LIGHT GRADE REPAIR

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.

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INTRODUCTION

1. This EMEI contains procedures for removing, dismantling, repairing, assembling and installing various components of the Truck, Electronic Repair, Light, MC2 (ERV) and Truck, Comsec Repair, Workshop Vehicle, MC2 models. Where applicable, instructions for the adjustment, lubrication and minor servicing of these items are included.

   **CAUTION**
   
   Do not use adhesive tapes to seal fuel or oil openings. The adhesive tape is soluble in fuel or oil and can cause contamination. Remove temporary covers before assembling.

2. Prevent dirt and foreign objects from entering any component by placing clean temporary coverings over all exposed openings, including hoses, tubes and lines.

   **CAUTION**
   
   Before removing any electrical system components, disconnect the battery leads and power supply cables.

3. When disconnecting electrical connectors, hoses and fittings, remove clamps, as required, to gain slack and avoid damage to connectors and fittings.

4. Discard all used gaskets, seals, cotter pins, tab washers, lock pins, key washers and lock washers. Discard all contaminated fuel and lubricants drained from the truck.

5. Use only those fuels and lubricants specified in the Servicing Instruction, EMEI Vehicle G 209, the User Handbook and this EMEI when replenishing fuel or lubricants.

6. Any fastenings or fittings being tightened to prescribed torques are to have dry, clean threads unless otherwise specified. When specified, thread sealants are to be applied to dry, clean, oil free threads.

7. The engine cooling system contains Nalcool corrosion inhibitor in water at a ratio of 1:12.

   **WARNING**
   
   Precautions should be taken prior to carrying out repairs which include painting, sanding, scraping or welding. Refer to EMEI Workshop D 701 – Repair Policy for Equipment Painted in Polyurethane Paint.

8. This vehicle is painted in polyurethane paint.

Associated Publications

9. Reference may be necessary to the latest issue of the following documents:

   a. Defence Road Traffic Instructions;

   b. Complete Equipment Schedules (CES):
      
      (1) SCES 12126 ................................................................. Truck, Electronic Repair, Light, MC2;
      
      (2) SCES 12166 ................................................................. Truck, Comsec Repair, Workshop Vehicle, MC2;

   c. Block Scale:
      
      (1) 2406/31 – Special Tools for RAEME – B Vehicles – Truck, Utility and Truck, Light, MC2 (Land Rover Model 110);
      
      (2) 2401/21 – Special Tools And Equipment For RAEME – Maintenance Shelters Series 110;

   d. EMEI Vehicle A 019-I – Replacement of Vehicle Speedometers/Hour Meters and Trailer Odometers;

   e. EMEI Electrical P 413 – Generator, Engine Accessory, 28 V, 100 A – Light Grade Repair;
f. EMEI Vehicle A 029 – Servicing of B Vehicles, Trailers, Motorcycles, Stationary Equipment, Auxiliary and Small Engines;

g. EMEI Vehicle A 291-5 – General Service B Vehicles Tyre Guide – Operating Instructions;

h. EMEI Vehicle A 459-2 – Hydraulic Brake Fluid Deterioration, Miscellaneous Instruction;

i. EMEI Vehicle G 203 – Truck, Cargo, Light, MC2, Landrover 110 6X6, All Types – Light Grade Repair;

j. EMEI Vehicle G 209 – Truck, Cargo, Light, MC2, Landrover 110 6X6, All Types – Servicing Instruction;

k. EMEI Vehicle G 250 – Truck, Electronic Repair, Light, MC2 (ERV) and Truck, Comsec Repair, Workshop Vehicle, MC2, Land Rover 110 6X6 – Data Summary;

l. EMEI Vehicle G 252 – Truck, Electronic Repair, Light, MC2 (ERV) and Truck, Comsec Repair, Workshop Vehicle, MC2, Land Rover 110 6X6 – Technical Description;

m. EMEI Vehicle G 254-1 – Truck, Electronic Repair, Light, MC2 (ERV) and Truck, Comsec Repair, Workshop Vehicle, MC2, Land Rover 110 6X6 – Medium and Heavy Grade Repair;

n. EMEI Workshop D 210 – The Use of Fibreglass Reinforced Plastics for the Repair of Equipment;

o. EMEI Workshop D 701 – Repair Policy for Equipment Painted in Polyurethane Paint;

p. RPS 02210 – ERV; and

q. RPS 02222 – Comsec.

10. A number of modifications and improvements have been made during the service life of the vehicle. Reference to the following publications may be required during repair activities:

   **NOTE**

   Any effect of these publications pertaining to the technical content of this document has been included in the text.

   a. EMEI Vehicle G 257-1 – Truck, Electronic Repair, Light, MC2, Land Rover 110 6X6 – Modifications to the Module Air-conditioning System;

   b. EMEI Vehicle G 257-2 – Truck, Electronic Repair, Light, MC2, Land Rover 110 6X6 – Air Conditioner Refrigerant Conversion from R12 to R134A;

   c. EMEI Vehicle G 257-3 – Truck, Electronic Repair, Light, MC2, Land Rover 110 6X6 – Replacement of Main Switchboard (Circuit Breaker Panel) Earth Terminal;

   d. EMEI Vehicle G 297-7 – Truck, Electronic Repair, Light, MC2, Land Rover 110 6X6 – Fitment of a Heavy Duty Indicator Flasher Unit; and

   e. EMEI Vehicle G 297-15 – Truck, Electronic Repair, Light, MC2, Land Rover 110 6X6 – Fitting of Improved Chassis Longitudinal Rails.

   **WARNING**

   All industrial safety work practices and equipment operating and maintenance instructions pertaining to this EMEI are to be adhered to.

   The handling, storage and use of chemical substances are to be in accordance with MOHS, MSDS and EMEI Workshop series requirements.

Identification Numbers

11. The locations of identification numbers on components of the vehicle are described in Table 1.
Table 1  Location of Identification Numbers

<table>
<thead>
<tr>
<th>Serial</th>
<th>Identification Number</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chassis number</td>
<td>Right hand side of the chassis, forward of the spring mounting turret</td>
</tr>
<tr>
<td>2</td>
<td>Chassis nameplate</td>
<td>Left hand seat box, in the cab</td>
</tr>
<tr>
<td>3</td>
<td>Engine number</td>
<td>Left hand side of the engine block</td>
</tr>
<tr>
<td>4</td>
<td>Injection pump identification</td>
<td>Side of the pump</td>
</tr>
<tr>
<td>5</td>
<td>Transmission and transfer case</td>
<td>Rear of the transfer case</td>
</tr>
<tr>
<td>6</td>
<td>Maintenance module</td>
<td>Right hand rear</td>
</tr>
</tbody>
</table>

Lubricants

12. The lubricants used with the vehicle are identified in Table 2.

Table 2  List of Lubricants

<table>
<thead>
<tr>
<th>Serial</th>
<th>Equipment</th>
<th>Lubricant</th>
<th>Capacity (Litres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Engine (including filters)</td>
<td>OMD-115</td>
<td>8.5</td>
</tr>
<tr>
<td>2</td>
<td>Transmission</td>
<td>OMD-115</td>
<td>2.7</td>
</tr>
<tr>
<td>3</td>
<td>Transfer case (with PTO)</td>
<td>OMD-115</td>
<td>5.8</td>
</tr>
<tr>
<td>4</td>
<td>Front axle</td>
<td>OEP-220</td>
<td>1.7</td>
</tr>
<tr>
<td>5</td>
<td>Intermediate axle</td>
<td>OEP-220</td>
<td>2.6</td>
</tr>
<tr>
<td>6</td>
<td>Rear axle</td>
<td>OEP-220</td>
<td>2.3</td>
</tr>
<tr>
<td>7</td>
<td>Swivel pin housings</td>
<td>Molytex Grease</td>
<td>EP00 Sachet</td>
</tr>
<tr>
<td>8</td>
<td>Brake master cylinder</td>
<td>OX (Aust) 8</td>
<td>Fill to level</td>
</tr>
<tr>
<td>9</td>
<td>Clutch master cylinder</td>
<td>OX (Aust) 8</td>
<td>Fill to level</td>
</tr>
<tr>
<td>10</td>
<td>Power steering system reservoir</td>
<td>OX-46</td>
<td>1.25</td>
</tr>
<tr>
<td>11</td>
<td>Fanbelt jockey pulley</td>
<td>XG-274</td>
<td>As required</td>
</tr>
<tr>
<td>12</td>
<td>Wheel bearings</td>
<td>XG-274</td>
<td>As required</td>
</tr>
<tr>
<td>14</td>
<td>Radiator inhibitor</td>
<td>Nalcool</td>
<td>As required (1:12 ratio)</td>
</tr>
<tr>
<td>15</td>
<td>Clutch pedal trunnion</td>
<td>XG-274</td>
<td>As required</td>
</tr>
<tr>
<td>16</td>
<td>Speedometer cable</td>
<td>XG-274</td>
<td>As required</td>
</tr>
<tr>
<td>17</td>
<td>Propeller shaft</td>
<td>XG-274</td>
<td>As required</td>
</tr>
<tr>
<td>18</td>
<td>Winch drive line</td>
<td>XG-274</td>
<td>As required</td>
</tr>
<tr>
<td>19</td>
<td>Parking brake adjuster</td>
<td>XG-274</td>
<td>As required</td>
</tr>
<tr>
<td>20</td>
<td>Windscreen wiper drive cable</td>
<td>XG-274</td>
<td>As required</td>
</tr>
<tr>
<td>21</td>
<td>Air conditioner refrigerant</td>
<td>HFC-134a</td>
<td>As required</td>
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<tr>
<td>22</td>
<td>Air conditioner compressor</td>
<td>OM-70</td>
<td>0.135</td>
</tr>
</tbody>
</table>
ENGINE – GROUP 1

Jockey Pulley

13. **Removal.** Remove the jockey pulley as follows:
   a. Slacken the adjusting bolt on the pulley arm (refer Figure 1).

   ![Jockey Pulley Exploded View](image)

   **Figure 1** Jockey Pulley Exploded View

   b. Detach the two fanbelts from the pulley.
   c. Remove the adjusting bolt from the pulley arm and mounting.
   d. Remove the pulley arm and pulley from the engine.

14. **Disassembly.** Disassemble the jockey pulley as follows:
   a. Remove the grease nipple from the pulley bolt.
   b. Secure the pulley arm in a vice.
   c. Remove and discard the lock nut securing the pulley bolt.
   d. Remove the pulley bolt and pulley.
   e. Remove the internal circlip retaining the bearing in the pulley.
   f. Remove the bearing from the pulley.
   g. Clean and degrease the pulley.

15. **Reassembly.** Reassemble the jockey pulley as follows:
   a. Install the bearing in the pulley.

   **NOTE**
   Ensure that the chamfered face is installed first.

   b. Insert the circlip into the pulley.
   c. Install the pulley on the pulley arm with the circlip facing the arm boss.
   d. Insert the pulley bolt and a new lock nut.
   e. Install the grease nipple and lubricate with XG–274.

16. **Installation.** Install the jockey pulley as follows:
   a. Align the pulley arm bolt hole with the mounting hole.
   b. Insert the adjusting bolt.
c. Fit the two fanbelts in the pulley grooves.
d. Position the pulley arm to allow a deflection of 5–10 mm on the longest span of the belts.
e. Tighten the adjusting bolt securely.

COOLING SYSTEM – GROUP 2

Fanbelts

17. Replacement. Replace the fanbelts as follows:
   a. Slacken the adjusting bolt on the pulley arm (refer Figure 1).
   b. Detach the two fanbelts from the pulley.
   c. Remove the two 28-volt alternator fanbelts from the crankshaft pulley.
   d. Loosen the 12-volt alternator mounting bolts and adjusting bolt (refer Figure 2).

   ![Figure 2 Fanbelt Replacement]

   e. Detach the fanbelt from the 12-volt alternator drive pulley.
   f. Remove all three fanbelts from the engine.
   g. Install the inner fanbelt.

   **NOTE**

   Ensure that all three drive pulleys are correctly located.

   h. Swing the 12-volt alternator away from the engine.
   i. Check the tension of the belt by applying moderate thumb pressure to the longest span of the belt.
   j. When a belt deflection of 10–15 mm has been obtained, tighten the adjusting bolt.
   k. Tighten the mounting bolts.
   l. Install the remaining two fanbelts and ensure that the belts are correctly located on the pulleys.
   m. Position the pulley arm to allow a deflection of 5–10 mm on the longest span of the belts.
   n. Tighten the adjusting bolt securely.

Engine and Cooling Group Specifications

18. The engine and cooling specifications are detailed in Table 3.
Table 3  Engine and Cooling Group Specifications

<table>
<thead>
<tr>
<th>Serial</th>
<th>Description</th>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fanbelt deflection</td>
<td>12-volt alternator</td>
<td>10–15 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28-volt alternator</td>
<td>5–10 mm</td>
</tr>
</tbody>
</table>

ELECTRICAL – GROUP 15

Alternator (28-Volt)

19. Removal. Remove the alternator as follows:
   a. Disconnect the batteries.
   b. Slacken the adjusting bolt on the pulley arm (refer Figure 3).
   c. Detach the drivebelt from the alternator pulley.

   d. Tag and disconnect the wiring harness from the alternator.
   e. Remove the two bolts, washers and nuts retaining the alternator to the engine mounting bracket and upper link.

   **WARNING**

   The 28-volt alternator is heavy. Care must be taken when removing the alternator or personal injury may result.

   f. Remove the alternator.

   **NOTE**

   Repair procedures for the 28-volt alternator are detailed in EMEI Electrical P 410 series.

20. Installation. Install the alternator as follows:
   a. Position the alternator on the engine mounting bracket and insert the long bolt through the bracket and alternator mounting lugs.
   b. Raise the alternator and insert the bolt through the upper link.
   c. Tighten the bolts securely.
d. Fit the drivebelt around the drive pulley and rotate the jockey pulley arm.

e. Check the tension of the belt by applying moderate thumb pressure to the longest span of the belt.

f. When a belt deflection of 5-10 mm has been obtained, tighten the pulley arm retaining bolt securely.

g. Connect the wiring harness to the alternator and connect the battery.

Wiring Harness

21. **General Precautions.** Exercise the following precautions when working on the wiring harness:

![CAUTION]

**Arcing wires to earth, to determine if the wire is live, will destroy solid state components.**

a. Use suitable testing meters or circuit testers to trace or locate faults and check circuits.

b. After tracing electrical faults, before carrying out any electrical repairs, disconnect the batteries, negative terminals first.

![CAUTION]

**Failure to disconnect the alternators will cause the transistors and diodes to fail as a result of current flow throughout the chassis when arc welding.**

c. Before carrying out any electrical arc welding on the vehicle, disconnect the batteries and the alternators.

![CAUTION]

**Reversing battery polarity will cause serious damage.**

d. When installing the batteries, ensure that the terminals are connected to the correct posts.

22. **Replacement.** Replace the wiring harness as follows:

a. Disconnect the batteries, negative terminals first.

**NOTE**

All electrical wiring in the vehicle is colour coded for identification and reference. If necessary, refer to the wiring diagram in EMEI Vehicle G 203, in conjunction with the relevant illustration, when replacing a wiring harness.

Refer to Figure 43 for a wiring diagram for the ERV and to Figure 44 for a wiring diagram of the Comsec module.

b. Determine which harness is to be replaced and ensure that the replacement harness is of the correct capacity and that the wires are correctly colour coded.

c. Using the old harness and tags as a guide, connect the wires to the appropriate terminals.

d. Reconnect the batteries.

e. Test the function of the components associated with the wiring harness that has been replaced to ensure correct function.

Batteries (24-Volt Installation)

23. **Replacement.** Replace the batteries as follows:

a. Remove the security clip and pin from the left hand battery carrier (refer Figure 4).
b. Slide the batteries and carrier clear of the vehicle body until the bridging cable is exposed.

c. Remove the two wing nuts with flat and spring washers.

d. Remove the battery box cover.

e. Disconnect the bridging cable from both the positive and negative terminals on the batteries.

f. Remove the cable.

g. Disconnect the remaining cables from the batteries.

h. Remove the nuts and washers securing the battery retaining bracket and remove the bracket.

i. Lift the batteries out of the battery carrier.

j. Install the new batteries in the battery carrier, ensuring that the batteries are installed correctly (refer Figure 5), and secure them with the retaining bracket.

k. Connect the battery cables and refit the battery box cover using the two wing nuts and washers.

l. Slide the battery carrier into the stowed position and secure the carrier with the security clip and pin.

---

**Voltmeter (24-Volt) Vehicle Dashboard**

24. **Bulb Replacement.** Replace the bulb as follows:

a. Disconnect the batteries for both the 12-volt and 24-volt systems.

b. Remove the four screws retaining the instrument panel (refer Figure 6).
c. Carefully ease the panel away from the surround.

**NOTE**

Disconnect the speedometer cable if necessary to allow easier access.

![Image of instrument panel]

Figure 6  Instrument Panel Light Bulb Replacement

1. Remove the bulb holder from the voltmeter gauge.
2. Tag and disconnect the electrical connections.
3. Remove the nuts securing the gauge to the instrument panel.
4. Remove the gauge.
5. Insert the gauge into the panel and secure it with the nuts.
6. Connect the electrical connections, as tagged.
7. Install the bulb holder on the voltmeter gauge.

**NOTE**

Ensure that the speedometer cable is connected.

8. Install the instrument panel and secure it with the four screws.
9. Connect the batteries.

Air Conditioner Motor (240-Volt)

25. **Removal.** Remove the motor as follows:

a. Disconnect the batteries and external power supply cables (if connected).

b. Open the air conditioner locker door.

c. Remove the two mounting tray locking bolts and slide out the compressor and motor as far as the compressor hoses will allow.

d. Slacken the compressor mountings and detach the drivebelt.

e. Remove the bolt securing the compressor to the mounting plate (refer Figure 7).

f. Place the compressor to one side taking care not to kink the hoses.
Figure 7  Air Conditioner (240-Volt) Motor Removal

Remove the two outer 240-volt motor mounting bolts.
Slide the mounting tray back into the air conditioner locker.
Remove the front bench access plate.
Remove the two rear 240-volt motor mounting bolts.
Tag and disconnect the electrical wiring from the 240-volt motor and the compressor.
Carefully remove the 240-volt motor from the air conditioner locker.

Installation. Install the motor as follows:

a. Install the 240-volt motor on the mounting bracket and secure it with the four bolts, washers and nuts.
b. Tighten the bolts securely.
c. Position the air conditioner compressor on to the mounting plate and insert the mounting bolt.
d. Fit the washers and nuts, but do not tighten them at this stage.
e. Install the drivebelt over the air conditioner compressor and 240-volt motor pulleys.
f. Swing the compressor away from the motor to obtain a deflection of 10-15 mm.
g. Tighten the mounting bolt and the adjusting bolt securely.
h. Connect the wiring harnesses to the motor and compressor.
i. Close the air conditioner compressor locker door and open the flap on the door.
j. Connect the batteries and external power supply cables (as necessary).
k. Test the operation of the 240-volt motor.

Transformer (240 Volt to 24 Volt)

27. Replacement. Replace the transformer as follows:
a. Disconnect the batteries and any external power supply cables (if connected).
b. Remove the access panel from the front left hand bench to gain access to the transformer and harness.
c. Tag and disconnect the wiring harnesses connecting the transformer to the module electrics (refer Figure 8).
Transformer (240-Volt to 24-Volt) Removal

d. Remove the four self locking nuts securing the transformer mounting bracket.
e. Lower the bracket and transformer.
f. Lift out the transformer.
g. Install the new transformer in the bracket and secure it with the four mounting bolts.
h. Connect the wiring harnesses to the battery charger and module electrics.
i. Connect the batteries and external power supply cables (as necessary).
j. Test the operation of the transformer.
k. Fit the access panel to the front left hand bench.

Transformer (240-Volt to 110-Volt) Comsec Repair

28. **Replacement.** Replace the transformer as follows:

a. Disconnect the batteries and external power supply cables (if connected).
b. Remove the security filing cabinet.
c. Remove the access panel from the front of the right hand bench to gain access to the transformer and harness.
d. Remove the Echidna battery charger.
e. Tag and disconnect the wiring harness connecting the transformer to the module electrics (refer Figure 9).
f. Remove the four self locking nuts securing the transformer mounting bracket and remove the bracket.

g. Lift out the transformer from the mounting base plate.

h. Install the new transformer on the base plate and fit the mounting bracket to the top of the transformer.

i. Secure the mounting bracket with the four self locking nuts.

j. Connect the wiring harness to the transformer, then connect the batteries and external power supply cables (as necessary).

k. Refit the Echidna battery charger.

l. Fit the access panel to the front of the right hand bench.

m. Refit the security filing cabinet.

**Air Conditioner Locker Extractor Fan**

29. **Removal.** Remove the extractor fan as follows:

   a. Disconnect the batteries and external power supply cables (if connected).

   b. Open the air conditioner locker door.

   c. Remove the cable tie which fastens the micro-switch electrical wiring to the extractor fan assembly.

   d. Discard the tie.

   e. Disconnect the fan wiring at the connecting plug.

   f. Remove the four extractor fan mounting screws (refer Figure 10).

   g. Remove the fan and spacer washers.

   h. Retain the spacer washers.

30. **Installation.** Install the extractor fan as follows:

   a. Install the fan with spacer washers (three under each fan mount) to the locker door and secure it with the four extractor fan mounting screws.

   b. Connect the fan wiring at the connector.

   c. Fasten the micro-switch electrical wiring to the extractor fan assembly using a new cable tie.

   d. Connect the batteries and external power supply cables (as necessary).

   e. Test the operation of the fan.

**Air Conditioner Locker Extractor Fan Micro-Switch**

31. **Removal.** Remove the micro-switch as follows:

   a. Disconnect the batteries and external power supply cables (if connected).

   b. Open the air conditioner locker vent door.
c. Tag and disconnect the spade terminals from the micro-switch.
d. Remove the two micro-switch mounting bolts.
e. Remove the micro-switch (refer Figure 11).

![Figure 11 Extractor Fan Micro-Switch Removal](image)

32. **Installation.** Install the micro-switch as follows:
   a. Install the micro-switch and secure it with the two mounting bolts.
   b. Connect the spade terminals to the micro-switch.
   c. Close the air conditioner locker vent door.
   d. Connect the batteries and external power supply cables (as necessary).
   e. Test the operation of the micro-switch.

**Power Input Sockets (415 and 240-Volt)**

33. **Removal.** Remove the power sockets as follows:
   a. Disconnect the batteries and external power supply cables (if connected).
   b. Loosen the bin pack frame mounting bolts.
   c. Slide the bin pack mounting frames (installed on the right side of the module) to one side to allow access to the cover panel.
   d. Remove the six screws retaining the cover panel to the module wall (refer Figure 12).
   e. Remove the panel.
   f. Tag and disconnect the wiring harness from the power inlet socket that is to be removed.
Figure 12  Power Input Socket Cover Panel Removal

- Remove the screws, nuts and washers that secure the socket to the module (refer Figure 13).
- Remove the socket.

Figure 13  Power Input Socket Removal

34. **Installation.** Install the power sockets as follows:
   - a. Apply a bead of sealant to the mating face of the socket.
   - b. Install the new socket in the recess and secure it with the screws, nuts and washers.
   - c. Connect the wiring harness to the socket.
   - d. Position the cover panel on the wall and secure it with the six screws.
   - e. Slide the bin packing frames into position and tighten the mounting bolts.
   - f. Connect the batteries.

**Fluorescent Lighting**

35. **Tube Replacement.** Replace the tubes as follows:
   - a. Select OFF on the voltage source and the input voltage selection switches at the circuit breaker and power selection panel.
   - b. Remove the ten screws retaining the diffuser and remove the diffuser.
c. Remove the ten screws securing the mesh shield to the light unit.
d. Remove the shield.
e. Slide the fluorescent tube toward the spring loaded tube holder and manipulate the other end of the tube from the light unit.
f. Install the new tube ensuring that the terminal pins are located and the tube is secure (refer Figure 14).
g. Turn ON the voltage source and the input voltage selection switches and check the serviceability of the tube.

**NOTE**

Should the light not illuminate, replace the starter.

h. Position the mesh shield on the light unit and secure it with the ten screws.
i. Position the diffuser on the light unit and secure it with the ten screws.

---

36. **Light Unit Replacement.** Replace the light unit as follows:

a. Disconnect the external power supply cables (if connected).
b. Remove the ten screws retaining the diffuser and remove the diffuser.
c. Remove the ten screws retaining the mesh shield and remove the mesh shield
d. Remove the fluorescent tubes from the light unit.
e. Tag and disconnect the wiring harness from the block connectors.
f. Drill out the four pop rivets securing the light unit to the roof panel.
g. Lower the light unit ensuring that the wiring harness is fed through the base.
h. Remove the light unit.
i. Feed the wiring harness through the new light unit base.
j. Position the light unit in the roof panel.
k. Secure the light unit with four new pop rivets.
l. Connect the wiring harness to the block connectors.
m. Install the fluorescent tubes.
n. Connect the external power supply cable and check that the lights function.
o. Position the mesh shield on the light unit and secure it with the ten screws.
p. Secure the diffuser to the light unit with the ten screws.
Module Interior/Ceiling Blackout Lights

37. **Bulb Replacement.** Replace the bulbs as follows:
   a. Remove the screws securing the lens on the light unit.
   b. Remove the lens (refer Figure 15).
   c. Remove the bulb from the light unit.
   d. Install a replacement bulb.
   e. Fit and secure the lens with the screws.

38. **Light Unit Replacement.** Replace the light unit as follows:
   a. Disconnect the batteries and the external power supply cable.
   b. Remove the screws securing the lens on the light unit, then remove the lens (refer Figure 15).
   c. Tag and disconnect the wiring harness from the light unit.
   d. Remove the screws securing the light unit to the panel.
   e. Remove the light unit.
   f. Position the new light unit on the panel, ensuring that the wiring harness is not trapped.
   g. Secure the light unit with the screws.
   h. Connect the wiring harness.
   i. Install and secure the lens with the screws.
   j. Connect the batteries and test the light function.

High Level Lights (Rear Door)

39. **Bulb Replacement.** Replace the bulbs as follows:

   **NOTE**
   The module rear lights utilize an identical base and festoon type bulb fitting. Therefore the replacement procedure is identical for each light unit.
   a. Remove the three screws securing the lens to the base of the light unit (refer Figure 16).
   b. Remove the lens.
   c. Replace the bulb.
d. Install and secure the lens with the three screws.

![Diagram of light unit replacement](image_url)

**Figure 16** High Level Lights Bulb Replacement

40. **Light Unit Replacement.** Replace the light unit as follows:
   a. Disconnect the batteries.
   b. Remove the three screws securing the lens to the base of the light unit (refer Figure 16).
   c. Remove the lens.
   d. Tag and disconnect the wiring harness from the light unit base.
   e. Remove the two screws securing the base to the rear door.
   f. Remove the light unit.
   g. Insert the wiring harness through the light unit base.
   h. Secure the base to the rear door with the two screws.
   i. Connect the wiring harness and ensure that the terminals are secure.
   j. Install the bulb and the lens, then secure the lens with the three screws.
   k. Connect the batteries and check the operation of the light.

**Switches**

41. **Replacement.** Replace the switches as follows:
   a. Disconnect the batteries and any external power cables (if connected).
   b. Remove the two plastic plugs to gain access to the switch mounting screws.
   c. Remove the two screws securing the switch to the panel.
   d. Tag and disconnect the wiring harness from the light switch.
   e. Connect the wiring harness to the new switch.
   f. Position the switch in the panel.
   g. Secure the switch with the two screws.
   h. Insert the two plastic plugs into the switch mounting screw holes.
   i. Connect the batteries and external power cables (if required).

**Ceiling Extractor Fans**

42. **Removal.** Remove the extractor fans as follows:

   **NOTE**
   The removal and installation procedure is identical for the two extractor fans mounted in the module ceiling.
   a. Disconnect the batteries and external power supply cables (if connected).
b. Remove the four exhaust vent shutter mounting screws and remove the exhaust vent shutter (refer Figure 17).

![Exhaust Vent Shutter Removal](image)

**Figure 17  Exhaust Vent Shutter Removal**

c. Remove the four fan mounting screws and lower the fan down through the exhaust vent mounting hole.
d. Tag the fan wiring harness.
e. Whilst supporting the fan disconnect the wiring and remove the fan.

43. **Installation.** Install the extractor fans as follows:

a. Feed the fan wiring through the exhaust vent mounting hole.
b. Connect the wiring, whilst supporting the fan.
c. Position the fan in the ceiling and insert the four mounting screws.
d. Tighten the mounting screws firmly.
e. Position the exhaust vent shutter on the ceiling and secure it with the four mounting screws.
f. Connect the batteries and test the operation of the exhaust fans.

**Circuit Breaker and Power Selection Panel**

44. **Circuit Breaker Removal.** Remove the circuit breaker as follows:

a. Disconnect the batteries and any external power source.
b. Remove the screws from the rotary switch knobs and remove the knobs.
c. Insert a suitable screwdriver into the upper right hand access slot of the circuit breaker panel cover to engage the locking mechanism.
d. Lift the screwdriver handle and simultaneously pull the upper right hand part of the cover free of the locking lug (refer Figure 18).

![Circuit Breaker Panel Cover Removal](image)

**Figure 18  Circuit Breaker Panel Cover Removal**
e. Insert the screwdriver into the lower left hand access slot to engage the locking mechanism.

f. Push the screwdriver handle down, then pull the left hand corner of the cover free of the locking lug and lift the cover from the panel far enough to access the voltmeter wiring harness.

g. Tag and disconnect the wiring from the voltmeter.

h. Remove the cover.

i. Tag and disconnect the wiring from the circuit breaker to be removed.

j. Insert the screwdriver into the locking bar slot at the base of the circuit breaker.

k. Lever the locking bar away from the circuit breaker body to disengage the locking lug from the mounting rail.

l. Remove the circuit breaker.

45. **Circuit Breaker Installation.** Install the circuit breaker as follows:

   a. Position the circuit breaker on the mounting rail and snap it into position, ensuring the locking lugs engage the mounting rail.

   b. Connect the wiring to the circuit breaker.

   c. Position the circuit breaker panel cover over the four corner posts and connect the voltmeter wiring.

   d. Press the cover into its locked position, ensuring the rotary switch shafts pass through the cover panel.

   e. Mount the power supply selector knobs in position and secure them firmly with the mounting screws.

   f. Connect the batteries and the external power source and test the operation of the circuit breaker.

**Surge Arrestor (Comsec Repair)**

46. **Removal.** Remove the surge arrestor as follows:

   a. Disconnect the batteries and any external power source.

   b. Remove the power selection panel cover as detailed in paragraph 44.

   c. Tag and disconnect the wiring from the surge arrestor to be removed.

   d. Insert a screwdriver into the locking bar slot at the base of the surge arrestor.

   e. Lever the locking bar away from the surge arrestor to disengage the locking lug from the mounting rail.

   f. Remove the surge arrestor.

47. **Installation.** Install the surge arrestor as follows:

   a. Position the new surge arrestor on the mounting rail and snap it into position.

   **NOTE**

   Ensure the locking lugs engage the mounting rail.

   b. Connect the wiring to the surge arrestor.

   c. Position the power selection panel cover over the four corner posts and connect the voltmeter wiring.

   d. Press the cover into its locked position.

   **NOTE**

   Ensure the rotary switch shafts pass through the panel cover.

   e. Mount the power supply selector knobs in position and secure them firmly with the mounting screws.

   f. Connect the batteries and any external power source.
Heater (Late Type or Early Type)

48. **Late Type Removal.** Remove the heater as follows:
   a. Disconnect the batteries and any external power supply cables (if connected).
   b. Remove the battery charger power point from the mounting block (refer to paragraph 55).
   c. Tag and disconnect the power supply wires (blue and brown) from the insulated connectors and the earth wire (green) from the earth terminal on the rear of the power point.
   d. Loosen the gland nut on the power point housing and withdraw the cable from the power point.
   e. Pull the spring loaded retaining lugs clear of the heater.
   f. Remove the heater from the bracket (refer Figure 19).

![Late Type Heater Removal](image)

**Figure 19** Late Type Heater Removal

49. **Installation.** Install the heater as follows:
   a. Locate the heater centrally in the mounting bracket, ensuring that the locating lugs are correctly positioned on the heater.
   b. Reposition the spring loaded retaining lugs over the heater.
   c. Pass the heater cable through the gland nut.
   d. Reconnect the previously tagged wires to the insulated terminal and the earth terminal.
   e. Tighten the gland nut.
   f. Install the power point (refer to paragraph 55).
   g. Test the operation of the heater.

50. **Early Type Removal.** Remove the heater as follows:
   a. Disconnect the batteries and any external power supply cables (if connected).
   b. Remove the battery charger power point from the mounting block (refer to paragraph 55).
   c. Tag and disconnect the power supply wires (blue and brown) from the insulated connectors and the earth wire (green) from the earth terminal on the rear of the power point.
   d. Loosen the gland nut on the power point housing and withdraw the cable from the power point.
e. Remove the two mounting bolts securing the end plate to the heater mounting bracket then lift the plate out of the locating slots in the heater.
f. Remove the heater from the bracket (refer Figure 20).

![Diagram of Early Type Heater Removal](image)

**Figure 20** Early Type Heater Removal

51. **Installation.** Install the heater as follows:

   a. Locate the heater centrally in the mounting bracket.
   b. Engage the end plate angle piece in the heater locating slot.
   c. Align the end plate mounting holes with the heater bracket root nuts.
   d. Fit the two mounting bolts and tighten them securely.
   e. Pass the heater cable through the gland nut.
   f. Reconnect the previously tagged wires to the insulated terminal and the earth terminal.
   g. Tighten the gland nut.
   h. Install the power point (refer to paragraph 55).
   i. Test the operation of the heater.

**Battery Charger (ERV)**

52. **Removal.** Remove the battery charger as follows:

   a. Disconnect the batteries and external power supply cables (if connected).
   b. Remove the circuit breaker and power selection panel cover (refer paragraph 44).
   c. Tag and disconnect the battery charger output leads at the panel.
   d. Attach a draw wire to the battery charger output leads at the circuit breaker and power selection panel end.
   e. Open the air conditioner locker door.
   f. Remove the battery charger power input lead from the power outlet.

**NOTE**

Prior to removing the battery charger ensure the draw wire is connected to the battery charger output leads at the circuit breaker and power selection panel end.
Whilst supporting the battery charger, remove the two wing nuts and washers from the supporting clamp and remove the clamp.

Carefully lower the battery charger and remove it through the air conditioner locker door.

Pull the battery charger output leads and draw wire down through the conduit and disconnect the draw wire.

NOTE
Leave the draw wire in position to facilitate the installation of the battery charger power leads.

53. **Installation.** Install the battery charger as follows:

a. Connect the battery charger output leads to the draw wire previously positioned during removal.

b. Position the battery charger in the air conditioner locker and draw the battery charger output leads up to the circuit breaker and power selection panel.

c. Disconnect the draw wire.

d. Align the battery charger in its mountings.

e. Fit the supporting clamp and secure it with two wing nuts and washers.

f. Connect the battery charger power lead to the power outlet.

g. Close the air conditioner locker door.

h. Connect the battery charger output leads at the circuit breaker and power selection panel.

i. Replace the panel cover (refer paragraph 44).

j. Connect the batteries and any external power supply cables and test the operation of the battery charger.

**Battery Charger (Comsec Repair)**

54. **Replacement.** Replace the battery charger as follows:

a. Disconnect the batteries and external power supply cables (if connected).

b. Remove the access cover from the electrical enclosure.

c. Tag and disconnect the wiring harness connecting the battery charger to the module electrics (refer Figure 21).

d. Disconnect the power output cable at the front panel of the battery charger.

e. Remove the four self locking nuts securing the battery charger retaining bracket, remove the bracket and lift out the battery charger.

f. Install the battery charger in the bracket, and secure it with the upper retaining bracket and four self locking nuts.

g. Connect the power input cable to the terminal strip in the electrical enclosure, and connect the power output cable at the front panel of the battery charger.

h. Connect the batteries and any external power supply cables and test the operation of the battery charger.
Power Points (240-Volt)

55. **Replacement.** Replace the power points as follows:
   a. Disconnect the batteries and external power supply cables (it fitted).
   b. Remove the two plastic plugs to gain access to the screws securing the power point to the wall socket.
   c. Remove the screws.
   d. Carefully remove the socket.
   e. Tag the wiring harness and disconnect the wires.
   f. Remove the power point.
   g. Connect the wiring harness to the new power point terminals and tighten the screws securely.
   h. Position the power point in the wall socket and secure it with the two screws.
   i. Replace the two plastic plugs.
   j. Connect the batteries and external power supply cables.
   k. Test the operation of the power point.

Air Conditioner Hour Meter

56. **Replacement.** Replace the hour meter as follows:
   a. Tag and remove the wiring from the hour meter.
   b. Remove the hour meter from the mounting bracket.
   c. Position the new hour meter in the mounting bracket and secure with the locking screws.
   d. Connect the wiring to the hour meter.
   e. The GM 120, Record Book for Service Equipment for the subject vehicle is to be endorsed in accordance with EMEI Vehicle A 019-1.

Blackout Micro-switch (Comsec Repair)

57. **Replacement.** Replace the micro-switch as follows:
   a. Disconnect the batteries and external power supply cables (if connected).
   b. Remove the access cover plate from the blackout micro-switch by unscrewing the black screw (adjacent to the cable entry).
   c. Tag and disconnect the wiring harness connecting the blackout micro-switch to the module electrics.
   d. Remove the two screws retaining the blackout micro-switch to the bracket (refer Figure 22).
NOTE

Mark the position of the roller arm on the blackout micro-switch shaft to ensure correct realignment.

Figure 22  Blackout Micro-Switch Removal

e. Position the blackout micro-switch on the bracket and secure it with the two screws.
f. Connect the wiring to the blackout micro-switch.
g. Refit the access cover plate and secure it using the black screw.
h. Connect the batteries and external power supply cables
i. Check for correct operation of the blackout micro-switch.

Over-voltage Relays (Comsec Repair)

58. Removal. Remove the relays as follows:
   a. Disconnect the batteries and external power supply cables (if connected).
   b. Remove the four screws in the over-voltage protection enclosure cover.
   c. Remove the cover.
   d. Tag and disconnect the wiring from the over-voltage relay to be removed.
   e. Insert a screwdriver into the locking bar slot at the base of the over-voltage relay.
   f. Lever the locking bar away from the over-voltage relay to disengage the locking lug from the mounting rail.
   g. Remove the over-voltage relay.

59. Installation. Install the relays as follows:
   a. Position the over-voltage relay on the mounting rail and snap it into position.

   NOTE

   Ensure the locking lugs engage the mounting rail.

   b. Connect the wiring to the over-voltage relay.
   c. Position the over-voltage protection enclosure cover and secure it firmly with the mounting screws.
   d. Connect the batteries and the external power supply cables and test the operation of the over-voltage relay.
Electrical Specifications

60. The electrical specifications are detailed in Table 4.

### Table 4 Electrical Specifications

<table>
<thead>
<tr>
<th>Serial</th>
<th>Description</th>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drive belt deflection</td>
<td>28-volt alternator</td>
<td>5–10 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air conditioner compressor</td>
<td>10–15 mm</td>
</tr>
</tbody>
</table>

Electrical-Alternator Fault Finding

61. The electrical-alternator fault finding is detailed in Table 5.

### Table 5 Electrical-Alternator Fault Finding

<table>
<thead>
<tr>
<th>Serial</th>
<th>Symptom</th>
<th>Probable Cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alternator not charging.</td>
<td>Worn or slack belt.</td>
<td>Tighten or replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worn or dirty brushes.</td>
<td>Clean or replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rotor faulty.</td>
<td>Replace alternator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poor connection in charging circuit.</td>
<td>Rectify.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Open circuit or faulty field diode.</td>
<td>Replace alternator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Defective regulator.</td>
<td>Replace regulator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rectifier diode(s) defective.</td>
<td>Replace alternator.</td>
</tr>
<tr>
<td>2</td>
<td>Irregular charging.</td>
<td>Worn or slack belt.</td>
<td>Tighten or replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worn or dirty brushes.</td>
<td>Clean or replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rectifier diode(s) defective.</td>
<td>Replace alternator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Open or short-circuited stator.</td>
<td>Replace alternator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Defective regulator.</td>
<td>Replace regulator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poor connection in charging circuit.</td>
<td>Rectify.</td>
</tr>
<tr>
<td>3</td>
<td>Over charging.</td>
<td>Defective regulator.</td>
<td>Replace regulator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High resistance or poor connection in regulator sensing line.</td>
<td>Rectify.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loose battery terminals.</td>
<td>Rectify.</td>
</tr>
<tr>
<td>4</td>
<td>Alternator noisy.</td>
<td>Defective bearings.</td>
<td>Replace alternator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loose fan or pulley.</td>
<td>Rectify.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loose alternator mountings.</td>
<td>Rectify.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Defective rectifier.</td>
<td>Replace alternator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Short circuited stator.</td>
<td>Replace alternator.</td>
</tr>
</tbody>
</table>

**BODY – GROUP 17**

Rear Access Door

62. **Removal.** Remove the rear access door as follows:

a. With the door in the closed position, remove the four bolts that secure the hinges to the module (refer Figure 23).

b. Remove the door.
NOTE

To ease the removal of the rear access door, the rear step can be lowered and used as a support.

Figure 23  Rear Access Door Removal

63. **Installation.** Install the rear access door as follows:
   a. Raise the door on to the rear step, and position the door hinges on the module.
   b. Insert the four bolts and tighten them securely, ensuring that the door closes correctly.

   **NOTE**
   If the door fails to close correctly, slacken the bolts and reposition the door on the hinges, then retighten the bolts.

**Rear Access Door Window**

64. **Replacement.** Replace the door window as follows:

   **NOTE**
   It will be necessary to utilize a second person to assist in the replacement of the rear door window.

   a. With an assistant supporting the rear window (refer Figure 24) from outside the module, insert a screwdriver into the extrusion seal channel and lever a section of the seal free of the extrusion.

Figure 24  Rear Door Window Removal
b. Pull the remainder of the seal out of the extrusion then remove the window.

c. Remove all trace of hardened sealer from the window frame and window.

d. Apply a bead of sealant to the seal channel in the frame (refer Figure 25).

![Diagram of Rear Window Frame - Applying Sealant]

**Figure 25** Rear Window Frame - Applying Sealant

**NOTE**

The inside face of the acrylic plastic can be determined by the etched motif on its surface.

e. Position the window in the frame.

f. With an assistant maintaining the window in position (refer Figure 24), fit the seal into the extrusion seal channel with the join of the seal at the bottom of the frame.

**Module Front Window**

**65. Replacement.** Replace the window as follows:

**NOTE**

It will be necessary to utilize a second person to assist in the replacement of the front window.

a. Remove the cabin rear window (refer to EMEI Vehicle G 203 – GROUP 17).

b. With an assistant supporting the front window (refer Figure 26) insert a screwdriver into the extrusion seal channel and lever a section of the seal free of the extrusion.

c. Pull the remainder of the seal out of the extrusion.

d. Remove the window.

e. Remove all trace of hardened sealer from the window frame and window.

![Diagram of Module Front Window Removal]

**Figure 26** Module Front Window Removal
f. Apply a bead of sealant to the seal channel in the frame (refer Figure 27).

**NOTE**

The inside face of the acrylic plastic can be determined by the etched motif on its surface.

g. Position the window in the frame.

h. With an assistant maintaining the window in position, fit the seal joint of the seal at the bottom of the frame (refer Figure 26).

i. Replace the cabin rear window (refer to EMEI Vehicle G 203 – GROUP 17).

![Figure 27 Front Window Frame - Applying Sealant](image)

Rear Door

66. **Removal.** Remove the door as follows:

![WARNING]

**WARNING**

This door is heavy. Ensure door is suitably supported while removing gas struts and hinges.

a. Position the rear door in the fully opened position.
b. Place suitable supports beneath the door to support the weight.
c. Disconnect the 7-pin trailer plug.
d. Disconnect the rear door electrical wiring from the connector.
e. Remove the sixteen screws and lock washers securing the four hinges to the upper door opening (refer Figure 28).

![Figure 28 Rear Door Hinge Removal](image)
f. Discard the lock washers.
g. With the aid of an assistant, carefully remove the supporting stands and remove the rear door.

67. **Inspection.** Inspect the hinges and the door locking devices for damage, replace as necessary.

68. **Installation.** Install the door as follows:
   a. With the aid of an assistant, align the rear door hinges with the mounting points on the upper door opening and support it on suitable stands.
   b. Install the sixteen screws and tighten them securely (refer Figure 28).
   c. Connect the rear door electrical wiring to the connector.
   d. Connect the 7-pin trailer plug.
   e. Check the operation of the rear door lights.

**External Locker Door**

69. **Replacement.** Replace the locker door as follows:

   **NOTE**
   Before removing the air conditioner locker door the micro-switch wiring must be removed (refer paragraph 31).
   a. Open the locker door.
   b. Using a suitably sized drill, remove the rivets securing the hinge to the module.
   c. Remove the door.
   d. Position the new door on the module external locker recess hinge.
   e. Pop rivet the door to the hinge.

   **NOTE**
   Ensure that the door opens and closes smoothly.

**Rear Step**

70. **Removal.** Remove the step as follows:

   **NOTE**
   Ensure that the step assembly is in the up position (closed) to allow access to the eight screws securing the step hinges to the rear cross-member.
   a. Support the step assembly with a suitable jack or similar device.
   b. Remove the eight hexagon headed screws and the two lower bolts securing the step assembly to the rear crossmember (refer Figure 29).
29     Rear Step Removal

c. With the aid of an assistant carefully manipulate the step assembly over the pintle hook.
d. Lower the jack and remove the step.

71. Disassembly. Disassemble the step as follows:
   a. Using a suitable drift, from the left side of the step, drive the hinge pin through the hinges (refer Figure 30).
   b. Using a suitable drift, drive the hinge pin through the hinges (securing the kick plate to the tread step).
   c. Separate the step and the kick plate.

d. Using a suitable drift, drive the roll pin from the catch retainer.
e. Remove the washers and the spring from the step.
f. Discard the roll pin.

72. Inspection. Inspect the hinge pins for wear or distortion and the eye of the hinges for ovality, replace as necessary.

73. Reassembly. Reassemble the rear step as follows:
   a. Position the spring, the washer and the catch retainer in the tread step.
   b. Install a new roll pin.
c. Align the mounting points of the tread step and the kick plate.
d. Using a suitable drift, drive the pin into position from the right side.

e. Position the hinges on the kick plate.

f. Drive the hinge pin through the hinges and the kick plate tunnel.

74. **Installation.** Install the rear step as follows:
   
   a. Ensure that the step assembly is in a closed position.
   
   b. Using a suitable jack, lift the step into position until the hinge holes align with the mounting points.
   
   c. Install the eight hexagon headed screws and the two lower bolts securing the step to the rear crossmember and tighten them securely.
   
   d. Check the fold out/fold in functions of the step assembly for satisfactory operation.

**Bin Pack Mounting Frame**

75. **Removal.** Remove the frame as follows:
   
   a. Remove the fire extinguisher (located in the rear corner of the module).
   
   b. Remove all equipment that may be stowed inside the bins.
   
   c. Remove the bins from the frame to allow access to the four mounting bolts (refer Figure 31).
   
   d. Remove the four bolts, then remove the frame from the module.

![Figure 31 Bin Pack Frame Removal](image)

76. **Installation.** Install the frame as follows:
   
   a. Position the frame on the Unistrut tracks.
   
   b. Insert the four bolts into the retaining plates and tighten the bolts securely.
   
   c. Install the bins into the frame and stow the equipment.
   
   d. Install the fire extinguisher.

**Shelving Brackets**

77. **Replacement.** Replace the brackets as follows:
   
   a. Remove the shelves and any equipment that may be stowed.
   
   b. Remove the screws securing the brackets to the module wall.
   
   c. Remove the brackets.
   
   d. Position the new brackets on the module wall and secure them with the screws.
   
   e. Install the shelves on the brackets.
Side Bench

78. **Removal.** Remove the side bench as follows:
   a. Open the rear door and support it in the raised position on suitable stands.
   b. Remove the four mounting bolts securing the cable reel stowage tray to the Unistrut tracks (Comsec Repair) and remove the tray.
   c. Remove all drawers to gain access to the eight bolts mounting the bench to the Unistrut tracks.
   d. Remove the eight mounting bolts and spring washers (refer Figure 32).

![Figure 32 Bench Removal](image)

   e. Slide the bench towards the module footwell to free the vinyl bench top from the wall fixing trim.
   f. Remove the bench from the module.

79. **Installation.** Install the side bench as follows:
   a. Install the bench onto the Unistrut tracks.

   **NOTE**

   Ensure that the vinyl bench covering is located in the wall fixing trim, and that there is no excessive gap between the two benches.

   b. Secure the bench to the sliding rails with the eight mounting bolts and washers.
   c. Tighten the bolts securely.
   d. Install the drawers in the bench.
   e. Refit the cable reel stowage tray into the Unistrut tracks (Comsec Repair).
   f. Remove the stands supporting the rear door and close the door.
   g. Secure the door.

Front Bench

80. **Removal.** Remove the front bench as follows:
   a. Remove the side bench (refer to paragraph 78).
   b. On the Comsec Repair Vehicle, remove the security filing cabinet (refer to paragraph 85).
   c. Remove the 240-volt air conditioner motor (refer to paragraph 25).
   d. Remove the mounting bracket for the air conditioner compressor / 240-volt motor.
   e. Remove the 240/24-volt transformer (refer to paragraph 27).
   f. On the ERV remove the Arlec battery charger (refer paragraph 52).
g. On the Comsec Repair Vehicle, remove the Echidna battery charger (refer paragraph 54).

h. On the Comsec Repair Vehicle, remove the 240/110-volt transformer (refer paragraph 28).

i. Remove the drawer from the front bench section.

j. Remove the six bolts securing the centre front bench section to the left and right hand front sections.

k. Remove the centre section of the front bench.

l. Remove the eight mounting bolts securing the left and right hand bench sections to the Unistrut tracks.

m. Slide the bench sections towards the footwell to release the vinyl bench top from the wall fixing trim.

n. Remove the bench sections from the module.

81. **Installation.** Install the front bench as follows:

   a. Install the left and right hand front bench sections onto the Unistrut tracks.

   b. Slide the sections into position and fit the eight mounting bolts ensuring the wall trim is correctly located.

   **NOTE**

   Do not tighten them at this stage.

   c. Install the centre section of the front bench and secure it to the left and right hand bench sections with the six mounting bolts.

   d. Tighten the eight mounting bolts securing the left and right hand bench sections of the Unistrut tracks.

   e. Install the 240/24-volt transformer (refer to paragraph 27).

   f. On the ERV install the Arlec battery charger (refer paragraph 53).

   g. On the Comsec Repair Vehicle, install the Echidna battery charger (refer paragraph 54).

   h. On the Comsec Repair Vehicle, install the 240/110-volt transformer (refer paragraph 28).

   i. Install the mounting bracket for the air conditioner compressor / 240-volt motor.

   j. Install the 240-volt motor (refer paragraph 26).

   k. Install the side bench (refer paragraph 79).

   l. On the Comsec Repair Vehicle, install the security filing cabinet (refer paragraph 86).

**Publications Locker Door**

82. **Replacement.** Replace the locker door as follows:

   a. Open the door on the locker.

   b. Remove the rivets securing the door hinge and backing plate to the locker (refer Figure 33).

   ![Figure 33 Publications Locker Door Removal](image-url)
c. Transfer the locker door to a workbench.
d. Remove the rivets securing the hinge and backing plate to the door.
e. Align the door hinge and backing plate on the new door mounting holes.
f. Secure the hinge and backing plate with new rivets.
g. Position the door hinge and backing plate on to the locker and secure them with new rivets.

First Aid Cabinet (Comsec Repair)

83. **Removal.** Remove the first aid cabinet as follows:
   a. Open the first aid cabinet and remove the two nuts and bolts in the front mounting bracket.
   b. Remove the one nut and bolt securing the first aid cabinet to the security filing cabinet upper mounting bracket.
   c. Remove the two bolts securing the rear of the first aid cabinet to the wall mounted bracket.
   d. Remove the first aid cabinet and the cushion pad fitted underneath the cabinet.

84. **Installation.** Install the first aid cabinet as follows:
   a. Place the rubber cushion pad in position on top of the security filing cabinet.
   b. Position the first aid cabinet and loosely fit all bolts and nuts to the wall bracket, the security filing cabinet upper mounting bracket and the front mounting bracket.
   c. Tighten all bolts.
   d. Close the first aid cabinet.

Security Filing Cabinet

85. **Removal.** Remove the filing cabinet as follows:
   a. Clear access to the security filing cabinet by removing the bin pack mounting frame (refer paragraph 75).
   b. Loosen the eight bolts securing the jerrican stowage trays.
   c. Slide the trays along the Unistrut and remove them from the module.
   d. Remove the first aid kit cabinet (refer Figure 34 and paragraph 83).
   e. Remove the bolt securing the upper retaining bracket to the top of the security filing cabinet.
   f. Loosen the bolt securing the upper retaining bracket to the wall mounted Unistrut and remove the bracket.
   g. Remove the right hand side rear mudguard by unscrewing the 17 Tek screws and two bolts at the rear of the mudguard.
   h. Remove the four self locking nuts from the filing cabinet retaining bolts (under the module body).
   i. Remove the drawers from the filing cabinet.

**WARNING**

*Lower edges of drawers may be sharp. Wear protective gloves when handling drawers.*

j. Remove the four retaining bolts in the base of the filing cabinet by unscrewing them from the tapping plates in the module base frame.
Due to the weight of the filing cabinet, ensure correct lifting procedures are followed.

k. Remove the security filing cabinet from the module.

![Security Filing Cabinet Diagram]

**Figure 34 Security Filing Cabinet**

86. **Installation.** Install the filing cabinet as follows:

a. Align the filing cabinet to enable the retaining bolts in the base to screw into the tapping plates.

b. Screw the bolts loosely in position.

c. Position the upper retaining bracket and loosely fit the bolts.

d. Tighten all retaining bolts.

e. Replace the drawers into the filing cabinet.

f. Install the four self-locking nuts onto the four retaining bolts (from under the module) and tighten them.

g. Replace the first aid kit cabinet (refer Figure 34 and paragraph 84).

h. Replace the mudguard.

**NOTE**

Ensure all bolts and screws are tight.

i. Replace the jerrican stowage trays and the bin pack mounting frames (refer paragraph 75).

**Blackout Curtains**

87. **Replacement.** Replace the blackout curtains as follows:

a. Undo the press studs retaining the left and right blackout curtains to the module walls.

b. Drill out the rivets from both curtain rails (attached to the module ceiling).

c. Slide the keyrings (fitted through the curtain eyelets) off the curtain rails.

d. Place the new blackout curtains onto the curtain rails.

e. Align the curtain rails and rivet them into position.
Fibreglass Damage

88. All fibreglass damage repairs are to be carried out in accordance with EMEI Workshop D 210.

MODULE COOLING – GROUP 18

Air Conditioner Condenser Extractor Fans

89. Removal. Remove the extractor fans as follows:

**WARNING**

When servicing the air conditioning system, the refrigerant (HFC–134a) must be reclaimed for reuse. Do not vent the refrigerant to the atmosphere.

Always wear suitable eye protection and protective clothing. Contact of the liquid refrigerant with skin will cause frostbite. Ensure that the area is well ventilated, as the refrigerant gas is both colourless and odourless and may cause breathing difficulties in confined spaces due to a lack of oxygen. The refrigerant gas is non-flammable. However, ensure that there are no naked flames within the vicinity as toxic phosgene gas is produced when the refrigerant gas comes in contact with fire. Do not clean the air conditioning condenser with steam cleaning equipment, as the expansion of the refrigerant gas within, may cause excessively high pressures in the air conditioning system that may result in an explosion.

a. Disconnect the batteries and external power supply cables (if connected).

b. Remove the screws and clips securing the wire mesh protective screens to the airconditioner condenser cover panel (refer Figure 35).

c. Remove the mesh.

d. Remove the three screws securing the condenser cover panel to the module roof.

e. Raise the panel, taking care not to put strain on the fan electrical leads (refer Figure 36).
Tag and disconnect the electrical leads of the extractor fan to be removed, at the central junction (refer Figure 36).

- Pull the lead out of the cover.
- Remove the four extractor fan mounting screws.
- Remove the extractor fan.

**Installation**

- Install the extractor fans as follows:
  - Install the extractor fan on the airconditioner condenser cover.
  - Secure it with four mounting screws.
  - Feed the fan leads through the cover and connect the leads.
  - Install the condenser cover panel and secure it with the three mounting screws.
  - Install the wire mesh protective mounting screens and secure them with the mounting screws.
  - Connect the batteries and external power supply cables (if necessary).
  - Test the operation of the extractor fans.

**Air Conditioning System**

**Reclaiming**

- Reclaim the gas from the air conditioning system as follows:

  - Clean around the suction and discharge hoses (refer Figure 37) with a suitable cleaning agent, then blow dry using compressed air.

  **WARNING**

  When servicing the air conditioning system, the refrigerant (HFC–134a) must be reclaimed for reuse. Do not vent the refrigerant to the atmosphere.
Remove the caps from the air conditioning suction and discharge service valves.

Connect a suitable manifold gauge set to the suction and discharge service valves and the centre manifold gauge line to the vacuum pump inlet.

Ensure that the high and low sides of the manifold hand valves are closed.

Start the vacuum pump and slowly open the high side manifold hand valve to prevent oil being drawn from the compressor crankcase.

At this point of reclaiming, the compound gauge should register vacuum and the high side gauge should show a reading slightly below zero.

If the compound gauge fails to register, check the system for a possible blockage.

Open the low side manifold hand valve until the compound gauge reads 98.19 kPa.

Shut both manifold hand valves.

NOTE

The low side gauge should remain stationary for several minutes.

If the reading holds and the ambient temperatures are above 32°C, resume pump-down for 30 minutes.

If the ambient temperature is below 32°C or high humidity conditions prevail, continue pump-down for 45-65 minutes.

On completion of reclaiming, close both manifold hand valves.

92. Recharging. Recharge the air conditioning system as follows:

a. Reclaim the air conditioning system completely (refer to paragraph 91).

b. Connect the centre manifold gauge line to a refrigerant can or drum.

c. Purge the system by slackening the fittings on the manifold and expel the gases for a few seconds.

**CAUTION**

Do not open the high pressure valve or operate the compressor while charging the air conditioning system.

d. Partially charge the system with 170 g of HFC-134a by slowly opening the high side manifold hand valve; the compound gauge should register a pressure, if not, check the system for blockage.
Damage to the compressor will occur if the following instructions are not strictly adhered to.

e. Shut the high side manifold hand gauge.

f. Using a suitable hand tool, rotate the compressor clutch plate for 12 revolutions to ensure that no refrigerant in liquid form is trapped in the suction side of the compressor.

g. Check for leaks in the system.

Do not operate the compressor without refrigerant in the system as the compressor lubrication relies on refrigerant flow.

h. Switch on the motor and allow operating temperature to be achieved.

i. Switch on the air conditioning system and select high fan speed and full ventilation (refer Figure 38).

To complete charging of the system, slowly open the low side manifold hand valve until the compound gauge reads 275-345 kPa.

k. Observe the receiver/drier sight glass for conditions as indicated in Table 6.

l. When foam disappears add approximately 113 g of refrigerant.

m. Check that the unit operates satisfactorily.

n. Stop the motor, disconnect the gauges and replace the protective caps.

Air Conditioner Condenser

93. Removal. Remove the condenser as follows:

a. Remove the condenser guard and the condenser extractor fan assembly (refer to paragraph 89).

To avoid personal injury when reclaiming the air conditioning system refrigerant gas, wear suitable eye protection and protective clothing. Do not allow contact with the skin.

NOTE

When performing removal or installation functions on the area around the condenser, it is necessary to utilize an elevated construction to access the area.
b. Reclaim the refrigerant gas from the air conditioning system (refer to paragraph 91).

c. Disconnect the inlet and outlet pipes from the condenser (refer Figure 39).

d. Fit plastic plugs to all hoses and apertures and discard the O-rings.

![Figure 39  Inlet and Outlet Pipes Removal](image)

39. Inlet and Outlet Pipes Removal

e. Remove the screws retaining the receiver/drier to the condenser well base and remove the receiver/drier.

f. Remove the screws retaining the condenser to its mounting bracket.

g. Remove the condenser through the front vent aperture (left hand end first).

94. **Cleaning and Inspection.** Clean and inspect the condenser as follows:

a. Clean any build-up of debris from the condenser core cooling fins, using a suitable cleaning agent and blow dry with compressed air.

b. Check the condenser assembly for damage to the core or fins and replace as required.

c. Inspect the condenser assembly for leaks, cracks or holes and replace as required.

d. Inspect the mounting brackets for cracks, wear or damage and replace if necessary.

95. **Installation.** Install the condenser as follows:

a. Install the condenser through the front vent aperture right hand end first.

b. Install the condenser mounting screws and tighten them securely.

c. Install the receiver/drier on the condenser well base and secure it with mounting screws.

d. Remove the plastic plugs from the pipes and apertures.

e. Using new O-rings, connect the inlet and outlet hoses to the condenser and the receiver/drier.

f. Tighten the connections securely.

g. Recharge the system (refer to paragraph 92).

**Air Conditioner Compressor**

96. **Removal.** Remove the compressor as follows:

a. Reclaim the air conditioning refrigerant (refer to paragraph 91).

b. Disconnect the suction and discharge lines to the compressor (refer Figure 40).

c. Fit plastic plugs to all hoses and apertures and discard the O-rings.
d. Switch off the power selection switch at the circuit breaker and power selection panel.

**CAUTION**

Do not kink the suction and/or discharge hoses.

e. Remove the compressor sliding mount locking bolt and slide the compressor out.
f. Slacken the compressor drive belt adjusting bolt and remove the drive belt.
g. Disconnect the electrical lead to the magnetic clutch.
h. Remove the compressor mounting bolt.
i. Remove the compressor from the air conditioner locker.

**Installation.** Install the compressor as follows:

a. Position the compressor in the mounting bracket on the vehicle and install the securing bolt finger tight.
b. Install the drivebelt on the pulley and connect the clutch electrical lead.
c. Turn the compressor drivebelt adjusting bolt to obtain a belt deflection of 10-15 mm and tighten the mounting bolt.
d. Remove the plastic plugs from the pipes and apertures.
e. Using new O-rings, install the discharge and suction hoses to the compressor.
f. Remove the oil filler plug and fill the compressor with OM-70.
g. Slide the compressor and motor into the air conditioner locker.
h. Install the sliding mount locking bolts, washers and nuts.
i. Tighten the bolts securely.
j. Recharge the air conditioning system with refrigerant gas (refer to paragraph 92).

**Air Conditioner Receiver/Drier**

**Removal.** Remove the receiver/drier as follows:

a. Remove the condenser fan guard (refer to paragraph 89).
b. Reclaim the refrigerant gas from the air conditioning system (refer to paragraph 91).
c. Switch off the master switch at the main switch panel.
d. Tag and disconnect the wiring at the receiver/drier.
e. Crack open the union nuts connecting the inlet and liquid pipes to the receiver/drier.
f. Fully unscrew the nuts and disconnect the pipes.
g. Loosen the bolt securing the clamp to the receiver/drier.

h. Remove the receiver/drier from the clamp (refer Figure 41).

![Diagram of Receiver/Drier Removal]

**Figure 41** Receiver/Drier Removal

99. **Inspection.** Inspect the receiver/drier for correct sealing; no leaks should be evident, replace as necessary.

100. **Installation.** Install the receiver/drier as follows:
   a. Position the receiver/drier into the clamp, but do not tighten the clamp.
   b. Align the inlet and liquid pipes with their respective unions.
   c. Lubricate the threads and pipe flares with a small amount of OM-70.
   d. Connect and tighten the pipes securely to the receiver/drier.
   e. Tighten the receiver/drier clamp retaining bolt securely.
   f. Connect the receiver/drier wiring to the connector.
   g. Switch on the master switch at the main switch panel.
   h. Install the condenser fan guard (refer to paragraph 90).
   i. Recharge the air conditioning system with refrigerant gas (refer to paragraph 92).

**Air Conditioner Evaporator Unit**

101. **Removal.** Remove the evaporator unit as follows:
   a. Reclaim the refrigerant gas from the air conditioning system (refer to paragraph 91).
   b. Disconnect the batteries.
   c. Disconnect the four pin plug from the evaporator unit connector.
   d. Disconnect the inlet, liquid and drain hoses from the evaporator unit.
   e. Discard the O-rings.
   f. Support the evaporator.
   g. Remove the six nuts and washers securing the evaporator unit to the module ceiling (refer Figure 42) and remove the evaporator unit.
102. Installation. Install the evaporator unit as follows:
   a. Position the evaporator on the mounting points in the module ceiling.
   b. Install the six washers and nuts and tighten them securely.
   c. Lubricate all threads, pipe flares and new O-rings with OM-70.
   d. Connect the inlet and liquid hoses to the evaporator unit and tighten the connections securely.
   e. Connect the wiring to the evaporator connector four pin plug.
   f. Reconnect the batteries.
   g. Recharge the air conditioning system with refrigerant gas (refer to paragraph 92).
   h. Switch on the motor and test the air conditioning system for operation and leaks and rectify as necessary.

Air Conditioner Switch

103. Removal. Remove the switch as follows:
   a. Disconnect the batteries and external power input cables (if connected).
   b. Remove the screws securing the fascia to the air conditioner evaporator unit (on the inside of the module).
   c. Lower the fascia to gain access to the switch assembly wiring.
   d. Tag and disconnect the wiring connectors from the fan and air conditioner switch assembly.
   e. Remove the knob from the air conditioner switch lever.
   f. Remove the screws securing the air conditioner switch to the mounting bracket.
   g. Remove the switch.

104. Testing. Test the switch as follows:
   a. Using an ohmmeter, connect the probes to the terminals of the switch.
   b. With the switch in the OFF position, check that continuity does not exist.
   c. Move the switch lever to the COLD position and check that continuity exists.
   d. Replace the temperature control switch if it failed any of the tests.

105. Installation. Install the switch as follows:
   a. Position the air conditioner switch on the switch mounting bracket on the fascia and install the retaining screws.
   b. Adjust the position of the switch, then tighten the screws.
c. Raise the fascia to the evaporator unit and connect the wiring to the tagged positions.

d. Position the fascia on the evaporator unit.

e. Install and tighten the retaining screws.

f. Install the knob onto the switch lever.

g. Connect the batteries.

h. Connect a 240-volt supply to enable the air conditioner to run.

i. Operate the air conditioning unit and check the operation of the switch.

Expansion Valve

106. Replacement. Replace the expansion valve as follows:

a. Reclaim the refrigerant gas (refer to paragraph 91).

b. Remove the inlet line from the expansion valve.

c. Remove the expansion valve from the evaporator.

d. Install the new expansion valve on the evaporator.

e. Install the inlet line.

f. Recharge the air conditioner system with refrigerant gas (refer to paragraph 92).

Receiver/Drier Sight Glass Condition

107. The receiver/drier sight glass condition is detailed in Table 6.

Table 6 Receiver/Drier Sight Glass Condition

<table>
<thead>
<tr>
<th>Condition/Action</th>
<th>Almost No Refrigerant</th>
<th>Insufficient Refrigerant</th>
<th>Adequate Refrigerant</th>
<th>Too Much Refrigerant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature of high pressure and low pressure lines</td>
<td>Almost no difference between discharge and suction side temperature.</td>
<td>Discharge side is warm and suction side is fairly cold.</td>
<td>Discharge side is hot and suction side is cold.</td>
<td>Discharge side is abnormally hot.</td>
</tr>
<tr>
<td>State in sight glass.</td>
<td>Bubbles flow continuously.</td>
<td>The bubbles are seen at intervals of 1-2 seconds.</td>
<td>Almost transparent. Bubbles may appear when the air conditioner cuts in or out.</td>
<td>No bubbles can be seen.</td>
</tr>
<tr>
<td></td>
<td>Bubbles will disappear and something like a mist will flow when refrigerant is nearly gone.</td>
<td></td>
<td></td>
<td>No clear difference exists between these two conditions.</td>
</tr>
</tbody>
</table>
### Table 6  Receiver/Drier Sight Glass Condition (Continued)

<table>
<thead>
<tr>
<th>Condition/Action</th>
<th>Almost No Refrigerant</th>
<th>Insufficient Refrigerant</th>
<th>Adequate Refrigerant</th>
<th>Too Much Refrigerant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure of system.</td>
<td>Discharge side is abnormally low.</td>
<td>Both pressures on discharge and suction sides are slightly low.</td>
<td>Both pressures on discharge and suction sides are normal. At 29.4°C ambient and with the module temperature at 21.7°C the discharge pressure will be approximately 1515 kPa and the suction pressure will be 482 kPa.</td>
<td>Both pressures on discharge and suction sides are abnormally high.</td>
</tr>
<tr>
<td>Action required.</td>
<td>Stop compressor immediately and conduct an overall check.</td>
<td>Check for gas leakage, repair as required. Replenish and charge system.</td>
<td>Nil.</td>
<td>Discharge refrigerant from service valve of suction side.</td>
</tr>
</tbody>
</table>

### Air Conditioning Fault Finding

108. The air conditioning fault finding is detailed in Table 7.

#### Table 7  Air Conditioning Fault Finding

<table>
<thead>
<tr>
<th>Serial</th>
<th>Symptom</th>
<th>Probable Cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sweating or frosted expansion valve.</td>
<td>Clogged or restricted expansion valve.</td>
<td>Replace expansion valve and recharge system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Damaged or inoperative expansion valve.</td>
<td>Replace expansion valve and recharge system.</td>
</tr>
<tr>
<td>2</td>
<td>Sweating or frosted suction hose.</td>
<td>Faulty expansion valve.</td>
<td>Replace expansion valve and recharge system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Damaged or inoperative expansion valve.</td>
<td>Replace expansion valve and recharge system.</td>
</tr>
<tr>
<td>3</td>
<td>Warm air being discharged from air conditioning system.</td>
<td>Receiver/drier is saturated with moisture.</td>
<td>Reclaim air conditioning system, replace the receiver/drier (twice if necessary), completely evacuate the system (repeat one hour evacuation, three times), then recharge system.</td>
</tr>
<tr>
<td>4</td>
<td>Excessively hot suction hose.</td>
<td>Restricted or damaged condenser surface.</td>
<td>Clean and check condenser cooling fins.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Excessive amount of refrigerant gas.</td>
<td>Reclaim and recharge system to specification.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Internal restriction in the condenser.</td>
<td>Replace condenser and recharge system.</td>
</tr>
<tr>
<td>5</td>
<td>Frosted discharge hose.</td>
<td>Restriction in receiver/drier.</td>
<td>Replace receiver/drier and recharge system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Restriction in high pressure line.</td>
<td>Reclaim system, replace hose and recharge system.</td>
</tr>
<tr>
<td>6</td>
<td>Inadequate cooling action.</td>
<td>Damaged or inoperative air conditioning compressor.</td>
<td>Repair or replace the compressor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Insufficient refrigerant.</td>
<td>Reclaim and recharge the system.</td>
</tr>
<tr>
<td>7</td>
<td>Insufficient air.</td>
<td>Air inlet blocked.</td>
<td>Remove obstruction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blocked evaporator core.</td>
<td>Clean evaporator core with compressed air.</td>
</tr>
<tr>
<td>Serial</td>
<td>Symptom</td>
<td>Probable Cause</td>
<td>Action</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------</td>
<td>------------------------------------------------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>8</td>
<td>Compressor does not run.</td>
<td>Air conditioner circuit breaker switched off.</td>
<td>Check, repair cause and switch circuit breaker on.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pressure switch inoperative.</td>
<td>Replace switch.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compressor drive belt loose.</td>
<td>Adjust belt.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Excessive air gap in compressor/drive clutch.</td>
<td>Adjust air gap.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Faulty air conditioner drive motor relay.</td>
<td>Replace the relay.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drive motor inoperative.</td>
<td>Remove drive motor for repair.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air exhaust flap micro switch inoperative or flap not opened.</td>
<td>Replace micro switch and/or open air exhaust flap.</td>
</tr>
<tr>
<td>9</td>
<td>Low pressure too high.</td>
<td>Internal malfunction of compressor.</td>
<td>Repair or replace the compressor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Faulty expansion valve.</td>
<td>Replace the expansion valve.</td>
</tr>
<tr>
<td>10</td>
<td>Low pressure too low.</td>
<td>Insufficient refrigerant.</td>
<td>Reclaim and recharge the system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clogged receiver/drier.</td>
<td>Replace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frosted piping.</td>
<td>Clean or replace piping.</td>
</tr>
<tr>
<td>11</td>
<td>High pressure is too high.</td>
<td>Excessive refrigerant.</td>
<td>Reclaim the excess refrigerant.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Condenser fans faulty.</td>
<td>Replace or repair fans.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Condenser fins blocked.</td>
<td>Clean cooling fins</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air in system.</td>
<td>Reclaim or recharge the system.</td>
</tr>
<tr>
<td>12</td>
<td>High pressure too low.</td>
<td>Insufficient refrigerant.</td>
<td>Charge with refrigerant.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compressor malfunction.</td>
<td>Repair or replace the compressor.</td>
</tr>
</tbody>
</table>
Figure 43  Wiring Diagram (Module ERV)
Figure 44  Wiring Diagram (Comsec Repair)

END

Distribution List: VEH G 20.4 – Code 2 (Maint Level)
(Sponsor: LV SPO, SPO, Light B Vehicles)
(Authority: TRAMM)

VEHICLE G 103
Issue 3, May 07