

## TRUCK, TRANSPORTER, FLOATING BRIDGE, MC3, W/WINCH, MACK, LAUNCH AND RECOVERY VEHICLE (LRV)

### REPOSITIONING OF HOOK ARM POSITION INDICATOR SWITCH

## MODIFICATION INSTRUCTION

This instruction is authorised for use by command of the Chief of the General Staff. It provides direction, mandatory controls and procedures for the operation, maintenance and support of equipment. Personnel are to carry out any action required by this instruction in accordance with GENERAL A 001.

### Introduction

1. This instruction details the procedure used to relocate the Hook Arm Position Indicator (HAPI) switch from its current position on the Truck, Transporter, Floating Bridge, MC3, W/Winch, Mack, LRV, to improve the accuracy of operation.

2. **Associated Publications.** Reference may be necessary to the latest issue of the following documents:

- a. EMEI Workshop A 850 - Modifications, Trial Modifications and Local Modifications to Equipment;
- b. EMEI Workshop A 851 - Recording Modifications to Equipment - Use of Modification Record Plates and Documentary Requirements;
- c. EMEI Vehicle G 787-2 - LRV - Fitting of Hook Arm Position Indicator Box;
- d. Technical Manual User Handbook, FSB and LRV 1992; and
- e. EMEI Workshop D 700 - Painting of Army Equipment.

3. **Authority.** The authority to carry out this modification is ECO No AEM 5012.

### General

4. **Modification Application.** This modification is applicable to all Launch and Recovery Vehicles.

5. **Items Affected.** This modification does the following:

- a. moves the Proximity Switch and Actuator Magnet from the current location to below the winch on the rear left face of the hook arm as shown in Figure 1; and
- b. replaces the existing HAPI box, and filter clog indicator lamp.

6. **Priority - Group 2.** All applicable equipment is to be modified:

- a. when next in a workshop for medium or heavy repair, or
- b. before issue from depot.

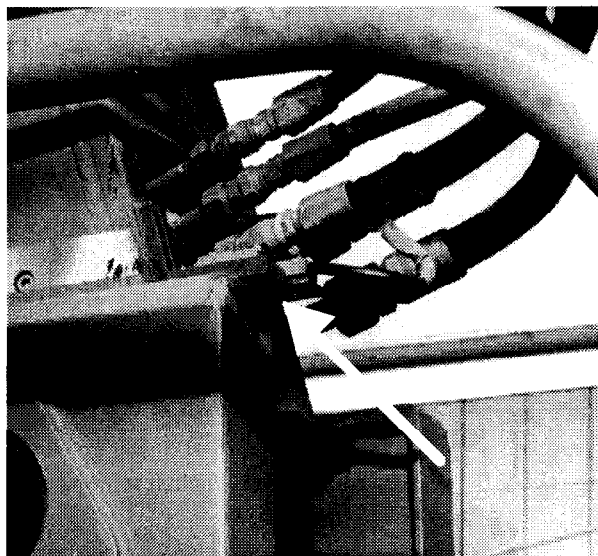


Figure 1 - Location of Proximity Switch and Actuator Magnet

### NOTE

Where modification would delay priority issues of depot stock, equipment not modified may be issued providing the equipment record book is endorsed appropriately.

7. **Action Required.** Actions detailed in this instruction are to be performed by RAEME workshops authorised to undertake medium or heavy repairs.

8. **Estimated Manhours.** For initial planning purposes only, it is estimated that this modification will take two manhours to perform.

9. **Stores Required.** The stores required are listed in Table 1. All stores are to be demanded through normal supply channels or purchased locally.

10. **Manufacturer's Details.** RS Components are available through:

RS Components Pty Ltd  
52 Derby St  
TULLAMARINE VIC 3043  
Tel (03) 9330 3666

11. **Items to be Removed.** The items to be removed are listed in Table 2. Retain the proximity switch, actuator magnet and backing plate, and dispose of the remainder.

#### Detail

12. **Modification of Hook Arm Indicator.** The procedure to modify the hook arm indicator is as follows:

- a. Park vehicle on level ground.
- b. Raise the hook arm until the rear face of the hook arm makes an angle of 75° to the upper surface of the lift frame.
- c. Remove the heat shrink material from the Proximity Switch cable joins, and disconnect the wires, taking note of how the switch is connected.
- d. Remove and retain the Proximity Switch, and Actuator Magnet from the brackets inside the lift frame.
- e. Using a grinder, remove the existing brackets and dispose of as scrap.
- f. Repaint the interior of the lift frame to prevent corrosion.
- g. Manufacture mounting bracket and mounting blocks, as shown at Figures 2, 3, and 4.
- h. Weld Mounting Block, Switch to hook arm, as shown at Figure 5 and 6.
- i. Weld Mounting Block, Sensor to lift frame as shown at Figure 5 and 7.
- j. Fit Mounting Bracket to Mounting Block, Switch using two bolts and two washers.
- k. Reduce the length of all bolts to suit application, allowing for possible adjustment of switch and magnet position.
- l. Secure the proximity switch to bracket, on the hook arm using two bolts, and two washers.
- m. Secure the actuator magnet, on mounting block, sensor, on lift frame using two bolts, and two washers.

#### NOTE

**Ensure that the proximity switch and magnet are horizontal, and there is a minimum of 4 mm between the faces when the hook arm is at an angle of 75°. Adjust as necessary.**

- n. Feed the insulation sleeving, through the bottom of the hook arm, between the hydraulic hoses.
- o. Feed three wires through the sleeving and fit enough heat shrink to the wires to cover joins.

#### NOTE

**Do not heat shrink until testing is complete.**

- p. Using crimp connectors, reconnect proximity switch wires and the main wiring loom down the centre of the lift frame.
- q. Secure the cable against the interior of the lift frame and hook arm using cable ties. Ensure that the radius on the cable coming out of the switch is not too tight.
- r. Carry out tests as detailed in Para 13, to ensure the switch is connected correctly.
- s. Disconnect the existing HAPI box, taking note of which wires are connected to the red and green lights.
- t. Drill a hole in the bottom centre of the box to allow access for the HAPI cables and grommet.
- u. Drill holes in the existing HAPI box backing plate to suit the mounting screws in the new HAPI box. Mount the new HAPI box, as depicted in Figure 8.
- v. Drill two 17.5 mm holes in the lid to the new HAPI box, as depicted in Figure 8. Mount the Red and Green Pilot Lamps in the lid, with the Red Lamp uppermost.
- w. Manufacture a wire to earth one side of each of the globe holders to the earth screw in the base of the box.
- x. Connect the HAPI cables to the Pilot Lamps and carry out tests as detailed in Para 13 to ensure the box is correctly connected. Secure the lid of the HAPI box.
- y. On successful completion of post modification testing, seal all joints using previously fitted heat shrink insulation.
- z. Remove the existing filter clog indicator lamp on the console. Drill a 17.5 mm hole concentric with the existing hole. Connect and mount a Red Pilot Lamp and globe.
- aa. Repaint all reworked areas to prevent corrosion.

13. **Post Modification Testing.** With power on carry out the following:

- a. check the green light is on with the hook arm at an angle of 75° to the lift frame,
- b. check that the red light is on when the hook arm is in any other position,
- c. operate hook arm through complete cycle ensuring that wiring is clear, and
- d. adjust the position of the switch and magnet as necessary.

**14. Recording Action.** On completion of the modification, the following action is to be taken:

- a. Deface the number 3 on the modification record plate located on the angled kick plate beneath the hydraulic controls on the LRV operator station.
- b. Enter the details into the Record Book for Service Equipment - Army GM 120, and
- c. Notify MMA, Fleet Manager Bridging, and MEA, SO3 ENGR EQUIP, by message or minute indicating the ARN of each equipment modified.

**Table 1 - Stores Required**

Item	Mfr Part No	Designation or Description	Qty per Equip
1	MEA1789-4/2	Mounting Block Switch (Mild Steel 65 mm x 25 mm x 12 mm)	1
2	MEA1789-4/3	Mounting Block Sensor (Mild Steel 65 mm x 25 mm x 12 mm)	1
3	MEA1789-4/1	Mounting Bracket Switch (Mild Steel 160 mm x 30 mm x 5 mm)	1
4	RS 339-752	Proximity Switch Changeover (Recover from Table 2)	1
5	RS 339- 768	Actuator Magnetic (Recover from Table 2)	1
6	RS 507-040	Box	1
7	Hella 2706	Pilot Lamp, Red	2
8	Hella 2700	Pilot Lamp, Green	1
9	Hella W 241.2	Globe, Wedge Base, 24 V, 1.5 W	3
10	Nil	Bolt M4, 25 mm	6
11	Nil	Washer, Spring, M4	6
12	Nil	Insulation Sleeving, Electrical, Flexible Plastic, 12 mm ID, Black	AR
13	Nil	Wire, Electrical, Insulated, 16/0.30 mm, Copper, 3 mm, Various Colours	AR
14	Nil	Insulation Sleeving, Electrical, Heat Shrinkable, 6 mm ID	AR
15	Nil	Insulation Sleeving, Electrical, Heat Shrinkable, 15 mm ID	AR
16	Nil	Utilux Crimp Connectors, 3 mm	AR
17	Nil	Cable Ties, Black Plastic, 250 mm	AR
18	Nil	Grommet, 12.5 mm	1

**Table 2 - Items to be Removed**

Item	Mfr Part No	Designation or Description	Qty per Equip
1	RS 339-752	Proximity Switch Changeover	1
2	RS 339- 768	Actuator Magnetic	1
3		Backing Plate for Sealed Flanged Diecast Box	1
4	RS 505-814	Sealed Flanged Diecast Box	1
5		Existing Filter Clog Indicator	1

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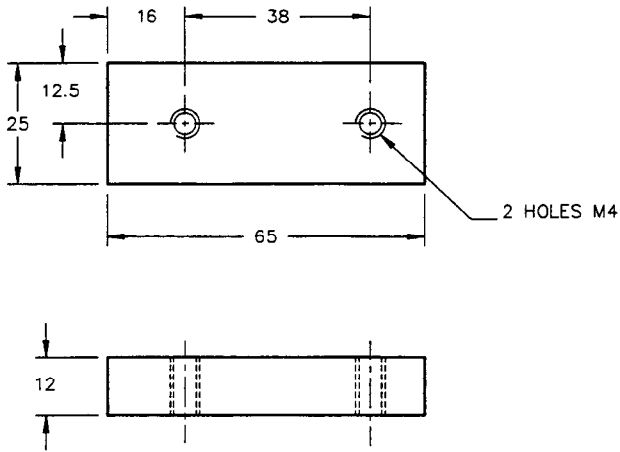


Figure 2 - Mounting Block, Switch

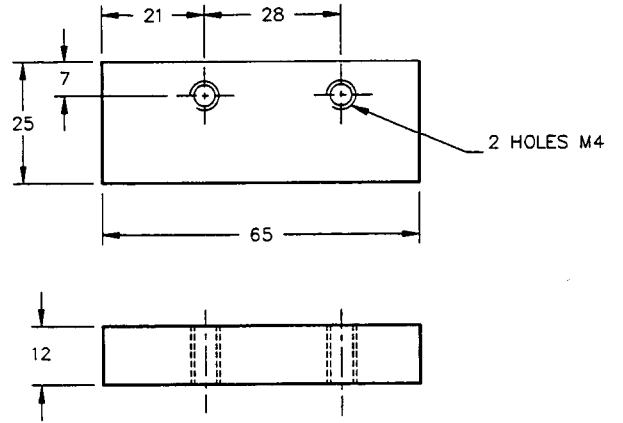


Figure 3 - Mounting Block, Sensor

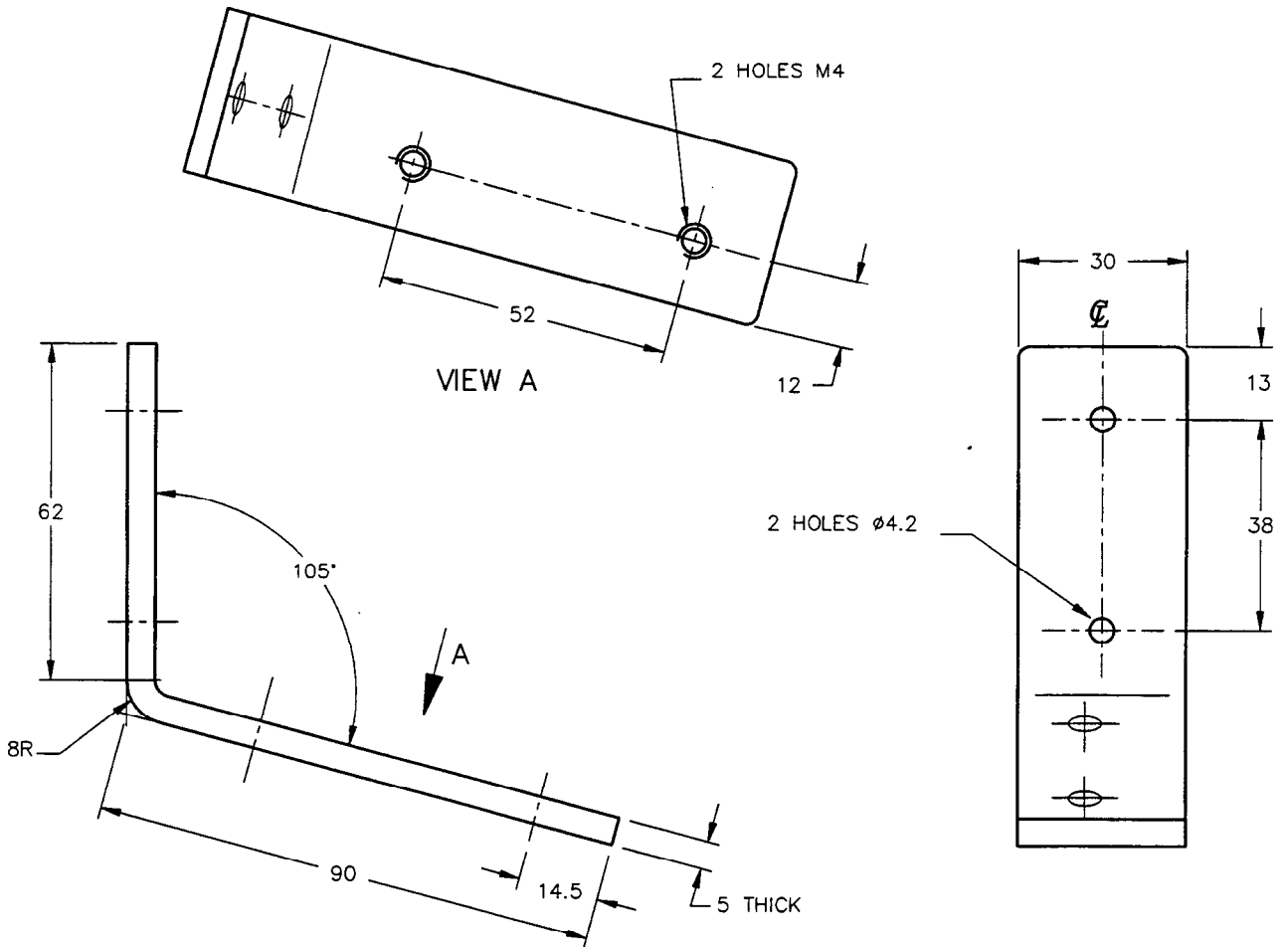
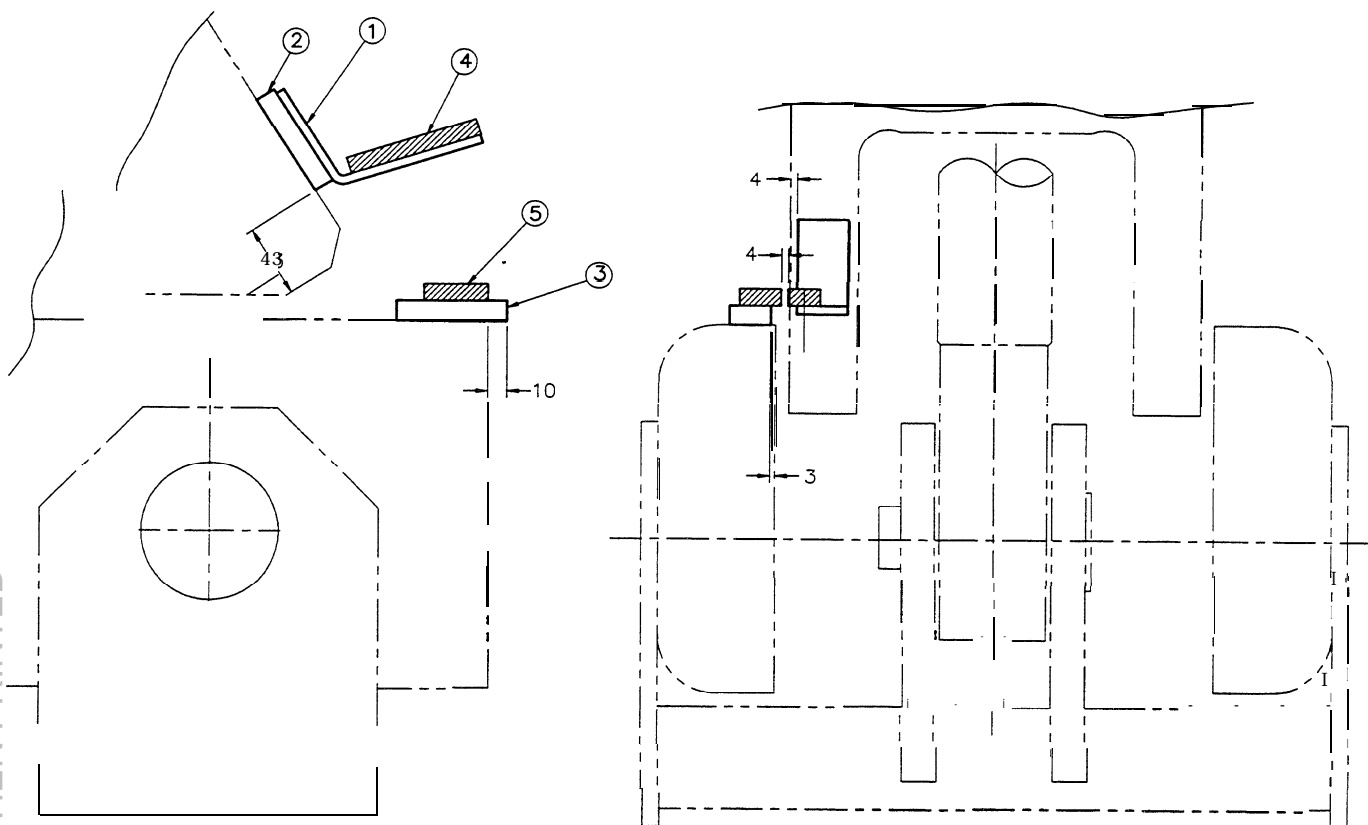


Figure 4 - Mounting Bracket, Switch

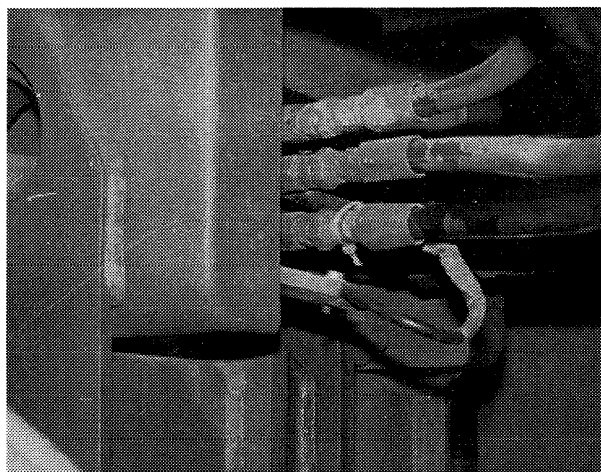
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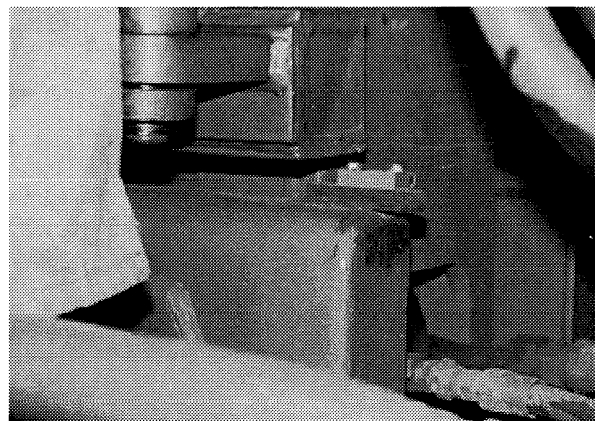


- 1. Mounting Bracket (Switch)
- 2. Mounting Block (Switch)
- 3. Mounting Block (Sensor)
- 4. Switch
- 5. Sensor (Magnet)

**Figure 5 - Hook Arm Limit Switch, Installation Details**



**Figure 6 - Mounting Block, Switch and Proximity Switch**



**Figure 7 - Mounting Block, Sensor and Actuator Magnet**

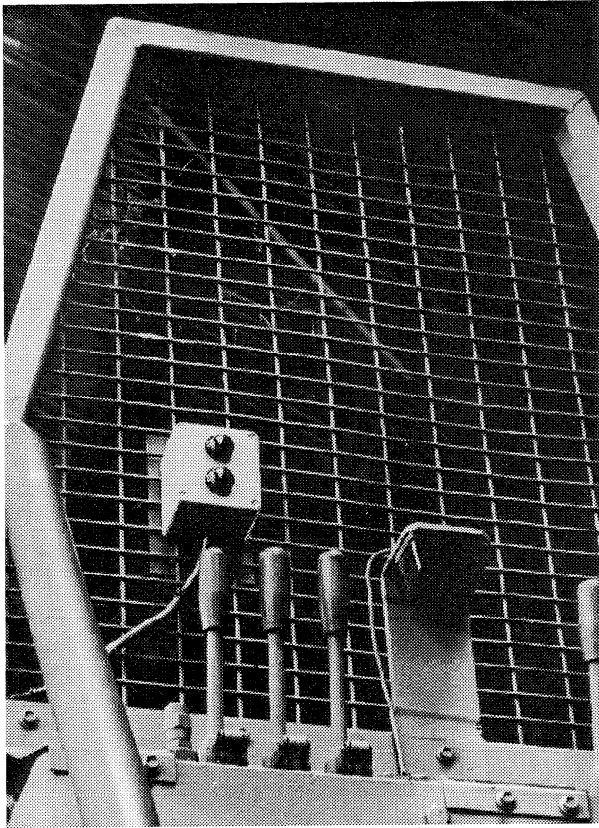


Figure 8 - Location of HAP1 Box

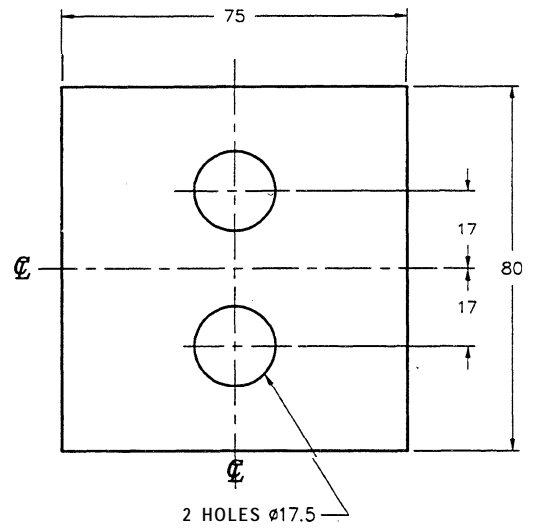


Figure 9 - HAP1 Box Lid

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