

# Enhanced Mine Detection For Limited Visibility Operations



by Sergeant First Class Paul E. Thompson Jr.

When clearing routes, mine rollers are among our most important pieces of equipment. They help detect the leading edges of minefields and complete the mission in a timely manner. But to complete the mission, the roller must survive. This article suggests some ways to enhance the roller tank's survivability.

## An Enhanced Lighting System

At the Joint Readiness Training Center at Fort Polk, we have experimented with a field expedient lighting system to improve operations in hours of darkness. The Driver's Thermal Viewer is not fully fielded yet, and when the infrared headlights are used, much of the infrared light is directed back into the driver's AN-VVS-2, reducing his visibility, and making an already bad situation worse. Current, traditionally-mounted, infrared lights do not aid the tank commander in early visual detection of potential minefields.

We have come up with a simple interim fix, which might easily be made into a permanent modification, that could save lives and equipment. Referring to Figure 1, follow these steps:

- Remove headlights, exposing wiring harness.
- Mount headlights to left and right trunnion pin appendages using 100 mile per hour tape.
- Using split WD-1 wire, attach a ground wire and the bright light wire from the wiring harness to the corresponding connections on the headlight. (The bright light wire is marked "D" on the harness, and the ground is marked "A"). Use electrical tape and plastic to waterproof both the wiring harness and the point where the wire is connected to the headlights. Secure the WD-1 wire to the frame of the roller using zip strips or tape. Leave enough slack wire hanging at the headlight assembly to compensate for roller move-

ment, but don't leave too much, or the WD-1 may be cut during movement.

- Using an infrared light easily found in most motor pools, or ordered through the supply system, (light, infrared NSN 6220-00-984-5180), run WD-1 wire from hot and ground on the rheostat assembly of the TC's domelight. Attach the light to the turret in such a manner that the beam can be directed to the front of the roller or, better yet, be handheld (Figure 2). (Author's note: On the M1A2, the tank fire suppression system is on the same wiring harness as the headlights. We wired the ground directly to the hull, as opposed to using the "A" ground, and had no problems.)

This addition makes it much easier to drive, allows surface laid mines to be spotted earlier, and picks out areas where mines may have been buried. As a bonus, the tank commander does not have to spend as much time directing the driver, because the driver has much better visibility. An enemy observing from an overwatch position will also have a hard time using night vision equipment because of the brightness of the infrared light.

This configuration has been used successfully by units on rotation at the Joint Readiness Training Center through use of the "Coach, Teach, Mentor," technique. We believe it to be a viable, field expedient modification to assist in route clearance operations in periods of darkness.

## Improved Detection And Margin of Safety

Many units get a false sense of security when using the mine roller to clear or proof a route. There is a margin of safety of only 9.5 inches on each side of the track on an M1-series tank. (Refer to Figure 3.) There is a distance of 71 inches that is completely uncleared in the center of the two roller assemblies. When you factor the differing

track vehicle widths (Figure 4), not to mention wheeled vehicles, there is quite a bit of room for error, and subsequently for disaster.

## What about the Dogbone?

The current dogbone and chain assembly between the rollers is designed to defeat tilt-rod fuzed mines. The dogbone has insufficient mass to pre-detonate magnetically fuzed mines. Recently, the Army fielded the Improved Dogbone Assembly (IDA), designed to defeat tilt rod and magnetically fuzed mines. The IDA projects a magnetic signature while rolling or plowing. We still have multiple impulse pressure fuzes to worry about, but these can be defeated by running more than one roller tank in tandem if the unit's intelligence preparation of the battlefield says that this type fuze is expected or suspected.

Mine rollers are an asset that are not easy to replace, and are best used to detect the leading edges of minefields and to proof lanes in obstacles breached by other means, such as the M1CLIC. The Joint Readiness Training Center believes these techniques used to employ the mineroller will ensure its survivability as well as the survivability of all combat vehicles in the column.

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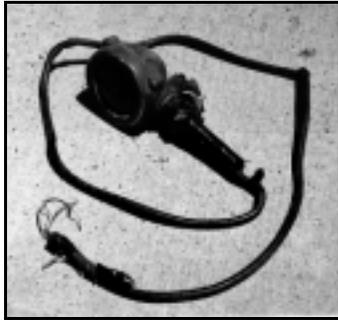


Fig. 2

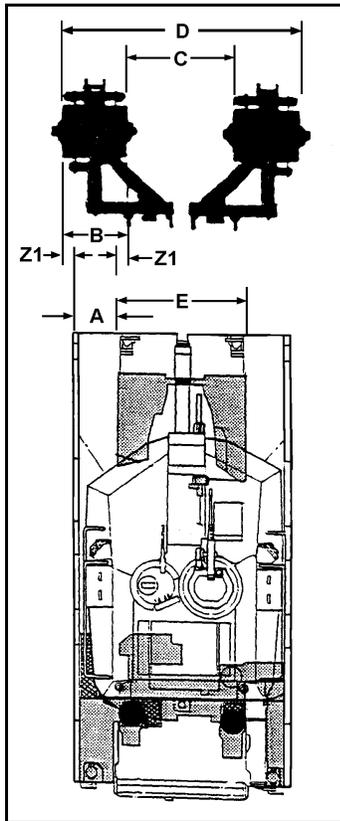


Fig. 3

- A - TRACK WIDTH  
25 in. (.7112m)
- B - MINE ROLLER WIDTH  
44 in. (1.1176m)
- C - DISTANCE BETWEEN ROLLERS  
(Inside) 71 in. (1.8034m)
- D - DISTANCE BETWEEN ROLLERS  
(Outside) 159 in. (4.0386m)
- E - DISTANCE BETWEEN TRACKS  
89 in. (2.2098m)
- Z1 - DIFFERENCE (Safety Margin)  
9.5 in. (.2032m)

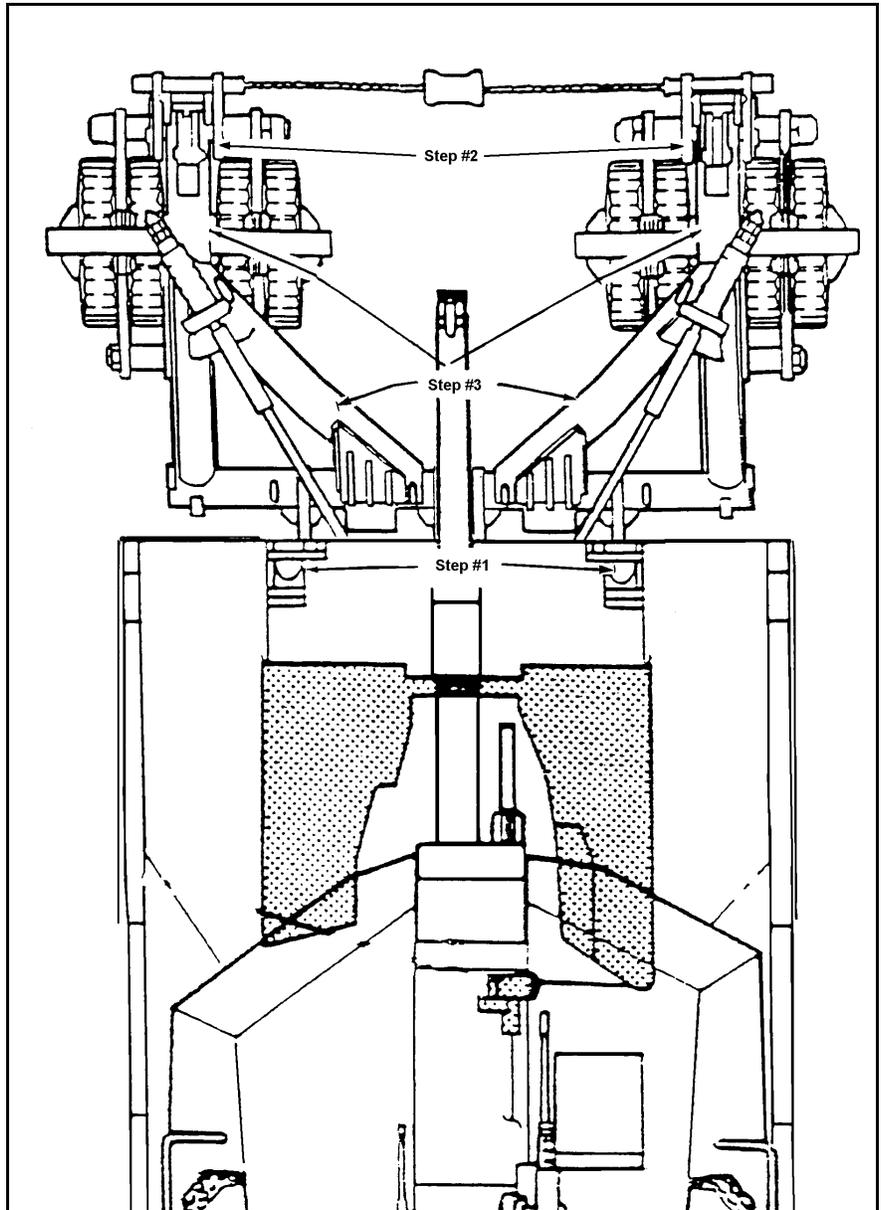


Fig. 1

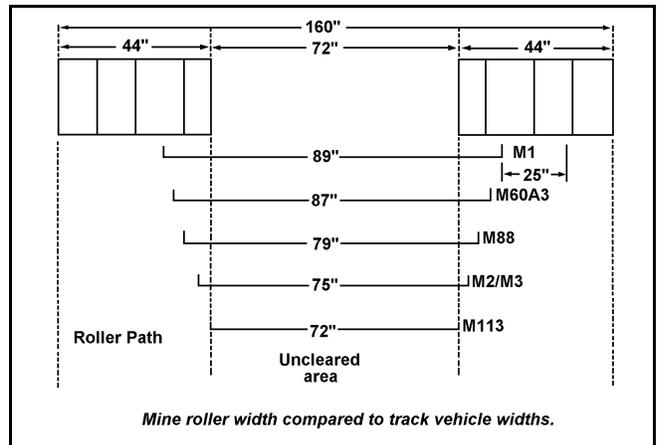


Fig. 4