

## APPENDIX A

# INSTALLATION AND REMOVAL OF US MINES AND FIRING DEVICES

### Warnings

1. If there is a problem when performing any installation or removal step, notify the NCOIC.

2. If you hear a click when removing the safety clip, or if the pressure plate snaps downward so it is level with the body of the mine, notify the NCOIC. DO NOT use the mine.

3. If the safety clip cannot be reinserted, notify the NCOIC.

4. Do not apply pressure to the pressure plate, tilt rod, or fuze at any time.

5. Before attempting to disarm and remove the mine, check for booby traps, damage, and malfunctions. If any of these conditions exist, notify the NCOIC. DO NOT attempt to disarm the mine.

6. If you feel a jar or hear a metallic click when removing the locking safety pin, stop and notify the NCOIC. The firing pin has gone forward and is resting on the positive safety pin. DO NOT remove the positive safety pin.

7. After removing the positive safety pin, proceed with extreme caution. The slider pin can detonate the mine if it is accidentally pushed in.

8. When attaching trip wires to the release pin ring on the fuze, leave a little slack in the wires. This prevents

pull on the release pin ring, which could set off the mine when the safety pins are removed.

9. Ensure the extension rod is vertical and is not tilted in any direction. A 20-degree tilt of the extension rod will detonate the mine.

10. Ensure the safety fork moves freely. If there is pressure on the fork, DO NOT remove it.

11. Do not apply pressure to the pressure plate of the fuze when inserting it into the fuze well.

12. If the setting knob is difficult to turn, do not force it. Notify the NCOIC.

13. Do not adjust the setting knob while the detonator is in the detonator well.

14. If any cracks are noted in the plastic collar, slowly and carefully reassemble the stop and safety pin on the fuze. Carefully remove the extension rod and the fuze from the mine. Give the fuze to your NCOIC and replace it with a new fuze.

15. Before cutting loose trip wires, look at each end to ensure there are no electric-producing devices that might initiate another system.

## Section I. Antipersonnel Mines

### MINE, ANTIPERSONNEL, NONMETALLIC, M14

The M 14 mine (Figures A-1 and A-2) is a nonmetallic, blast-type AP mine. It has a plastic body and an integral plastic fuze with a steel firing pin.

#### M14 CHARACTERISTICS

Main Chg	Dia	Ht	Wt	No Mines Per Box	Wt Per Box
Tetryl 1 oz	2.19"	1.56"	3.5 oz fuzed	90	44 lb

- Employed in protective, tactical, and nuisance minefields.
- Size allows for employment in large numbers, and rapid concealment is possible.
- Bury mine to prevent target from knocking it over.
- Not designed to kill, but to penetrate boot and foot.
- Difficult to detect because of plastic construction.
- Operating force of 20 to 25 pounds to activate.

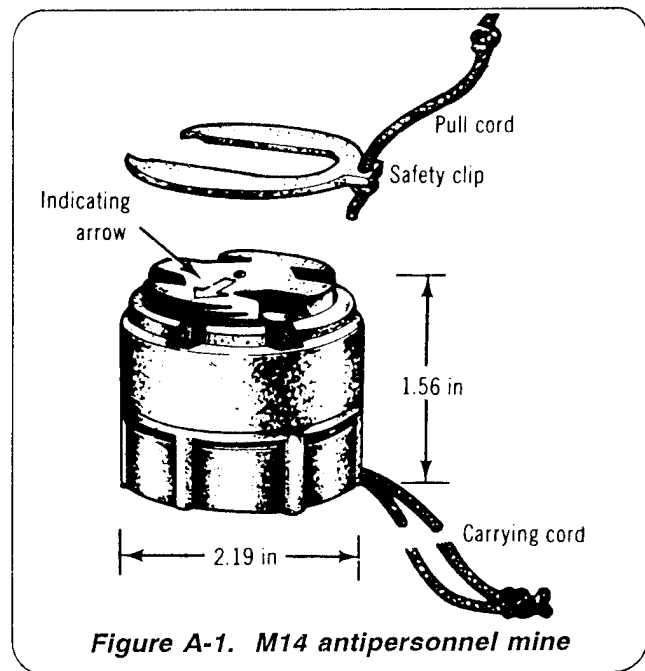


Figure A-1. M14 antipersonnel mine

#### INSTALLATION

##### 1. Inspect the mine.

- If the mine is dented, cracked, or damaged, DO NOT USE IT.
- Use the M22 wrench (Figure A-3), packed in the box with the mines, to unscrew the white plastic shipping plug from the detonator well in the bottom of the mine.
- Inspect the position of the firing pin. If it extends into the detonator well, it is unsafe to use. DO NOT USE IT.

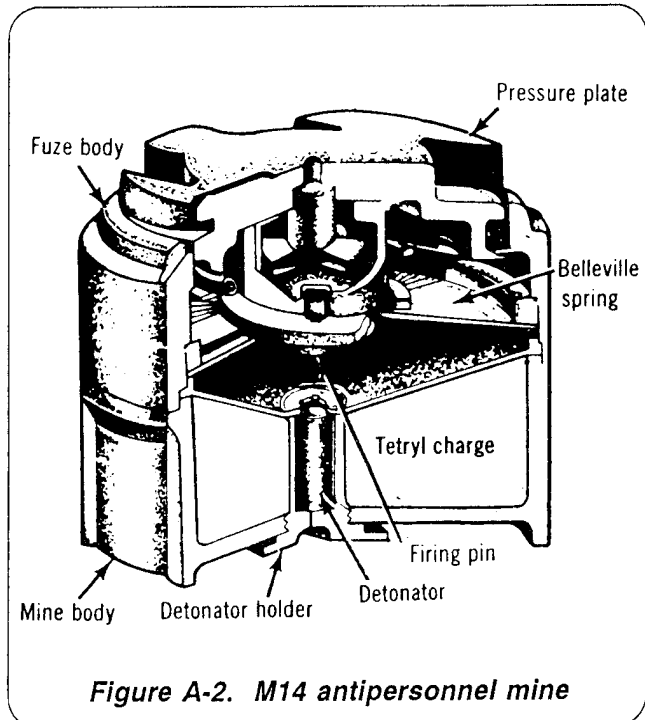
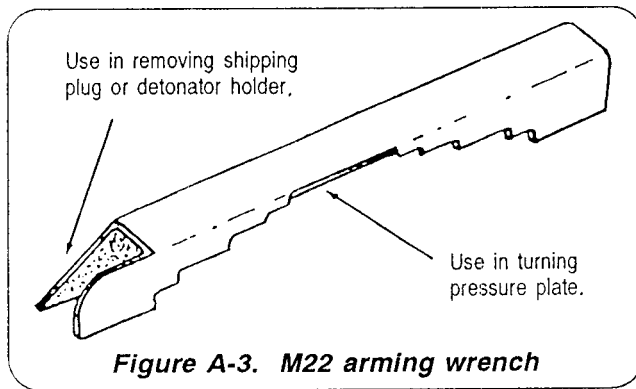


Figure A-2. M14 antipersonnel mine



d. Inspect the detonator well for foreign material. If foreign material is present, remove it by carefully tapping the mine against the palm of your hand. If it cannot be removed, replace the shipping plug. **DO NOT USE IT.**

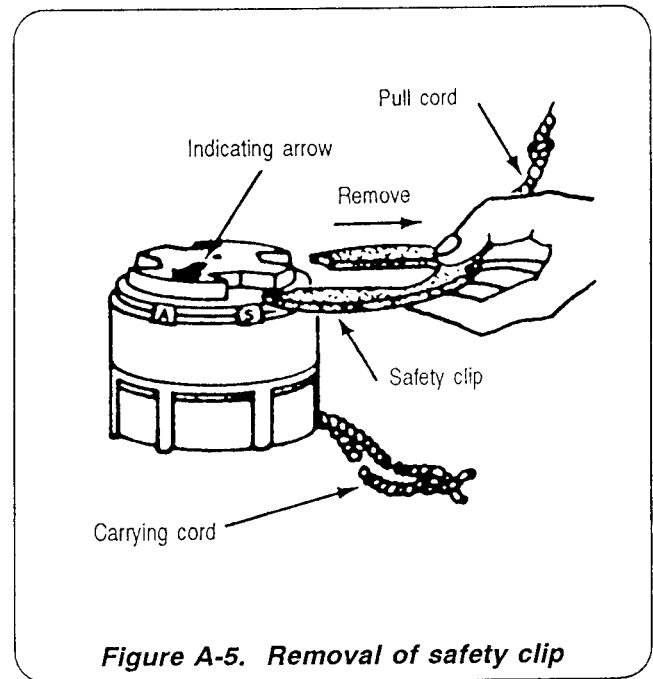
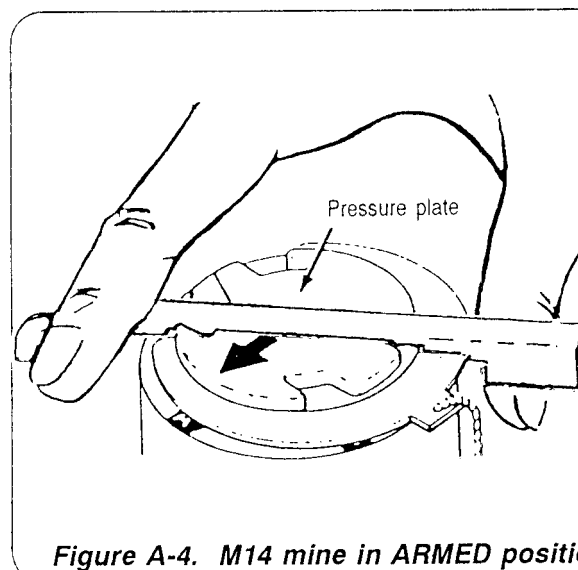
**2. Test the pressure plate.**

a. Ensure the arrow is in the SAFE (S) position.

b. Use the M22 wrench to turn the pressure plate from the SAFE (S) to the ARMED (A) position (Figure A-4).

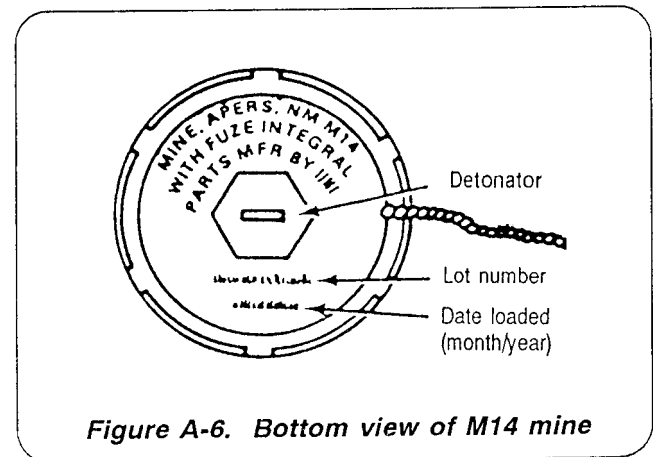
★ c. Grasp the mine in one hand and with the other hand remove the safety clip. (This procedure is necessary to listen for the click that indicates the firing pin has dropped.) Recheck the fuze well (Figure A-5).

d. Replace the safety clip.



e. Use the M22 wrench to turn the pressure plate back to the SAFE (S) position.

**3. Screw the 6-sided detonator into the weU on the bottom of the mine (Figure A-6).**



**NOTE: Ensure the rubber gasket is tightly wedged between the detonator gasket and the body of the mine so water cannot enter the mine.**

**4. Dig a hole to fit the mine.**

a. Dig a hole about 4 inches in diameter and deep enough (about 1 1/2 inches deep) so the pressure plate extends above the ground.

b. Check the ground surface at the bottom of the hole.

(1) Ensure the ground is hard enough to support the mine when pressure is applied to the pressure plate.

(2) If the ground is too soft, place a nonmetallic object in the bottom of the hole for the mine to rest on. Allow additional depth for the object.

**5. Arm the mine with an M22 wrench by turning the pressure plate to the ARMED (A) position (Figure A-5, page A-3).**

**6. Place the mine in the hole.**

**7. Carefully remove the safety clip while holding the mine body firmly in the hole.**

**8. Camouflage the mine.**

a. Carefully camouflage the mine and remove the extra soil from the area.

b. Give the safety clip and the shipping plug to the NCOIC.

## REMOVAL

**★ 9. Disarm the mine.**

a. Carefully clear the soil away from the mine.

b. Grasp the body of the mine firmly with one hand, and insert the safety clip with the other hand,

c. Remove mine from hole.

d. Use the M22 arming wrench to turn the pressure plate until the arrow points to the SAFE (S) position.

**★ 10. Remove the mine from the hole.**

a. Turn the mine over and carefully remove the detonator from the detonator well.

b. Screw the plastic shipping plug into the detonator well.

c. Give the detonator to the NCOIC.

**MINE, ANTIPERSONNEL, M16A1**

The M16A1 (Figures A-7 and A-8) is a bounding fragmentation-type mine. Once actuated, the mine is propelled out of the ground (to a height of approximately 6 feet) and explodes. The mine consists of an M605 fuze, a propelling charge, and a projectile. They are contained in a sheet-steel case. The fuze is screwed into the top of the case and extends through the center of the projectile to the bottom of the case where the propelling charge is located. The remaining space inside the case is occupied by the projectile. Earlier versions of the mine are also available for issue. The principal difference between the old and new version is the construction of detonators and boosters.

M16A1 CHARACTERISTICS

Main Chg	Dia	Ht	Wt	No Mines Per Box	Wt Per Box
TNT (1 lb)	4"	4.7"	8 lb.	4	45 lb

- Employed in protective, tactical, and nuisance minefields.
- Used to defeat dismounted assaults and breaching operations.
- Mine is either pressure- or pull-actuated. Eight to 45 pounds of pressure in pressure mode; 3 to 15 pounds of pull in trip-wire mode.
- The M16A2 has a casualty radius of 30 meters. The M16 and M16A1 have a casualty radius of 27 meters. Danger radius for friendly forces is 183 meters for both mines.

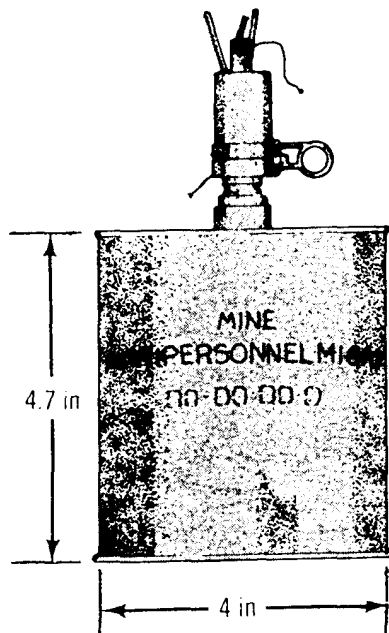


Figure A-7. M16A1 antipersonnel mine

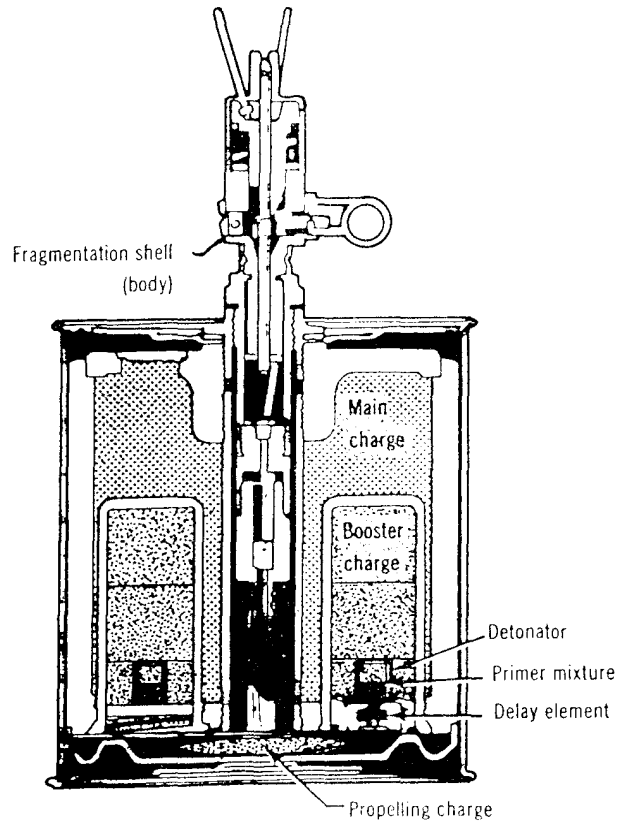


Figure A-8. M16A1 antipersonnel mine

INSTALLATION

1. *Inspect the mine.*

a. If the mine is dented, cracked, or damaged, DO NOT USE IT.

b. Use the closed end of an M25 wrench to unscrew and remove the hexagonal shipping

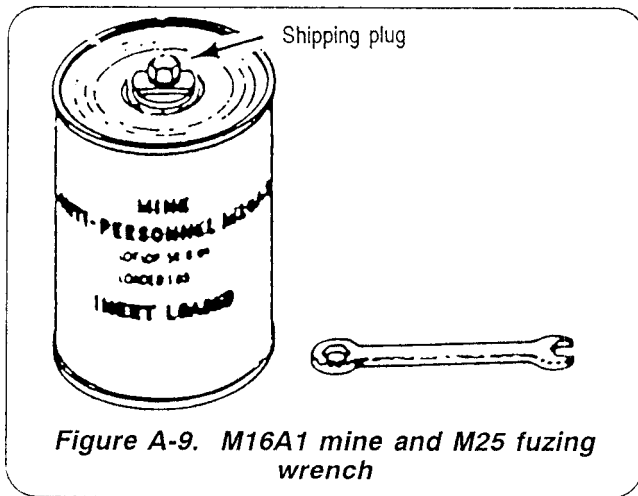


Figure A-9. M16A1 mine and M25 fuze wrench

plug from the fuze well of the mine (Figure A-9).

c. Examine the fuze well for foreign material. If foreign material is present, turn the mine upside down and gently tap the bottom with your hand to dislodge it. If it cannot be removed, replace the shipping plug. **DO NOT USE THE MINE.**

d. Carefully examine the fuze assembly for evidence of damage or missing safety pins. Ensure the safety pins move freely in the safety-pin holes. Ensure the rubber gasket is around the fuze base (Figure A-10).

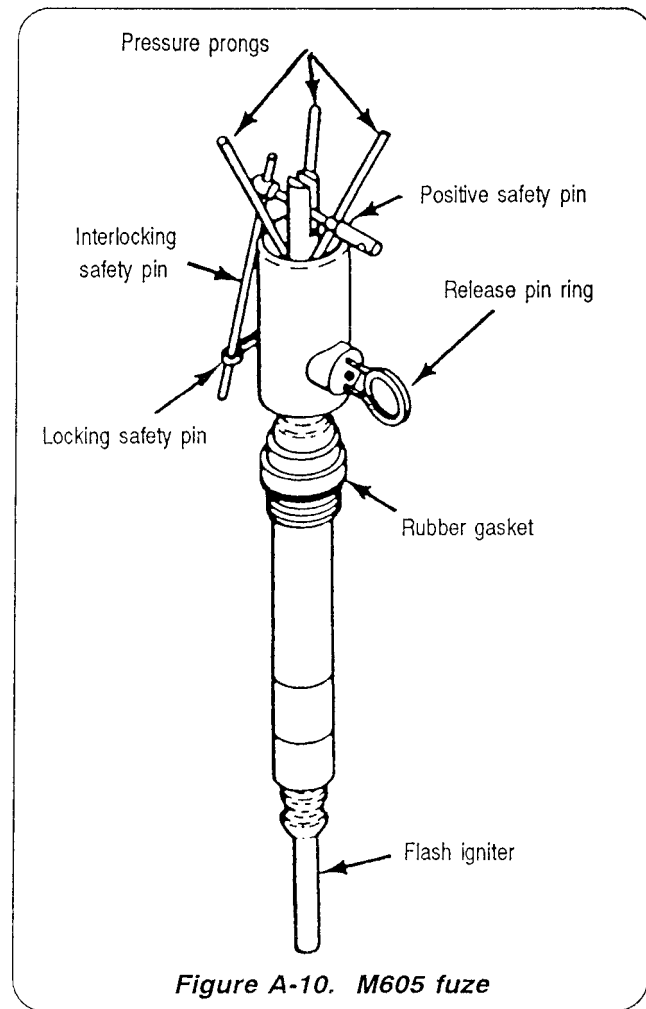


Figure A-10. M605 fuze

## 2. Fuze the mine.

a. Use the open end of the M25 wrench to tighten the bushing adapter on the fuze well.

b. Screw the fuze assembly into the fuze well by hand. Using the wrench, ensure that the fuze is tight and the rubber gasket is between the fuze body and the bushing adapter.

**NOTE: For long-term use, smear a thin layer of silicone grease or similar lubricant on the fuze and threads.**

## 3. Dig a hole to fit the mine.

a. For pressure installation, dig the hole so only the pressure prong tips are above ground level.

b. For trip-wire installation, dig the hole so the release-pin ring is above ground level.

## 4. Emplace the mine.

a. Place the mine in the hole and ensure the safety pins remain in place.

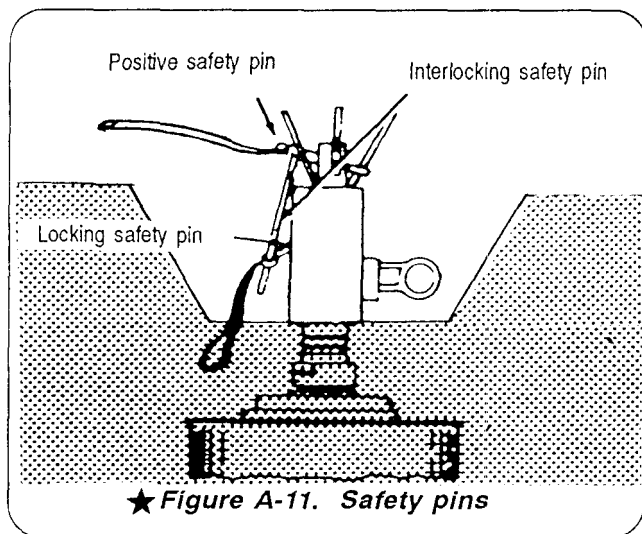
b. Cover the mine with soil to the bottom of the release-pin ring.

c. Press the soil firmly around the sides of the mine.

**NOTE: Proceed to paragraph 6 for trip-wire installation. Continue to paragraph 5 for pressure-role installation.**

**5. Perform pressure-role installation.**

a. Remove the locking safety pin (Figure A- 11). The interlocking safety pin will come free.

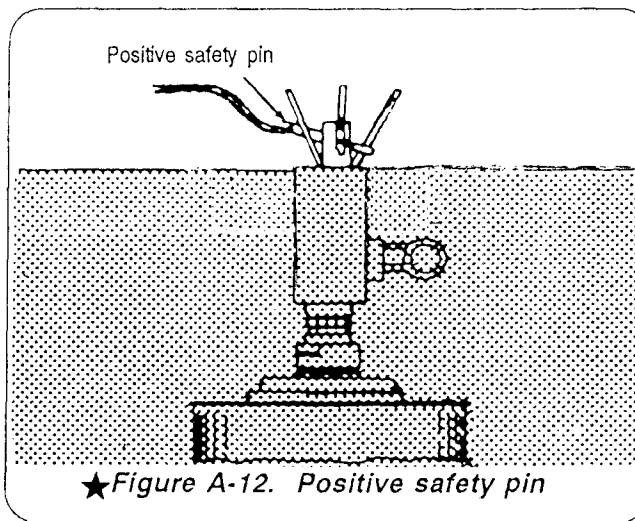


b. Arrange the pull cord on the positive safety pin so it withdraws easily.

c. Finish covering the mine with soil until only the pressure prongs are above ground level.

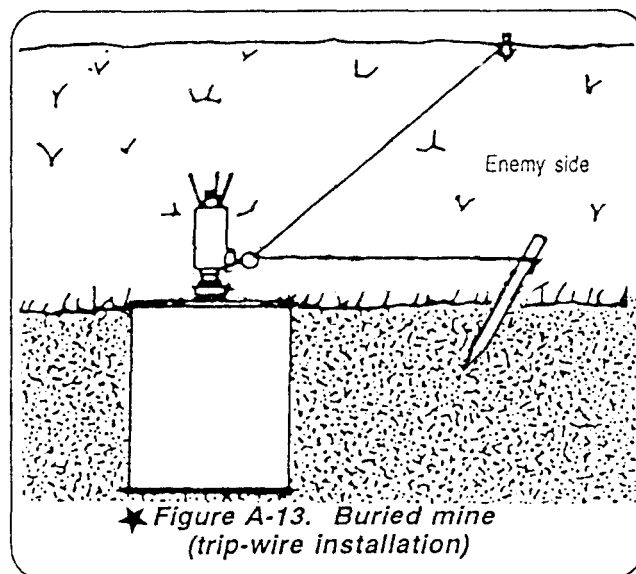
d. Camouflage the mine, place excess soil in sandbags, and remove them from the area.

e. Arm the mine by removing the positive safety pin (Figure A- 12).



f. Give the safety pins and shipping plug to the NCOIC.

**6. Perform trip-wire installation (Figure A-13).**



a. Cover the mine with soil, pressing it firmly around the sides of the mine. Leave the release-pin ring and the pressure prongs exposed.

b. Tie off trip wires approximately 10 meters from the mine. The wires should form a wide V with the opening toward the enemy.

c. Attach the trip wires to the release-pin ring on the fuze.

d. Remove the locking safety pin. The interlocking safety pin will come free.

e. Arrange the pull cord on the positive safety pin so it withdraws easily.

f. Camouflage the mine. Place excess soil in sandbags and remove them from the area.

g. Arm the mine by removing the positive safety pin.

h. Give safety pins and shipping plug to the NCOIC.

## REMOVAL

**WARNING**

**Before attempting to disarm and remove the mine, ensure the metal collar (Figure A-14) over the top of the striker on the M605 fuze is in place**

**7. Disarm the mine.**

- a. Carefully clear the soil from the top of the fuze.
- b. Insert the positive safety pin through the positive safety-pin hole.
- c. Insert the locking safety pin through the locking safety-pin hole.
- d. Cut the slack trip wires attached to the release-pin ring.

**8. Check for AHDs.**

- a. Hold the mine body firmly in place with one hand.
- b. With the other hand, feel for AHDs by digging around the sides and underneath the mine.

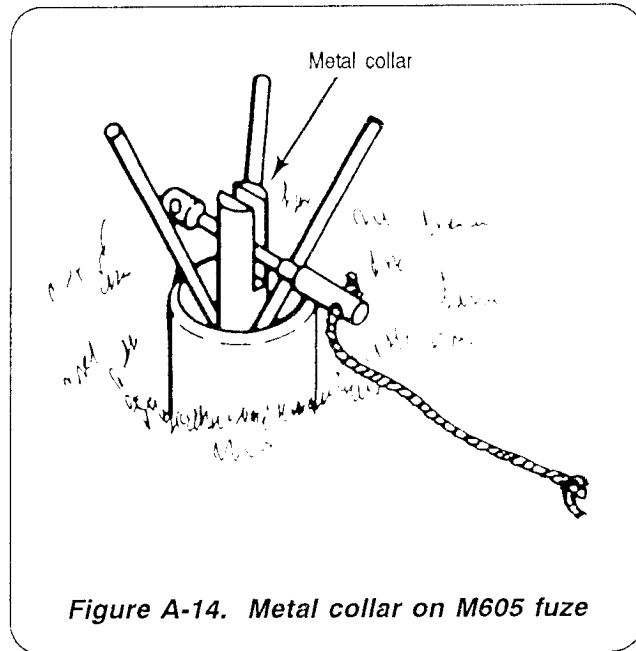


Figure A-14. Metal collar on M605 fuze

**9. Remove the mine.**

- a. Remove the mine from the hole. Ensure the safety pins remain in place.
- b. Unscrew and remove the M605 fuze with the M25 wrench.
- c. Replace the shipping plug in the fuze well.

## Section II. Antitank Mines

AT mines are designed to immobilize or destroy tanks, vehicles, and their crews. They perform this function by producing either an M-Kill or a K-Kill. An M-Kill is achieved by destroying one or more of the vehicle's vital drive components (usually breaking the track on a tank), which causes the target to be immobilized. With an M-Kill, the weapon system and crew are not destroyed. The weapon system, although immobile, continues to function. A K-Kill results when the weapon system or crew is destroyed, and the vehicle can no longer perform its intended mission.

Conventional AT mines are distinguished by their warheads and the type of fuzing mechanism used. Blast AT mines, such as the M 15 and M 19, derive their effectiveness through the blast caused by detonation of an HE. These mines usually produce an M-Kill, but a K-Kill can result. SFF mines, such as the M21, utilize a direct energy (shaped charge-like) warhead designed to penetrate the underside of a vehicle's armor. It sprays shrapnel throughout the inside of the vehicle, and kills the crew. A K-Kill normally results.



## MINE, ANTITANK, HE, HEAVY, M 15

The M1 5 mine (Figures A- 15 and A- 16) is a blast-type, AT mine contained in a round, sheet-steel casing. The primary fuze well is located in the top center of the mine. There are also two secondary fuze wells - one on the side and one on the bottom of the mine. The primary fuze well accepts an M603 pressure-actuated fuze. A standard firing device (FD) can be used in the secondary fuze wells with the M1 activator. The M624 tilt rod-actuated fuze can also be used with this mine.

### M15 CHARACTERISTICS

Main Chg	Dia	Ht	Wt	No Mines Per Box	Wt Per Box
Comp B (22 lb)	13.13"	4.88"	30 lb	1	40 lb

- Employed in protective, tactical, and nuisance minefields.
- Emplaced on the surface or buried by hand.
- A force of 350 to 750 pounds is required to detonate the M603 fuze. A force of 3.75 pounds is required to deflect the tilt rod and detonate the M624 fuze.
- Designed to defeat heavy tanks.
- Produces an M-Kill upon contact with the track or tilt rod.
- Twenty-two pounds of composition B is sufficient to penetrate the belly armor of most threat vehicles.

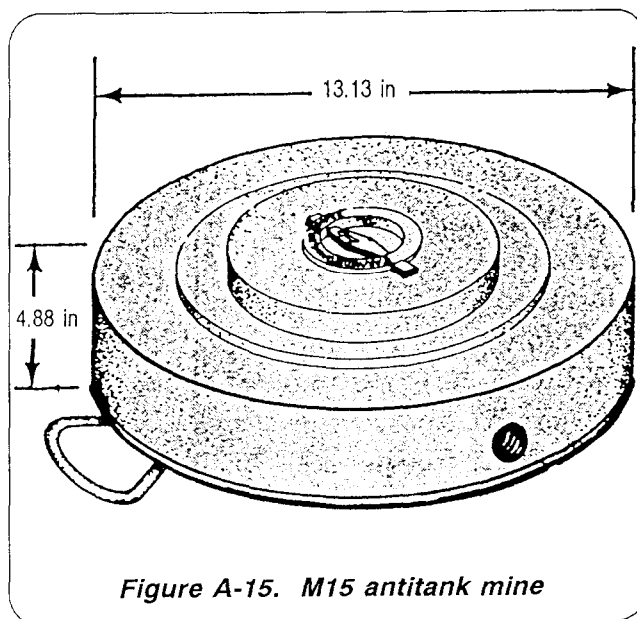


Figure A-15. M15 antitank mine

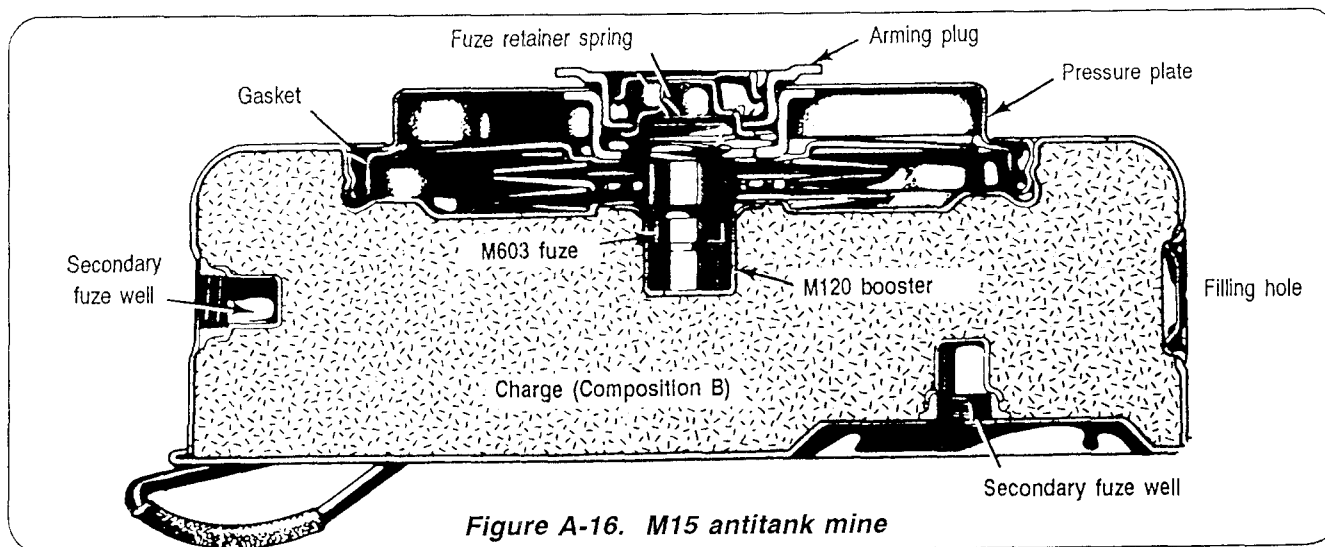
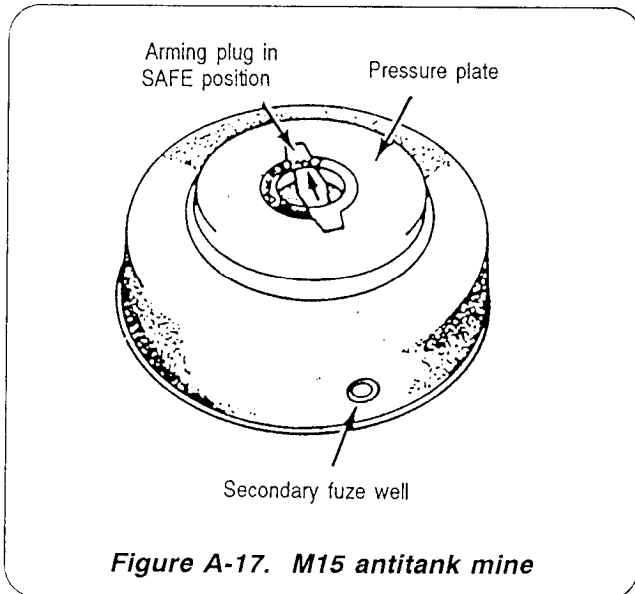


Figure A-16. M15 antitank mine

**INSTALLATION USING THE M624 FUZE**

**1. Inspect the mine.**

- a. If the mine is dented, cracked, or damaged, DO NOT USE IT.
- b. Use the M20 arming wrench to unscrew and remove the arming plug from the mine (Figure A- 17).

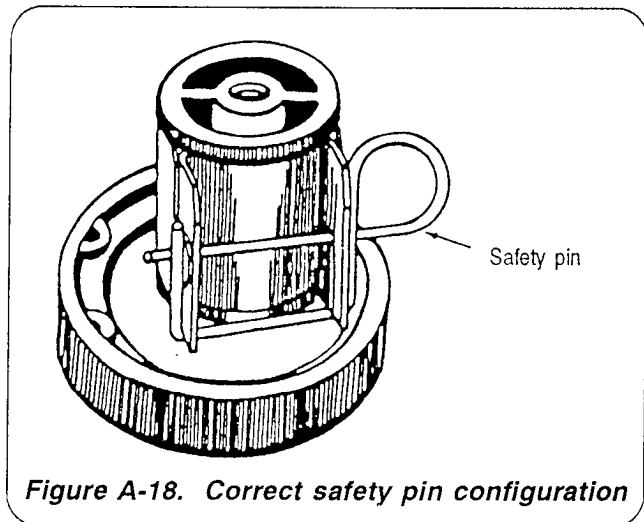


**Figure A-17. M15 antitank mine**

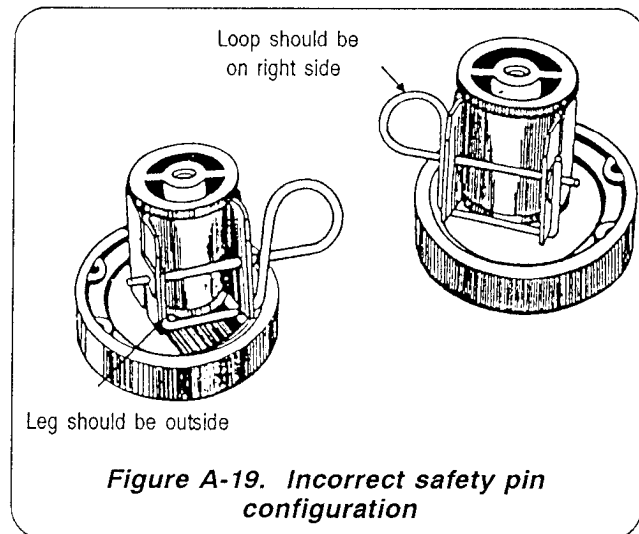
- c. Examine the fuze well for foreign material. If foreign material is present, turn the mine upside down and gently tap the bottom with your hand to dislodge it. If it cannot be removed, replace the arming plug. DO NOT USE IT.
- d. Ensure the booster retainer ring is seated in the fuze well. If the retainer ring is missing, replace the mine.

**2. Inspect the fuze.**

- a. Before removing the M624 fuze from its metal shipping container, inspect it for serviceability.
- b. Inspect the plastic collar of each fuze by looking down through the top of the pressure ring. If the safety pin is missing or improperly



**Figure A-18. Correct safety pin configuration**



**Figure A-19. Incorrect safety pin configuration**

assembled, DO NOT USE IT (Figures A- 18 and A-19).

- c. If the plastic collar appears cracked, DO NOT USE IT.

**3. Fuze the mine.**

- a. Remove the M624 fuze from its fiber sleeve,

**NOTE: For long-term emplacement, coat the fuze threads and gasket with silicone grease before removing the end closure (Figure A-20).**

- b. Unscrew and remove the end closure on the M624 fuze.

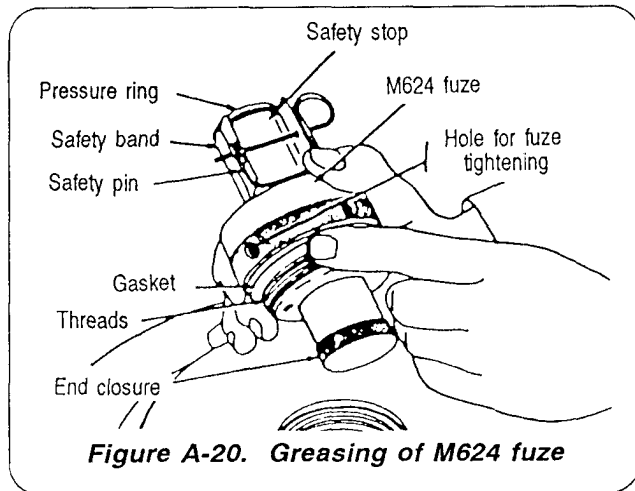


Figure A-20. Greasing of M624 fuze

c. Screw the fuze hand-tight into the threaded fuze well of the M 15 mine.

d. Remove the extension rod from its packaging.

e. Tighten the fuze by inserting one unthreaded end of the extension rod piece into a hole on the side of the fuze. Turn the fuze a quarter turn (Figure A-21).

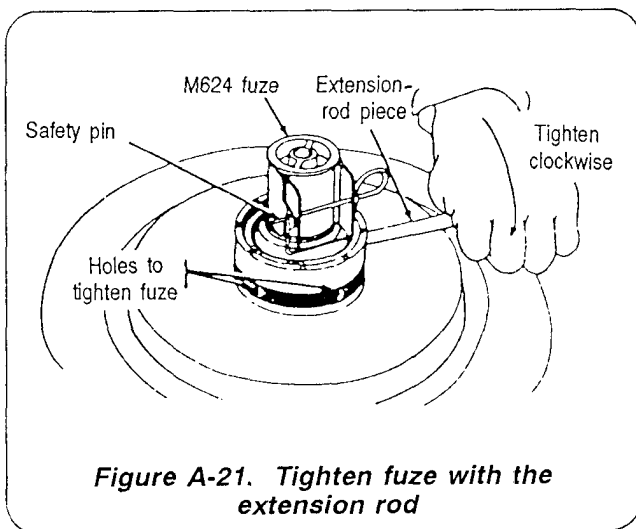


Figure A-21. Tighten fuze with the extension rod

f. After the fuze is secure, remove the extension rod for further use.

**NOTE: The M15 AT mine with the M624 fuze can be buried or surface-laid.**

**4. Dig a hole to fit the mine.**

a. Dig a hole deep enough so the top of the mine pressure plate will be at ground level.

b. Dig the sides of the hole at a 45-degree angle to prevent vehicles from bridging the mine.

**5. Emplace the mine.**

a. Place the mine in the hole.

b. Cover the mine with 1 inch of soil (Figure A-22).

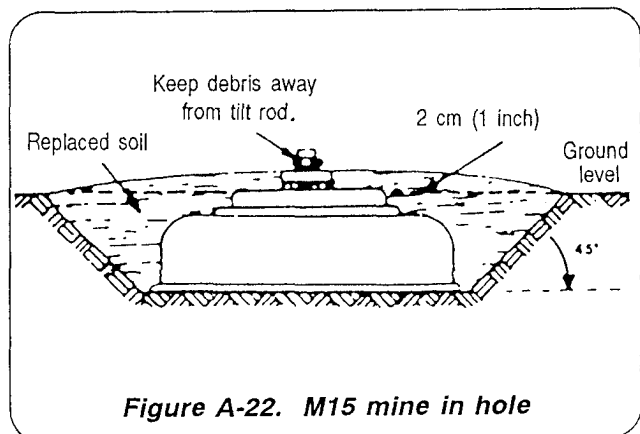


Figure A-22. M15 mine in hole

**NOTE: The M15 AT mine (with the M624 fuze) can be used in the tilt-rod role or set up in the pressure role.**

c. For tilt-rod role, assemble all three pieces of the extension rod (Figure A-23).

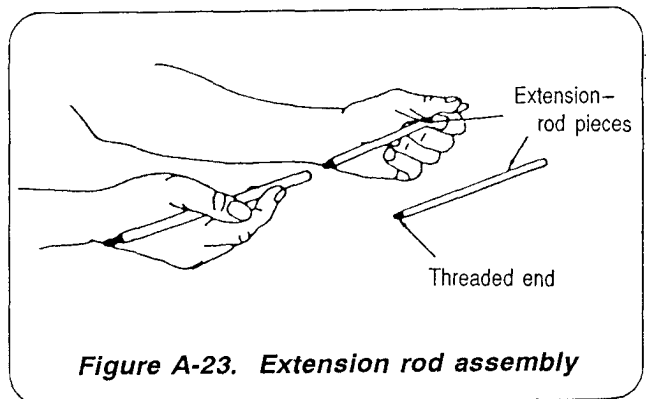
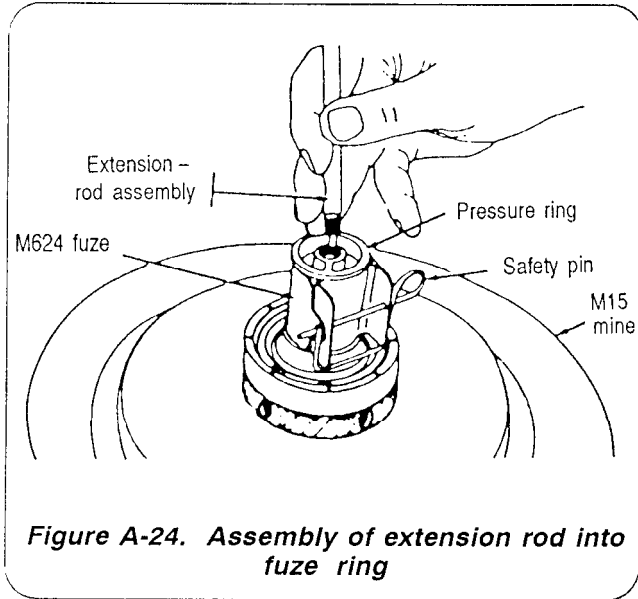


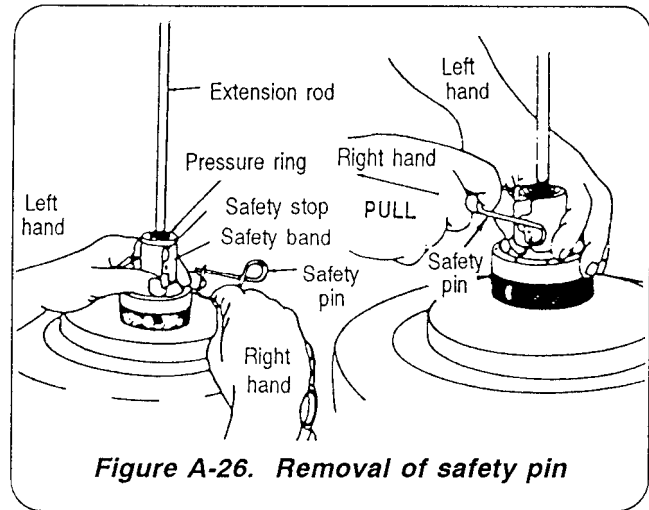
Figure A-23. Extension rod assembly

**NOTE: For surface emplacement, only use the first two sections of the extension rod.**

d. Thread the extension rod into the threaded pressure ring of the fuze (Figure A-24).



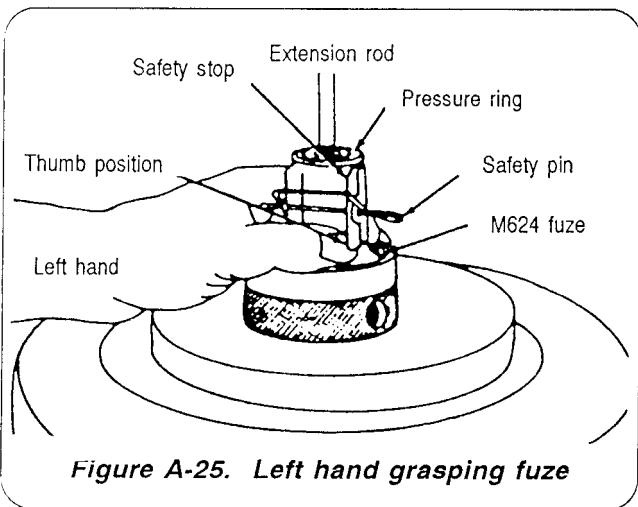
b. With the right-hand index finger, pull the safety pin out while sliding it to the right (Figure A-26).



**NOTE: For pressure role, do not assemble or thread the extension rod into the fuze.**

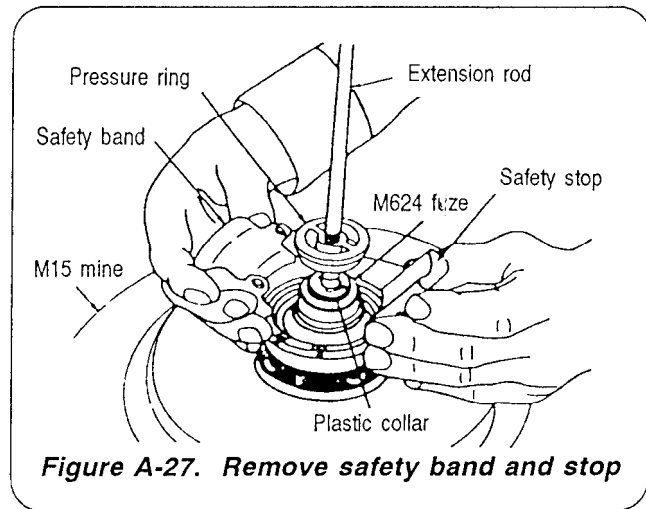
**6. Arm the mine.**

a. Raise the safety pin to the horizontal position, and grasp the safety band and safety stop with the left hand (note position of thumb) (Figure A-25).



c. Carefully remove the safety stop while holding the safety band in place.

d. Remove the safety band (Figure A-27). The fuze is now armed.



**7. Camouflage the mine.**

a. Add twigs, grass, or other materials natural to the area. Ensure no pressure is applied to the tilt rod or the fuze.

b. Place excess soil in sandbags and remove them from the area.

**NOTE: Mines with extension rods are placed in tall grass, if possible.**

c. Give the band, stop, pull ring assembly, arming plug, and end closure to the NCOIC.

**REMOVAL USING THE M624 FUZE**

**8. Disarm the mine.**

a. Carefully clear camouflage away from the mine.

b. Assemble the band, stop, and safety pin assembly on the fuze so the pressure ring is immobilized.

c. Unscrew and remove the extension rod.

**9. Check for AHDs.**

a. Without putting pressure on the fuze, hold the mine firmly in place with one hand.

b. With the other hand, feel for AHDs by digging around the sides and underneath the mine.

**10. Remove the mine.**

a. Remove the mine from the hole.

b. Remove the fuze from the mine (use the extension rod, if necessary).

c. Replace the end closure on the fuze.

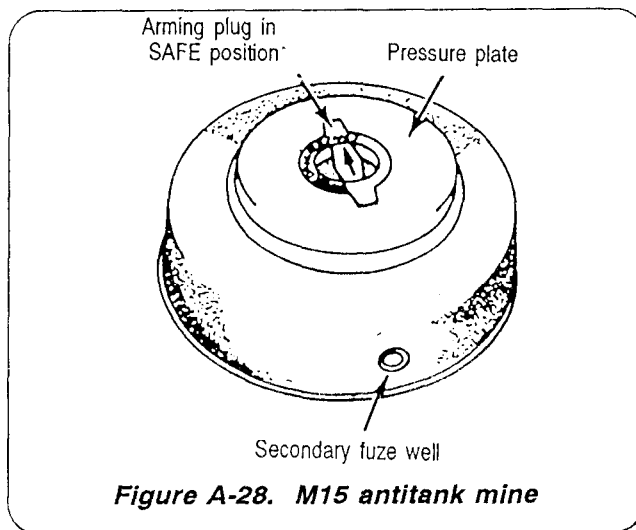
d. Install the arming plug into the fuze well of the mine.

**INSTALLATION USING THE M603 FUZE**

**1. Inspect the mine.**

a. If the mine is dented, cracked, or damaged, DO NOT USE IT.

b. Use the M20 wrench to unscrew and remove the arming plug from the mine (Figure A-28).



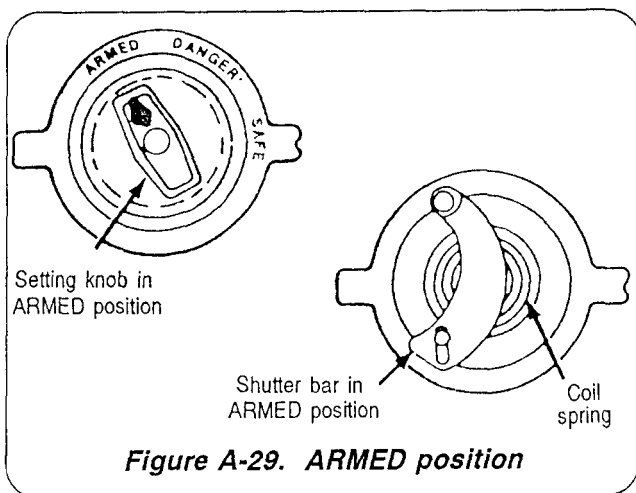
c. Examine the fuze well for foreign material. If foreign material is present, turn the mine upside down and gently tap the bottom with your hand to dislodge it. If it cannot be removed, replace the arming plug. DO NOT USE IT.

d. Ensure the booster retainer ring is seated in the fuze well. If the retainer ring is missing, replace the mine.

**2. Perform a function check with the arming plug.**

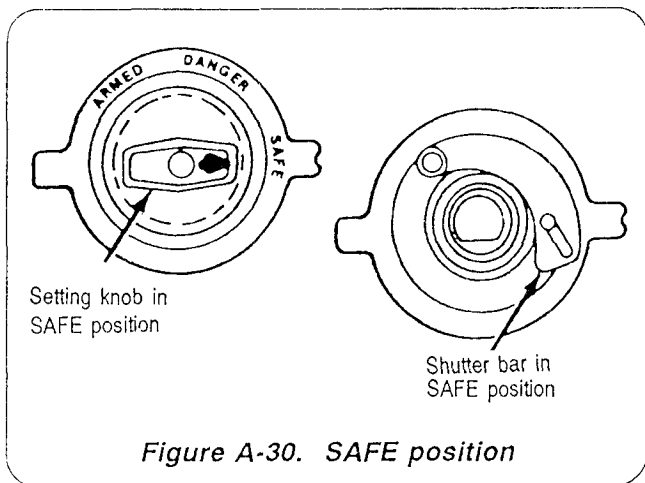
a. Turn the setting knob to the ARMED (A) position. Ensure the shutter bar moves across the bottom of the arming plug (Figure A-29).

**NOTE: A spring coil may not be present in older models.**



b. Turn the setting knob to the SAFE (S) position. Ensure the shutter bar moves back across the bottom of the arming plug (Figure A-30).

**NOTE:** If the shutter bar does not go into the SAFE (S) or ARMED (A) position, notify the NCOIC.



**3. Fuze the mine.**

a. After removing the M603 fuze from its metal shipping container, inspect it for serviceability.

**NOTE:** The green end of the detonator must show in the bottom of the fuze.

b. Remove the safety fork. If necessary, use the hooked end of an M20 wrench (Figure A-31).

c. Carefully insert the fuze into the fuze well until it seats securely on top of the booster retaining ring.

d. Perform a clearance test using the tab end of the M20 arming wrench (Figure A-32).

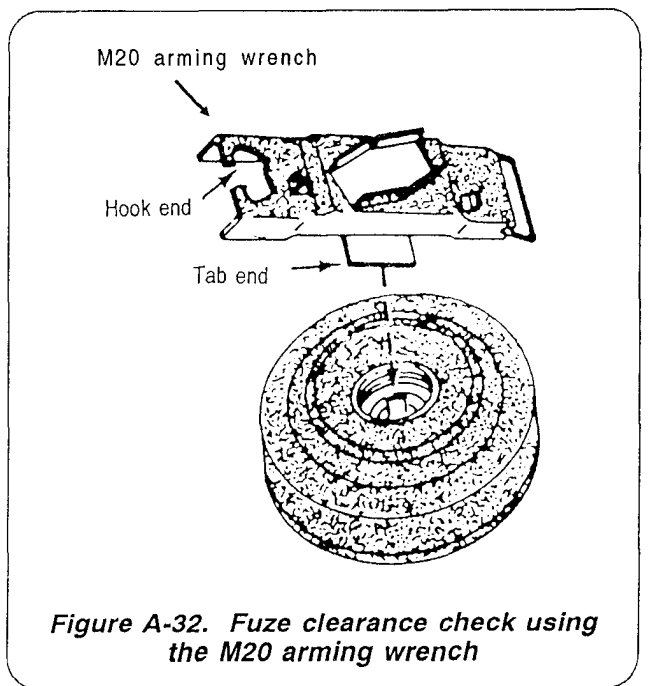
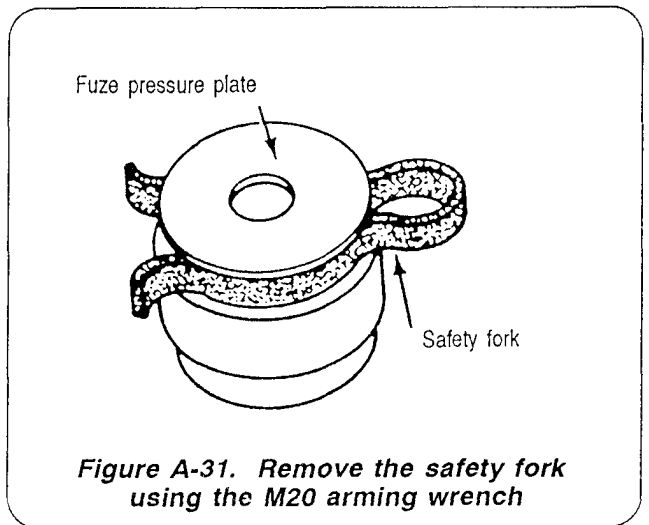
**NOTE:** For long-term emplacement, smear a thin layer of silicone grease or similar lubricant on the arming plug, threads, and gasket.

e. Ensure the setting knob is in the SAFE (S) position.

**WARNING**

**If the fuze pressure plate interferes with the tab end of the M20 arming wrench, investigate the cause and notify the NCOIC. Do not arm the mine.**

f. Screw the arming plug into the mine by hand. Ensure a watertight seal by tightening the arming plug with the N120 arming wrench.



#### 4. Dig a hole to fit the mine.

- Dig a hole deep enough so the top of the mine pressure plate will be about 1 1/2 inches below ground level.
- Dig the sides of the hole at a 45-degree angle to prevent vehicles from bridging the mine (Figure A-33).

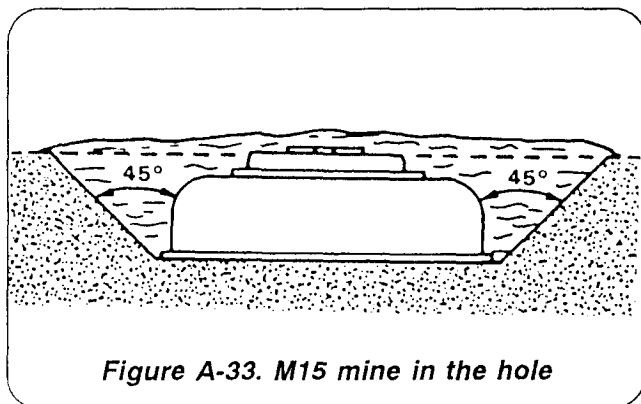


Figure A-33. M15 mine in the hole

#### 5. Emplace the mine.

- Place the mine in the hole.
- Cover the mine with soil until it is level with the top of the pressure plate.

**6. Use the M20 arming wrench to arm the mine by turning the setting knob from the SAFE (S) position to the ARMED (A) position.**

#### 7. Camouflage the mine.

- Cover the mine with 1 to 2 inches of soil.

- Camouflage the mine. Place excess soil in sandbags and remove them from the area.
- Give the safety clip to the NCOIC.

#### REMOVAL USING THE M603 FUZE

#### 8. Disarm the mine.

- Carefully clear the soil from the top of the mine.
- Without putting pressure on the pressure plate, hold the mine firmly in place with one hand.
- With the other hand, feel for AHDs by digging around the sides and underneath the mine.
- Use the M20 arming wrench to turn the setting knob to the SAFE (S) position.

#### 9. Remove the mine.

- Remove the mine from the hole.
- Use the M20 arming wrench to turn the arming plug counterclockwise and remove it.
- Remove the M603 fuze from the fuze well and replace the safety fork.
- Install the arming plug.

### MINE, ANTITANK, HE, NONMETALLIC, M19

The M 19 (Figures A-34 and A-35, page A-16) is housed in a square, plastic case. It is easily identified in the dark by its box shape. The mine holds 21 pounds of composition B (HE charge). It consists of an M606 integral pressure fuze and two secondary fuze wells—one located in the side and one on the bottom. The fuze body contains the pressure plate, Belleville spring, setting knob, step plate, firing pin assembly, and detonator.

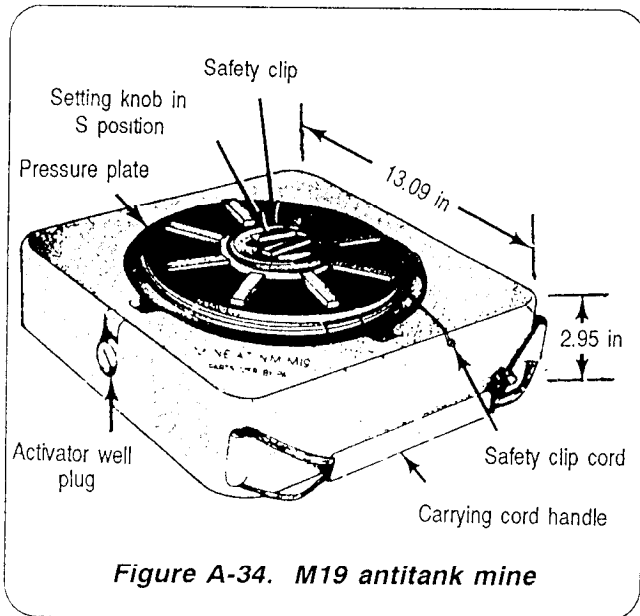


Figure A-34. M19 antitank mine

M19 CHARACTERISTICS

Main Chg	Dia	Ht	Wt	No Mines Per Box	Wt Per Box
Comp B (21 lb)	13.09"	2.95"	28 lb	2	72 lb

- Employed in protective, tactical, and nuisance minefields.
- Can be buried or surface-laid.
- A force of 300 to 500 pounds is required to detonate it.
- Standard FD can be used with the M2 activator in any of the secondary fuze wells.

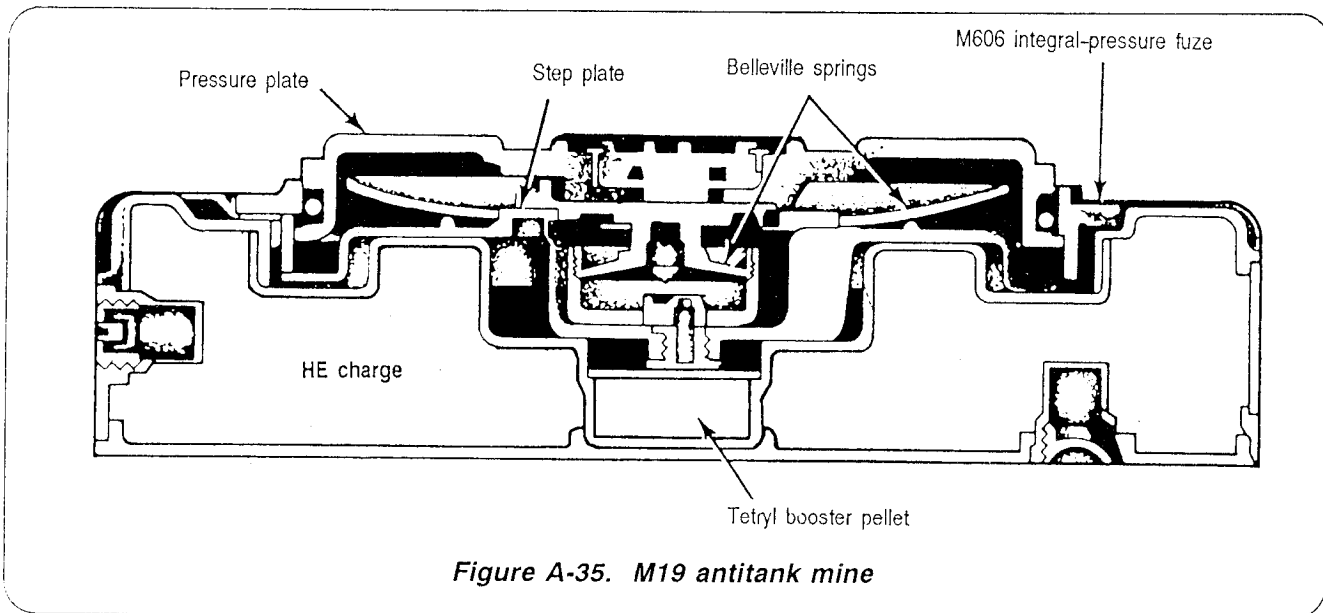


Figure A-35. M19 antitank mine

INSTALLATION

1. Inspect the mine.

a. If the mine is dented, cracked, or damaged, DO NOT USE IT.

b. Remove the M606 fuze from the fuze well by turning it counterclockwise 1 1/4 turn (Figure A-36).

c. Ensure the rubber gasket is on the M606 fuze.

d. Remove any foreign material found in the fuze well.

e. Ensure the setting knob is in the SAFE (S) position and the safety clip is in place.



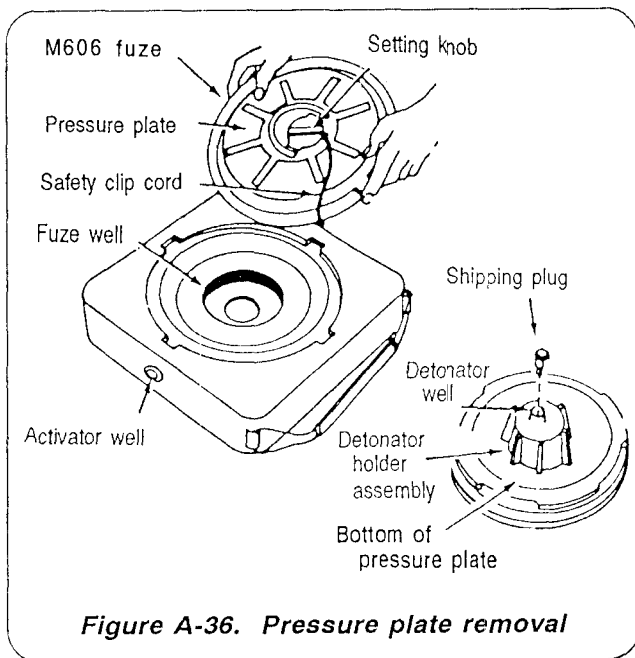


Figure A-36. Pressure plate removal

f. Use the M22 wrench to remove the shipping plug from the detonator well (Figure A-36).

g. Examine the detonator well for foreign material. If foreign material is present, gently tap the pressure plate with your hand to dislodge it.

**2. Test the position of the firing pin (Figure A-37).**

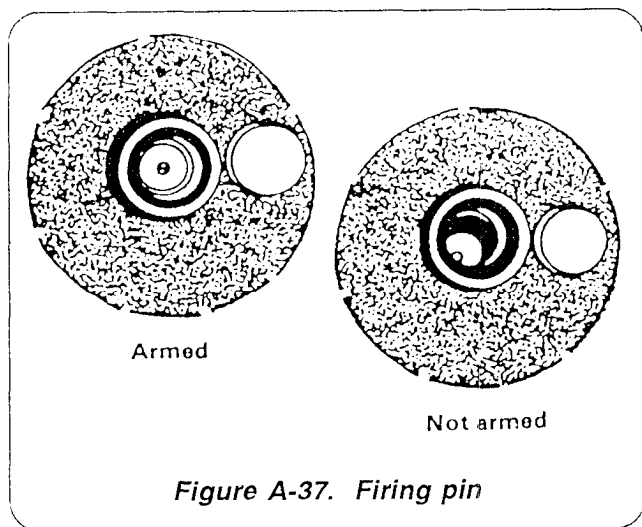


Figure A-37. Firing pin

a. Visually check the position of the firing pin. Ensure the firing pin is at the edge of the well when the setting knob is in the SAFE (S) position.

**NOTE: If the pin is in the middle of the well, notify the NCOIC.**

b. Remove the safety clip.

c. Use the M22 wrench to turn the setting knob to the ARMED (A) position. Ensure the firing pin is in the center of the well.

d. Use the M22 wrench to turn the setting knob back to the SAFE (S) position. Ensure the firing pin moves back to the side of the well.

**NOTE: If the firing pin is not in the correct position when the setting knob is in either the ARMED (A) or SAFE (S) position, notify the NCOIC.**

e. Replace the safety clip.

**3. Use the M22 arming wrench to screw the M50 detonator into the detonator well.**

**4. Use the M22 wrench to tighten the M606 fuze into the fuze well.**

**5. Dig a hole to fit the mine.**

a. Dig a hole deep enough so the top of the mine pressure plate will be even or slightly below ground level.

b. Dig the sides of the hole at a 45-degree angle to prevent vehicles from bridging the mine.

**6. Emplace the mine.**

a. Place the mine in the hole.

b. Cover the mine with soil until it is level with the top of the pressure plate.

**7. Arm the mine.**

a. Remove the safety clip.

b. Use the M22 wrench to turn the setting knob from the SAFE (S) to the ARMED (A) position.

**8. Camouflage the mine.**

- a. Cover the mine with 1 1/2 inches of soil.
- b. Camouflage the mine. Place excess soil in sandbags and remove them from the area.
- c. Give the safety clip and the shipping plug to the NCOIC.

**REMOVAL**

**9. Disarm the mine.**

- a. Carefully clear the soil from the top of the mine.
- b. Without putting pressure on the pressure plate, hold the mine firmly in place with one hand.

c. With the other hand, feel for AHDs by digging around the sides and underneath the mine.

d. Use the M22 wrench to turn the setting knob to the SAFE (S) position.

e. Replace the safety clip on the M606 fuze.

**10. Remove the mine.**

- a. Remove the mine from the hole.
- b. Use the M22 wrench to remove the M606 fuze by turning it counterclockwise and lifting it out of the fuze well.
- c. Use the M22 wrench to remove the detonator from the detonator well.
- d. Replace the shipping plug in the detonator well.
- e. Replace the pressure plate in the mine.

**MINE, ANTITANK, HE, HEAVY, M21**

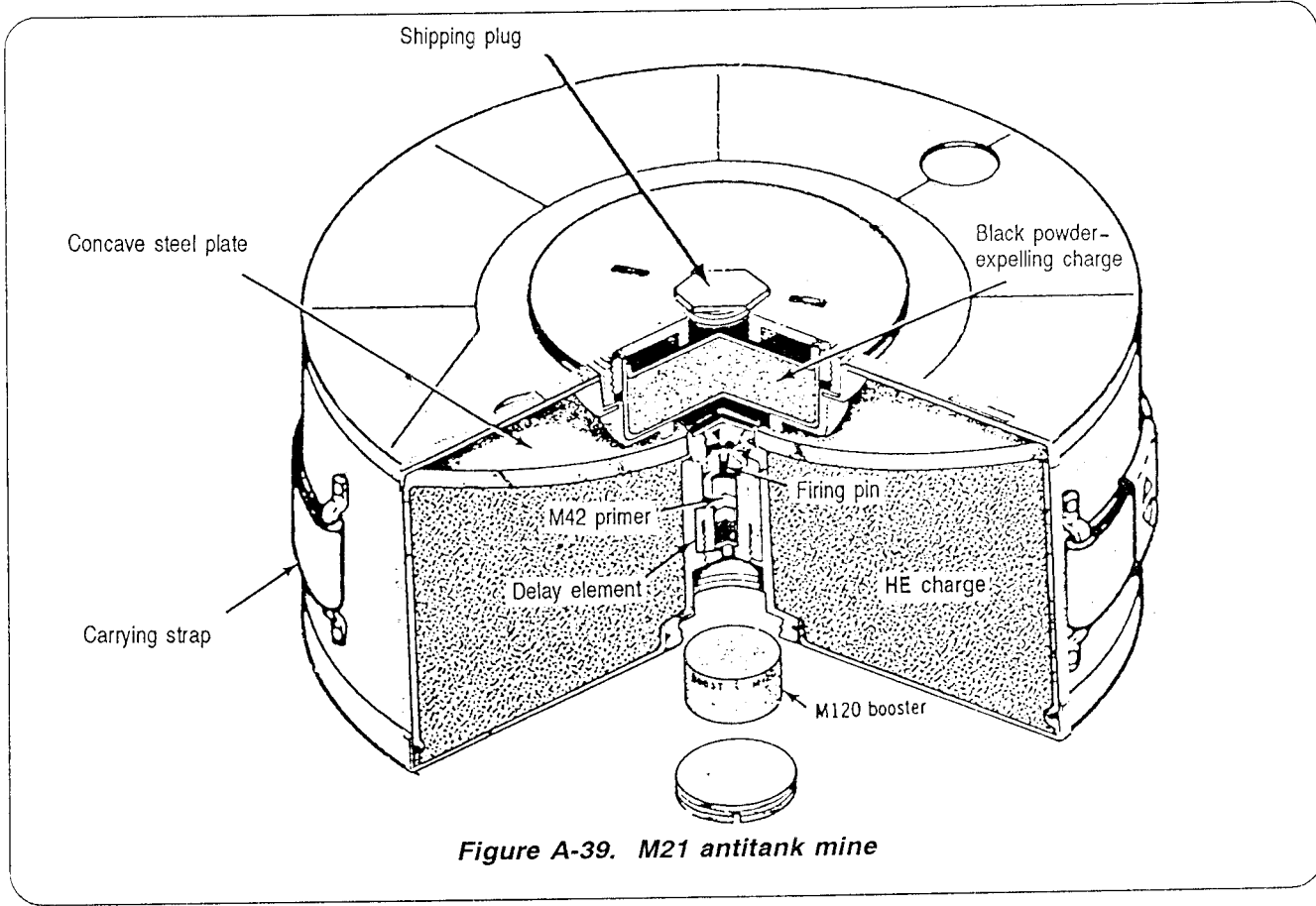
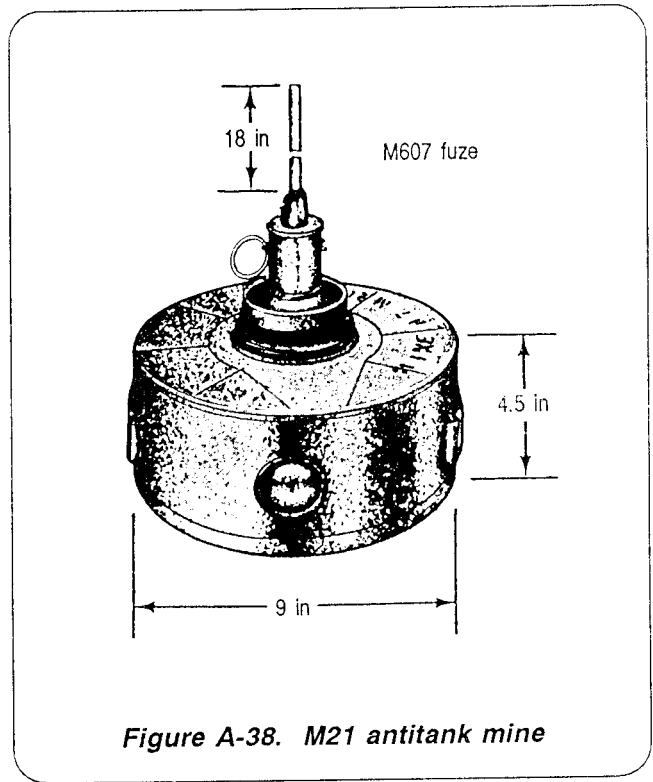
The M21 (Figures A-38 and A-39) utilizes a direct-energy warhead designed to produce a K-Kill. It is used in conjunction with the M607 fuze. The M21 produces a K-Kill against threat heavy tanks. When used with a tilt rod, the mine should be buried. If surface-laid and used with a tilt rod, the mine must be staked to prevent it from being knocked over and causing the warhead to be directed away from the target.

**M21 CHARACTERISTICS**

Main Chg	Dia	Ht	Wt	No Mines Per Box	Wt Per Box
Comp H6 (11 lb)	9"	4.5"	17.25 lb.	4	91 lb

- Can be used with a tilt-rod assembly requiring 3.75 pounds of pressure on the extension rod to cause a 20-degree deflection.
- Only conventional US AT mine with a direct-energy warhead.

- Requires a minimum of 290 pounds of pressure to detonate.



**INSTALLATION**

**1. Inspect the mine.**

- a. If the mine is dented, cracked, or damaged, DO NOT USE IT.
- b. Ensure the cotter pin of the fuze pull ring assembly and the fuze closure assembly are securely in place (Figure A-40).

- b. Examine the booster well for foreign material. If foreign material is present, gently tap the top of the mine with your hand to dislodge it. If it cannot be removed, replace the closing plug. DO NOT USE IT (Figure A-42).

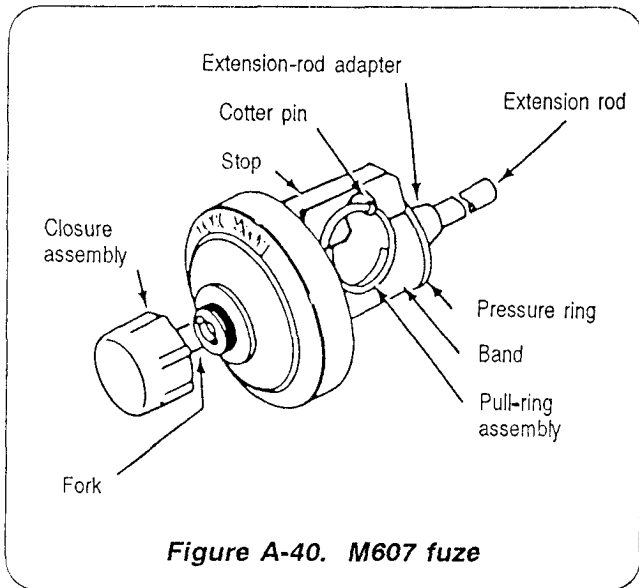


Figure A-40. M607 fuze

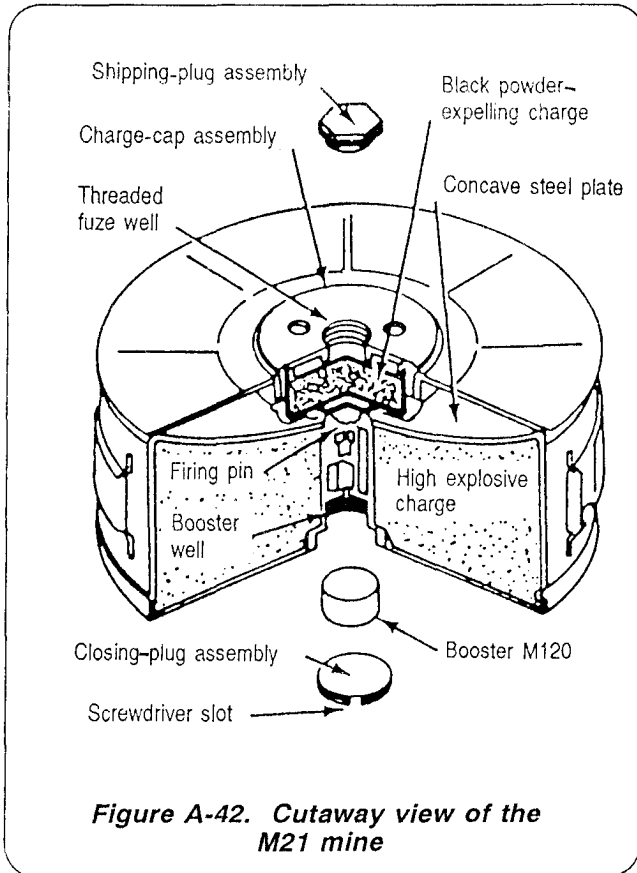


Figure A-42. Cutaway view of the M21 mine

- c. Inspect the fuze to ensure the neck portion behind the collar is not cracked.

- c. Insert the M 120 booster, with the washer side toward the fuze, into the booster well.
- d. Use the M26 wrench to replace the closing plug.

**2. Insert the booster.**

**3. Fuze the mine.**

- a. Use a screwdriver end of an M26 wrench to remove the closing plug from the bottom of the mine (Figure A-41).

- a. Use the M26 wrench to remove the shipping plug from the fuze well on top of the mine.
- b. Examine the fuze well for foreign material. If foreign material is present, gently shake the mine to dislodge it.

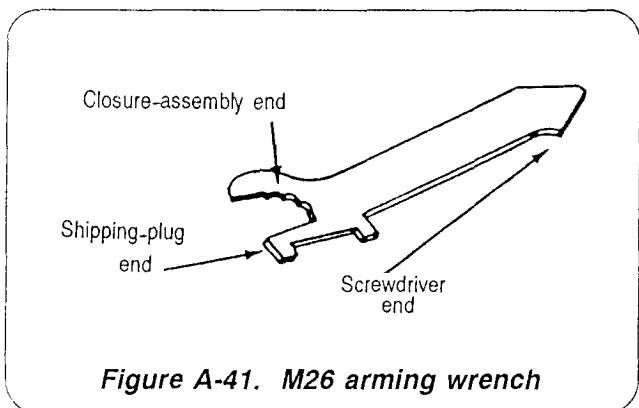


Figure A-41. M26 arming wrench

**NOTE: If black powder falls out of the fuze well or foreign material cannot be removed, DO NOT use the mine.**

c. Use the M26 wrench to remove the closure assembly from the M607 fuze. Ensure the gasket remains in place on the fuze.

d. Screw the fuze hand-tight into the fuze well.

**4. Dig a hole to fit the mine.**

a. Dig a hole deep enough so the top of the mine will be at ground level (Figure A-43).

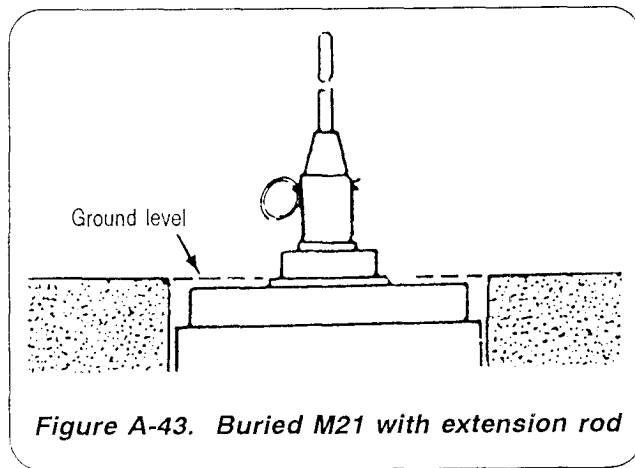


Figure A-43. Buried M21 with extension rod

b. Check the bottom of the hole to ensure the ground is solid enough to support the mine. If necessary, place a flat object under the mine to provide a firm foundation. Allow additional depth for the object.

**5. Emplace the mine.**

a. Place the mine in the hole.

b. Cover the mine with soil until it is level with the top of the mine.

c. Firmly press the soil around the sides of the mine.

**NOTE: Ensure no soil falls around or under the plastic collar. For pressure operation, do not use the extension rod assembly.**

**6. Assemble the extension rod.**

a. Screw the extension rod onto the M607 fuze.

b. Ensure the extension rod is pointing straight up.

**7. Arm the mine.**

a. On the pull ring, squeeze the end of the cotter pin together.

b. Remove the cotter pin by holding the fuze firmly in one hand and pulling the pull ring with the other hand.

c. Slowly and carefully remove the band and stop assembly from the neck of the fuze (Figure A-44).

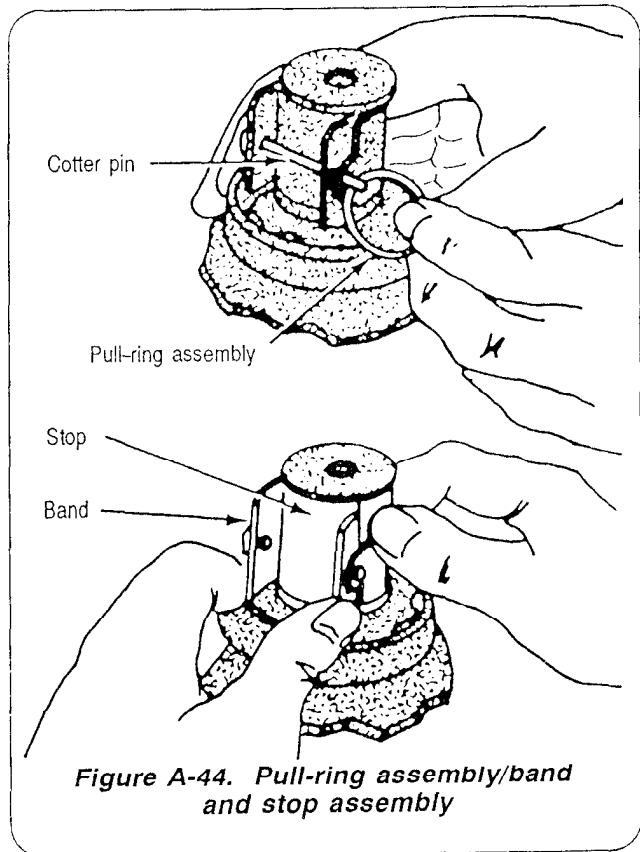


Figure A-44. Pull-ring assembly/band and stop assembly

**8. Camouflage the mine.**

a. Add twigs, grass, or other material natural to the area. Ensure no pressure is applied to the tilt rod or the fuze.

b. Place the excess soil in sandbags, Remove them from the area.

**NOTE: Mines with extension rods are placed in tall grass, if possible.**

c. Give the band, stop, pull ring assembly, shipping plugs, and closure assemblies to the NCOIC.

## REMOVAL

### 9. Disarm the mine.

- a. Carefully clear camouflage away from the mine.
- b. Attach the band and stop to the fuze.
- c. Insert the cotter pin into the band and stop. Spread the ends of the cotter pin.
- d. Unscrew and remove the extension rod.

### 10. Check for AHDs.

a. Without putting pressure on the fuze, hold the mine firmly in place with one hand.

b. With the other hand, feel for AHDs by digging around the sides and underneath the mine.

### 11. Remove the mine.

- a. Remove the mine from the hole.
- b. Remove the fuze from the mine.
- c. Install the closure assembly on the fuze.
- d. Install the shipping plug into the fuze well of the mine.
- e. Remove the closing plug from the bottom of the mine.
- f. Remove the booster from the mine.
- g. Install the closing plug into the booster well.

## Section III. Firing Devices

An FD performs the function of a mine fuze by providing an alternative means to detonate the mine. An FD is normally used in conjunction with a standard fuze so a mine will have two separate explosive chains. The purpose of the second firing chain is to prevent the enemy from disarming or removing mines after emplacement. When used for this purpose, the FD is called an AHD. It is designed to function by detonating the attached mine or another explosive charge nearby, if unauthorized personnel attempt to remove or tamper with the mine. Both the M19 and the M15 have two secondary fuze wells for attaching an FD and an activator.

There are five standard US FDs:

- M1 pull.
- M3 pull/tension-release.

- M5 pressure-release.
- M1A1 pressure.
- M142 multipurpose.

These FDs utilize a spring-loaded striker and standard base and are designed to function in one or more of the following modes:

- Pressure.
- Pressure-release.
- Pull-tension.
- Tension-release.

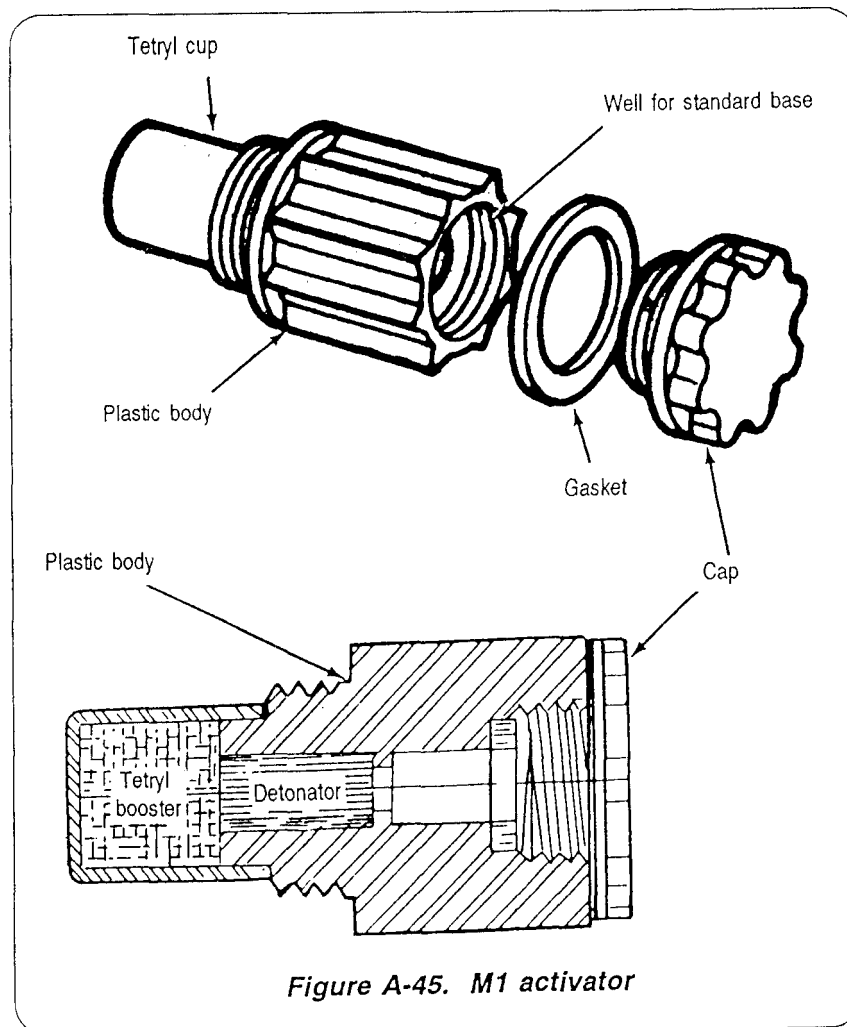
When FDs are employed with M 15 and M 19 AT mines, they require the use of an M1 or M2 activator.

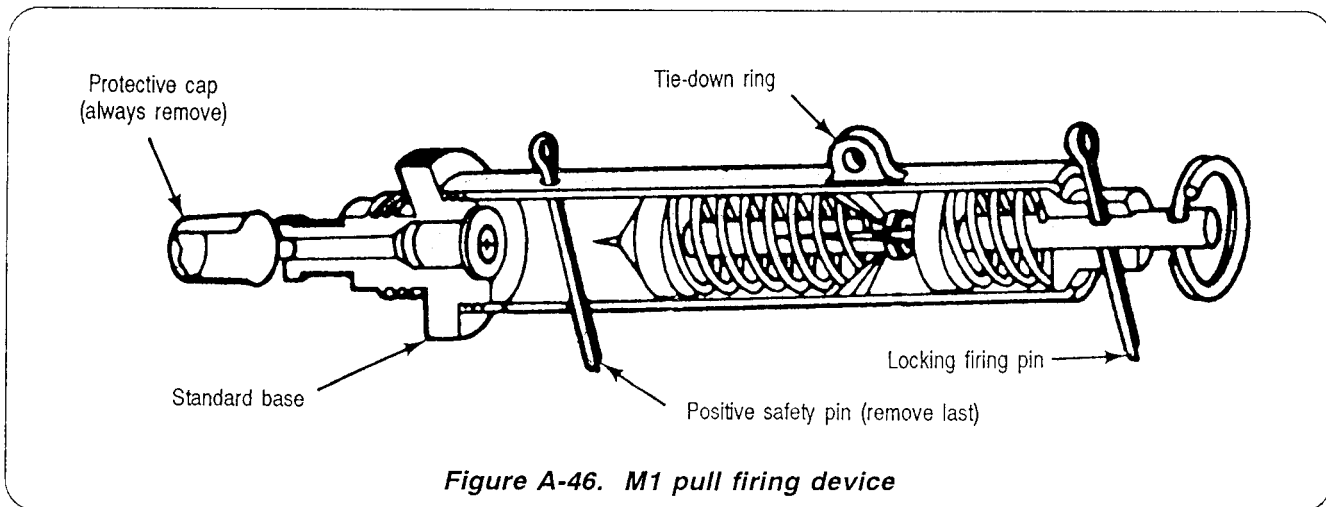
## ACTIVATOR, ANTITANK MINE, M1 AND M2

Activators are essentially detonator boosters designed to magnify the explosive force generated by an FD with a standard base and transfer it to the main charge. Activators can be used with any one of several types of FDs to supply an AT mine with a secondary fuze for antihandling purposes. The M 1 activator is used with the M 15 AT mine, and the M2

activator is used with the M 19 nonmetallic AT mine. The activator also performs the function of an adapter for attaching the FD to the mine. One end of the activator is threaded externally for insertion in the secondary well of the mine. The other end is threaded internally to receive the standard base coupling of the FD.

The M1 activator (Figure A-45) is 2.1 inches long and is made of olive-drab plastic. It has a threaded closing plug and gasket. It contains a detonator and has a cylindrical, unthreaded cap which is cemented to the opposite end of the body and contains a tetryl booster charge. The thread, which screws into the mine, is 0.75 inch in diameter. The M2 activator is similar to the M 1, but it contains an HE pellet and its overall length is 1.9 inches. It is also made of olive-drab plastic.





## MI PULL FIRING DEVICE

The M1 pull FD (Figure A-46) has the following characteristics:

- **Case: Metal.**
- **Color: Olive-drab.**
- **Diameter: 0.56 inch.**
- **Length: 3.31 inches.**
- **Internal action: Mechanical with split striker-head release.**
- **Initiating action: Pull of 3 to 5 pounds on trip wire.**
- **Safeties: Locking and positive safety pins.**
- **Packaging: Five units with standard base and two 80-foot spools of trip wire are packed in a fiberboard container; 30 fiberboard containers are packed in a wooden box.**
- **Activated only by pull or tension.**
- **Pull of 3 to 5 pounds on a trip wire attached to the pull ring and a suitable anchor withdraws the tapered end of the release pin from the split head of the striker. This frees the striker to fire the percussion cap.**

### INSTALLATION

1. Inspect the FD for damage.
2. Ensure the positive safety and locking safety pins are in place.
3. Remove the protective cap from the standard base. Screw the standard base to the FD and the activator onto the standard base (Figure A-46).
4. Install the M 1 pull FD assembly into the secondary fuze/activator well (Figure A-47).
5. Place the mine with the FD in the hole. Ensure the safety pins remain in place.
  - a. Attach the wire to the stake.
  - b. Attach the wire to the pull ring. Leave slack in the wire (Figure A-47).
6. Arm the mine.
7. Cover and camouflage the mine. Leave a hole (trench) at the side of the mine to remove the safety pins (Figure A-47).
8. Carefully remove the locking safety first (Figure A-48).
9. Remove the positive safety pin.



10. Complete camouflaging the mine.  
Give safety pins to the NCOIC.

**REMOVAL**

11. Uncover the mine and carefully check surrounding area for booby traps, trip wires, and signs of tampering.

12. Replace the positive safety pin.  
Replace the locking safety pin. Cut all trip wires.

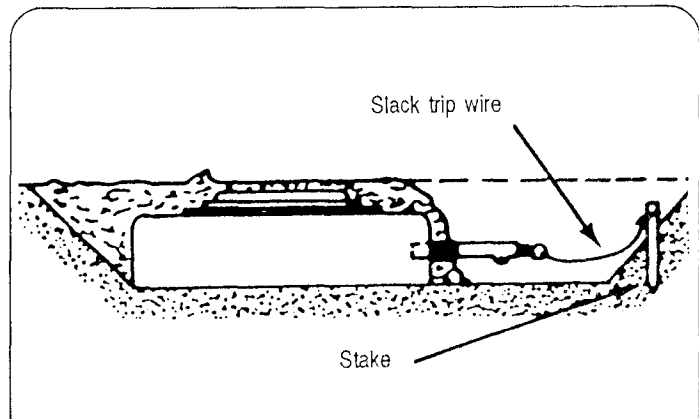


Figure A-47. M1 in the side fuze well

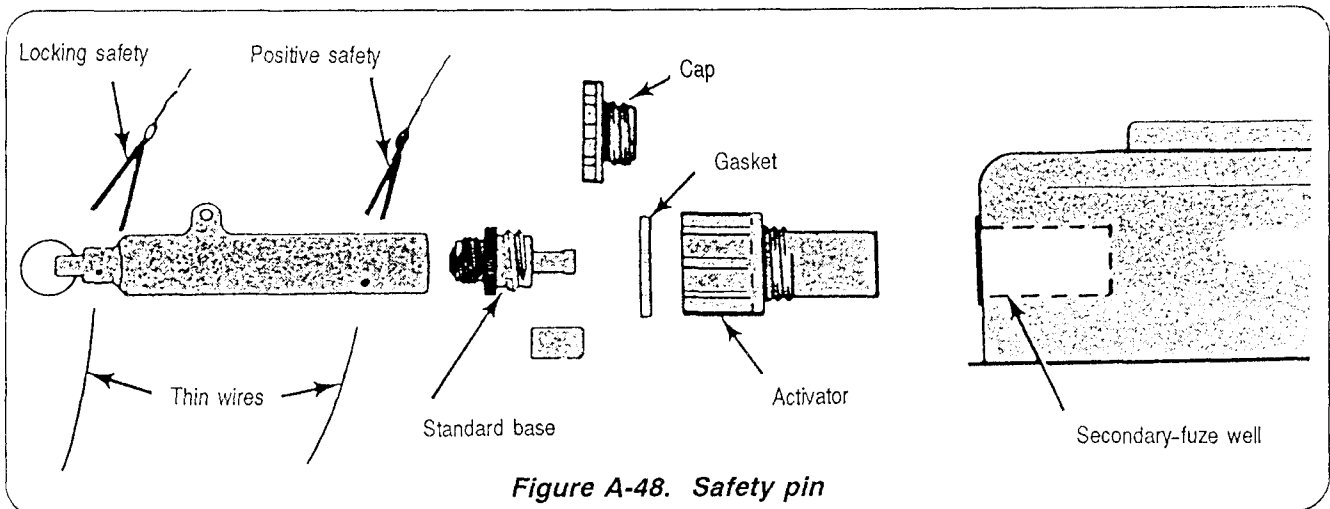


Figure A-48. Safety pin

**M3 PULL/TENSION-RELEASE FD**

The M3 pull/tension release FD (Figure A-49, page A-26) has the following characteristics:

- **Case:** Metal.
- **Color:** Olive-drab.
- **Diameter:** 0.56 inch.
- **Length:** 4 inches.
- **Internal action:** Mechanical with spreading striker-head release.
- **Initiating action:** Direct pull of 6 to 10 pounds or tension-release.
- **Safeties:** Locking and positive safety pins.
- **Packaging:** Five units with two 80-foot spools of trip wire packed in a carton; five cartons packed in a wooden box.
- **M3 pull/tension-release FD is a dual-function device.**
- **In the pull mode,** pull of 6 to 10 pounds of pull on a trip wire detonates the mine.
- **Tension-release mode,** cutting or breaking of a taut trip wire permits detonation.

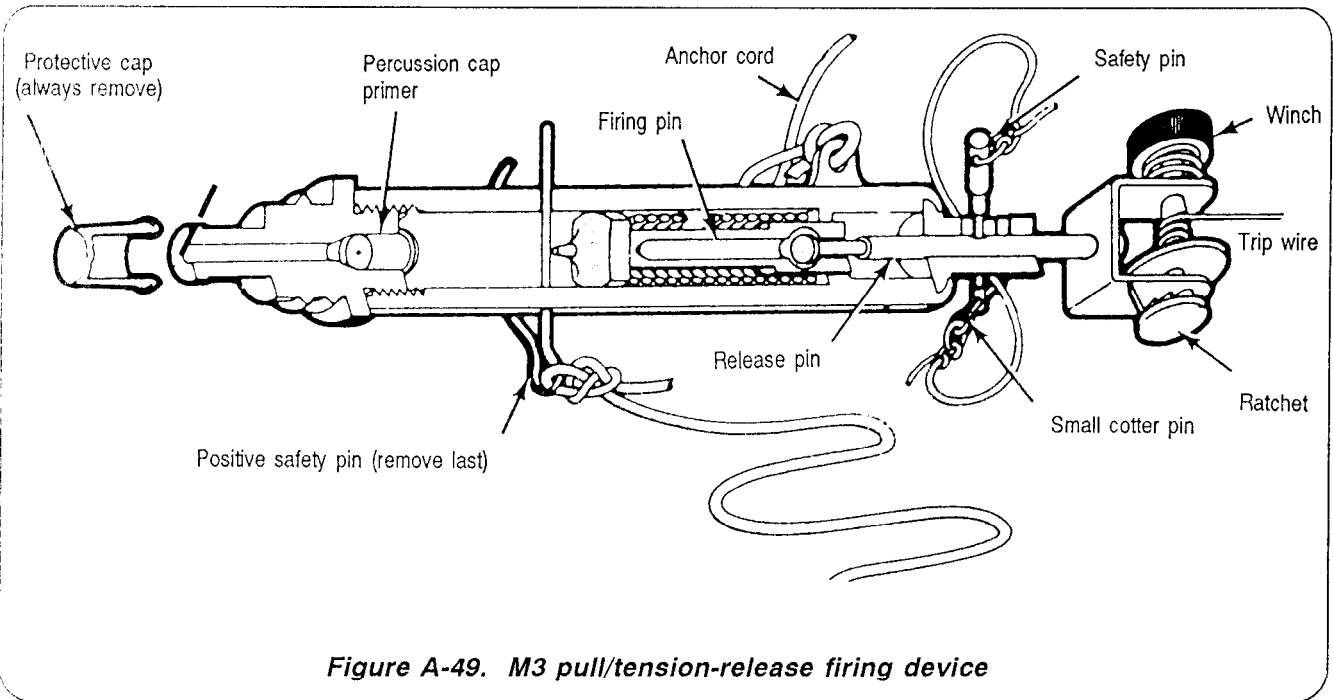


Figure A-49. M3 pull/tension-release firing device

**WARNING**  
**Either cutting the trip wire or applying sufficient tension to the trip wire can activate this device.**

**INSTALLATION**

1. Dig a hole deep enough to bury the mine on a firm foundation.
2. Remove the protective cap from the standard base, and attach it to the M3 and activator.
3. Attach the device to the mine.
4. Place the mine in the hole. Leave a small trench for the FD.
5. Anchor the mine enough to withstand a pull of at least 10 pounds.
6. Attach one end of the trip wire to the anchor and the other end to the FD winch.
7. Arm the mine.

8. Use the knurled knob to draw the trip wire taut until the locking pin is pulled into the wide portion of the safety-pin hole (Figure A-50).

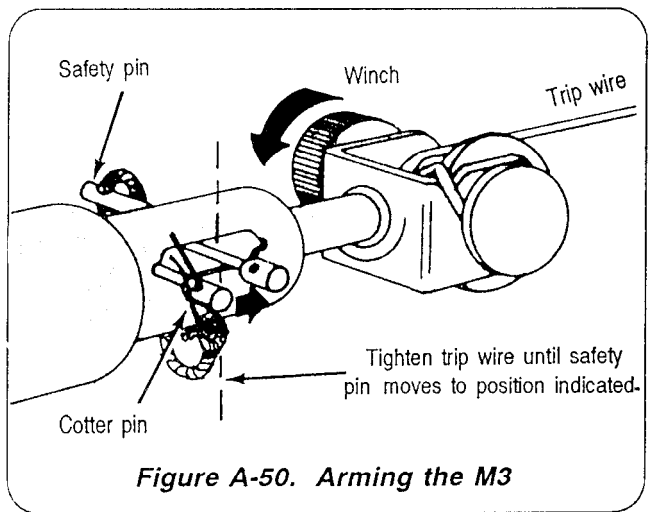


Figure A-50. Arming the M3

9. Remove the small cotter pin. Remove the locking safety pin.

**NOTE: If a metallic click is heard, DO NOT remove the positive safety pin. Remove the device from the mine.**

10. Remove the positive safety pin. Camouflage the area

**REMOVAL**

**NOTE: Mines fitted with the M3 FD should be destroyed in place or removed by an EOD team.**

11. Carefully uncover the mine. Locate all AHDs attached to it.

12. Replace the positive safety pin (Figure A-51).

13. Replace the locking safety pin.

14. Check both ends of the trip wire before cutting it.

15. Place the mine in the SAFE (S) position, and disassemble the device.

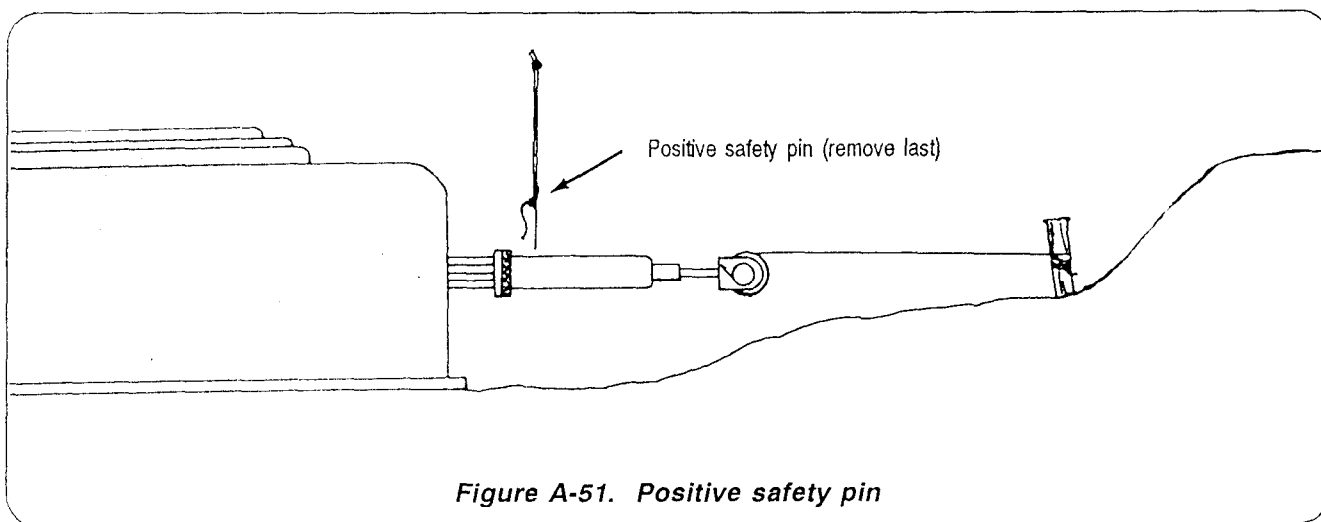


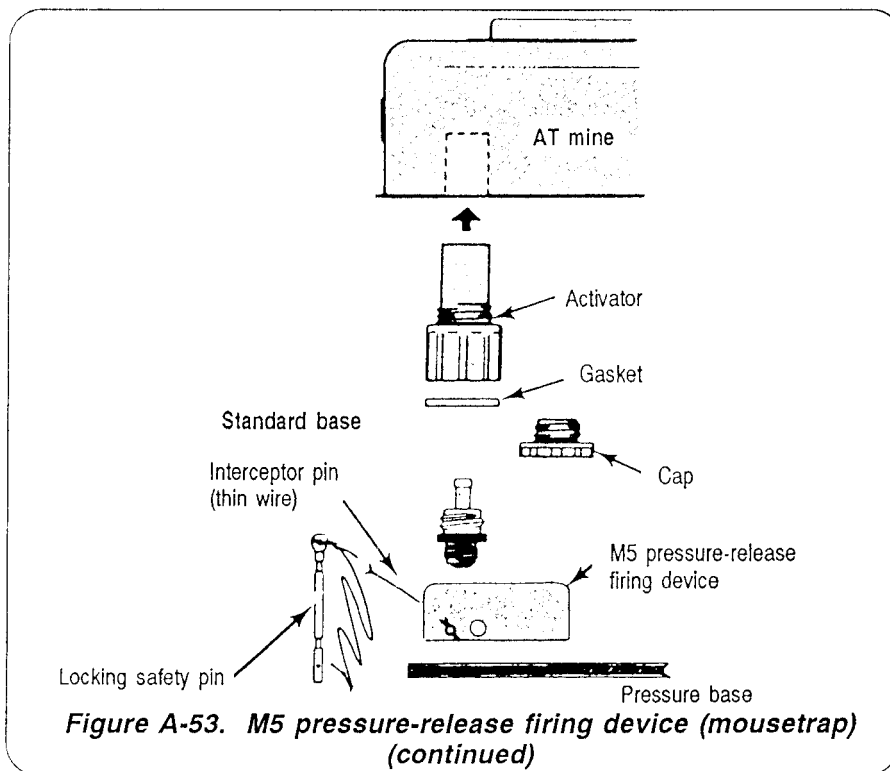
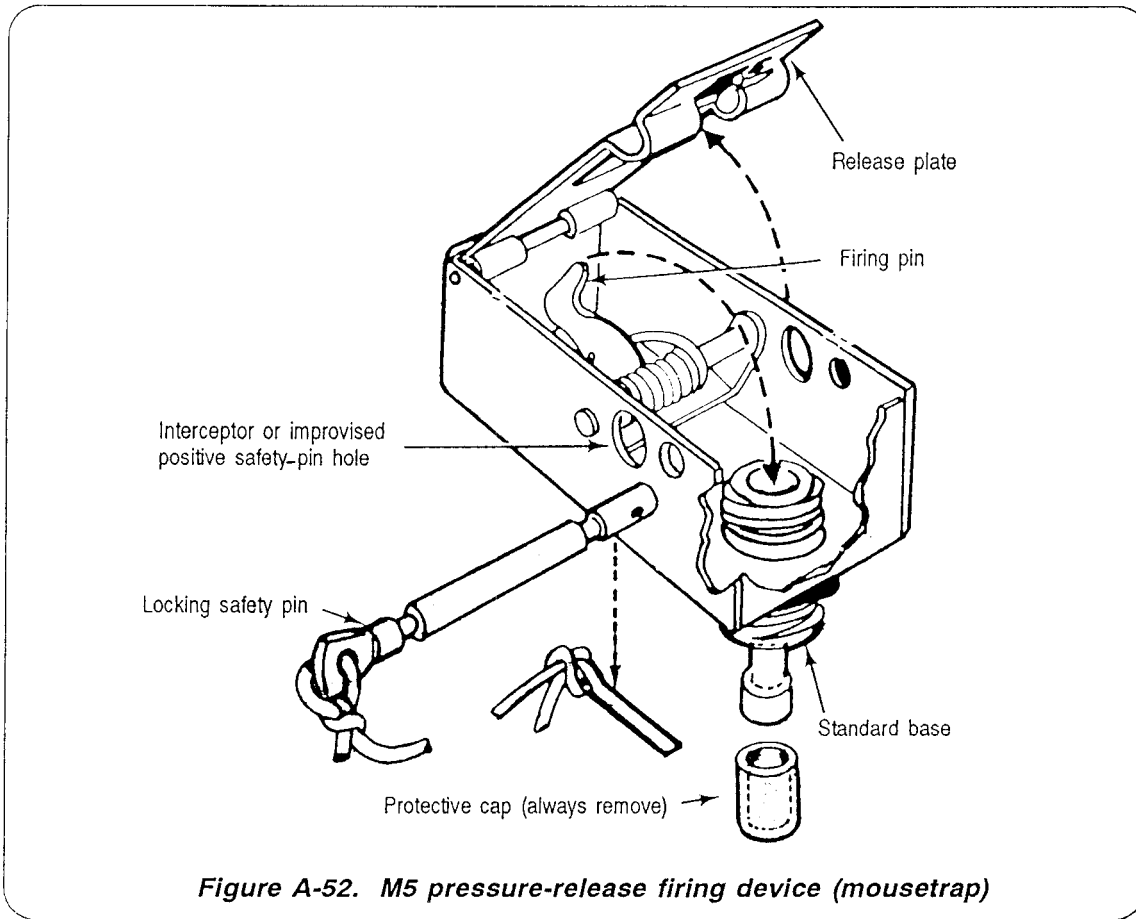
Figure A-51. Positive safety pin

**M5 PRESSURE-RELEASE FIRING DEVICE (MOUSETRAP)**

The M5 (Figures A-52 and A-53, page A-28) is activated by the release of pressure. Lifting or

removing a restraining weight releases the striker to fire the cap. It has the following characteristics:

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• <b>Case:</b> Metal.</li> <li>• <b>Color:</b> Olive-drab.</li> <li>• <b>Length:</b> 1.75 inches.</li> <li>• <b>Width:</b> 0.94 inch.</li> <li>• <b>Height:</b> 0.69 inch.</li> <li>• <b>Internal action:</b> Mechanical with a hinged striker release.</li> <li>• <b>Initiating action:</b> Removal of restraining weight, 5 pounds or more.</li> </ul> | <ul style="list-style-type: none"> <li>• <b>Accessories:</b> Pressure board.</li> <li>• <b>Safeties:</b> Safety pin and hole for interceptor pin.</li> <li>• <b>Packaging:</b> Four complete FDs and four plywood pressure boards are packaged in a paper carton; five cartons are packed in a fiberboard box; and 10 fiberboard boxes are shipped in a wooden box.</li> </ul> |
|---|--|



**INSTALLATION**

1. Dig a hole deep enough to bury the mine on a firm foundation. The pressure plate should be slightly above ground level.
2. Remove the protective cap from the standard base. Assemble the FD.
3. Use a coat hanger as a positive safety pin. Place the mine in the hole. Leave enough room to remove the pins.

**ing the locking safety, carefully remove the mine and replace the FD.**

7. Remove the positive safety pin (interceptor pin).

**REMOVAL**

8. Carefully uncover the mine and inspect it for tampering. Locate and carefully uncover the FD.

**WARNING**

**Ensure the mine and the FD are resting on a firm foundation before removing the pins.**

**WARNING**

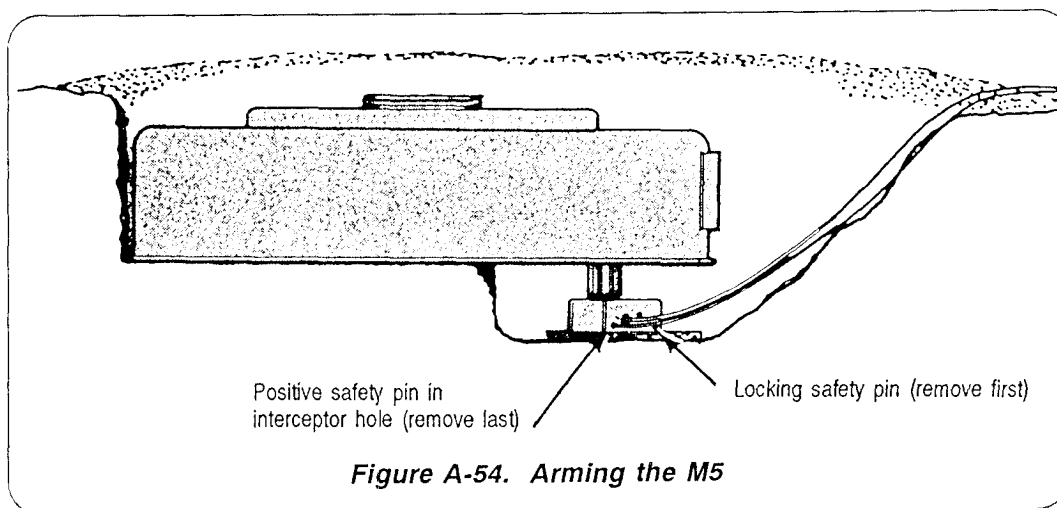
**Do not release the pressure being applied to the device.**

4. Bury and camouflage the mine.
5. Arm the mine.
6. Remove locking safety pin (Figure A-54).

9. Insert the positive safety pin into the interceptor hole, and then insert the locking safety pin into the safety-pin hole.

**NOTE: If the positive safety pin is difficult to remove or if you hear a click when remov-**

10. Place the mine in the SAFE (S) position. Remove the mine and recover the FD.



## M1A1 PRESSURE FIRING DEVICE

The M1A1 (Figure A-55 and A-56) is pressure-actuated. Pressure is applied directly to the trigger head or can be transmitted via the three-pronged pressure head. A press of 20 pounds applied to the head compresses the

striker release-pin spring and pushes the release-pin inward. The spring-loaded firing pin then fires the primer and standard base. It has the following characteristics:

- **Case:** Metal.
- **Color:** Olive-drab.
- **Length:** 2.75 inches.
- **Width:** 0.63 inch.
- **Internal action:** Spring-driven striker with keyhole slot release.
- **Initiating action:** Pressure of 20 pounds or more.
- **Accessories:** Three-pronged pressure head and extension rod.
- **Safeties:** Safety fork and positive safety pin.
- **Packaging:** Five units with standard base are packed in a cardboard carton; 30 cartons are shipped in a wooden box.

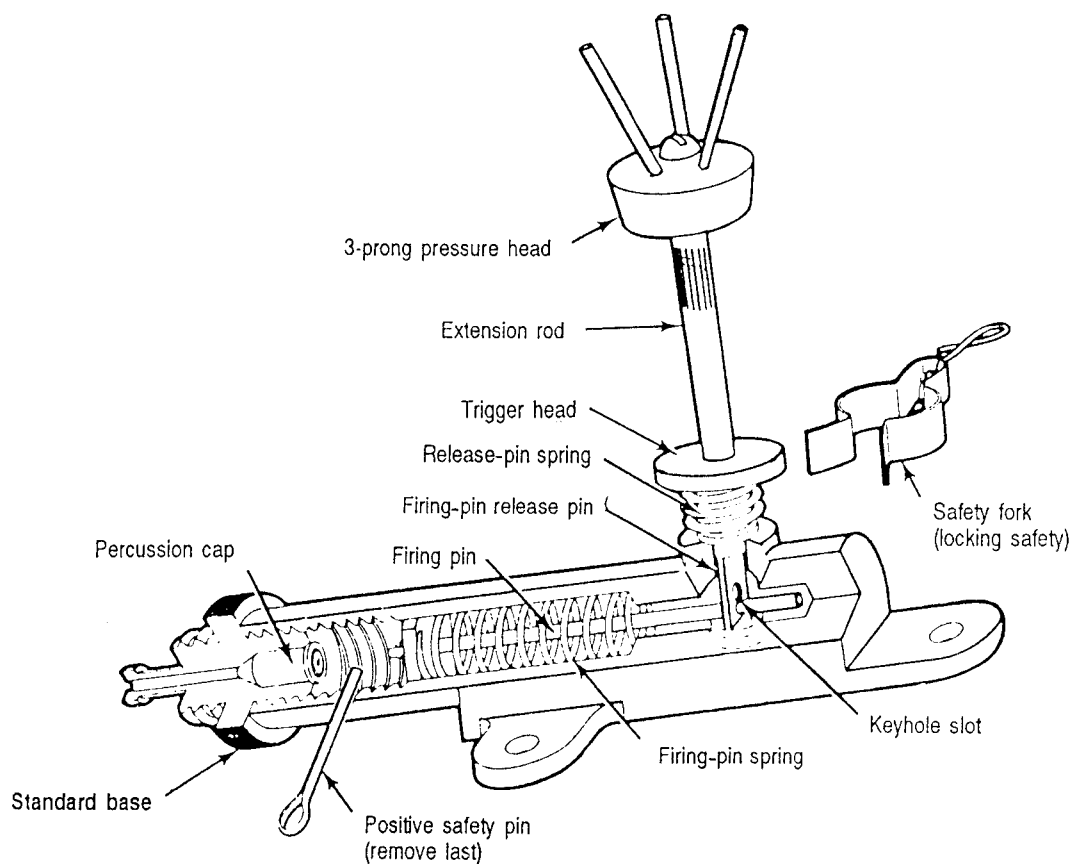


Figure A-55. M1A1 pressure firing device

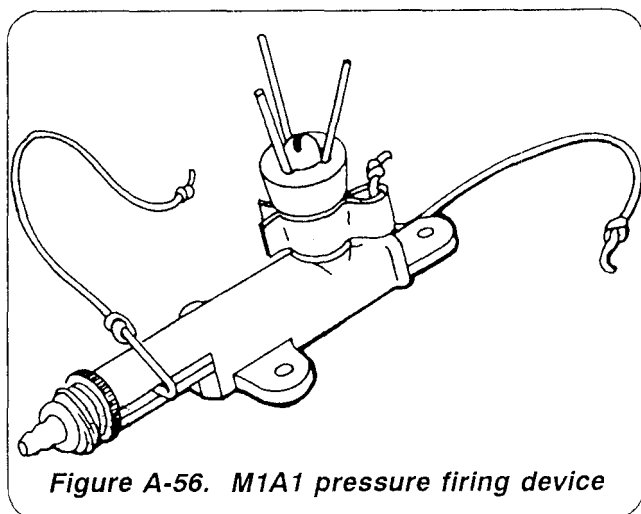


Figure A-56. M1A1 pressure firing device

**INSTALLATION**

1. Dig a hole deep enough to bury the mine on a firm foundation. The top of the pressure plate should be slightly above ground level with an open trench to accommodate the device.

2. Remove the protective cap from the standard base and mate it to the FD. Assemble the proper activator on to standard base.

3. Install the FD, and place the mine in the hole.

4. Arm the mine.

5. Screw the three-pronged pressure head into the top of the trigger head (use an extension rod, if necessary).

6. Remove the safety fork.

7. Remove the positive safety pin (Figure A-57). Camouflage the mine and FD. Leave the three-pronged head above ground level.

**REMOVAL**

8. Carefully uncover the mine. Locate all AHDs.

9. Replace positive safety pin. Replace safety fork.

10. Place the mine in the SAFE (S) position

11. Disassemble the FD.

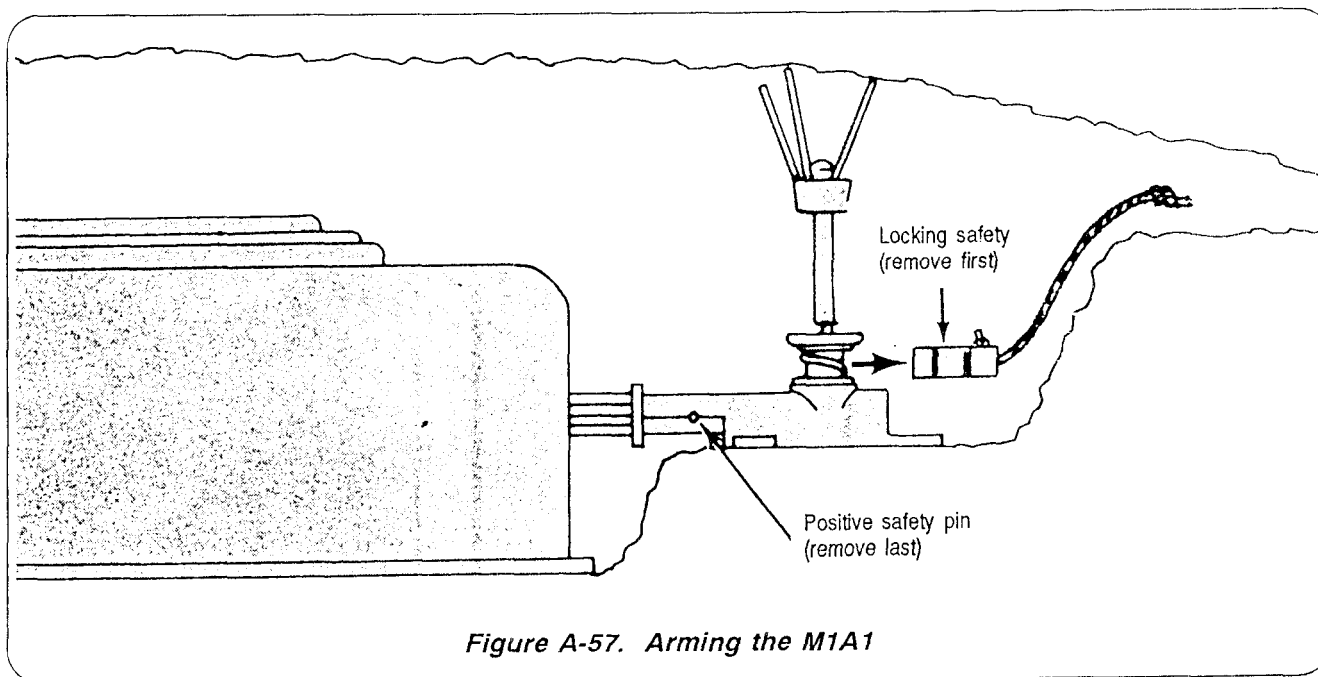


Figure A-57. Arming the M1A1

## MI42 MULTIPURPOSE FIRING DEVICE

The M 142 (Figure A-58) can be set up in any one of four modes:

- Pressure (25 pounds or more) (Figure A-59).
- Pressure-release (between 2 and 150 pounds) (Figure A-60).
- Pull (7 pounds or more) (Figure A-61).
- Tension-release (Figure A-62).

Although primarily intended for booby-trap applications, the M 142 is readily adapted as an AHD for mines. The device comes with a coupling device/primer that accepts a standard nonelectric blasting cap. The initiating action

sets off an explosive chain that is passed from the FD and primer to the blasting cap, and then via the detonating cord to the main charge. However, the coupling device with primer will not initiate the detonating cord alone without a blasting cap attached. It is not adaptable to any activator or secondary fuze well. Therefore, when the M 142 is used as an AHD, replace the coupling device with a standard base. It has the following characteristics:

- **Case:** Plastic.
- **Color:** Olive-drab.
- **Diameter:** 0.75 inch.
- **Length:** 2.25 inches.
- **Internal action:** Spring-driven striker.
- **Safeties:** Positive safety pin, square-head pivot pin, round-head pivot pin, and alternative safety-pin hole.
- **Accessories:** Nail and screw fasteners, coupling body assembly (F4), tension-release attachment, 50-foot spool of trip wire, and vinyl instruction sheet.
- **Packaging:** Round metal can that contains an FD and accessories.

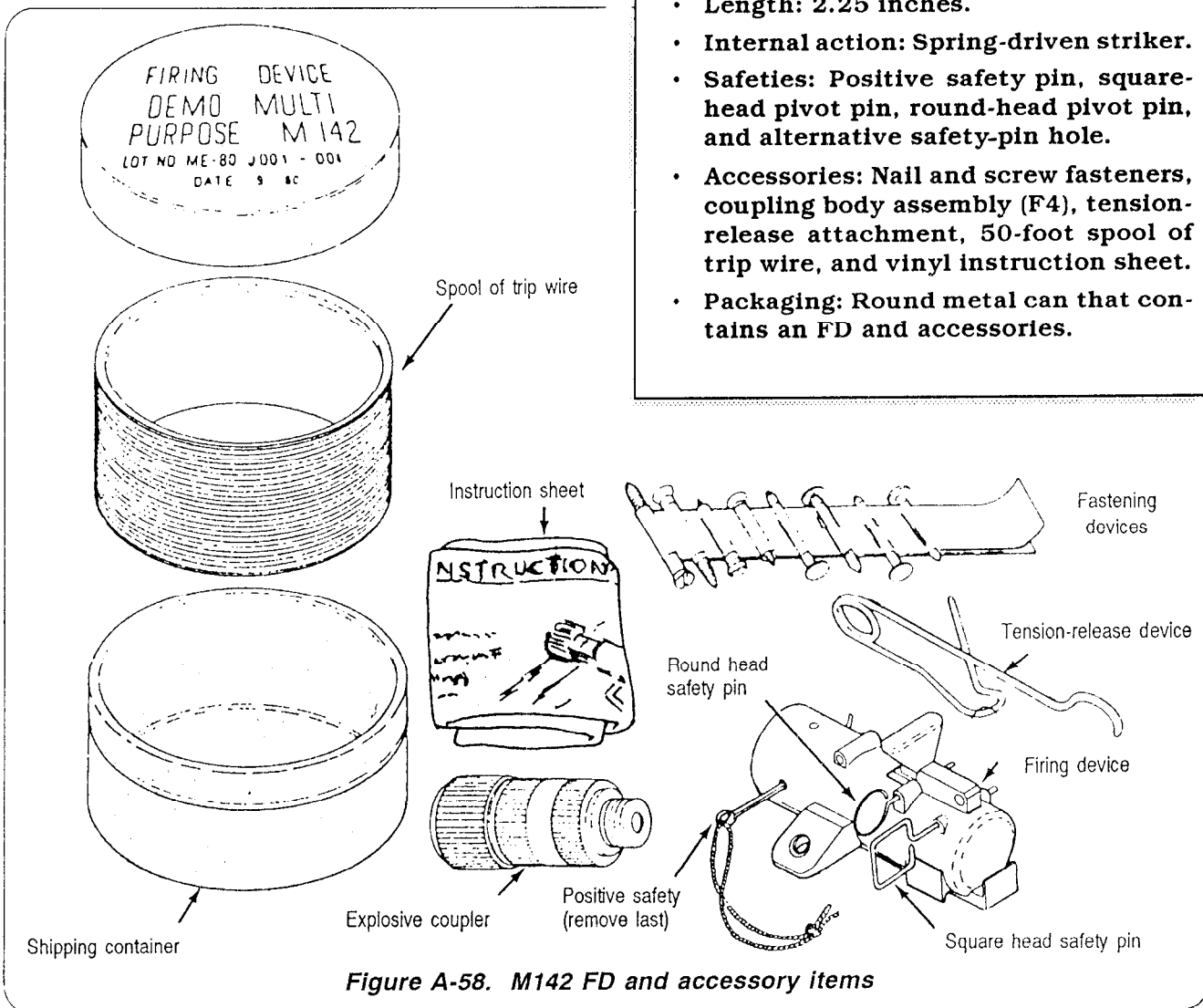


Figure A-58. M142 FD and accessory items



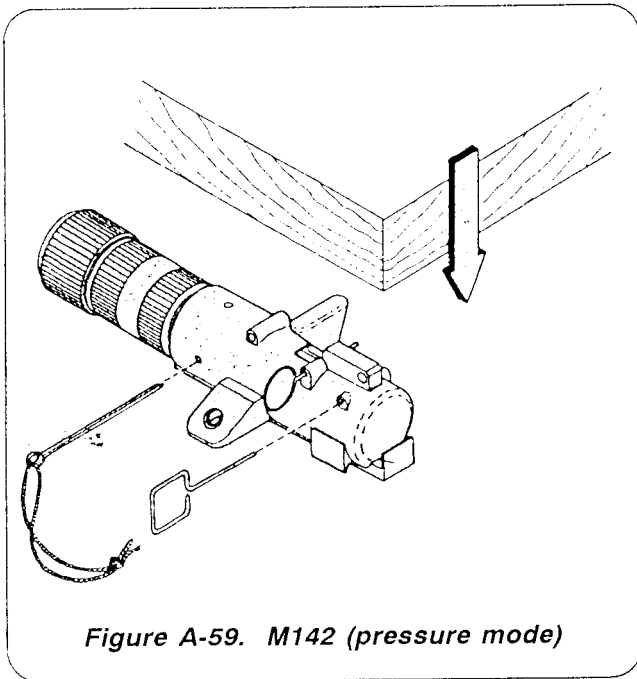


Figure A-59. M142 (pressure mode)

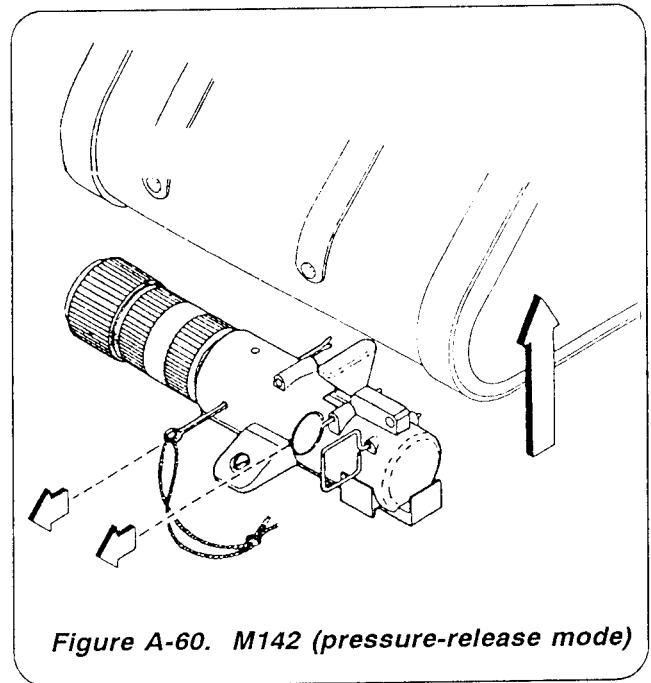


Figure A-60. M142 (pressure-release mode)

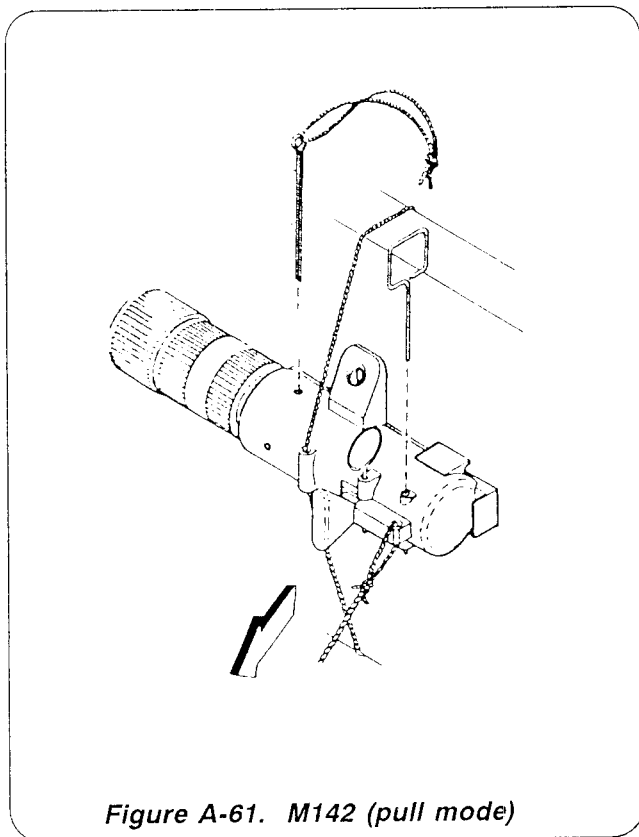


Figure A-61. M142 (pull mode)

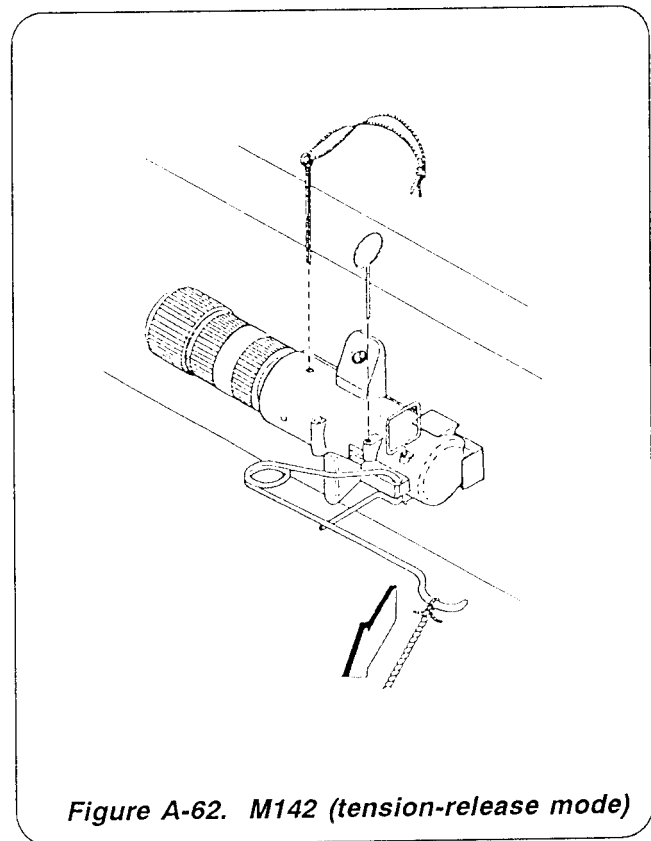


Figure A-62. M142 (tension-release mode)

**INSTALLATION/REMOVAL**

Arming and disarming procedures vary based on the activation mode. Detailed instructions

are printed on a weatherproof, vinyl sheet included in each FD package.