

**TRUCK, ELECTRONIC REPAIR, LIGHT, MC2 - TRUCK, COMSEC REPAIR, LIGHT,
MC2 - LAND ROVER 110 6X6**

AIRCONDITIONER REFRIGERANT CONVERSION FROM R12 TO R134A

MODIFICATION 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 GENERAL A 001.

Introduction

1. This instruction details the conversion of the Land Rover 110 6x6 ERV airconditioner refrigerant gas. The current R12 refrigerant is to be changed to R134A refrigerant. Government regulations ban the use of R12 because it is an ozone depleting substance.
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 General P Section - Stores Procedure.
3. **Authority.** ECO LR 6x6:0004 is the authority to carry out this modification.

General

4. **Modification Application.** This modification is to be applied all Truck, Electronic Repair, Light, MC2 and Truck, Comsec Repair, Light, MC2 Land Rover 110 6x6.
5. **Items Affected.** This modification alters the air conditioner assembly.
6. **Priority - Group 2.** All applicable equipment is to be modified;
 - a. when next in workshops for repair, or
 - b. prior to issue from depot or pool stock.

NOTE

Where modification would delay priority issues of depot or pool stock, equipment may be issued unmodified 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 carry out Medium Grade repairs or by trade repair agencies as appropriate.

NOTE

On receipt of this instruction, enter all relevant information other than date completed in the modifications section of the Record Book for Service Equipment (GM 120).

8. **Estimated Manhours.** For initial planning purposes only, it is estimated that this modification will take 6 manhours to perform.
9. **Stores Required.** The stores required are listed in Table 1. All stores are to be demanded through normal supply channels.
10. **Items to be Removed.** The items to be removed are listed in Table 2. All stores removed are to be processed in accordance with the EMEI General P Section.
11. **Special Equipment Required.** The following equipment is required:
 - a. R12 recovery equipment,
 - b. vacuum pump,
 - c. nitrogen purge set,
 - d. refrigeration tool kit, and
 - e. R134a coupling adaptors.

Detail

12. **Modification of Air Conditioner.** The procedure is as follows:
 - a. Conduct a thorough visual and physical inspection of the system and its components.
 - b. Inspect the condenser for blockages, fin or tube damage, and check the cooling fans are functioning correctly. Check for the clockwise rotation of the condenser fan.
 - c. Inspect the hoses and hose connections for damage and leaks. Leaks are often indicated by an oil stain around the area.

- d. Check for worn/loose drive belt.
- e. Visually check the compressor for oil leaks, damage or signs of clutch slipping.
- f. Check the evaporator blower motors for all speeds and direction.
- g. Check that the evaporator drain hoses are connected and not blocked.
- h. Install an R12 gauge set to the compressor service ports.
- i. Run the airconditioning, and check the system for any unusual noises or pressures. Make sure the airconditioning is operating correctly.
- j. Run the airconditioning system with the evaporator blower fans at high speed for 5 minutes to maximise the amount of oil returned to the compressor.
- k. Turn the system off and recover all R12 refrigerant from the airconditioning system. Evacuate the airconditioning system for at least 30 minutes to a vacuum of 29 in. Hg, using R12 equipment, to remove as much R12 as possible from the residue mineral oil. Remove all R12 service equipment.
- l. Remove the compressor from the vehicle.
- m. Remove the compressor oil plug and drain as much mineral oil as possible from the compressor body.
- n. Drain mineral oil from the cylinder head suction and discharge ports while turning the shaft with a socket wrench on the clutch armature retaining nut.
- o. Remove the existing R12 receiver/drier from the front of the condenser and discard. Allow as much oil as possible to drain from the airconditioning hoses.
- p. Flush the system to remove as much mineral oil from the system as possible. This reduces the chance of contamination of the new oil used in the retro fit.
- q. Change both O-rings on the receiver-drier joints to approved HNBR O-rings; check and replace any other O-rings that have been disturbed.

NOTE

Coat any O-ring or seal being renewed with refrigerant oil before installing. DO NOT use PAG oil.

- r. Empty the contents of the plastic bottle supplied in the retrofit kit (**135cc +/- 15cc of**

SP20) into the compressor oil filler hole. Replace the O-ring on the compressor oil filler plug with a HNBR type O-ring. Reinstall the compressor filler plug making sure the plug seat is clean and free from damage. Torque the plug to 15-25 N.m.

- s. Change any seals at the compressor ports to approved HNBR seals.
- t. Reinstall the compressor to the airconditioning system.
- u. After installing the compressor on to its mount, rotate the centre shaft of the compressor about 20 times **CLOCKWISE** to distribute the new oil through the compressor, which guards against hydraulic lock.
- v. Replace the receiver-drier with a new R134A compatible receiver/drier (supplied in kit) containing XH9 desiccant.
- w. Install the new angled R134A service ports to the existing service ports on the compressor.
- x. Connect R134A service hoses and other equipment. Re-evacuate the system for 30 minutes using the R134A equipment.
- y. Charge the system with R134A. Generally, about 5% (by weight) less than the R12 charge amount is required (**0.75 kg +/- 25 grams**).
- z. 'Leak Check' the system using an R134A electronic leak detector.
- aa. Replace all R12 compressor labels with retrofit labels in order to provide information on the R134A retrofit, which has been performed. This includes type of refrigerant, refrigerant charge/amount, and lubricant type and amount.

13. Post Modification Testing. After determining the system does not have any leaks, it should be checked for proper operation. Run the system for approximately 5 minutes to let the components settle. Set the temperature control to the coldest setting and the fan speed to 3. Ensure the system cycles.

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

- a. Deface the number 15 on the Truck, Electronic Repair, Light, MC2 and Truck, Comsec Repair, Light, MC2 - Land Rover 110 6x6, modification record plate.
- b. Complete the modification details in the Record Book for Service Equipment (GM 120).

c. Forward the modification completion details to:

Fleet Manager B Veh
Army Materiel Management Agency
GPO Box 840J
MELBOURNE VIC 3001

d. The return should include the following information:

- (1)** Modification No: EMEI Vehicle G 257-2
- (2)** Unit:
- (3)** Major Equip Ser No:
- (4)** Sub-System Ser No:
- (5)** Completion Date:

Table 1 - Stores Required

Item	NSN	Mfr Part No	Designation or Description	Unit of Issue	Qty per Kit	Qty per Equip
1	4120-66-143-3000	-	Conversion Kit, Airconditioning	kt	1	1

Table 2 - Items to be Removed

Item	NSN	Mfr Part No	Designation or Description	Qty per Equip
1	-	23-7000 HYL 9029	Receiver Filter Drier	1

UNCONTROLLED WHEN PRINTED

END

List VEH G 20.4 - Code 2 (Job No 9600139)