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## **CHAPTER IX**

### **FINAL DISPOSAL**

#### **SECTION 47**

#### **DEMOLITION**

4701. Whenever possible a UXB will be disposed of by demolition in situ.

#### **Positioning the Charge**

4702. There is a best position for the charge on every bomb. The best position should be used whenever possible but when it cannot be reached without the additional risk and waste of time involved in further excavation, certain alternative positions may sometimes be used.

4703. Factors to consider when deciding where to place the charge are the position of the booster charges within the bomb and the thickness of the bomb wall.

#### **Best Position**

4704. a. When a fuze pocket completely spans the width of any bomb, the charge is best placed directly opposite the fuze and thus as close as possible to the booster charge.
- b. When the booster charge does not reach close to the outside of the bomb the thinnest portion of the bomb wall should be attacked. Where the metal is approximately the same thickness at a number of points, the attack should be made for preference near to a booster charge.

#### **Alternative Positions**

4705. Successful demolition cannot be guaranteed if the charge is placed where the bomb wall is thick. The choice of alternative positions is, therefore, restricted to those parts where the bomb wall is comparatively thin. This means that armour piercing bombs and most penetration bombs must be uncovered until a thin portion of the wall is exposed,

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while blast and general purpose bombs can normally be attacked successfully anywhere but on the nose and tail sections. (But see para 7 below).

### **Rule of Thumb Method**

4706. Where sectional diagrams are not available and the person carrying out the demolition is not familiar with the construction of the bomb he is to demolish, the following rules of thumb may be applied:

- a. **Parallel Sided Bombs.** The walls of parallel sided bombs are nearly always of equal thickness throughout the parallel section. The charge may, therefore, be placed anywhere on the parallel portion of the bomb. If a position near a booster charge can be reached without movement of the bomb or further excavation, so much the better. If the bomb is fuzed in the side, the charge should be placed diametrically opposite the fuze head. If the bomb is fuzed in the nose or tail, place the charge towards the end known to contain a fuze.
- b. **Streamlined Bombs.** The walls of streamlined bombs usually become progressively thinner towards the tail, possibly thickening again over the last few inches. Unless it is known that the fuze pocket spans the bomb and the charge can easily be positioned opposite the fuze, the attack should be made at a point approximately  $\frac{1}{2}$  the length of the bomb body measured from the filler cap (Fig 68).

**Best position**



**Alternative position**



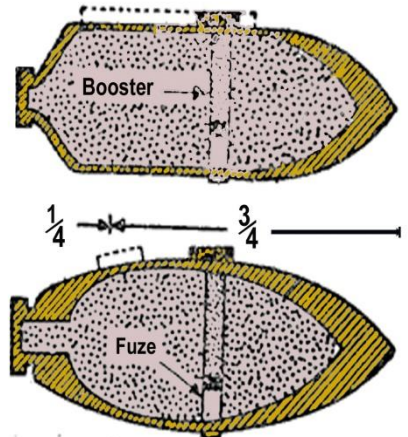
**SIDE FUZING WITH THE BOOSTER CHARGES SPANNING THE BOMB**

4707. **Parallel Sided Bomb**

- a. **Best Position.** Directly opposite the fuze.
- b. **Alternative Position.** Anywhere on the parallel section.

4708. **Streamlined Bomb**

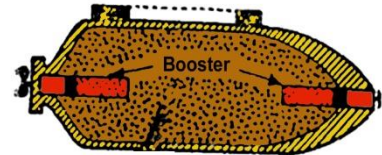
- a. **Best Position.** Directly opposite the fuze.
- b. **Alternative position.**
  - (1) With sectional diagram available on the thinnest part of the wall.
  - (2) By rule of thumb- about  $\frac{1}{4}$  the length of the bomb measured from the filler cap.



**SIDE FUZING WITH THE BOOSTER CHARGE NOT  
SPANNING THE BOMB**

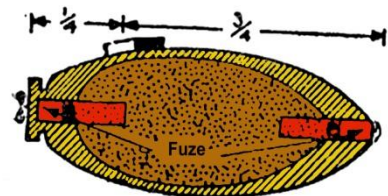
4709. **Parallel Sided Bomb**

- a. **Best Position.**  
Directly opposite the fuze.
- b. **Alternative Position.**  
Anywhere on the parallel section.



4710. **Streamlined Bomb**

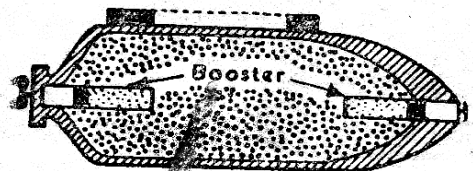
- a. **Best Position.** With sectional diagram available- on the thinnest part of the wall.
- b. **Alternative Position.** By rule of thumb- about  $\frac{1}{4}$  the length of the bomb, measure from the filler cap.



**NOSE AND/OR TAIL FUZING**

4711. **Parallel sided bomb**

- a. **Best Position.** On the parallel section close to the booster charge.
- b. **Alternative Position** Anywhere on the parallel section.



4712. **Streamlined bomb**

- a. **Best Position.** With sectional diagram available- on the thinnest part of the bomb wall.
- b. **Alternative Position.** By rule of thumb about  $\frac{3}{4}$  the length of the bomb measured from the filler cap.

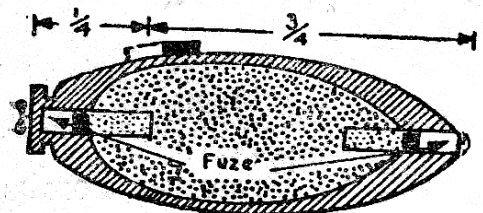


Fig 47-1: Summary of Principles for Positioning Demolition Charges

**Other Considerations When Placing the Charge**

4713. a. Technical descriptions and sectional drawings of the bomb should be studied if available, to ensure that bomb case is not reinforced at the point chosen.
- b. Examine the surface of the casing to ensure that a carrying lug or other external fitting has not broken off. The bomb wall is usually reinforced at such positions (Fig 47-2).

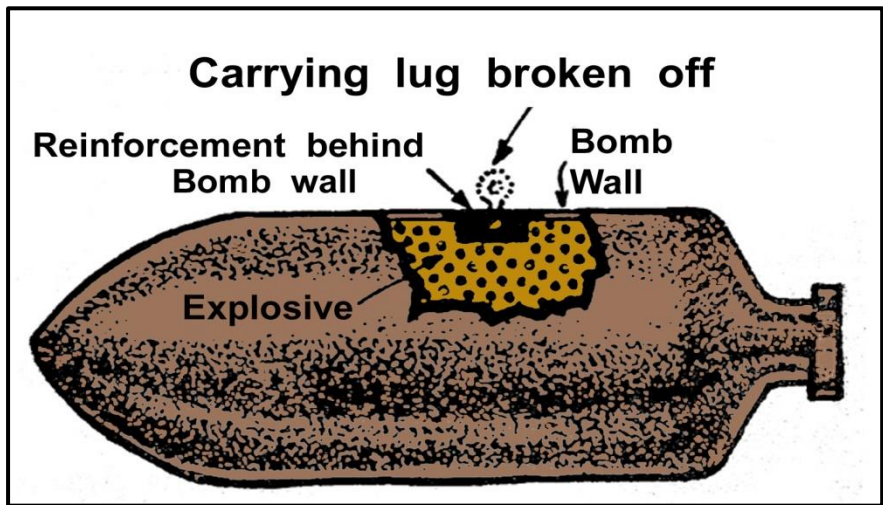


Fig 47-2: Bomb Wall Reinforce

**Weight of Charge Required**

4714. The weight of gun cotton required to demolish bombs are shown in Table 13 below. An equivalent charge of other service cutting explosives will suffice equally well.

**TABLE 13 – WEIGHTS OF CHARGES REQUIRED TO DEMOLISH BOMBS**

Type of bomb	Weight of charge in lb
(a)	(b)
Weighing up to 100 lb	2
Weighing over 100 lb	4
Wall up to $\frac{1}{4}$ in thick	
Weighing over 100 lb	9
Wall over $\frac{1}{4}$ in thick	

Notes - (1) Where the weight or the wall thickness of the bomb is in doubt, use the larger charge.

(2) Bombs weighing 10000 lb or more should be attacked at both ends if possible. If this cannot easily be done because of the wall thickness or the position of the bomb, the weight of the single charge should be doubled.

### **Placing the Charge**

4715. All the normal rules given in FE Pamphlet No 3 and ESPB No 4 apply. When slab charges are used there will be a considerable gap between much of the explosive and the curved surface of the bomb. The charge must be well tamped.

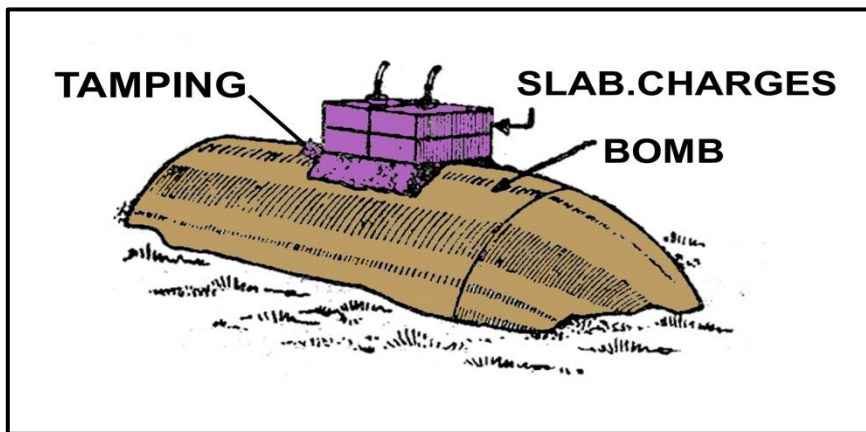


Fig 47-3: Good Tamping is Essential

Note - Chocks and weights to hold the charge in position are omitted from this drawing.

**Alternative Methods of Demolition**

4716. a. Bombs which are not fuze'd but which contain booster charges are best demolished by placing a primer in the fuze pocket in contact with the booster charge.
- b. Where the main filling is exposed, a single 1- lb slab of gun cotton or an equivalent cutting charge is sufficient if placed in close contact with the filling.
- c. Beehives and other shaped charges may be used but sometimes only bring about partial detonation of the bomb.

**Disposal of Loose Explosive**

4717. a. **Cast Explosive.** Large pieces of solid explosive scattered from a bomb which has broken up should be disposed of by detonation. Pieces weighing not more than two lb each, should be laid out in a continuous line and burned. Great care being taken so that no detonators or portions of the booster charge are included. The explosive may be ignited with a piece of waste soaked in petroleum, which should be applied to the down-wind end of the line. The waste should be fired with an electrical safety fuze igniter initiated from a distance.
- b. **Powder Explosive.** Powder fillings should be scattered over a wide area. They will not harm the soil or crops if in small quantities but must not be allowed to contaminate drinking water.
- c. **Precautions**
- (1) Before moving any pieces of metal with explosive attached, soak with large quantities of water. Soak the surrounding ground as well if it is stony. The object is to prevent sparks igniting the explosive.
- (2) Loose explosive should not be allowed to touch the skin. Clothing or part of the body which have been contaminated must be washed preferably in a strong soda solution.

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(3) Should explosive dust blow into the eye, wash it immediately. A weak solution of bicarbonate of soda is very effective. A medical officer must be consulted as soon as possible.

### **Safety Precaution for Misfire**

4718. a. Should the demolition charge misfire, the bomb should not be approached for 10 minutes if an electrical method of initiation has been used and for 30 minutes if safety fuze has been used. If more explosive is available, the original charge should not be dismantled. A new charge should be applied.
- b. Should the charge fire but the bomb fail to explode or be thought to have only partially denoted, the bomb should not be approached for 30 minutes. If a long delay fuze is known to be or might be fitted, the bomb should be left. If possible, until the maximum delay period of the fuze has elapsed.
- c. Should the bomb only partially detonate and merely split open, the portions containing fuzes must be identified. The remaining explosive may be removed. The fuzed portion must not be disturbed but should be demolished simultaneously in situ.

### **Safety Distances**

4719. The figures given in Chapter 4 are the minimum distances for evacuation (sec 23, para 4). Table 14 below gives the true safety distances in the open. These should be applied whenever possible when demolishing bombs. The distances involved are so great however, that in war conditions some relaxation will often have to be accepted.

**TABLE 14 – SAFETY DISTANCES**

Total weight of bomb	Buried bomb		Unburied bomb	
	Protected persons	Unprotected persons	Protected persons	Unprotected persons
Lb	Yds	Yds	Yds	Yds
(a)	(b)	(c)	(d)	(e)
20	26	40	40	700
40	35	50	50	790



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250	67	100	100	1050
500	130	200	200	1200
1000	150	220	220	1350
2000	200	300	300	1500
4000	260	390	390	1700
8000	330	500	500	1900
12000	420	630	630	2000
22000	450	675	675	2300

*Note:* (1) A bomb is considered buried when the upper surface is at least twice the length of the bomb body below the ground level.

(2) For the purpose of table 14 protected persons must have side cover equal to 18 inches of brick and head cover equal to six inches of concrete.

**Reducing the Effects of Explosion**

4720. It will be seen from table 14 that whenever it is possible to move an unburied bomb (eg. When no fuzes are fitted) it is advantageous to place it down a shaft or in a crater. The bomb then being buried, the safety distances can be reduced, when placed in an open shaft the bomb should preferably be stood vertically so that most of the explosive force and the splinters formed are expended sideways into the earth.

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