

**TRUCK, CARRYALL, LIGHTWEIGHT, SENIOR COMMANDER, FFR, WINCH, MC2 —
LAND ROVER 110**

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, Carryall, Lightweight, Senior Commander, FFR, with winch. Where applicable, instructions for the adjustment, lubrication and minor servicing of these items are included.



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.



Before removing any electrical system components, disconnect the battery leads.

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 109, 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.



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 12042; and
 - (2) Equipment Kit SCES 12036;
- c. Block Scale 2406/31 – Special Tools for RAEME- B Vehicles – Truck, Utility and Truck, Light, MC2 (Land Rover Model 110);
- d. EMEI Electrical P 410 – Generator Engine Accessory, 28 Volt–100 Ampere – Data Summary;
- e. EMEI Vehicle A 029 – Vehicles General – Servicing of B Vehicles, Trailers, Motorcycles, Stationary Equipment, Auxillary and Small Engines;
- f. EMEI Vehicle A 291-5 – General Service B Vehicles Tyre Guide – Operating Instructions;

- g. EMEI Vehicle G 008-1 – Truck, Lightweight, MC2, All Types – Inspection of Towing Pintle Assembly;
- h. EMEI Vehicle G 103 – Truck, Utility, Lightweight , MC2, Land Rover 110 and Truck, Utility, Lightweight , W/Winch, MC2, Land Rover 110 – Light Grade Repair;
- i. EMEI Vehicle G 109 – Truck, Lightweight, MC2, Land Rover 110 4X4, All Types – Servicing Instruction;
- j. EMEI Vehicle G 140 – Truck, Carryall, Lightweight, Senior Commander, FFR, Winch, MC2, Land Rover 110 – Data Summary;
- k. EMEI Vehicle G 142 – Truck, Carryall, Lightweight, Senior Commander, FFR, Winch, MC2, Land Rover 110 – Technical Description;
- l. EMEI Vehicle G 144-1 – Truck, Carryall, Lightweight, Senior Commander, FFR, Winch, MC2, Land Rover 110 – Medium and Heavy Grade Repair;
- m. EMEI Workshop – D 701 Repair Policy for Equipment Painted in Polyurethane Paint; and
- n. RPS 02194.

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.

Location of Identification Numbers

- 10. The location of identification numbers on components of the vehicle is described in Table 1.

Table 1 Location of Identification Numbers

Serial	Identification Number	Location
1	Chassis number	Right hand side of the chassis, forward of the spring mounting turret
2	Chassis nameplate	Left hand seat box, in the cab
3	Engine number	Left hand side of the engine block
4	Injection pump identification	Side of the pump
5	Transmission and transfer case	Rear of the transfer case
6	Torque limiter	On rear end of the drive plate
7	Front axle number	Adjacent to the axle breather
8	Rear axle number	Adjacent to the axle breather

NOTE

NSN and Manufacturers part numbers and designations used in this EMEI were current at the date of issue. If twelve months or more have expired since issue, the NSN and Manufacturers part number should be checked for supersession.

List of Lubricants

- 11. A list of lubricants is detailed in Table 2.

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Table 2 List of Lubricants

Serial	Equipment	Lubricant	Capacity (litres)
1	Engine (including filter)	OMD-115	8.5
2	Transmission	OMD-115	2.7
3	Transfer case (with PTO)	OMD-115	5.8
4	Front differential	OEP-220	1.7
5	Rear differential	OEP-220	2.3
6	Swivel pin housings	Molytex grease	EP00 Sachet
7	Brake master cylinder	OX (Aust) 8	Fill to level
8	Clutch master cylinder	OX (Aust) 8	Fill to level
9	Steering box	OEP-220	0.45
10	Fanbelt jockey pulley	XG-274	As required
1	Wheel bearings	XG-274	As required
12	Winch rope	Rocol wire rope lube NSN 9510-66-150-1763	As required
13	Radiator inhibitor	Nalcool	As required (1:12 ratio)
14	Propeller shaft	XG-274	As required
15	Winch drive line	XG-274	As required
16	Winch	OEP-220	1.3

ENGINE – GROUP 1

Jockey Pulley

12. Removal. Remove the jockey pulley as follows:

- a. Slacken the adjusting bolt on the pulley arm (refer Figure 1).

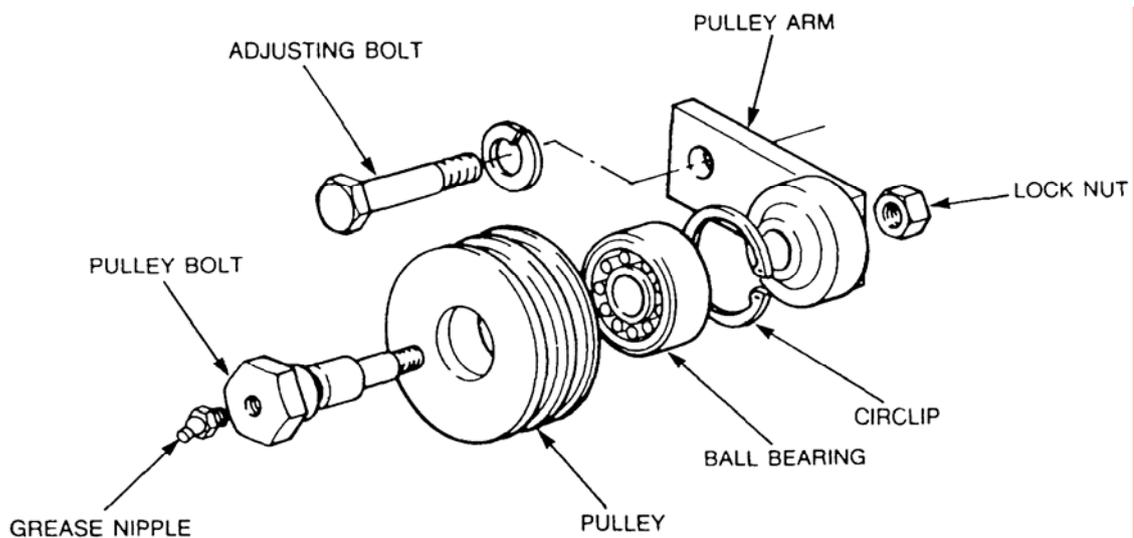


Figure 1 Jockey Pulley Exploded View

- 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.

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- 13. Disassembly.** Disassemble the jockey pulley as follows:
- Remove the grease nipple from the pulley bolt.
 - Secure the pulley arm in a vice.
 - Remove and discard the lock nut securing the pulley bolt.
 - Remove the pulley bolt and pulley.
 - Remove the internal circlip retaining the bearing in the pulley.
 - Remove the bearing from the pulley.
 - Clean and degrease the pulley.
- 14. Reassembly.** Reassemble the jockey pulley as follows:
- Install the bearing in the pulley.

NOTE

Ensure that the chamfered face is installed first.

- Insert the circlip into the pulley.
 - Install the pulley on the pulley arm with the circlip facing the arm boss.
 - Insert the pulley bolt and a new lock nut.
 - Install the grease nipple and lubricate with XG-274.
- 15. Installation.** Install the jockey pulley as follows:
- Align the pulley arm bolt hole with the mounting hole.
 - Insert the adjusting bolt.
 - Fit the two fanbelts in the pulley grooves.
 - Position the pulley arm to allow a deflection of 5–10 mm on the longest span of the belts.
 - Tighten the adjusting bolt securely.

COOLING SYSTEM – GROUP 2

Fanbelts

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

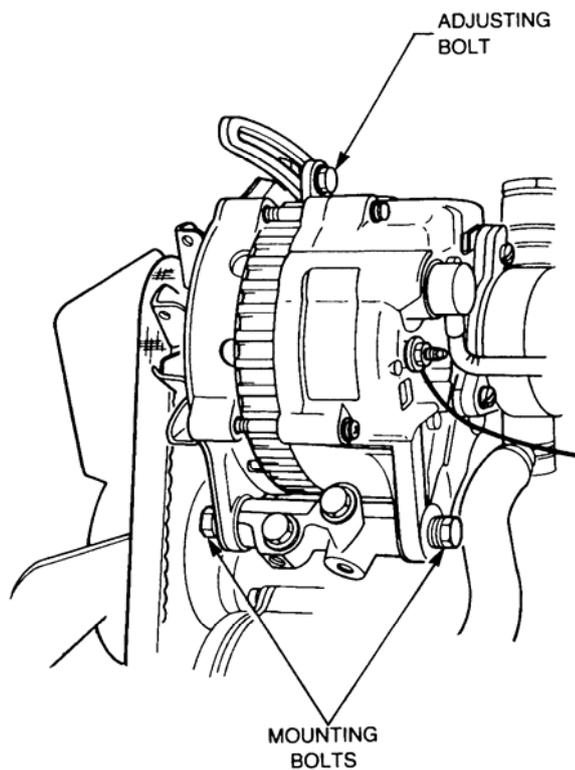


Figure 2 Fanbelt Replacement

- 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

- 17. The engine and cooling specifications are detailed in Table 3.

Table 3 Engine and Cooling Group Specifications

Serial	Description	Item	Specification
1	Fanbelt deflection	12 volt alternator	10–15 mm
		28 volt alternator	5–10 mm

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FUEL – GROUP 4

Fuel Tank Breather Pipe

18. **Removal.** Remove the fuel tank breather pipe as follows:
- Using a suitable drill, remove the rivet securing the breather pipe to the B pillar (refer Figure 3).

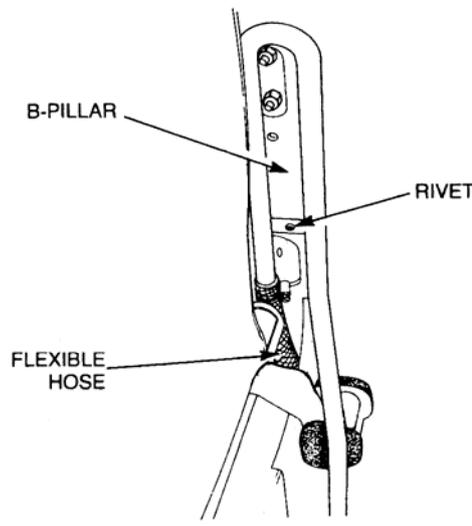


Figure 3 Fuel Tank Breather Pipe Removal

- Slacken the hose clamp securing the flexible hose to the breather pipe.
 - Withdraw the pipe.
19. **Installation.** Fit the breather pipe as follows:
- Fit the breather pipe in the flexible hose.
 - Align the mounting hole and secure the breather pipe with a new rivet.
 - Tighten the hose clamp securely.

Fuel Tank

20. **Removal.** Remove the fuel tank as follows:

NOTE

When fuel lines / pipes are disconnected they must be plugged to prevent the ingress of dirt.

- Clean the areas around the fuel pipes and blow dry with compressed air.
- Remove the hexagonal head drain plug from the fuel tank (refer Figure 4).
- Drain the fuel into a suitable container.
- Place a suitable support under the fuel tank.
- Remove the driver's side rubber mat and floor panel.
- Remove the bolt securing the front of the fuel tank to the chassis bracket.
- Loosen the bolts securing the fuel tank mounting bracket to the chassis.
- Move the bracket clear of the fuel tank.
- Loosen the hose clamp securing the breather pipe to the tank.
- Remove the hose from the fuel tank.
- Tag and remove the supply and return hoses from the tank sender unit and pick up pipe.

- l. Loosen the hose clamp securing the filler pipe to the tank.
- m. Remove the hose from the fuel tank.
- n. Disconnect the wiring harness from the tank sender unit.
- o. Remove the bolts securing the tank to the rear chassis bracket.
- p. Lower the tank from under the vehicle, carefully withdrawing the filler hose through the mounting brackets.

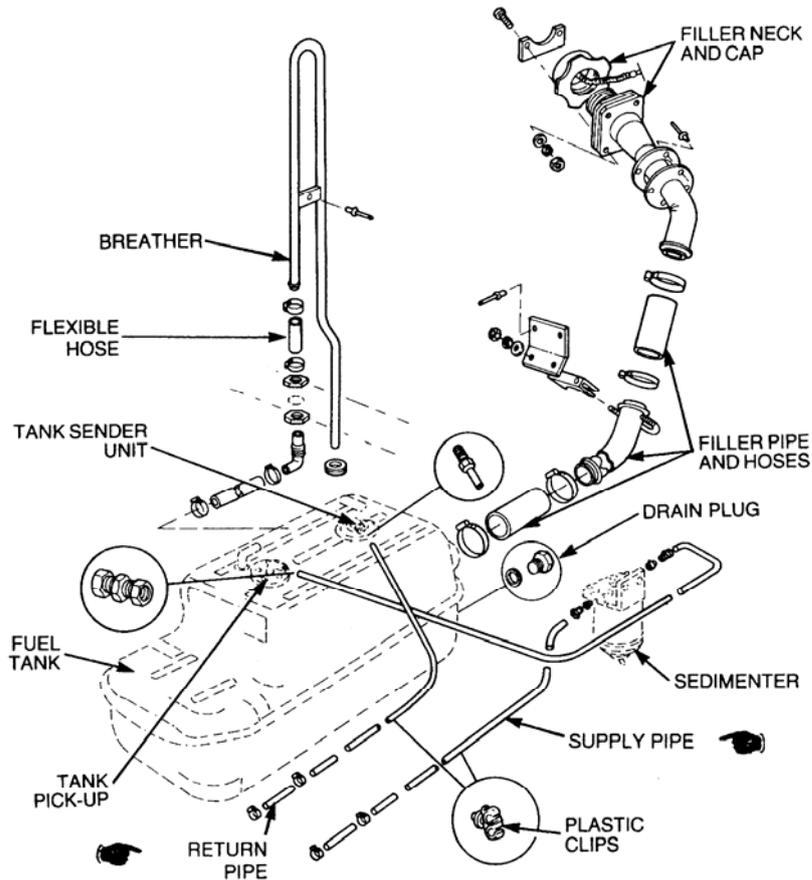


Figure 4 Fuel Tank Exploded View

21. **Installation.** Install the fuel tank as follows:
- a. Raise the fuel tank into position.
 - b. Install the tank front mounting bracket, the mounting bolts, nuts and new lock washers and tighten securely.
 - c. Secure the fuel tank to the front mounting bracket.
 - d. Install the supply and return fuel hoses onto the tank sender unit and pick up pipe and tighten the connectors securely.
 - e. Install the filler pipe and breather pipe hoses and tighten the hose clamps securely.
 - f. Install the bolts securing the tank to the rear chassis bracket and tighten securely.
 - g. Reconnect the wiring harness to the tank sender unit.
 - h. Install the drivers side rubber mat and floor panel.
 - i. Ensure the drain plug is tight and refill the fuel tank with clean fuel.
 - j. Bleed the fuel system as detailed in EMEI Vehicle G 103 – Group 4.

ELECTRICAL – GROUP 15

Alternator (28 Volt)

22. **Removal.** Remove the 28 volt alternator as follows:
- Disconnect the vehicle and FFR system batteries.
 - Cut the lock wire securing the cannon plug to the 28 volt alternator.
 - Remove the cannon plug.
 - Slacken the adjusting bolt on the pulley arm (refer Figure 1).
 - Detach the two fanbelts from the pulley.

WARNING

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

- Support the alternator, then remove the bolts that retain the alternator clamp rings to the mounting.
- Carefully remove the alternator from the vehicle.
- Discard the lock washers.
- Remove the bolts, nuts and washers that secure the clamp rings on the alternator.
- Remove the clamp rings.
- Discard the lock washers.

NOTE

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

23. **Installation.** Install the 28 volt alternator as follows:
- Fit the clamp rings onto the alternator and install the bolts, nuts and washers (refer Figure 5).

NOTE

Do not tighten at this stage.

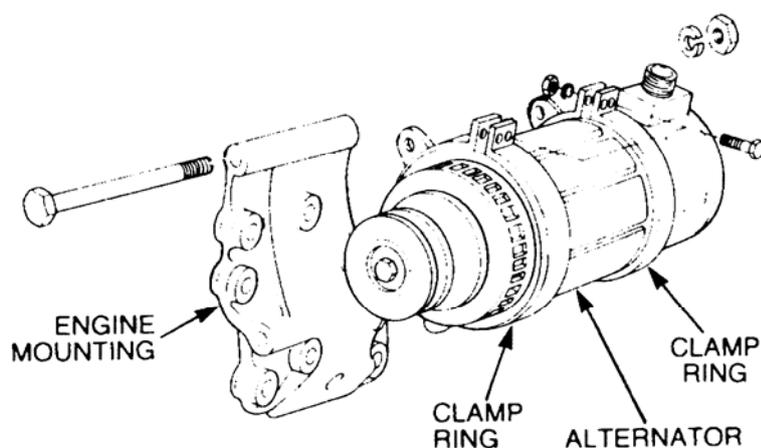


Figure 5 Alternator Installation

WARNING

The 28 volt alternator is heavy. Care must be taken on installation or personal injury may result.

- b. Support the alternator and clamp rings beside the engine mounting.
- c. Insert the bolts that secure the clamp rings to the mounting.
- d. Install the nuts and new lock washers and tighten securely.

NOTE

Ensure that the alternator and crankshaft pulleys are aligned by using a suitable straight edge.

- e. Connect the cannon plug,
- f. Tighten the nuts on the clamp rings securely.
- g. Fit the two fanbelts in the pulley grooves.
- h. Position the pulley arm to allow a deflection of 5–10 mm on the longest span of the belts.
- i. Tighten the adjusting bolt securely.
- j. Lock wire the cannon plug to the 28 volt alternator.
- k. Connect the vehicle and FFR system batteries.

Wiring Harness

24. **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 both alternators.

CAUTION

Reversing battery polarity will cause serious damage.

- d. When installing the batteries, ensure that the terminals are connected to the correct posts.
- e. The layout of the rear wiring harness for a vehicle fitted for radio is shown in Figure 6.

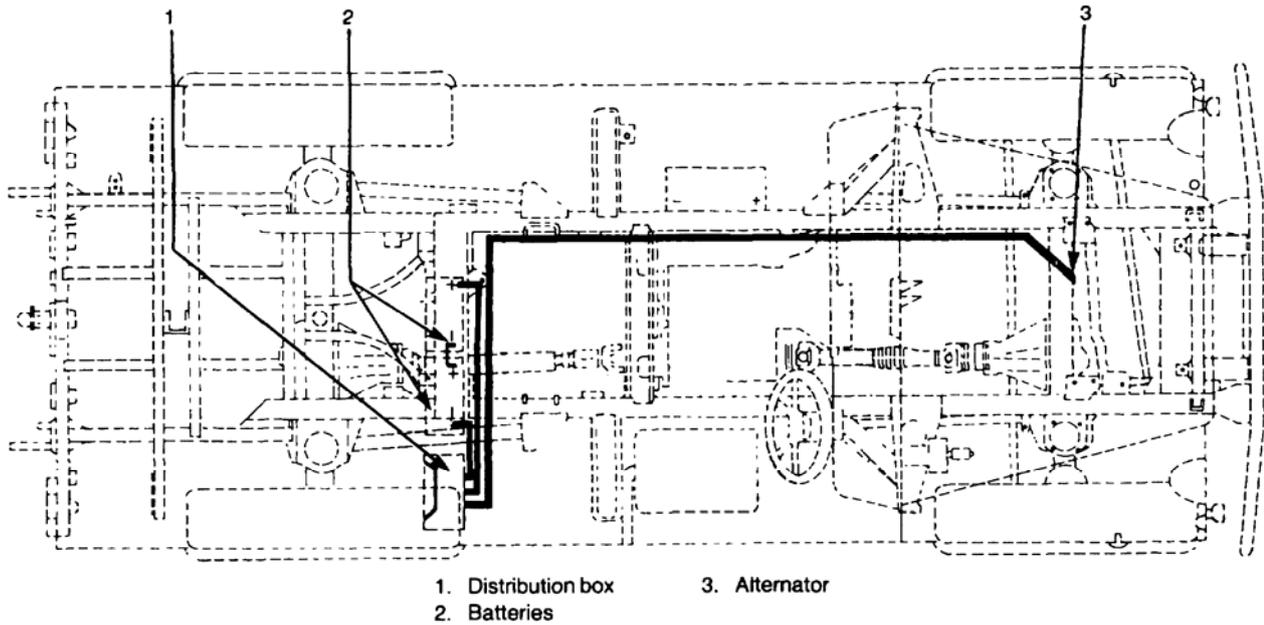


Figure 6 Rear Wiring Harness (FFR)

25. **Replacement.** Replace the wiring harness as follows:
- a. Disconnect the batteries, negative terminals first (refer Figure 7).

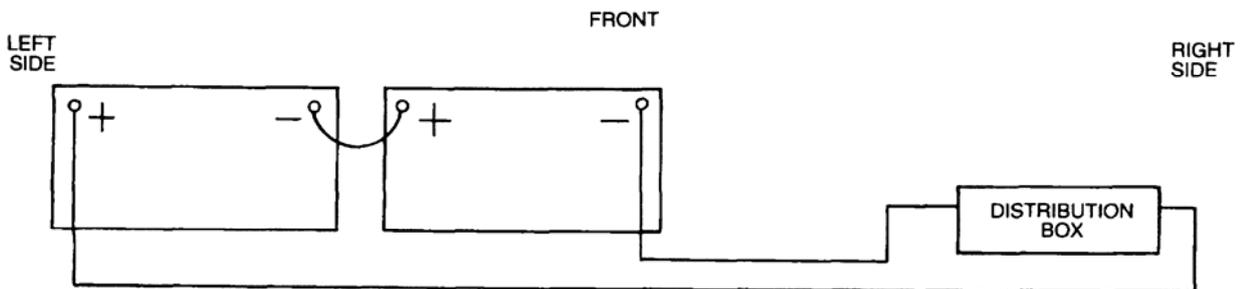


Figure 7 Batteries Installation

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 103, in conjunction with the relevant illustration, when replacing a wiring harness.

- 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 (28 Volt Installation)

26. **Replacement.** Replace the batteries (28 volt installation) as follows:
- a. Switch off the master switch on the power distribution box.
 - b. Raise the lid of the battery box to allow the battery cables to be exposed.
 - c. Disconnect the bridging cable from the batteries.

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- d. Remove the cable.
- e. Disconnect the remaining cables from the batteries.
- f. Remove the nuts and washers securing the battery retaining bracket and remove the bracket.
- g. Lift the batteries out of the battery carrier.
- h. Install the batteries in the battery carrier, ensuring that they are installed correctly.
- i. Secure the batteries with the retaining bracket.
- j. Connect the battery cables and bridging cable.
- k. Switch on the master switch on the power distribution box.
- l. Close the battery box lid and secure it with the two catches.

Electrical System (28 Volt) Fault Finding

27. The procedures for 28 volt electrical system fault finding are detailed in Table 4.

Table 4 Electrical System (28 Volt) Fault Finding

Serial	Symptom	Probable Cause	Action
1	Low reading on ammeter.	Loose fan belt.	Tighten to correct tension.
		Defective regulator.	Test / replace end bell assembly.
		Poor connection in charging circuit.	Rectify.
		Defective batteries.	Replace defective batteries.
		Defective rectifier.	Test / replace end bell assembly.
2	No reading on ammeter.	Open circuit regulator sensing line.	Test / rectify defective sensing line switch or relay.
		Defective fan belt.	Replace fan belt.
		Loose or disconnected Cannon plug.	Tighten plug.
		Open circuit in main circuit.	Test / rectify defect.
		Defective regulator.	Test / replace end bell assembly.
		Open circuit in RF filter capacitor(s).	Test / replace end bell assembly.
		Disconnected field leads.	Refit / tighten plugs.
		Open circuit batteries.	Test / replace batteries.
3	Alternator overheating.	Defective connection resulting in arcing.	Tighten connections.
		Restricted or blocked air grille.	Clean air grille.
		Alternator delivering maximum continuous output.	Check regulator sensing line for high resistance or poor connection.
		Defective regulator.	Test / replace end bell assembly.
		Rectifier diode(s) defective.	Test / replace end bell assembly.
		Defective batteries.	Test / replace batteries.
4	Alternator noisy.	Defective bearings.	Replace alternator.
		Loose fan or pulley.	Rectify.
		Loose alternator mountings.	Rectify.
		Defective rectifier.	Test / replace end bell assembly.

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Table 4 Electrical System (28 Volt) Fault Finding (Continued)

Serial	Symptom	Probable Cause	Action
5	Intermittent overcharging.	High resistance or poor connection in regulator sensing line.	Rectify.
		Defective regulator.	Test / replace end bell assembly.
		Loose battery terminals.	Rectify.
6	No reading on battery condition indicator when master switch is in the ON position.	Defective indicator.	Replace indicator.
		Open circuit in the power distribution box wiring harness.	Rectify.
		Defective fuse.	Replace fuse.
		Defective circuit breaker in the power distribution box.	Replace circuit breaker.
		Loose battery terminals.	Rectify.
7	Low reading on battery condition indicator when master switch is in the ON position.	Defective batteries.	Test / replace batteries.
		Defective indicator.	Replace indicator.
8	Hour meter not working.	Defective hour meter.	Replace hour meter.
		Open circuit in hour meter wiring.	Rectify.

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FRAME – GROUP 16

Towing Pintle

28. Replacement. Replace the towing pintle as follows:

- a. Support the weight of the towing pintle.
- b. Remove and discard the nuts, washers and bolts securing the towing pintle to the rear cross-member.
- c. Remove the towing pintle.
- d. Position the towing pintle on the rear cross-member.
- e. Install the new bolts, washers and nuts.
- f. Torque to 61 Nm (44 lb.ft).

WARNING

The wear limits shown in Figure 8 are only to be used in conjunction with tow coupling Part No. FV332153. For the wear limits of all other towing pintles refer to EMEI Vehicle G 008-1.

29. Cleaning and Inspection. Clean all parts in a suitable cleaning agent and inspect for excessive wear (refer Figure 8). Replace worn parts as necessary.

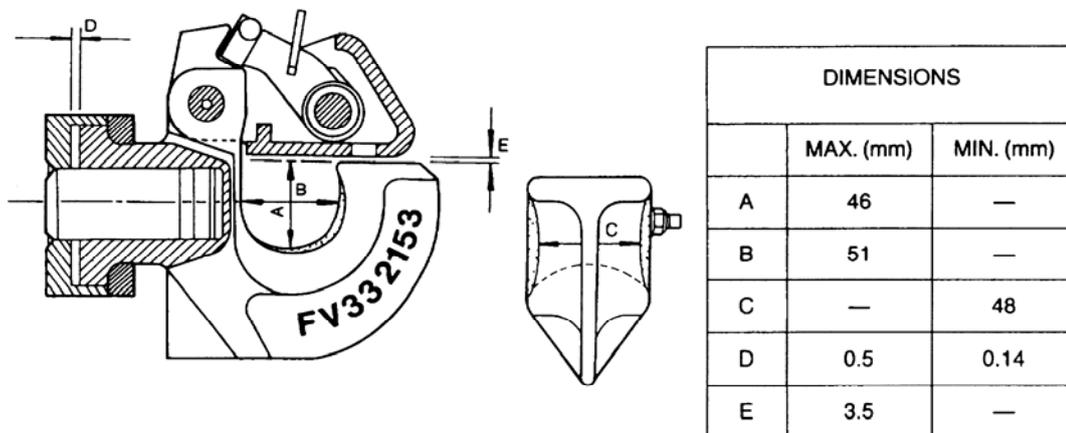


Figure 8 Towing Pintle Wear Limits

BODY – GROUP 17

Central Passenger Seat

30. Removal. Remove the central passenger seat as follows:

- a. Remove the bolts, washers and nuts retaining the lower section of the seat hinges to the body floor.
- b. Release the seat locking mechanism.
- c. Remove the seat assembly.

31. Installation. Install the central passenger seat as follows:

- a. Position the seat assembly in the vehicle and align the bolt holes.
- b. Install the bolts, washers and nuts that retain the seat hinges and tighten securely.

Rear Inward Facing Seats (Left or Right)

32. Removal. Remove the rear inward facing seats as follows:

- a. Remove the bolts, washers and nuts retaining the seat base to the wheel arch (refer Figure 9).
- b. Slide the seat base towards the centre of the vehicle, until the upper locating dowels on the frame are clear of the upper body capping.
- c. Remove the seat.

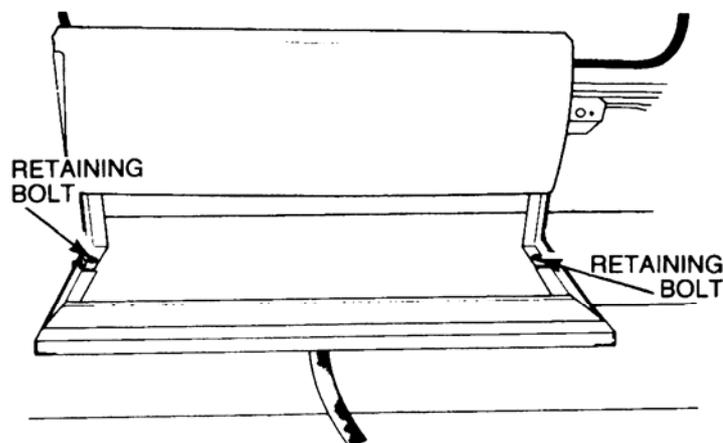


Figure 9 Left Side Rear Inward Facing Seat Removal

33. **Installation.** Install the rear inward facing seat as follows:
- Position the seat base so that the locating dowels are engaged in the upper body capping.
 - Slide the seat towards the outside until the holes align with the securing holes in the wheel arch.
 - Install the bolts, washers and nuts.
 - Tighten the nuts securely.

Front Door

34. **Removal.** Remove the front door as follows:
- Remove the split pin and clevis pin securing the door check link.
 - Support the door and remove the lock nuts, special plastic washers and bolts that secure the door to the A post.
 - Remove the door.
 - Place the door on a clean workbench with a soft protective covering to prevent damage to the door surface.
35. **Disassembly.** Disassemble the front door as follows:
- Prise the plastic cover (refer Figure 10) from the window winder handle.

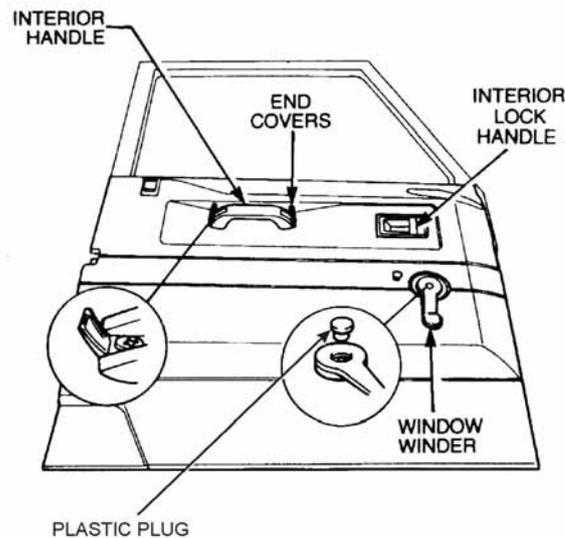


Figure 10 Window Winder Handle Removal

- Remove the securing screw.
- Remove the handle.
- Using a small screwdriver, prise the end covers from the interior handle (refer Figure 10).
- Remove the screws.
- Remove the handle from the door.
- Remove the plastic escutcheon from the lock button by depressing the locking tab with a small screwdriver (refer Figure 11).

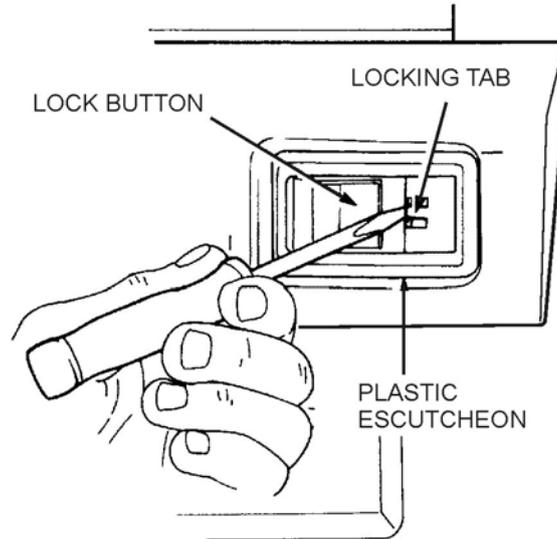


Figure 11 Door Lock Button Escutcheon Removal

- h. Remove the screws securing the interior lock handle bezel (refer Figure 11).
- i. Remove the bezel.
- j. Carefully prise the plastic trim fasteners from around the edge of the door trim, removing the corner fasteners first.
- k. Remove the trim (refer Figure 12).

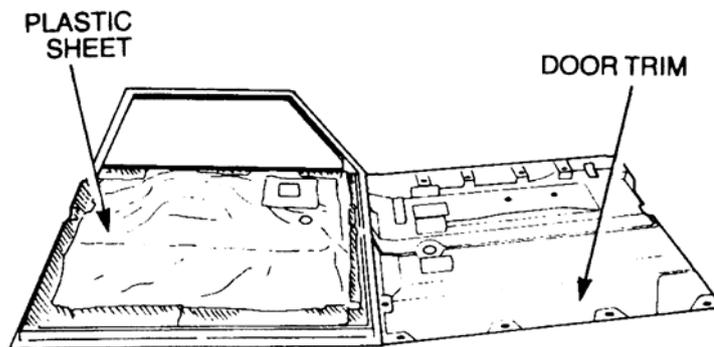


Figure 12 Door Trim Removal

- l. Remove the adhesive tape and plastic sheet from the door.
- m. Temporarily fit the window winder handle to allow the window to be lowered approximately half way.
- n. Disconnect the clip securing the lock handle rod to the door lock (refer Figure 13).
- o. Remove the screws securing the door lock to the door frame.

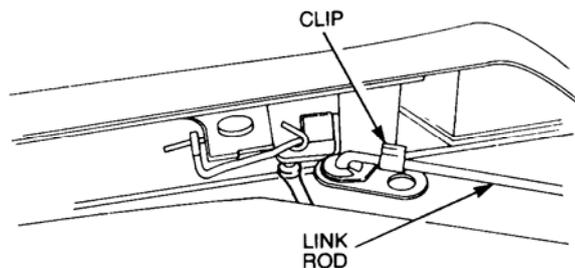


Figure 13 Door Lock Handle Link Rod Removal

- p. Raise the lock sufficiently to allow the link rod to be disconnected from the lock.

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- q. Remove the screws securing the inner panel (refer Figure 14).

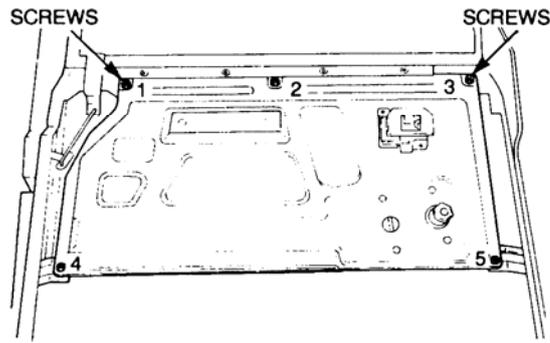


Figure 14 Door Inner Panel Removal

NOTE

It may be necessary to remove the screws and washers securing the interior lock handle and window regulator prior to removal of the inner panel.

- r. Slide the inner panel down to disengage it from the door frame.
- s. Slide the panel towards the front edge of the door to disengage the regulator rollers from the window lift channel.
- t. Remove the inner panel from the door (refer Figure 15).

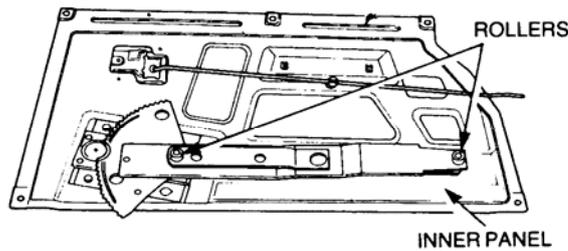


Figure 15 Window Regulator Roller Location

- u. Remove the recessed screws securing the lower end of the rear window channel (refer Figure 16).

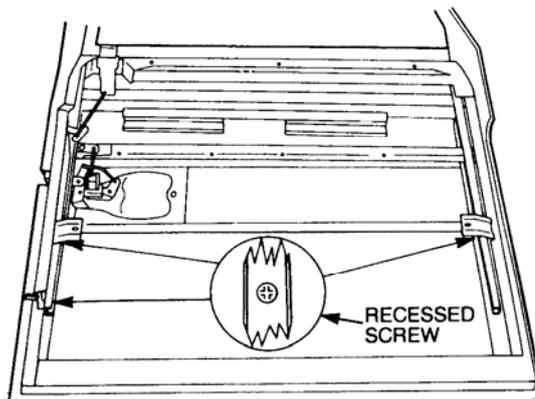


Figure 16 Window Channel Lower End Detachment

- v. Remove the screw securing the front channel.
- w. Remove the inner and outer waist seals (refer Figure 17).

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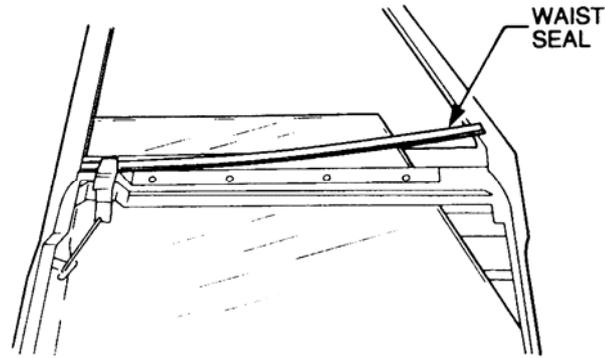


Figure 17 Window Glass Removal

- x. Slide the window down to the bottom of the door.
- y. Lift the lower edge of the window to clear the door frame and slide the window from the channels.

NOTE

It may be necessary to bend back the two lower inner panel mounting brackets to allow the window to clear the door frame.

- z. Remove the recessed screws securing the window channels (refer Figure 18).
- aa. Remove the channels, spacers and plastic fill channels.

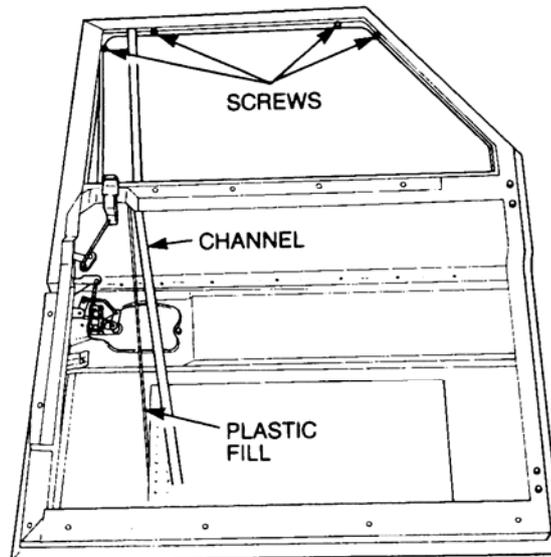


Figure 18 Window Channel Removal

- bb. Disconnect the outer handle link rod from the lock assembly (refer Figure 19).

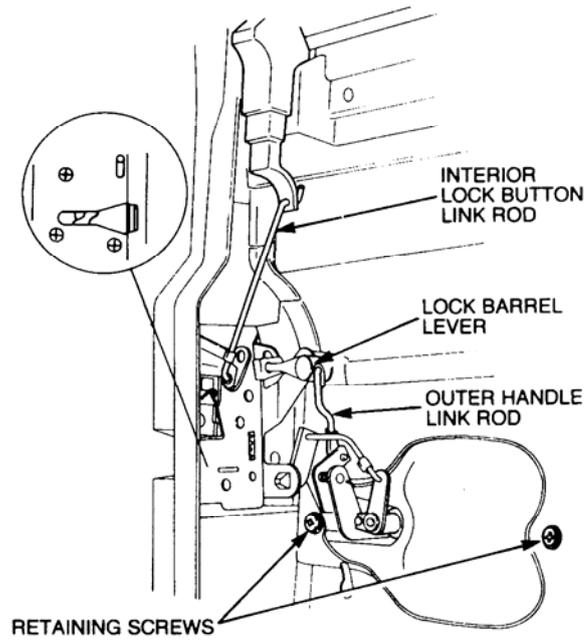


Figure 19 Door Lock Removal

- cc. Disconnect the interior lock button link rod from the lock assembly.
- dd. Remove the countersunk screws securing the door lock to the door.
- ee. Remove the lock.
- ff. Remove the recessed screws securing the outer door handle to the door (refer Figure 19).
- gg. Remove the handle and plastic seals.
- hh. Remove the screws securing the lock barrel lever to the lock barrel (refer Figure 20).
- ii. Remove the shouldered spacer, lever, spacer washer and sleeve.
- jj. Remove the insert and barrel.

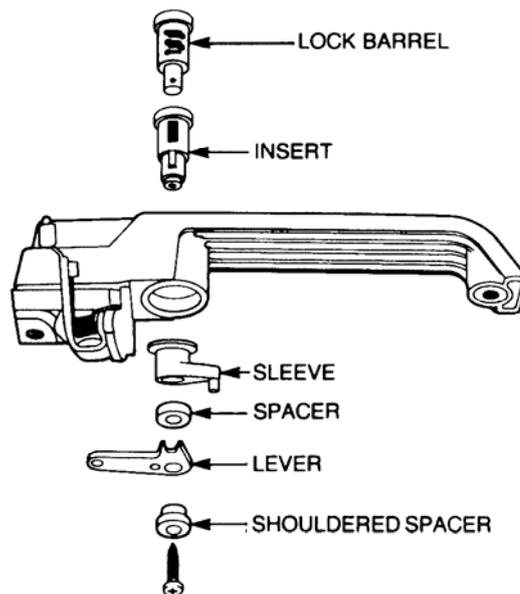


Figure 20 Lock Barrel Removal

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- kk. Press the locking pin on the barrel (refer Figure 21).

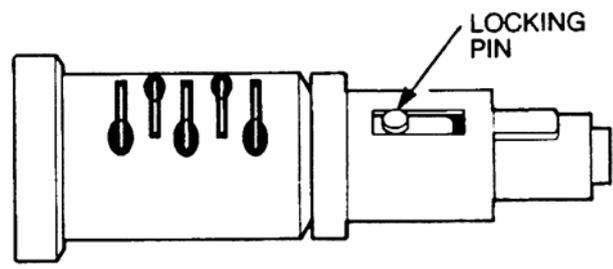


Figure 21 Lock Barrel Insert Removal

- ll. Remove the insert.
- mm. Remove the nuts, screws and nylon washers securing the door hinges to the door frame.
- nn. Remove the hinges.

36. **Reassembly.** Reassemble the front door as follows:

- a. Position the hinges on the door frame, then install the bolts.
- b. Fit the special plastic washers with the taper towards the door frame and install the lock nuts.
- c. Tighten the lock nuts securely.
- d. Fit the lock barrel into the insert.

NOTE

Ensure that the locking pin is correctly positioned (refer Figure 21).

- e. Install the barrel and insert into the handle.
- f. Fit the sleeve, spacer washer, lever and shouldered washer, ensuring that the letter L or R stamped on the lever is installed away from the handle.

NOTE

The lock barrel lever is marked with an L or R to correspond with the left or right side door handles.

- g. Position the new plastic gaskets (refer Figure 22) on the door handle.

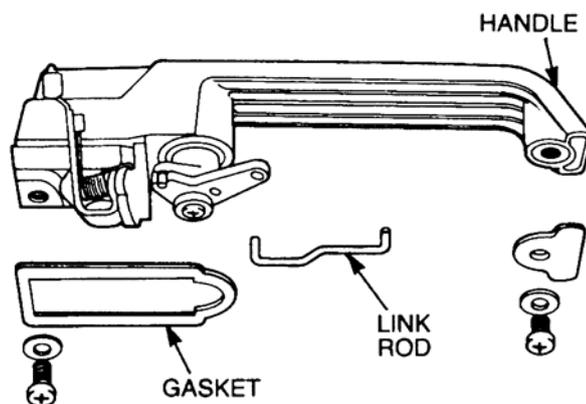


Figure 22 Door Handle Gaskets Installation

- h. Fit the handle to the door.
- i. Secure the handle with the screws and washers.
- j. Install the door lock assembly into the door frame and loosely fit the screws.

- k. Connect the link rods (refer Figure 19).
- l. Install the plastic fill channels and corner pieces on the door frame.
- m. Fit the window channels and spacers.
- n. Secure the channels with the recessed screws, except the two screws fitted to the bottom of the rear vertical channel (refer Figure 16).
- o. Insert the window glass into the channels and carefully slide the glass to the top of the door.

NOTE

Ensure that the glass slides freely.

- p. Secure the bottom of the vertical channels.
- q. Install the window regulator and interior lock handle on the inner panel and secure with the screws.
- r. Press the link rod into the plastic support clip (refer Figure 23).

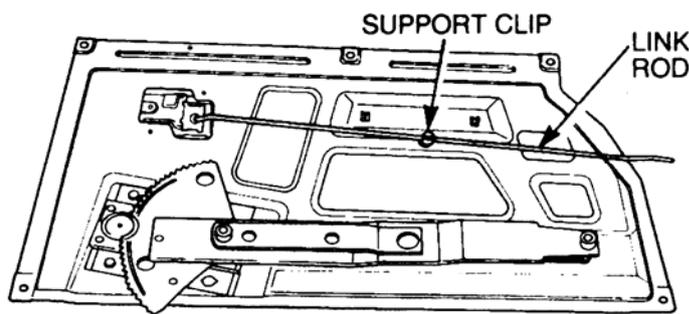


Figure 23 Window Regulator Installation

- s. Fit the inner panel into the door frame.

NOTE

Ensure the regulator rollers engage in the window lift channel.

- t. Connect the interior lock link rod to the lock assembly (refer Figure 24).
- u. Secure the inner panel to the door with the screws and tighten the screws retaining the door lock assembly.

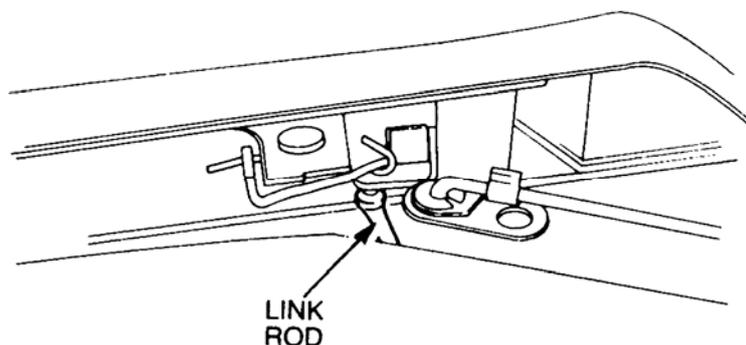
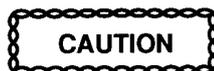


Figure 24 Door Lock Handle Link Rod Connection

- v. Lightly smear a suitable grease into the window lift channel.
- w. Install the plastic sheet onto the door, using new adhesive tape as required.
- x. Position the door trim on the door.
- y. Secure with the plastic trim fasteners.



Do not over tighten the screw.

- z.** Install the interior lock handle trim and secure the screw.
- aa.** Fit the lock button plastic escutcheon (refer Figure 11).
- bb.** Install the window winder and escutcheon and secure with the screw.
- cc.** Press in the plastic cover.
- dd.** Fit the grab handle and secure with the screws.
- ee.** Clip the end covers into place.

37. Installation. Install the front door as follows:

- a.** Support the door and position the hinges.
- b.** Install the bolts.
- c.** Fit the special plastic washers towards the door frame and install the lock nuts.
- d.** Tighten the lock nuts securely.
- e.** Ensure that the door lock aligns with the striker plate and, if necessary, slacken the bolts that secure the hinges to the A post, then retighten.
- f.** Install the check link into the firewall bracket.
- g.** Insert the clevis pin and flat washer.
- h.** Secure the clevis pin with a new split pin.

Rear Side Door

38. Removal. Remove the rear side door as follows:

- a.** Remove the lock nut securing the door check link.
- b.** Support the door and remove the lock nuts that secure the door to the B pillar.
- c.** Remove the special plastic washers and bolts.
- d.** Remove the door.
- e.** Place the door on a clean workbench with a soft protective covering to prevent damage to the door surface.

39. Disassembly. Disassemble the rear side door as follows:

- a.** Prise the plastic cover (refer Figure 25) from the window winder handle.
- b.** Remove the securing screw.
- c.** Remove the handle.
- d.** Using a small screwdriver, prise the end covers from the interior handle (refer Figure 25).

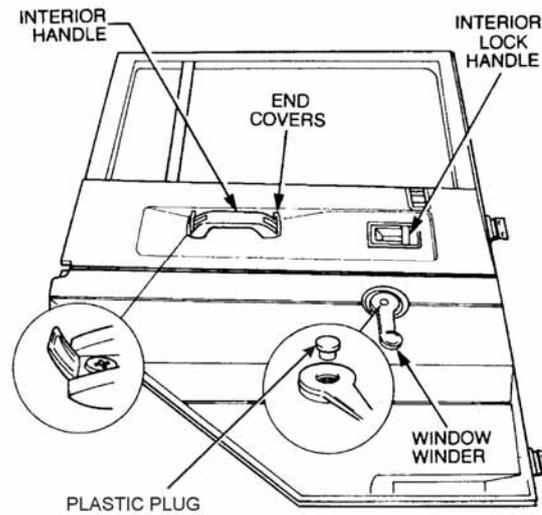


Figure 25 Window Winder Handle Removal

- e. Remove the screws.
- f. Remove the handle from the door.
- g. Remove the plastic escutcheon from the lock button by depressing the locking tab with a small screwdriver (refer Figure 11).
- h. Remove the screws securing the interior lock handle bezel (refer Figure 25).
- i. Remove the bezel.
- j. Carefully prise the plastic trim fasteners from around the edge of the door trim.
- k. Remove the trim (refer Figure 26),

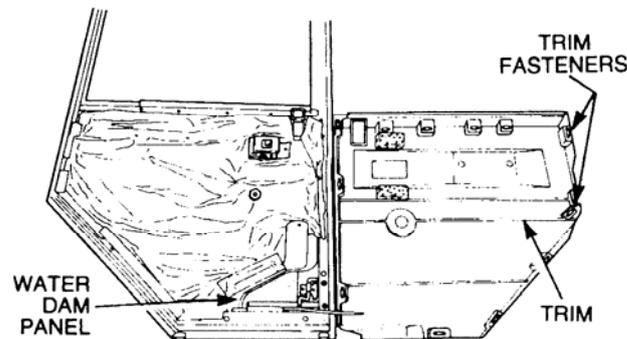


Figure 26 Rear Side Door Trim Removal

- l. Remove the screws and washers securing the water dam panel to the door frame.
- m. Remove the panel.
- n. Remove the adhesive tape and plastic sheet from the door.
- o. Temporarily fit the window winder handle to allow the window to be lowered approximately half way.
- p. Disconnect the clips and link rods from the interior door lock button.
- q. Disconnect the lock button link at the lock assembly.
- r. Disconnect the interior lock release link rod at the lock.
- s. Remove the hexagonal head screws securing the inner panel.

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- t. Slide the panel towards the the lock assembly to disengage the window regulator roller.
- u. Remove the panel (refer Figure 27).

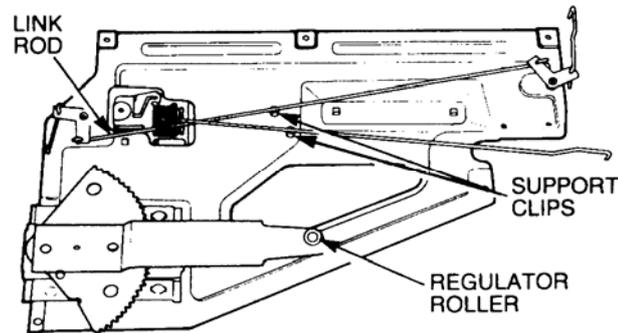


Figure 27 Rear Side Door Inner Panel Removal

- v. Remove the screws and washers securing the regulator assembly to the panel.
- w. Remove the regulator.
- x. Remove the pins from the centre of the bell crank lever pivots (refer Figure 28).

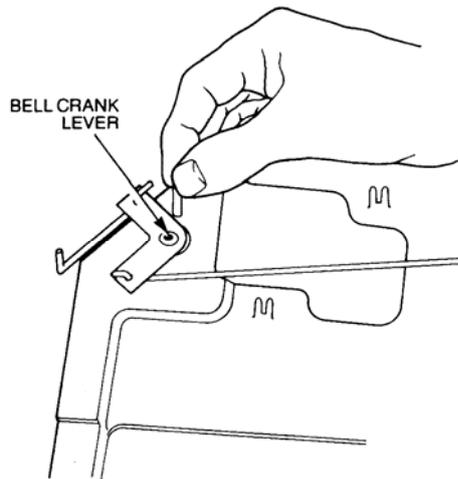


Figure 28 Link Rod Bell Crank Pivot Removal

- y. Remove the bell cranks and link rod.
- z. Remove the screws securing the interior lock handle.
- aa. Remove the handle.
- bb. Disconnect the outer handle link rod from the handle.
- cc. Remove the countersunk screws securing the lock assembly to the door (refer Figure 29).
- dd. Remove the lock.

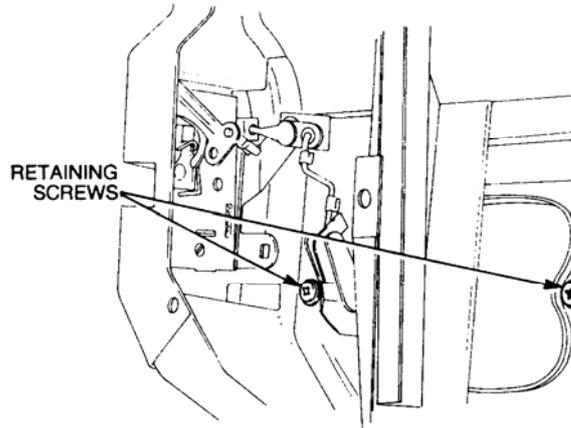


Figure 29 Rear Side Door Lock Removal

- ee. Remove the screws securing the outer door handle to the door.
- ff. Remove the handle and gaskets.
- gg. Loosen the nuts securing the door check link to the door (refer Figure 30).

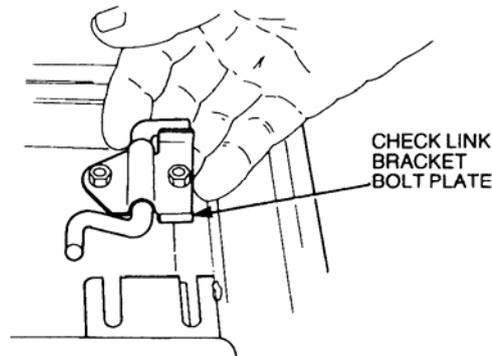


Figure 30 Check Link Bracket Removal

- hh. Remove the bracket and bolt plate as an assembly.
- ii. Remove the recessed screws securing the lower ends of the window channels to the door frame (refer Figure 31).

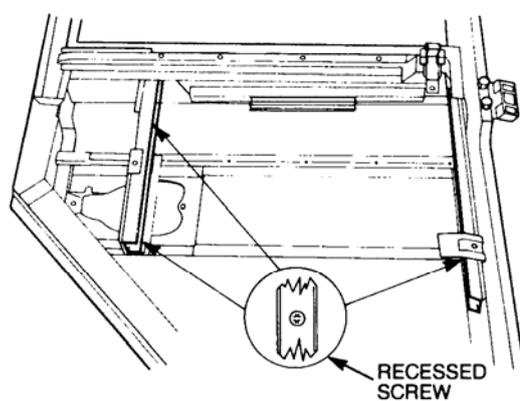


Figure 31 Window Channel Screws Removal

- jj. Using suitable pliers, bend the stop tab retaining the check link.
- kk. Remove the link.
- ll. Carefully bend back the bracket at the lower end of the forward channel (refer Figure 32).
- mm. Lift the lower edge of the glass.

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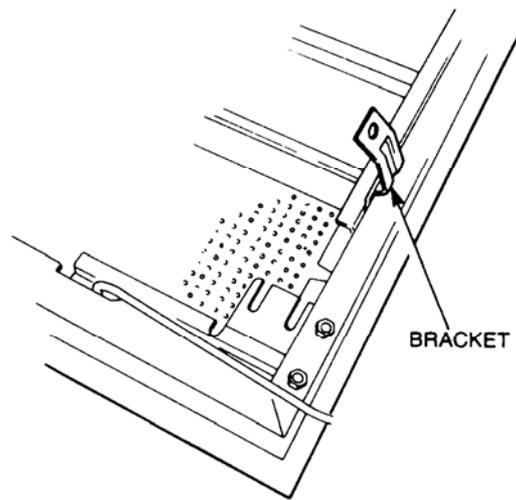


Figure 32 Window Glass Removal

- nn. Slide the window down and out of the channels.
- oo. Remove the inner and outer waist seals from the door flanges (refer Figure 33).

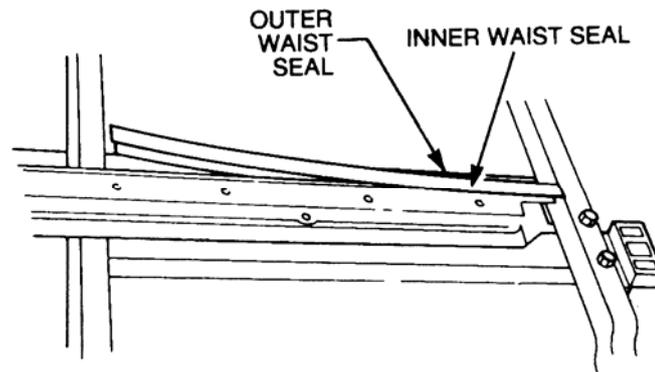


Figure 33 Window Waist Seals Removal

- pp. Slide the rear channel from the division channel.
- qq. Remove the screw securing the top of the division channel to the top of the door frame.
- rr. Remove the channel and spacers.
- ss. Remove the nuts, washers and screws securing the quarter window retention bracket to the frame (refer Figure 34).

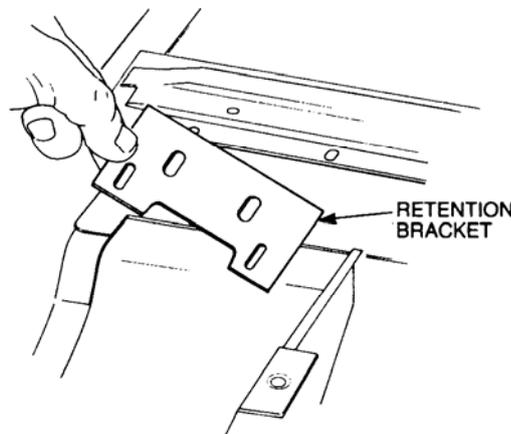


Figure 34 Quarter Window Retaining Bracket

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- tt. Remove the bracket.
- uu. Pull the forward channel from the glass (refer Figure 35).

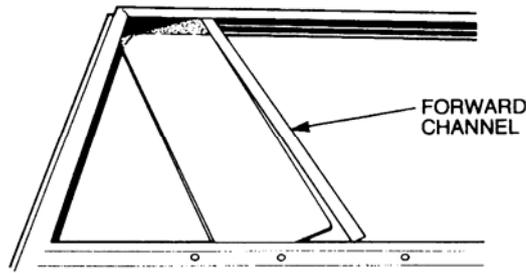


Figure 35 Quarter Window Glass Removal

- vv. Remove the glass.
- ww. Remove the screws securing the top and rear quarter window channels to the frame.
- xx. Remove the channels.
- yy. Remove the screws securing the top and forward window channels to the frame.
- zz. Remove the channels, plastic filler strips, spacer and corner piece.
- aaa. Remove the screws and washers securing the interior door lock button to the door frame (refer Figure 36).
- bbb. Remove the assembly.

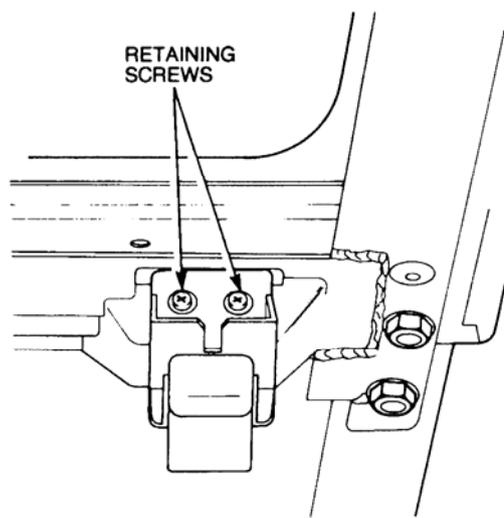


Figure 36 Interior Door Lock Button Removal

40. **Reassembly.** Reassemble the rear side door as follows:
- a. Install the interior door lock button and secure with the screws and washers (refer Figure 36).
 - b. Install the top, rear and forward plastic fill channels and two corner pieces on the door frame.
 - c. Install the quarter window channel with the open end uppermost.
 - d. Secure the rear channel to the frame with the two screws.
 - e. Install the top quarter window channel and carefully slide the glass into place.
 - f. Push the forward channel onto the glass.
 - g. Fit the quarter division channel.

NOTE

Ensure that it is correctly located on the window channel and in the slot provided in the top of the door frame.

- h.** Secure the top of the channel with the screw.
- i.** Install the quarter window retaining bracket (refer Figure 34).

NOTE

Ensure that the bracket is pushed hard against the window lower channel.

- j.** Fit the screws, new lock washers and nuts, then tighten securely.
- k.** Fit the forward and top window channels together with the shims.
- l.** Install the upper screws and tighten securely.
- m.** Install the rear window channel into the division channel.

NOTE

Ensure that the channel is pushed fully into the top of the door frame.

- n.** Position the window glass into the window channels, then raise the glass to the top of the door.
- o.** Align the lower channel mounting holes in the frame and secure with the screws (refer Figure 31).
- p.** Install the door check link into the slide and bend back the stop tab.
- q.** Bend the inner panel mounting (refer Figure 32) back into position.
- r.** Install the inner and outer waist rail seals on the door flanges (refer Figure 33).
- s.** Fit the new rubber gaskets to the door handle and install the handle on the door.
- t.** Install the screws.

NOTE

Ensure that the longest screw is fitted towards the front of the handle.

- u.** Install the door lock assembly in the door frame (refer Figure 29).
- v.** Secure with the countersunk screws.
- w.** Connect the link rod to the outer door handle and secure with the clip.
- x.** Position the window regulator on the inner panel and secure with the screws and washers.
- y.** Fit the internal door handle and link rod to the door frame.
- z.** Insert the screws and tighten securely.
- aa.** Press the link rod into the support clip (refer Figure 27).
- bb.** Install the bell crank levers and link rods onto the inner panel.
- cc.** Press the securing pins into the pivots and press the intermediate link rod into the upper support clip.
- dd.** Position the inner panel on the door frame and ensure that the window regulator roller engages in the window lift channels.
- ee.** Fit the top screws and the lower rear screw and washer, then tighten securely.
- ff.** Install the door check link torsion bar and bracket assembly (refer Figure 30).
- gg.** Tighten the nuts securely.
- hh.** Fit the water dam panel (refer Figure 26) and secure with the screw and washer.
- ii.** Fit the hexagonal head screw and washer, that secures the dam to the inner panel.
- jj.** Lightly smear a suitable grease into the window lift channel.

- kk. Install the plastic sheet onto the door using new adhesive tape as required.
- ll. Position the door trim on the door, then secure with the plastic fasteners.
- mm. Install the interior lock handle trim and secure with the screw.



Do not over tighten the screw.

- nn. Install the window winder handle and escutcheon and secure with the screw.
 - oo. Press in the plastic cover.
 - pp. Fit the grab handle and secure with the screws.
 - qq. Clip the end covers into place.
41. **Installation.** Install the rear side door as follows:
- a. Support the door and position the hinges.
 - b. Install the bolts.
 - c. Fit the special plastic washers towards the door frame and install the lock nuts.
 - d. Tighten the lock nuts securely.
 - e. Ensure that the door lock aligns with the striker plate and, if necessary, slacken the bolts that secure the hinges to the B pillar, then retighten.
 - f. Install the check link into the bracket and secure with a new lock nut.

Rear Door

42. **Removal.** Remove the rear door as follows:
- a. Remove the split pin securing the door check link clevis pin to the bracket.
 - b. Remove the washer and pin.
 - c. Disconnect the number plate lamp wiring at the connectors.
 - d. Support the door and remove the screws, tabs washers and nuts securing the hinge valves together (refer Figure 37).
 - e. Lift the door off the hinge halves.
 - f. Remove the brass inserts.

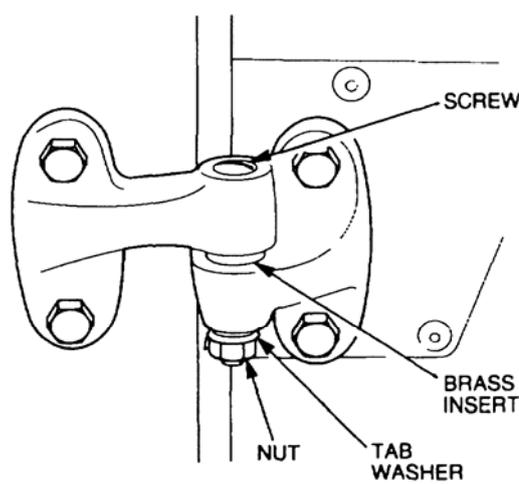


Figure 37 Rear Door Removal

- 43. Installation.** Install the rear door as follows:
- Position the brass inserts on the hinges.
 - Fit the door.
 - Install the screws, tab washers and nuts (refer Figure 37).
 - Tighten the nuts sufficiently to remove all slack.
 - Secure with the lock tab.

Rear Door Glass

- 44. Removal.** Remove the rear door glass as follows:
- Open the rear door.
 - Remove the screws securing the lower glass retainer to the door frame.
 - Remove the retainer (refer Figure 38).

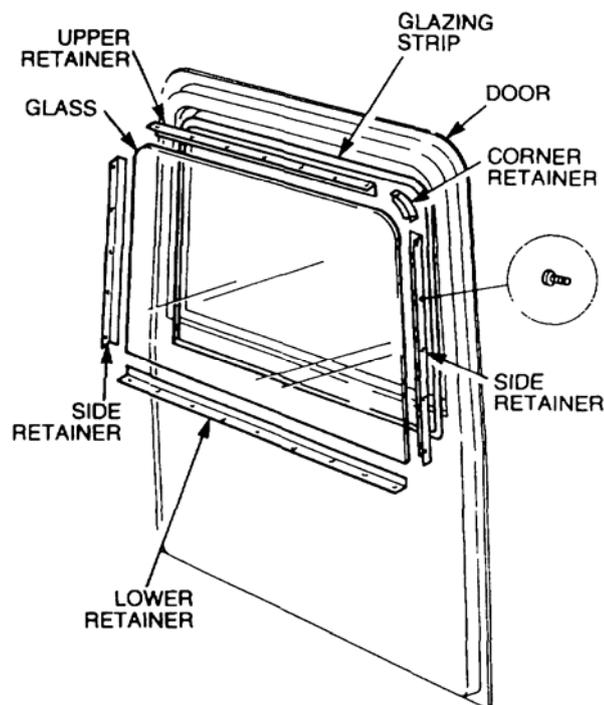


Figure 38 Rear Door Glass Removal

- Remove the screws securing each of the two side glass retainers to the door.
- Remove the two side glass retainers.
- Remove the screws securing each of the upper corner retainers to the door.
- Remove the upper corner retainers.
- Remove the screws securing the upper glass retainers to the door.
- Remove the upper glass retainers.
- Remove the glazing strip from around the inside of the window.
- Carefully push the glass inwards from the window aperture.
- Remove all traces of sealant used around the glass retainers and door.

45. **Installation.** Install the rear door glass as follows:
- Apply a thin bead of sealant around the window aperture.
 - Fit the glass.
 - Install a new glazing strip (refer Figure 38) on the inside of the window.
 - Fit all the retainers.
 - Tighten all the retaining screws securely.
 - Trim off any excess sealant.

Rear Side Window

46. **Replacement.** Replace the rear side window as follows:
- Remove the rubber filler strip from the groove in the glazing rubber (refer Figure 39) to expose the rivets.

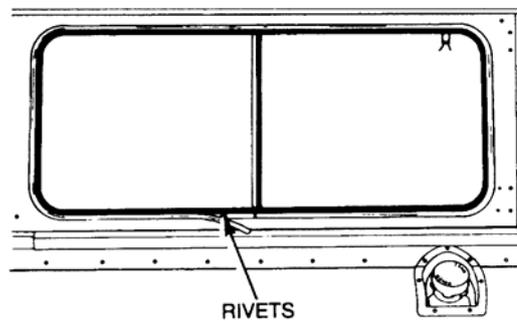


Figure 39 Filler Strip Removal

- Using a suitable drill, remove the rivets securing the window to the body side.
- Remove the window assembly.
- Remove the rubber filler strip from the inside groove at the front of the window frame (refer Figure 40).

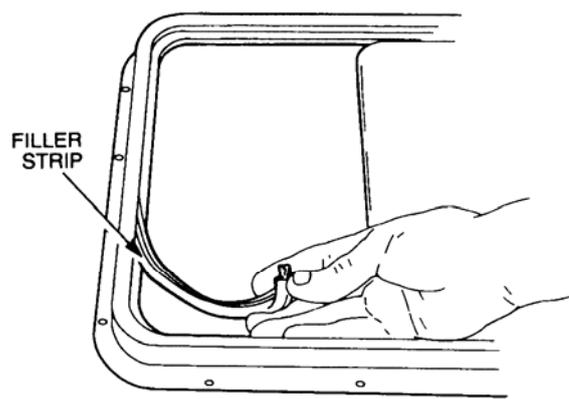


Figure 40 Forward Filler Strip Removal

- Remove the recessed screws securing the upper and lower halves of the window frame together (refer Figure 41).

NOTE

Two of the recessed screws retain the draught rail to the window frame.

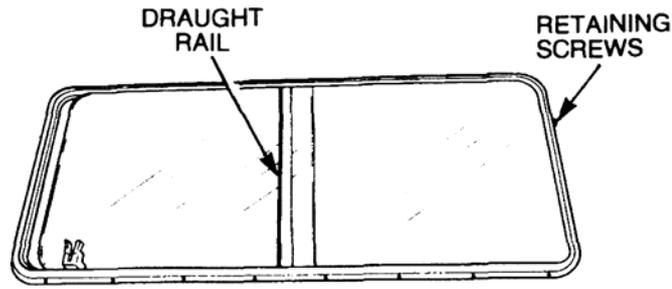


Figure 41 Window Frame Halves Removal



Do not pull the frame completely apart at this stage as damage to the felt channel could result.

- f. Carefully pull the frame halves apart sufficiently to allow the glass to be removed (refer Figure 42).

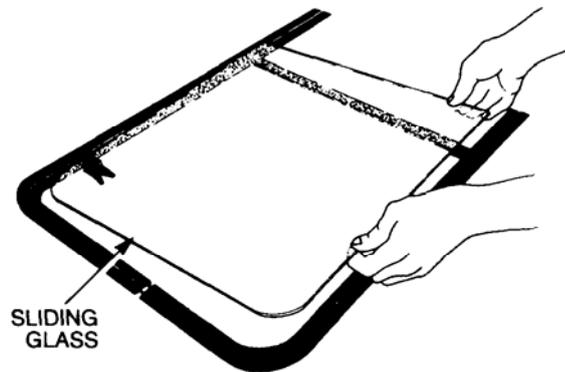


Figure 42 Sliding Glass Removal

- g. Remove the sliding glass.
- h. Carefully remove the fixed glass and draught rail from the glazing rubber (refer Figure 43).

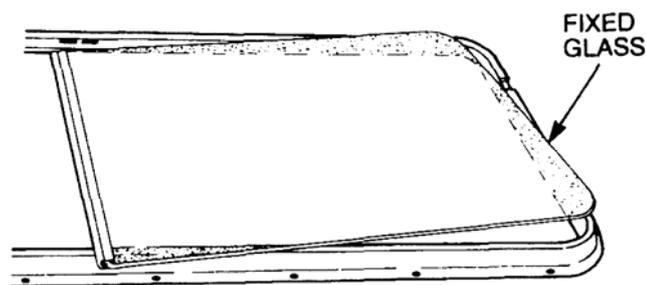
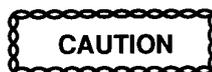


Figure 43 Fixed Glass Removal

Remove the glazing rubber from the frame.



Do not remove the felt channel, unless it is to be replaced as damage to the seal could result.

- i. If necessary, remove the felt seals (refer Figure 44).

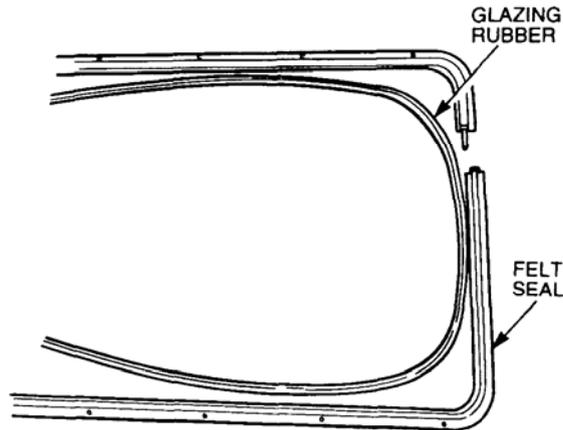


Figure 44 Glazing Rubber Removal

- j. Remove the draught rail seal by pulling it out of the groove (refer Figure 45).

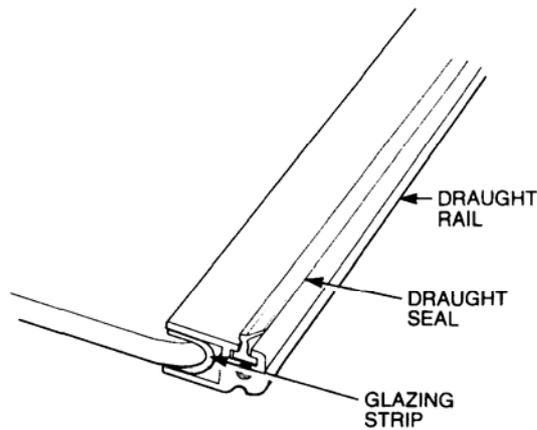


Figure 45 Draught Rail Removal

- k. Carefully tap the draught rail off the glass.
- l. Discard the glazing strip.
- m. Remove the screw securing the window catch to the sliding window (refer Figure 46).
- n. Remove the catch.

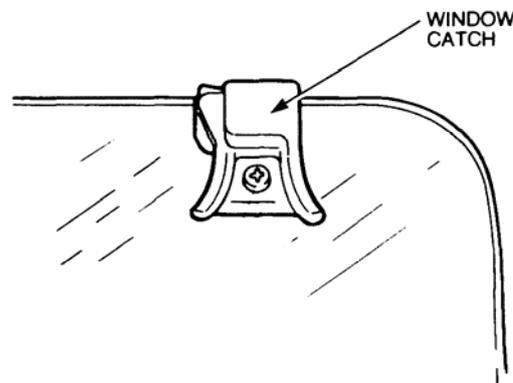


Figure 46 Window Catch Removal

- o. Apply a small amount of sealant around the catch mounting hole in the sliding window.
- p. Fit the catch.
- q. Secure with the screw.

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- r. Fit a new glazing strip on the sliding window.
- s. Apply a soapy solution to the glass.
- t. Using a soft-faced hammer tap the rail fully onto the strip and glass.
- u. Trim off any excess strip.
- v. Lubricate the draught rail seal with the soapy solution and fit the draught seal (refer Figure 45).
- w. Apply a soapy solution to the outside edge of the fixed window glass and position the glazing rubber around the glass.
- x. Locate the rubber around the glass, ensuring that the glass is located in the groove (refer Figure 47).

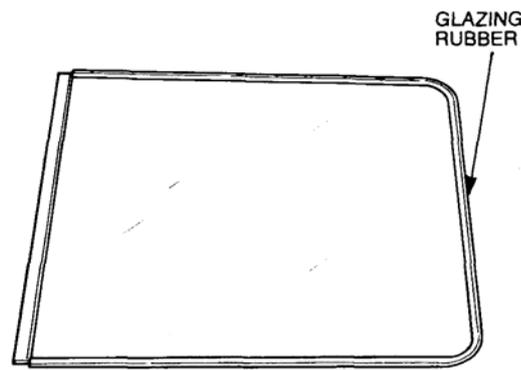


Figure 47 Fixed Window Rubber Installation

- y. Fit the sliding and fixed window glass into the frame.

NOTE

Ensure that the windows are in their respective channels and the fixed glass has the draught rail seal facing the sliding glass.

- z. Push the fixed window and seal into the channel as far as possible.
- aa. Install the screws to secure the two halves of the window frame together.
- bb. Apply pressure on the fixed glass and carefully ease the seal into the channel.
- cc. Using a small screwdriver, ensure that the seal is correctly located.
- dd. Check that the sliding glass moves freely and seats correctly in the felt channel when fully cleared.
- ee. Tighten the screws securely (refer Figure 41).
- ff. Fit the filler strip to the outer channel at the sliding glass end of the frame (refer Figure 40).
- gg. Remove all traces of sealant from the window frame aperture on the vehicle.
- hh. Install the new frame seal on the outside of the quarter panel.
- ii. Position the window frame in the body aperture and secure with rivets (refer Figure 39).
- jj. Install the frame filler strip.

END

Distribution List: **VEH G 16.6 – Code 2** (Maint Level)
(Sponsor: LV SPO, Light B Vehicles)
(Authority: TRAMM)