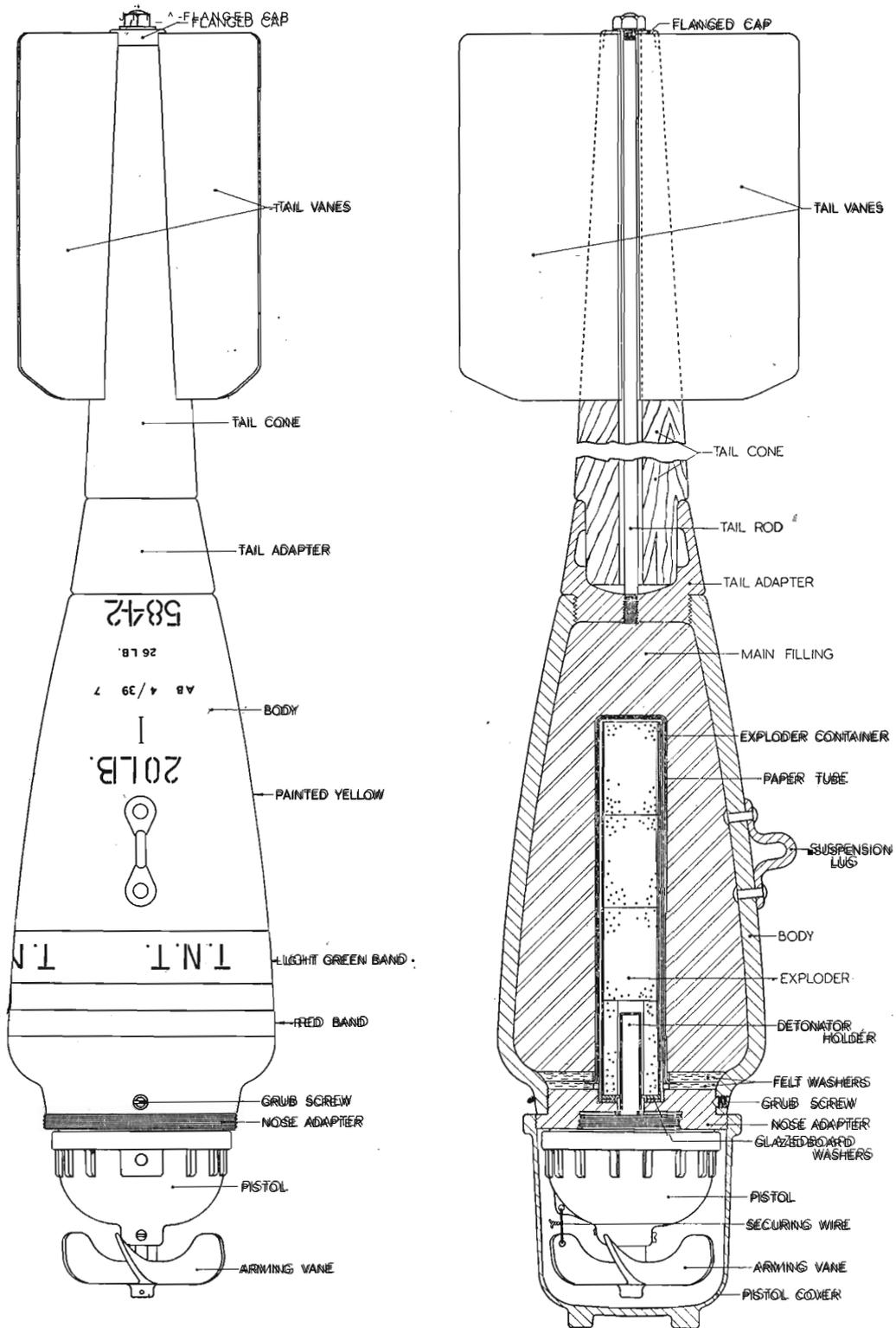


Fig. 1.—Bomb, H.E., aircraft, 20 lb., Mk I

CHAPTER 2

BOMB, H.E., AIRCRAFT, 20 lb., Mk. I

Introduction

1. The 20 lb. H.E. bomb, which is intended for attacking personnel, aerodromes, and road transport, is exploded for fuzing at the nose only, and is issued assembled with tail and pistol, bomb, D.A., No. 16, Mk. I (Stores Ref. 12G/37), the pistol being protected by a cover.

Leading particulars

| | |
|--|----------------------|
| 2. Stores Ref. ... | 12A/1 |
| Overall length (pistol cover in position) ... | 2 ft. 1 in., approx. |
| Maximum diameter ... | 5.175 in. |
| Weight of empty bomb (pistol and cover in position)... | 21 lb. 8 oz. |
| Weight and nature of filling ... | 5 lb. 4 oz., T.N.T. |
| Terminal velocity ... | 855 ft. per sec. |

GENERAL DESCRIPTION

3. The bomb, see fig. 1, consists of the following main parts:—a steel, semi-steel, or malleable iron body; a cast iron nose adapter which supports a detonator holder and an exploder container, and also carries the No. 16 pistol and its cover; a cast iron tail adapter which screws into the rear end of the bomb body and carries a tail rod; and a wooden tail cone with four sheet metal tail vanes.

Bomb body

4. The bomb body is hollow and open at both ends, the forward end being internally threaded to receive the nose adapter, and the rear end being internally threaded to take the tail adapter. The nose adapter is secured against removal by a grub screw, and the tail adapter is locked against unscrewing, by stabbing, at its joint with the rear end of the bomb body. A wrought iron or mild steel suspension lug is riveted to the bomb body.

5. The nose adapter is in the form of a flanged plug which is bored through axially and counterbored from both sides, the bore and counterbores being threaded. The detonator holder is screwed into the bore from the rear side, the exploder container is screwed into the counterbore on the rear side so as to enclose the detonator holder, and a threaded spigot on the base of the No. 16 pistol is screwed into the counterbore on the forward side.

6. The spigot portion of the nose adapter is threaded and is screwed into the nose end of the bomb body, on which the flange seats; the flange being externally threaded to receive the screw-on pistol cover.

7. The tail adapter, the spigot of which screws into the rear end of the bomb body, has its rear portion tapered so as to conform to and constitute a rearward extension of the streamlined bomb body. It is bored through axially and counterbored from the rear, the bore being threaded to receive the tail rod, which is threaded at both ends, and the counterbore serving as a bearing socket for the wooden tail cone.

Filling

8. The main filling consists of T.N.T., and is sealed at the nose end by two waxed felt washers. A waxed paper tube surrounds the exploder container, and its forward serrated end is pressed outwardly and seated between the waxed felt washers, whilst these are warm and plastic, so as to ensure an efficient seal at this end.

9. An exploder, consisting of three solid C.E. pellets, and one perforated C.E. pellet, covered by glazedboard washers, is housed in the exploder container and held in position by the nose adapter.

Tail

10. The wooden tail cone conforms to the streamlined shape of the bomb body and tail adapter, and is bored through axially to accommodate the tail rod and the roots of the tail vanes. It has, at its forward end, a cylindrical spigot which fits in the socket in the tail adapter, and two diametrical saw-cuts at right angles extend from the rear end, over a slightly greater length than that of the tail vanes, to accommodate the four sheet metal tail vanes which are made in integral pairs.

11. A flanged cap, with four slots in the flange to receive the rear edges of the tail vanes, fits on the rear end of the wooden tail cone, and the tail assembly as a whole is held in position by a washer and a nut screwed on to the threaded rear end of the tail rod.

12. The tail assembly is so positioned that the tail vanes are all at 45 deg. to the plane of the suspension lug on the bomb body.

Cover, pistol, bomb, D.A., No. 16, Mk. I

13. The cover, pistol, bomb, D.A., No. 16, Mk. I (Stores Ref. 12A/71), which is screwed on to the nose adapter so as to enclose the No. 16 pistol and protect it during transit, is in the form of a cup which is internally threaded at the rim and has two diametrically opposed bosses on its base to facilitate screwing up and unscrewing.

Identification colouring and markings

Colouring

14. The bomb body, pistol cover, tail adapter, and tail vanes are painted yellow. A red band, $\frac{1}{2}$ in. wide, is painted round the bomb body $1\frac{1}{2}$ in. from the nose end; and a light green band, $1\frac{1}{2}$ in. wide, $2\frac{1}{2}$ in. from the nose end.

Markings

15. The letters T.N.T. are stencilled, in black, in three places equally spaced around the green band.

16. To the rear of the suspension lug are stencilled, in black, the following particulars:—

- (i) 20 lb., 1.
- (ii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iii) The date of filling, month and year.
- (iv) The lot number of the filling.
- (v) The actual weight of the filled bomb.
- (vi) The design number of the method of filling.

17. Stamped on the bomb body are the following particulars:—

- (i) 20 lb.
- (ii) The manufacturer's initials or recognized trade mark.
- (iii) $\frac{1}{2}$.
- (iv) The date of manufacture, month and year.

18. The pistol cover has the following markings stamped on it:—

- (i) $\frac{1}{2}$.
- (ii) The manufacturer's initials or recognized trade mark.

Functioning

19. When the bomb is released from the bomb carrier, the arming vane is rotated by the air stream so as to arm the pistol after a predetermined number of revolutions, depending upon the original pistol setting.

20. On impact with the target, the arming vane, with its spindle and gear pinion, is forced inwards so as to break the shear wire, overcome the creep spring, and cause the striker to fire the detonator. The detonator then fires the exploder which, in turn, detonates the main filling.

INSTRUCTIONS FOR USE

Fuzing the bomb

21. Remove the pistol cover by unscrewing it from the nose adapter, and then remove the pistol by unscrewing it from the nose adapter.

22. Remove the securing wire which connects the arming vane of the pistol to the pistol body, test the arming vane for freedom of movement, and set the pistol with the number "25" visible through the central hole in the base, as described in A.P.13661C, Vol. I, Sect. 1, Chapter 4. Replace the securing wire so as to lock the arming vane against rotation.

A.P.1661B, Vol. I, Sect. 16, Chap. 2

23. Clean the detonator holder with a clean dry cloth, and insert a detonator, 20 lb., aircraft bomb, Mk. II or III in the detonator holder.

Note.—If there is any deposit of white or coloured salts or crystals in or about the detonator holder, the bomb is unserviceable and must be set aside for A.I.D. inspection.

24. Replace the pistol, screwing it tightly home on to the nose adapter.

Loading the bomb on the aircraft bomb carrier

25. The bomb is loaded on the Light Series bomb carrier as described in the relevant chapter of A.P.1664, Vol. I, the No. 1 or 1A attachment being fitted and adjusted, with extension out, to hold the arming vane stationary before the vane securing wire is finally removed.

Unloading the bomb from the aircraft bomb carrier

26. Replace the securing wire so as to lock the arming vane against rotation, and then unload the bomb as described in the relevant chapter of A.P.1664, Vol. I.

Unfuzing the bomb

27. Remove the pistol by unscrewing it from the nose adapter, remove the detonator from the detonator holder, and replace the pistol and its cover.

SUPPLY AND STORAGE**Supply**

28. The bomb is supplied with the pistol, D.A., No. 16, Mk. I in the nose, and cover, pistol, bomb, D.A., No. 16, Mk. I in position. It is packed in Box, B.200, Mk. I or Box, B.8, Mk. II.

Storage

29. The bomb is classified, for storage purposes, in Group VII.

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CHAPTER 3

BOMB, H.E., AIRCRAFT, I.T., 6 lb., Mk. I

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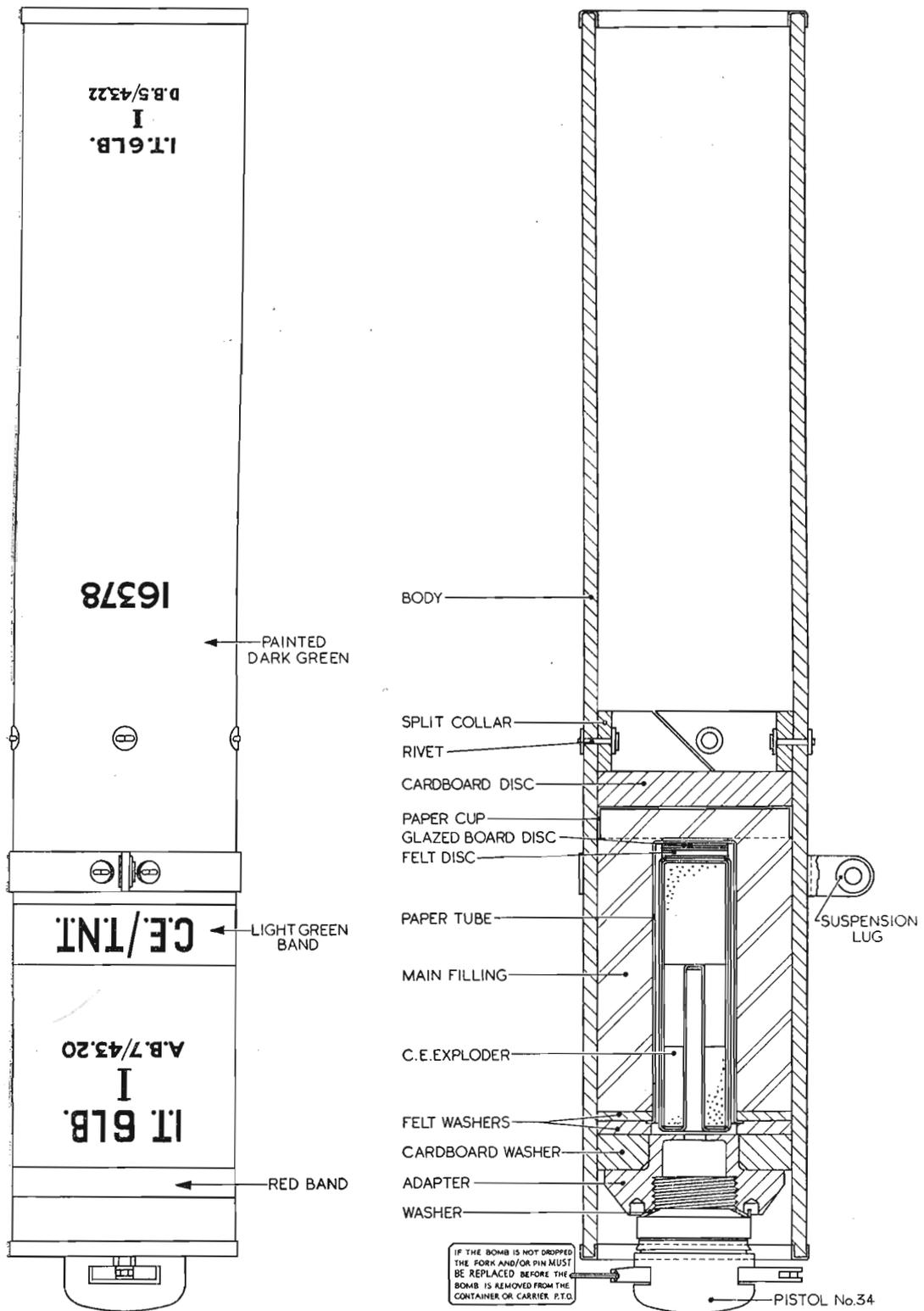


Fig. 1.—Bomb, H.E., aircraft, I.T., 6 lb., Mk I

CHAPTER 3

BOMB, H.E., AIRCRAFT, I.T., 6 lb., Mk. I

Introduction

1. This bomb is used to provide realistic bombing attacks on infantry undergoing training. On impact, the effect as regards noise and flash is comparable with that produced by medium sized bombs used for dive bombing operations. The bomb, however, is splinterless.

2. The bomb is fuzeed at the nose only with a No. 34 pistol and No. 43 detonator (Stores Ref. 12G/346). It is issued exploded and with the pistol in position, the pistol serving as a nose plug during transit and storage.

3. The bomb is intended for carriage on the Light Series bomb carrier.

Leading particulars

| | |
|-----------------------------------|---|
| 4. Stores Ref..... | 12A/1169 |
| Length, with pistol | 21 $\frac{1}{2}$ in., approx. |
| Diameter | 3.88 in. |
| Weight and nature of filling..... | 2 lb. C.E./T.N.T. 30/70, or 2 lb. pentolite, desensitised, Grade I |

GENERAL DESCRIPTION

Bomb body, fig. 1

5. The bomb body consists of a rolled paper cylinder of uniform diameter and is shellacked internally and externally. At the nose end, an adapter is attached to a chamfered cardboard washer and is threaded internally to receive the pistol. The exploder is contained in a paper tube which is held in position at the nose end by two felt washers. The main filling is held in the body between the paper cup, which is shellacked to the body in order to provide a seal, and the two felt washers which position the exploder. The shellacked cup is supported by a cardboard washer, which is in turn supported by a split collar secured to the body by four rivets.

6. A suspension lug is provided on the bomb body.

Filling

7. The filling consists of C.E./T.N.T. or desensitised pentolite, Grade I.

8. The 4 oz. 6 dr. C.E. exploder is contained in the paper tube and rests on a felt disc, which rests on a glazed board disc. There are three exploder pellets, two of which are perforated to form a detonator cavity.

Identification colouring and markings*Colouring*

9. The bomb body is painted dark green. A red band, $\frac{1}{2}$ in. in width, is painted round the bomb body 1 in. from the nose end. A light green band, 1 in. wide and 4 in. from the nose end bears in two places, equi-spaced around the body, the marking C.E./T.N.T. or PEN./D.I., as applicable.

Markings

10. Stencilled between the red and light green bands are the following particulars:—

- (i) I.T. 6 lb. I, indicating the type of bomb, weight, and mark number.
- (ii) The monogram of the filling station, or the initials or recognized trade mark of the filling contractor.
- (iii) The date of filling, month and year.
- (iv) The lot number of the filling.

11. The design number of the method of filling is stencilled approximately 4.0 in. behind the suspension lug.

12. At the tail end of the bomb body are the body manufacturer's markings in stencil, as follows:—

- (i) I.T. 6 lb. I.
- (ii) Manufacturer's initials or recognized trade mark.
- (iii) The date of manufacture, month and year.
- (iv) The lot number.

Functioning

13. When the bomb is released from the carrier, the safety cap of the pistol is immediately removed by the action of the safety cap spring. On impact, the pistol fires the detonator, the detonator fires the exploder, and the exploder detonates the main filling.

INSTRUCTIONS FOR USE

Fuzing the bomb

14. Unscrew and remove the pistol by hand. Ensure that the detonator cavity is clear using a gauge, cavity, detonator, No. 2, Mk. I (Stores Ref. 12A/349); the line for the 20 lb. and 40 lb. bombs is applicable. Bombs which fail to pass this test must be set aside for A.I.D. inspection.

15. Insert a No. 43 detonator which must be used with this bomb. *Force must not be used when inserting the detonator.*

16. Screw in the pistol by hand until it is well seated on its washer and locked in position. *Undue force must not be used when screwing the pistol home.*

Loading the bomb on to the Light Series bomb carrier

17. Load the bomb on to the Light Series bomb carrier as described in A.P.1664, Vol. I, Chap. 2, for the 20 lb. F. bomb. The No. 1A attachment must be used to retain the safety cap in position.

Note.—Front and rear crutch adapters must be fitted to the Light Series carrier as described in leaflet A.P.1243/G.411. Crutch extensions, if not already incorporated as in the newer types of carrier, must be fitted as described in leaflet A.P.1664/B.9—W.

18. After the bomb is securely in position on the carrier, remove the safety pin and safety fork. Hand these to the pilot or bomb aimer.

Unloading the bomb from the Light Series bomb carrier

19. Before unloading an unexpended bomb, replace the safety fork and then the safety pin of the No. 34 pistol. Unload the bomb from the carrier as described in A.P.1664, Vol. I, Chap. 2.

Unfuzing the bomb

20. If it is necessary to unfuze the bomb, ensure that the bomb has been rendered safe as described in para. 19. Remove the pistol by hand and extract the detonator using extractor, detonator, No. 2, Mk. I (Stores Ref. 12A/348). Replace the pistol by hand.

SUPPLY AND STORAGE

Supply

21. Four bombs, H.E., aircraft, I.T., 6 lb., Mk. I (Stores Ref. 12A/1169) are supplied in Box B.271A (Stores Ref. 12A/1250).

Storage

22. The bomb is classified, for the purpose of storage, in Group 7, Cat. Z, see A.P.2608A, Chap. 7.

This leaf issued with A.T. No. 97
October, 1944

A.P.1661B, Vol. I, Sect. 16

CHAPTER 4

BOMBS, AIRCRAFT, NICKLE, No. 2, Mk. I and II

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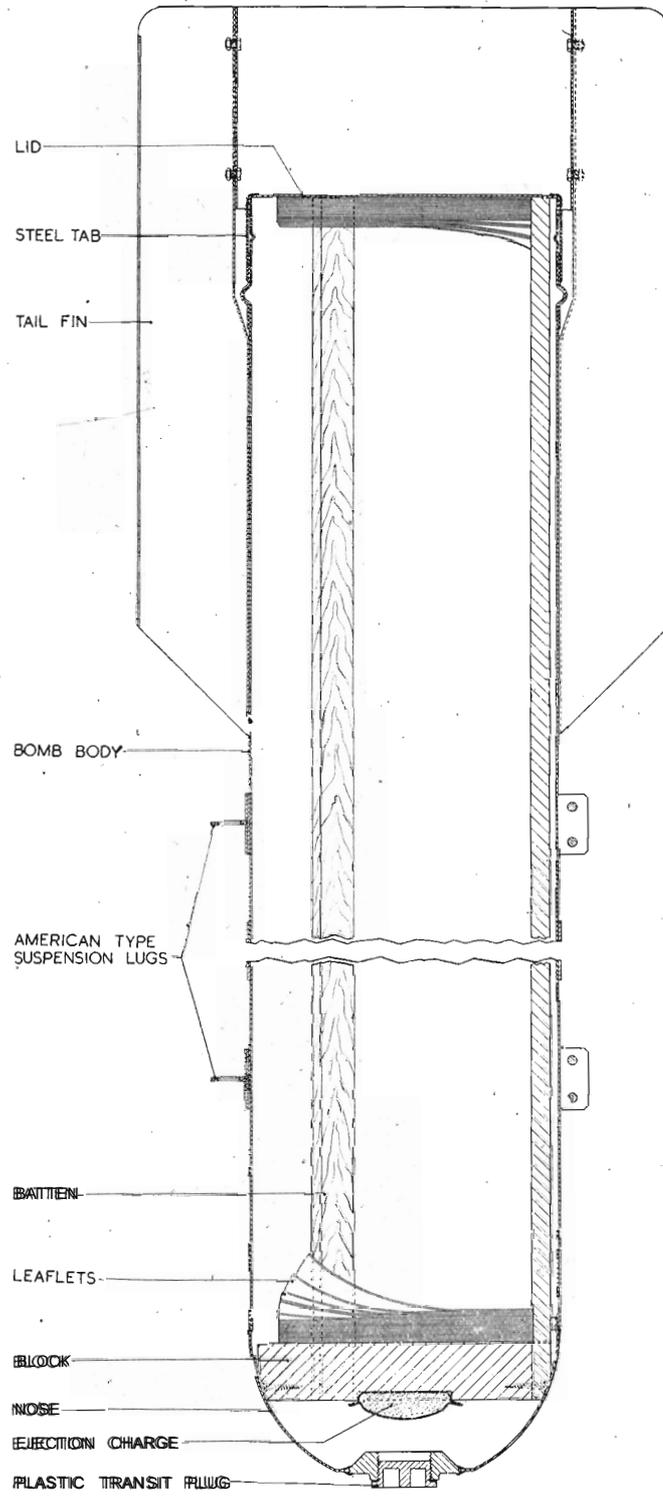


Fig. 1.—Section through the Mk. I bomb

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CHAPTER 4

BOMBS, AIRCRAFT, NICKLE, No. 2, Mk. I and II

Introduction

1. These bombs consist primarily of American M.26 flare bodies filled with leaflets. They are similar in construction but the Mk. I bomb is for carriage only in aircraft having American type bomb stowage, and the Mk. II bomb is for carriage only in aircraft using the Universal type bomb carrier. The Mk. I bomb is fitted only with two American type suspension lugs to permit it to be attached to a B.7 shackle, but the Mk. II bomb is fitted with the two American type suspension lugs and with a British type suspension lug. The Mk. II bomb as supplied, cannot be fitted to a

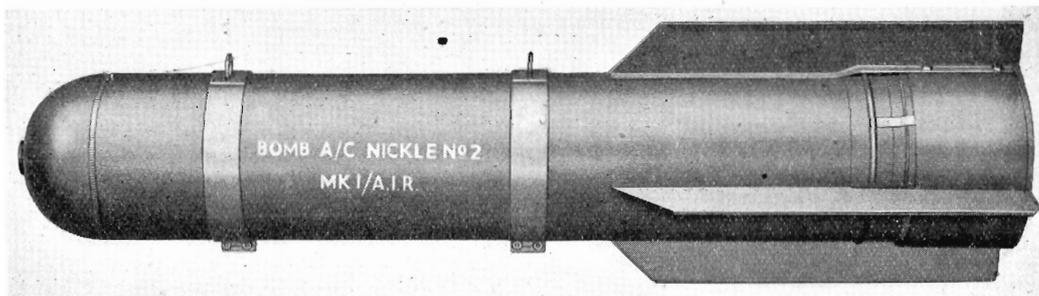


Fig. 2.—No. 2, Mk. I nickle bomb

B.7 shackle because the American type lugs are not in the correct positions to permit this. In the Mk. II bomb the American type suspension bands, carrying the lugs, are so positioned that when the bomb is fitted to a British type bomb carrier they are beneath the carrier crutching forks and so act as strengthening bands. This is necessary because the bomb body is made of very thin gauge steel and will dent very easily.

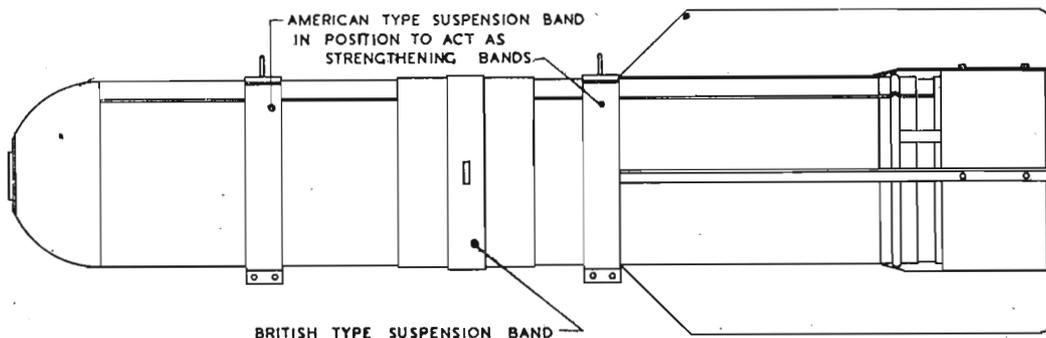


Fig. 3.—No. 2, Mk. II nickle bomb

2. The purpose of these bombs is to spread leaflets so that as many persons as possible may obtain a copy and to make it difficult for the enemy authorities to collect and destroy the leaflets. Because of the thinness of the bomb body great care must be exercised when handling the bomb, and if it is a Mk. III bomb, when crutching down, to avoid denting the bomb body. Should the body be seriously dented the dents may interfere with the correct ejection of the leaflets and so render ineffective the purpose of the bomb.

3. Some of the bombs will be supplied to Units filled with leaflets, others will be supplied empty and will require to be filled during their preparation for use. First issues of the bombs will not have ejection changes fitted. In such instances the ejection changes will be supplied separately and will be fitted during the preparation of the bomb.

4. Each of the bombs is to be fuze with a No. 860, Mk. II fuze, setting A, (Stores Ref. 12G/801). When fuzeing a bomb, an adapter, fuze, aircraft flare, No. 1, Mk. I (Stores Ref. 12G/675) is required because the fuze cannot be screwed directly into the nose of the bomb due to the bomb body being an American store and designed to take a fuze smaller than the British fuze which is to be used.

Landing particulars

| | | | | | |
|---|-----|-----|-----|-----|--------------------------|
| 5. Stores Ref., Mk. I bomb | ... | ... | ... | ... | 12D/966 |
| Stores Ref., Mk. II bomb | ... | ... | ... | ... | 12D/967 |
| Length overall, unfuzed | ... | ... | ... | ... | 47 in., approx. |
| Maximum diameter, excluding suspension lugs | ... | ... | ... | ... | 8 in., approx. |
| Weight, filled | ... | ... | ... | ... | 64 lb., approx. |
| Terminal velocity | ... | ... | ... | ... | 600 ft. per sec., approx |

GENERAL DESCRIPTION

Bomb, Mk. I or II, fig. 1 to 3

6. Apart from the differences mentioned in para. 11, the bombs are similar and the following description applies to both bombs.

7. The nose of the bomb body is closed by a plastic transit plug and the tail end is closed by a lid. When the bomb is filled, ready for use, this lid is held in position by four soft steel tabs which are secured at one end to the bomb body and have their free ends bent over against the lid. These tabs are not bent over if the bomb is supplied empty, but in such circumstances they are to be bent over after the bomb has been filled. Undue bending and straightening of the tabs is to be avoided or they may snap off. Four tail fins are secured to the tail end of the bomb body.

8. Inside the bomb body is a wooden frame consisting of a block which fits snugly into the nose of the bomb body but does not fill it, and three equi-spaced battens each of which is secured at one end to the block. These battens extend the full length of the bomb body between the block and the lid. The leaflets are contained in the wooden frame between the battens.

9. The outer end of the block is recessed to locate an ejection charge consisting of 400 grains of G.12 gunpowder in a muslim bag. In later issues of the bombs this charge will be supplied secured in position but in first issues the charge is to be secured, during preparation of the bomb, as described in para. 15.

Identification colouring and markings

10. The bomb is painted grey all over and on its side, stencilled in white letters, is the following information:—

- (i) The full nomenclature of the bomb.
- (ii) The date of filling, month and year (when the ejection charge is supplied fitted).
- (iii) The initials or recognized trade mark of the manufacturer.
- (iv) The filled lot number (when the ejection charge is supplied fitted).

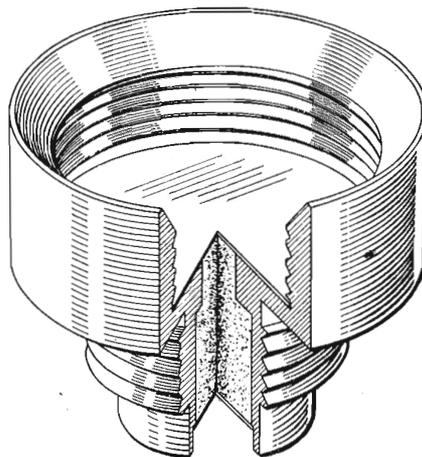


Fig. 4.—Part section through the No. 1, Mk. I adapter

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October, 1944*

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Adapter, fuze, aircraft flare, No. 1, Mk. I, fig. 4

11. This adapter is made of brass and at one end has external threads to permit it to be screwed into the nose of the bomb. At its other end it has internal threads to receive the No. 860, Mk. II fuze. A central hole through the adapter houses a quantity of gunpowder and the hole is sealed at each end by a waterproof seal.

Identification colouring and markings

12. The adapter is natural unpainted brass and stamped on it is the following information:—
- (i) The number and mark of the adapter.
 - (ii) The date of filling, month and year.
 - (iii) The initials or recognized trade mark of the filling contractor.
 - (iv) The filled lot number.

FUNCTIONING

13. When the fuzed bomb is released "live" from an aircraft it falls freely until the fuze functions and the magazine charge of the fuze ignites the gunpowder in the No. 1 adapter. The flash from the gunpowder fires the ejection charge and the gases formed by the burning of the ejection charge force the wooden frame containing the leaflets towards the tail end of the bomb body, thus forcing off the lid so that the frame is ejected from the bomb body. After being ejected, the wooden frame falls end over end and the leaflets fall out of the frame to become scattered over the target.

INSTRUCTIONS FOR USE

Filling the bomb

14. In all instances when filling the bomb the wooden frame must be removed from the bomb body either to check that the ejection charge is secured to the wooden block or to secure it in position if it has been supplied separately from the bomb body. If desired the leaflets can be packed into the frame while it is removed from the bomb body, but if this is done and the leaflets are not neatly packed, it may be difficult to return the filled frame into the bomb body. It is, therefore, recommended that the procedure stated in para. 15 be adopted when filling the bomb. This procedure includes instructions for securing the ejection charge in position in the wooden frame but if the bomb to be filled should be supplied ready fitted with an ejection charge it will only be necessary to check that the charge is, in fact, in position and then to proceed with the filling as stated in para. 15.

15. To fill the bomb, proceed as follows:—
- (i) Remove the lid from the tail end of the bomb body.
 - (ii) Remove the wooden frame from the bomb body.
 - (iii) If an ejection charge is not secured to the block of the wooden frame, secure a charge, ejection, aircraft bomb, No. 3, Mk. I (Stores Ref. 12G/1118) in the recess in the block. Preferably, shellac adhesive should be used for this purpose, but if this is not available adhesive tape may be used.
 - (iv) Carefully insert the frame, block first, into the bomb body. To facilitate packing the leaflets into the frame, it may be found desirable only to insert the frame into the bomb body for about half its length until the frame is about one-half filled with leaflets.
 - (v) Pack the leaflets into the wooden frame, stacking them between the wooden battens.
 - (vi) When the leaflets have been inserted into the frame, ensure that the frame is pushed completely home into the bomb body and then fit the lid over the tail end of the bomb body.
 - (vii) Ensure that the lid is properly seated against the end of the bomb body and then bend down each of the upstanding tabs so that they engage the lid and hold it securely in position.

Fuzing the bomb

16. The bomb is to be fuzed while lying on its side in a fuzing shed. Proceed as follows:—
- (i) Remove the plastic nose transit plug from the bomb.
 - (ii) Screw an adapter, fuze, aircraft flare, No. 1, Mk. I (Stores Ref. 12G/675), by hand, firmly into the nose of the bomb.
 - (iii) Screw a No. 860, Mk. II fuze, "A" setting, by hand, firmly into the No. 1 adapter. Grip the fuze round the fuze body, *not round its thin outer cover*.

- (iv) If necessary, carefully move the fuzeing clip on the shear wire of the fuze along the shear wire until it is approximately aligned with the appropriate suspension lug or lugs on the bomb.
- (v) Clearly chalk the letters "F.D." on the bomb near the nose.

Loading into aircraft

Mk. I bomb

17. The B.7 shackle is to be fitted to the bomb and the bomb then loaded into the aircraft in the normal manner. When this has been done, connect the hook of a link, fuze-setting control, flexible, short (Stores Ref. 11A/2570) to the fuzeing clip on the fuze and connect the hook of a link, fuze-setting control, flexible, fixed length (Stores Ref. 11A/683) to the loop of the short fuzeing link and to the lug on the arming vane cover of the fuze. Connect additional fuzeing links end to end, as necessary, to the long fuzeing link to permit proper connection to be made to the E.M. fuzeing unit.

18. Just before the aircraft takes off, remove the white tape from around the fuze to uncover the vent holes in the outer cover of the fuze.

Mk. II bomb

19. The Universal type bomb carrier is to be fitted to the bomb in the normal manner, but care must be taken when crutching down to avoid applying undue pressure such as to dent the thin body of the bomb.

20. Load the bomb into the aircraft in the normal manner and then connect the hook of a link, fuze-setting control, flexible, short (Stores Ref. 11A/2570) to the fuzeing clip on the fuze and connect the hook of a link, fuze-setting control, flexible, fixed length (Stores Ref. 11A/683) to the loop of the short fuzeing link and to the lug on the arming vane cover of the fuze. Insert the loop of the long fuzeing link into the E.M. fuzeing unit of the bomb carrier.

21. Just before the aircraft takes off, remove the white tape from the fuze to uncover the vent holes in the outer cover of the fuze.

Unloading and unfuzeing the bomb

22. If the bomb is to be unloaded from the aircraft, ensure that the aircraft fuze-setting switches are set at SAFE, then disconnect the fuze-setting control link from the E.M. fuzeing unit. Unload the bomb in the normal manner, remove the fuzeing links from the fuze, and remove the bomb carrier or the B.7 shackle from the bomb.

23. Convey the fuzeed bomb to a fuzeing shed and proceed as follows:—

- (i) Unscrew and remove the fuze, by hand, from the No. 1 adapter. Grip the fuze round the fuze body, *not round its thin outer cover*.
- (ii) Unscrew and remove the No. 1 adapter, by hand, from the nose of the bomb.
- (iii) Screw a plastic nose transit plug firmly into the nose of the bomb.
- (iv) Delete the letters "F.D." from the bomb.
- (v) Secure a piece of adhesive tape, white if available, round the fuze to cover the vent holes in the outer cover.
- (vi) Return the fuze to its No. 407 cylinder, seal the cylinder with adhesive tape, and clearly mark the cylinder "FOR FIRST ISSUE".
- (vii) Return the No. 1 adapter to its No. 308 cylinder, seal the cylinder with adhesive tape, and clearly mark the cylinder "FOR FIRST ISSUE".
- (viii) Return the plugged bomb, the fuze and the No. 1 adapter to storage for use at the first opportunity.

SUPPLY AND STORAGE

Supply

- 24. Bomb, aircraft, nickle, No. 2, Mk. I or II is supplied packed one in a wooden box.
- 25. Adapters, fuze, aircraft flare, No. 1, Mk. I are supplied under Stores Ref. 12G/675 packed five in Cylinder No. 308, Mk. I. Thirty-two filled cylinders are packed in Box B.444, Mk. I.
- 26. Charges, ejection, aircraft bomb, No. 3, Mk. I are supplied under Stores Ref. 12G/1118 packed ten in Cylinder No. 289, Mk. I. Ten filled cylinders are packed in Box B.267, Mk. I.

Storage

27. When filled, or when supplied fitted with ejection charges, the No. 2 nickle bombs are provisionally classified, for storage purposes, in Group 6, Category X. When empty, and not fitted with ejection charges, the bombs may be stored in any dry storehouse.

28. The No. 1, Mk. I adapters are classified, for storage purposes, in Group 1, Category Z.

29. The No. 3 ejection charges are classified, for storage purposes, in Group 1, Category Z.

This leaf issued with A.L. No. 116
June, 1945

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CHAPTER 5

BOMB, AIRCRAFT, NICKEL, No. 1, Mk. I

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8. Bomb with No. 75, Mk. I tail unit fitted

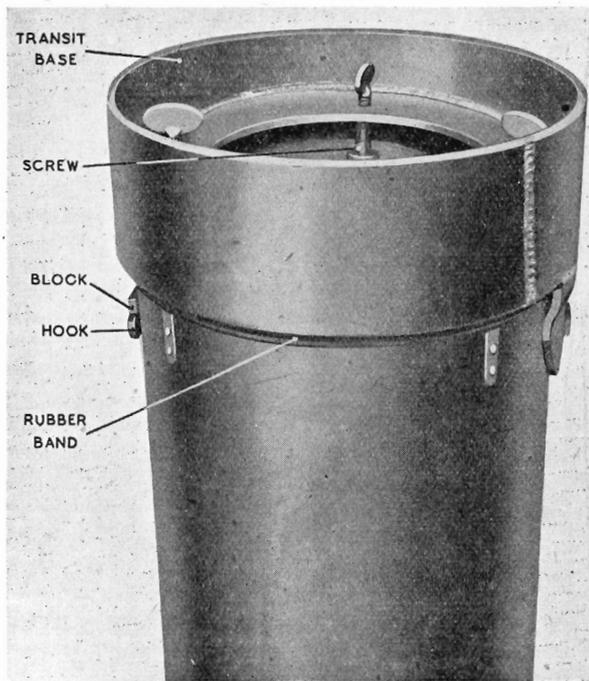


Fig. 1.—View of bomb—No. 43, Mk. I transit base fitted

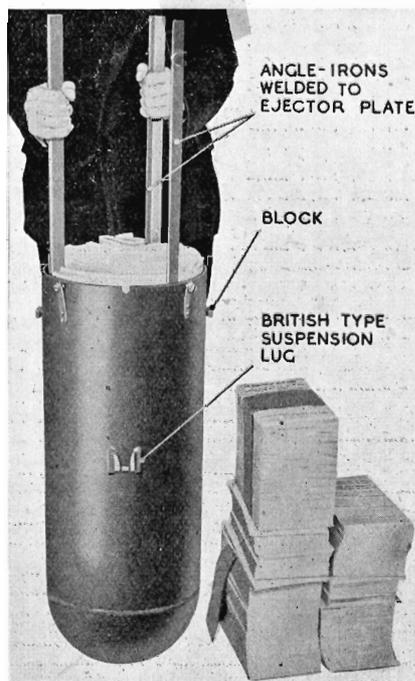


Fig. 2.—First layer of leaflets packed

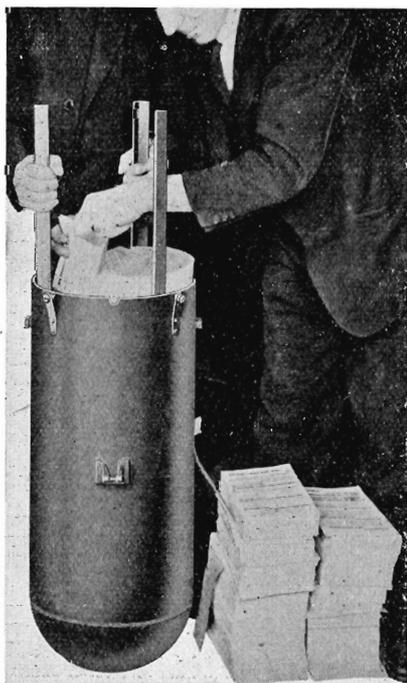


Fig. 3.—Packing second layer of leaflets

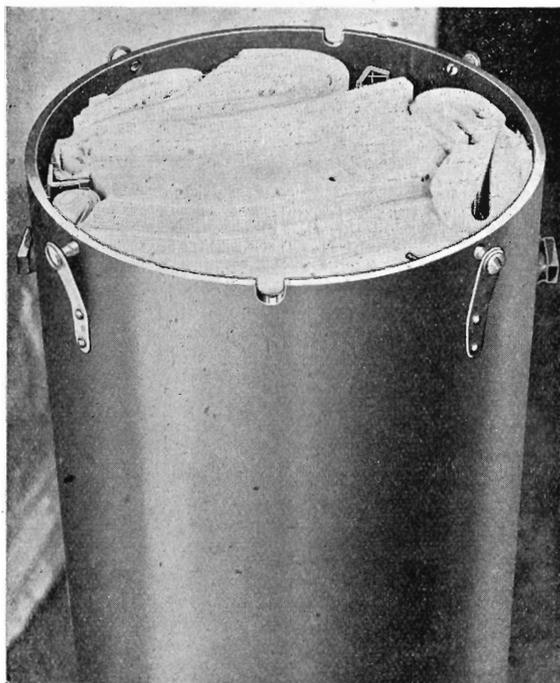


Fig. 4.—Leaflet packing completed

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CHAPTER 5

BOMB, AIRCRAFT, NICKEL, No. 1, Mk. I

Introduction

1. This bomb is a light-case bomb intended to spread leaflets so that as many persons as possible may obtain a copy. When fitted with a No. 75, Mk. I or II tail unit it is an aimable projectile, and it is initiated by a fuze and a 5 oz. burster charge which causes the leaflets to be ejected from the bomb approximately at a predetermined height above the ground so that the leaflets scatter adequately.

2. When the bomb is functioned, the bomb body, a steel ejector plate fitted with angle-irons, and the tail plate together with the tail unit, fall separately and are dangerous missiles. It is not, therefore, to be released over land areas in friendly territory without Air Ministry permission.

3. During transit and storage, the tail plate of the bomb is protected by a No. 43, Mk. I transit base.

Leading particulars

| | |
|---|-----------------------------|
| 4. Length, without fuze, tail, or transit base | 34-25 in., approx. |
| Diameter, excluding suspension lug(s) | 12 in., approx. |
| Weight of bomb, empty | 199 lb., approx. |
| Weight of bomb, filled | 271 lb., approx. |
| Terminal velocity | 1,100 ft. per sec., approx. |

GENERAL DESCRIPTION

No. 1, Mk. I bomb, fig. 1 to 6 and 8

5. The bomb consists of a cylindrical body to one end of which is welded a hemispherical nose. The other end of the body is closed by a tail plate held in position by Dzus fasteners and located by two pegs which fit into U-slots in the bomb, see fig. 4 and 5. A rubber band (known as band, sealing, Mk. I) seals the joint between the body and the tail plate and the tail plate has two bayonet slots and a hole to be engaged by the securing screws of a No. 75, Mk. I or II tail unit. The bomb is fitted with a British Universal-type suspension lug and, diametrically opposite to this lug, with two American-type suspension lugs for attachment to a B.7 shackle. Two steel blocks, with which the transit base engages, are welded to the outside of the body near the tail end.

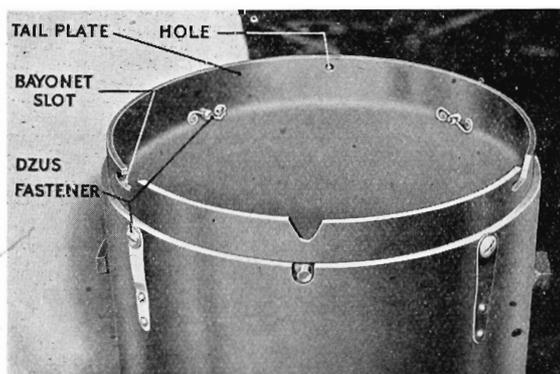


Fig. 5.—Tail plate fitted



Fig. 6.—Fitting rubber band

6. A burster container is welded inside the hemispherical nose and is sealed by a transit plug and leather washer. Inside the bomb is an ejector plate, in the form of a steel disc, to which three equi-spaced lengths of angle-iron are welded. When the bomb is functioned, the gases formed by the burning of the burster charge force the ejector plate towards the tail end of the bomb, the angle-irons force off the tail plate, together with the tail unit and the ejector plate, and leaflets are forced out of the bomb.

Identification colouring and markings

7. The bomb is painted black all over, except the suspension lugs, and on it, in white, is stencilled the nomenclature of the bomb and details relevant to the manufacturer and the date of manufacture.

No. 43, Mk. I transit base, fig. 1

8. The transit base consists of a short steel tube to the inside of which is welded a ring. Four equi-spaced wing-screws are threaded through the ring and at the inner end of each screw is a swivelling pad to engage the tail plate of the bomb. Two hook-shaped members are welded to the lower edge of the transit base and engage with the steel blocks on the bomb body.

No. 75, Mk. I tail unit, fig. 7

9. This tail unit is a shortened cone and drum type tail fitted with an arming vane, arming spindle, and arming fork. As the bomb is to be nose fuze the arming mechanism is to be ignored, but it is not necessary to remove the mechanism from the tail.

10. At the base of the tail cone is a skirt to fit over the tail plate of the bomb. Three equi-spaced securing plates are riveted to the inside of the tail cone, each securing plate having a joggled portion so that, when the tail unit is fitted to a bomb, the rim of the tail plate is located between the joggled portions of the securing plates and the skirt of the tail cone.

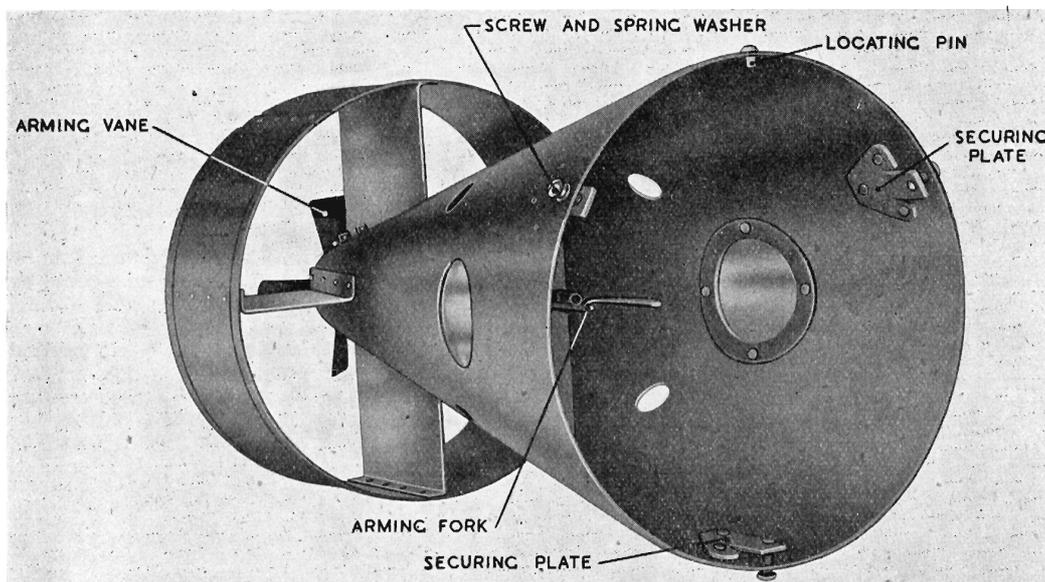


Fig. 7.—No. 75, Mk. I tail unit

11. Inserted through the skirt of the tail cone are three round-headed $\frac{1}{4}$ in. B.S.F. screws, one for each securing plate, each screw having a single-coil spring washer beneath its head. A locating pin is riveted to the skirt of the tail cone and is to engage a V-slot in the rim of the tail plate of the bomb.

No. 75, Mk. II tail unit

12. This tail unit is similar to the Mk. I tail unit except that the arming vane of the Mk. II tail unit is below the outer edge of the tail drum, whereas the arming vane of the Mk. I tail stands proud of the drum, see fig. 8.

INSTRUCTIONS FOR USE

Filling the bomb

13. To fill the bomb with leaflets, stand it on its nose and proceed as follows:—
- (i) Unscrew each of the screws in the transit base, turn the transit base through about 90 deg. to disengage its hooks from the steel blocks on the side of the bomb, and lift the transit base from the bomb.

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- (iii) Remove the rubber band from the bomb.
- (iiii) Release each of the Dzus fasteners and lift the tail plate from the bomb.
- (iv) Grip the angle-irons and raise the ejector plate until it is about 6 in. from the open end of the bomb, see fig. 2. Pack the first layer of leaflets against the ejector plate. The leaflets are to be packed edgewise, see fig. 3, as four layers are to be contained in the bomb. Pack as many leaflets as possible into the layer but do not pack them so tightly that they may jam in the bomb when it functions.
Note.—Before packing the leaflets, remove the paper strips from round the bundles.
- (v) Lower the ejector plate about 6 in. and pack the second layer similarly to the first, see fig. 3. Proceed similarly for layers three and four but when packing the fourth layer, ensure that the leaflets do not extend above the tops of the angle-irons, see fig. 4.
- (vi) Fit the tail plate into the bomb, locating the two pins on the tail plate in the slots in the top of the bomb, and secure it in position with the Dzus fasteners, see fig. 5.
- (vii) Stretch the rubber band over the tail plate, see fig. 6, and position it so that it covers the joint between the bomb body and the tail plate.

Fitting the No. 75 tail unit

114 To fit the No. 75, Mk. I or II tail unit, lay the bomb on its side on a bomb trolley and proceed as follows:—

- (i) Turn down the edge of the rubber band to expose the tail plate.
- (ii) Remove the three $\frac{1}{4}$ in. B.S.F. screws from the skirt of the tail cone, taking care not to lose the spring washers.
- (iii) Place the skirt of the tail unit over the rim of the tail plate, with the joggled portions of the securing plates inside the rim and fit the locating pin in the V-slot in the rim of the tail plate of the bomb.
- (iv) Insert a $\frac{1}{4}$ in. B.S.F. screw through each of the sets of aligned holes, after ensuring that each screw has a spring washer fitted beneath its head, and screw them firmly home.
- (v) Turn up the down-turned portion of the rubber band to cover the joint between the bomb body and the tail plate, see fig. 8.

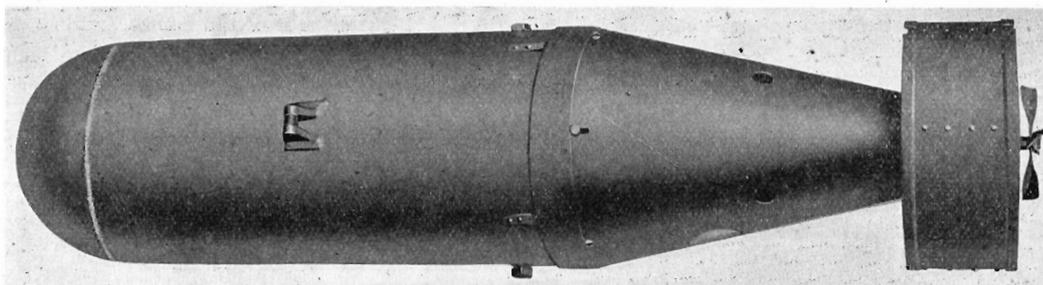


Fig. 8.—Bomb with No. 75, Mk. I tail unit fitted

Fuzing the bomb

115 When fuzing the bomb, the No. 11 burster and one of the following fuzes will be required:—

- (i) Burster, 5 oz., aircraft bomb, No. 11, Mk. I (Stores Ref. 112G/11156).
- (ii) Fuze No. 860A, Mk. III (Stores Ref. 112G/801).
- (iii) Fuze No. 896A2, Mk. II (Stores Ref. 112G/1084).
- (iv) Fuze No. 896A3, Mk. I (Stores Ref. 112G/1085).
- (v) Fuze No. 896A4, Mk. I (Stores Ref. 112G/1086).

The No. 11 burster is described in A.P.1661H, Vol. I, Sect. 2 and the fuzes in A.P.2560A, Vol. I, Sect. 11.

116 The fuze to be used must be chosen in the light of experience and with regard to the height from which the bomb is to be released and the height of the target above sea level. For release from low altitudes against a target approximately at sea level, fuze No. 896A2 has been found to be satisfactory.

117. The following precautions must be observed:—

- (i) When handling the fuze always hold it with the magazine end directed away from personnell.
- (ii) Always be careful not to break the shear wire which retains the safety pin in position.
- (iii) Never dislodge the arming vane cover or rotate the arming vane.
- (iv) When lifting the fuzed bomb, do not hold it by the fuze.

118. To fuze the bomb, proceed as follows:—

- (i) Remove the transit plug from the burster container of the bomb, and remove the leather washer from the plug.
- (ii) Insert the No. 1, Mk. I burster into the burster container of the bomb.
- (iii) Place the leather washer over the threads on the body of the fuze, serve the threads with luting, thin, Mk. V (Stores Ref. 12F/41), and screw the fuze, by hand, firmly into the burster container of the bomb, gripping the fuze round the fuze body (*not round its thin outer cover*) and taking care not to break the shear wire.
- (iv) Using white dope, clearly mark the letters "FZD" on the bomb near the nose to indicate that the bomb is fuzed.

Operations after loading the fuzed bomb

119. When the fuzed bomb has been loaded on to the appropriate bomb carrier or shackle, proceed as follows:—

- (i) Carefully move the clip on the shear wire which retains the fuze safety pin in position, until the clip is aligned with the suspension lug (or lugs) by which the bomb is attached to the bomb carrier or shackle.
- (ii) After examination to ensure that the link is not frayed or damaged, attach the hook of a link, fuze-setting control, flexible, fixed length, short (Stores Ref. 11A/2570) to the clip on the shear wire of the fuze.
- (iii) After examination to ensure that the link is not frayed or damaged, attach the hook of a link, fuze-setting control, flexible, fixed length (Stores Ref. 11A/683) to the loop of the short fuzing link and also to the lug on the arming vane cover of the fuze.

Warning.—At no time is the arming vane cover to be removed by personnel.

- (iv) Insert the loop of the long fuzing link into the E.M. fuzing unit of the bomb carrier.
Note.—Should the bomb be attached to a B.7 shackle, it may be necessary to attach further fuzing links, end to end, to permit proper connection to be made to the fuzing unit.
- (v) Remove the white tape from the fuze and attach it to the bomb body near the nose. The tape will be required again should it be necessary to unfuze the bomb.
Note.—Particular care is to be taken to ensure that it is the white tape and *not the red one* which is removed.

Unloading the bomb

20. If the bomb is to be unloaded from the aircraft, proceed as follows:—

- (i) Ensure that the aircraft fuze-setting switches are set to the SAFE position.
- (ii) Detach the fuzing link from the E.M. fuzing unit.
- (iii) Detach the fuzing links from the fuze, taking particular care not to break the shear wire.
- (iv) Unload the bomb from the aircraft in the normal manner.
- (v) Return the fuzing links to storage.

Unfuzing the bomb

21. When unfuzing the bomb, proceed as follows:—

- (i) Unscrew and remove the fuze, by hand, from the bomb, taking care to grip the fuze round the fuze body (*not round the thin outer cover*), and to avoid breaking the shear wire.
- (ii) Carefully extract the No. 1, Mk. I burster from the burster container and return it to its cylinder for storage.
- (iii) Remove the leather washer from the fuze, place the washer over the threads of the transit plug, serve the threads of the plug with luting, thin, Mk. V (Stores Ref. 12F/41), and screw the plug firmly into the burster container of the bomb.

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- (iv) Remove the white tape from the bomb and secure it round the fuze to seal the vent holes in the outer cover. Should the white tape not be available, use any suitable adhesive tape.
- (v) Return the fuze to its cylinder and seal the cylinder. Mark the cylinder "FOR FIRST ISSUE".
- (vi) Delete the letters "FZD" on the bomb.
- (vii) Return the bomb, the fuze, and the No. 1 burster, to storage.

SUPPLY AND STORAGE

Supply

22. Bomb, aircraft, nickel, No. 1, Mk. I is supplied unboxed, empty and without a burster, and fitted with a No. 43, Mk. I transit base.

Storage

23. The empty No. 1, Mk. I nickel bomb may be stored in any dry place.

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Section 17

AMERICAN BOMBS

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A.P.1661B, Vol. I

SECTION 17

AMERICAN BOMBS

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Note.—A list of contents appears at the beginning of each chapter.

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CHAPTER 2—Bombs, G.P., 250 lb., AN-M57 and AN-M57A1

CHAPTER 3—Bombs, G.P., 500 lb., AN-M43, AN-M64, and AN-M64A1

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CHAPTER 7—Bomb, incendiary, 500 lb., AN-M76

(A.L. 126)

Insert

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CHAPTER 2

BOMBS, G.P., 250 lb., AN-M57 and AN-M57A1

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APPENDIX 3.—Instructions for use—using the M112 or M112A1 fuze

APPENDIX 4.—Instructions for use—using the M123 or M123A1 fuze (*to be issued later*)

CHAPTER 2

BOMBS, G.P., 250 lb., AN-M57 and AN-M57A1

Introduction

1. These bombs, which have a charge/weight ratio similar to that of the 250 lb. M.C. bombs, are used for general bombardment purposes. They are similar in their general design, constructional and functioning characteristics, and differ only in that the AN-M57A1 is modified to ensure that, when fitted with a long delay fuze incorporating an anti-removal device, the fuze cannot be removed from the bomb in any circumstances whatsoever. The bombs are adapted for fuzeing at both the nose and the tail with either British or American fuzeing components, as listed in para. 16. It should be noted that all these components require the use of the horizontal system of arming, that is, on release of a bomb from its carrier, arming is initiated by the horizontal pull-off of safety wires threaded through the arming vanes of the appropriate nose and/or tail fuzeing components.

2. The bombs are fitted with twin suspension lugs for use with American shackles or racks and are, in addition, provided with a single British type suspension lug for use when loading on to standard British bomb carriers.

3. The normal American fin assembly, modified by the addition of a No. 3 Mk. I arming wire guide, is used in all instances.

BOMB, G.P., 250 lb., AN-M57

Leading particulars*Bomb body*

| | |
|---|--|
| 4. Length (nose and tail transit plugs fitted) | 36.9 in. |
| Maximum diameter (excluding suspension lugs) | 11.09 in. |
| Nature and weight of filling | 98.4 lb. Amatol 50/50 with 22.5 lb. T.N.T. surrounds, or 129 lb. cast T.N.T. |
| Total weight, filled Amatol | 240.9 lb. |
| Total weight, filled T.N.T. | 247.3 lb. |
| Terminal velocity | 1,070 ft. per sec. |

Fin assembly

| | |
|---|----------|
| 5. Length | 12.2 in. |
| Maximum diagonal width across fins | 14.9 in. |

The overall length of the complete bomb, when fitted with a No. 52 nose pistol, is approximately 47.3 in.

General description, fig. 1 and 2

6. The bomb consists of a bomb body filled with high explosive, and a detachable box type fin assembly which is secured to the body by a fin lock-nut.

Bomb body

7. The bomb body consists of a hollow steel casting open at both ends. The nose opening is closed by a fuze seat liner, the inner end of which engages with an auxiliary booster, set in the main explosive filling. The tail opening is closed by a filling plug screwed and cemented in position. Into this plug is screwed an M102 adapter booster, which houses a solid C.E. pellet. The adapter booster is in alignment with a second auxiliary booster, set in the main filling. During transit and storage the fuze seat liner and the adapter booster are closed by transit plugs seated on leather washers.

8. The fin lock-nut, for use in securing the fin assembly to the bomb body, is screwed to external threads on the filling plug. This lock-nut has four key holes and two short tommy bars, or, alternatively, six key holes. During transit and storage it is wired to the filling plug to prevent loss.

Note.—Some bombs are provided with a cardboard distance piece (not shown in the illustrations) located between the fin lock-nut and the face of the filling plug. This distance piece protects the external screw threads on the filling plug during transit and storage.

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9. Three suspension lugs are welded to the bomb body, two of the lugs being located diametrically opposite to the third lug. The single lug is for use when loading the bomb on to a standard British bomb carrier, the twin lugs being used with American shackles or racks. During transit and storage these lugs are protected against damage by two protecting rings locked round the bomb body. These rings are hinged, and are tightened on to the bomb body by bolts and nuts, as shown in fig. 2.

10. The bomb body is filled with either Amatol 50/50 or cast T.N.T. When filled Amatol, the nose and tail ends of the body are sealed with thick pads of cast T.N.T.

Fin assembly

11. The fin assembly, see fig. 1, is supplied separately from the bomb body, and consists of a tail ring to which four fins are attached. Extensions on these fins are riveted together to form the box portion of the assembly. A No. 3 Mk. I arming wire guide is secured to a side of this box to provide a support for the No. 1 Mk. I safety wire, when the bomb is to be tail fuze.

Identification colouring and markings

12. The exterior of the bomb body is painted an olive drab colour. Three yellow bands are painted around the bomb body, located at the nose and tail ends, and at the centre of gravity of the bomb. The markings and information normally stencilled on the bomb body are shown in fig. 2. It should be noted that the markings and information are all American and that some of the information given does not apply when the bomb is issued for loading on to British aircraft.

13. The fin assembly is similarly painted an olive drab colour.

Functioning

14. On "live" release of the fuze bomb from its carrier, the safety wire is withdrawn from the nose pistol and/or tail fuze by a fuze-setting control link, thus allowing the fuze components to become armed.

15. On impact of the fuze bomb with its target, the nose pistol and/or tail fuze initiates the explosive train in the bomb, thus detonating the main filling.

Instructions for use

| | | |
|---|---|----------------|
| <i>Nose</i> | | |
| (i) Pistol, bomb, D.A., No. 52, Mk. I | } | See Appendix 1 |
| (ii) Pistol, bomb, D.A., No. 52, Mk. II | | |
| (iii) Fuze, bomb, AN-M103A1 (nose) | | See Appendix 4 |
| <i>Tail</i> | | |
| (iv) Fuze, bomb, AN-M100A1 (tail) | } | See Appendix 2 |
| (v) Fuze, bomb, AN-M100A2 (tail) | | |
| (vi) Fuze, bomb, M1112 (tail) | } | See Appendix 3 |
| (vii) Fuze, bomb, M1112A1 (tail) | | |

(A.L. 120)

These fuze components are fully described in A.P.1661C, Vol. I, Sect. 5. The detailed instructions for fuzeing a bomb with these components, together with the instructions for loading, unloading, and unfuzeing the fuze bomb, are given in the Appendices to this Chapter.

Supply

17. The ANNM572301 lb. G.P. bomb body is supplied plugged at both the nose and the tail with transit plugs, and fitted with two protecting rings around the body to protect the suspension lugs. The stowage dimensions of the bomb body are 36.9 in. length, and 14.75 in. maximum diameter across the protecting rings. The stowage weight of the bomb is 255.9 lb. when filled Amatol 50/50, and 262.3 lb. when filled cast T.N.T.

Note.—Some bomb bodies may be supplied fitted with a cardboard distance piece to protect the external threads on the filling plug.

18. One fin assembly, fitted with a No. 3 Mk. I arming wire guide, and complete with one No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips, is supplied packed in a metal crate, the wire and clips being secured to the fin assembly with adhesive tape. The fin assembly may also be supplied without the arming wire guide, safety wire, or clips, in which instance these items will be issued separately. The stowage dimensions of the crate are 11½ in. x 11½ in. x 12½ in.; its filled weight is 10 lb.

Storage

19. The bomb bodies are classified, for the purpose of storage, in Group 7, see A.P.2608A, Chap. 7. The fin assemblies, in their crates, may be stored together with the bomb bodies but should be stacked well clear of the filled stores.

BOMB, G.P., 250 lb., AN-M57A1

Comparison with the AN-M57 250 lb. G.P. bomb

20. As stated in para. 1, the AN-M57A1 bomb is similar to the AN-M57 bomb. Attention is directed, therefore, to para. 1 to 19, as the information given in these paragraphs for the AN-M57 bomb applies equally to the AN-M57A1, *with the exception of the following differences:—*

- (i) The filling plug is positively locked in position at the rear end of the bomb body by two long studs screwed into the underside of the filling plug and "set" in the main filling.
- (ii) The M102 adapter booster has a hole drilled through its wall to align with a blind hole located in the wall of the filling plug. These holes are provided so that when a bomb is to be fuze with a long delay fuze incorporating an anti-removal device, the adapter booster, into which the fuze will be locked, may itself be locked to the filling plug by a lock pin inserted through the adapter booster hole to engage with the blind hole in the filling plug.

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APPENDIX 1

INSTRUCTIONS FOR USE—USING THE No. 52 PISTOL

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Introduction

1. The No. 52 Mk. I or II pistol, when used for the nose fuzing of either the AN-M57 or AN-M57A1 250 lb. G.P. bomb, is to be used in conjunction with a No. 1 Mk. I exploder adapter, and either a No. 52 Mk. II or III detonator. A No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips, which are supplied with the pistol, are also required.

Note.—The pistols and exploder adapter are described in Sect. 5 of A.P.1661C, Vol. I.

Fuzing a bomb

2. Before fuzing a bomb with a No. 52 pistol, examine the paper disc at the base of the pistol striker guide to check that this disc has not been pierced by the striker needle. If it is suspected that the disc has been punctured, *the pistol must not be used*, but is to be set aside for A.I.D./A.I.S. inspection. Also ensure that the pistol screw-threads are clear and that the leather washer is in position.

3. Unscrew and remove the nose transit plug from the bomb. Examine the threads of the fuze seat liner and clean where necessary.

4. Remove the No. 46 transit plug from a No. 1 Mk. I exploder adapter and gauge the detonator cavity of the exploder adapter using a No. 2 Mk. I detonator cavity gauge. The engraved line for 20/40 lb. bombs is applicable. Exploder adapters which fail to pass this test are not to be used, but are to be set aside for A.I.D./A.I.S. inspection.

5. Insert the exploder adapter into the fuze seat liner and screw home using a 1½ in. Whit, spanner, C-spanner, or other suitable tool. Ensure that the exploder adapter is securely locked in position by its fibre inserts.

6. Fit the small conical spring, supplied with the pistol, over the stem of a No. 52 Mk. II or III detonator, so that the small end of the spring abuts the underside of the detonator head. Then insert the detonator into the detonator cavity of the exploder adapter.

Note.—*The conical spring must always be fitted*, as it ensures that the detonator is in contact with the end of the striker guide when the pistol is screwed into the exploder adapter.

7. With the pistol locking nut screwed forward a few turns, screw the pistol, by hand, into the exploder adapter until it is well seated on its washer. Lock the pistol in position by screwing its locking nut hard on to the top of the exploder adapter.

Fitting the fin assembly

8. If the bomb is to be used nose fuzed only, the fin assembly is to be attached to the bomb body as follows:—

- (i) Remove the transit wires securing the fin lock-nut to the tail end of the bomb body. Unscrew and remove the fin lock-nut and also remove the cardboard distance piece, if fitted.
- (ii) Offer up the fin assembly to the rear end of the bomb body, so that the fins are at 45 deg. to the plane of the suspension lugs. This is required to ensure ease of stowage of the bomb in British aircraft.
- (iii) Secure the fin assembly in position by replacing and screwing down the fin lock-nut. The lock-nut is to be tightened using a suitable short tommy bar.

Loading a fuzed bomb

9. With the single suspension lug of the bomb uppermost, load the fuzed bomb on to its carrier in the normal manner, as described in the Chapter of A.P. 1664, Vol. I, relevant to the carrier used.

10. When the bomb is securely attached to its carrier, remove the safety pin from the pistol and rotate the safety cap just sufficiently to bring the hole in one of the arming vanes into line with the hole in the *uppermost* lug of the pistol locking nut.

Note.—The safety pin is to be handed to the pilot or air bomber.

11. Insert the plain end of a No. 1 Mk. I safety wire first through the hole in the lug of the locking nut and then through the arming vane hole until the end protrudes approximately 3 in., as shown in fig. 1 of Chap. 2. Slip two No. 1 Mk. I safety clips over the protruding end of the safety wire, so that the inner clip is in light contact with the pistol arming vane, see fig. 1 of Chap. 2.

Note.—It is not essential that the pull-off of the safety wire should be exactly in line with the bomb suspension lug.

12. Attach the hook end of a standard flexible fuze-setting control link to the loop end of the safety wire, and then insert the loop end of the link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzing unit must *not* be positioned *vertically* above the nose pistol, but must be moved inward towards the bomb suspension lug a *minimum* distance of 3 in., measured from the drilled lug on the pistol locking nut, as shown in fig. 1 of Chap. 2. Preferably, however, the fuzing unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier and on the position of the E.M. fuzing unit, two or more fuze-setting control links, attached end to end, may be required.

Unloading and unfuzing a bomb, and removing the fin assembly

13. Disconnect the fuze-setting control link from the E.M. fuzing unit and then unload the bomb from its carrier in the normal manner.

14. Having unloaded the bomb, remove the two safety clips from the end of the safety wire, and then withdraw this wire from the pistol.

15. Screw up the safety cap until the stop pins are engaged. With a Mk. I pistol screw back the cap just sufficiently to bring its two safety pin holes into line with the slots cut in the top of the pistol body; then insert the safety pin. With a Mk. II pistol, the safety cap is to be screwed up until the stop pins prevent further movement. Then engage the U-shaped end of the safety pin with the hole in the arming vane which is opposite to the hole in the safety cap. Insert the plain end of the safety pin in the hole in the safety cap and then slowly unscrew the cap until this end of the safety pin drops into the groove in the pistol body.

Note.—If the safety pin does not engage with the groove in the pistol body within one complete revolution of the cap, the cause must be ascertained; for example, the plain end of the safety pin may be burred or distorted.

16. Disconnect the fuze-setting control link from the safety wire and return the wire to its box.

Note.—Should the safety wire be kinked, bent or otherwise distorted or damaged, it must *not* be used again. Such a wire is to be discarded and not returned to its box.

17. To unfuze the bomb, proceed as follows:—

- (i) Slacken back the pistol locking nut.
- (ii) Unscrew and remove the pistol by hand.
- (iii) Extract the detonator using an extractor, detonator, No. 2, Mk. I.
- (iv) Remove the conical spring from the detonator stem, or from the exploder adapter, and return it to its linen bag.
- (v) Seal the exploder adapter with its No. 46 transit plug.

18. Having unfuzed the bomb, remove the fin assembly as follows:—

- (i) Unscrew and remove the fin lock-nut from the rear end of the bomb body.
- (ii) Detach the fin assembly from the bomb body.
- (iii) If originally fitted, replace the cardboard distance piece and then replace the fin lock-nut and wire it in position to prevent loss.
- (iv) Return the fin assembly to its metal crate.

19. Suitably mark the bomb at its nose end as "EXPLODERED" and then return it to store, where it should be segregated for use as soon as possible.

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APPENDIX 2

INSTRUCTIONS FOR USE—USING THE AN-M100A1 or AN-M100A2 FUZE

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Introduction

1. Both the AN-M57 and AN-M57A1 250 lb. G.P. bombs may be fuzed at the tail with either the AN-M100A1 or AN-M100A2 tail fuze. These fuzes (which are fully described in A.P.1661C, Vol. I, Sect. 5) are fitted with the M14 series of primer detonators, which are interchangeable, and may thus be used to provide a non-delay, 0-01 sec., 0-025 sec., or 0-1 sec. delay action as required.

2. As these fuzes also incorporate a mechanical arming delay, they require certain minimum heights of bomb release to ensure that they are fully armed prior to impact with the target. These minimum heights of release are promulgated to the Units concerned through the normal channels.

Note.—The AN-M100A1 fuze may, if authorized, be partially pre-armed before take-off. *Partial pre-arming of the AN-M100A2 fuze is not to be undertaken in any circumstances whatsoever.*

3. A standard AN-M57 fin assembly, modified by the addition of a No. 3 Mk. I arming wire guide, is to be used. In addition, one No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips are required when fuzing a bomb with either of these fuzes. The arming wire guide, safety wire, and safety clips may be supplied with the fin assembly, or as separate items.

Fitting the fin assembly

4. The fin assembly is to be attached to the bomb body before fuzing is commenced. The procedure to be adopted is detailed in the following para. 5 to 8.

5. Remove the fin assembly from its crate and ascertain whether or not a No. 3 Mk. I arming wire guide is fitted. Where the wire guide is not fitted proceed as follows:—

- (i) Hook the two halves of the arming wire guide to one of the four sides of the box portion of the fin assembly so that the bracket of the guide projects into the fin assembly, as illustrated in fig. 1 of Chap. 2.
- (ii) Rigidly secure the wire guide to the fin assembly by tightening the nut on the coupling screw.

6. Remove the transit wires securing the fin lock-nut to the tail end of the bomb body. Then unscrew and remove the nut and also, if fitted, the cardboard distance piece.

7. Partially unscrew the tail transit plug from the bomb body.

8. Check that the arming wire guide is securely attached to the fin assembly and then offer up the fin assembly to the rear end of the bomb body so that the arming wire guide is in line with the single suspension lug of the bomb, as shown in fig. 1 of Chap. 2. Secure the fin assembly in this position with the fin lock-nut, which is to be tightened using a short tommy bar.

Fuzing a bomb

9. With the fin assembly fitted to the bomb body, completely unscrew the tail transit plug and examine the screw threads of the M102 adapter booster. Clean these threads where necessary. Ensure that the adapter booster is securely positioned in the bomb body.

10. Remove the fuze from its sealed container and examine and test the fuze as follows:—
- (i) Examine the fuze to ascertain that it is not partially or fully armed, as described in A.P.1661C, Vol. I, Sect. 5, Chap. 2.
 - (ii) Examine the fuze for signs of external damage, corrosion (appearing as a white deposit on the fuze), or for traces of moisture on the arming stem cup which houses the reduction gear train.
 - (iii) Test the fuze to ensure that the stationary gear in the reduction gear train is locked. To do this grip the top of the fuze (that is, the lock-nut and adjusting nut) and, using finger pressure only, rotate the arming stem. A movement up to $\frac{1}{16}$ in. is normally possible, due to manufacturing tolerances, but should the arming stem rotate through 90 deg. or more the stationary gear is *not* locked and the fuze must *not* be used.

Having examined and tested the fuze, change the M14 primer detonator if necessary. It should be noted that the fuzes are normally supplied fitted with the 0.025 sec. delay version of the M14 primer detonator. If it is required to change the primer detonator, unscrew it from the base of the fuze, by hand, and then screw in the appropriate M14 primer detonator giving the delay selected. Force must *not* be used in these operations, and should a primer detonator show signs of external corrosion or other damage, or should its primer be a loose fit, *it must not be used*.

- Notes.—(i) The primer detonator giving the required delay may be identified by its delay time which is stamped on the head of the primer detonator body. In addition, the head of the non-delay primer detonator is painted white, that of the 0.1 sec. delay, black, whilst the 0.01 sec. and 0.025 sec. delay versions have, respectively, a ∇ and a $\frac{1}{4}$ sector of the head painted black.
- (ii) Long delay primer detonators of the M16 series cannot be used with these fuzes.

- Warnings.—(i) Care must be taken when handling either a primer detonator, or a fuze containing a primer detonator, as the primer component is partially exposed in the top of the primer detonator body.
- (ii) Should a fuze be dropped or accidentally knocked, it must be carefully examined externally to ensure that no damage has been sustained.

11. Withdraw the split pin from the body of the fuze and then screw the fuze (less its arming vane) by hand into the rear end of the bomb body.

12. Thread the plain end of a No. 1 Mk. I safety wire first through the arming wire guide on the fin assembly and then through the uppermost pair of adjacent holes in the fuze arming stem cup and eyelet strap, on the lines indicated in fig. 1 of Chap. 2. The safety wire holes in the fuze need not be exactly in line with the arming wire guide.

Note.—Should the uppermost pair of adjacent holes be occupied by the fuze safety pin, this pin is to be removed, to allow insertion of the safety wire, *but only after* a second safety pin has first been secured through the second pair of adjacent holes in the arming stem cup and eyelet strap of the fuze.

13. Having inserted the safety wire, cut the sealing wire threaded through the safety pin and then remove the pin. Thread the plain end of the safety wire through one of the holes in the arming vane blades and at the same time slip the arming vane over the end of the fuze so that the grooves in the arming vane assembly engage with the two locating pins on the fuze. Lock the arming vane to the fuze by screwing down the vane nut, hand tight.

Note.—The safety pin and its sealing wire, together with the split pin (see para. 11) are to be handed to the pilot or air bomber.

14. Adjust the safety wire to protrude approximately 3 in. beyond the fuze arming vane, as indicated in fig. 1 of Chap. 2, and then slip two No. 1 Mk. I safety clips over the end of the wire so that the inner clip is in light contact with the arming vane blade.

Loading a fuzed bomb

15. With the single suspension lug uppermost, load the fuzed bomb on to its carrier in the normal manner, as described in the chapter of A.P.1664, Vol. I, relevant to the carrier used.

16. When the bomb is securely attached to its carrier, attach the hook end of a link, fuze-setting control, Type E.M., flexible, adjustable, to the loop end of the safety wire threaded through the fuze. Insert the loop end of the fuze-setting control link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzing unit must *not* be located vertically above the head of the tail fuze, but is to be moved inward towards the bomb

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suspension lug a *minimum* distance of 3 in., measured from the arming wire guide on the fin assembly, as shown in fig. 1 of Chap. 2. Preferably, however, the fuzing unit should be moved inward towards the suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier and on the position of the E.M. fuzing unit, two or more fuze-setting control links, attached end to end, may be required.

Unloading and unfuzing an unexpended bomb, and removal of fin assembly

Warning.—Before unloading and unfuzing an unexpended bomb, examine the fuze to make certain that it is not partially or fully armed, as detailed in A.P.1661C, Vol. I, Sect. 5, Chap. 2.

17. Disconnect the fuze-setting control link from the carrier E.M. fuzing unit and unload the bomb from the carrier in the normal manner.

18. Having unloaded the bomb from its carrier, remove the two safety clips from the safety wire, *but do not withdraw this wire from the fuze.* Unscrew the vane nut from the end of the fuze and remove the arming vane.

19. Insert the safety pin through the second pair of adjacent holes in the arming stem cup and eyelet strap of the fuze, and secure it in position with its sealing wire. Then withdraw the safety wire from the fuze and arming wire guide. Unhook the fuze-setting control link(s) from the safety wire.

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must be discarded and not used again.

20. Unscrew and remove the fuze, by hand, from the rear end of the bomb body and *immediately* replace the split pin through the body of the fuze. Return the fuze to its container and seal with adhesive tape.

21. Having removed the fuze from the bomb, unscrew the fin lock-nut and remove the fin assembly. Fit the cardboard distance piece, if originally provided, round the external screw threads of the bomb filling plug and then replace the fin lock-nut. Re-wire the nut to the filling plug to prevent loss.

22. Close the rear end of the bomb body with its transit plug.

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APPENDIX 3

INSTRUCTIONS FOR USE—USING THE M112 or M112A1 FUZE

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Introduction

1. Either the M112 or the M112A1 fuze (which are fully described in A.P.1661C, Vol. I, Sect. 5) can be used for the tail fuzing of both the AN-M57 and AN-M57A1 250 lb. G.P. bombs. These fuzes do not incorporate a mechanical delay in their arming mechanism, but are fitted with primer detonators of the M16 series which provide either a 4 to 5 sec. or 8 to 11 sec. delay.

2. A standard AN-M57 fin assembly, modified by the addition of a No. 3 Mk. I arming wire guide, is to be used. In addition, one No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips are required when fuzing a bomb with either of these fuzes. The arming wire guide, safety wire, and safety clips may be supplied with the fin assembly, or as separate items.

Fitting the fin assembly

3. The fin assembly is to be attached to the bomb body before fuzing is commenced. The procedure to be adopted is detailed in the following para. 4 to 7.

4. Remove the fin assembly from its crate and ascertain whether or not a No. 3 Mk. I arming wire guide is fitted. Where the wire guide is not fitted, proceed as follows:—

- (i) Hook the two halves of the arming wire guide to one of the four sides of the box portion of the fin assembly so that the bracket of the arming wire guide projects into the fin assembly, as illustrated in fig. 1 of Chap. 2.
- (ii) Rigidly secure the wire guide to the fin assembly by tightening the nut on the coupling screw.

5. Remove the transit wires securing the fin lock-nut to the tail end of the bomb body. Then unscrew and remove the lock-nut and also, if fitted, the cardboard distance piece.

6. Partially unscrew the tail transit plug from the bomb body.

7. Offer up the fin assembly to the rear end of the bomb body so that the arming wire guide is in line with the single suspension lug of the bomb, as shown in fig. 1 of Chap. 2. Secure the fin assembly in this position with the fin lock-nut, which is to be tightened using a suitable tommy bar.

Fuzing a bomb

8. With the fin assembly fitted to the bomb body, completely unscrew the tail transit plug and examine the screw threads of the M102 adapter booster. Clean these threads where necessary, and check that the adapter booster is securely positioned in the bomb body.

9. Remove the fuze from its sealed container and examine it for external damage and for corrosion (appearing as a white deposit). Check that the fuze is not partially or fully armed, as detailed in A.P.1661C, Vol. I, Sect. 5, Chap. 3.

10. Carefully unscrew and remove the primer detonator from the base of the fuze, and then test the fuze to ensure that it is not partially uncocked, using a gauge, striker depth, No. 16, Mk. I. To do this, insert the stem of the gauge into the base of the fuze; the head of the gauge should abut the base of the fuze. If this does not obtain and it is possible to "rock" the gauge whilst in the fuze, the fuze plunger and firing pin are partially uncocked and the fuze must not be used. In such circumstances the primer detonator must not be screwed back into the fuze.

Warning.—Great care must always be exercised when handling a primer detonator (or a fuze containing a primer detonator), particularly as the primer component is partially exposed in the top of the primer detonator body.

11. Having examined and gauged the fuze, fit the primer detonator giving the delay required; this may or may not be the one supplied with the fuze. Force must not be used in this operation, and should a primer detonator show signs of external corrosion or damage, or should its primer be a loose fit, it must not be used.

- Notes.*—(i) The M112 and M112A1 fuzes are normally supplied fitted with the 8 to 11 sec. delay version of the M16 or M16A1 primer detonator.

(ii) The M16 and M16A1 primer detonators are identifiable by their milled and grooved heads.

The 4 to 5 sec. and 8 to 11 sec. delay versions of these primer detonators are distinguishable by the delay times which are marked in two places on their heads. The delay times are also clearly marked on the cylinders in which the primer detonators are packed.

- (iii) The M16 primer detonator may be used with either the M112 or M112A1 fuze. The M16A1 primer detonator is for use only with the M112A1 fuze. Short delay primer detonators of the M14 series cannot be used with either of these fuzes.
- (iv) Should the fuze be dropped or accidentally knocked at any time, it must be carefully examined externally to ensure that no damage has been sustained.

12. Having fitted the required primer detonator, remove the "special instructions" tablet from the fuze arming stem tube and screw the fuze (less its arming vane), by hand, into the rear end of the bomb body.

13. Thread the plain end of a No. 1 Mk. I safety wire first through the arming wire guide on the fin assembly and then through the uppermost pair of adjacent holes in the stem cup and circular plate of the fuze, as shown in fig. 1 of Chap. 2. It is not essential for the safety wire holes in the fuze to be exactly in line with the arming wire guide.

Note.—Should the uppermost pair of adjacent holes be occupied by the fuze safety pin, the pin is to be removed, to allow insertion of the safety wire, *but only after* a second safety pin has first been inserted through the second pair of adjacent holes.

14. Having inserted the safety wire, cut the sealing wire threaded through the safety pin and remove the pin. Thread the plain end of the safety wire through the hole in one of the arming vane blades, and at the same time slip the arming vane over the head of the fuze so that the grooves in the arming vane assembly engage with the two locating pins on the fuze. Lock the arming vane to the fuze by screwing down the knurled vane nut, hand tight.

15. Adjust the safety wire to protrude approximately 3 in. beyond the arming vane, as shown in fig. 1 of Chap. 2, and then slip two No. 1 Mk. I safety clips over the end of the wire so that the inner clip is in light contact with the arming vane blade.

Note.—The safety pin and its sealing wire are to be handed to the pilot or air bomber.

Loading a fuzed bomb

16. With the single suspension lug uppermost, load the fuzed bomb on to its carrier in the normal manner, as described in the Chapter of A.P. 1664, Vol. I relevant to the carrier used.

17. When the bomb is securely attached to its carrier, attach the hook end of a link, fuze-setting control, Type E.M., flexible, adjustable, to the loop end of the safety wire threaded through the fuze. Insert the loop end of the fuze-setting control link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzing unit must *not* be located *vertically* above the head of the tail fuze, but is to be moved inward towards the bomb suspension lug a *minimum* distance of 3 in., measured from the arming wire guide on the fin assembly, as shown in fig. 1 of Chap. 2. Preferably, however, the fuzing unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier, and on the position of the E.M. fuzing unit, two or more fuze-setting control links, attached end to end, may be required.

Unloading and unfuzing an unexpended bomb, and removal of fin assembly

Warning.—Before unloading and unfuzing an unexpended bomb, examine the fuze to make certain that it is not partially or fully armed, as detailed in A.P. 1661C, Vol. I, Sect. 5, Chap. 3.

18. Disconnect the fuze-setting control link from the carrier E.M. fuzing unit and unload the bomb from the carrier in the normal manner.

19. Having unloaded the bomb from its carrier, remove the two safety clips from the safety wire, *but do not withdraw the wire from the fuze*. Unscrew the knurled vane nut from the head of the fuze and remove the arming vane.

20. Insert the safety pin through the second pair of adjacent holes in the stem cup and circular plate of the fuze and secure it in position with the sealing wire. Then withdraw the safety wire from the fuze and arming wire guide. Unhook the fuze-setting control link(s) from the safety wire.

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must be discarded and not used again.

21. Unscrew and remove the fuze, by hand, from the rear end of the bomb body, return the fuze to its container and re-seal the container with adhesive tape.

22. Having removed the fuze from the bomb, unscrew the fin lock-nut and remove the fin assembly. Fit the cardboard distance piece, if originally provided, round the external screw threads of the bomb filling plug and replace the fin lock-nut. Re-wire the nut to the filling plug to prevent loss.

23. Close the rear end of the bomb body with its transit plug.

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A.P.1661B, Vol. I, Sect. 17, Chap. 2

APPENDIX 4

INSTRUCTIONS FOR USE—USING THE AN-M103A1 FUZE

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Introduction

1. The AN-M103A1 fuze (which is fully described in A.P.1661C, Vol. I, Sect. 5, Chap. 11) may be used for the nose fuzing of either the AN-M57, or AN-M57A1 250 lb. G.P. bomb. As the fuze is selective, giving either an instantaneous or 0T sec. delay action, it may be used to provide a 0T sec. delay action "insurance" fuze when a bomb is tail fuzed with an AN-M100 series fuze or, when necessary, as an alternative to the No. 52 nose pistol (with the exploder adapter, No. 1, Mk. I); the fuze, in this instance, being set for instantaneous action.

2. As the fuze incorporates a mechanical delay in its arming mechanism, it requires certain minimum heights of bomb release to ensure that the fuze is fully armed prior to impact of the fuzed bomb with its target. These minimum heights of bomb release are promulgated to the Units concerned through the normal channels.

Note.—Partial pre-arming of the fuze is not to be undertaken in any circumstances whatsoever.

3. One No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips are required for use with the fuze.

Fuzing a bomb

4. Unscrew and remove the nose transit plug of the bomb and examine the fuze seat liner and its threads. Clean, where necessary, using a short length of wood stick.

5. Remove the fuze from its sealed container and check that the fuze is not partially or fully armed, as described in A.P.1661C, Vol. I, Sect. 5, Chap. 11. Also examine the fuze for signs of damage or corrosion (appearing as a white deposit), or for traces of moisture on the vane cup which houses the reduction gear train.

6. Cut and remove the sealing wire threaded through the fuze vane and eyelet straps, and vane holder. Ensure that the split pin is threaded through the vane and eyelet straps, and then screw the fuze (less its arming vane), by hand, into the fuze seat liner of the bomb.

Note.—No tools are to be used when screwing home the fuze.

7. Insert the plain end of a No. 1 Mk. I safety wire through the adjacent holes in the uppermost pair of vane and eyelet straps, that is, through the pair of straps nearest in line with the single suspension lug of the bomb. The end of the wire should project about 3 in. beyond the straps. It is not essential that the pull-off of the safety wire be exactly in line with the suspension lug.

Note.—Should the holes in the uppermost pair of straps be occupied by the split pin, it is to be withdrawn, to allow for the insertion of the safety wire, but only after a second split pin has first been inserted through the second pair of holes in the straps.

8. Slip two No. 1 Mk. I safety clips over the end of the safety wire so that the inner clip is in light contact with the vane strap.

9. Fit the arming vane over the top of the fuze vane holder so that its two locating pins engage with the two holes in the vane holder. Ensure that the spring ring in the arming vane snaps into the circular groove in the top of the vane holder.

110. Set the fuze for instantaneous or 0-1 sec. delay action, as required. To do this, pull the setting pin outwards against the action of its spring and rotate the pin so that its peg engages with either the deep or shallow pair of slots, as appropriate. For *instantaneous* action the peg is to engage with the *shallow* slots, and for *delay* action, with the *deep* slots. A summary of these instructions is stamped on the fuze around the setting pin.

Note.—As supplied, the fuze is normally set for delay action.

Fitting the fin assembly

111. If the bomb is to be used nose fuze only, the fin assembly is to be attached to the bomb body as follows:—

- (i) Remove the transit wires securing the fin lock-nut to the tail end of the bomb body. Unscrew and remove the fin lock-nut and also remove the cardboard distance piece, if fitted.
- (ii) Offer up the fin assembly to the rear end of the bomb body so that the fins are at 45 deg. to the plane of the suspension lugs. This is required to ensure ease of stowage of the bomb in British aircraft.
- (iii) Secure the fin assembly in position by replacing and screwing down the fin lock-nut. The lock-nut is to be tightened, using a suitable tommy bar.

Loading a fuze bomb

112. With the single suspension lug of the bomb uppermost, load the fuze bomb on to its carrier in the normal manner, as described in the chapter of A.P. 1664, Vol. I, relevant to the carrier used.

113. When the bomb is securely attached to its carrier, attach the hook end of a standard flexible fuze-setting control link to the loop end of the safety wire threaded through the fuze. Insert the loop end of the fuze-setting control link into the E.M. fuze unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuze unit must *not* be positioned *vertically* above the fuze, but is to be moved inward towards the bomb suspension lug a *minimum* distance of 3 in. measured from the straps on the fuze, on similar lines to fig. 1 of Chap. 2. Preferably, however, the fuze unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier and on the position of the E.M. fuze unit, two or more fuze-setting control links, attached end to end, may be required.

114. Finally, withdraw the split pin from the vane and eyelet straps and hand it to the pilot or air bomber.

Unloading and unfuzing an unexpended bomb, and removing fin assembly

Warning.—Before unloading and unfuzing an unexpended bomb, examine the fuze to make certain that it is not partially or fully armed, as described in A.P. 1661C, Vol. I, Sect. 5, Chap. 111.

115. To obtain additional safety while unloading a bomb from its carrier, first insert, wherever possible, the split pin into the second pair of adjacent holes in the fuze vane and eyelet straps. Then disconnect the fuze-setting control link(s) from the E.M. fuze unit and unload the bomb from the carrier in the normal manner.

116. Having unloaded the bomb from the carrier, disconnect the fuze-setting control link(s) from the safety wire, *but do not withdraw the wire from the fuze*. Remove the arming vane from the fuze, ensure that the split pin is securely threaded through the vane and eyelet straps, and then unscrew and remove the fuze from the bomb by hand. Seal the nose of the bomb with its transit plug.

117. Remove the two safety clips from the safety wire and then withdraw the wire from the fuze. Inspect the fuze for damage and set it for delay action, as necessary. Return the fuze to its container and seal with adhesive tape. Mark the container for "FIRST ISSUE".

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must be discarded and not used again.

118. Having removed the fuze from the bomb, unscrew the fin lock-nut and remove the fin assembly. Fit the cardboard distance piece, if originally provided, round the external screw threads of the bomb filling plug, and then replace the fin lock-nut. Re-wire the lock-nut to the filling plug to prevent loss.

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ALIK
MINISTRY
February, 1945

This is A.L. No. 100 to A.P.1661B, Vol. I and concerns Sect. 17
(1) Remove and dispose of the existing Chapter 3 and Appendices 1
and B, and substitute therein Chapter 3 and the attached new
Appendices 1, 2, and 3.
When you have done this, make an entry in the Amendment Record
Sheet at the beginning of the book.

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CHAPTER 3

BOMBS, G.P., 500 lb., AN-M43, AN-M64, and AN-M64A1

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ARMAMENT

CHAPTER 3

BOMBS, G.P., 500 lb., AN-M43, AN-M64, and AN-M64A1

Introduction

1. These bombs, which have a charge/weight ratio similar to that of the 500 lb. M.C. bombs, are used for general bombardment purposes. They are similar in their general design, constructional and functioning characteristics, the AN-M43 differing in that it is not provided with a tail fuze adapter and the AN-M64A1 in that it is modified to ensure that, when fitted with a long delay fuze incorporating an anti-removal device, the fuze cannot be removed from the bomb in any circumstances whatsoever. The bombs are adapted for fuzeing at both the nose and the tail, and are fitted with twin suspension lugs for carriage on American shackles and racks. In addition, a single British type suspension lug is provided so that the bombs can be loaded on to standard British bomb carriers.

2. A British drum-type tail unit, the No. 54 Mk. I tail unit, which is fitted with an arming wire guide, is normally to be used with these bombs as it enables the bombs to be more economically stowed on British aircraft. Where, however, this tail unit is not available, the standard box type American fin assembly AN-M64, modified by the addition of a No. 4 Mk. I arming wire guide, may be used, *except* with the AN-M43 bomb.

Note.—When fitting a No. 54 Mk. I tail unit to an AN-M43 bomb, a No. 1 Mk. I adapter ring, fitted to the tail ring of the tail unit, is required to form a seating for the fin lock-mut of the bomb.

3. The bombs may be fuzeed with both British and American fuzeing components, as listed in para. 17. These components all require the use of the horizontal system of arming; that is, on release of a bomb from its carrier, arming is initiated by the horizontal pull-off of a safety wire threaded through the arming vane of the nose or tail fuzeing component.

BOMB, G.P., 500 lb., AN-M64

Leading particulars

Bomb body

| | |
|---|---|
| 4. Length (nose and tail transit plugs fitted) | 47.2 in. |
| Maximum diameter (excluding suspension lugs) | 14.1 in. |
| Nature and weight of filling | 236 lb. Amatol 50/50 with 24.4 lb. T.N.T. surrounds or 267 lb. cast T.N.T. |
| Total weight, fitted Amatol 50/50 | 494 lb. |
| Total weight, filled T.N.T. | 499 lb. |
| Terminal velocity | 1,310 ft. per sec. |

Tail, No. 54, Mk. I

| | |
|-------------------------|----------|
| 5. Length | 14 in. |
| Maximum diameter | 14.2 in. |

Fin assembly, AN-M64

| | |
|---|----------|
| 6. Length | 13.7 in. |
| Maximum diagonal width across fins | 18.9 in. |

The length of the bomb is approximately 58.8 in. when fitted with the No. 54 Mk. I tail unit and a No. 52 nose pistol.

General description, fig. 11 and 2

7. The bomb consists of a bomb body filled with high explosive and a detachable tail unit, or fin assembly, secured to the body by a fin lock-mut

Bomb body

8. The bomb body consists of a hollow steel casting open at both ends. The nose opening is closed by a fuze seat liner, the inner end of which engages with an auxiliary booster, set in the main explosive filling. The tail opening is closed by a filling plug screwed and cemented in position. Into this plug is screwed an M115 adapter booster which aligns with a second auxiliary booster. The adapter booster contains a solid C.E. pellet and is also provided with a fuze adapter. During transit and storage the fuze seat liner and fuze adapter are sealed by transit plugs seated on leather washers.

Note.—The fuze adapter may be unscrewed and removed from the M115 adapter booster, and is provided to enable certain alternative tail fuzes to be used with this bomb.

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9. The fin lock-nut, for use in securing the tail unit or fin assembly to the bomb body, is screwed to external threads on the filling plug. This lock-nut has four key holes and two short tommy bars or, alternatively, six key holes. During transit and storage it is wired to the filling plug to prevent loss.

Note.—Some bombs are provided with a cardboard distance piece (not shown in the illustrations) located between the fin lock-nut and the face of the filling plug. This distance piece protects the external screw threads on the filling plug during transit and storage.

10. Three suspension lugs are welded to the bomb body, two of the lugs being located diametrically opposite to the third lug. The single lug is for use when loading the bomb on to a standard British bomb carrier, the twin lugs being used with American shackles or racks. During transit and storage these lugs are protected against damage by two protecting rings locked round the bomb body. These rings are hinged, and are tightened on to the bomb body by bolts and nuts, as shown in fig. 2.

11. The bomb body is filled with either Amatol 50/50 or cast T.N.T. When filled with Amatol, the nose and tail ends of the body are sealed with thick pads of cast T.N.T.

Tail unit and fin assembly

12. The No. 54 Mk. I tail unit, which is supplied separately from the bomb body, consists of a tail ring to which a drum type cylindrical vane is attached by four vane supports. Extensions on these vane supports are riveted together to form a box support inside the tail unit. An arming wire guide is secured to a side of this box to provide a support for the No. 1 Mk. I safety wire which is used when the bomb is tail fuze. The AN-M64 fin assembly is of similar construction, having a tail ring to which four fins are attached. Extensions on these fins are riveted together to form the box portion of the assembly. A detachable No. 4 Mk. I arming wire guide is secured to a side of this box to provide a support for the safety wire.

Identification colouring and markings

13. The exterior of the bomb body is painted an olive drab colour. Three yellow bands are painted around the bomb body, located at the nose and tail ends, and at the centre of gravity of the bomb. The markings and information normally stencilled on the bomb body are shown in fig. 2. It should be noted that the markings and information given are all American and that some of the information does not apply when the bomb is issued for loading on to British aircraft.

14. The tail unit and fin assembly are similarly painted an olive drab colour, the tail unit having stencilled on it the following:—"No. 54 Mk. I".

Functioning

15. On "live" release of the fuze bomb from its carrier, the safety wire is withdrawn from the nose pistol and/or tail fuze by a fuze-setting control link, thus allowing the fuze components to become armed.

16. On impact of the fuze bomb with its target, the nose pistol and/or tail fuze initiates the explosive train in the bomb, thus detonating the main filling.

Instructions for use

17. The following alternative pistols and fuzes are used with this bomb:—

Nose

- | | | |
|---|---|----------------|
| (i) Pistol, bomb, D.A., No. 52, Mk. I | } | see Appendix 1 |
| (ii) Pistol, bomb, D.A., No. 52, Mk. II | | |

Tail

- | | | |
|-------------------------------------|---|-------------------------------------|
| (iii) Fuze, bomb, AN-M100A11 (tail) | } | see Appendix 2 |
| (iv) Fuze, bomb, AN-M101A22 (tail) | | |
| (v) Fuze, bomb, M113 (tail) | } | see Appendix 3 |
| (vi) Fuze, bomb, M113A11 (tail) | | |
| (vii) Fuze, bomb, M1124 (tail) | | |
| (viii) Fuze, bomb, M1124A11 (tail) | } | see Appendix 4 (To be issued later) |

These fuze components are fully described in A.P.1661C, Vol. I, Sect. 5. The detailed instructions for fuze a bomb with these components, together with the instructions for loading, unloading, and unfuze the fuze bomb, are given in the Appendices to this Chapter.

Supply

18. The AN-M64 500 lb. G.P. bomb body is supplied plugged at both the nose and the tail with transit plugs, and fitted with two protecting rings around the body to protect the suspension lugs. The stowage dimensions of the bomb body are 47.2 in. length, and 19.25 in. maximum diameter across the protecting rings. The stowage weight of the body is 510 lb. when filled Amatol 50/50 or 515 lb. when filled cast T.N.T.

Note.—Some bomb bodies may be supplied fitted with a cardboard distance piece to protect the external threads on the filling plug.

19. Two No. 54 Mk. I tail units, each complete with one wire, safety, No. 1, Mk. I, and two clips, safety, No. 1, Mk. I, are supplied in Container B.471, Mk. I. The wire and clips are secured to the tail with adhesive tape. The stowage dimensions of the container are 29 in. length and 14.4 in. diameter; its filled weight is 30 lb. The AN-M64 fin assembly, fitted with a No. 4 Mk. I arming wire guide, and complete with one No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips, is supplied packed singly in a metal crate. The fin assembly may also be supplied without the arming wire guide, safety wire, or clips, in which instance these items will be separately supplied. The stowage dimensions of the crate are 14 in. x 14.4 in. x 14.4 in.; its filled weight is 22.4 lb.

Storage

20. The bomb bodies are classified, for the purpose of storage, in Group 7, see A.P.2608A, Chap. 7. The tails or fin assemblies in their containers or crates, may be stored together with the bomb bodies but should be stacked well clear of the filled stores.

BOMB, G.P., 500 lb., AN-M64A1

Comparison with the AN-M64 500 lb. G.P. bomb

21. As stated in para. 1, the AN-M64A1 bomb is similar to the AN-M64 bomb. Attention is directed, therefore, to para. 1 to 20, as the information given in those paragraphs for the AN-M64 bomb applies equally to the AN-M64A1 bomb, *with the exception of the following differences:*—

- (i) The filling plug is positively locked in position at the rear end of the bomb body by two long studs screwed into the underside of the filling plug and "set" in the main filling.
- (ii) The fuze adapter and M115 adapter booster each have a hole drilled through its wall, these holes aligning with a blind hole in the wall of the filling plug. The holes are provided so that when a bomb is to be fuzed with a long delay fuze incorporating an anti-removal device, the adapter booster and fuze adapter, into which the fuze will be locked, may themselves be locked to the filling plug by a lock pin inserted through the hole in the fuze adapter and adapter booster to engage with the blind hole in the filling plug.

BOMB, G.P., 500 lb., AN-M43

Comparison with the AN-M64 500 lb. G.P. bomb

22. As stated in para. 1, the AN-M43 bomb is similar to the AN-M64 bomb. Attention is directed, therefore, to para. 1 to 20, as the information given in these paragraphs for the AN-M64 bomb applies equally to the AN-M43 bomb, *with the exception of the following differences:*—

- (i) An M102 adapter booster is screwed into the filling plug of the AN-M43 bomb. This adapter booster has a smaller diameter than the M115 adapter booster fitted into the AN-M64 bomb, and is not provided with a fuze adapter.
- (ii) The diameter of the fin lock-nut is less than that of the AN-M64 bomb and, therefore, a No. 1 Mk. I adapter ring, fitted to the tail ring of the No. 54 Mk. I tail unit, is required to provide a seating for the fin lock-nut when assembling the tail unit to the bomb body. This ring is normally supplied secured to the bomb filling plug by the fin lock-nut.
- (iii) An AN-M64 fin assembly cannot be fitted to the bomb body.

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APPENDIX 1

INSTRUCTIONS FOR USE—USING THE No. 52 PISTOL

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Introduction

1. The No. 52 Mk. I or II pistol, when used for the nose fuzing of either the AN-M43, AN-M64 or AN-M64A1 500 lb. G.P. bomb, is to be used in conjunction with a No. 1 Mk. I exploder adapter, and either a No. 52 Mk. II or III detonator. A No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips, which are supplied with the pistol, are also required.

Note.—The pistols and exploder adapter are described in Sect. 5 of A.P.1661C, Vol. I.

Fuzing a bomb

2. Before fuzing a bomb with a No. 52 pistol, examine the paper disc at the base of the pistol striker guide to check that this disc has not been pierced by the striker needle. If it is suspected that the disc has been punctured, *the pistol must not be used*, but is to be set aside for A.I.D./A.I.S. inspection. Also ensure that the pistol screw-threads are clear and that the leather washer is in position.

3. Unscrew and remove the nose transit plug from the bomb. Examine the threads of the fuze seat liner and clean where necessary.

4. Remove the No. 46 transit plug from a No. 1 Mk. I exploder adapter and gauge the detonator cavity of the exploder adapter using a No. 2 Mk. I detonator cavity gauge. The engraved line for 20/40 lb. bombs is applicable. Exploder adapters which fail to pass this test are not to be used, but are to be set aside for A.I.D./A.I.S. inspection.

5. Insert the exploder adapter into the fuze seat liner and screw home using a 1½ in. Whit. spanner, C-spanner, or other suitable tool. Ensure that the exploder adapter is securely locked in position by its fibre inserts.

6. Fit the small conical spring, supplied with the pistol, over the stem of a No. 52 Mk. II or III detonator, so that the small end of the spring abuts the underside of the detonator head. Then insert the detonator into the detonator cavity of the exploder adapter.

Note.—The conical spring must always be fitted, as it ensures that the detonator is in contact with the end of the striker guide when the pistol is screwed into the exploder adapter.

7. With the pistol locking nut screwed forward a few turns, screw the pistol, by hand, into the exploder adapter until it is well seated on its washer. Lock the pistol in position by screwing its locking nut hard on to the top of the exploder adapter.

Fitting the tail unit or fin assembly

8. If the bomb is to be used nose fuzed only, the tail unit, or fin assembly, is to be attached to the bomb body as follows:—

- (i) Remove the transit wires securing the fin lock-nut to the tail end of the bomb body. Unscrew and remove the fin lock-nut and also remove the cardboard distance piece and adapter ring if fitted.
- (ii) Offer up the tail unit, or fin assembly, to the rear end of the bomb body. With the fin assembly, the fins are to be at 45 deg. to the plane of the suspension lugs; this ensures ease of stowage of the bomb in British aircraft.
- (iii) Secure the tail unit, or fin assembly, in position by replacing and screwing down the fin lock-nut. The lock-nut is to be tightened using a suitable short tommy bar.

Notes.—(i) The AN-M64 fin assembly cannot be fitted to the AN-M43 bomb body.

- (ii) When fitting a No. 54 tail unit to an AN-M43 bomb, a No. 1 Mk. I adapter ring must be placed over the tail ring of the tail unit, to provide a seating for the fin lock-nut, before this nut is replaced to secure the tail unit in position.

Loading a fuzed bomb

9. With the single suspension lug of the bomb uppermost, load the fuzed bomb on its carrier in the normal manner, as described in the chapter of A.P. 1664, Vol. I, relevant to the carrier used.

10. When the bomb is securely attached to its carrier, remove the safety pin from the pistol and rotate the safety cap just sufficiently to bring the hole in one of the arming vanes into line with the hole in the *uppermost* lug of the pistol locking nut.

Note.—The safety pin is to be handed to the pilot or air bomber.

11. Insert the plain end of a No. 1 Mk. I safety wire first through the hole in the lug of the locking nut and then through the arming vane hole until the end protrudes approximately 3 in., as shown in fig. 1 of Chap. 3. Slip two No. 1 Mk. I safety clips over the protruding end of the safety wire, so that the inner clip is in light contact with the pistol arming vane, see fig. 1 of Chap. 3.

Note.—It is not essential that the pull-off of the safety wire should be exactly in line with the bomb suspension lug.

12. Attach the hook end of a standard flexible fuze-setting control link to the loop end of the safety wire, and then insert the loop end of the link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzing unit must *not* be positioned vertically above the nose pistol, but must be moved inward towards the bomb suspension lug a *minimum* distance of 3 in., measured from the drilled lug on the pistol locking nut, as shown in fig. 1 of Chap. 3. Preferably, however, the fuzing unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier and on the position of the E.M. fuzing unit, two or more fuze-setting control links, attached end to end, may be required.

Unloading and unfuzing an unexpended bomb, and removing tail unit or fin assembly

13. Disconnect the fuze-setting control link from the E.M. fuzing unit and then unload the bomb from its carrier in the normal manner.

14. Having unloaded the bomb, remove the two safety clips from the end of the safety wire, and then withdraw this wire from the pistol.

15. Screw up the safety cap until the stop pins are engaged. With a Mk. I pistol, screw back the cap just sufficiently to bring its two safety pin holes into line with the slots cut in the top of the pistol body; then insert the safety pin. With a Mk. II pistol, the safety cap is to be screwed up until the stop pins prevent further movement. Then engage the U-shaped end of the safety pin with the hole in the arming vane which is opposite to the hole in the safety cap. Insert the plain end of the safety pin into the hole in the safety cap and then slowly unscrew the cap until this end of the safety pin drops into the groove in the pistol body.

Note.—If the safety pin does not engage with the groove in the pistol body within one complete revolution of the cap, the cause must be ascertained; for example, the plain end of the safety pin may be burred or distorted.

16. Disconnect the fuze-setting control link (or links) from the safety wire, and return the wire to its box.

Note.—Should the safety wire be kinked, bent or otherwise distorted or damaged, it must *not* be used again. Such a wire is to be discarded and not returned to its box.

17. To unfuze the bomb, proceed as follows:—

- (i) Slacken back the pistol locking nut.
- (ii) Unscrew and remove the pistol by hand.
- (iii) Extract the detonator using an extractor, detonator, No. 2, Mk. I.
- (iv) Remove the conical spring from the detonator stem, or from the exploder adapter, and return it to its linen bag.
- (v) Seal the exploder adapter with its No. 46' transit plug.

18. Having unfuzed the bomb, remove the tail unit, or fin assembly, as follows:—

- (i) Unscrew and remove the fin lock-nut from the rear end of the bomb body.
- (ii) Detach the tail unit, or fin assembly, from the bomb body.
- (iii) If originally fitted, replace the cardboard distance piece and adapter ring, and then replace the fin locknut and wire it in position to prevent loss.
- (iv) Return the tail unit, or fin assembly, to its container or crate, as applicable.

19. Suitably mark the bomb at its nose end as "EXPLODERED" and then return it to store, where it should be segregated for use as soon as possible.

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APPENDIX 2

INSTRUCTIONS FOR USE—USING THE AN-M101A1 or AN-M101A2 FUZE

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Introduction

1. The AN-M43, AN-M64, and AN-M64A1 500 lb. G.P. bombs may be fuzed at the tail with either the AN-M101A1 or AN-M101A2 tail fuze. These fuzes (which are fully described in A.P.1661C, Vol. I, Sect. 5) are fitted with the M14 series of primer detonators, which are interchangeable, and may thus be used to provide a non-delay, 0-01 sec., 0-025 sec., or 0-1 sec. delay action as required.

2. As these fuzes also incorporate a mechanical arming delay, they require certain minimum heights of bomb release to ensure that they are fully armed prior to impact with the target. These minimum heights of release are promulgated to the Units concerned through the normal channels.

Note.—The AN-M101A1 fuze may, if authorized, be partially pre-armed before take-off. *Partial pre-arming of the AN-M101A2 fuze is not to be undertaken in any circumstances whatsoever.*

3. A No. 54 Mk. I tail unit, incorporating an arming wire guide, is normally to be used with these bombs. Where, however, this tail unit is not available, a standard fin assembly AN-M64, modified by the addition of a No. 4 Mk. I arming wire guide, may be used, except with the AN-M43 bomb, to which the fin assembly cannot be fitted.

Note.—When the tail unit is fitted to an AN-M43 bomb, a No. 1 Mk. I adapter ring is required to form a seating for the fin lock-nut of the bomb.

4. A No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips are required when fuzing a bomb with either of these fuzes. The wire and clips are normally supplied with the tail unit or fin assembly, but may also be issued as separate items.

Fitting the tail unit or fin assembly

5. The tail unit, or fin assembly, is to be attached to the bomb body before fuzing is commenced. The procedure to be adopted is detailed in the following para. 6 to 9.

6. Remove the tail unit, or fin assembly, from its container or crate. If a fin assembly is being used, ascertain whether or not a No. 4 Mk. I arming wire guide is fitted. Where the arming wire guide is not fitted, proceed as follows:—

- (i) Hook the two halves of the arming wire guide to one of the four sides of the box portion of the fin assembly so that the bracket of the arming wire guide projects into the fin assembly.
- (ii) Rigidly secure the arming wire guide to the fin assembly by tightening the nut on the coupling screw.

7. Remove the transit wires securing the fin lock-nut to the tail end of the bomb body. Then unscrew and remove the nut and also, if fitted, the cardboard distance piece and adapter ring.

8. Partially unscrew the tail transit plug from the bomb body.

9. Offer up the tail unit, or fin assembly, to the rear end of the bomb body so that the arming wire guide is in line with the single suspension lug of the bomb, as shown in fig. 1 of Chap. 3. Secure the tail unit, or fin assembly, in this position with the fin lock-nut, which is to be tightened using a short tommy bar.

Note.—When fitting the tail unit to an AN-M43 bomb, the No. 1 Mk. I adapter ring must be placed over the tail ring of the tail unit to provide a seating for the fin lock-nut before this nut is screwed down to secure the tail unit in position.

Fuzing a bomb

10. With the tail unit, or fin assembly, fitted to the bomb body, completely unscrew the tail transit plug and examine the screw threads of the fuze adapter or, as appropriate, of the M102 adapter booster. Clean these threads where necessary. Ensure that the fuze adapter or, as applicable, the M102 adapter booster is securely positioned in the bomb body.

11. Remove the fuze from its sealed container, and examine and test the fuze as follows:—
- (i) Examine the fuze to ascertain that it is not partially or fully armed, as described in A.P. 1661C, Vol. I, Sect. 5, Chap. 2.
 - (ii) Examine the fuze for signs of external damage, corrosion (appearing as a white deposit on the fuze), or for traces of moisture on the arming stem cup which houses the reduction gear train.
 - (iii) Test the fuze to ensure that the stationary gear, in the reduction gear train, is locked. To do this grip the top of the fuze (that is, the lock-nut and adjusting nut) and, using finger pressure only, rotate the arming stem. A movement up to $\frac{1}{16}$ in. is normally possible due to manufacturing tolerances, but should the arming stem rotate through 90 deg. or more the stationary gear is *not* locked and the fuze must *not* be used.

Having examined and tested the fuze, change the M14 primer detonator if necessary. It should be noted that the fuzes are normally supplied fitted with the 0.025 sec. delay version of the M14 primer detonator. If it is required to change the primer detonator, unscrew it from the base of the fuze, by hand, and then screw in the appropriate M14 primer detonator giving the delay selected. Force must *not* be used in these operations, and should a primer detonator show signs of external corrosion or other damage, or should its primer be a loose fit, *it must not be used*.

Notes.—(i) The primer detonator giving the required delay may be identified by its delay time which is stamped on the head of the primer detonator body. In addition, the head of the non-delay primer detonator is painted white, that of the 0.1 sec. delay, black, whilst the 0.01 sec. and 0.025 sec. delay versions have, respectively, a $\frac{1}{8}$ and a $\frac{1}{4}$ sector of the head painted black.

(ii) Long delay primer detonators of the M16 series cannot be used with these fuzes.

Warnings.—(i) Care must be taken when handling either a primer detonator, or a fuze containing a primer detonator, as the primer component is partially exposed in the top of the primer detonator body.

(ii) Should a fuze be dropped or accidentally knocked, it must be carefully examined externally to ensure that no damage has been sustained.

12. Withdraw the split pin from the body of the fuze and then screw the fuze (less its arming vane) by hand into the rear end of the bomb body.

13. Thread the plain end of a No. 1 Mk. I safety wire first through the arming wire guide on the tail unit, or fin assembly, and then through the uppermost pair of adjacent holes in the fuze arming stem cup and eyelet strap, on the lines indicated in fig. 1 of Chap. 3. The safety wire holes in the fuze need not be exactly in line with the arming wire guide.

Note.—Should the uppermost pair of adjacent holes be occupied by the fuze safety pin, this pin is to be removed, to allow for insertion of the safety wire, *but only after* a second safety pin has first been inserted through the second pair of adjacent holes in the arming stem cup and eyelet strap of the fuze.

14. Having inserted the safety wire, cut the sealing wire threaded through the safety pin and then remove the pin. Thread the plain end of the safety wire through one of the holes in the arming vane blades and at the same time slip the arming vane over the end of the fuze so that the grooves in the arming vane assembly engage with the two locating pins on the fuze. Lock the arming vane to the fuze by screwing down the vane nut, hand tight.

Note.—The safety pin and its sealing wire, together with the split pin (see para. 12), are to be handed to the pilot or air bomber.

15. Adjust the safety wire to protrude approximately 3 in. beyond the fuze arming vane, on the lines indicated in fig. 1 of Chap. 3, and then slip two No. 1 Mk. I safety clips over the end of the wire so that the inner clip is in light contact with the arming vane blade.

Loading a fuzed bomb

16. With the single suspension lug uppermost, load the fuzed bomb on to its carrier in the normal manner as described in the chapter of A.P. 1664, Vol. I, relevant to the carrier used.

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17. When the bomb is securely attached to its carrier, attach the hook end of a link, fuze-setting control, Type E.M., flexible, adjustable, to the loop end of the safety wire threaded through the fuze. Insert the loop end of the fuze-setting control link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzing unit must *not* be located *vertically* above the head of the tail fuze, but is to be positioned inward towards the bomb suspension lug a *minimum* distance of 3 in., measured from the arming wire guide on the tail unit or fin assembly, as shown in fig. 11, Chap. 3. Preferably, however, the fuzing unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier and on the position of the E.M. fuzing unit, two or more fuze-setting control links, attached end to end, may be required.

Unloading and unfuzing an unexpended bomb, and removal of tail unit or fin assembly

Warning.—Before unloading and unfuzing an unexpended bomb, examine the fuze to make certain that it is not partially or fully armed, as detailed in A.P.1661C, Vol. I, Sect. 5, Chap. 2.

18. Disconnect the fuze-setting control link from the carrier E.M. fuzing unit and unload the bomb from the carrier in the normal manner.

19. Having unloaded the bomb from its carrier, remove the two safety clips from the safety wire, *but do not withdraw this wire from the fuze.* Unscrew the vane nut from the end of the fuze and remove the arming vane.

20. Insert the safety pin through the second pair of adjacent holes in the arming stem cup and eyelet strap of the fuze, and secure it in position with its sealing wire. Then withdraw the safety wire from the fuze and arming wire guide. Unhook the fuze-setting control link(s) from the safety wire.

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must be discarded and *not* used again.

21. Unscrew and remove the fuze, by hand, from the rear end of the bomb body and *immediately* replace the split pin through the body of the fuze. Return the fuze to its container and seal with adhesive tape.

22. Having removed the fuze from the bomb, unscrew the fin lock-nut and remove the tail, or fin assembly. Fit the cardboard distance piece, if originally provided, round the external screw threads of the filling plug and then replace the fin lock-nut and, where applicable, the No. 1 Mk. I adapter ring. Re-wire the nut to the filling plug to prevent loss.

23. Close the rear end of the bomb body with its transit plug.

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APPENDIX 3

INSTRUCTIONS FOR USE—USING THE M113 or M113A1 FUZE

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Introduction

1. Either the M113 or the M113A1 fuze (which are fully described in A.P.1661C, Vol. I, Sect. 5) can be used for the tail fuzing of the AN-M43, AN-M64, or AN-M64A1 500 lb. G.P. bomb. These fuzes, which do not incorporate a mechanical delay in their arming mechanism, are fitted with primer detonators of the M16 series, which provide either a 4 to 5 sec. or 8 to 11 sec. delay.

2. A British No. 54 Mk. I tail unit, which incorporates an arming wire guide, is normally to be used with these bombs when they are loaded on to standard British type bomb carriers. When this tail unit is fitted to the AN-M43 bomb, a No. 1 Mk. I adapter ring is required to form a seating for the fin lock-nut of the bomb.

Note.—If a No. 54 tail unit is not available, a standard American fin assembly AN-M64, modified by the addition of a No. 4 Mk. I arming wire guide may be used with the AN-M64 or AN-M64A1 bomb. The fin assembly cannot be used with the AN-M43 bomb.

3. A No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips are required when fuzing a bomb with either of these fuzes. The safety wire and safety clips, and where applicable the arming wire guide, are normally supplied with the tail unit or fin assembly. Where this is not so, the safety wires, clips, and guides are supplied as separate items.

Fitting the tail unit or fin assembly

4. The tail unit, or fin assembly, is to be attached to the bomb body before fuzing is commenced. The procedure to be adopted is detailed in the following para. 5 to 8.

5. Remove the tail unit, or fin assembly, from its container or crate. If a fin assembly is being used, ascertain whether or not a No. 4 Mk. I arming wire guide is fitted. Where the arming wire guide is not fitted, proceed as follows:—

- (i) Hook the two halves of the arming wire guide to one of the four sides of the box portion of the fin assembly so that the bracket of the arming wire guide projects into the fin assembly.
- (ii) Rigidly secure the arming wire guide to the fin assembly by tightening the nut on the coupling screw.

6. Remove the transit wires securing the fin lock-nut to the rear end of the bomb body, and then unscrew and remove the nut and also, if fitted, the cardboard distance piece and adapter ring.

7. Partially unscrew the tail transit plug from the bomb body.

8. Offer up the tail unit (or fin assembly) to the rear end of the bomb body, so that the arming wire guide is in line with the single suspension lug of the bomb, as shown in fig. 1 of Chap. 3. Secure the tail unit (or fin assembly) in this position with the fin lock-nut, which is to be tightened, using a suitable tommy bar.

Note.—When fitting the No. 54 tail unit to an AN-M43 bomb, a No. 1, Mk. I adapter ring must be placed over the tail ring of the tail unit to provide a seating for the fin lock-nut, before this nut is replaced to secure the tail unit in position.

Fuzing a bomb

9. With the tail unit (or fin assembly) fitted to the bomb body, completely unscrew and remove the tail transit plug and examine the screw-threads of the fuze adapter or, as appropriate, of the M102 adapter booster. Clean these threads where necessary, and ensure that the fuze adapter, or M102 adapter booster, is securely positioned in the bomb body.

10. Remove the fuze from its sealed container and examine it for external damage and for corrosion (appearing as a white deposit). Check that the fuze is not partially or fully armed, as detailed in A.P.1661C, Vol. I, Sect. 5, Chap. 3.

11. Carefully unscrew and remove the primer detonator from the base of the fuze, and then test the fuze to ensure that it is not partially uncocked, using a gauge, striker depth No. 16 Mk. I. To do this, insert the stem of the gauge into the base of the fuze; the head of the gauge should abut the base of the fuze. If this does not obtain and it is possible to "rock" the gauge whilst in the fuze, the fuze plunger and firing pin are partially uncocked and the fuze must *not* be used. In such circumstances the primer detonator must *not* be screwed back into the fuze.

Warning.—Great care must always be exercised when handling a primer detonator (or a fuze containing a primer detonator), particularly as the primer component is partially exposed in the top of the primer detonator body.

12. Having examined and gauged the fuze, fit the primer detonator giving the delay required; this may or may not be the one supplied in the fuze. Force must *not* be used in this operation, and should a primer detonator show signs of external corrosion or damage, or should its primer be a loose fit, *it must not be used*.

Notes.—(i) The M113 and M113A1 fuzes are normally supplied fitted with the 8 to 11 sec. delay version of the M16 or M16A1 primer detonator.

(ii) The M16 and M16A1 primer detonators are identifiable by their milled and grooved heads. The 4 to 5 sec. and 8 to 11 sec. delay versions of these primer detonators are distinguishable by the delay times which are marked in two places on their heads. The delay times are also clearly marked on the cylinders in which the primer detonators are packed.

(iii) The M16 primer detonator may be used with either the M113 or M113A1 fuze. The M16A1 primer detonator is for use only with the M113A1 fuze. Short delay primer detonators of the M14 series cannot be used with either of these fuzes.

(iv) Should the fuze be dropped or accidentally knocked at any time, it must be carefully examined externally to ensure that no damage has been sustained.

13. Having fitted the required primer detonator, remove the "special instructions" tablet from the fuze arming stem tube and screw the fuze (less its arming vane), by hand, into the rear end of the bomb body.

14. Thread the plain end of a No. 1 Mk. I safety wire first through the arming wire guide on the tail unit (or fin assembly) and then through the uppermost pair of adjacent holes in the stem cup and circular plate of the fuze, as shown in fig. 1 of Chap. 3. It is not essential for the safety wire holes in the fuze to be exactly in line with the arming wire guide,

Note.—Should the uppermost pair of adjacent holes be occupied by the fuze safety pin, the pin is to be removed, to allow insertion of the safety wire, *but only after* a second safety pin has first been inserted through the second pair of adjacent holes.

15. Having inserted the safety wire, cut the sealing wire threaded through the safety pin and remove the pin. Thread the plain end of the safety wire through the hole in one of the arming vane blades, and at the same time slip the arming vane over the head of the fuze so that the grooves in the arming vane assembly engage with the two locating pins on the fuze. Lock the arming vane to the fuze by screwing down the knurled vane nut, hand tight.

16. Adjust the safety wire to protrude approximately 3 in. beyond the fuze arming vane, as shown in fig. 1 of Chap. 3, and then slip two No. 1, Mk. I safety clips over the end of the wire so that the inner clip is in light contact with the arming vane blade.

Note.—The safety pin and its sealing wire are to be handed to the pilot or air bomber.

Loading a fuzed bomb

17. With the single suspension lug uppermost, load the fuzed bomb on to its carrier in the normal manner, as described in the Chapter of A.P.1664, Vol. I, relevant to the carrier used.

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18. When the bomb is securely attached to the carrier, attach the hook end of a link, fuze-setting control, Type E.M., flexible, adjustable, to the loop end of the safety wire threaded through the fuze. Insert the loop end of the fuze-setting control link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzing unit must *not* be located *vertically* above the head of the tail fuze, but is to be moved inward towards the bomb suspension lug a *minimum* distance of 3 in., measured from the arming wire guide on the tail unit (or fin assembly) as shown in fig. 1 of Chap. 3. Preferably, however, the fuzing unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier, and on the position of the E.M. fuzing unit, two or more fuze-setting control links, attached end to end, may be required.

Unloading and unfuzing an unexpended bomb, and removal of tail unit or fin assembly

Warning.—Before unloading and unfuzing an unexpended bomb, examine the fuze to make certain that it is not partially or fully armed, as detailed in A.P.1661C, Vol. I, Sect. 5, Chap. 3.

19. Disconnect the fuze-setting control link from the carrier E.M. fuzing unit and unload the bomb from the carrier in the normal manner.

20. Having unloaded the bomb from its carrier, remove the two safety clips from the safety wire, *but do not withdraw this wire from the fuze*. Unscrew the knurled vane nut from the head of the fuze and remove the arming vane.

21. Insert the safety pin through the second pair of adjacent holes in the stem cup and circular plate of the fuze and secure it in position with the sealing wire. Then withdraw the safety wire from the fuze and arming wire guide. Unhook the fuze-setting control link(s) from the safety wire.

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must be discarded and not used again.

22. Unscrew and remove the fuze, by hand, from the rear end of the bomb body, return the fuze to its container and re-seal the container with adhesive tape.

23. Having removed the fuze from the bomb, unscrew the fin lock-nut and remove the tail unit (or fin assembly). Fit the cardboard distance piece and adapter ring, if originally provided, round the external screw threads of the bomb filling plug and replace the fin lock-nut. Re-wire the nut to the filling plug to prevent loss.

24. Close the rear end of the bomb body with its transit plug.

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APPENDIX 4

Instructions for use—using the AN-M103A1 fuze

(A.L.121)

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Introduction

1. The AN-M103A1 fuze (which is fully described in A.P.1661C, Vol. I, Sect. 5, Chap. 11) may be used for the nose fuzing of either the AN-M43, AN-M64 or AN-M64A1 500 lb. G.P. bomb. As the fuze is selective, giving either an instantaneous or 0.1 sec. delay action, it may be used to provide a 0.1 sec. delay action "insurance" fuze when a bomb is tail fuzed with an AN-M101 series fuze or, when necessary, as an alternative to the No. 52 nose pistol (with the exploder adapter, No. 1, Mk. I); the fuze, in this instance, being set for instantaneous action.

2. As the fuze incorporates a mechanical delay in its arming mechanism, it requires certain minimum heights of bomb release to ensure that the fuze is fully armed prior to impact of the fuzed bomb with its target. These minimum heights of bomb release are promulgated to the Units concerned, through the normal channels.

Note.—Partial pre-arming of the fuze is not to be undertaken in any circumstances whatsoever.

3. One No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips are required for use with the fuze.

Fuzing a bomb

4. Unscrew and remove the nose transit plug of the bomb and examine the fuze seat liner and its threads. Clean, where necessary, using a short length of wood stick.

5. Remove the fuze from its sealed container and check that the fuze is not partially or fully armed, as described in A.P.1661C, Vol. I, Sect. 5, Chap. 11. Also examine the fuze for signs of damage or corrosion (appearing as a white deposit), or for traces of moisture on the vane cup which houses the reduction gear train.

6. Cut and remove the sealing wire threaded through the fuze vane and eyelet straps, and vane holder. Ensure that the split pin is threaded through the vane and eyelet straps, and then screw the fuze (less its arming vane), by hand, into the fuze seat liner of the bomb.

Note.—No tools are to be used when screwing home the fuze.

7. Insert the plain end of a No. 1 Mk. I safety wire through the adjacent holes in the uppermost pair of vane and eyelet straps, that is, through the pair of straps nearest in line with the single suspension lug of the bomb. The end of the wire should project about 3 in. beyond the straps. It is not essential that the pull-off of the safety wire be exactly in line with the suspension lug.

Note.—Should the holes in the uppermost pair of straps be occupied by the split pin, it is to be withdrawn, to allow for the insertion of the safety wire, but only after a second split pin has first been inserted through the second pair of holes in the straps.

8. Slip two No. 1 Mk. I safety clips over the end of the safety wire so that the inner clip is in light contact with the vane strap.

9. Fit the arming vane over the top of the fuze vane holder so that its two locating pins engage with the two holes in the vane holder. Ensure that the spring ring in the arming vane snaps into the circular groove in the top of the vane holder.

10. Set the fuze for instantaneous or 0.1 sec. delay action, as required. To do this, pull the setting pin outwards against the action of its spring and rotate the pin so that its peg engages with either the deep or shallow pair of slots, as appropriate. For *instantaneous* action the peg is to engage with the *shallow* slots, and for *delay* action, with the *deep* slots. A summary of these instructions is stamped on the fuze around the setting pin.

Note.—As supplied, the fuze is normally set for delay action.

Fitting the tail unit or fin assembly

11. If the bomb is to be used nose fuze only, the tail unit, or fin assembly, is to be attached to the bomb body as follows:—

- (i) Remove the transit wires securing the fin lock-nut to the tail end of the bomb body. Unscrew and remove the fin lock-nut and also remove the cardboard distance piece, if fitted.
- (ii) Offer up the tail unit, or fin assembly, to the rear end of the bomb body. With the fin assembly, the fins are to be at 45 deg. to the plane of the suspension lugs; this ensures ease of stowage of the bomb in British aircraft.
- (iii) Secure the tail unit, or fin assembly, in position by replacing and screwing down the fin lock-nut. The lock-nut is to be tightened, using a suitable tommy bar.

Notes.—(i) The AN-M64 fin assembly cannot be fitted to the AN-M43 bomb body.

- (ii) When fitting a No. 54 tail unit to an AN-M43 bomb, a No. 1 Mk. I adapter ring must be placed over the tail ring of the tail unit, to provide a seating for the fin lock-nut, before this nut is replaced to secure the tail unit in position.

Loading a fuze bomb

12. With the single suspension lug of the bomb uppermost, load the fuze bomb on to its carrier in the normal manner, as described in the chapter of A.P.1664, Vol. I, relevant to the carrier used.

13. When the bomb is securely attached to its carrier, attach the hook end of a standard flexible fuze-setting control link to the loop end of the safety wire threaded through the fuze. Insert the loop end of the fuze-setting control link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzing unit must *not* be positioned *vertically* above the fuze, but is to be moved inward towards the bomb suspension lug a *minimum* distance of 3 in. measured from the straps on the fuze, on similar lines to fig. 1 of Chap. 3. Preferably, however, the fuzing unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier and on the position of the E.M. fuzing unit, two or more fuze-setting control links, attached end to end, may be required.

14. Finally, withdraw the split pin from the vane and eyelet straps and hand it to the pilot or air bomber.

Unloading and unfuzing an unexpended bomb, and removing tail unit or fin assembly

Warning.—Before unloading and unfuzing an unexpended bomb, examine the fuze to make certain that it is not partially or fully armed, as described in A.P.1664C, Vol. I, Sect. 5, Chap. 11.

15. To obtain additional safety while unloading a bomb from its carrier, first insert, wherever possible, the split pin into the second pair of adjacent holes in the fuze vane and eyelet straps. Then disconnect the fuze-setting control link(s) from the E.M. fuzing unit and unload the bomb from the carrier in the normal manner.

16. Having unloaded the bomb from the carrier, disconnect the fuze-setting control link(s) from the safety wire, *but do not withdraw the wire from the fuze*. Remove the arming vane from the fuze, ensure that the split pin is securely threaded through the vane and eyelet straps, and then unscrew and remove the fuze from the bomb by hand. Seal the nose of the bomb with its transit plug.

17. Remove the two safety clips from the safety wire and then withdraw the wire from the fuze. Inspect the fuze for damage and set it for delay action, as necessary. Return the fuze to its container and seal with adhesive tape. Mark the container for "FIRST ISSUE".

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must be discarded and not used again.

18. Having removed the fuze from the bomb, unscrew the fin lock-nut and remove the tail unit, or fin assembly, as appropriate. Fit the cardboard distance piece, if originally provided, round the external screw threads of the bomb filling plug, and then replace the fin lock-nut. Re-wire the lock-nut to the filling plug to prevent loss.

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CHAPTER 4

BOMBS, G.P., 1,000 lb., AN-M44, AN-M65, and AN-M65A1

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- APPENDIX 4.—Instructions for use—using the M125 or M125A1 fuze (*To be issued later*)

REMOVE AND USE INSTEAD OF THE EXISTING CHAPTER 4 AND APPENDICES 1 AND 2, AND SUBSTITUTE THIS NEW CHAPTER 4 AND THE ATTACHED NEW APPENDICES 1, 2 AND 3.
 When you have done this, make an entry in the Amendment Record Sheet at the beginning of the Book.

(For official use only)



CHAPTER 4

BOMBS, G.P., 1,000 lb., AN-M44, AN-M65, and AN-M65A1

Introduction

1. These bombs, which have a charge/weight ratio similar to that of the 1,000 lb. M.C. bombs, are used for general bombardment purposes. They are similar in their general design, constructional and functioning characteristics, the AN-M44 differing in that it is not provided with a tail fuze adapter and the AN-M65A1 in that it is modified to ensure that, when fitted with a long delay fuze incorporating an anti-removal device, the fuze cannot be removed from the bomb in any circumstances whatsoever. The bombs are adapted for fuzing at both the nose and the tail, and are fitted with twin suspension lugs for carriage on American shackles and racks. In addition, a single British type suspension lug is provided so that the bombs can be loaded on to standard British bomb carriers.

2. A British drum-type tail unit, the No. 55 Mk. I tail unit, which incorporates an arming wire guide, is normally to be fitted to the AN-M65 and AN-M65A1 bomb bodies. Where, however, this tail unit is not available, the standard American box type fin assembly AN-M65, modified by the addition of a No. 5 Mk. I arming wire guide, may be used as an alternative. With the AN-M44 bomb body the fin assembly AN-M44, modified by the addition of a No. 5 Mk. I arming wire guide, is normally to be used, but in an emergency the No. 55 tail unit may be substituted. When using this tail unit with the AN-M44 bomb body a No. 1 Mk. I adapter ring is required to form a seating for the fin lock-nut of the bomb.

Note.—The AN-M44 and AN-M65 fin assemblies are not interchangeable.

3. The bombs may be fuzed with both British and American fuzing components, as listed in para. 17. These components all require the use of the horizontal system of arming; that is, on release of a bomb from its carrier, arming is initiated by the horizontal pull-off of a safety wire threaded through the arming vane of the nose or tail fuzing component.

BOMB, G.P., 1,000 lb., AN-M65

Leading particulars

Bomb body

| | |
|---|---|
| 4. Length (nose and tail transit plugs fitted) | 53.3 in. |
| Maximum diameter (excluding suspension lugs) | 18.6 in. |
| Nature and weight of filling | 489 lb. Amatol 50/50, with 39 lb. T.N.T. surrounds or 558.3 lb. cast T.N.T. |
| Total weight, filled Amatol 50/50 | 970 lb. |
| Total weight, filled T.N.T. | 998 lb. |
| Terminal velocity | 1,385 ft. per sec. |

Tail, No. 55, Mk. I

| | |
|-------------------------|-----------|
| 5. Length | 18.85 in. |
| Maximum diameter | 18.88 in. |

Fin assembly, AN-M65

| | |
|---|-----------|
| 6. Length | 18.88 in. |
| Maximum diagonal width across fins | 23.44 in. |

The length of the bomb is approximately 69 in. when fitted with the No. 55 Mk. I tail unit and a No. 52 nose pistol.

General description, fig. 1 and 2

7. The bomb consists of a bomb body filled with high explosive and a detachable tail unit, or fin assembly, secured to the body by a fin lock-nut.

Bomb body

8. The bomb body consists of a hollow steel casting, open at both ends. The nose opening is closed by a fuze seat liner, the inner end of which engages with an auxiliary booster, set in the main explosive filling. The tail opening is closed by a filling plug screwed and cemented in position. Into this plug is screwed an M115 adapter booster, which aligns with a second auxiliary booster.

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The adapter booster contains a solid C.E. pellet, and is also provided with a fuze adapter. During transit and storage the fuze seat liner and fuze adapter are sealed by transit plugs seated on leather washers.

Note.—The fuze adapter may be unscrewed and removed from the M115 adapter booster, and is provided to enable certain alternative tail fuzes to be used with this bomb.

9. The fin lock-nut, for use in securing the tail unit, or fin assembly, to the bomb body, is screwed to external threads on the filling plug. This lock-nut has four key holes and two short tommy bars, or alternatively, six key holes. During transit and storage it is wired to the filling plug to prevent loss.

Note.—Some bombs are provided with a cardboard distance piece (not shown in the illustrations) located between the fin lock-nut and the face of the filling plug. This distance piece protects the external screw threads on the filling plug during transit and storage.

10. Three suspension lugs are welded to the bomb body, two of the lugs being located diametrically opposite to the third lug. The single lug is for use when loading the bomb on to a standard British bomb carrier, the twin lugs being used with American shackles or racks. During transit and storage these lugs are protected against damage by two protecting rings locked round the bomb body. These rings are hinged, and are tightened on to the bomb body by bolts and nuts, as shown in fig. 2.

11. The bomb body is filled with either Amatol 50/50 or cast T.N.T. When filled Amatol, the nose and tail ends of the body are sealed with thick pads of cast T.N.T.

Tail unit and fin assembly

12. The No. 55 Mk. I tail unit, which is supplied separately from the bomb body, consists of a tail ring to which a drum-type cylindrical vane is attached by four vane supports. Extensions on these vane supports are riveted together to form a box support inside the tail unit. An arming wire guide is secured to a side of this box to provide a support for the No. 1 Mk. I safety wire, which is used when the bomb is tail fuze. The AN-M65 fin assembly is of similar construction, having a tail ring to which four fins are attached. Extensions on these fins are riveted together to form the box portion of the assembly. A detachable No. 5 Mk. I arming wire guide is secured to a side of this box to provide a support for the safety wire.

Identification colouring and markings

13. The exterior of the bomb body is painted an olive drab colour. Three yellow bands are painted round the bomb body, located at the nose and tail ends, and at the centre of gravity of the bomb. The markings and information normally stencilled on the bomb body are shown in fig. 2. It should be noted that the markings and information are all American and that some of the information does not apply when the bomb is supplied for loading on to British aircraft.

14. The tail unit and fin assembly are similarly painted an olive drab colour, the tail unit having stencilled on it the following:—"No. 55 Mk. I".

Functioning

15. On "live" release of the fuzed bomb from its carrier, the safety wire is withdrawn from the nose pistol and/or tail fuze by a fuze-setting control link, thus allowing the fuzing components to become armed.

16. On impact of the fuzed bomb with its target, the nose pistol and/or tail fuze initiates the explosive train in the bomb, thus detonating the main filling.

Instructions for use

17. The following alternative pistols and fuzes are used with this bomb:—

Nose

- | | |
|---|------------------|
| (i) Pistol, bomb, D.A., No. 52, Mk. I | } See Appendix 1 |
| (ii) Pistol, bomb, D.A., No. 52, Mk. II | |
| (iii) Fuze, bomb, AN-M1103A1 (nose) |  | See Appendix 4 |

Tail

- | | |
|------------------------------------|------------------|
| (iv) Fuze, bomb, AN-M1102A1 (tail) | } See Appendix 2 |
| (v) Fuze, bomb, AN-M1102A2 (tail) | |
| (vi) Fuze, bomb, M1114 (tail) | } See Appendix 3 |
| (vii) Fuze, bomb, M1114A1 (tail) | |

(A.L. 122)

These fuze components are fully described in A.P. 1661C, Vol. I, Sect. 5. The detailed instructions for fuzeing a bomb with these components, together with the instructions for loading, unloading, and unfuzeing the fuzeed bomb, are given in the Appendices to this Chapter.

Supply

18. The AN-M65 1,000 lb. G.P. bomb body is supplied plugged at both the nose and the tail with transit plugs, and fitted with two protecting rings around the body to protect the suspension lugs. The stowage dimensions of the bomb body are 53.3 in. length, and 23.9 in. maximum diameter across the protecting rings. The stowage weight of the body is 994 lb. when filled Amatol 50/50, and 1,022 lb. when filled with cast T.N.T.

Note.—Some bomb bodies may be supplied fitted with a cardboard distance piece to protect the external threads on the filling plug.

19. One No. 55, Mk. I tail unit, complete with one wire, safety, No. 1, Mk. I, and two clips, safety, No. 1, Mk. I, is supplied in Container B.490, Mk. I. The wire and clips are secured to the tail with adhesive tape. The stowage dimensions of the container are 21 in. length and 20 in. diameter; its filled weight is 40 lb. The AN-M65 fin assembly, fitted with a No. 5, Mk. I arming wire guide and complete with one No. 1, Mk. I safety wire and two No. 1, Mk. I safety clips, is supplied packed in a metal crate. The fin assembly may also be supplied without an arming wire guide, safety wire or clips, in which instance these items will be separately supplied. The stowage dimensions of the crate are 18½ in. x 18½ in. x 19½ in. Its filled weight is 45½ lb.

Storage

20. The bomb bodies are classified, for the purpose of storage, in Group 7, see A.P. 2608A, Chap. 7. The tail units, or fin assemblies, in their containers or crates, may be stored together with the bomb bodies, but should be stacked well clear of the filled stores.

BOMB, G.P., 1,000 lb., AN-M65A1

Comparison with the AN-M65 1,000 lb. G.P. bomb

21. As stated in para. 1, the AN-M65A1 bomb is similar to the AN-M65 bomb. Attention is directed, therefore, to para. 1 to 20, as the information given in those paragraphs for the AN-M65 bomb applies equally to the AN-M65A1 bomb, *with the exception of the following differences:*—

- (i) The filling plug is positively locked in position at the rear end of the bomb body by two long studs screwed into the underside of the filling plug and "set" in the main filling.
- (ii) The fuze adapter and M115 adapter booster each have a hole drilled through its wall, these holes aligning with a blind hole in the wall of the filling plug. The holes are provided so that when a bomb is to be fitted with a long delay fuze incorporating an anti-removal device, the adapter booster and fuze adapter, into which the fuze will be locked, may themselves be locked to the filling plug by a lock pin inserted through the hole in the fuze adapter and adapter booster to engage with the blind hole in the filling plug.

BOMB, G.P., 1,000 lb., AN-M44

Comparison with the AN-M65 1,000 lb. G.P. bomb

22. As stated in para. 1, the AN-M44 bomb is similar to the AN-M65 bomb. Attention is directed, therefore, to para. 1 to 20, as the information given in those paragraphs for the AN-M65 bomb applies equally to the AN-M44 bomb, *with the exception of the following differences:*—

- (i) An M102 adapter booster is screwed into the filling plug of the AN-M44 bomb. This adapter booster has a smaller diameter than the M115 adapter booster fitted into the AN-M65 bomb, and is not provided with a fuze adapter.
- (ii) The diameter of the fin lock-nut is less than that of the AN-M65 bomb, and therefore a No. 1, Mk. I adapter ring, fitted to the tail ring of the No. 55 Mk. I tail unit, is required to provide a seating for the fin lock-nut when assembling the tail unit to the bomb body. *Note.*—This ring is normally supplied secured to the bomb filling plug by the fin lock-nut.
- (iii) An AN-M65 fin assembly cannot be fitted to the bomb body.

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APPENDIX 1

INSTRUCTIONS FOR USE—USING THE No. 62 PISTOL

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Introduction

1. The No. 52 Mk. I or II pistol, when used for the nose fuzing of either the AN-M44, AN-M65, or AN-M65A1 1,000 lb. G.P. bomb, is to be used in conjunction with a No. 1 Mk. I exploder adapter and either a No. 52 Mk. II or Mk. III detonator. A No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips, which are supplied with the pistol, are also required.

Note.—The pistols and exploder adapter are described in Sect. 5 of A.P.1661C, Vol. I.

Fuzing a bomb

2. Before fuzing a bomb with a No. 52 pistol, examine the paper disc at the base of the pistol striker guide to check that this disc has not been pierced by the striker needle. If it is suspected that the disc has been punctured, *the pistol must not be used*, but is to be set aside for A.I.D./A.I.S. inspection. Also ensure that the pistol screw-threads are clear and that the leather washer is in position.

3. Unscrew and remove the nose transit plug from the bomb. Examine the threads of the fuze seat liner and clean where necessary.

4. Remove the No. 46 transit plug from a No. 1 Mk. I exploder adapter and gauge the detonator cavity of the exploder adapter using a No. 2 Mk. I detonator cavity gauge. The engraved line for 20/40 lb. bombs is applicable. Exploder adapters which fail to pass this test are not to be used, but are to be set aside for A.I.D./A.I.S. inspection.

5. Insert the exploder adapter into the fuze seat liner and screw home, using a 1½ in. Whit. spanner, C-spanner, or other suitable tool. Ensure that the exploder adapter is securely locked in position by its fibre inserts.

6. Fit the small conical spring, supplied with the pistol, over the stem of a No. 52 Mk. II or III detonator, so that the small end of the spring abuts the underside of the detonator head. Then insert the detonator into the detonator cavity of the exploder adapter.

Note.—The conical spring must always be fitted, as it ensures that the detonator is in contact with the end of the striker guide when the pistol is screwed into the exploder adapter.

7. With the pistol locking nut screwed forward a few turns, screw the pistol, by hand, into the exploder adapter until it is well seated on its washer. Lock the pistol in position by screwing its locking nut hard on to the top of the exploder adapter.

Fitting the tail unit or fin assembly

8. If the bomb is to be used nose fuzed only, the tail unit, or fin assembly, is to be attached to the bomb body as follows:—

- (i) Remove the transit wires securing the fin lock-nut to the rear end of the bomb body. Unscrew and remove the fin lock-nut and also remove the cardboard distance piece and adapter ring, if fitted.
- (ii) Offer up the tail unit, or fin assembly, to the rear end of the bomb body. With the fin assembly, the fins are to be set at 45 deg. to the plane of the suspension lugs; this ensures ease of stowage of the bomb in British aircraft.
- (iii) Secure the tail unit, or fin assembly, in this position by replacing and screwing down the fin lock-nut. The lock-nut is to be tightened, using a suitable short tommy bar.

Notes.—(i) The AN-M65 fin assembly cannot be fitted to an AN-M44 bomb body.

- (ii) When fitting a No. 55 tail unit to an AN-M44 bomb body, a No. 1 Mk. I adapter ring must be placed over the tail ring of the tail unit, to provide a seating for the fin lock-nut, before this nut is replaced to secure the tail unit in position.

Loading a fuzed bomb

9. With the single suspension lug of the bomb uppermost, load the fuzed bomb on to its carrier in the normal manner, as described in the chapter of A.P. 11664, Vol. I, relevant to the carrier used.

10. When the bomb is securely attached to its carrier, remove the safety pin from the pistol and rotate the safety cap just sufficiently to bring the hole in one of the arming vanes into line with the hole in the uppermost lug of the pistol locking nut.

Note.—The safety pin is to be handed to the pilot or air bomber.

11. Insert the plain end of a No. 1 Mk. I safety wire first through the hole in the lug of the locking nut and then through the arming vane hole, until the end protrudes approximately 3 in., as shown in fig. 1 of Chap. 4. Slip two No. 1 Mk. I safety clips over the protruding end of the safety wire, so that the inner clip is in light contact with the pistol arming vane, see fig. 1 of Chap. 4.

Note.—It is not essential that the pull-off of the safety wire should be exactly in line with the bomb suspension lug.

12. Attach the hook end of a standard flexible fuze-setting control link to the loop end of the safety wire, and then insert the loop end of the link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzing unit must *not* be positioned vertically above the nose pistol, but must be moved inward towards the bomb suspension lug a minimum distance of 3 in., measured from the drilled lug on the pistol locking nut, as shown in fig. 1 of Chap. 4. Preferably, however, the fuzing unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier and on the position of the E.M. fuzing unit, two or more fuze-setting control links, attached end to end, may be required.

Unloading and unfuzing an unexpended bomb, and removal of tail unit or fin assembly

13. Disconnect the fuze-setting control link from the E.M. fuzing unit and then unload the bomb from its carrier in the normal manner.

14. Having unloaded the bomb, remove the two safety clips from the end of the safety wire, and then withdraw this wire from the pistol.

15. Screw up the safety cap until the stop pins are engaged. With a Mk. I pistol, screw back the cap just sufficiently to bring its two safety pin holes into line with the slots cut in the top of the pistol body; then insert the safety pin. With a Mk. II pistol, the safety cap is to be screwed up until the stop pins prevent further movement. Then engage the U-shaped end of the safety pin with the hole in the arming vane which is opposite to the hole in the safety cap. Insert the plain end of the safety pin into the hole in the safety cap and then slowly unscrew the cap until this end of the safety pin drops into the groove in the pistol body.

Note.—If the safety pin does not engage with the groove in the pistol body within one complete revolution of the cap, the cause must be ascertained; for example, the plain end of the safety pin may be burred or distorted.

16. Disconnect the fuze-setting control link (or links) from the safety wire, and return the wire to its box.

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must not be used again. Such a wire is to be discarded and *not* returned to its box.

17. To unfuze the bomb, proceed as follows:—

- (i) Slacken back the pistol locking nut.
- (ii) Unscrew and remove the pistol by hand.
- (iii) Extract the detonator using an extractor, detonator, No. 2, Mk. I.
- (iv) Remove the conical spring from the detonator stem, or from the exploder adapter, and return it to its linen bag.
- (v) Seal the exploder adapter with its No. 46 transit plug.

18. Having unfuzed the bomb, remove the tail unit, or fin assembly, as follows:—

- (i) Unscrew and remove the fin lock-nut from the rear end of the bomb body.
- (ii) Detach the tail unit, or fin assembly, from the bomb body.
- (iii) If originally fitted, replace the cardboard distance piece and adapter ring, and then replace the fin lock-nut and wire it in position to prevent loss.
- (iv) Return the tail unit, or fin assembly, to its container or crate, as applicable.

19. Suitably mark the bomb at its nose end as "EXPLODERED" and then return it to store, where it should be segregated for use as soon as possible.

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APPENDIX 2

INSTRUCTIONS FOR USE—USING THE AN-M102A1 or AN-M102A2 FUZE

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Introduction

1. The AN-M44, AN-M65, and AN-M65A1 1,000 lb. G.P. bombs may be fuzed at the tail with either the AN-M102A1 or AN-M102A2 tail fuze. These fuzes (which are fully described in A.P. 1661C, Vol. I, Sect. 5) are fitted with the M14 series of primer detonators, which are interchangeable, and may thus be used to provide a non-delay, 0-01 sec., 0-025 sec., or 0-1 sec. delay action as required.

2. As these fuzes also incorporate a mechanical arming delay, they require certain minimum heights of bomb release to ensure that they are fully armed prior to impact with the target. These minimum heights of release are promulgated to the Units concerned through the normal channels.

Note.—The AN-M102A1 fuze may, if authorized, be partially pre-armed before take-off. *Partial pre-arming of the AN-M102A2 fuze is not to be undertaken in any circumstances whatsoever.*

3. A No. 55 Mk. I tail unit, which incorporates an arming wire guide, is normally to be fitted to the AN-M65 and AN-M65A1 bomb bodies. Where, however, this tail unit is not available, the fin assembly AN-M65, modified by the addition of a No. 5 Mk. I arming wire guide, may be fitted as an alternative. With the AN-M44 bomb body, the fin assembly AN-M44, modified by the addition of a No. 5 Mk. I arming wire guide, is normally to be fitted, but in an emergency the No. 55 Mk. I tail unit may be substituted. When using this tail unit with the AN-M44 bomb body, a No. 1 Mk. I adapter ring is required to form a seating for the fin lock-nut of the bomb.

Note.—The AN-M44 and AN-M65 fin assemblies are not interchangeable.

4. A No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips are required when fuzing a bomb with either the AN-M102A1 or AN-M102A2 fuze. The safety wire and clips and, where applicable, the No. 5 Mk. I arming wire guide, are normally issued with the tail unit or fin assemblies. Where this is not so, the safety wires, clips and guides will be issued as separate items.

Fitting the tail unit or fin assembly

5. The tail unit, or fin assembly, is to be attached to the bomb body before fuzing is commenced. The procedure to be adopted is detailed in the following para. 6 to 9.

6. Remove the tail unit, or fin assembly, from its container or crate. If a fin assembly is being used, ascertain whether or not a No. 5 Mk. I arming wire guide is fitted. Where the arming wire guide is not fitted, proceed as follows:—

- (i) Hook the two halves of the arming wire guide to the box portion of the fin assembly so that the bracket of the arming wire guide projects into the fin assembly.
- (ii) Rigidly secure the arming wire guide to the fin assembly by tightening the nut on the coupling screw.

7. Remove the transit wires securing the fin lock-nut to the tail end of the bomb body. Then unscrew and remove the nut and also, if fitted, the cardboard distance piece and adapter ring.

8. Partially unscrew the tail transit plug from the bomb body.

9. Offer up the tail unit, or fin assembly, to the rear end of the bomb body so that the arming wire guide is in line with the single suspension lug of the bomb, as shown in fig. 1 of Chap. 4. Secure the tail unit, or fin assembly, in this position with the fin lock-nut, which is to be tightened using a short tommy bar.

Note.—When fitting the tail unit to an AN-M44 bomb a No. 1 Mk. I adapter ring must be placed over the tail ring of the tail unit to provide a seating for the fin lock-nut before this nut is screwed down to secure the tail unit in position.

Fuzing a bomb

10. With the tail unit, or fin assembly, fitted to the bomb body, completely unscrew the tail transit plug and examine the screw threads of the fuze adapter or, as appropriate, of the M102 adapter booster. Clean these threads where necessary. Ensure that the fuze adapter or, as applicable, the M102 adapter booster is securely positioned in the bomb body.

11. Remove the fuze from its sealed container, and examine and test the fuze as follows:—

- (i) Examine the fuze to ascertain that it is not partially or fully armed, as described in A.P.1661C, Vol. I, Sect. 5, Chap. 2.
- (ii) Examine the fuze for signs of external damage, corrosion (appearing as a white deposit on the fuze), or for traces of moisture on the arming stem cup which houses the reduction gear train.
- (iii) Test the fuze to ensure that the stationary gear, in the reduction gear train, is locked. To do this grip the top of the fuze (that is, the lock-nut and adjusting nut) and, using finger pressure only, rotate the arming stem. A movement up to $\frac{1}{16}$ in. is normally possible, due to manufacturing tolerances, but should the arming stem rotate through 90 deg. or more the stationary gear is *not* locked, and the fuze must *not* be used.

Having examined and tested the fuze, change the M14 primer detonator if necessary. It should be noted that the fuzes are normally supplied fitted with the 0.025 sec. delay version of the M14 primer detonator. If it is required to change the primer detonator, unscrew it from the base of the fuze, by hand, and then screw in the appropriate M14 primer detonator giving the delay selected. Force must *not* be used in these operations, and should a primer detonator show signs of external corrosion or other damage, or should its primer be a loose fit, *it must not be used*.

Notes.—(i) The primer detonator giving the required delay may be identified by its delay time which is stamped on the head of the primer detonator body. In addition, the head of the non-delay primer detonator is painted white, that of the 0.1 sec. delay, black, whilst the 0.01 sec. and 0.025 sec. delay versions have, respectively, a $\frac{1}{8}$ and a $\frac{1}{4}$ sector of the head painted black.

- (ii) Long delay primer detonators of the M16 series cannot be used with these fuzes.

Warnings.—(i) Care must be taken when handling either a primer detonator, or a fuze containing a primer detonator, as the primer component is partially exposed in the top of the primer detonator body.

- (ii) Should a fuze be dropped or accidentally knocked, it must be carefully examined externally to ensure that no damage has been sustained.

12. Withdraw the split pin from the body of the fuze and then screw the fuze (less its arming vane) by hand into the rear end of the bomb body.

13. Thread the plain end of a No. 1 Mk. I safety wire first through the arming wire guide on the tail unit, or fin assembly, and then through the uppermost pair of adjacent holes in the fuze arming stem cup and eyelet strap, on the lines indicated in fig. 1 of Chap. 4. The safety wire holes in the fuze need not be exactly in line with the arming wire guide.

Note.—Should the uppermost pair of adjacent holes be occupied by the fuze safety pin, this pin is to be removed, to allow for insertion of the safety wire, *but only after* a second safety pin has first been inserted through the second pair of adjacent holes in the arming stem cup and eyelet strap of the fuze.

14. Having inserted the safety wire, cut the sealing wire threaded through the safety pin and then remove the pin. Thread the plain end of the safety wire through one of the holes in the arming vane blades and at the same time slip the arming vane over the end of the fuze so that the grooves in the arming vane assembly engage with the two locating pins on the fuze. Lock the arming vane to the fuze by screwing down the vane nut, hand tight.

Note.—The safety pin and its sealing wire, together with the split pin (see para. 12), are to be handed to the pilot or air bomber.

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A.P.1661B, Vol. I, Sect. 17, Chap. 4, App. 2

15. Adjust the safety wire to protrude approximately 3 in. beyond the fuze arming vane, on the lines indicated in fig. 1 of Chap. 4, and then slip two No. 1 Mk. I safety clips over the end of the wire so that the inner clip is in light contact with the arming vane blade.

Loading a fuzed bomb

16. With the single suspension lug uppermost, load the fuzed bomb on to its carrier in the normal manner as described in the chapter of A.P.1664, Vol. I, relevant to the carrier used.

17. When the bomb is securely attached to its carrier, attach the hook end of a link, fuze-setting control, Type E.M., flexible, adjustable, to the loop end of the safety wire threaded through the fuze. Insert the loop end of the fuze-setting control link into the E.M. fuzeing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzeing unit must *not* be located *vertically* above the head of the tail fuze, but is to be positioned inward towards the bomb suspension lug a *minimum* distance of 3 in., measured from the arming wire guide on the tail unit, or fin assembly, as shown in fig. 1 of Chap. 4. Preferably, however, the fuzeing unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier and on the position of the E.M. fuzeing unit, two or more fuze-setting control links, attached end to end, may be required.

Unloading and unfuzing an unexpended bomb, and removal of tail unit or fin assembly

Warning.—Before unloading and unfuzing an unexpended bomb, examine the fuze to make certain that it is not partially or fully armed, as detailed in A.P.1661C, Vol. I, Sect. 5, Chap. 2.

18. Disconnect the fuze-setting control link from the carrier E.M. fuzeing unit and unload the bomb from the carrier in the normal manner.

19. Having unloaded the bomb from its carrier, remove the two safety clips from the safety wire, *but do not withdraw this wire from the fuze*. Unscrew the vane nut from the end of the fuze and remove the arming vane.

20. Insert the safety pin through the second pair of adjacent holes in the arming stem cup and eyelet strap of the fuze, and secure it in position with its sealing wire. Then withdraw the safety wire from the fuze and arming wire guide. Unhook the fuze-setting control link(s) from the safety wire.

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must be discarded and *not* used again.

21. Unscrew and remove the fuze, by hand, from the rear end of the bomb body and *immediately* replace the split pin through the body of the fuze. Return the fuze to its container and seal with adhesive tape.

22. Having removed the fuze from the bomb, unscrew the fin lock-nut and remove the tail unit, or fin assembly. Fit the cardboard distance piece, if originally provided, round the external screw threads of the bomb filling plug and then replace the fin lock-nut and, where applicable, the No. 1 Mk. I adapter ring. Re-wire the nut to the filling plug to prevent loss.

23. Close the rear end of the bomb body with its transit plug.

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A.P.1681B, Vol. I, Sect. 17, Chap. 4

APPENDIX 3

INSTRUCTIONS FOR USE—USING THE M114 or M114A1 FUZE

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Introduction

1. Either the M114 or the M114A1 fuze (which are fully described in A.P.1661C, Vol. I, Sect. 5) can be used for the tail fuzing of the AN-M44, AN-M65, or AN-M65A1 1,000 lb. G.P. bomb. These fuzes, which do not incorporate a mechanical delay in their arming mechanism, are fitted with primer detonators of the M16 series which provide either a 4 to 5 sec. or 8 to 11 sec. delay.

2. The AN-M65 and AN-M65A1 bomb bodies are normally to be fitted only with the No. 55 Mk. I tail unit, which incorporates an arming wire guide. If, however, this tail unit is not available a standard American fin assembly AN-M65 may be used as an alternative. The AN-M44 bomb is normally to be fitted only with the American fin assembly AN-M44, but in an emergency the No. 55 tail unit may be used. The two fin assemblies, which are not interchangeable, require the addition of a No. 5 Mk. I arming wire guide.

Note.—When fitting a No. 55 tail unit to an AN-M44 bomb body, a No. 1, Mk. I adapter ring is required to form a seating for the fin lock-nut of the bomb.

3. A No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips are required when fuzing a bomb with either the M114 or M114A1 fuze. The safety wire and clips and, where applicable, the arming wire guide, are normally issued with the tail unit or fin assemblies. Where this is not so, the safety wires, clips, and guides are supplied as separate items.

Fitting the tail unit or fin assembly

4. The tail unit, or fin assembly, is to be attached to the bomb body before fuzing is commenced. The procedure to be adopted is detailed in the following para. 5 to 8.

5. Remove the tail unit, or fin assembly, from its container or crate. If a fin assembly is being used, ascertain whether or not a No. 5 Mk. I arming wire guide is fitted. Where the arming wire guide is not fitted, proceed as follows:—

- (ii) Hook the two halves of the arming wire guide to one of the four sides of the box portion of the fin assembly so that the bracket of the arming wire guide projects into the fin assembly.
- (iii) Rigidly secure the arming wire guide to the fin assembly by tightening the nut on the coupling screw.

6. Remove the transit wires securing the fin lock-nut to the rear end of the bomb body, and then unscrew and remove the lock-nut and also, if fitted, the cardboard distance piece, and adapter ring.

7. Partially unscrew the tail transit plug from the bomb body.

8. Offer up the tail unit (or fin assembly) to the rear end of the bomb body, so that the arming wire guide is in line with the single suspension lug of the bomb, as shown in fig. 1 of Chap. 4. Secure the tail unit (or fin assembly) in this position with the fin lock-nut, which is to be tightened, using a suitable tommy bar.

Note.—When fitting the No. 55 tail unit to an AN-M44 bomb, a No. 1 Mk. I adapter ring must be placed over the tail ring of the tail unit to provide a seating for the fin lock-nut, before this nut is replaced to secure the tail unit in position.

Fuzing a bomb

9. With the tail unit (or fin assembly) fitted to the bomb body, completely unscrew and remove the tail transit plug and examine the screw-threads of the fuze adapter or, as appropriate, of the M102 adapter booster. Clean these threads where necessary, and check that the fuze adapter, or M102 adapter booster, is securely positioned in the bomb body.

10. Remove the fuze from its sealed container and examine it for external damage and for corrosion (appearing as a white deposit). Check that the fuze is not partially or fully armed, as detailed in A.P.1661C, Vol. I, Sect. 5, Chap. 3.

11. Carefully unscrew and remove the primer detonator from the base of the fuze, and then test the fuze to ensure that it is not partially uncocked, using a gauge, striker depth, No. 16, Mk. I. To do this, insert the stem of the gauge into the base of the fuze; the head of the gauge should abut the base of the fuze. If this does not obtain and it is possible to "rock" the gauge whilst in the fuze, the fuze plunger and firing pin are partially uncocked and the fuze must *not* be used. In such circumstances the primer detonator must *not* be screwed back into the fuze.

Warning—Great care must always be exercised when handling a primer detonator (or a fuze containing a primer detonator), particularly as the primer component is partially exposed in the top of the primer detonator body.

12. Having examined and gauged the fuze, fit the primer detonator giving the delay required; this may or may not be the one supplied in the fuze. Force must *not* be used in this operation, and should a primer detonator show signs of external corrosion or damage, or should its primer be a loose fit, *it must not be used*.

Notes.—(i) The M114 and M114A1 fuzes are normally supplied fitted with the 8 to 11 sec. delay version of the M116 or M116A1 primer detonator.

(ii) The M116 and M116A1 primer detonators are identifiable by their milled and grooved heads. The 4 to 5 sec. and 8 to 11 sec. delay versions of these primer detonators are distinguishable by the delay times which are marked in two places on their heads. The delay times are also clearly marked on the cylinders in which the primer detonators are packed.

(iii) The M116 primer detonator may be used with either the M114 or M114A1 fuze. The M116A1 primer detonator is for use only with the M114A1 fuze. Short delay primer detonators of the M114 series cannot be used with either of these fuzes.

(iv) Should the fuze be dropped or accidentally knocked at any time, it must be carefully examined externally to ensure that no damage has been sustained.

13. Having fitted the required primer detonator, remove the "special instructions" tablet from the fuze arming stem tube and screw the fuze (less its arming vane), by hand, into the rear end of the bomb body.

14. Thread the plain end of a No. 1 Mk. I safety wire first through the arming wire guide on the tail unit (or fin assembly) and then through the uppermost pair of adjacent holes in the stem cup and circular plate of the fuze, as shown in fig. 11 of Chap. 4. It is not essential for the safety wire holes in the fuze to be exactly in line with the arming wire guide.

Note.—Should the uppermost pair of adjacent holes be occupied by the fuze safety pin, the pin is to be removed, to allow insertion of the safety wire, *but only after* a second safety pin has first been inserted through the second pair of adjacent holes.

15. After inserting the safety wire, cut the sealing wire threaded through the safety pin and then remove the pin. Thread the plain end of the safety wire through the hole in one of the arming vane blades, and at the same time slip the arming vane over the head of the fuze so that the grooves in the arming vane assembly engage with the two locating pins on the fuze. Lock the arming vane to the fuze by screwing down the knurled vane nut, hand tight.

16. Adjust the safety wire to protrude approximately 3 in. beyond the fuze arming vane, as shown in fig. 11 of Chap. 4, and then slip two No. 1 Mk. I safety clips over the end of the wire so that the inner clip is in light contact with the arming vane blade.

Note.—The safety pin and its sealing wire are to be handed to the pilot or air bomber.

Loading a fuzed bomb

17. With the single suspension lug uppermost, load the fuzed bomb on to its carrier in the normal manner, as described in the Chapter of A.P.1664, Vol. I, relevant to the carrier used.

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A.P. 1661B, Vol. I, Sect. 17, Chap. 4, App. 3

18. When the bomb is securely attached to the carrier, attach the hook end of a link, fuze-setting control, Type E.M., flexible, adjustable, to the loop end of the safety wire threaded through the fuze. Insert the loop end of the fuze-setting control link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzing unit must *not* be located *vertically* above the head of the tail fuze, but is to be moved inward towards the bomb suspension lug a *minimum* distance of 3 in., measured from the arming wire guide on the tail unit (or fin assembly), as shown in fig. 1 of Chap. 4. Preferably, however, the fuzing unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier, and on the position of the E.M. fuzing unit, two or more fuze-setting control links, attached end to end, may be required.

Unloading and unfuzing an unexpended bomb, and removal of tail unit or fin assembly

Warning.—Before unloading and unfuzing an unexpended bomb, examine the fuze to make certain that it is not partially or fully armed, as detailed in A.P. 1661C, Vol. I, Sect. 5, Chap. 3.

19. Disconnect the fuze-setting control link from the carrier E.M. fuzing unit and unload the bomb from the carrier in the normal manner.

20. Having unloaded the bomb from its carrier, remove the two safety clips from the safety wire, *but do not withdraw this wire from the fuze.* Unscrew the knurled vane nut from the head of the fuze and remove the arming vane.

21. Insert the safety pin through the second pair of adjacent holes in the stem cup and circular plate of the fuze and secure it in position with the sealing wire. Then withdraw the safety wire from the fuze and arming wire guide. Unhook the fuze-setting control link(s) from the safety wire.

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must be discarded and not used again.

22. Unscrew and remove the fuze, by hand, from the rear end of the bomb body, return the fuze to its container and re-seal the container with adhesive tape.

23. Having removed the fuze from the bomb body, unscrew the fin lock-nut and remove the tail unit (or fin assembly). Fit the cardboard distance piece and adapter ring, if originally provided, round the external screw-threads of the bomb filling plug and replace the fin lock-nut. Re-wire the nut to the filling plug to prevent loss.

24. Close the rear end of the bomb body with its transit plug.

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APPENDIX 4

Instructions for ~~USE~~ using the AN-M103A1 fuze

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Introduction

1. The AN-M103A1 fuze (which is fully described in A.P.1661C, Vol. I, Sect. 5, Chap. 11) may be used for the nose fuzing of either the AN-M44, AN-M65 or AN-M65A1 1,000 lb. G.P. bomb. As the fuze is selective, giving either an instantaneous or 0.4 sec. delay action, it may be used to provide a 0.1 sec. delay action "insurance" fuze when a bomb is tail fuzed with an AN-M102 series fuze or, when necessary, as an alternative to the No. 52 nose pistol (with the exploder adapter, No. 1, Mk. I); the fuze, in this instance, being set for instantaneous action.

2. As the fuze incorporates a mechanical delay in its arming mechanism, it requires certain minimum heights of bomb release to ensure that the fuze is fully armed prior to impact of the fuzed bomb with its target. These minimum heights of bomb release are promulgated to the Units concerned through the normal channels.

Note.—Partial pre-arming of the fuze is not to be undertaken in any circumstances whatsoever.

3. One No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips are required for use with the fuze.

Fuzing a bomb

4. Unscrew and remove the nose transit plug of the bomb and examine the fuze seat liner and its threads. Clean, where necessary, using a short length of wood stick.

5. Remove the fuze from its sealed container and check that the fuze is not partially or fully armed, as described in A.P.1661C, Vol. I, Sect. 5, Chap. 11. Also examine the fuze for signs of damage, or corrosion (appearing as a white deposit), or for traces of moisture on the vane cup which houses the reduction gear train.

6. Cut and remove the sealing wire threaded through the fuze vane and eyelet straps, and vane holder. Ensure that the split pin is threaded through the vane and eyelet straps, and then screw the fuze (less its arming vane), by hand, into the fuze seat liner of the bomb.

Note.—No tools are to be used when screwing home the fuze.

7. Insert the plain end of a No. 1 Mk. I safety wire through the adjacent holes in the uppermost pair of vane and eyelet straps, that is, through the pair of straps nearest in line with the single suspension lug of the bomb. The end of the wire should project about 3 in. beyond the straps. It is not essential that the pull-off of the safety wire be exactly in line with the suspension lug.

Note.—Should the holes in the uppermost pair of straps be occupied by the split pin, it is to be withdrawn, to allow for the insertion of the safety wire, *but only after* a second split pin has first been inserted through the second pair of holes in the straps.

8. Slip two No. 1 Mk. I safety clips over the end of the safety wire so that the inner clip is in light contact with the vane strap.

9. Fit the arming vane over the top of the fuze vane holder so that its two locating pins engage with the two holes in the vane holder. Ensure that the spring ring in the arming vane snaps into the circular groove in the top of the vane holder.

10. Set the fuze for instantaneous or 0-1 sec. delay action, as required. To do this, pull the setting pin outwards against the action of its spring and rotate the pin so that its peg engages with either the deep or shallow pair of slots, as appropriate. For *instantaneous* action the peg is to engage with the *shallow* slots, and for *delay* action, with the *deep* slots. A summary of these instructions is stamped on the fuze around the setting pin.

Note.—As supplied, the fuze is normally set for delay action.

Fitting the tail unit or fin assembly

11. If the bomb is to be used nose fuze only, the tail unit, or fin assembly, is to be attached to the bomb body as follows:—

- (i) Remove the transit wires securing the fin lock-nut to the tail end of the bomb body. Unscrew and remove the fin lock-nut and also remove the cardboard distance piece, if fitted.
- (ii) Offer up the tail unit, or fin assembly, to the rear of the bomb body. With the fin assembly, the fins are to be at 45 deg. to the plane of the suspension lugs; this ensures ease of stowage of the bomb in British aircraft.
- (iii) Secure the tail unit, or fin assembly, in position by replacing and screwing down the fin lock-nut. The lock-nut is to be tightened, using a suitable tommy bar.

Notes.—(i) The AN-M65 fin assembly cannot be fitted to the AN-M44 bomb body.

- (ii) When fitting a No. 55 tail unit to an AN-M44 bomb body, a No. 1 Mk. I adapter ring must be placed over the tail ring of the tail unit, to provide a seating for the fin lock-nut, before this nut is replaced to secure the tail unit in position.

Loading a fuze bomb

12. With the single suspension lug of the bomb uppermost, load the fuze bomb on to its carrier in the normal manner, as described in the chapter of A.P. 1664, Vol. I, relevant to the carrier used.

13. When the bomb is securely attached to the carrier, attach the hook end of a standard flexible fuze-setting control link to the loop end of the safety wire threaded through the fuze. Insert the loop end of the fuze-setting control link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzing unit must *not* be positioned *vertically* above the fuze, but is to be moved inward towards the bomb suspension lug a *minimum* distance of 3 in. measured from the straps on the fuze, on similar lines to fig. 1 of Chap. 4. Preferably, however, the fuzing unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier and on the position of the E.M. fuzing unit, two or more fuze-setting control links, attached end to end, may be required.

14. Finally, withdraw the split pin from the vane and eyelet straps and hand it to the pilot or air bomber.

Unloading and unfuzing an unexpended bomb, and removing tail unit or fin assembly

Warning.—Before unloading and unfuzing an unexpended bomb, examine the fuze to make certain that it is not partially or fully armed, as described in A.P. 1661C, Vol. I, Sect. 5, Chap. 111.

15. To obtain additional safety while unloading a bomb from its carrier, first insert, wherever possible, the split pin into the second pair of adjacent holes in the fuze vane and eyelet straps. Then disconnect the fuze-setting control link(s) from the E.M. fuzing unit and unload the bomb from the carrier in the normal manner.

16. Having unloaded the bomb from the carrier, disconnect the fuze-setting control link(s) from the safety wire, *but do not withdraw the wire from the fuze*. Remove the arming vane from the fuze, ensure that the split pin is securely threaded through the vane and eyelet straps, and then unscrew and remove the fuze from the bomb by hand. Seal the nose of the bomb with its transit plug.

17. Remove the two safety clips from the safety wire and then withdraw the wire from the fuze. Inspect the fuze for damage and set it for delay action, as necessary. Return the fuze to its container and seal with adhesive tape. Mark the container for "FIRST ISSUE".

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must be discarded and not used again.

18. Having removed the fuze from the bomb, unscrew the fin lock-nut and remove the tail unit, or fin assembly, as appropriate. Fit the cardboard distance piece, if originally provided, round the external screw threads of the bomb filling plug, and then replace the fin lock-nut. Re-wire the lock-nut to the filling plug to prevent loss.

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CHAPTER 6

BOMBS, S.A.P., 1,000 lb., AN-M59 and AN-M59A1

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ARMAMENT

Delete "(To be issued later)" after title of Chap. 6 in the List of Chapters, and "A.L. 106" in the outer margin of the list, issue this chapter, with appropriate amendments and make an entry in the Amendment Record Sheet at the beginning of the Volume.

CHAPTER 6

BOMBS, S.A.P., 1,000 lb., AN-M59 and AN-M59A1

Introduction

1. These bombs, although designated semi-armour piercing, are intended to supplement stocks of the AN-M65 1,000 lb. G.P. bomb (described in Chap. 4 of this Section), and are for use for general bombardment purposes. Normally they are not to be used as semi-armour piercing bombs but, due to their more robust construction (as compared with the AN-M65), they should be segregated for use against special targets of a more resistant nature.

2. The bombs, which have a charge/weight ratio of approximately 30.5 per cent., are similar in their general design, constructional and functioning characteristics and differ only in that the AN-M59A1 bomb is modified to ensure that, when fitted with a long delay fuze incorporating an anti-removal device, the fuze cannot be removed from the bomb in any circumstances whatsoever. The bombs are adapted for fuzing at both the nose and the tail, using British and American fuzing components as listed in para. 19. These fuzing components all require the use of the "horizontal" system of arming, that is, on "live" release of a bomb arming is initiated by the "horizontal" pull-off of a safety wire threaded through the arming mechanism.

3. The normal American box type fin assembly, modified by the addition of a No. 6 Mk. I arming wire guide, is to be used with these bombs in all instances.

4. The bombs are fitted for both single and twin point suspension and may thus be loaded on to the appropriate standard British bomb carriers or on to American shackles or racks.

5. The terminal velocity of the bombs is approximately 1,600 ft. per sec.

BOMB, S.A.P., 1,000 lb., AN-M59

Leading particulars*Bomb body*

| | |
|--|---|
| 6. Length (nose and tail transit plugs fitted) ... | 57.3 in. |
| Maximum diameter (excluding suspension lugs) | 15 in. |
| Weight and nature of filling | 292 lb. Amatol 50/50, with 10.7 lb. T.N.T. surround or 313.5 lb. cast T.N.T. |
| Total weight, filled Amatol 50/50 | 971 lb. |
| Total weight, filled T.N.T. | 991 lb. |

Fin assembly

| | |
|---|----------------|
| 7. Length... .. | 16.8 in. |
| Maximum diagonal width across fins | 20.7 in. |
| Weight | 17 lb. approx. |

8. The overall length of the bomb is approximately 70.4 in. when fitted with its nose plug and fin assembly, and 71.2 in. when fitted at the nose with a No. 52 pistol. The all-up weight of the complete bomb, fuzed nose and tail, is 993 lb. when filled Amatol and 1,112 lb. when filled T.N.T.

General description, fig. 1 and 2

9. The bomb comprises a bomb body filled with high explosive and a detachable fin assembly secured to the body by a fin lock-nut.

Bomb body

10. The bomb body consists of a hollow steel casting closed at the nose end by a fuze seat liner surrounded by a thick pad of wax, and at the tail end by a filling plug, screwed and cemented in position. This plug is centrally tapped to take an M102 adapter booster which houses a small booster lead-in and a C.E. pellet. An auxiliary booster, consisting of eleven C.E. pellets, is set in the main filling, and is aligned with the adapter booster. During transit and storage the fuze seat liner and adapter booster are closed by transit plugs.

11. The fin lock-nut, for use in securing the fin assembly to the bomb body, is screwed to external threads on the filling plug. The lock-nut is provided with two short tommy bars and four key-holes and, during transit and storage, is wired to the filling plug to prevent loss.

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Note.—Some bombs are provided with a cardboard distance piece (not shown in the illustrations) located between the fin lock-nut and the face of the filling plug. This distance piece protects the external screw-threads on the filling plug during transit and storage.

12. Three suspension lugs are welded to the bomb body, two of the lugs being positioned diametrically opposite to the third. During transit and storage the lugs are protected against damage by two protecting rings locked round the bomb body. These rings are hinged and are tightened on to the bomb body by bolts and nuts.

13. The bomb body is filled with either Amatol 50/50 or cast T.N.T. When filled Amatol 50/50, the tail end of the body is sealed by a thick pad of cast T.N.T.

Fin assembly

14. The box type fin assembly, see fig. 1, is supplied separately from the bomb body, and consists of a tail ring to which four fins are attached. Extensions on these fins are riveted together to form the box portion of the assembly.

15. When a bomb is to be fuzed at the tail, a detachable No. 6 Mk. I arming wire guide, as illustrated in fig. 1, is to be fitted to the box portion of the fin assembly to provide a support for the safety wire which is used when the bomb is tail fuzed.

Identification colouring and markings

16. The exterior of the bomb body is painted an olive drab colour. Three yellow bands are painted round the bomb body and are located at the nose and tail ends, and at the centre of gravity of the bomb. The markings and other information normally stencilled on the bomb body are shown in fig. 2. These are all of American origin and do not apply in all particulars when the bomb is supplied for loading on to British aircraft.

17. The fin assembly is similarly painted an olive drab colour.

Functioning

18. On "live" release of the fuzed bomb from its carrier, the safety wire is withdrawn from the nose pistol and/or tail fuze, by the appropriate fuze-setting control link, thus allowing the fuzing components to become armed. On impact of the fuzed bomb with its target, the nose pistol and/or tail fuze initiates the explosive train in the bomb, thus detonating the main filling.

Instructions for use

19. The following alternative pistols and fuzes are used with this bomb:—

Nose

- | | | |
|---|---|------------|
| (i) Pistol, bomb, D.A., No. 52, Mk. I | } | Appendix 1 |
| (ii) Pistol, bomb, D.A., No. 52, Mk. II | | |
| (iii) Fuze, bomb, AN-M103A1 (nose) | | Appendix 4 |

Tail

- | | | |
|----------------------------------|---|------------|
| (iv) Fuze, bomb, ANNM02A1 (tail) | } | Appendix 2 |
| (v) Fuze, bomb, ANNM02A2 (tail) | | |
| (vi) Fuze, bomb, M114 (tail) | } | Appendix 3 |
| (vii) Fuze, bomb, M114A1 (tail) | | |

A full description of these fuzing components is given in S.P.1661C, Vol. I, Sect. 5. The detailed instructions for fuzing a bomb with these pistols and fuzes, together with the instructions for loading, unloading, and unfuzing the fuzed bomb are given in the Appendices to this Chapter.

Supply

20. The AN-M59, 1,000 lb. S.A.P. bomb body is supplied plugged at both the nose and the tail with transit plugs, and fitted with two protecting rings around the body to protect the suspension lugs. The stowage dimensions of the bomb body are 57.3 in. length, and 20.25 in. maximum diameter across the protecting rings. The stowage weight of the body is 992 lb. when filled Amatol 50/50 and 1,012 lb. when filled cast T.N.T.

Note.—Some bomb bodies may be supplied fitted with a cardboard distance piece to protect the external screw threads on the filling plug.

21. One fin assembly is supplied packed in a metal crate. A No. 6 Mk. I arming wire guide, one No. 1 Mk. I safety wire, and two No. 1 Mk. I safety clips are required for use with the fin assembly. These items may either be supplied with the fin assembly, or as a separate issue. The stowage dimensions of the metal crate are $16\frac{1}{8}$ in. x $16\frac{1}{8}$ in. x 17 in. Its filled weight is 40 lb. approx.

Storage

22. The bomb bodies are classified, for the purpose of storage, in Group 7, see A.P.2608A, Chap. 7. The fin assemblies, in their crates, may be stored together with the bomb bodies, but should be stacked well clear of the filled stores.

BOMB, S.A.P., 1,000 lb., AN-M59A1

Comparison with the AN-M59 1,000 lb. S.A.P. bomb

23. As stated in para. 2, the AN-M59A1 bomb is similar to the AN-M59 bomb. Attention is directed, therefore, to para. 1 to 22, as the information given in these paragraphs for the AN-M59 bomb applies equally to the AN-M59A1, with the exception of the following differences:—

- (i) The filling plug is positively locked in position at the rear end of the bomb body by two long studs screwed into the underside of the filling plug and "set" in the main explosive filling.
- (ii) The M102 adapter booster has a hole drilled through its wall to align with a blind hole located in the wall of the filling plug. The holes are provided so that when the bomb is to be fuzed with a long delay fuze incorporating an anti-removal device, the adapter booster, into which the fuze will be locked, may itself be locked to the filling plug by a lock pin inserted through the adapter booster hole to engage with the blind hole in the filling plug.

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APPENDIX 1

INSTRUCTIONS FOR USE—USING THE No. 52 PISTOL

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| Unloading and unfuzing an unexpended bomb, and removal of fin assembly | 13 |

Introduction

1. The No. 52 Mk. I or II pistol, when used for the nose fuzing of either the AN-M59 or AN-M59A1 bomb, is to be used in conjunction with a No. 1 Mk. I exploder adapter, and either a No. 52 Mk. II or III detonator. A No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips, which are supplied with the pistol, are also required.

Note.—The pistols and exploder adapter are fully described in Sect. 5 of A.P. 1661C, Vol. I.

Fuzing a bomb

2. Before fuzing a bomb with a No. 52 pistol, examine the paper disc at the base of the striker guide. If it is suspected that the disc has been punctured by the striker needle, the pistol must *not* be used but is to be set aside for A.I.D./A.I.S. inspection. Also check that the pistol screw-threads are clear and that the leather washer is in position.

3. Unscrew and remove the nose transit plug from the bomb. Inspect the threads of the fuze seat liner and clean where necessary.

4. Remove the No. 46 transit plug from a No. 1 Mk. I exploder adapter and gauge its detonator cavity using a No. 2 Mk. I detonator cavity gauge. The engraved line for 20/40 lb. bombs is applicable. Exploder adapters which fail to pass this test are to be set aside for A.I.D./A.I.S. inspection.

5. Insert the exploder adapter into the fuze seat liner and screw home, using a 1½ in. Whit. spanner, C-spanner, or other suitable tool. Ensure that the exploder adapter is securely locked in position by its fibre inserts.

6. Fit the small conical spring, supplied with the pistol, over the stem of the detonator so that the small end of the spring abuts the underside of the detonator head. Then carefully insert the detonator into the exploder adapter cavity.

Note.—The conical spring must always be fitted, as it ensures that the detonator is in contact with the end of the striker guide when the pistol is screwed into the exploder adapter.

7. With the pistol locking nut screwed forward a few turns, screw the pistol, by hand, into the exploder adapter until well seated on its washer. Lock the pistol in position by screwing its locking nut hard down on to the top of the exploder adapter.

Fitting the fin assembly

8. If the bomb is to be used nose fuzed only, the fin assembly is to be attached to the bomb body as follows:—

- (i) Remove the transit wires securing the fin lock-nut to the tail end of the bomb body. Unscrew and remove the fin lock-nut and also the cardboard distance piece, if fitted.
- (ii) Offer up the fin assembly to the rear end of the bomb body so that the fins are at 45 deg. to the plane of the suspension lugs; this ensures ease of stowage of the bomb in British aircraft.
- (iii) Secure the fin assembly in position by replacing and screwing down the fin lock-nut. The lock-nut is to be tightened, using a suitable short tommy-bar.

Loading a fuzed bomb

9. With the single suspension lug of the bomb uppermost, load the fuzed bomb on to its carrier in the normal manner, as described in the Chapter of A.P. 1664, Vol. I, relevant to the carrier used.

10. When the bomb is securely attached to its carrier, remove the safety pin from the pistol and rotate the safety cap just sufficiently to bring the hole in one of the arming vanes into line with the uppermost lug of the pistol locking nut.

Note.—The safety pin is to be handed to the pilot or air bomber.

11. Insert the plain end of a No. 1 Mk. I safety wire first through the hole in the lug of the locking nut and then through the arming vane hole, until the end protrudes approximately 3 in., as shown in fig. 1 of Chap. 6. Slip two No. 1 Mk. I safety clips over the protruding end of the safety wire, so that the inner clip is in light contact with the pistol arming vane.

Note.—It is not essential that the pull-off of the safety wire should be exactly in line with the bomb suspension lug.

12. Attach the hook end of a standard flexible fuze-setting control link to the loop end of the safety wire, and then insert the loop end of the link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull-off of the safety wire is required, the E.M. fuzing unit must *not* be positioned vertically above the nose pistol, but is to be positioned inward towards the bomb suspension lug a minimum distance of 3 in. measured from the drilled lug on the pistol locking nut, as shown in fig. 1 of Chap. 6. Preferably, however, the fuzing unit should be moved inward towards the suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier and on the position of the E.M. fuzing unit, two or more fuze-setting control links, attached end to end, may be required.

Unloading and unfuzing an expended bomb, and removal of fin assembly

13. Disconnect the fuze-setting control link from the E.M. fuzing unit and then unload the bomb from its carrier in the normal manner.

14. Having unloaded the bomb, remove the two safety clips from the end of the safety wire, and then withdraw this wire from the pistol.

15. Screw up the safety cap until the stop pins are engaged. With a Mk. I pistol, screw back the safety cap just sufficiently to bring its two safety pin holes into line with the slots cut in the top of the pistol body; then insert the safety pin. With a Mk. II pistol, the safety cap is to be screwed up until the stop pins prevent further movement. Then engage the U-shaped end of the safety pin with the hole in the arming vane, which is opposite to the hole in the safety cap. Insert the plain end of the safety pin into the hole in the safety cap and then slowly unscrew the cap until this end of the safety pin drops into the groove in the pistol body.

Note.—If the safety pin does not engage with the groove in the pistol body within one revolution of the cap, the cause must be ascertained, for example, the end of the safety pin may be burred or distorted.

16. Disconnect the fuze-setting control link (or links) from the safety wire, and return the wire to its box. Should, however, the wire be kinked, bent or otherwise distorted or damaged, it must *not* be used again and is to be discarded.

17. To unfuze the bomb proceed as follows:—

- (i) Slacken back the pistol locking nut.
- (ii) Unscrew and remove the pistol by hand.
- (iii) Extract the detonator, using an extractor, detonator, No. 2, Mk. I.
- (iv) Remove the conical spring from the detonator stem, or exploder adapter, and return it to its linen bag.
- (v) Seal the exploder adapter with its No. 46 transit plug.

18. Having unfuzed the bomb, remove the fin assembly as follows:—

- (i) Unscrew and remove the fin lock-nut from the rear end of the bomb body.
- (ii) Detach the fin assembly from the bomb body.
- (iii) If originally fitted, replace the cardboard distance piece and then replace the fin lock-nut on the bomb body and wire it in position to prevent loss.
- (iv) Return the fin assembly to its metal crate.

19. Suitably mark the bomb body, at its nose end, as "EXFLODERED" and then return it to store, where it should be set aside for use as soon as possible.

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APPENDIX 2

INSTRUCTIONS FOR USE—USING THE AN-M102A1 or AN-M102A2 FUZE

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Introduction

1. Both the AN-M59 and AN-M59A1 bombs may be fuzed at the tail, using either the AN-M102A1 or AN-M102A2 fuze. The fuzes (which are fully described in A.P.1661C, Vol. I, Sect. 5) are fitted with a primer detonator of the M14 series. The primer detonators of this series are interchangeable and may be used to provide a non-delay action, or a delay of 0.01 sec., 0.025 sec., or 0.1 sec., as required.

2. The fuzes also incorporate a mechanical arming delay, and hence require certain minimum heights of bomb release to ensure that they are fully armed prior to impact with the target. These minimum heights of release are promulgated to the Units concerned through the normal channels.

Note.—The AN-M102A1 fuze may, if authorized, be partially pre-armed before take-off. *Partial pre-arming of the AN-M102A2 fuze is not to be undertaken in any circumstances whatsoever.*

3. A No. 6 Mk. I arming wire guide, fitted to the box portion of the standard American fin assembly AN-M59, a No. 1 Mk. I safety wire, and two No. 1 Mk. I safety clips are required when fuzing a bomb with either of these fuzes.

Note.—The guide, wire, and clips may be supplied together with the fin assembly, or as separate items.

Fitting the fin assembly

4. The fin assembly is to be fitted to the bomb body before fuzing is commenced. To fit the fin assembly the procedure detailed in the following para. 5 to 8 is to be adopted.

5. Remove the fin assembly from its crate and ascertain whether or not a No. 6 Mk. I arming wire guide is fitted. If the guide is not fitted proceed as follows:—

- (i) Hook the two halves of the arming wire guide to one of the four sides of the box portion of the fin assembly so that the bracket of the arming wire guide projects into the fin assembly, as illustrated in fig. 1 of Chap. 6.
- (ii) Rigidly secure the arming wire guide to the fin assembly by tightening the nut on the coupling screw.

6. Remove the transit wires securing the fin lock-nut to the tail end of the bomb body and then unscrew and remove the lock-nut, and also, if fitted, the cardboard distance piece.

7. Partially unscrew the tail transit plug from the bomb body.

8. Offer up the fin assembly to the rear end of the bomb body so that the arming wire guide is in line with the single suspension lug of the bomb, as shown in fig. 1 of Chap 6. Secure the fin assembly in this position with the fin lock-nut, which is to be tightened, using a short tommy bar.

Fuzing a bomb

9. With the fin assembly fitted to the bomb body, completely unscrew the tail transit plug and examine the screw-threads of the M102 adapter booster. Where necessary, clean these threads, using a short length of wood stick. Check that the adapter booster is securely positioned in the bomb body.

10. Remove the fuze from its sealed container, and examine and test it as follows:—

- (i) Examine the fuze to ascertain that it is not partially or fully armed, as detailed in A.P. 1661C, Vol. I, Sect. 5, Chap. 2.
- (ii) Examine the fuze for signs of external damage, corrosion (appearing as a white deposit), or traces of moisture on the arming stem cup which houses the reduction gear train.
- (iii) Test the fuze to ensure that the stationary gear, in the reduction gear train, is locked. To do this grip the top of the fuze (that is, the lock-nut and adjusting nut) and, using finger pressure only, rotate the arming stem. A movement up to $\frac{1}{8}$ in. is normally possible due to manufacturing tolerances, but should the arming stem rotate through 90 deg. or more the stationary gear is *not* locked and the fuze must be rejected.

Note.—If, when handling a fuze, it is dropped or accidentally knocked, it must be carefully examined externally to ensure that no damage has been sustained.

11. Having examined and tested the fuze, change the M14 primer detonator, if necessary, bearing in mind that the fuzes are normally supplied fitted with the 0.025 sec. delay version of this primer detonator. To change the primer detonator, unscrew the one supplied in the base of the fuze, by hand, and then screw in an M14 primer detonator giving the delay selected. Force must *not* be used in these operations, and should a primer detonator show signs of external corrosion or other damage, or should its primer be a loose fit, it *must not be used*.

Notes.—(i) The primer detonators have their delay time stamped on their heads. In addition, the head of the non-delay primer detonator is painted white, and that of the 0.1 sec. delay black, whilst the 0.01 sec. and 0.025 sec. delay versions have, respectively, a $\frac{1}{2}$ and a $\frac{1}{4}$ sector of the head painted black.

(ii) Long delay primer detonators of the M16 series cannot be used with these fuzes.

Warning.—Care must be taken when handling a primer detonator (or a fuze containing a primer detonator) as the primer component is partially exposed in the top of the primer detonator body.

12. Withdraw the split pin from the body of the fuze and screw the fuze (less its arming vane) by hand into the adapter booster at the rear end of the bomb body.

13. Thread the plain end of a No. 1 Mk. I safety wire first through the arming wire guide on the fin assembly and then through the uppermost pair of adjacent holes in the fuze arming stem cup and eyelet strap, as illustrated in fig. 1 of Chap. 6. These holes need not be exactly in line with the arming wire guide.

Note.—Should the uppermost pair of holes be occupied by the fuze safety pin, this pin is to be removed, to allow for insertion of the safety wire, *but only after* a second safety pin has first been inserted through the second pair of adjacent holes in the arming stem cup and eyelet strap.

14. After inserting the safety wire, cut the sealing wire threaded through the safety pin and remove the pin. Thread the plain end of the safety wire through the hole in one of the arming vane blades, and at the same time slip the arming vane over the head of the fuze so that the grooves in the arming vane assembly engage with the two locating pins on the fuze. Lock the arming vane to the fuze by screwing down the vane nut, hand tight.

Note.—The safety pin and its sealing wire, together with the split pin (see para. 12), are to be handed to the pilot or air bomber.

15. Adjust the safety wire to protrude approximately 3 in. beyond the fuze arming vane, as illustrated in fig. 1 of Chap. 6, and then slip two No. 1 Mk. I safety clips over the end of the wire so that the inner clip is in light contact with the arming vane.

Loading a fuzed bomb

16. With the single suspension lug uppermost, load the fuzed bomb on to the carrier in the normal manner, as described in the Chapter of A.P. 1664, Vol. I, relevant to the carrier used.

17. When the bomb is securely attached to the carrier, attach the hook end of a link, fuze-setting control, type E.M., flexible, adjustable to the loop end of the safety wire threaded through the fuze. Insert the loop end of the fuze-setting control link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzing unit must *not* be located *vertically* above the head of the tail fuze, but is to be moved inward towards the bomb suspension lug a *minimum* distance of 3 in., measured from the arming wire guide on the fin assembly, as shown in fig. 1 of Chap. 6. Preferably, however, the fuzing unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier and on the position of the E.M. fuzing unit, two or more fuze-setting control links, attached end to end, may be required.

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Unloading and unfuzing an unexpended bomb, and removal of fin assembly

Warning.—Before unloading and unfuzing an unexpended bomb, examine the fuze to make certain that it is not partially or fully armed, as detailed in A.P.1661B, Vol. I, Sect. 5, Chap. 2.

18. Disconnect the fuze-setting control link(s) from the carrier E.M. fuzing unit and unload the bomb from the carrier in the normal manner.

19. After unloading the bomb from its carrier, remove the two safety clips from the safety wire, *but do not withdraw the wire from the fuze*. Unscrew the vane nut from the head of the fuze and remove the arming vane.

20. Insert the safety pin through the unoccupied pair of adjacent holes in the arming stem cup and eyelet strap of the fuze, and secure it in position with the sealing wire. Then withdraw the safety wire from the fuze and arming wire guide. Unhook the fuze-setting control link(s) from the wire.

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must be discarded and *not* used again.

21. Unscrew and remove the fuze, by hand, from the rear end of the bomb body and *immediately* replace the split pin through the body of the fuze. Return the fuze to its container and seal with adhesive tape.

22. Having removed the fuze from the bomb, unscrew the fin lock-nut and remove the fin assembly. Fit the cardboard distance piece, if originally provided, round the threads of the filling plug and then replace the fin lock-nut and re-wire to prevent loss.

23. Close the rear end of the bomb body with the tail transit plug.

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APPENDIX 3

INSTRUCTIONS FOR USE—USING THE M114 or M114A1 FUZE

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Introduction

1. Either the M114 or M114A1 tail fuze (which are fully described in A.P.1661C, Vol. I, Sect. 5) can be used for the tail fuzing of both the AN-M59 and AN-M59A1 bombs. These fuzes, which do not incorporate a mechanical delay in their arming mechanism, are fitted with primer detonators of the M16 series, which provide either a 4 to 5 sec., or 8 to 11 sec. delay.

2. When fuzing a bomb with either of these fuzes, a No. 6 Mk. I arming wire guide, fitted to the box portion of the standard American fin assembly AN-M59, a No. 1 Mk. I safety wire, and two No. 1 Mk. I safety clips, are required.

Note.—The arming wire guide, safety wire, and safety clips may be supplied together with the fin assembly, or as separate items.

Fitting the fin assembly

3. The fin assembly is to be attached to the bomb body before fuzing is commenced. The procedure to be adopted is detailed in the following para. 4 to 7.

4. Remove the fin assembly from its crate and ascertain whether or not a No. 6 Mk. I arming wire guide is fitted. Where the wire guide is not fitted, proceed as follows:—

- (i) Hook the two halves of the arming wire guide to one of the four sides of the box portions of the fin assembly so that the bracket of the arming wire guide projects into the fin assembly, as illustrated in fig. 1 of Chap. 6.
- (ii) Rigidly secure the arming wire guide to the fin assembly by tightening the nut on the coupling screw.

5. Remove the transit wires securing the fin lock-nut to the rear end of the bomb body, and then unscrew and remove the lock-nut, and also, if fitted, the cardboard distance piece.

6. Partially unscrew the tail transit plug from the bomb body.

7. Offer up the fin assembly to the rear end of the bomb body, so that the arming wire guide is in line with the single suspension lug of the bomb, as shown in fig. 1 of Chap. 6. Secure the fin assembly in this position, using the fin lock-nut, which is to be tightened, using a suitable tommy bar.

Fuzing a bomb

8. With the fin assembly fitted to the bomb body, completely unscrew and remove the tail transit plug and examine the screw-threads of the M102 adapter booster. Clean these threads, where necessary, and check that the adapter booster is securely positioned in the bomb body.

9. Remove the fuze from its sealed container, and examine it for damage and for corrosion (appearing as a white deposit). Check that the fuze is not partially or fully armed, as detailed in A.P.1661C, Vol. I, Sect. 5, Chap. 3.

10. Carefully unscrew and remove the primer detonator from the base of the fuze, and then test the fuze to ensure that it is not partially uncocked, using a gauge, striker depth, No. 16, Mk. II. To do this, insert the stem of the gauge into the base of the fuze; the head of the gauge should abut the base of the fuze. If this does not obtain, and it is possible to "rock" the gauge whilst in the fuze,

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the fuze plunger and firing pin are partially uncocked and the fuze must *not* be used. In such circumstances the primer detonator must *not* be screwed back into the fuze.

Warning.—Care must always be taken when handling a primer detonator (or a fuze containing a primer detonator) as the primer component is partly exposed in the top of the primer detonator body.

11. Having examined and gauged the fuze, fit the primer detonator giving the delay required; this may or may not be the one supplied in the fuze. Force must *not* be used in this operation, and should a primer detonator show signs of external corrosion or damage, or should its primer be a loose fit, it *must not be used*.

Notes.—(i) The M114 and M114A1 fuzes are normally supplied fitted with the S to 11 sec. delay version of the M16 or M16A1 primer detonator, as appropriate.

(ii) The M16 and M16A1 primer detonators are identifiable by their milled and grooved heads. The 4 to 5 sec. and 8 to 11 sec. delay versions of these primer detonators are distinguishable by the delay times which are marked in two places on the heads. The delay times are also clearly marked on the cylinders in which the primer detonators are packed.

(iii) The M16 primer detonator may be used with either the M114 or M114A1 fuze. The M16A1 primer detonator is for use only with the M114A1 fuze. Short delay primer detonators of the M14 series cannot be used with either of the fuzes.

(iv) Should a fuze be dropped or accidentally knocked at any time, it must be carefully examined externally to ensure that no damage has been sustained.

12. Having fitted the required primer detonator, remove the "special instructions" tablet from the fuze arming stem tube and screw the fuze (less its arming vane), by hand, into the rear end of the bomb body.

13. Thread the plain end of a No. 1 Mk. I safety wire first through the arming wire guide on the fin assembly and then through the uppermost pair of adjacent holes in the stem cup and circular plate of the fuze, as shown in fig. 1 of Chap. 6. It is not essential for the holes in the fuze to be exactly in line with the arming wire guide.

Note.—Should the uppermost pair of adjacent holes be occupied by the fuze safety pin, the pin is to be removed, to allow insertion of the safety wire, *but only after* a second safety pin has first been inserted through the second pair of adjacent holes.

14. After inserting the safety wire, cut the sealing wire threaded through the safety pin and then remove the pin. Thread the plain end of the safety wire through the hole in one of the arming vane blades, and at the same time slip the arming vane over the head of the fuze so that the grooves in the arming vane assembly engage with the two locating pins on the fuze. Lock the arming vane to the fuze by screwing down the knurled vane nut, hand tight.

15. Adjust the safety wire to protrude approximately 3 in. beyond the fuze arming vane, as shown in fig. 1 of Chap. 6, and then slip two No. 1 Mk. I safety clips over the end of the wire so that the inner clip is in light contact with the arming vane blade.

Note.—The safety pin and its sealing wire are to be handed to the pilot or air bomber.

Loading a fuzed bomb

16. With the single suspension lug uppermost, load the fuzed bomb on to its carrier in the normal manner, as described in the Chapter of A.P.1664, Vol. I, relevant to the carrier used.

17. When the bomb is securely attached to the carrier, attach the hook end of a link, fuze-setting control, type E.M., flexible, adjustable, to the loop end of the safety wire threaded through the fuze. Insert the loop end of the fuze-setting control link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzing unit must *not* be located *vertically* above the head of the tail fuze, but is to be moved inward towards the bomb suspension lug a *minimum* distance of 3 in. measured from the arming wire guide on the fin assembly, as shown in fig. 1 of Chap. 6. Preferably, however, the fuzing unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier and on the position of the E.M. fuzing unit, two or more fuze-setting control links, attached end to end, may be required.

Unloading and unfuzing an unexpended bomb, and removal of fin assembly

Warning.—Before unloading and unfuzing an unexpended bomb, examine the fuze to make certain that it is not partially or fully armed, as detailed in A.P. 1661C, Vol. I, Sect. 5, Chap. 3.

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A.P.1661 B., Vol. I, Sect. 17, Chap. 6, App. 3

18. Disconnect the fuze-setting control link from the carrier E.M. fuzing unit and unload the bomb from the carrier in the normal manner.

19. Having unloaded the bomb from its carrier, remove the two safety clips from the safety wire, *but do not withdraw this wire from the fuze.* Unscrew the knurled vane nut from the head of the fuze and remove the arming vane.

20. Insert the safety pin through the second pair of adjacent holes in the stem cup and circular plate of the fuze and secure it in position with the sealing wire. Then withdraw the safety wire from the fuze and arming wire guide. Unhook the fuze-setting control link (or links) from the safety wire.

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must be discarded and not used again.

21. Unscrew and remove the fuze, by hand, from the rear end of the bomb body, return the fuze to its container and re-seal the container with adhesive tape.

22. Having removed the fuze from the bomb, unscrew the fin lock-nut and remove the fin assembly. Fit the cardboard distance piece, if originally provided, round the threads of the filling plug, and then replace the fin lock-nut on the rear end of the bomb body. Re-wire the nut to the filling plug to prevent loss.

23. Close the rear end of the bomb body with its transit plug.

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A.P.1661B, Vol. I, Sect. 17, Chap. 6

APPENDIX 4

Instructions for use—using the AN-M103A1 fuze | **FUZE**

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Introduction

1. The AN-M103A1 fuze (which is fully described in A.P.1661C, Vol. I, Sect. 5, Chap. 11) may be used for the nose fuzing of either the AN-M59 or AN-M59A1 1,000 lb. S.A.P. bomb. As the fuze is selective, giving either an instantaneous or 0.1 sec. delay action, it may be used to provide a 0.1 sec. delay action "insurance" fuze when a bomb is tail fuzed with an AN-M102 series fuze or, when necessary, as an alternative to the No. 52 nose pistol (with the exploder adapter, No. 1, Mk. I); the fuze, in this instance, being set for instantaneous action.

2. As the fuze incorporates a mechanical delay in its arming mechanism, it requires certain minimum heights of bomb release to ensure that the fuze is fully armed prior to impact of the fuzed bomb with its target. These minimum heights, of bomb release are promulgated to the Units concerned through the normal channels.

Note.—Partial pre-arming of the fuze is not to be undertaken in any circumstances whatsoever.

3. One No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips are required for use with the fuze.

Fuzing a bomb

4. Unscrew and remove the nose transit plug off the bomb and examine the fuze seat liner and its threads. Clean, where necessary, using a short length of wood stick.

5. Remove the fuze from its sealed container and check that the fuze is not partially or fully armed, as described in A.P.1661C, Vol. I, Sect. 6, Chap. 11. Also examine the fuze for signs of damage or corrosion (appearing as a white deposit), or for traces of moisture on the vane cup which houses the reduction gear train.

6. Cut and remove the sealing wire threaded through the fuze vane and eyelet straps, and vane holder. Ensure that the split pin is threaded through the vane and eyelet straps and then screw the fuze (less its arming vane), by hand, into the fuze seat liner of the bomb.

Note.—No tools are to be used when screwing home the fuze.

7. Insert the plain end of a No. 1 Mk. I safety wire through the adjacent holes in the uppermost pair of vane and eyelet straps, that is, through the pair of straps nearest in line with the single suspension lug of the bomb. The end of the wire should project about 3 in. beyond the straps. It is not essential that the pull-off of the safety wire be exactly in line with the suspension lug.

Note.—Should the holes in the uppermost pair of straps be occupied by the split pin, it is to be withdrawn, to allow for the insertion of the safety wire, but only after a second split pin has first been inserted through the second pair of holes in the straps.

8. Slip two No. 1 Mk. I safety clips over the end of the safety wire so that the inner clip is in light contact with the vane strap.

9. Fit the arming vane over the top of the fuze vane holder so that its two locating pins engage with the two holes in the vane holder. Ensure that the spring ring in the arming vane snaps into the circular groove in the top of the vane holder.

110. Set the fuze for instantaneous or 0.1 sec. delay action, as required. To do this, pull the setting pin outwards against the action of its spring and rotate the pin so that its peg engages with either the deep or shallow pair of slots, as appropriate. For *instantaneous* action the peg is to engage with the *shallow* slots, and for *delay* action, with the *deep* slots. A summary of these instructions is stamped on the fuze around the setting pin.

Note.—As supplied, the fuze is normally set for delay action.

Fitting the fin assembly

111. If the bomb is to be used nose fuze only, the fin assembly is to be attached to the bomb body as follows:—

- (i) Remove the transit wires securing the fin lock-nut to the tail end of the bomb body. Unscrew and remove the fin lock-nut and also remove the cardboard distance piece, if fitted.
- (ii) Offer up the fin assembly to the rear end of the bomb body so that the fins are at 45 deg. to the plane of the suspension lugs; this ensures ease of stowage of the bomb on British aircraft.
- (iii) Secure the fin assembly in position by replacing and screwing down the fin lock-nut. The lock-nut is to be tightened using a suitable tommy bar.

Loading a fuze bomb

112. With the single suspension lug of the bomb uppermost, load the fuze bomb on to its carrier in the normal manner, as described in the Chapter of A.P. 11664, Vol. I, relevant to the carrier used.

113. When the bomb is securely attached to its carrier, attach the hook end of a standard flexible fuze-setting control link to the loop end of the safety wire threaded through the fuze. Insert the loop end of the fuze-setting control link into the E.M. fuzeing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzeing unit must *not* be positioned *vertically* above the fuze, but is to be moved inward towards the bomb suspension lug a *minimum* distance of 3 in. measured from the straps on the fuze, on similar lines to fig. 11 of Chap. 6. Preferably, however, the fuzeing unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier and on the position of the E.M. fuzeing unit, two or more fuze-setting control links, attached end to end, may be required.

114. Finally, withdraw the split pin from the vane and eyelet straps and hand it to the pilot or air bomber.

Unloading and unfuizing an unexpended bomb, and removing fin assembly

Warning.—Before unloading and unfuizing an unexpended bomb, examine the fuze to make certain that it is not partially or fully armed, as described in A.P. 11661C, Vol. I, Sect. 51 Chap. 111.

115. To obtain additional safety while unloading a bomb from its carrier, first insert, wherever possible, the split pin into the second pair of adjacent holes in the fuze vane and eyelet straps. Then disconnect the fuze-setting control link(s) from the E.M. fuzeing unit and unload the bomb from the carrier in the normal manner.

116. Having unloaded the bomb from the carrier, disconnect the fuze-setting control link(s) from the safety wire, *but do not withdraw the wire from the fuze*. Remove the arming vane from the fuze, ensure that the split pin is securely threaded through the vane and eyelet straps, and then unscrew and remove the fuze from the bomb by hand. Seal the nose of the bomb with its transit plug.

117. Remove the two safety clips from the safety wire and then withdraw the wire from the fuze. Inspect the fuze for damage and set it for delay action, as necessary. Return the fuze to its container and seal with adhesive tape. Mark the container for "FIRST ISSUE".

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must be discarded and not used again.

118. Having removed the fuze from the bomb, unscrew the fin lock-nut and remove the fin assembly. Fit the cardboard distance piece, if originally provided, round the external screw threads of the bomb filling plug, and then replace the fin lock-nut. Rewire the lock-nut to the filling plug to prevent loss.

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A.P.1661B, Vol. I, Sect. 17

CHAPTER 7

BOMB, INCENDIARY, 500 lb., AN-M76

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1. Section through AN-M76 bomb
2. AN-M76 bomb complete with protective bands
3. No. 54, Mk. I tail unit

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- APPENDIX 1—Instructions for use—using the AN-M101A2 (tail) fuze
 APPENDIX 2—Instructions for use—using the No. 52 pistol
 APPENDIX 3—Instructions for use—using the AN-M103A1 (nose) fuze (*to be issued later*)

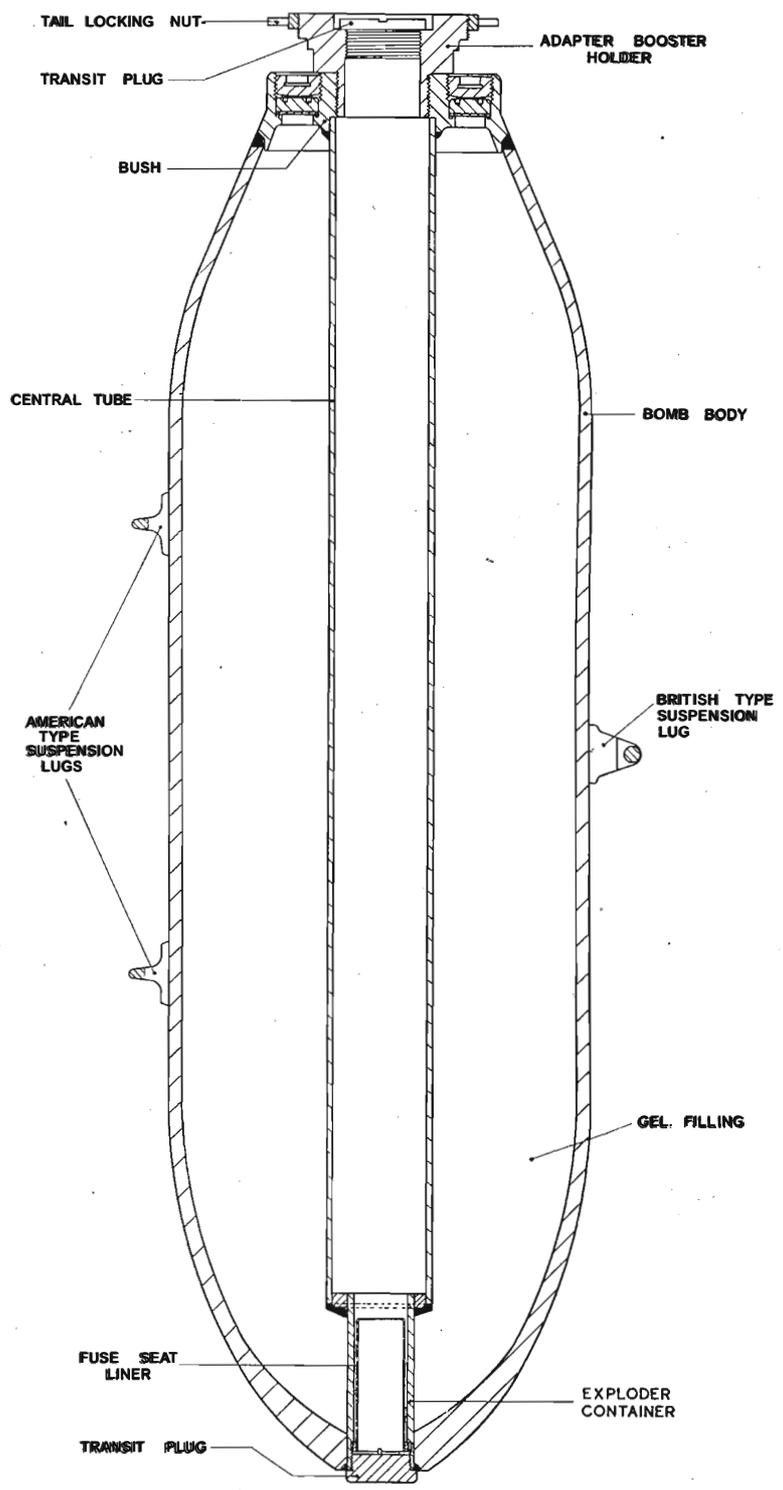


Fig. 1.—Section through AN-M76 bomb

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CHAPTER 7

BOMB, INCENDIARY, 500 lb., AN-M76

Introduction

1. This is an American bomb having high penetrative power and good ballistics. When released from a height of 25,000 ft. it will penetrate 30 in. of concrete but, for reasons of safety, it must not be released from less than 300 ft.

2. When the bomb is to be loaded into British aircraft the British No. 54 Mk. I tail unit must be used, as the bomb fitted with its American tail will not fit into a British 500 lb. bomb stowage.

3. The bomb is to be nose and tail fuzed. It is fuzed with either British or American fuzing components, as listed in para. 16. These components all require the use of the horizontal system of arming, that is, on release of a bomb from its carrier, arming is initiated by the horizontal pull-off of safety wires threaded through the arming vane of the nose or tail fuzing component.

4. The following components, each of which is described in A.P.1661C, Vol. I, Sect. 5, are also necessary for use with the bomb:—

- (i) W.P. igniter, AN-M5
- (ii) M14 burster
- (iii) Adapter booster, M115

Leading particulars

| | | | | | |
|---|-----|-----|-------|-------|----------------------------|
| 5. Length of bomb | ... | ... | ... | ... | 59.2 in. |
| Diameter of bomb body | ... | ... | ... | ... | 14 in. |
| Weight of filled bomb | ... | ... | ..... | ..... | 473 lb. |
| Weight of bomb fuzed and tail fitted | ... | ... | ... | ... | 530 lb. approx. |
| Terminal velocity (release from 25,000 ft.) | ... | ... | ... | ... | 1,070 ft. per sec. approx. |

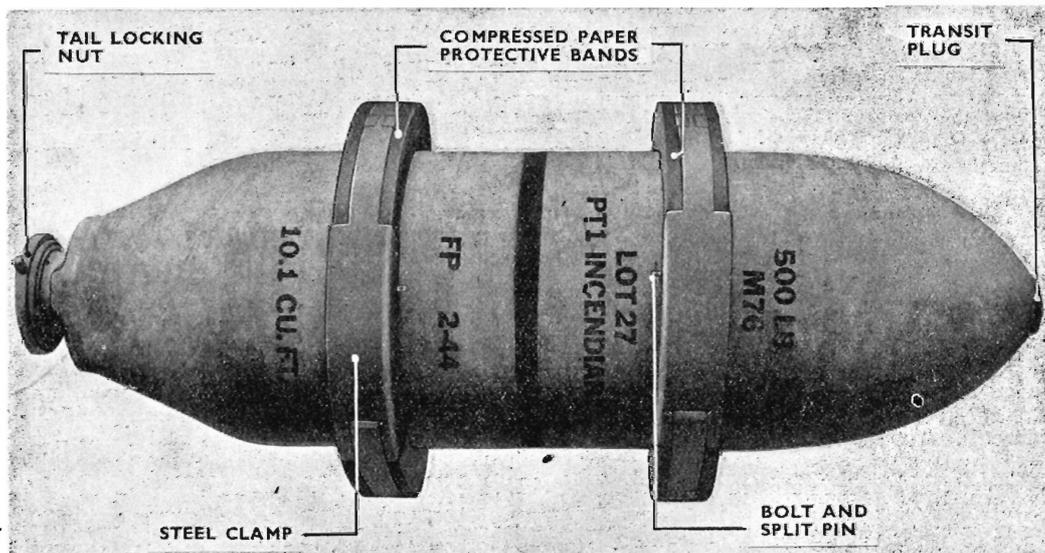


Fig. 2.—AN-M76 bomb complete with protective bands

General description

Bomb body, fig. 11 and 2

6. The bomb body is made of steel and has a central tube welded to a bush at the tail end of the bomb and to the inner end of an exploder container. The exploder container is welded to the nose

and is closed by a transit plug. Inside the exploder container is screwed a fuze seat liner. This liner consists of an aluminium cup $4\frac{1}{2}$ in. long, closed at its inner end. In some instances the fuze seat liner may be supplied separately from the bomb, when this is so they will be supplied as stated in para. 18.

7. At the tail end of the bomb is a removable adapter booster holder which is screwed into the bush. The adapter booster holder is closed by a transit plug and has a tail locking nut screwed on to it.

8. The bomb is fitted with twin American suspension lugs and, diametrically opposite these, with a British type suspension lug.

Filling

9. The incendiary filling is a petrol gel consisting of 1880 lb. of a mixture of finely divided magnesium, petrol, and IM polymer to form a paste. This fills the whole of the bomb body except the central tube. When the bomb is prepared for use a W.P. igniter and an M14 burster are inserted into the central tube.

Tail unit, fig. 3

10. The No. 54 Mk. I tail unit, which is supplied separately from the bomb body, consists of a tail ring to which a drum type cylindrical vane is attached by four vane supports. Reinforcing plates are riveted to the vane supports to increase the rigidity of the tail unit. An arming wire guide is secured to one of the reinforcing plates to receive a No. 1 Mk. I safety wire when the bomb is fuzed. The No. 1 safety wire, together with two No. 1 Mk. I safety clips, is secured to one of the reinforcing plates by adhesive tape.

Protective bands, fig. 2

11. Each AN-M76 bomb is fitted with two protective bands to prevent damage during transit and storage. In one form the bands are made of compressed paper consisting of a band approximately $1\frac{1}{2}$ in. thick held in place by a steel clamp secured by a bolt and split pin.

12. Alternatively, the bands may be made of metal and each consists of two semi-circular steel bands passing round the body of the bomb. They are hinged together on one side by means of a bolt and split pin and on the other side are held together by a bolt and two nuts.

Identification colouring and markings

13. The exterior of the bomb is painted olive drab, but a purple band 1 in. wide is painted round the central diameter of the bomb. Stencilled on the bomb is the following information:— Nomenclature, lot number, date (month and year) of manufacture, manufacturer's initials and cubic capacity. Typical markings are shown in fig. 2.

Functioning

14. When the bomb is released "live" from an aircraft, the safety wire is withdrawn from the nose pistol or fuze and/or from the tail fuze by a fuze-setting control link, thus allowing the fuzing components to become armed.

15. On impact of the fuzed bomb with its target the nose pistol or fuze and the tail fuze initiate the explosive train in the bomb, thus detonating the M14 burster. This ruptures the W.P. igniter and the bomb body, scattering the contents and mixing the white phosphorous with the incendiary gel filling. The white phosphorous ignites the incendiary gel.

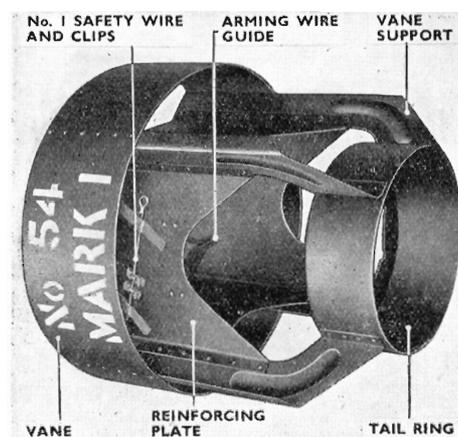


Fig. 3.—No. 54, Mk. I tail unit

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A.P.1661B, Vol. I, Sect. 17, Chap. 7

Instructions for use

16. The following alternative fuzes and pistols are used with this bomb:—

Tail

(i) Fuze, bomb, AN-M101A2 (tail) (see Appendix 1).

Nose

(ii) Pistol, bomb, D.A., No. 52, Mk. I (see Appendix 2).

(iii) Fuze, bomb, AN-M103A1 (nose) (see Appendix 3).

These fuzing components are fully described in A.P.1661C, Vol. I, Sect. 5. The detailed instruction, for fuzing a bomb with these components, together with the instructions for loading, unloading and unfuzing the fuzed bomb, are given in the appendices to this chapter.

Supply

17. The bomb, incendiary, 500 lb., AN-M76, is supplied plugged at the nose and tail, unboxed, and fitted with two protective bands as described. The weight of the bomb fitted with bands is approximately 455 lb. The storage dimensions of the bomb fitted with protective bands are approximately 60 in. x 20 in.

18. If the fuze seat liners are supplied separately they are supplied packed in a wooden box. The stowage dimensions of the box are 24 in. x 15½ in. x 12½ in. and its filled weight is 85 lb.

Storage

19. The AN-M76 incendiary bomb is classified, for storage purposes, in Group 15, category Y.

20. If the fuze seat liners are supplied separately they can be stored in any dry storehouse, but if stored in an explosives storehouse must be kept well away from fuzed stores.

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A.P.1661B, Vol. I, Sect. 17, Chap. 7

APPENDIX 1

INSTRUCTIONS FOR USE—USING THE AN-M101A2 (TAIL) FUZE

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LIST OF ILLUSTRATIONS

Fig.

1. Exploding the bomb and fitting the tail unit
2. Tail fuzing
3. Tail fuzing completed

Introduction

1. The American fuze AN-M101A2 is used for the tail fuzing of the AN-M76 incendiary bomb. This fuze is described in A.P. 1661C, Vol. I, Sect. 5. A No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips are required when fuzing a bomb with this fuze. The wire and clips are supplied with the tail unit.

Removing the protective hands

2. If the bomb is fitted with compressed paper bands they are removed by taking out the split pins and bolts from the metal clamps and easing the bands off the tail end of the bomb. If, however, metal bands are fitted, they are removed by unscrewing the nuts from the bolt which holds the semi-circular bands on the bomb.

Exploding the bomb and fitting the tail unit, fig. 1

3. To explode the bomb and fit the tail unit, proceed as follows:—

- (i) Remove the adapter booster holder complete with its transit plug and the tail securing nut.
- (ii) Remove the tail securing nut and the transit plug from the adapter booster holder.
- (iii) Insert a W.P. igniter, AN-M5, into the central tube of the bomb, through the opening in the tail end of the bomb.
Note.—The pipe plugs on the igniter are to be at the tail end of the bomb.
- (iv) Insert an M14 burster into the W.P. igniter.
- (v) Screw the adapter booster holder securely into the tail end of the bomb.
- (vi) Screw an M115 adapter booster into the adapter booster holder, using a suitable wrench to obtain a tight fit.
- (vii) Remove the transit plug from the adapter booster. Clean the threads of the adapter booster if necessary.
- (viii) Offer up a No. 54 Mk. I tail unit to the tail end of the bomb so that the arming wire guide on the tail unit is in line with the single (British type) suspension lug. Screw the tail securing nut on to the adapter booster holder to secure the tail in position. Tighten the nut, using a suitable tommy bar.

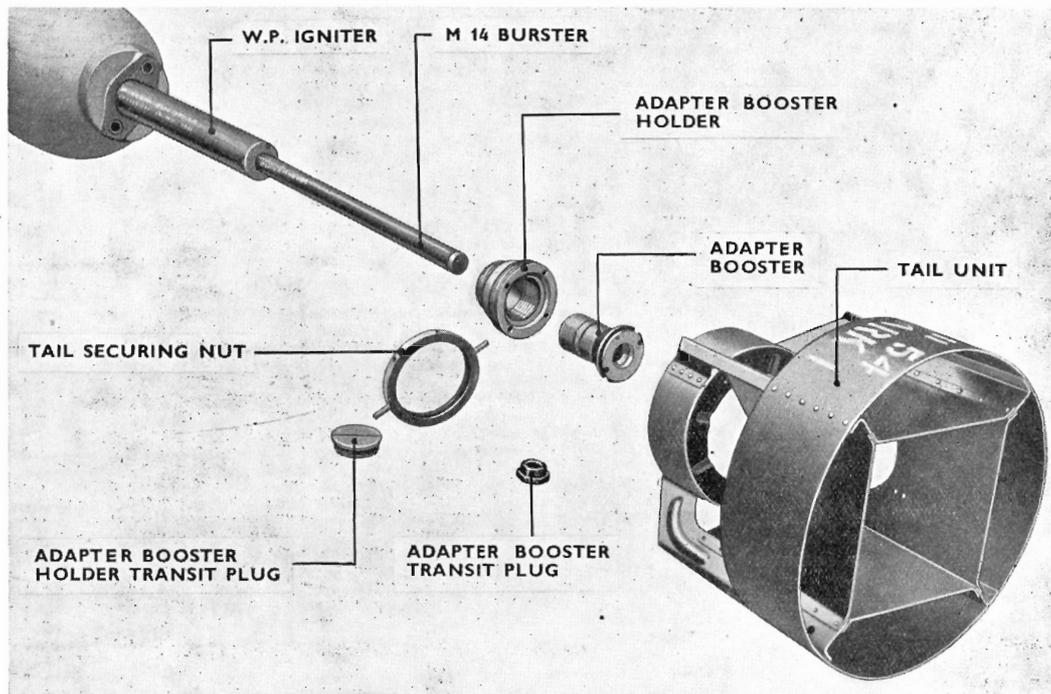


Fig. 1.—Exploding the bomb and fitting the tail unit

Fuzing a bomb, fig. 2 and 3

4. The tail fuze AN-M101A2 must first be examined and tested as follows:—

- (i) Examine the fuze to ascertain that it is not partially or fully armed, as described in A.P.1661C, Vol. I, Sect. 5, Chap. 2.
- (ii) Examine the fuze for signs of external damage, corrosion (appearing as a white deposit on the fuze), and for traces of moisture on the arming stem cup housing the reduction gear train.
- (iii) Test the fuze to ensure that the stationary gear, in the reduction gear train is locked. To do this, grip the top of the fuze (that is, the lock-nut and adjusting nut) and, using finger pressure only, rotate the arming stem. A movement up to $\frac{1}{16}$ in. tolerance is normally possible, but should the arming stem rotate through 90 degrees or more the stationary gear is *not* locked and the fuze must *not* be used.

5. Having examined and tested the fuze, unscrew, by hand, the primer detonator from the base of the fuze (normally a 0.025 sec. delay M14 primer detonator is supplied in the fuze). Insert a non-delay M14 primer detonator. Force must *not* be used during these operations, and should the primer detonator show signs of external corrosion or other damage, or should its primer be a loose fit, *it must not be used*.

Note.—The head of the non-delay primer detonator is painted white.

Warnings.—(i) Care must be taken when handling either a primer detonator or a fuze, as the primer component of the primer detonator is partially exposed in the top of the primer detonator body.

- (ii) Should a fuze be dropped or accidentally struck, it must be carefully examined externally to ensure that no damage has been sustained.

6. Withdraw the split pin from the body of the fuze and then screw the fuze (less its arming vane) into the open end of the adapter booster.

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A.P.1661B, Vol. I, Sect. 17, Chap. 7, App. 1

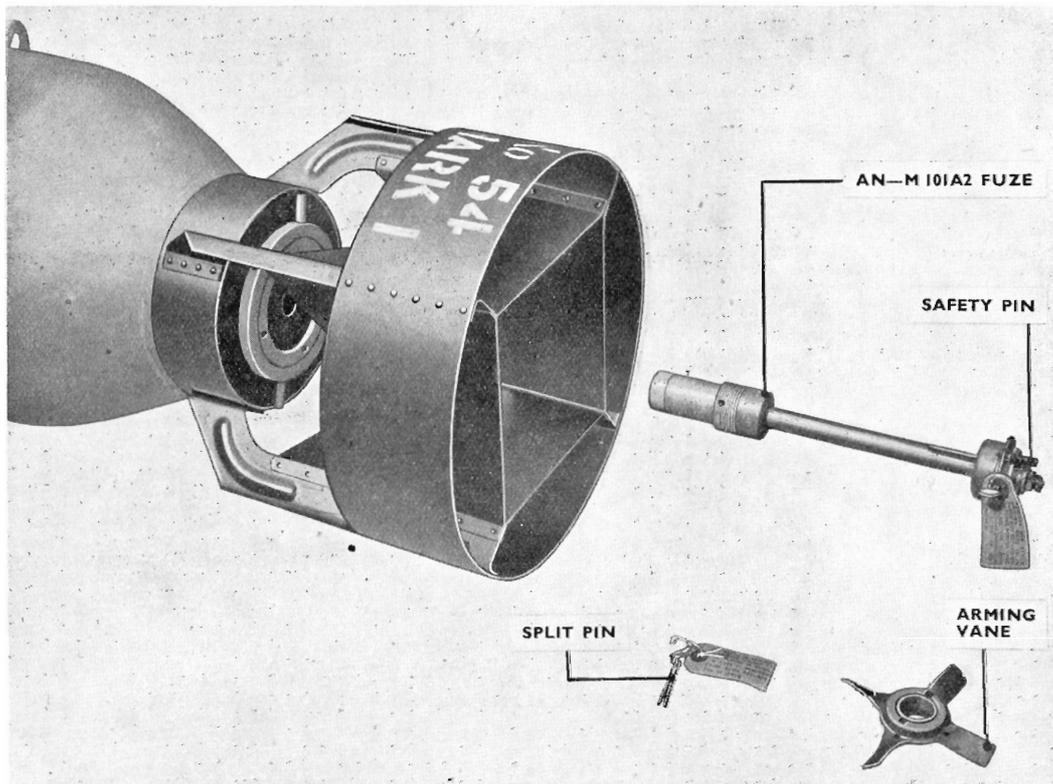


Fig. 2.—Tail fuzing

7. Remove the No. 11 Mk. I safety wire from its stowage on the tail unit and thread the plain end of the wire first through the arming wire guide on the tail unit and then through the uppermost pair of adjacent holes in the fuze arming stem cup and eyelet strap. The safety wire holes in the fuze need not be exactly in line with the arming wire guide.

Note.—Should the uppermost pair of adjacent holes be occupied by the fuze safety pin, this pin is to be removed to allow for insertion of the safety wire, *but only after a second safety pin has first been inserted through the second pair of adjacent holes in the arming stem cup and eyelet strap of the fuze.*

8. Having inserted the safety wire, cut the sealing wire threaded through the safety pin and then remove the pin. Thread the plain end of the safety wire through one of the holes in the arming vane blades and at the same time slip the arming vane over the end of the fuze so that the grooves in the arming vane assembly engage with the two locating pins on the fuze. Lock the arming vane to the fuze by screwing down the vane nut, hand tight.

Note.—The safety pin and its sealing wire, together with the split pin, see para. 6, are subsequently to be handed to the pilot or air bomber of the aircraft on to which the bomb is loaded.

9. Adjust the No. 11 safety wire to protrude approximately 3 in. beyond the fuze arming vane, and then attach two No. 11 Mk. I safety clips to the end of the wire so that the inner clip is in light contact with the arming vane blade (fig. 3).

Loading a fuzed bomb

10. With the single suspension lug of the bomb uppermost (for British aircraft) load the fuzed bomb on to its carrier, in the normal manner, as described in the chapter of A.P. 1664, Vol. I relevant to the type of bomb carrier used.

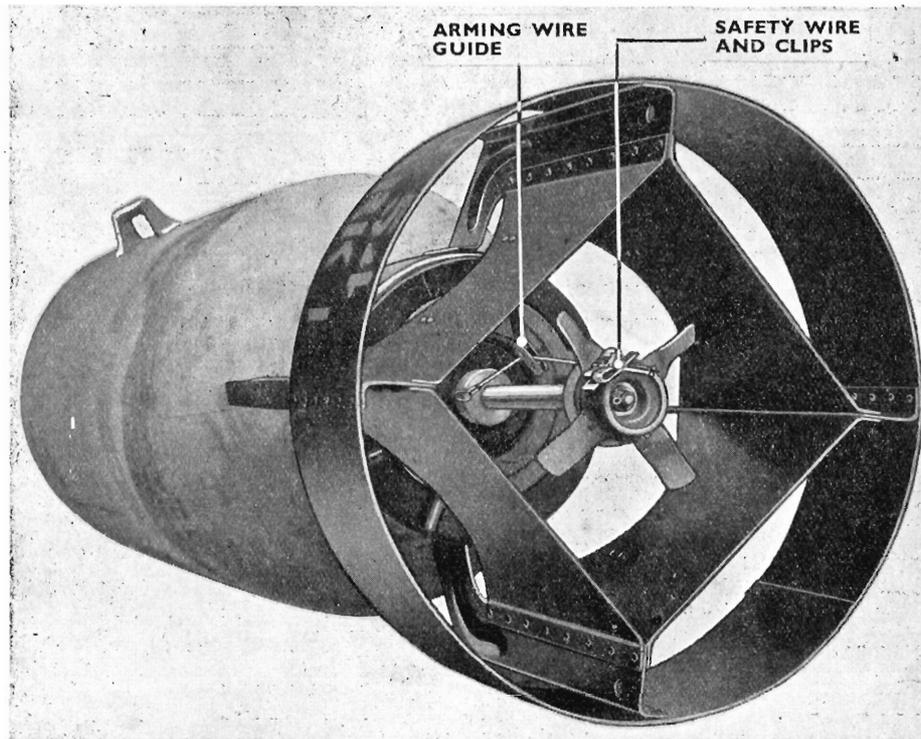


Fig. 3.—Tail fuzing completed

11. With the bomb securely attached to its carrier attach the hook end of an appropriate flexible fuze-setting control link to the loop end of the safety wire threaded through the fuze. Insert the loop end of the fuze-setting control link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzing unit must not be located vertically above the tail fuze, but is to be positioned inward towards the bomb suspension lug by a minimum distance of 3 in., measured from the safety wire guide on the tail unit. Preferably, however, the unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

Note.—Depending on the type of carrier, on the length of the bomb, and on the position of the E.M. fuzing unit, two or more fuze-setting control links, attached end to end, may be required.

Unloading and unfuizing a bomb

Warning.—Before unloading and unfuizing an unexpended bomb, examine the fuze to make certain that it is not partially or fully armed, as detailed in A.P.1661C, Vol. I, Sect. 5, Chap. 2.

12. Disconnect the fuze-setting control link from the E.M. fuzing unit and then unload the bomb from its carrier in the normal manner, as described in the chapter of A.P.1664, Vol. I, relevant to the bomb carrier used.

13. Having unloaded the bomb from its carrier, remove the two safety clips from the safety wire, but do not withdraw this wire from the fuze. Unscrew the vane nut from the end of the fuze and remove the arming vane.

14. Insert the safety pin through the second pair of adjacent holes in the arming stem cup and eyelet strap of the fuze, and secure it in position with its sealing wire. Then withdraw the safety wire from the fuze and arming wire guide on the tail.

Note.—Should the safety wire be kinked, bent or otherwise damaged or distorted, it must not be used again. Such a wire is to be discarded.

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October, 1945*

A.P. 11661B, Vol. I, Sect. 17, Chap. 7, App. 1

15. Unscrew the fuze, by hand, from the rear end of the bomb body and *immediately* replace the split pin through the body of the fuze and splay open the ends of the split pin. Return the fuze to its container and seal the container with adhesive tape.

16. Unscrew and remove the tail securing nut, using a suitable tommy bar to loosen it. Remove the tail unit from the bomb.

17. Unscrew and remove the M115 adapter booster, using a suitable wrench to loosen it. Seal the adapter with its transit plug.

18. Unscrew and remove the adapter booster holder and carefully withdraw the M14 burster from the W.P. igniter. Carefully withdraw the W.P. igniter from the central tube of the bomb.

19. Seal the adapter booster holder with its tail transit plug, and screw the tail securing nut on to the holder to prevent its loss. Replace the adapter booster holder into the tail end of the bomb.

20. Return the fuzing components, and the tail unit, to their appropriate storage.

APPENDIX 2

INSTRUCTIONS FOR USE—USING THE No. 52 PISTOL

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LIST OF ILLUSTRATIONS

- Fig.*
1. Nose fuzing
2. Nose fuzing completed

Introduction

1. The No. 52 Mk. I pistol, when used for the nose fuzing of the AN-M76 incendiary bomb, is to be used in conjunction with a No. 1 Mk. I exploder adapter, and either a No. 52 Mk. II or III detonator. A No. 1 Mk. I safety wire and two No. 1 Mk. I safety clips, which are supplied with the pistol, are also required.

Note.—The pistols and exploder adapter are described in A.P.1661C, Vol. I, Sect. 5. Alternatively, the American fuze AN-M103A1 (nose fuze) may be used (see App. 3). For instructions on exploding the bomb and fitting the tail unit, see App. 1, para. 3.

Removing the protective bands

2. If the bomb is fitted with compressed paper bands they are removed by taking out the split pins and bolts from the metal clamps and easing the bands off the tail end of the bomb. If, however, metal bands are fitted, they are removed by unscrewing the nuts from the bolt which holds the semi-circular bands on the bomb.

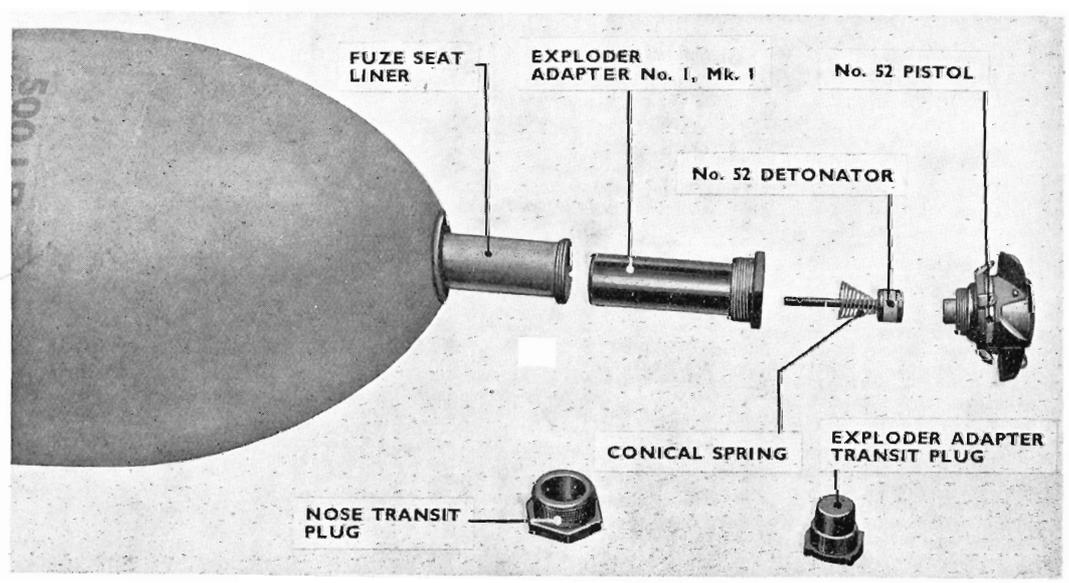


Fig. 1.—Nose fuzing

Fuzing a bomb, fig. 1

3. Before fuzing a bomb with a No. 52 pistol, examine the disc at the base of the pistol striker guide to check that this disc has not been pierced by the striker needle. If it is suspected that the disc has been punctured, *the pistol must not be used*, but is to be set aside for A.I.D./A.I.S. inspection.

4. Remove the nose transit plug and ensure that a fuze seat liner is screwed into the nose. Check the cleanliness of this liner and the threads of the exploder container.

5. Remove the No. 46 transit plug from a No. 1 Mk. I exploder adapter and gauge the detonator cavity of the exploder adapter, using a No. 2 Mk. I detonator cavity gauge (Stores Ref. 12A/349). The engraved line for 250/500 lb. bombs is applicable. Exploder adapters which fail to pass this test are not to be used, but are to be set aside for A.I.D./A.I.S. inspection.

6. Insert the exploder adapter into the fuze seat liner and screw it home, using a 1½ in. Whit. spanner, a C-spanner, or other suitable tool. Ensure that the exploder adapter is securely locked in position.

7. Fit the small conical spring (supplied with the pistol) over the stem of a No. 52, Mk. II or III detonator, so that the small end of the spring abuts the underside of the detonator head. Then insert the detonator into the detonator cavity of the exploder adapter.

Note.—The conical spring must always be fitted, as it ensures that the detonator is in contact with the end of the striker guide when the pistol is screwed into the exploder adapter.

8. With the pistol locking nut screwed forward a few turns, screw the pistol, by hand, into the exploder adapter until it is well seated on its washer. Lock the pistol in position by screwing its locking nut hard against the end of the exploder adapter.

Loading a fuzed bomb

9. With the single suspension lug of the bomb uppermost (for British aircraft) load the fuzed bomb on to its carrier, in the normal manner, as described in the chapter of A.P.1664, Vol. I, relevant to the type of bomb carrier used.

10. With the bomb securely attached to its carrier, withdraw the safety pin from the pistol and rotate the safety cap just sufficiently to bring the hole in one of the two arming vane bosses into line with the hole in the uppermost lug of the pistol locking nut.

Note.—The safety pin is to be handed to the pilot or air bomber of the aircraft on to which the bomb is loaded.

11. Insert the plain end of a No. 1 Mk. I safety wire first through the hole in the lug of the locking nut and then through the arming vane hole until the end protrudes approximately 3 in. Slip two No. 1 Mk. I safety clips over the protruding end of the safety wire, so that the inner clip is in light contact with the pistol arming vane; (fig. 2).

Note.—It is not essential that the pull-off of the safety wire should be exactly in line with the bomb suspension lug.

12. Attach the hook end of an appropriate flexible fuze-setting control link to the loop end of the safety wire, and then insert the loop end of the link into the E.M. fuzing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuzing unit must not be positioned vertically above the nose pistol, but must be moved inward towards the bomb suspension lug by a minimum distance of 3 in., measured from the drilled lug on the pistol locking nut. Preferably, however, the unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

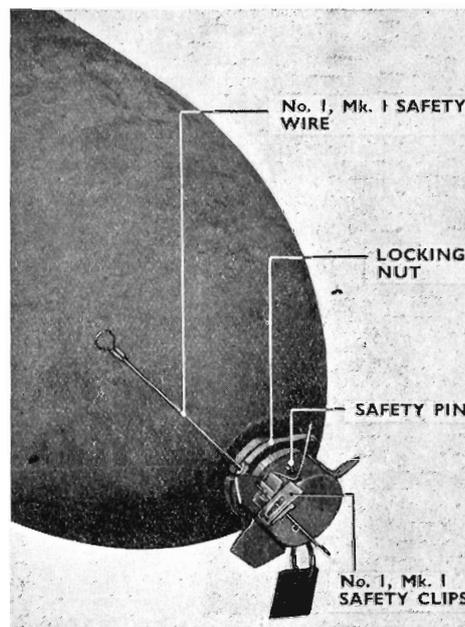


Fig. 2.—Nose fuzing completed

*This leaf issued with A.L. No. 126
October, 1945*

A.P.1661B, Vol. I, Sect. 17, Chap. 7, App. 2

Note.—Depending on the type of carrier, on the length of the bomb, and on the position of the E.M. fuzeing unit, two or more fuze-setting control links, attached end to end, may be required.

Unloading and unfuizing a bomb

13. Disconnect the fuze-setting control links from the E.M. fuzeing units and then unload the bomb from its carrier in the normal manner, as described in the chapter of A.P. 1664, Vol. I, relevant to the bomb carrier used.

14. Having unloaded the bomb, remove the two safety clips from the end of the safety wire, and then withdraw the wire from the pistol.

Note.—Should the safety wire be kinked, bent or otherwise damaged or distorted, it must not be used again. Such a wire is to be discarded and not returned to its box.

15. Screw up the safety cap until its stop pins are engaged, then unscrew the cap just sufficiently to bring its safety pin holes into line with the slots in the pistol body, and insert the safety pin.

16. To unfuze the bomb, proceed as follows:—

- (i) Slacken back the pistol locking nut.
- (ii) Unscrew and remove the pistol by hand.
- (iii) Extract the detonator, using an Extractor, detonator, No. 2, Mk. I (Stores Ref. 12A/348).
- (iv) Remove the conical spring from the detonator stem, or from the exploder adapter, and return it to its linen bag.
- (v) Remove the exploder adapter from the fuze seat liner. Screw home the No. 46 transit plug firmly into the exploder adapter.

17. Having removed the pistol and the exploder adapter, replace the nose transit plug of the bomb and return the bomb to storage for use as soon as possible. Return the fuzeing components to their appropriate storage.

This leaf issued with A.L. No. 138
January, 1947

A.P.1661B, Vol. I, Sect. 17, Chap. 7

APPENDIX 3

INSTRUCTIONS FOR USE—USING THE AN-M103A1 (NOSE) FUZE

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| 1. | Nose fuzing |
| 2. | Nose fuzing completed |

Introduction

1. The AN-M103A1 fuze (fully described in A.P.1661C, Vol. I, Sect. 5, Chap. 11) is used for the nose fuzing of the AN-M76 incendiary bomb as an alternative to the No. 52 pistol. The fuze is selective but must, in this instance, be set for instantaneous action.

2. As the fuze incorporates reduction gearing in its arming mechanism, it requires certain minimum heights of bomb release to ensure that the fuze is fully armed prior to impact of the fuzed bomb with its target. These minimum heights of bomb release are promulgated to the Units concerned through the normal channels.

Note.—Partial pre-arming of the fuze is not to be undertaken in any circumstances whatsoever.

3. One No. 1, Mk. I safety wire and two No. 1, Mk. I safety clips are required for use with the fuze.

4. For instructions on exploding the bomb and fitting the tail unit, see Appendix I, para. 3.

Removing the protective bands

5. If the bomb is fitted with compressed paper bands they are removed by taking out the split pins and bolts from the metal clamps and easing the bands off the tail end of the bomb. If, however, metal bands are fitted, they are removed by unscrewing the nuts from the bolt which holds the semi-circular bands on the bomb.

Fuzing a bomb, fig. 1 and 2

6. Remove the nose transit plug of the bomb and ensure that a fuze seat liner is screwed into the nose. Check the cleanliness of this liner and the threads of the exploder container.

7. Remove the fuze from its sealed container and check that the fuze is not partially or fully armed, as described in A.P.1661C, Vol. I, Sect. 5, Chap. 11. Also examine the fuze for signs of damage or corrosion (appearing as a white deposit), or for traces of moisture on the vane cup which houses the reduction gear train.

8. Cut and remove the sealing wire threaded through the fuze vane and eyelet straps, and vane holder. Ensure that the split pin is threaded through the vane and eyelet straps, and then screw the fuze (less its arming vane), by hand, into the fuze seat liner of the bomb.

Note.—No tools are to be used when screwing home the fuze.

9. Insert the plain end of a No. 1, Mk. I safety wire through the adjacent holes in the uppermost pair of vane and eyelet straps, that is, through the pair of straps nearest in line with the single suspension lug of the bomb. The end of the wire should project about 3 in. beyond the straps. It is not essential that the pull-off of the safety wire be exactly in line with the suspension lug.

Note.—Should the holes in the uppermost pair of straps be occupied by the split pin, it is to be withdrawn, to allow for the insertion of a safety wire, but only after a second split pin has first been inserted through the second pair of holes in the straps.

AIR
 MINISTRY
 Necessary, 1947

This is A.P. No. 138 in A.P.1661B, Vol. I, and concerns Sect. 17, Chap. 7
 Delete "(To be issued later)" after the title of Appendix 3 in the List
 of Contents, write "A.L. 138" in the outer margin of the list, insert
 this Appendix, and make an entry in the Amendment Record
 Sheet at the beginning of the Volume.

RESEARCH

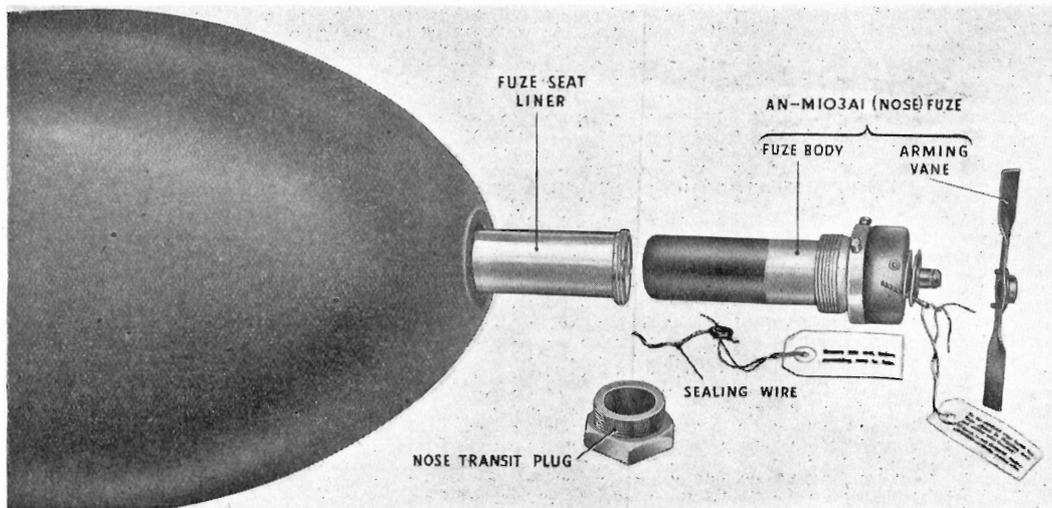


Fig. 1.—Nose fuizing

10. Slip two No. 1, Mk. I safety clips over the end of the safety wire so that the inner clip is in light contact with the vane strap.

11. Fit the arming vane over the top of the fuze vane holder so that its two locating pins engage with the two holes in the vane holder. Ensure that the spring ring in the arming vane snaps into the circular groove in the top of the vane holder.

12. Set the fuze for instantaneous action. To do this, pull the setting pin outwards against the action of its spring and rotate the pin so that its peg engages the *shallow* pair of slots. A summary of these instructions is stamped on the fuze around the setting pin.

Note.—As supplied, the fuze is normally set for delayed action, that is, with the peg engaging the deep pair of slots.

Loading a fuized bomb

13. With the single suspension lug of the bomb uppermost, load the fuized bomb on to its carrier in the normal manner, as described in the chapter of A.P.1664, Vol. I, relevant to the carrier used.

14. When the bomb is securely attached to its carrier, attach the hook end of a standard flexible fuze-setting control link to the loop end of the safety wire threaded through the fuze. Insert the loop end of the fuze-setting control link into the E.M. fuizing unit in the normal manner. As a "horizontal" pull on the safety wire is required, the E.M. fuizing unit must *not* be positioned *vertically* above the fuze, but is to be moved *inward* towards the bomb suspension lug a *minimum* distance of 3 in. measured from the straps on the fuze. Preferably, however, the fuizing unit should be moved inward towards the bomb suspension lug to the limit permitted by the contour of the bomb.

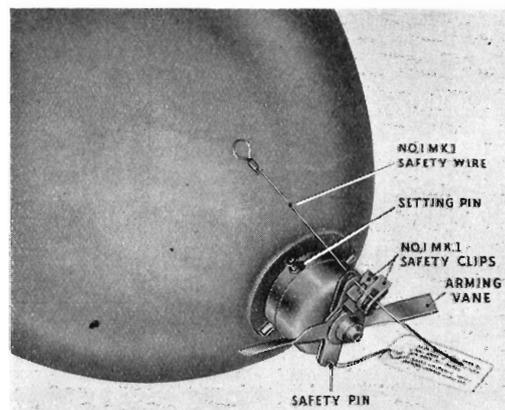


Fig. 2.—Nose fuizing completed

Note.—Depending on the type of carrier and on the position of the E.M. fuizing unit, two or more fuze-setting control links, attached end to end, may be required.

*This leaf issued with A.L. No. 138
January, 1947*

A.P.1661B, Vol. I, Sect. 17, Chap. 7, App. 3

15. Finally, withdraw the split pin from the vane and eyelet straps and hand it to the pilot or air bomber of the aircraft on to which the bomb is loaded.

Unloading and unfuzing a bomb

Warning.—Before unloading and unfuzing an unexpended bomb, examine the fuze to make certain that it is not partially or fully armed, as described in A.P.1661C, Vol. I, Sect. 5, Chap. 11.

16. To obtain additional safety while unloading a bomb from its carrier, first insert, wherever possible, the split pin into the second pair of adjacent holes in the fuze vane and eyelet straps. Then disconnect the fuze-setting control link(s) from the E.M. fuzing unit and unload the bomb from the carrier in the normal manner.

17. Having unloaded the bomb from the carrier, disconnect the fuze-setting control link(s) from the safety wire, *but do not withdraw the wire from the fuze*. Remove the arming vane from the fuze, ensure that the split pin is securely threaded through the vane and eyelet straps, and then unscrew and remove the fuze from the bomb by hand. Seal the nose of the bomb with its transit plug.

18. Remove the two safety clips from the safety wire and then withdraw the wire from the fuze. Examine the fuze for damage and set it for delay action. Return the fuze to its container and seal with adhesive tape. Mark the container "FOR FIRST ISSUE", and return the fuze to its appropriate storage.

Note.—Should the safety wire be kinked, bent, or otherwise distorted or damaged, it must be discarded and not used again.

Section 19

IMPLEMENTS, AMMUNITION

*Relevant amendments up to A.L. 72
incorporated in this reprint
January, 1944*

A.P.1661B, Vol. I

SECTION 19
IMPLEMENTS, AMMUNITION

GENERAL CONTENTS LIST

Note.—A detailed contents list appears at the beginning of each chapter.

CHAPTER 1—Extractors, detonator

CHAPTER 2—Gauges, cavity, detonator

CHAPTER 3—Keys *(to be issued later)*

CHAPTER 1

DETONATOR EXTRACTORS

Introduction

1. Detonator extractors are used to remove detonators from bombs during unfuzing, and in some instances for inserting detonators during fuzing.

2. The following detonator extractors are at present in use in the Service:—

- (1) Extractor, detonator, No. 1, Mk. I
- (2) Extractor, detonator, No. 2, Mk. I
- (3) Extractor, detonator, No. 4, Mk. I

EXTRACTOR, DETONATOR, No. 1, Mk. I

General description, fig. 1

3. The No. 1, Mk. I detonator extractor is a pair of spring tongs, approx. 5 in. long, having the ends turned inwards. It is used for gripping the head of the No. 28 Detonator-burster.

Identification markings

4. On the head of the No. 1, Mk. I detonator extractor is stamped the following:—

- (1) EXTR. DETR.
- (2) A/B. No. 1, I

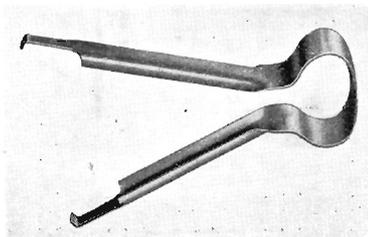


Fig. 1.—The No. 1, Mk. I detonator extractor

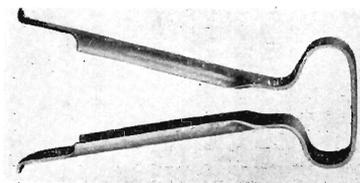


Fig. 2.—The No. 2, Mk. I detonator extractor

EXTRACTOR, DETONATOR, No. 2, Mk. I

General description, fig. 2

5. The No. 2, Mk. I detonator extractor is a pair of spring tongs, approx. 4½ in. long, having the ends turned outwards, to fit into the grooves of all aircraft bomb detonators at present in use, with the exception of the No. D.38 detonator, for which the No. 4, Mk. I detonator extractor is used, see para. 7, and the No. 28 detonator-burster, for which the No. 1, Mk. I detonator extractor is used, see para. 3.

Identification markings

6. On the head of the No. 2, Mk. I detonator extractor is stamped the following:—

- (1) EXTR. DETR.
- (2) A/B. No. 2, I
- (3) The manufacturer's initials or recognised trade mark
- (4) The month and year of manufacture

*This leaf issued with A.L. No. 139
April, 1947*

A.P. 16911B, Vol. I., Sect. 19, Chap. 1

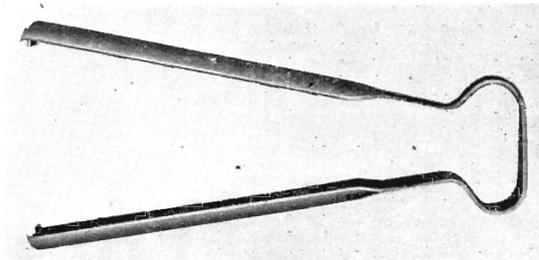


Fig. 3.—The No. 4, Mk. I detonator extractor

EXTRACTOR, DETONATOR, No. 4, Mk. I

General description, fig. 3

7. The No. 4, Mk. I detonator extractor is a pair of spring tongs, approx. 7 in. long, having the ends turned inwards and formed into a sharp knife-edge. It is used for gripping the head of the No. D.38 detonator when inserting or extracting this detonator.

Identification markings

8. On the head of the No. 4, Mk. I detonator extractor is stamped the following:—■

- (1) EXTR. DETR.
- (2) A/B. No. 4, I
- (3) The manufacturer's initials or recognised trade mark
- (4) The month and year of manufacture

*This leaf issued with A.L. No. 140
May, 1947*

A.P.1661B, Vol. I, Sect. 19

CHAPTER 2

GAUGES

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| Gauge, striker depth, No. 16, Mk. I— | |
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 2. The No. 16, Mk. I striker depth gauge
 3. The No. 17, Mk. I detonator cavity gauge

Note.—Gauges, cavity, detonator, No. 1 Mk. I and No. 7, Mk. I have been declared
obsolete by A.M.O. (N) 1129/45.
nkC 17
(A.T.J.28)

CHAPTER 2

GAUGES

Introduction

1. Gauges are used during the fuizing of bombs, the following being at present in use in the Service:—

- (1) Gauge, cavity, detonator, No. 2, Mk. I
- (2) Gauge, striker depth, No. 16, Mk. I
- (3) Gauge, cavity, detonator, No. 17, Mk. I

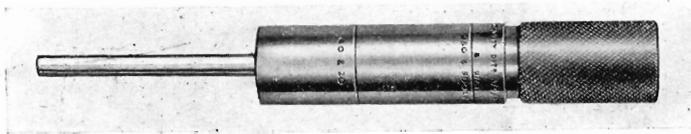


Fig. 1—The No. 2, Mk. I detonator cavity gauge

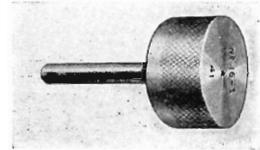


Fig. 2—The No. 16, Mk. I striker depth gauge

GAUGE, CAVITY, DETONATOR, No. 2, Mk. I

General description, fig. 1

2. The No. 2, Mk. I detonator cavity gauge is a brass plug gauge, approx. 7·8 in. long, and is used for ensuring that the detonator cavity of any British bomb is unobstructed prior to inserting the detonator. The instructions for using the gauge are contained in the instructions for fuizing the relevant bombs.

3. The gauge is packed in Case, gauge, Mk. I.

Identification markings

4. The following information is stamped around the body of the gauge below the knurled head:—

- (1) GAUGE, CAVITY, DET., A/C BOMB, No. 2, Mk. I
- (2) The manufacturer's initials or recognized trade mark.
- (3) The month and year of manufacture.

GAUGE, STRIKER DEPTH, No. 16, Mk. I

General description, fig. 2

5. The No. 16, Mk. I striker depth gauge is a steel plug gauge, approx. 2·45 in. long, and is used to ensure that Fuzes, M.112 A1, M.113 A1, M.114, and M.114 A1 are not in the half-cocked condition when fuizing a bomb. The instructions for using the gauge are contained in the instructions for fuizing the relevant bombs.

6. The gauge is packed in Box, B.522, Mk. II.

Identification markings

7. The following information is stamped on the head of the gauge:—

- (1) No. 16 — I.
- (2) The manufacturer's initials or recognized trade mark.
- (3) The year of manufacture.

*This leaf issued with A.L. No. 140
May, 1947*

A.P. 11661B, Vol. I, Sect. 19, Chap. 2

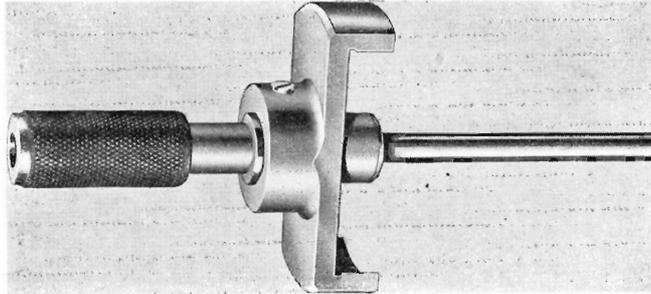


Fig. 3.—The No. 17, Mk. I detonator cavity gauge

GAUGE, CAVITY, DETONATOR, No. 17, Mk. I

General description, fig. 3

8. The No. 17, Mk. I detonator cavity gauge is used for gauging the detonator-burster holder of practice bombs and comprises a plug and a crosshead. The plug, approximately $6\frac{1}{2}$ in. in overall length, is a sliding fit in the crosshead, which is about 3 in. in diameter. A locating screw is provided in the crosshead and engages a large hole in the plug, to give a fore-and-aft movement of .105 in. Brief instructions for use (SHOULDER OF PLUG MUST NOT PROJECT BEYOND FACE OF CROSSHEAD) are stamped on the crosshead. Detailed instructions for use are contained in the instructions for fuzeing the relevant bombs.

Identification markings

9. The following information is stamped on the plug handle:—
- (1) No. 17, Mk. I.
 - (2) The manufacturer's initials or recognised trade mark.
 - (3) The month and year of manufacture.

Section 20

EXAMINATION OF BOMBS BY UNIT PERSONNEL

*Relevant amendments up to A.L. 72
incorporated in this reprint
January, 1944*

A.P.1661B, Vol. I

SECTION 20

EXAMINATION OF BOMBS BY UNIT PERSONNEL

GENERAL CONTENTS LIST

Note.—A detailed contents list appears at the beginning of each chapter.

CHAPTER 1—General notes on the examination of bombs and explosives packages by Unit Personnel

CHAPTER 2—Routine examination of fuzed H.E. bombs

Issued with A.L. No. 2
 February, 1942
 Relevant amendments up to A.L. 72
 incorporated in this reprint
 January, 1944

A.P.1661B, Vol. I, Sect. 20

CHAPTER 1

General notes on the examination of bombs and explosives packages by Unit Personnel

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CHAPTER 1

General notes on the examination of bombs and explosives packages by Unit Personnel

Introduction

1. The examination described in this chapter is to be made by Unit personnel, under the supervision of the Armament Officer, Warrant Officer, Flight Sergeant or Sergeant fitter armourer or armourer, at Royal Air Force Stations other than Maintenance Units.

2. On receipt, all unboxed bombs are to be examined for damage in transit. Boxed bombs, the packages containing which are damaged, are also to be examined.

H.E. BOMBS

Frequency of examination

3. Bombs in store, except those mentioned in para. 4, require no examination other than the annual A.I.D. inspection, unless there is reason to suspect that they are damaged, rusty, or exuding.

4. Bombs of 1917 to 1918 manufacture, whether they are loose or in crates, are to be examined by the Armament Officer, 25 per cent, being examined each quarter of the year. This examination is not to be made in the storehouse, but in the open or in a separate building or tent provided for the purpose.

5. Bombs which, either on receipt or subsequently, are found to be defective or damaged to such an extent as to impair their serviceability are to be regarded as "unclassified", and are to be segregated for inspection by the A.I.D. Inspector of Explosives at his next visit. If, however, the number found to be defective reduces the serviceable stock below the minimum establishment, application is to be made for a special inspection by the A.I.D. Inspector.

Tail units

6. All tail units are to be examined on receipt and, if found to be damaged then, or subsequently, they are to be repaired at once. During repair, care is to be taken to prevent further damage. If the repair is beyond the capacity of the Unit, they are to be set aside until the next inspection by the A.I.D. Inspector. If, however, the number found to be defective reduces the number of serviceable bombs below the minimum establishment, application is to be made for a special inspection by the A.I.D. Inspector.

Legibility of markings

7. All bombs are to be examined periodically for the legibility of their markings. If the markings are becoming illegible, they are to be re-stencilled. If the markings are illegible, and the store cannot be identified, it is to be set aside for the attention of the A.I.D. Inspector at his next visit.

Warning.—The use of lead-free paint is essential when stencilling stores filled with picric type explosives, for example, bomb, H.E., aircraft, A.P., 2,000 lb., filled with shellite.

Painting

8. When defective paint, or rust, is found, the damage is to be repaired at once. A note should be made of all markings, and the surface of the bomb is to be cleaned as necessary with an oily rag, using oil, linseed, boiled (Stores Ref. 12F/9), which is a lead-free oil. Two coats of paint are to be applied, the first being white, and the second green. The bomb is then to be re-marked as necessary. At the conclusion of each period of work, all rags, paints, paint brushes, etc., are to be removed from the explosives storehouse.

Warning.—The use of lead-free paints, oils, etc., is essential when applied to stores filled with picric type explosives, for example, shellite. They may, if available, be used on stores having other types of filling.

9. The following is a list of paints which are to be used for the marking and painting of bombs. No. (ii) to (vi) are lead-free paints, and *these paints only must be used on bombs filled with picric type explosives.* No. (vii) to (xii) are non-lead-free paints and are for use on all bombs not filled with picric type explosives; *they must not be used on bombs filled with picric type explosives.* Paints No. (ii) to (vi) must be used on all bombs if the corresponding non-lead-free paints are not available.

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| <i>Lead-free paints</i> | | <i>Non-lead-free paints</i> | |
|----------------------------------|--------------------|----------------------------------|--------------------|
| <i>Nomenclature</i> | <i>Stores Ref.</i> | <i>Nomenclature</i> | <i>Stores Ref.</i> |
| (i) Paint, black, No. 1 | 12F/10 | (vii) Paint, black | 12F/109 |
| (ii) Paint, bright red | 12F/11 | (viii) Paint, red, No. 1 | 12F/72 |
| (iii) Paint, green, No. 1 | 12F/13 | (ix) Paint, green, No. 5 | 12F/69 |
| (iv) Paint, white, No. 1 | 12F/14 | (x) Paint, white, No. 2 | 12F/76 |
| (v) Paint, yellow, No. 1 | 12F/15 | (xi) Paint, yellow | 12F/110 |
| (vi) Paint, green, No. 6 | 12F/102 | (xii) Paint, green, No. 6 | 12F/111 |

Exudation of explosive fillings

10. Some bombs, filled with T.N.T. or amatol, are liable to exude an oily substance on exposure to elevated temperatures. This oily substance, which is brown and viscous, may be found on the exterior of bombs, or in the central tubes or exploder cavities. The cleaning of exuding bombs is to be done under "clean" conditions, and under the supervision of a qualified officer.

11. If exudation is found on the exterior of a bomb, it is to be carefully wiped away, using a cloth dampened with warm water; if necessary a wooden scraper may also be used. As exudation may cause an explosion if subjected to friction, any found around the nose or tail plugs, or pistols, is to be removed before any attempt is made to remove the plugs or pistols.

12. After any exudation around the nose and tail plugs, or pistols, has been removed, the plugs or pistols are to be carefully removed, and the central tube or exploder cavity examined. The appropriate keys only are to be used to remove the plugs, or pistols, and no undue force is to be applied, either by hammering or extra leverage. Any exudation in the central tube or exploder cavity is to be removed in a manner similar to that described in para. 11. The screw-threads are also to be cleaned with a mop dampened with warm water.

13. If the plugs or pistols cannot be removed without undue force, the bomb is to be considered as "unclassified" and treated as stated in para. 5.

14. Filling plugs are not to be removed except under the supervision of an A.I.D. inspector.

15. There is another form of exudation which is due to the deliquescence of ammonium nitrate in the presence of moisture. This exudation takes the form of a yellowish liquid, and its action on the brass portions of a pistol may result in the formation of blue crystals which are very sensitive to blows or friction.

16. If such crystals, or any formations of blue, white, purple, or green salts are observed in the central tubes or exploder cavities, no attempt at cleaning is to be made, but the store is to be placed apart from serviceable stores and an application made for a special inspection by the A.I.D. inspector.

17. In the absence of any such crystals or salts, the second type of exudation may be cleaned away in a manner similar to that described in para. 11, but see, however, para. 19. Owing to the good protection from damp afforded by the present method of sealing bombs after filling, this second form of exudation is not likely to occur in bombs of recent manufacture.

18. Bombs which have exuded are to be examined every three months, and are to be brought to the notice of the A.I.D. Inspector at his next visit.

Central tubes or exploder cavities

19. The central tubes of most bombs filled since April, 1934, are varnished internally; such tubes are not to be lubricated but are to be wiped out with a *dry* cloth.

20. The central tubes of bombs other than those covered by para. 19 are to be cleaned with a damp cloth and lubricated with a light film of jelly, mineral (Stores Ref. 12F/6) all excess jelly being wiped away.

Pistols, plugs, and tail units

21. Before pistols or plugs are replaced in bombs, the following action must be taken:—

- (i) The screw-threads are to be cleaned.
- (ii) The washers on pistols and, where used, on plugs, are to be examined, and if unserviceable, are to be renewed. The appropriate washers are as follows:—

| <i>Nomenclature</i> | <i>Stores Ref.</i> |
|--|--------------------|
| Washers, leather:— | |
| 1F5 in. ext. dia., 1F01 in. int. dia. | 12F/20 |
| 1F6 in. ext. dia., 1-32 in. int. dia. | 12F/21 |

- (iii) The threads of pistols or plugs with leather washers are to be covered with luting, thin, Mk. V (Stores Ref. 12F/41), except that the three threads nearer the head of the pistol or plug, must be left clean, the No. 16 pistol is an exception, see (iv). A fillet of luting, thick, Mk. IV (Stores Ref. 12F/8), is to be placed under the flange of plugs without washers. Pistols having washers, must not be inserted without them.
- (iv) All threads of the No. 16 pistol are to be covered with thin luting.
- (v) After the pistols or plugs have been securely screwed into the bomb, any excess luting must be wiped off.

22. Tail pistols and the bearing of the arming vane spindle of the tail unit are to be examined for the presence of mineral jelly or vaseline; where this is found, it should be thoroughly cleaned off. The only lubricant to be used on tail pistols or the arming spindles of tail units is oil, anti-freezing, Type A (Stores Ref. 34A/43 or 46). This oil should be applied sparingly.

PRACTICE BOMBS FILLED WITH TITANIUM TETRACHLORIDE**Examination for leakage**

23. There is little risk of leakage of titanium tetrachloride from a properly filled and serviceable practice bomb, but leakage may occur due to a faulty plug or washer, a flaw in the metal, or damage done to the bomb body. The presence of a leak is shown by the formation of smoke at the leak, or by brown discolouration in the vicinity of the leak. A leaking bomb is to be disposed of, as it may in time cause damage to other bombs.

24. Practice bombs in store are to be examined at least once a month by an Armament Officer or Warrant Officer, leaking bombs being reported to the A.I.D. Inspector if the number affected is large; otherwise a leaking bomb should be disposed of. During this examination, it should be ascertained that the oldest bombs are being used first.

EXPLOSIVES PACKAGES**General**

25. Before any attempt is made to repair explosives packages, all the contents are to be removed. Unless special means are provided, lids of wooden boxes are to be secured with screws.

26. No attempt is to be made to apply heat to, or to solder, packages containing explosives, except under the direct supervision of the A.I.D. Inspector.

Sealing of packages with tape

27. Small tinplate packages containing explosive stores are usually issued hermetically sealed by a strip of tinned sheet metal, soldered round the junction of the lid and body. If these strips are damaged or broken, allowing air to penetrate to the contents, they are to be completely removed and the package re-sealed by a linen tape band secured in position with shellac cement.

28. The shellac cement used for this purpose is prepared by dissolving powdered gum shellac in methylated spirit, industrial (Stores Ref. 33C/209), in the proportion of 1 lb. of shellac to 1 pt. of spirit. It is necessary to boil the spirit for about one hour before the shellac completely dissolves, and this should be done in a water bath, under strict precautions, owing to the inflammability of the spirit.

29. The tape used should be a linen tape, wide enough to make a good joint, and long enough to provide an overlap of 2 in. It should be impregnated with shellac cement and, when it has become tacky, is to be wrapped tightly round the joint, the loose end being turned back to form a $\frac{1}{2}$ in. loop. When in position, the band should be given a coat of shellac cement. The loop is to be painted red when sealing yellow or black cylinders or boxes, or black when sealing red packages.

30. Some packages are issued with tape bands in place of the sheet metal strips; if such tape bands are loose or damaged, they are to be renewed as described in para. 27 to 29.

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31. Some explosives are issued in wooden boxes having an inner lining of tinfoil, this lining being closed by a tinfoil lid, the edges of which fit into a groove formed in the lining. This groove is filled with thick luting, thus making the lining air-tight. If the lid is removed, the luting is to be examined and, if it is hard or cracked, it is to be scraped away and a fillet of thick luting placed in the groove. The lid is then to be pressed down and more luting applied to the groove to fill it completely.

Demands for labels

32. When the labels, other than sealing labels, of packages containing explosives are found to be damaged or missing, new labels are to be affixed. Labels are supplied in bulk from No. 2 Maintenance Unit, and demands are to state the letter, number, and description of the labels required. This information can normally be obtained from the old labels.

Affixing labels

33. Labels, both interior and exterior, are to be fixed to explosives packages with shellac varnish applied with a suitable brush. The shellac varnish should be freshly made, by dissolving $\frac{1}{2}$ lb. of powdered gum shellac in 1 pt. of methylated spirit, industrial (Stores Ref. 33C/209). It is necessary to boil the spirit for a time before the shellac completely dissolves, and this should be done in a water bath, under strict precautions, owing to the inflammability of the spirit. As an alternative, the following adhesive may be used. Mix $\frac{1}{2}$ gall. of methylated spirit, mineralized (Stores Ref. 33C/211), and 4 lb. of powdered gum, copal, manilla, soft, in a galvanized container and stir well, removing any scum. Place the container in boiling water and allow the contents to simmer for half-an-hour, again removing the scum. Allow to cool for 12 hrs. and then pour the mixture into containers and render the containers air-tight. This will make approximately 6 lb. of adhesive.

New labels

34. Before fixing new labels, other than sealing or packing labels, great care is to be taken to transfer to the new labels all the information that is necessary to identify the contents of the packages as to quantity, description, etc. If the printed label requires amendment in this respect, it is to be amended in ink, which should be allowed to become quite dry before the label is affixed with varnish.

Packages with damaged or missing sealing labels

35. All packages containing explosives are to be sealed with station monogram labels, and in addition packages that have been inspected will bear an Inspection Department sealing label. If these labels are found to be damaged or missing, the package is to be opened. If there is a hermetically sealed liner to the package, and it is found to be intact, the lid of the package is to be replaced, secured, and sealed, but otherwise the contents of the package are to be examined to ensure that they agree in quantity and description with the information given on the descriptive labels or with stencilling on the outside of the package. This labelling or stencilling is to be amended as necessary, the lining made air-tight, and the lid of the package replaced, secured, and sealed. The sealing label used will be L.600, the appropriate station monogram being marked on the label.

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CHAPTER 2

Routine examination of fuzed H.E. bombs

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CHAPTER 2

Routine examination of fuzed H.E. bombs

Introduction

1. Bombs, H.E., held ready for use in the fuzed condition, whether in storage, or in position on aircraft, are to be examined periodically as described in this chapter. The examination is to be undertaken in a fuzed bomb area or in a fuzing point. Bombs on aircraft are to be removed for examination, and only one bomb is to be under examination at one time.

2. The object of the examination is to ensure that the components of the fuzed bomb are in a serviceable condition, and that deterioration due to exposure has not occurred. The removable components are to be withdrawn for examination and the exposed portions of the central tube, detonator holder, or exploder container examined for the presence of moisture. Force must not be used when extracting a detonator, and the correct tools must always be used. If a detonator cannot readily be extracted, the bomb is to be set aside for A.I.D. inspection.

3. If it is considered that the filling of a bomb, or a built-in paper-cased exploder is affected by moisture the bomb is to be set aside for A.I.D. inspection.

Frequency of examination

4. Subject to instructions from a higher authority, the Commanding Officer of a Station is responsible for deciding the frequency of examination, taking into account the climatic conditions, the situation of the bombs, and all other relevant factors. The following intervals for particular conditions are not to be exceeded:—

| <i>Situation of bombs</i> | <i>Maximum interval between examinations</i> |
|---|--|
| (i) Loaded on flying boats with external bomb stowage, or on float planes; or on any aircraft with internal or external bomb stowage, operating in tropical climates. | 1 week |
| (ii) Loaded on flying boats with internal bomb stowage, or on land planes With internal or external bomb stowage not operating in tropical climates. | 2 weeks |
| (iii) Stacked in the open on battens or under tarpaulins, or stored under permanent cover. | 2 months |

Routine examinations

5. The following operations are specified for general guidance in the examination of fuzed bombs; they are not to be regarded as absolving personnel from the responsibility of making such additional examinations as circumstances may warrant. These operations are additional to any inspectional work called for by other instructions in A.P. 1243, A.P. 1245, or the A.P. 1661 series, and do not affect the routine examination of stored explosives described in A.P. 1661B, Vol. I, Sect. 20, Chap. I.

Examination of bomb bodies and tails

6. Examine the bomb body generally for damage and corrosion, and remove any rust that may have formed on the suspension lug. Examine the tail unit for distortion, and the arming vane, where applicable, for freedom of rotation. Examine the parachute, where fitted, for dampness, mildew, or other deterioration; if affected the parachute is to be returned to the appropriate maintenance unit.

Examination of pistols

7. Pistols are to be examined as follows:—

- (i) Examine the arming vane or arming fork for damage, and for freedom of rotation. If the vane is secured by screws, ensure that they have not become loose. If they are loose the undersides of the heads are to be coated with cement, R.D., No. 1 (Stores Ref. 12F/1), and the screws replaced and screwed firmly in position. If R.D. cement is not available, varnish, shellac (Stores Ref. 33A/511, 512, or 513) is to be used.
- (ii) Ensure that the striker is not bent or corroded. Corrosion may be removed from the striker by the application of oil, lubricating, anti-freezing, Type A (Stores Ref. 34A/43, 46, or 141).
- (iii) Check the efficient functioning of any springs.
- (iv) Clean the pistol, remove any corrosion, and coat the screw-threads of the body with luting, thin, Mk. V (Stores Ref. 12F/41).

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8. If a pistol shows signs of deterioration, which might impair its efficiency and which cannot be rectified by the Unit, it is to be set aside for A.I.D. inspection, and a serviceable pistol substituted.

Exposed life of fuzes and detonators

9. All fuzes and detonators are to be treated as follows:—

- (i) All fuzes and detonators, except detonators, No. 35, Mk. II, are to be removed after two months in bombs, and new items inserted. Detonators, No. 35, Mk. II, will not be fitted to bombs until actually required, but if fitted they are to be renewed after two weeks.
- (ii) Fuzes removed from bombs after two months are to be returned to the appropriate Maintenance Unit, marked "Exposed—For re-filling".
- (iii) Detonators removed from bombs after two months, or two weeks, will be dealt with as described in A.P.1245, Chap. 3, Sect. XIX, para. 15 (viii).
- (iv) Fuzes, No. 32, fitted to bombs carried externally on flying boats or float planes, are to be removed and examined as described in para. 12, if the aircraft have been taxied over sea so rough as to cause the noses of bombs to be partly submerged.

Examination of detonators and exploders

10. Examine these components for signs of deterioration, and for the presence of moisture. If detonators and exploders are corroded, they are to be set aside for A.I.D. inspection. No attempt is to be made to remove corrosion from these components.

Examination of fuzes

11. All types of bomb fuzes are to be examined as follows:—

- (i) Examine the arming vane for damage, and ensure that the securing screws, if fitted, are not loose. If the screws are loose, they are to be treated as described in para. 7 (ii).
- (ii) Ensure that the spring safety clip is a good fit.
- (iii) Clean the outside of the fuze body and the external screw-threads, and remove any corrosion present. Coat the screw-threads with thin luting.

12. No. 32, Mk. II* or III fuzes which are suspected of having been submerged, or having become armed by reason of the absence or the displacement of the safety clip, are to be further examined, under the supervision of an Armament Officer, as follows:—

- (i) Hold the fuze nose upwards, remove the plug located between the fuze setting cover, and inspect the shutter. The shutter should be approximately half-way along the shutter chamber. If the shutter has moved towards the plug, the fuze is to be treated as highly dangerous. It is to be kept nose-up, handled with great care, and demolished as soon as possible. If the shutter is positioned correctly, inspect the shutter chamber for the presence of corrosion or moisture. No attempt is to be made to remove corrosion from this part, and if corrosion has occurred, or if moisture is present, the fuze is to be set aside for A.I.D. inspection.
- (ii) Remove the plug opposite to that referred to in para. 12 (i), and inspect the spring and its housing for the presence of corrosion or moisture. No attempt is to be made to remove corrosion from this part, and if corrosion has occurred, or if moisture is present, the fuze is to be set aside for A.I.D. inspection.
- (iii) Coat the threads of the two plugs with R.D., No. 1 cement or shellac varnish, and replace them.
- (iv) Replace the fuze in the bomb, applying thin luting to the threads above and below the securing ring.
- (v) Apply thin luting to the threads of the ballistic cap.
- (vi) Ensure that the ballistic cap is correctly filled with luting, thick, Mk. IV (Stores Ref. 12F/8), adding more luting if necessary. Replace the cap, wipe off any surplus luting, and ensure that the luting does not enter the clearance between the fuze body and the arming vane hub.
- (vii) Examine the rubber covers of No. 32 fuzes for signs of wear, distortion, or deterioration, and immediately renew any defective cover.

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AIR MINISTRY

April, 1947

This is A.L. No. 139 to A.P.1661B, Vol. I, and concerns Sect. 19

Remove and dispose of the existing Chapter I, substitute this chapter, and make an entry in the Armament Record Sheet at the beginning of the Volume.

REPRODUCTION

CHAPTER 1

DETONATOR EXTRACTORS

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ARMAMENT

