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MM1310
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STUDENT OUTLINE

M224 60MM MORTAR MISFIRE PROCEDURES

TERMINAL LEARNING OBJECTIVES

1. Given a mounted, SL3 complete, M224 60mm mortar, inert round of ammunition, as a mortar squad, clear a misfire for a M224 60mm mortar in conventional mode by returning the weapon into action. (41TR.04.06)
2. Given a mounted SL3 complete, M224 60mm mortar, inert round of ammunition, as a mortar squad, clear a misfire for a M224 60mm mortar in hand-held mode by returning the weapon into action. (41TR.04.09)

ENABLING LEARNING OBJECTIVES

1. Given a list of choices and a scenario, identify a mortar malfunction in accordance with FM 23-90. (41TR.04.06)

1. **MALFUNCTIONS**. All mortarmen should be aware of the following malfunctions.

a. **Misfire**. A misfire is a complete failure of a cartridge to fire when the round is dropped into the barrel with the selector lever set on D or when trigger fired with the selector lever set on T.

b. **Hangfire**. Is simply the round is stuck in the barrel.

c. **Cook-off**. A cook-off is the functioning of one or more of the explosive components of a round chambered in a hot weapon, initiated by the heat of the barrel. A cook-off may occur any time after half loading the round and the round striking the firing pin.

2. **CAUSES OF A MISFIRE**. The procedures for removing a misfire are different for handheld and conventional modes. The propelling charge explosive train may not function for the following reasons:

a. Defective ignition cartridge.

b. Defective, damaged, or loose firing pin.

c. Fouled firing pin or firing pin obstructed by extraneous material.

d. Fouled bore.

e. Excess oil or water in the bore.

- f. Misaligned stabilizing fin assembly.
- g. Foreign matter or excess paint on round.
- h. Selector switch in wrong position.

3. **CAUSES OF A HANGFIRE**

- a. Improper storage and handling of the ammunition.
- b. Fouled bore.
- c. Fouled ammunition.

4. **CAUSES OF A COOK-OFF**

- a. Exceeding the max rate of fire.
- b. Smoldering debris in the barrel.

5. **PROCEDURES FOR CLEARING A MISFIRE**

a. Any crewmember shouts, "MISFIRE!" The entire platoon will echo, "mis fire."

b. Gunner will brace the bipod.

c. During peacetime live-fire training, the entire section or platoon to include the ammunition bearer from the misfiring gun moves at least 50 meters to the rear of the mortar.

d. The A-gunner positions his body to the right rear of the baseplate. If it is obvious the round has reached the bottom, the A-gunner places the selector on trigger fire and squeezes the trigger 3 times.

e. If the round fires, the mortar is re-laid and firing is continued. If time permits, swab the bore before firing is continued to remove any debris that may have caused the misfire.

f. If round does not fire, the A-gunner places selector back on "D" and kicks the cooling fins with the heel of his boot in a downward motion just above the range indicator on the carrying handle. Care should be taken not to kick the range indicator.

g. If round still does not fire, place selector lever on "S", and gunner and A-Gunner move back with the ammo-man and wait 60 seconds.

h. After 60 seconds is up, the gunner moves up to the left side of the gun parallel to the baseplate. And piano feel with fingertips down the outside of the barrel, from just below the reinforced lip of the barrel to the base-cap to check the cannon for heat. If the barrel is not cool enough to handle, the gunner will join his crew 50 meters behind the gun to wait for it to cool, or he may attempt to cool the cannon by splashing water on it. If time permits "WAIT!"

i. If the cannon is cool enough to handle, the gunner locks down the data

locking knobs on the sight and slowly lowers the cannon to lowest elevation and backs off one-quarter turn.

j. The gunner then removes the sight unit by pressing on latching lever and sliding the sight unit out of the dovetail slot on the bipod.

k. The gunner places the sight unit in the carrying case.

l. The gunner loosens collar knob enough to allow cannon to rotate. Do not unlock collar knob.

m. The gunner loosens clamp and rotates cannon 90 degrees at handle. This can be accomplished by pushing the side of the carrying handle until the flat sides of the base cap are aligned to the flat sides of the locking cap.

n. The gunner tightens the collar locking knob, and places his hands near the base cap with his palms up. The gunner then calls his A-gunner up.

o. The A-gunner approaches the cannon in a low profile staying to the right of the gun, and takes a kneeling position to the right of the bipod.

p. The A-gunner places his left boot heel on the spread cable. He also places his right hand at six o'clock on the barrel below the reinforced lip of the cannon and his left hand at twelve o'clock on the barrel below the reinforced lip of the cannon. Never put your hands in front of the muzzle.

q. The gunner will make eye contact with the A-gunner and ask "Are you ready?"

(1) If the A-gunner is ready he will respond "Ready. If not, he will respond "No."

(2) The gunner will not continue until he hears the response from the A-gunner "Ready."

r. The gunner slowly lifts the basecap out of the baseplate. Do not put your hands on the basecap when lifting and holding breech end of cannon tube. After lifting the mortar out of the baseplate, and the gunner notices the cannon at the horizontal position, he will announce "Horizontal". Never depress the basecap below a horizontal position until the round is removed. The command "HORIZONTAL" is the key for the a-gunner to slide the fleshy portion at the base of his thumb over the top of the muzzle to catch the round.

s. The A-gunner will position his hands, then sound off "READY". T

t. The gunner sounds off "LIFTING" and lifts the breech end of cannon slowly, and listens for the sound of the round sliding out of the cannon. When the gunner or A-gunner hear the sound of the round sliding out sound off "Sliding", and Stop lifting.

u. The A-gunner will not move his hands until the round makes contact with his hand. When the round stops against his hand, he will remove it from the barrel sound off "I HAVE THE ROUND" and immediately attempt to replace the safety wire in the round.

(1) If the wire will not go into the fuze, DO NOT TRY TO FORCE IT INTO THE FUZE! The round may be armed.

(1) Armed rounds will be treated with extreme caution. They will be placed in a sand bagged misfire pit, and EOD will be notified.

v. Once the A-gunner has replaced the safety wire in the fuze, he will call the ammo-man up.

(1) The ammo-man will take the round and inspect it to try to find the cause of the misfire. He will check the primer on the base of the fin assembly.

(2) If the primer is dented the round will be repacked in the original shipping material, and placed in the misfire pit. An ammunition tech. will be notified for disposal.

(a) If the primer is not dented and there is no apparent cause for the misfire, attempt to fire the round on a neighboring gun. If the cause of the misfire can be found, misaligned fin assembly, primer missing, excess paint on the body of the round, the round will be repacked in the original packing material and placed in the misfire pit (located 50 meters away from the guns on both sides of the gunline). An ammunition tech. will be notified for disposal of the round.

(b) If the gun has two misfires in a row replace the barrel and notify armory personnel.

6. RELAY THE GUN

a. After the misfire is cleared, the gunner will lift the breech end of the cannon and shake out any debris from the cannon.

b. Insert the basecap into the locking cap on the baseplate and rotate the carrying handle back up, locking the cannon to the baseplate.

d. Tighten the collar locking knob wrist tight.

d. The gunner commands the A-gunner to swab the bore while he braces the bipod.

e. The gunner will place the sight back on the gun.

f. The gunner will then relay his gun on the aiming posts.

g. Place the firing selector back on D.

7. LODGED ROUND

a. If the round is firmly lodged in the cannon, the gunner may tap the side of the cannon in an attempt to dislodge the round. If tapping does not work, the gunner may lightly shake the cannon. Caution should be taken to avoid causing the A-gunner to lose his grip on the muzzle.

b. If the round will not slide out of the cannon. The entire barrel will be lowered to the horizontal position. The gunner will balance the cannon,

and the A-gunner will place his right hand under the shock absorbers and loosen the collar locking knob with his left hand.

c. The A-gunner will lay the bipod back on the baseplate and stand.

d. The gunner will stand, keeping the barrel horizontal with the muzzle down range.

(1) If the nearest misfire pit is to the gunners front he will carry the barrel to it.

(2) If the nearest misfire pit is to the A-gunners front he will take control of the cannon and carry it to the misfire pit.

(3) The barrel will be taken to the nearest misfire pit and placed flat on the ground. EOD will be notified for further clearance of the misfire.

8. MISFIRE PROCEDURES - HANDHELD MODE

a. If round doesn't fire, squeeze trigger a second time to confirm malfunction.

b. If the round doesn't fire after second trigger squeeze, any crewman shouts Misfire!

c. All personnel will clear the gun line except for the gunner. The gunner will not proceed until all personnel are at least 50 meters behind the gun line.

d. Gunner places selector on S and lifts the cannon with his forward hand, keeping the weapon pointed down range, and strikes the base plate on the ground to dislodge around.

e. If the gunner heard the round strike the bottom of the cannon this step is not necessary.

f. If the round slides to the bottom of the cannon, place the firing selector back on "T" and attempt to trigger fire. The round should fire.

g. If it does not fire place the selector on S and rest the cannon on empty ammo cases or sandbags, then join the platoon 50 meters behind the gun line and wait for 60 seconds.

h. The gunner will approach the cannon in a low profile from the left rear, (DO NOT WALK DIRECTLY BEHIND THE CANNON) and sweep the cannon with his fingertips to check for heat.

(1) If the cannon is too hot to safely handle allow it to air cool or cool the outer surface with water until the tube can be held by bare hands.

(2) When the cannon is cool enough to handle the gunner will call the A-gunner up. The A-gunner will approach the cannon in a low profile from the right rear (DO NOT WALK DIRECTLY BEHIND THE CANNON).

i. The assistant gunner places hands around muzzle and the gunner will ask 'Are you ready?' The gunner will not proceed until the A-gunner replies "READY".

j. The gunner then lifts basecap end of cannon until it reaches horizontal. After lifting basecap end of mortar, always keep muzzle in a horizontal position until the round is removed. Never put your hands in front of the muzzle.

k. As the base cap end is lifted, the round should slide out. The first crewman to hear the round sliding will sound off "SLIDING".

l. The assistant gunner stops it with his thumbs and removes it from bore and sounds off " I HAVE THE ROUND".

m. Replace the safety wire and/or pin in fuze if possible. If the safety wire can't be replaced, the fuze may be armed.

(1) If the wire will not go into the fuze, **DO NOT TRY TO FORCE IT INTO THE FUZE!** The round may be armed.

(2) Armed rounds will be treated with extreme caution. They will be placed in a sand bagged misfire pit, and EOD will be notified.

n. If a round won't slide out of cannon, keep cannon in a horizontal position and stand, the cannon must remain pointed in the direction of fire.

(1) The A-gunner will detach the M-8 baseplate from the cannon.

(2) If the nearest misfire pit is to the gunner's front he will carry the barrel to it.

(3) If the nearest misfire pit is to the A-gunner's front he will take control of the cannon and carry it to the misfire pit.

o. Call the ammo-man up to inspect the round. If the primer isn't dented, attempt to fire it in a neighboring gun.

p. If the primer is dented repack the round in the original shipping material and taken to the nearest misfire pit.

q. The gunner will lift the breech end of the cannon and shake cannon to dislodge any debris. Swab tube if time permits. Place the M-8 baseplate back on the cannon and place the fire selector back on D.

r. Continue firing.

REFERENCES:

FM 23-90 Mortars; pages 3-12 through 3-17.

EXAM ID: MM1310P

EXAM TITLE: M224 60mm Mortar Misfire Procedures Performance Examination

TLO/ELO: 41TR.04.06/41TR.04.09

STUDENT INSTRUCTIONS:

1. You are a mortar squad and must perform misfire procedures for a M224 60mm mortar in hand-held mode.
2. There is no time limit for this task.
3. To achieve mastery, the mortar squad must perform each of the performance steps correctly.

PERFORMANCE STEPS AND/OR PERFORMANCE STANDARDS:

Performance Steps	Master	Non-Master	Remarks
1. The first crewmember that notices the failure to fire announces, "Misfire."			
2. When a misfire occurs all crewmen will remain with the gun. During peacetime live fire training, the section will move to a safe position 50 meters to the rear. Only the gunner and assistant gunner will remain on the gun to clear the misfire.			
3. The gunner maintains a grip on the cannon and carrying handle and attempt to trigger fire again.			
4. The gunner places the firing selector on safe "S" and bounces the mortar on the ground from about 6 inches to dislodge round.			
5. The gunner places the firing selector on trigger "T" and attempts to trigger fire twice.			
6. If the round fails to fire, the gunner places the firing selector on safe "S" and the assistant gunner supports the barrel with logs, sandbags, or empty ammo boxes to keep the barrel upright and stable.			
7. The mortar squad moves back 50 meters and wait for 1 minute to allow the cannon to cool and to prevent a hang fire from injuring crewmen.			
8. After waiting 1 minute, the gunner approaches the weapon in a low profile on the left side and sweeps the barrel with fingertips from below the reinforced lip of the cannon down to the base-cap.			

9.	If the barrel is too hot to handle with bare hands, the gunner may cool the barrel with water, snow, or, if time allows, wait longer. Then recheck for heat.			
10.	As soon as the barrel is cool enough, the gunner calls the assistant gunner up.			
11.	The assistant gunner approaches in a low profile from the right rear of the cannon.			
12.	The assistant gunner places the right hand under the muzzle and the left hand on top of the muzzle.			
13.	The gunner lifts the base of the barrel with the M8 baseplate slowly to a horizontal position. Once the barrel is raised to horizontal it should never be lowered until the round is removed.			
14.	The gunner checks with the assistant-gunner to see if he is ready to stop the cartridge.			
15.	The assistant gunner places the fleshy portion of the heel of the thumbs over the muzzle in preparation to stop the cartridge.			
16.	The gunner continues to slowly lifting the base of the barrel past the horizontal position while listening for the sound of the cartridge moving in the barrel.			
17.	The first crewman that hears the cartridge moving in the cannon will announce, "sliding". If the cartridge is lodged in the barrel, remove the barrel from the bipod and place the barrel in the misfire pit. Notify EOD.			
18.	The assistant gunner allows the fuse to pass between the fleshy portion of the thumbs and stops the cartridge by applying pressure on the wide portion of the cartridge.			
19.	The assistant gunner removes the cartridge from the barrel and attempts to install the safety wire. Do not attempt to force the safety wire into the fuse. If the safety wire cannot be inserted into the fuse place the cartridge in a misfire pit and notify EOD.			
20.	The gunner inverts the barrel and shakes out any unburned increments or debris then lower the barrel and calls the ammunition man up.			

<p>21. The ammunition man receives the cartridge and inspects it for a dented primer or the lack of a dent in the primer. Identify the cause of the malfunction. If the primer is dented, re-pack the cartridge with all packing material and place the cartridge in the misfire pit and notify EOD. If the primer is not dented attempt to fire the cartridge on a neighboring gun.</p>			
<p>22. Assistant gunner swabs the bore of the mortar.</p>			
<p>23. Gunner places the firing selector back on trigger fire "T" and continue firing.</p>			