

TRUCK, UTILITY, LIGHTWEIGHT, MC2 – LAND ROVER 110 4X4 – ALL TYPES

REPLACEMENT OF FRONT AXLE DIFFERENTIAL COVER PLATE

MISCELLANEOUS INSTRUCTION

This instruction is authorised for use by command of the Chief of Army. 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 EMEI General A 001.

GENERAL

Introduction

1. The front axle differential cover plate often becomes damaged during off-road operations and requires repair. The cover plate is welded to the axle housing and is not normally replaceable. This situation has led to unauthorised repairs being performed on the differential cover plate.
2. This instruction details the procedure to be used to replace the differential cover plate on front axle housings fitted to Land Rover 4X4 variants whilst the axle is undergoing rebuild.
3. It is intended that this procedure is performed during front axle assembly rebuild at Heavy Grade Repair facilities.

NOTE

Prior to carrying out the procedures detailed in this EMEI ensure that the front axle has been removed from the vehicle in accordance with EMEI Vehicle G 104-1 and Vehicle G 104-2.

Associated Publications

4. Reference may be necessary to the latest issue of the following documents:
 - a. EMEI Vehicle G 104-1 – Truck, Utility, Lightweight and Truck, Utility, Lightweight, Winch, MC2 – Land Rover 110 4X4 – Medium Grade Repair;
 - b. EMEI Vehicle G 104-2 – Truck, Utility, Lightweight and Truck, Utility, Lightweight, Winch, MC2 – Land Rover 110 4X4 – Heavy Grade Repair;
 - c. [EMEI Workshop D 180](#) – Flaw Detection, Non Destructive;
 - d. [Defence Safety Manual \(SAFETYMAN\)](#);
 - e. EMEI Workshop J Series – Welding and Cutting Equipment;
 - f. [AS/NZS 1554.1](#) Structural Steel Welding – Part 1: Welding of Steel Structures;
 - g. [AS/NZS 2717.1](#) Welding – Electrodes – Gas Metal Arc – Ferritic Steel Electrodes;
 - h. [Technical Regulation of Army Materiel Manual \(TRAMM\)](#);
 - i. TRAMM, Volume 3, Section 2, Chapter 2, Fleet Engineering Change Management Process;
 - j. [Defence Supply Chain Manual \(DSCM\)](#);
 - k. DSCM, Volume 4, Section 3 – Supply Management Processes, Stores Accounting General; and
 - l. DSCM, Volume 6 – Manage Repairable Items.

Application

5. This procedure is to be applied to front axle housings (part of axle assembly NSN 2520-66-128-4250) of Land Rover 4X4 variants that require replacement of impact damaged differential cover plates that have contacted the differential crown wheel resulting in wear and oil leaks.

Action Required

6. Actions detailed in this instruction are to be performed by technical maintenance organisations authorised to perform Heavy Grade Repairs. This procedure is to be carried out by the following qualified personnel:
- a. ECN 235-2 Metalsmith;
 - b. RAAF Ground Welder; or
 - c. civilian equivalent.
7. All welding repairs are to be in accordance with the guidelines stated in AS/NZS 1554.1, Section 5.
8. All repair welds are to be visually inspected in accordance with AS/NZS 1554.1, Section 6, Table 6.2.2 (SP).

Estimated Workhours

9. For initial planning purposes only, it is estimated that it will require one workhour to carry out this repair.

Stores Required

10. The stores required to carry out this modification are detailed in Table 1. All stores should be obtained through normal supply channels. The differential cover plate (Table 1, item 3) can be ordered on an as-required basis from:

Tighe Metal Spinners Pty Ltd
8 Bignell Road
MOORABBIN VIC 3189

Table 1 Stores Required

Item	NSN	Manufacturer Part No or Identification	Description	Qty Per Equipment
1	NA	FRC 5690	Housing Assembly, Pinion – unusable	1
2	NA	NA	Nut, 3/8 in, UNF	10
3	NA	Tenix/Land Rover Land Rover Differential Pans	Plate Assembly, Differential Cover	1
4	8010-66-147-5678	465-6452-23	Paint, Primer, Zinc Phosphate (APAS 0162/1)	As required
5	8010-66-148-1737	342-7165-23/400GM Spray Pack	Paint, Black (APAS 0165)	As required

DETAIL

11. The repair procedure is as follows:

WARNING

All industrial safety, work practices and equipment operating and maintenance instructions pertaining to this EMEI must be followed.

- a. Place the axle housing on a suitable bench and support it so that it will not move or become unstable during the repair.
- b. Position an unusable pinion housing (Table 1, item 1) to the axle housing and secure it using the 10 nuts (Item 2).

WARNING

Take care when using grinding or air carbon arc gouging equipment as personal injury may occur.

- c. Remove the existing differential cover plate from the axle housing using the Air Carbon Arc Gouging process or an angle grinder.

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- d. After removal of the cover plate, all weld metal residue and dross is to be removed. Any indications in the axle housing are to be re-welded using the consumables listed in sub-para h. The repaired area is to be ground back to the original profile.
- e. Position the cover plate on the axle housing so that it is centrally located on the differential opening.

NOTE

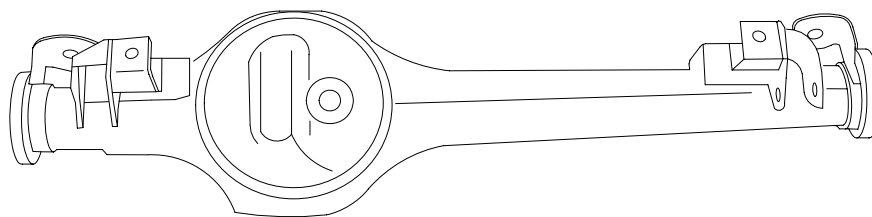
The long centre line of the crown wheel clearance hump is at right angles to the transverse centre line of the axle housing and the filler plug opening is on the same side as the long axle tube (Figure 1).

- f. Tack weld the cover plate in position using the consumables listed in sub-para h.
- g. Using a small hammer, tap the edge of the cover plate down onto the axle housing.
- h. Weld the cover plate to the axle housing with a 2 mm continuous fillet weld, ensuring that the top edge of the weld joint is fully consumed.

NOTE

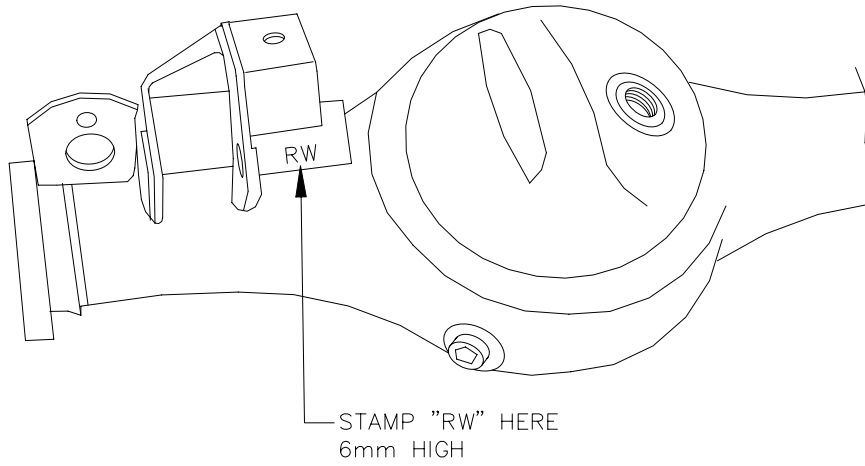
Use the gas metal arc welding (GMAW) process and consumables that conform to AS/NZS 2717.1:ES6-GC/M-W503AH and applicable shielding gas for GMAW.

- i. Clean off any weld splatter and remove any sharp edges and burrs.
- j. Check the weld for defects using the penetrant inspection method in accordance with Para 4.c. Allow a penetrant dwell time of at least 10 minutes. Any defects indicated are to be repaired using the consumables listed in sub-para h. and re-inspected.
- k. Stamp the letters 'RW' with 6 mm letter stamps on the front face of the reinforcement bracket on the right-hand side of the axle housing adjacent to the radius arm bracket, as shown in Figure 2.
- l. Remove the pinion housing from the axle housing.
- m. Retain both the housing and nuts for future use.
- n. Using a suitable cleaning process thoroughly wash out the interior of the axle housing to remove all foreign matter.
- o. The completed repair is to be painted with zinc phosphate primer (Table 1, item 4) and black paint (Item 5).



DE(EME1) 3371-1

Figure 1 Correct Location of Cover Plate to Axle Housing



DE(EMEI) 3371-2

Figure 2 Position to Stamp Indication of Rework

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END

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