

THESE INSTRUCTIONS MUST NOT BE TAKEN TO PLACES WHERE THEY MAY FALL INTO ENEMY HANDS. DO NOT SHOW THEM TO UNAUTHORIZED PERSONNEL. DESTROY THEM AFTER THEY HAVE SERVED THEIR PURPOSE.

TB 5-25-4

WAR DEPARTMENT TECHNICAL BULLETIN

INSTRUCTIONS FOR USE OF DETONATOR, CONCUSSION, TYPE T-1

Ref.: FM 5-25, Explosives and Demolitions

War Department, Washington 25, D. C., 25 May 1944

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1. DESCRIPTION.—a. The Concussion Detonator T-1 (see fig. 1), is a mechanical firing device which is actuated by the concussion wave of a blast. It is used to fire several charges simultaneously without interconnecting the charges with wires or detonating cord. A single charge, fired in any desirable way, will fire all charges equipped with concussion detonators provided that they are within range of the main charge or within range of each other. The device can be used to fire demolition charges either in air or in water, and a table showing the ranges at which the concussion detonators will reliably function in either medium is shown below:

RESTRICTED

Operating range of concussion detonators

Initiating charge (pounds)	In water		In air—Recom- mended range (feet)
	Depth of water (feet)	Recommended range (feet)	
0.5	2	10	-----
0.5	4	50	-----
0.5	6	80	-----
0.5	8	80	-----
2.5	-----	-----	15
2.5	2	20	-----
2.5	4	80	-----
2.5	6	80	-----
2.5	8	150	-----
5	-----	-----	20
10	-----	-----	35
15	-----	-----	35
20	-----	-----	35
20	2	20	-----
20	4	80	-----
20	6	180	-----
20	8	260	-----

b. The concussion detonator is supplied with a protective shipping plug in place and with a base and blasting cap assembly and base gasket contained in the package. In preparing the detonator for use the plug should be discarded and replaced by the base and blasting cap assembly. In this replacement it should be carefully observed that the joint is tight and that the gasket is properly seated to form a water-tight seal. The base is constructed with a thread to fit the threaded cap wells of Corps of Engineers explosives. If the detonator is used with some other type charge than one of those equipped with the standard cap well, a short length of detonating cord should be taped to the blasting cap and its other end, containing a Corps of Engineers Special Nonelectric Cap, connected to the charge. In any case it is advisable to wire or tie the detonator to its associated charge, using the holes in the detonator provided for this purpose.

2. USE OF CONCUSSION DETONATOR IN WATER.—a. To provide safety during the arming of the device in water, the detonator is supplied with two time delay tablets of a water-soluble nature. A blue normal delay tablet of approximately 3½ minutes' dissolving time is installed within the device, and a yellow long-delay tablet of approximately 7 minutes' dissolving time is packaged with the device for alternate installation in the field. One or the other of these delay tablets should be used for underwater installations.

b. Since surf conditions and water temperatures influence the dissolving time of salt tablets, it is advisable to expend one detonator to measure its arming time. The same device can be used to test either

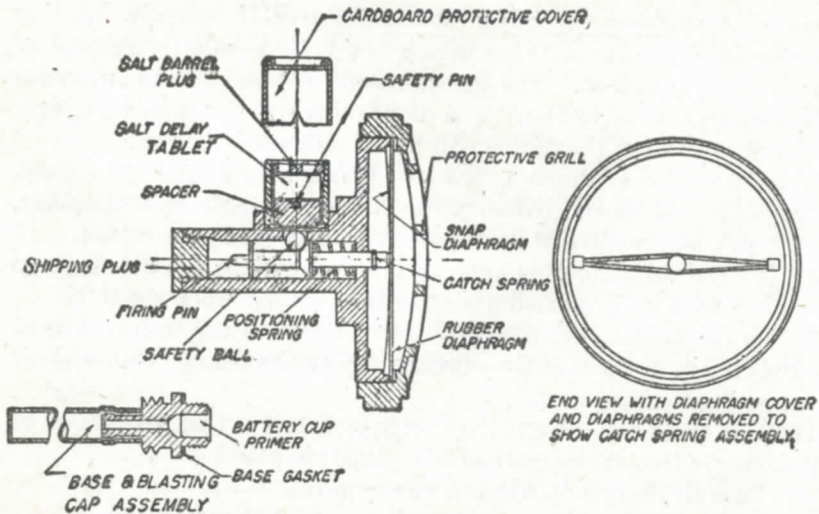


Figure 1.—Detonator, Concussion, Type T-1

or both delay elements. This detonator, when equipped with the type of tablet that will be used, should be tested under conditions similar to those contemplated in the actual operation. This test should be made by submerging the device to the proper depth under simulated operating conditions, with the shipping plug in place and the cardboard protective cover and the safety pin removed, and observing the time required for the salt tablet to dissolve.

c. The dissolving or arming time observed in the foregoing test is the proper interval that should elapse before the main initiating charge is fired under the proposed conditions of use. Since the tablets become soft during solution before they completely dissolve, and since this softening takes place within approximately one-half of the dissolving time, the detonators should be considered dangerous after one-half of the arming time has elapsed. Personnel should be withdrawn from the danger area within half the dissolving or arming time, since a nearby concussion from enemy bombs or shells could fire the detonators.

d. A major function of the cardboard protective cover with which the device is equipped is the protection of the water-soluble tablet during the preliminary phase of its underwater installation. This cover should be undisturbed and should remain in place, if possible, during placing of the charge under water. It should be removed at the last possible moment prior to the removal of the safety pin.

e. When using concussion detonators in water, the charges with which they are connected should be spaced within the recommended ranges, predicated on the anticipated minimum depth of water, as

shown in the foregoing table. Detonators will frequently function at greater ranges than those shown but their reliability at greater ranges is not assured. The device should not be used in surf of a greater depth than 15 feet. The diaphragm will function by hydrostatic pressure and the device will fire at a depth of 25 feet.

f. Installation of device in water.—(1) If long delay is necessary, remove blue tablet and install yellow tablet, taking care that spacer, safety pin, and cardboard protective cap are properly assembled.

(2) Discard shipping plug and carefully insert base and blasting cap assembly with its associated gasket to form a tight waterproof fit.

(3) Fit the blasting cap and base into a threaded cap well contained in the charge or connect the blasting cap to the charge with a short length of detonating cord.

(4) Wire or tie detonator to the charge and observe that diaphragm of detonator is free of obstructions and clearly exposed.

(5) Place all charges in water where required.

(6) Remove cardboard protective covers and pull safety pins.

(7) Evacuate the danger area within one-half of the arming time of the delay tablets in use.

(8) Wait the full interval of the arming time of the delay tablet in use before firing the initiating charge.

3. USE OF CONCUSSION DETONATOR IN AIR.—*a.* When the device is used in air the salt delay tablet installed within the device during manufacture must be removed and discarded. All devices to be used in air should also be checked to insure that the catch spring properly restrains the firing pin when the safety pin is withdrawn and the spacer is released. Removal of salt tablets and checking of firing pin restraint should be accomplished before the base and blasting cap assembly is fitted to the device. In checking the restraint of the firing pin it will be observed that the pin moves forward approximately $\frac{1}{16}$ inch. This movement is proper but the firing pin should neither fall nor fly out of the barrel of the device. In either case the device should be discarded. After checking the firing pin restraint, the spacer and safety pin should be replaced and the base and blasting cap assembly should be firmly fitted into the threaded barrel in place of the shipping plug.

b. When used in air it is advisable that all charges equipped with concussion detonators be placed reasonably equidistant from the main or initiating charge and that they be placed a minimum distance of approximately 15 feet from the main charge. When placed too close to another charge in air the concussion wave frequently causes the firing pin to pierce the diaphragm and be impaled thereon with a resultant probability of a misfire.

- c. Installation of the device in air.*—(1) Remove salt delay tablets.
 (2) Check the restraint of all firing pins by removing safety pins and observing that firing pin is held in place by catch spring.
 (3) Replace spacer and safety pin.
 (4) Discard shipping plug and carefully insert base and blasting cap assembly with its associated gasket to form a firm fit.
 (5) Fit the blasting cap and base into a threaded cap well contained in the charge or connect the blasting cap to the charge with a short length of detonating cord.
 (6) Wire or tie the detonator to the charge and observe that diaphragm of detonator is free of obstructions and clearly exposed.
 (7) Place all charges with diaphragms of detonators facing the initiating charge.
 (8) Withdraw safety pins and evacuate the area—**THE DEVICES ARE IMMEDIATELY ARMED.**
 (9) Fire initiating charge when personnel are clear of the danger zone.
- 4. TO DISARM DEVICE.**—*a.* Depress spacer and force safety ball against shoulder of firing pin.
b. Insert tenpenny nail through holes in salt barrel.
c. Remove base and blasting cap assembly from device.

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BY ORDER OF THE SECRETARY OF WAR:

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