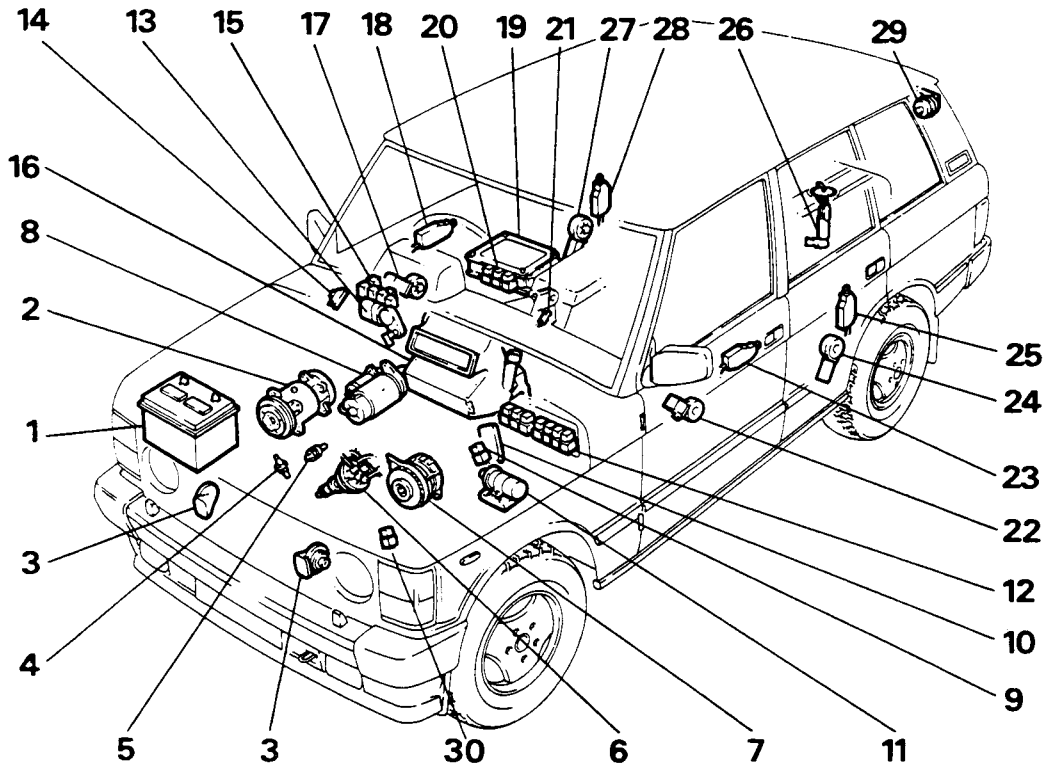


RR789M

LOCATION OF ELECTRICAL EQUIPMENT

1. Battery
2. Air conditioning compressor (if fitted)
3. Horns
4. Oil pressure switch
5. Water temperature switch
6. Electronic distributor
7. Alternator
8. Starter motor
9. Fuel shut-off relay (fuel injection models only)
10. Power resistor (fuel injection models only)
11. Coil and amplifier assembly
12. Relays
13. Wiper motor—front screen
14. Choke warning light switch (carburetter models only)
15. Relays
16. Heater
17. Window lift motor (front right-hand door)
18. Door lock actuator (front right-hand door)
19. Electronic control unit (fuel injection models only)
20. Relays (fuel injection models only)
21. Handbrake warning light switch
22. Window lift motor (front left-hand door)
23. Door lock actuator (front left-hand door)
24. Window lift motor (rear left-hand door)
25. Door lock actuator (rear left-hand door)
26. Electrical in-tank fuel pump
27. Window lift motor (rear right-hand door)
28. Door lock actuator (rear right-hand door)
29. Wiper motor—rear screen
30. Fuel cut-off relay (carburetter models only)

NOTE: Right-hand drive vehicle illustrated: Certain electrical components may change position on left-hand drive vehicles, but can be found in a similar location on the opposite side of the vehicle.

For full information on fuel injection related items—see fuel injection section of manual.

To identify individual relays (items 12 and 15) see relays in electrical section of manual.

FAULT DIAGNOSIS

SYMPTOM	*POSSIBLE CAUSE*	*CURE*
A— Battery in low state of charge	1. Broken or loose connection in alternator circuit	1. Examine the charging and field circuit wiring. Tighten any loose connections and renew any broken leads. Examine the battery connection
	2. Current voltage regulator not functioning correctly	2. Adjust or renew
	3. Slip rings greasy or dirty	3. Clean
	4. Brushes worn, not fitted correctly or wrong type	4. Renew
B— Battery overcharging, leading to burnt-out bulbs and frequent need for topping-up	1. Current voltage regulator not functioning correctly	1. Renew
C— Lamps giving insufficient illumination	1. Battery discharged	1. Charge the battery from an independent supply or by a long period of daylight running
	2. Bulbs discoloured through prolonged use	2. Renew
D— Lamps light when switched on but gradually fade out	1. Battery discharged	1. Charge the battery from an independent supply or by a long period of daylight running
E— Lights flicker	1. Loose connection	1. Tighten
F— Failure of lights	1. Battery discharged	1. Charge the battery from an independent supply or by a long period of daylight running
	2. Loose or broken connection	2. Locate and rectify
G— Starter motor lacks power or fails to turn engine	1. Stiff engine	1. Locate cause and remedy
	2. Battery discharged	2. Charge the battery either by a long period of daytime running or from independent electrical supply
	3. Broken or loose connection in starter circuit	3. Check and tighten all battery, starter and starter switch connections and check the cables connecting these units for damage
	4. Greasy or dirty slip rings	4. Clean
	5. Brushes worn, not fitted correctly or wrong type	5. Renew
	6. Brushes sticking in holders or incorrectly tensioned	6. Rectify
	7. Starter pinion jammed in mesh with flywheel	7. Remove starter motor and investigate
H— Starter noisy	1. Starter pinion or flywheel teeth chipped or damaged	1. Renew
	2. Starter motor loose on engine	2. Rectify, checking pinion and the flywheel for damage
	3. Armature shaft bearing	3. Renew
J— Starter operates but does not crank the engine	1. Pinion of starter does not engage with the flywheel	1. Check operation of starter solenoid. If correct, remove starter motor and investigate
K— Starter pinion will not disengage from the flywheel when the engine is running	1. Starter pinion jammed in mesh with the flywheel	1. Remove starter motor and investigate
L— Engine will not start	1. The starter will not turn the engine due to a discharged battery	1. The battery should be recharged by running the car for a long period during daylight or from an independent electrical supply
	2. Sparking plugs faulty, dirty or incorrect plug gaps	2. Rectify or renew
	3. Defective coil or distributor	3. Remove the lead from the centre distributor terminal and hold it approximately 6 mm (¼ in) from some metal part of the engine while the engine is being turned over. If the sparks jump the gap regularly, the coil and distributor are functioning correctly. Renew a defective coil or distributor
	4. A fault in the low tension wiring circuit	4. Examine all the ignition cables and check that the bottom terminals are secure and not
	5. Faulty amplifier	5. corroded
	6. Air gap out of adjustment	6. Check or renew
	7. Controls not set correctly or trouble other than ignition	7. Adjust See Starting Procedure in the Owner's Instruction Manual
M— Engine misfires	1. Distributor incorrectly set	1. Adjust
	2. Faulty coil or reluctor	2. Renew
	3. Faulty sparking plugs	3. Rectify
	4. Faulty carburetter	4. Check and rectify

Continued

SYMPTOM	*POSSIBLE CAUSE*	*CURE*
N— Frequent recharging of the battery necessary	1. Alternator inoperative	1. Check the brushes, cables and connections or renew the alternator
	2. Loose or corroded connections	2. Examine all connections, especially the battery terminals and earthing straps
	3. Slipping fan belt	3. Adjust
	4. Voltage control out of adjustment	4. Renew
	5. Excessive use of the starter motor	5. In the hands of the operator
	6. Vehicle operation confined largely to night driving	6. In the hands of the operator
	7. Abnormal accessory load	7. Superfluous electrical fittings such as extra lamps, etc.
	8. Internal discharge of the battery	8. Renew
P— Alternator not charging correctly	1. Slipping fan belt	1. Adjust
	2. Voltage control not operating correctly	2. Rectify or renew
	3. Greasy, charred or glazed slip rings	3. Clean
	4. Brushes worn, sticking or oily	4. Rectify or renew
	5. Shorted, open or burn-out field coils	5. Renew
Q— Alternator noisy	1. Worn, damaged or defective bearings	1. Renew
	2. Cracked or damaged pulley	2. Renew
	3. Alternator out of alignment	3. Rectify
	4. Alternator loose in mounting	4. Rectify
	5. Excessive brush noise	5. Check for rough or dirty slip rings, badly seating brushes, incorrect brush tension, loose brushes and loose field magnets. Rectify or renew
R— Defective distributor (refer to distributor overhaul and test procedure)	1. Air gap incorrectly set	1. Adjust
	2. Distributor cap cracked	2. Renew
	3. Faulty pick-up or reluctor	3. Renew
	4. Excessive wear in distributor shaft bushes, etc.	4. Renew
	5. Rotor arm and flash shield cracked or showing signs of tracking	5. Renew
S— Mixture control warning light fails to appear when engine reaches running temperature	1. Mixture control already pushed in	1. In the hands of the operator
	2. Broken connection in warning light circuit	2. Rectify
	3. Blown bulb	3. Renew
	4. Faulty thermostat switch (at cylinder head)	4. Renew
	5. Faulty manual switch (at mixture control)	5. Renew
	6. Broken operating mechanism at manual switch	6. Rectify
T— Mixture control warning light remains on with engine at running temperature	1. Mixture control out	1. Push control right in
	2. Faulty manual switch	2. Renew
	3. Broken operating mechanism at manual switch	3. Rectify
U— Poor performance of horns	1. Low voltage due to discharged battery	1. Recharge
	2. Bad connections in wiring	2. Carefully inspect all connections and horn push
	3. Loose fixing bolt	3. Rectify
	4. A faulty horn	4. Renew
V— Central door locking does not operate (on all four doors)	1. Battery discharged	1. Recharge
	2. Control unit in driver's door lock actuator faulty	2. Renew
	3. Loose or broken connection in driver's door	3. Locate and rectify
	4. Blown fuse	4. Rectify
W— Central door locking does not operate (on one door only)	1. Loose or broken connection	1. Locate and rectify
	2. Lock actuator failure	2. Renew
	3. Faulty lock	3. Rectify
	4. Mechanical linkages disconnected	4. Locate and rectify
X— Window lift will not operate	1. Motor failure	1. Renew
	2. Loose or broken connection	2. Locate and rectify
	3. Faulty switch	3. Renew
	4. Mechanical linkage faulty	4. Rectify
Y— Exterior mirrors fail to operate	1. Loose or broken connection	1. Locate and rectify
	2. Faulty switch	2. Renew
	3. Mirror motor failure	3. Renew

ELECTRICAL EQUIPMENT

DESCRIPTION

The electrical system is Negative earth, and it is most important to ensure correct polarity of the electrical connections at all times. Any incorrect connections made when reconnecting cables may cause irreparable damage to the semiconductor devices used in the alternator and regulator. Incorrect polarity would also seriously damage any transistorised equipment such as radio and tachometer etc.

Before carrying out any repairs or maintenance to an electrical component, always disconnect the battery.

ALTERNATOR

The V-drive fan belt used with alternators is not the same as that used with d.c. machines. Only use the correct Rover replacement fan belt. Occasionally check that the engine and alternator pulleys are accurately aligned.

It is essential that good electrical connections are maintained at all times. Of particular importance are those in the charging circuit (including those at the battery) which should be occasionally inspected to see that they are clean and tight. In this way any significant increase in circuit resistance can be prevented.

Do not disconnect battery cables while the engine is running or damage to the semi-conductor devices may occur. It is also inadvisable to break or make any connections in the alternator charging and control circuits while the engine is running.

The Model 15TR electronic voltage regulator employs micro-circuit techniques resulting in improved performance under difficult service conditions. The whole assembly is encapsulated in silicone rubber and housed in an aluminium heat sink, ensuring complete protection against the adverse effects of temperature, dust, and moisture etc.

The regulating voltage is set during manufacture to give the required regulating voltage range of 14.2 ± 0.2 volts, and no adjustment is necessary. The only maintenance needed is the occasional check on terminal connections and wiping with a clean dry cloth.

The alternator system provides for direct connection of a charge (ignition) indicator warning light, and eliminates the need for a field switching relay or warning light control unit. As the warning lamp is connected in the charging circuit, lamp failure will cause loss of charge. Lamp should be checked regularly and a spare carried.

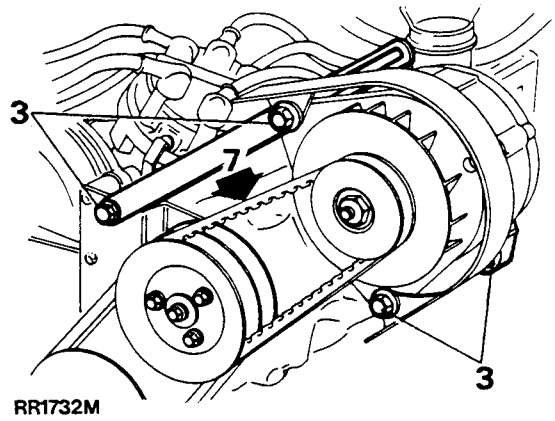
When using rapid charge equipment to re-charge the battery, the battery must be disconnected from the vehicle.

ALTERNATOR

Remove and refit

Removing

1. Disconnect battery earth lead.
2. Disconnect leads from alternator.
3. Slacken alternator fixings, pivot alternator inwards and remove fan belt.
4. Remove alternator.



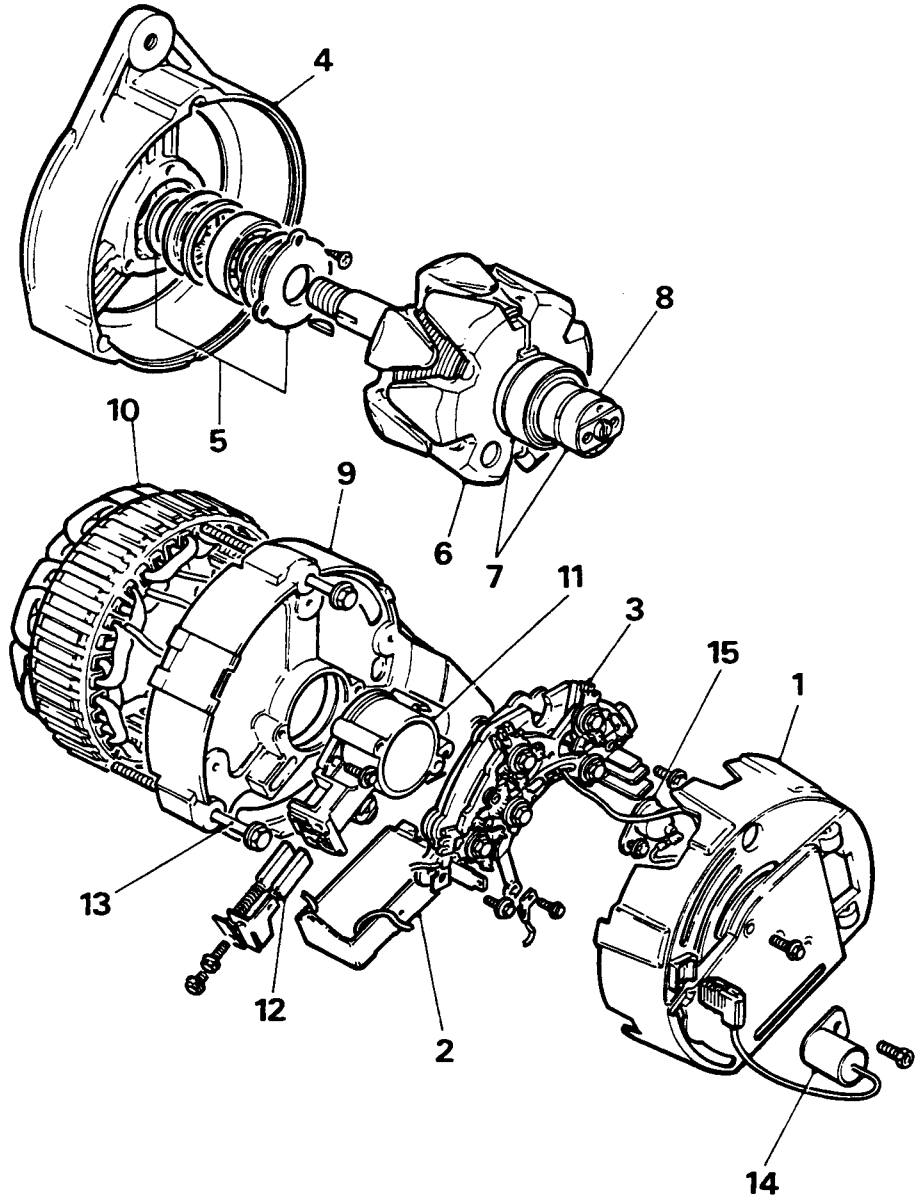
RR1732M

Refitting

5. Attach the alternator lower fixing bolts and nuts.

NOTE: The fan guard is attached to the front fixing and the adjustment bracket bolt.

6. Slacken the alternator adjustment bracket and attach the alternator to the bracket.
7. Fit the fan belt and adjust the belt tension.
8. Connect the wiring plug to the alternator.
9. Connect the battery.



RR171M

Alternator type 133/65

1. Cover
2. Regulator
3. Rectifier
4. Drive end bracket
5. Bearing assembly
6. Rotor
7. Slip ring end bearing
8. Slip rings
9. Slip ring end bracket
10. Stator
11. Brush box
12. Brushes
13. Through bolt
14. Suppressor
15. Surge protection diode

ALTERNATOR — Lucas — 133/65

Overhaul

Including Test (Bench)

NOTE: Alternator charging circuit — The ignition warning light is connected in series with the alternator field circuit. Bulb failure would prevent the alternator charging, except at very high engine speeds, therefore, the bulb should be checked before suspecting an alternator failure.

Precautions

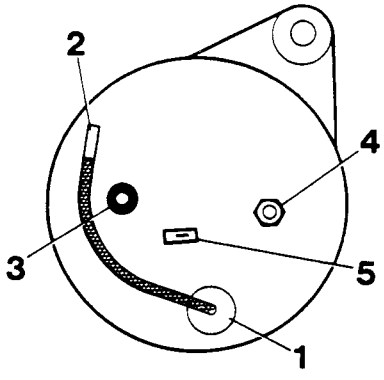
Battery polarity is NEGATIVE EARTH, which must be maintained at all times.

No separate control unit is fitted; instead a voltage regulator of micro-circuit construction is incorporated on the slip ring end bracket, inside the alternator cover.

Battery voltage is applied to the alternator output cable even when the ignition is switched off, the battery must be disconnected before commencing any work on the alternator. The battery must also be disconnected when repairs to the body structure are being done by arc welding.

Surge protection device

Some protection of the alternator is provided by a surge protection device, to absorb high transient voltages.



RR 172M

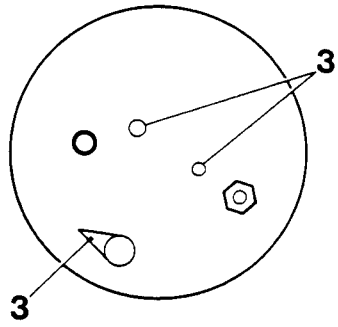
1. Suppression capacitor
2. Positive suppression terminal
3. IND terminal
4. + output terminal
5. Sensing terminal

Testing in position

Surge protection device

If the alternator output falls to zero, the fault may be caused by the surge protection device failing safe, short-circuit, or a fault in the alternator circuit. Check the surge protection device as follows:

1. Check that the fan belt is correctly tensioned.
2. Withdraw the connectors from the alternator.
3. Disconnect the suppressor and remove the alternator cover.



RR 173M

4. Remove the surge protection device.
5. Refit the alternator cover, and connectors. Ensure that all circuit connections are clean and tight.
6. Start and run the engine. If the alternator output is now normal, fit a new surge protection device.

Output test

7. Check that the fan belt is correctly tensioned and that all charging circuit connections are secure.
8. Run the engine at fast idle until normal operating temperature is attained.
9. Stop the engine.
10. Withdraw the connectors from the alternator.
11. Disconnect the suppressor and remove the alternator cover.
12. Connect the regulator case to the alternator frame.
13. Connect a 0–60 ammeter between the alternator and the battery.
14. Connect a 0–20 voltmeter across the battery terminals.
15. Connect a 15 ohm 35 amp variable resistor across the battery terminals.

CAUTION: Do not leave the variable resistor connected across the battery terminals for longer than is necessary to carry out the following test, items 16 and 17.

16. Start the engine and run at 750 rev/min. The warning light bulb should be extinguished.

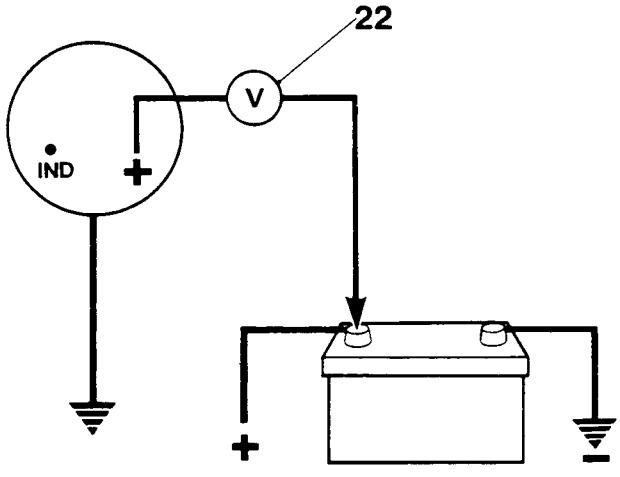
17. Increase the engine speed to 3000 rev/min, and adjust the variable resistance until the voltmeter reads 13.6 volts. The ammeter reading should then be approximately 60 amps. Any appreciable deviation from this figure will necessitate removing and dismantling the alternator. If the output test is satisfactory, proceed with the regulator test.

Regulator test

18. Disconnect the variable resistor and remove the connection between the regulator and the alternator frame.
19. With the remainder of the circuit connected as for the alternator output test, start the engine and run at 3000 rev/min, until the ammeter shows an output current of less than 10 amperes.
20. The voltmeter should now give a reading of 13.6 to 14.4 volts. Any appreciable deviation from this (regulating) voltage indicates a faulty regulator which must be replaced.
21. If the foregoing output and regulator tests show the alternator and regulator to be performing satisfactorily, disconnect the test circuit, reconnect the alternator terminal connector and proceed with the charging circuit resistance test.

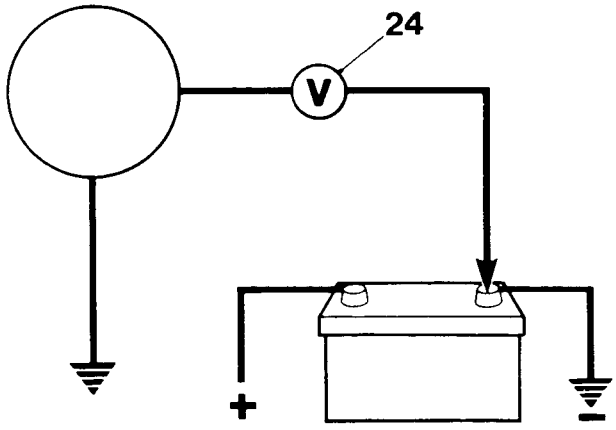
Charging circuit resistance test

22. Connect a low range voltmeter between either of the alternator terminals marked + and the positive terminal of the battery.



RR 175M

23. Switch on the headlamps and start the engine. Set the throttle to run at approximately 3000 rev/min. Note the voltmeter reading.
24. Transfer the voltmeter connections to the frame of the alternator and the negative terminal of the battery, and again note the voltmeter reading.



RR174M

25. If the reading exceeds 0.5 volt on the positive side or 0.25 volt on the negative side, there is a high resistance in the charging circuit which must be traced and remedied.

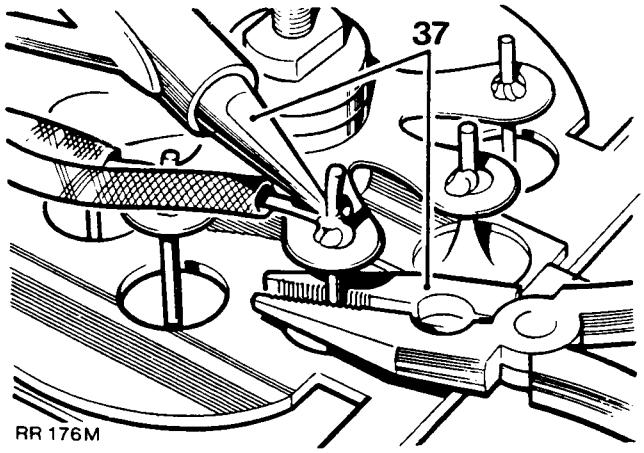
Testing — alternator removed

26. Withdraw the connectors from the alternator.
27. Remove the alternator.
28. Disconnect the suppressor and remove the alternator cover.
29. Detach the surge protection device.
30. Disconnect the lead and remove the rectifier assembly.
31. Note the arrangement of the brush box connections and remove the screws securing the regulator to the brush box and withdraw. This screw also retains the inner brush mounting plate in position.
32. Remove the screw retaining the outer brush box in position and withdraw both brushes.
33. Check brushes for wear by measuring length of brush protruding beyond brush box moulding. If length is 10 mm (0.4 in) or less, brush must be renewed.
34. Check that brushes move freely in holders. If brush is sticking, clean with petrol moistened cloth or polish sides of brush with fine file.
35. Check brush spring pressure using push-type spring gauge. Gauge should register 136 to 279 g (5 to 10 oz) when brush is pulled back until face is flush with housing. If reading is outside these limits, renew brush assembly.
36. Remove the two screws securing the brush box to the slip ring end bracket and lift off the brush box assembly.

continued

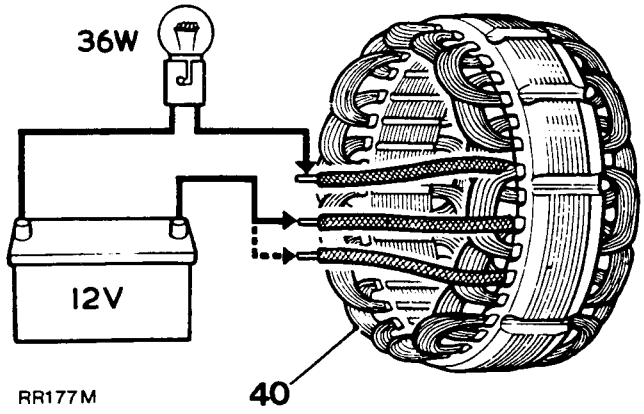
37. Securely clamp alternator in a vice and release the stator winding cable ends from the rectifier by applying a hot soldering iron to the terminal tags of the rectifier. Prise out the cable ends when the solder melts.

CAUTION: When soldering or unsoldering connections to diodes take care not to overheat the diodes or bend the pins. During soldering operations, diode pins should be gripped lightly with a pair of long nosed pliers which will act as a thermal shunt.



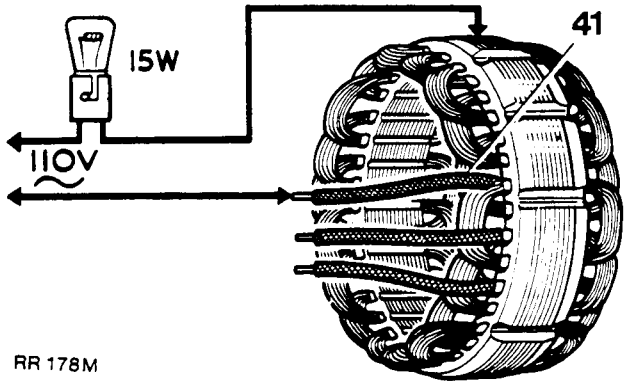
RR 176M

38. Remove the two remaining screws securing the rectifier assembly to the slip ring end bracket and lift off the rectifier assembly. Further dismantling of the rectifier is not required.
39. Remove the slip ring end bracket bolts and lift off the bracket.
40. Connect a 12 volt battery and a 36 watt test lamp to two of the stator connections. Repeat the test replacing one of the two stator connections with the third. If test lamp fails to light in either test, stator must be renewed.



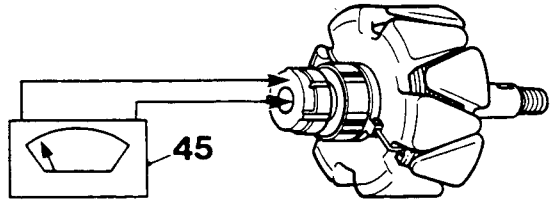
RR177M

41. Using a 110 volt a.c. supply and a 15 watt test lamp, test for insulation between any one of the three stator connections and stator laminations. If test lamp lights, stator must be renewed.



RR 178M

42. Clean surfaces of slip rings using petrol moistened cloth.
43. Inspect slip ring surfaces for signs of burning; remove burn marks using very fine sandpaper. On no account should emery cloth or similar abrasives be used, or any attempt made to machine the slip rings.
44. Note the position of the stator output leads in relation to the alternator fixing lugs, and lift the stator from the drive end bracket.
45. Connect an ohmmeter or a 12 volt battery and an ammeter to the slip rings. An ohmmeter reading of 3.2 ohms or an ammeter reading of 4 amps should be recorded.



RR 179M

46. Using a 110 volt a.c. supply and a 15 watt test lamp, test for insulation between one of the slip rings and one of the rotor poles. If the test lamp lights, the rotor must be renewed.
47. To separate the drive end bracket and rotor, remove the shaft nut, washers, woodruff key and spacers from the shaft.
48. Remove bearing retaining plate by removing the three screws. Using a press, drive the rotor shaft from the drive end bearing.
49. If necessary, to remove the slip rings or the slip ring end bearing on the rotor shaft, unsolder the outer slip ring connection and gently prise the slip ring off the shaft, repeat the procedure for the inner slip ring connection. Using a suitable extraction tool, withdraw the slip ring bearing from the shaft.

Continued

Reassembling

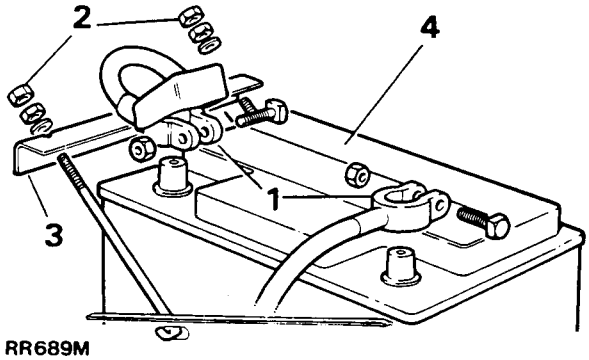
50. Reverse the dismantling procedure, noting the following points.
    (a) Use Shell Alvania 'RA' to lubricate bearings.
    (b) When refitting slip ring end bearing, ensure it is fitted with open side facing rotor.
    (c) Use Fry's H.T.3 solder on slip ring field connections.
    (d) When refitting rotor to drive end bracket, support inner track of bearing. Do not use drive end bracket to support bearing when fitting rotor.
    (e) Tighten through-bolts evenly.
    (f) Fit brushes into housings before fitting brush moulding.
    (g) Tighten shaft nut to the correct torque, see Torque Wrench Settings.
    (h) Refit regulator pack to brush moulding.
51. Reconnect the leads between the regulator; brush box and rectifier, as illustrated.
52. Refit the alternator.

BATTERY

Remove and refit

Removing

1. Disconnect the battery.
2. Release the four nuts securing the battery bracket in position.
3. Remove the bracket from the studs.
4. Remove the battery.



RR689M

Refitting

5. Reverse the removal procedure.

NOTE: Smear the battery clamps and terminals with petroleum jelly before refitting.

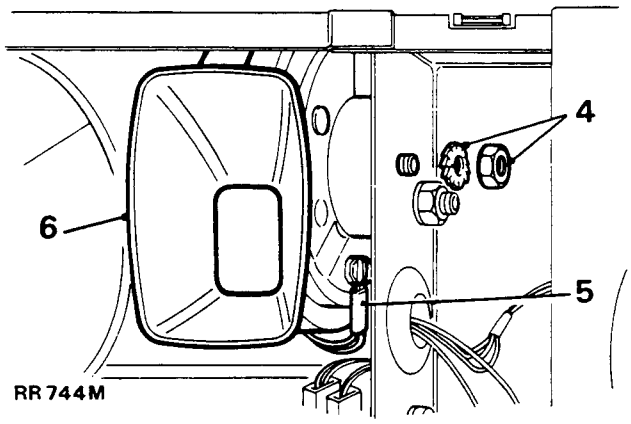
HORNS

Remove and refit

Removing

1. Disconnect the battery.
2. Remove radiator grille.
3. Remove the headlamp surround.
4. Remove the nut and serrated washer securing the horn in position.
5. Disconnect the electrical leads.
6. Withdraw the horns.

NOTE: Twin horns are fitted. An identification letter is stamped on the front outer rim of the horn; 'H'—high note, 'L'—low note.



RR744M

Refitting

7. Reverse removal procedure.

SPARK PLUGS

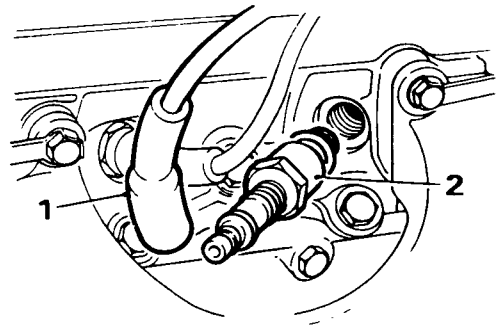
Remove, clean, adjust and refit

Removing

1. Withdraw leads by gripping end shrouds. DO NOT pull leads alone.

   NOTE: Remove the hot air pipe for access to the RH plugs as necessary.

2. Remove sparking plugs and washers.



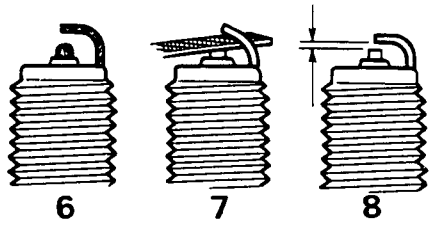
RR 615 M

Cleaning

3. Fit plug in plug cleaning machine.
4. Wobble plug with circular motion while operating abrasive blast for a maximum of four seconds.

   CAUTION: Excessive abrasive blasting will erode insulator nose.

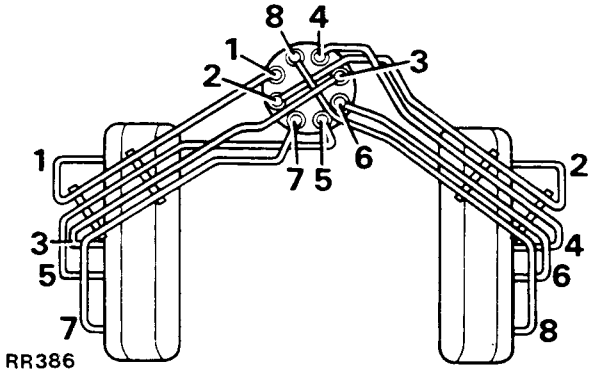
5. Change to air blast only and continue to wobble plug for a minimum of thirty seconds to remove abrasive grit from plug cavity.
6. Wire brush plug threads, open gap slightly.
7. Using point file, square off electrode surfaces.
8. Set electrode gap: 0,80 mm (0.030 in).



RR475M

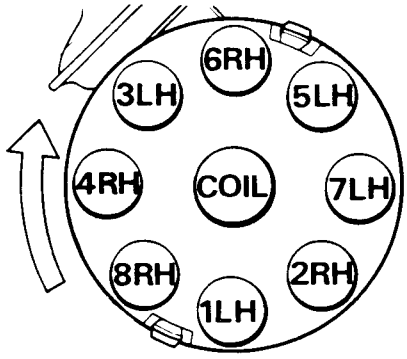
9. Test plugs in accordance with cleaning machine manufacturers instructions. If satisfactory, refit plugs in engine.

10. Examine high tension leads, including coil to distributor lead, for insulation cracking or corrosion at end contacts. Fit new leads as necessary.
11. In addition to correct firing order, high tension leads must also be fitted in correct relation to each other to avoid cross firing.



RR386

12. Leads at distributor cap must be connected as illustrated—Figures 1 to 8 inclusive—indicate plug lead numbers. RH—Right-hand side of engine when viewed from rear. LH—Left-hand side of engine when viewed from rear.



RR616M

13. When pushing leads on plugs ensure ferrules within shrouds are firmly seated on plugs. A guide is that shroud ends are within 6 mm (0.250 in) of metal body of plugs.

    NOTE: If new plugs are necessary refer to technical data section.

ELECTRONIC IGNITION

A Lucas model 35DM8 distributor is employed. This has a conventional advance/retard vacuum unit and centrifugal automatic advance mechanism.

A pick-up module, in conjunction with a rotating timing reluctor inside the distributor body, generates timing signals. These are applied to an electronic ignition amplifier unit fitted under the ignition coil mounted on top of the left front wing valance.

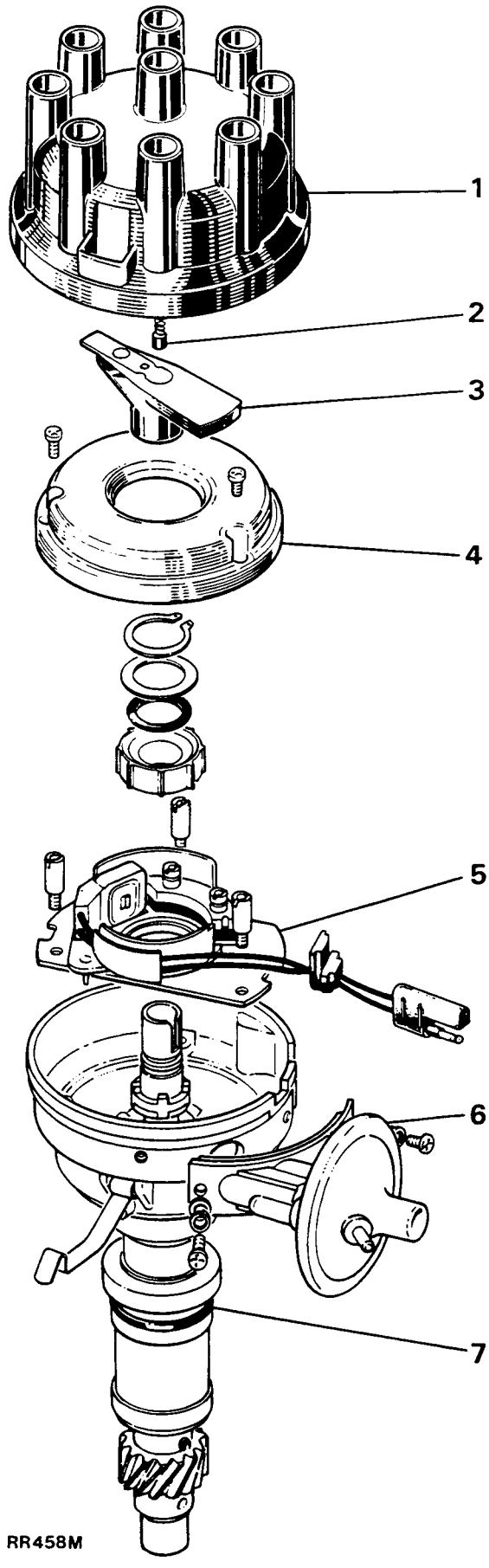
MAINTENANCE

80,000 km (48,000 miles).
Remove the distributor cap and rotor arm and wipe inside with a nap-free cloth.

DO NOT DISTURB the clear plastic insulating cover which protects the magnetic pick-up module.

Service Parts

1. Cap
2. H.T. brush and spring
3. Rotor arm
4. Insulation cover (Flash shield)
5. Pick-up and base plate assembly
6. Vacuum unit
7. 'O' ring oil seal

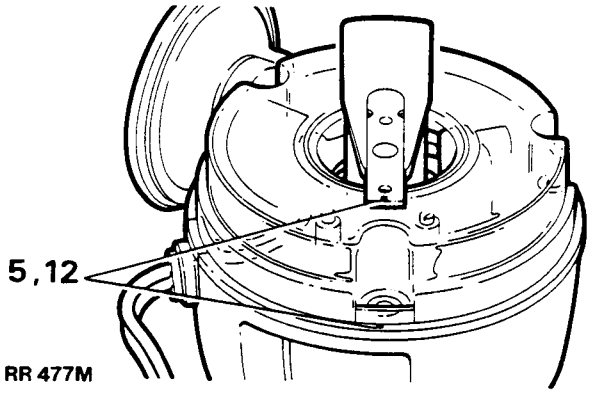


DISTRIBUTOR

Remove and refit

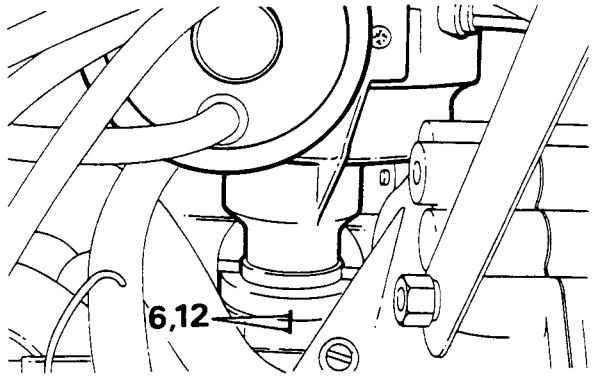
Removing

1. Disconnect battery.
2. Disconnect vacuum pipe(s).
3. Remove distributor cap.
4. Disconnect low tension lead from coil.
5. Mark distributor body in relation to centre line of rotor arm.



RR 477M

6. Add alignment marks to distributor and front cover.



RR476M

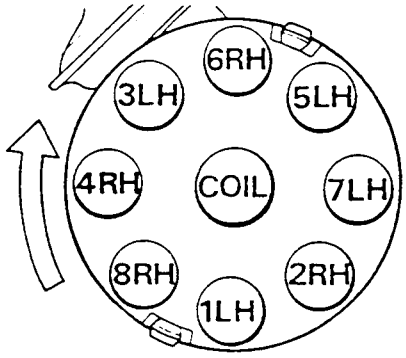
NOTE: Marking distributor enables refitting in exact original position, but if engine is turned while distributor is removed, complete ignition timing procedure must be followed.

7. Release the distributor clamp and remove the distributor.

Refitting

NOTE: If a new distributor is being fitted, mark body in same relative position as distributor removed.

8. Leads for distributor cap should be connected as illustrated.
   Figures 1 to 8 inclusive indicate plug lead numbers.
   RH—Right-hand side of engine, when viewed from the rear.
   LH—Left-hand side of engine, when viewed from the rear.



RR616M

9. If engine has not been turned whilst distributor has been removed, proceed as follows (items 10 to 17).
10. Fit new 'O' ring seal to distributor housing.
11. Turn distributor drive until centre line of rotor arm is 30° anti-clockwise from mark made on top edge of distributor body.
12. Fit distributor in accordance with alignment markings.

    NOTE: It may be necessary to align oil pump drive shaft to enable distributor drive shaft to engage in slot.

13. Fit clamp and bolt. Secure distributor in exact original position.
14. Connect vacuum pipe to distributor and low tension lead to coil.
15. Fit distributor cap.
16. Reconnect battery.
17. Using suitable electronic equipment, set the ignition timing as follows.
18. If, with distributor removed, engine has been turned it will be necessary to carry out the following procedure.
19. Set engine—No. 1 piston to static ignition timing figure (see data section) on compression stroke.
20. Turn distributor drive until rotor arm is approximately 30° anti-clockwise from number one sparking plug lead position on cap.
21. Fit distributor to engine.
22. Check that centre line of rotor arm is now in line with number one sparking plug lead on cap. Reposition distributor if necessary.
23. If distributor does not seat correctly in front cover, oil pump drive is not engaged. Engage by lightly pressing down distributor while turning engine.

24. Fit clamp and bolt leaving both loose at this stage.
25. Set the ignition timing statically to within 2°–3° of T.D.C.
26. Connect the vacuum pipe to the distributor.
27. Fit low tension lead to coil.
28. Fit distributor cap.
29. Reconnect the battery.
30. Using suitable electronic equipment set the ignition timing.

DISTRIBUTOR—LUCAS 35DM8

Overhaul

DISTRIBUTOR CAP

1. Unclip and remove cap.
2. Renew cap if known to be faulty.
3. Clean cap with a nap-free cloth.

ROTOR ARM

4. Pull rotor arm from keyed shaft.
5. Renew rotor arm if known to be faulty.

INSULATION COVER (Flash shield)

6. Remove cover, secured by three screws.
7. Renew cover if known to be faulty.

VACUUM UNIT

8. Remove two screws from vacuum unit securing bracket, disengage vacuum unit connecting rod from pick-up base plate connecting peg, and withdraw vacuum unit from distributor body.

PICK-UP AND BASE PLATE ASSEMBLY

9. Use circlip pliers to remove the circlip retaining the reluctor on rotor shaft.
10. Remove the flat washer and then the 'O' ring recessed in the top of the reluctor.
11. Insert the blade of a small screwdriver beneath the reluctor and prise it partially along the shaft, sufficient to enable it to be gripped between the fingers and withdrawn from the shaft.

    NOTE: Coupling ring fitted beneath reluctor.

12. Remove pick-up and base plate assembly, secured by three support pillars.

    NOTE: Do not disturb the two barrel nuts securing the pick-up module, otherwise the air gap will need re-adjustment.

13. Renew pick-up and base plate assembly if module is known to be faulty, otherwise check pick-up winding resistance (2k–5k ohm).

RE-ASSEMBLY

14. This is mainly a reversal of the dismantling procedure, noting the following points:

LUBRICATION

Apply clean engine oil:

a. Three drops to felt pad reservoir in rotor shaft.

Apply Chevron SR1 (or equivalent) grease.

b. Auto advance mechanism.
c. Pick-up plate centre bearing.
d. Pre tilt spring and its rubbing area (pick-up and base plate assy).
e. Vacuum unit connecting peg (pick-up and base plate assy).
f. The connecting peg hole in vacuum unit connecting rod.

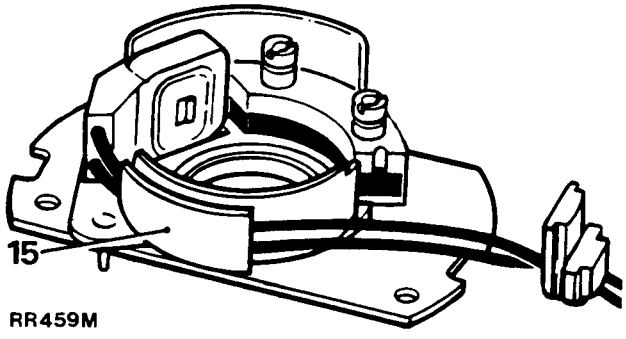
Apply Rocal MHT (or equivalent) grease:

g. Vacuum unit connecting rod seal (located in vacuum unit where connecting rod protrudes).

NOTE: Applicable only to double acting vacuum units.

FITTING PICK-UP AND BASE PLATE ASSEMBLY

15. Pick-up leads must be prevented from fouling the rotating reluctor. Both leads should be located in plastic carrier as illustrated. Check during re-assembly.



RR459M

REFITTING RELUCTOR

16. Slide reluctor as far as it will go on rotor shaft, then rotate reluctor until it engages with the coupling ring beneath the pick-up base plate. The distributor shaft, coupling ring and reluctor are 'keyed' and rotate together.

Continued

PICK-UP AIR GAP ADJUSTMENT

17. The air gap between the pick-up limb and reluctor teeth must be set within the specified limits, using a non-ferrous feeler gauge.

NOTE: When the original pick-up and base plate assembly has been refitted the air gap should not normally require resetting as it is pre-set at the factory. When renewing the assembly the air gap will require adjusting to within the specified limits. Refer to 'Engine Tuning Data' for ignition timing data.

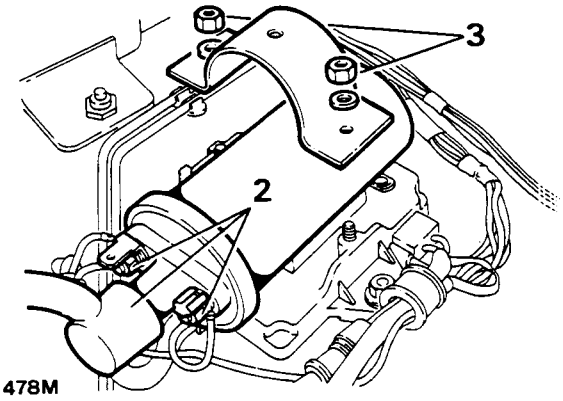
IGNITION COIL

Remove and refit

Removing

1. Disconnect the battery.
2. Disconnect the electrical leads from the coil.
3. Remove the two retaining nuts and washers securing the coil to the amplifier.

4. Lift the coil off the amplifier.



RR478M

Refitting

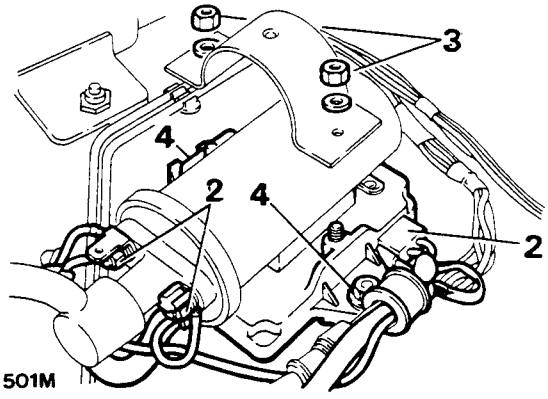
5. Reverse the removal procedure.

AMPLIFIER

Remove and Refit

Removing

1. Disconnect the battery.
2. Disconnect the electrical leads from the amplifier and coil.
3. Remove the two retaining nuts with washers securing the coil to the amplifier.
4. Remove the two bolts, nuts, spring washers and plain washers securing the amplifier to the valance.
5. Remove the amplifier from the valance.



RR501M

Refitting

6. Reverse the removal procedure, ensuring that all electrical leads are correctly reconnected.

NOTE: The amplifier is not serviceable, in the event of a fault a new amplifier must be fitted.

IGNITION TIMING

1. It is essential that the following procedures are adhered to. Inaccurate timing can lead to serious engine damage and additionally create failure to comply with the emission regulations applying to the country of destination. If the engine is being checked in the vehicle and is fitted with an air conditioning unit the compressor must be isolated.

2. On initial engine build, or if the distributor has been disturbed for any reason, the ignition timing must be set statically to within 2°–3° of T.D.C.
(This sequence is to give only an approximation in order that the engine may be started) **ON NO ACCOUNT MUST THE ENGINE BE STARTED BEFORE THIS OPERATION IS CARRIED OUT.**

Equipment required

Calibrated Tachometer
Stroboscopic lamp

3. Couple stroboscopic timing lamp and tachometer to engine following the manufacturers instructions.

4. Disconnect the vacuum pipes from the distributor.

5. Start engine, with no load and not exceeding 3,000 rpm, run engine until normal operating temperature is reached. (Thermostat open). Check that the normal idling speed falls within the tolerance specified in the data section.

6. Idle speed for timing purposes must not exceed 750 rpm, and this speed should be achieved by removing a breather hose **NOT BY ADJUSTING IDLE SETTING SCREWS.**

7. With the distributor clamping bolt slackened turn distributor until the timing flash coincides with the timing pointer and the correct timing mark on the rim of the torsional vibration damper as shown in the engine tuning section.

8. Retighten the distributor clamping bolt securely. Recheck timing in the event that retightening has disturbed the distributor position.

9. Refit vacuum pipes.

10. Disconnect stroboscopic timing lamp and tachometer from engine.

LUCAS CONSTANT ENERGY IGNITION SYSTEM 35DM8 PRELIMINARY CHECKS

Inspect battery cables and connections to ensure they are clean and tight. Check battery state of charge if in doubt as to its condition.

Inspect all LT connections to ensure that they are clean and tight. Check the HT leads are correctly positioned and not shorting to earth against any engine components. The wiring harness and individual cables should be firmly fastened to prevent chafing.

PICK-UP MODULE AIR GAP SETTINGS

Air gap settings vary according to vehicle application.

NOTE: The gap is set initially at the factory and will only require adjusting if tampered with or when the pick-up module is replaced.

Test Notes

(i) The ignition must be switched on for all checks.
(ii) Key to symbols used in the charts for Tests 2.

✓	Correct Reading	H	High Reading	L	Low Reading

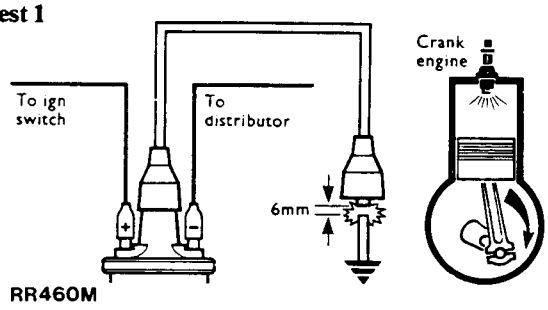
(iii) Use feeler gauges manufactured from a non-magnetic material when setting air gaps.

TEST 1:

Check HT Sparking

Remove coil/distributor HT lead from distributor cover and hold approximately 6 mm (0.25 in) from the engine block. Switch the ignition 'on' and operate the starter.
If regular sparking occurs, proceed to Test 6. If no sparking proceed to Test 2.

Test 1



TEST 2:

Amplifier Static Checks

Switch the ignition 'on'
(a) Connect voltmeter to points in the circuit indicated by the arrow heads and make a note of the voltage readings.

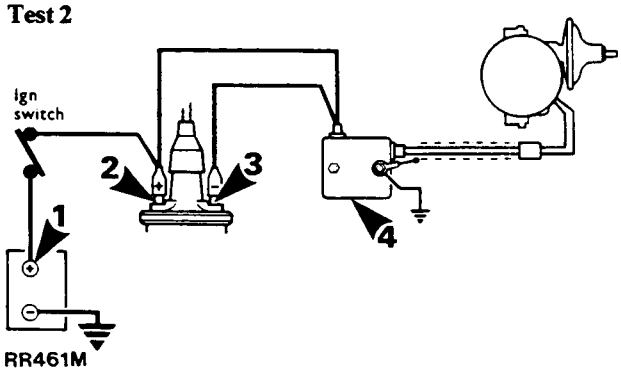
NOTE: Only move the voltmeter POSITIVE lead during tests 2, 3 and 4.

(b) Compare voltages obtained with the specified values listed below:

EXPECTED READINGS

1. More than 11.5 volts
2. 1 volt max below volts at point 1 in test circuit
3. 1 volt max below volts at point 1 in test circuit
4. 0 volt—0.1 volt

Test 2



Continued

(c) If all readings are correct proceed to Test 3.
(d) Check incorrect reading(s) with chart to identify area of possible faults, i.e. faults listed under heading 'Suspect'.

1	2	3	4	SUSPECT
L	✓	✓	✓	DISCHARGED BATTERY
✓	L	L	✓	IGN. SWITCH AND/OR WIRING
✓	✓	L	✓	COIL OR AMPLIFIER
✓	✓	✓	H	AMPLIFIER EARTH

TEST 3:

Check Amplifier Switching

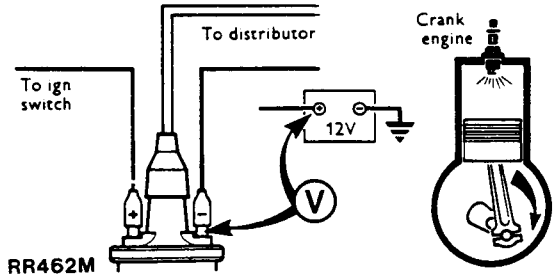
Disconnect the high tension lead between the coil and distributor.

Connect the voltmeter between battery positive (+ ve) terminal and H.T. coil negative (− ve) terminal, the voltmeter should register zero volts.

Switch the ignition 'on' then crank the engine. The voltmeter reading should increase just above zero, in which case proceed with Test 5.

If there is no increase in voltage during cranking proceed to Test 4.

Test 3



TEST 4:

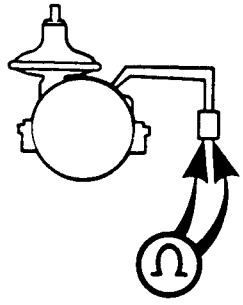
Pick-Up Coil Resistance
Applications with Separate Amplifier

Disconnect the pick-up leads at the harness connector. Connect the ohmmeter leads to the two pick-up leads in the plug.

The ohmmeter should register between 2k and 5k ohm if pick-up is satisfactory. Change the amplifier if ohmmeter reading is correct. If the engine still does not start carry out Test 5.

Change the pick-up if ohmmeter reading is incorrect. If the engine still does not start proceed to Test 5.

Test 4



TEST 5:

Check H.T. Sparking

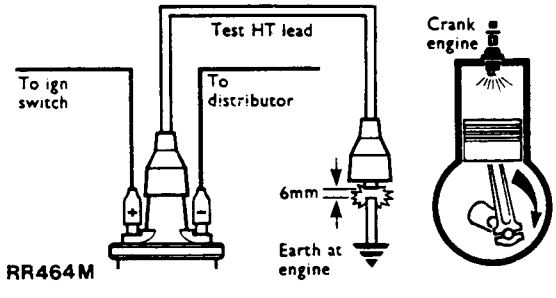
Remove existing coil/distributor H.T. lead and fit test H.T. lead to coil chimney. Hold free end about 6 mm (0.25 in) from the engine block and crank the engine.

H.T. sparking good, repeat test with original H.T. lead, if then no sparking, change H.T. lead. If sparking is good but engine will not start, proceed to Test 6.

If no sparking, replace coil.

If engine will not start carry out Test 6.

Test 5



Continued

TEST 6:

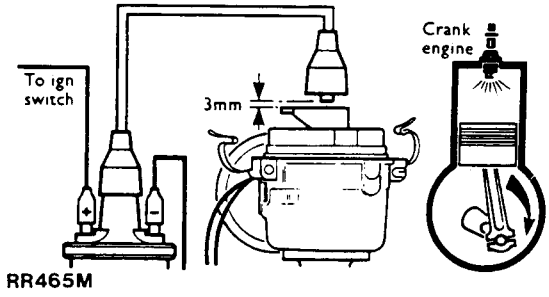
Check Rotor Arm

Remove distributor cover. Disconnect coil H.T. lead from cover and hold about 3 mm (0.13 in) above rotor arm electrode and crank the engine. There should be no H.T. sparking between rotor and H.T. lead. If satisfactory carry out Test 7.

H.T. sparking, replace rotor arm.

If engine will not start carry out Test 7.

Test 6



TEST 7:

Visual and H.T. Cable Checks

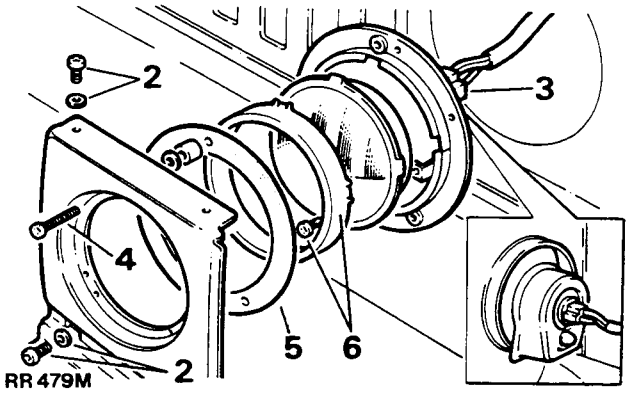
Examine:	Should be:
1. Distributor Cover.	Clean, dry, no tracking marks.
2. Coil Top.	Clean, dry, no tracking marks.
3. H.T. Cable Insulation.	Must not be cracked, chafed or perished.
4. H.T. Cable Continuity.	Must not be open circuit.
5. Sparking Plugs.	Clean, dry, and set to correct gap.
NOTE:	
1. Reluctor.	Must not foul pick-up or leads.
2. Rotor and Flash Shield.	Must not be cracked or show signs of tracking marks.

HEADLAMP ASSEMBLY

Remove and refit

Removing

1. Disconnect the battery.
2. Remove screws and washers securing the headlamp frame to the body.
3. Ease the headlamp assembly forward and disconnect.
4. Remove the two adjusting screws and one clamp to separate lamp unit from the frame.
5. Remove the rubber seal.
6. Separate the lamp unit from rim by loosening the three retaining screws.



RR 479M

Refitting

7. Reverse removal procedure.

HEADLAMP BULB

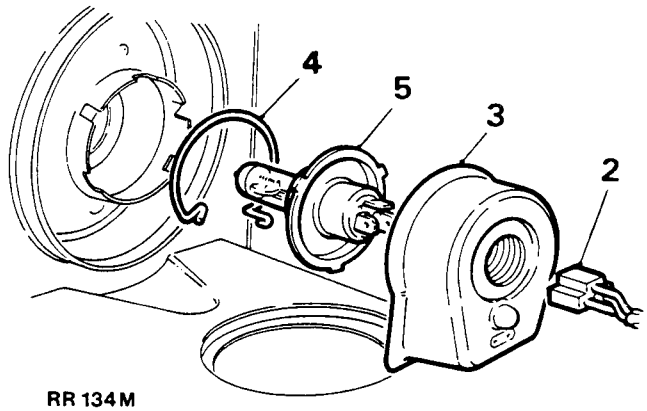
Remove and refit (Halogen)

Removing

1. Prop open the bonnet. Two large clearance holes are provided, one on each side of the front valance, to give access to the respective bulb holders in the headlamp reflectors.

   NOTE: To obtain access to the right-hand clearance hole it will be necessary to remove the battery from the vehicle.

2. Disconnect the multi-plug lead.
3. Remove the rubber dust cover.
4. Release the bulb retaining spring clip.
5. Remove the faulty bulb.



RR 134M

Refitting

6. Fit the correct 'Halogen' type. The bulb holder is keyed to facilitate fitting.

   IMPORTANT: Do not touch the quartz envelope of the bulb with the fingers. If contact is accidentally made wipe gently with methylated spirits.

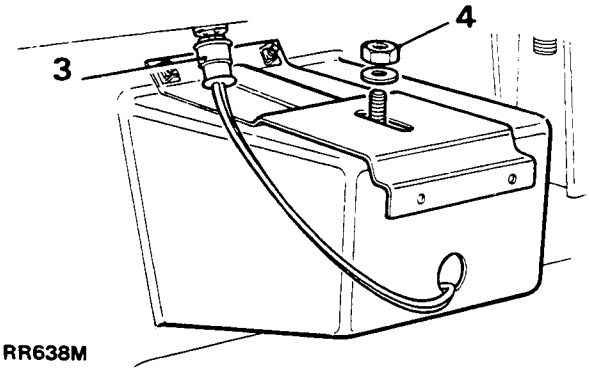
7. Reverse remaining removal procedure.

AUXILIARY DRIVING LAMP—RH AND LH

Remove and refit

Bulb replacement

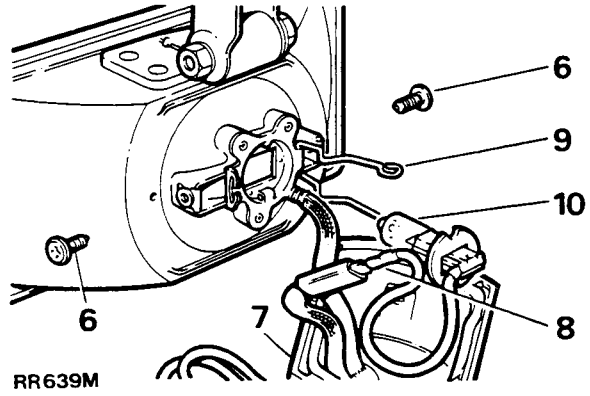
1. Disconnect the battery.
2. The auxiliary driving lamp securing nut is located beneath the front wing adjacent to the front body fixing. Access to the lamp is gained through the front wheel arch.
3. Disconnect the electrical plug.
4. Remove the single nut and washer.



RR638M

5. From the front of the vehicle, manoeuvre the lamp and remove it from the spoiler aperture.

6. Remove the two screws securing the cover to the rear of the lamp.
7. Withdraw the cover.
8. Disconnect the lucar connector.
9. Release the spring clip securing the bulb to the lamp unit.
10. Remove the bulb.



RR639M

Refitting

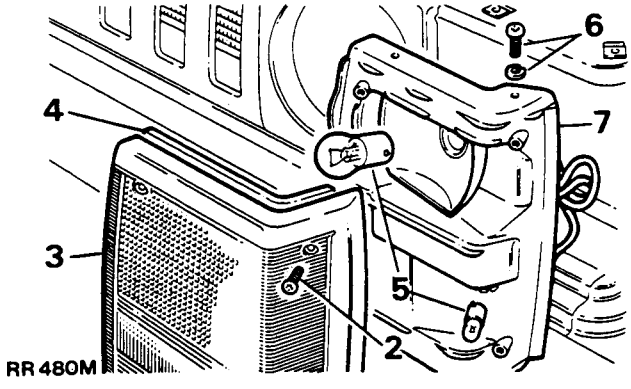
11. Reverse the removal procedure.
12. Fit a new bulb ensuring that the two notches on the bulb body locate with the registers on the lamp unit.

SIDE LIGHT AND FLASHER LAMP ASSEMBLY—RH AND LH AND BULB

Remove and refit

Removing

1. Disconnect the battery.
2. Remove the four screws securing the lamp lens.
3. Release the lamp lens from the lamp body.
4. Remove the foam rubber seal.
5. Remove the two bayonet fitting bulbs.
6. Remove the two screws securing the lamp body.
7. Ease the lamp body forward to reveal the electrical connection.



RR480M

8. Disconnect the electrical plug at the rear of the lamp body.
9. Remove the lamp body.

Refitting

10. Reverse the removal procedure.

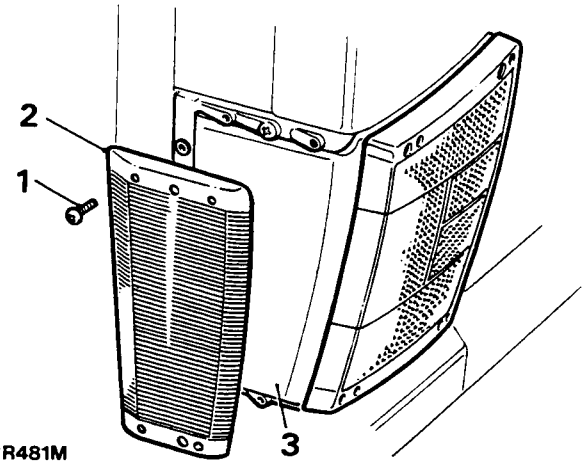
REFLECTORS

Remove and refit

Removing

1. Remove the four screws securing reflector.
2. Remove reflector.
3. Remove rubber seal.

NOTE: To remove the rubber seal completely it is necessary to remove the tail light lens.



RR481M

Refitting

4. Reverse the removal procedure.

TAIL, STOP, REVERSE, FOG GUARD AND FLASHER LAMP ASSEMBLY—RH AND LH

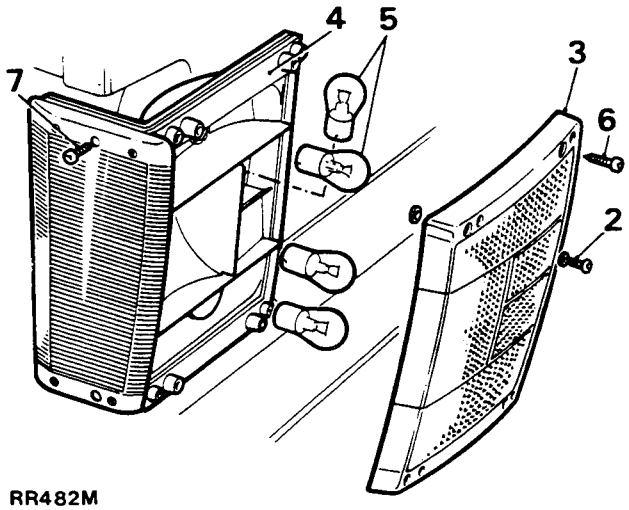
Remove and refit

Removing

1. Disconnect the battery.
2. Remove the four lens retaining screws.
3. Remove lens.
4. Remove sealing rubber.

NOTE: To remove the sealing rubber complete it is necessary to remove the side reflector lens.

5. Remove the bulbs.
6. Remove the four screws securing the lamp unit to the body.
7. Remove the two through-screws from the reflector side, which also secure the lamp unit to the body.
8. Ease the lamp unit forward and disconnect leads at moulded connectors.



RR482M

Refitting

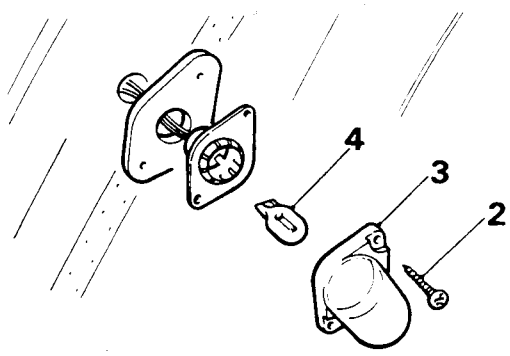
9. Reverse the removal procedure.

UNDER BONNET LAMP ASSEMBLY

Remove and refit

Removing

1. Disconnect the battery.
2. Remove the two securing screws.
3. Remove the lamp glass.
4. Pull the five-watt 'wedge' type bulb from the bulb holder.



RR483M

5. Disconnect the electrical leads located below the bonnet lamp switch attached to the inner wing.
6. Pull the rubber grommet off the leads and pull the lamp and leads up through the bonnet stiffener channel.

Refitting

7. Reverse operations 1 to 6.

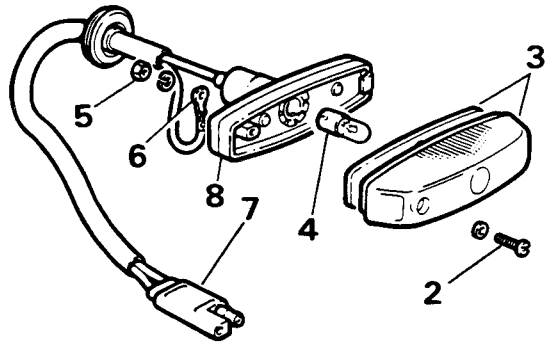
NOTE: A piece of bent wire will be needed to pull the electrical leads out of the channel exit hole when fitting a new lamp assembly.

SIDE REPEATER LAMPS

Remove and refit

Removing

1. Disconnect the battery.
2. Remove the single screw retaining the lamp lens.
3. Remove the lamp lens and rubber seal.
4. Remove the four-watt bayonet fitting bulb.
5. Remove the two nuts and spring washers from the rear of the lamp body accessible from behind the front wing.
6. Remove the earth wire from the rear of the lamp.
7. Disconnect the twin snap connector from within the engine compartment located directly behind the lamp.
8. Remove the lamp body from the outer wing.



RR457M

Refitting

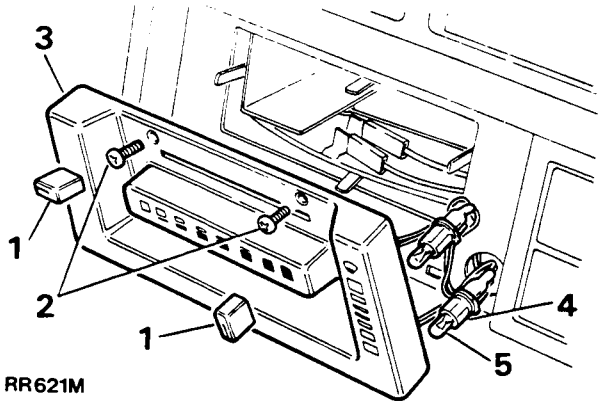
9. Reverse the removal procedure.

HEATER/VENTILATION CONTROL PANEL

Bulb replacement

The heater/ventilation control panel is illuminated by four 12-volt 1.2-watt 'wedge' type (capless) bulbs. In the event of a bulb failure a replacement bulb can be fitted as follows:

1. Pull the four finger tip knobs off the control levers.
2. Remove the two screws at the top of the panel.
3. Carefully ease the panel away from the centre console only as far as the electrical leads will permit.
4. Pull the appropriate bulb holder out of the rear of the panel.
5. Pull the bulb from the holder.
6. Renew the bulb and push the bulb holder firmly back into its location at the rear of the panel.



RR621M

Refitting

7. Ensuring that the electrical leads do not become trapped between the panel console and operating levers, refit the panel.

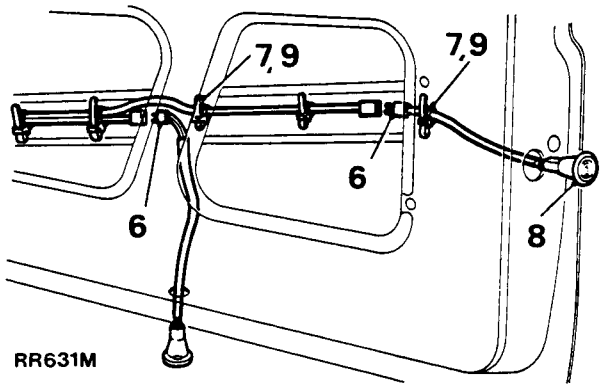
DOOR EDGE LAMPS/PUDDLE LAMPS

Incorporated into the front door assemblies are door edge lamps and puddle lamps, these are located on the shut face and bottom of the door. The lamps are activated by the courtesy light switches when either front door is opened and will immediately switch off when both doors are closed.

Remove and Refit

Removing

1. Ensure the side door glass is fully closed.
2. Disconnect the battery.
3. Remove the interior door handle and arm rest/door pull from the door.
4. Carefully release the interior door trim pad from the inner door panel.
5. Peel back the lower half of the plastic weather sheet.
6. Disconnect the door edge lamp and puddle lamp two pin electrical plugs within the door, accessible through the lower centre and outer apertures of the inner door panel.
7. Release the door edge lamp electrical leads from the retaining clips.
8. Prise the lamps out of the door and withdraw the electrical leads.



RR631M

Refitting

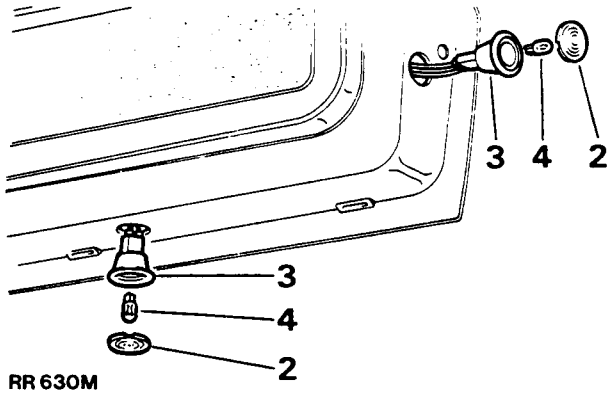
9. Reverse the removal procedure.

NOTE: Ensure the door lamp wiring harness is securely clipped to the lower stiffener plate within the door to prevent damage occurring to the electrical leads when the door glass is in its lowest position.

DOOR EDGE LAMPS/PUDDLE LAMPS

Bulb replacement

1. Disconnect battery.
2. Carefully prise out the lamp lens.
3. Withdraw the lamp body from the door **ONLY** as far as the electrical leads will permit.
4. Pull the bulb from the holder.



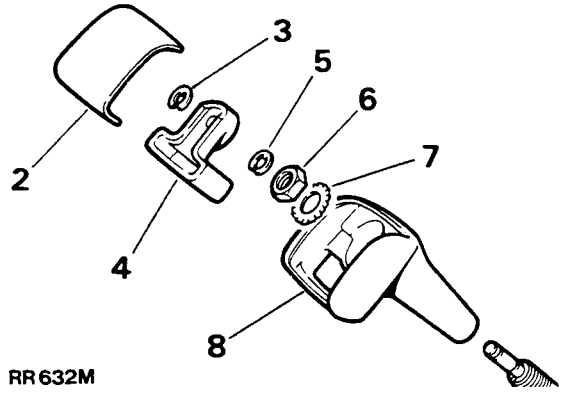
RR630M

5. Renew the bulb and refit the lamp lens.
6. Push the lamp into the door.
   The correct bulb type is a 12-volt 10/5-watt capless.

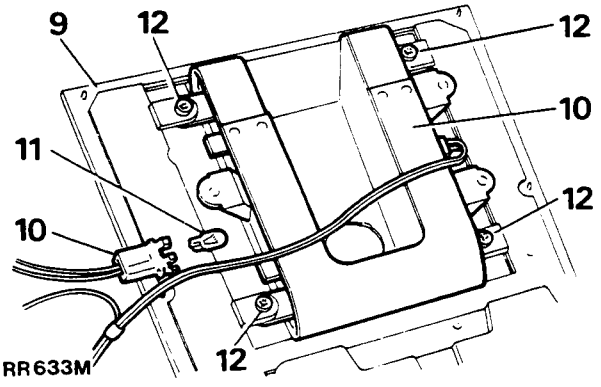
AUTOMATIC GEAR SELECTOR—PANEL ILLUMINATION

Bulb replacement

1. Disconnect the battery.
2. Unclip the cover from the top of the gear selector knob.
3. Remove the circlip retaining the detent button.
4. Withdraw the detent button.
5. Remove the lower circlip above the gear selector knob securing nut.
6. Remove the securing nut.
7. Withdraw the serrated washer.
8. Slide the selector knob off the shaft.



9. Carefully prise the inset panel out of the floor mounted console, complete with selector illumination panel and ash tray.
10. The two illumination bulbs are located on the reverse side of the illumination panel.
11. Pull the appropriate bulb holder from its location.
12. If necessary, to facilitate easier removal of the bulb holders, remove the four screws securing the illumination panel to the outer surround panel.



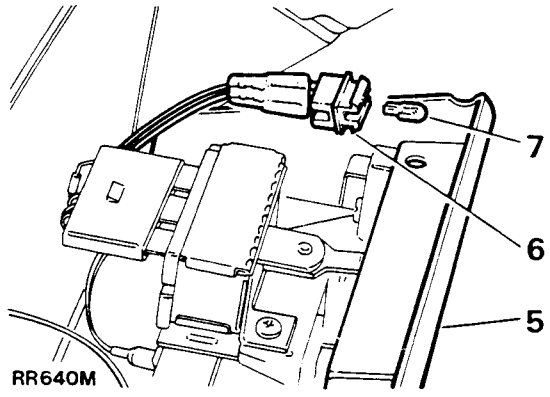
13. Pull the bulb from the holder.
    The correct bulb type is a 24-volt 5-watt 'wedge' base (capless).

Refitting

14. Reverse the removal procedure ensuring that the electrical leads beneath the floor mounted console do **NOT** become trapped between mating surfaces.
15. To prevent damage to the gear selector knob (Automatic only) on reassembly do **NOT** overtighten the retaining nut, see data section for correct torque.

AIR CONDITIONING CONTROL PANEL ILLUMINATION—Bulb replacement

1. Disconnect the battery.
2. Pull the finger tip control knobs off the control levers.
3. Carefully prise the four air vents out of the fascia panel.
4. Remove the fifteen screws securing the panel to the upper and lower panels.
5. Withdraw the panel only as far as the electrical leads will permit.
6. Pull the bulb holder from the rear right-hand side of the control panel.
7. Pull the bulb from the holder.



Refitting

8. Reverse the removal procedure.
   The correct bulb type is a 12-volt 1.2-watt 'wedge' base (capless).

NUMBER PLATE LAMP ASSEMBLY AND BULB REPLACEMENT

Remove and refit

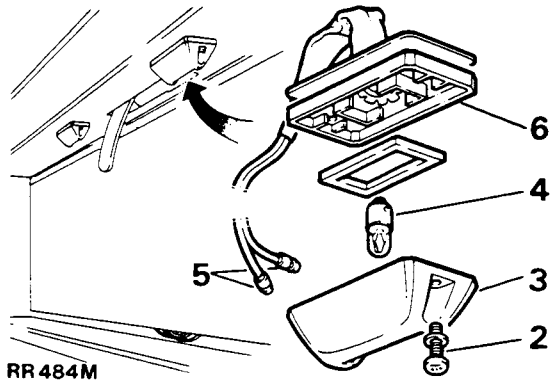
Removing

1. Disconnect the battery.
2. Remove the two self-tapping screws and fibre washers.
3. Detach the lens surround and lamp lens.
4. Remove the bulb.

Continued

NOTE: Carefully pull the electrical leads out of the bottom of the lower tailgate panel to reveal the snap connectors.

5. Disconnect the electrical connections located at the bottom of the lower tailgate.
6. Remove the bulb holder surround.
7. Carefully pull the electrical leads up through the inside of the lower tailgate panels.



RR484M

Refitting

8. Reverse the removal procedure.

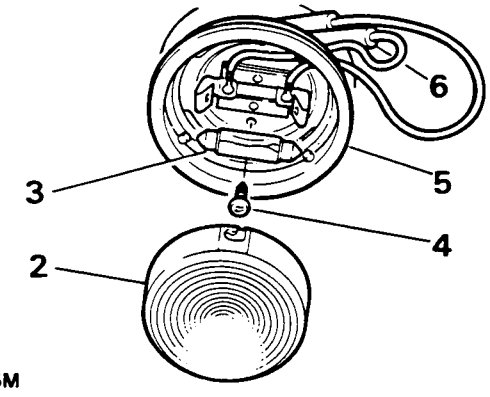
INTERIOR ROOF LAMPS

Remove and refit

The interior roof lamps are operated automatically via the side door and tailgate courtesy switches or by an independent switch located on the auxiliary switch panel.

Removing

1. Disconnect the battery.
2. Remove the lens from the courtesy lamp by pressing upward and turning it anti-clockwise.
3. Withdraw bulb from spring clip holder.
4. Remove screws securing lamp base to roof panel.
5. Lower the lamp to reveal the cable snap connections.
6. Disconnect the electrical connections.



RR485M

Refitting

7. Reverse the removal procedure.

INTERIOR ROOF LAMPS CIRCUIT DELAY

Remove and refit

The roof lamp circuit incorporates a delay function which is designed to allow the lamps to remain on for 12 to 18 seconds after either of the front doors are closed.

NOTE: Switching on the ignition (with both doors closed) will immediately over-ride this feature, switching the interior lamps off.

Removing

1. Disconnect the battery.
2. Remove the six screws securing the lower fascia panel.
3. Lower the fascia panel to gain access to the red delay unit attached to the steering column support bracket.
4. Remove the delay unit by pushing the unit up off its retaining bracket, to clear the steering column support bracket.
5. Pull the red multi-plug off the delay unit.

Refitting

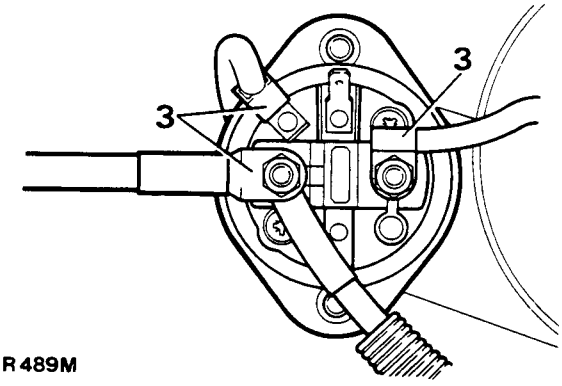
6. Reverse the removal operations.

STARTER MOTOR

Remove and refit

Removing

1. Place car on a suitable ramp.
2. Disconnect the battery.
3. Disconnect the leads from the solenoid and starter motor and remove the exhaust heat shield.
4. Remove the two bolts securing the starter motor to the flywheel housing.
5. Remove starter motor from underneath the vehicle.



RR489M

Refitting

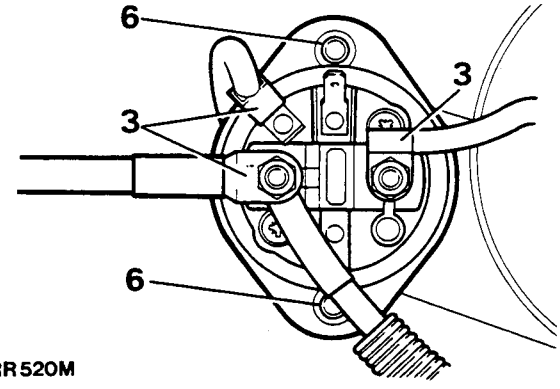
6. Reverse the removal procedure.

STARTER SOLENOID

Remove and refit

Removing

1. Place car on a suitable ramp.
2. Disconnect the battery.
3. Disconnect the leads from the solenoid and starter motor and remove the exhaust heat shield.
4. Remove the two bolts securing the starter motor to the flywheel housing.
5. Remove the starter motor from underneath the vehicle.



RR520M

6. Remove the two bolts securing the solenoid to the starter motor.
7. Withdraw the solenoid from the solenoid housing.

Refitting

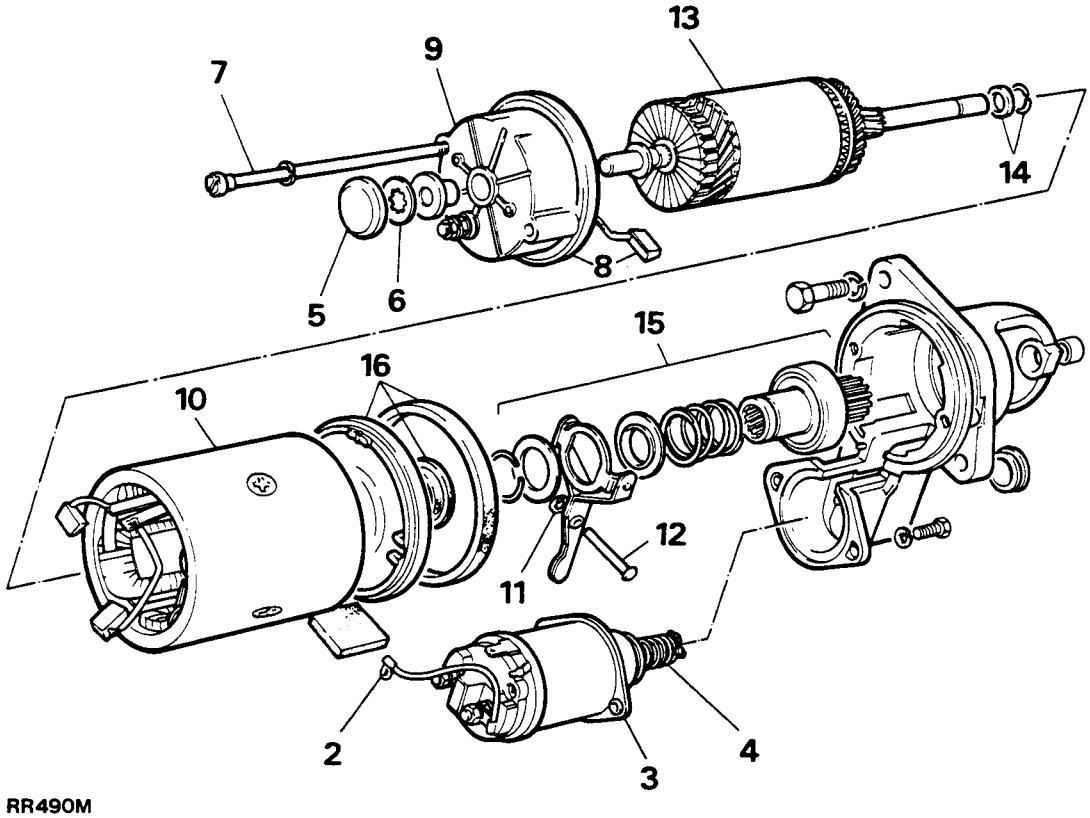
8. Reverse the removal procedure.

STARTER MOTOR—Lucas 3M100PE

Overhaul

Dismantling

1. Remove the starter motor.
2. Remove the connecting link between the starter and the solenoid terminal 'STA'.
3. Remove the solenoid from the drive end bracket.
4. Grasp the solenoid plunger and lift the front end to release it from the top of the drive engagement lever.
5. Remove the end cap seal.
6. Using an engineer's chisel, cut through a number of the retaining ring claws until the grip on the armature shaft is sufficiently relieved to allow the retaining ring to be removed.
7. Remove the two through bolts.
8. Partially withdraw the commutator end cover and disengage the two field coil brushes from the brush box.
9. Remove the commutator end cover.
10. Withdraw the yoke and field coil assembly.
11. Remove the retaining ring from the drive engagement lever pivot-pin, using the method previously described.
12. Withdraw the pivot pin.
13. Withdraw the armature.
14. Using a suitable tube, remove the collar and jump ring from the armature shaft.
15. Slide the thrust collar and the roller clutch drive and lever assembly off the shaft.
16. Remove the intermediate bracket and seals.



RR490M

Continued

Inspecting

Clutch

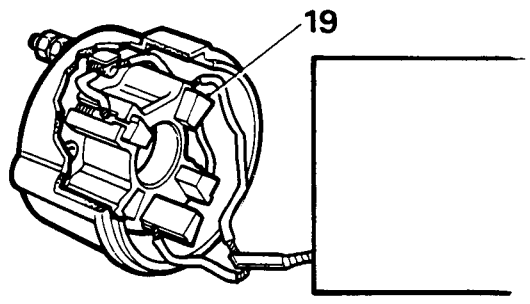
17. Check that the clutch gives instantaneous take-up of the drive in one direction and rotates easily and smoothly in the other direction.
    Ensure that the clutch is free to move round and along the shaft splines without any tendency to bind.

NOTE: The roller clutch drive is sealed in a rolled steel cover and cannot be dismantled.

18. Lubricate all clutch moving parts with Shell SB 2628 grease for cold and temperate climates or Shell Retinax 'A' for hot climates.

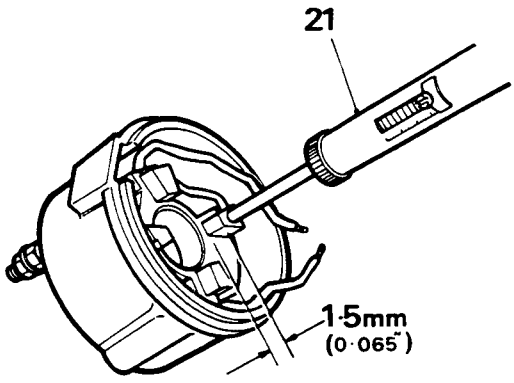
Brushes

19. Check that the brushes move freely in the brush box moulding. Rectify sticking brushes by wiping with a petrol moistened cloth.



RR491M

20. Fit new brushes if they are damaged or worn to approximately 9.5 mm (0.375 in).
21. Using a push-type spring gauge, check the brush spring pressure. With new brushes pushed in until the top of the brush protrudes about 1.5 mm (0.065 in) from the brush box moulding, the spring pressure reading should be 1.0 kgf (36 ozf).

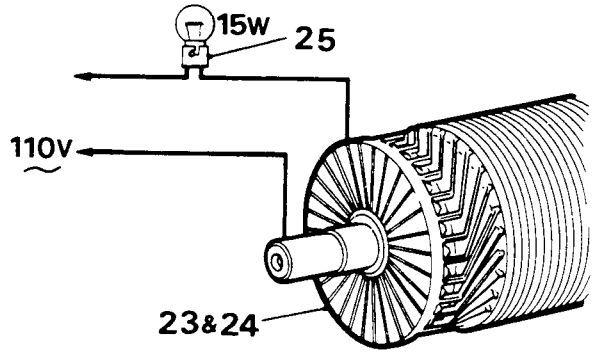


RR492M

22. Check the insulation of the brush springs by connecting a 110-volt a.c. 15-watt test lamp between a clean part of the commutator end cover and each of the springs in turn. The lamp should not light.

Armature

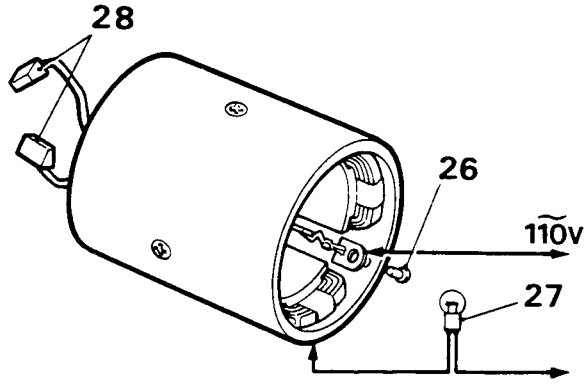
23. Check the commutator. If cleaning only is necessary, use a flat surface of very fine glass paper, and then wipe the commutator surface with a petrol moistened cloth.
24. If necessary, the commutator may be machined providing a finished surface can be obtained without reducing the thickness of the commutator copper below 3.5 mm (0.140 in), otherwise a new armature must be fitted. Do not undercut the insulation slots.
25. Check the armature insulation by connecting 110-volt a.c. 15-watt test lamp between any one of the commutator segments and the shaft. The lamp should not light, if it does light fit a new armature.



RR493M

Field coil insulation

26. Disconnect the end of the field winding where it is riveted to the yoke, by filing away the riveted over end of the connecting-eyelet securing rivet, sufficient to enable the rivet to be tapped out of the yoke.

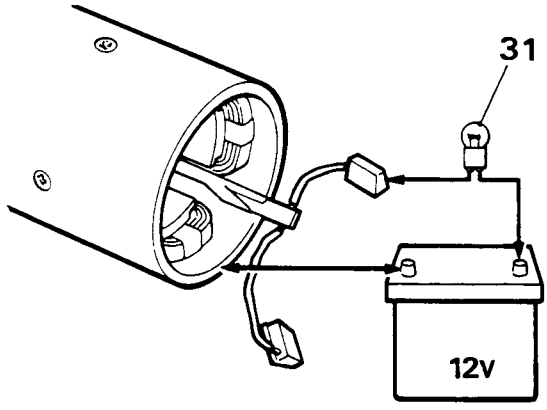


RR494M

27. Connect a 110-volt a.c. 15-watt test lamp between the disconnected end of the winding and a clean part of the yoke.
28. Ensure that the brushes or bare parts of their flexibles are not touching the yoke during the test.
29. The lamp should not light, if it does light, fit a new field coil assembly.
30. Resecure the end of the field winding to the yoke.

Field coil continuity

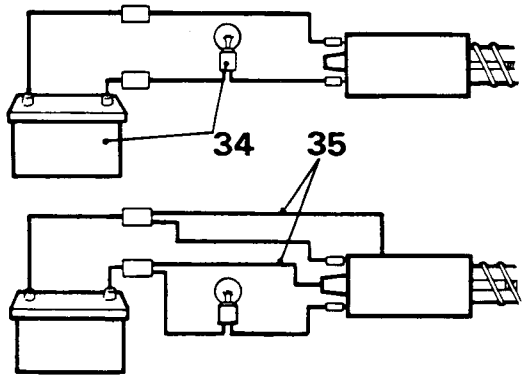
31. Connect a 12-volt battery operated test lamp between each of the brushes in turn and a clean part of the yoke.
32. The lamp should light, if it does not light, fit a new field coil assembly.



RR495M

Solenoid

33. Disconnect all cables from the solenoid terminals and connectors.
34. Connect a 12-volt battery and a 12-volt 60-watt test lamp between the solenoid main terminals. The lamp should not light, if it does light, fit new solenoid contacts or a new solenoid complete.
35. Leave the test lamp connected and, using the same 12-volt battery supply, energise the solenoid by connecting 12-volt between the small solenoid operating 'Lucar' terminal blade and a good earth point on the solenoid body.



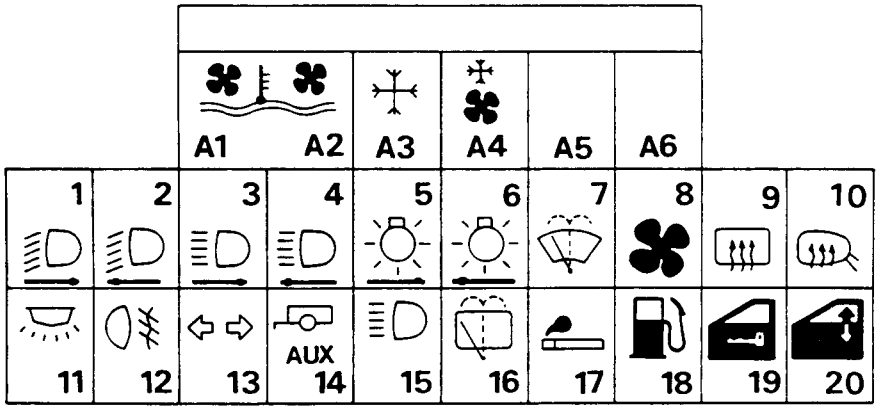
RR496M

36. The solenoid should be heard to operate and the test lamp should light with full brilliance, otherwise fit new solenoid contacts or a new solenoid complete.

Reassembling

37. Reverse 1 to 15, including the following:
38. Fit the commutator end cover before refitting the solenoid to facilitate assembly of the block shaped grommet which, when assembled, is compressed between the yoke, solenoid and fixing bracket.
39. Ensure that the internal thrust washer is fitted to the commutator end of the armature shaft.
40. Tighten the through bolts, solenoid fixing and upper terminal nuts to the correct torque—see Torque Wrench Settings.
41. Set the armature end float by driving the retaining ring on the armature shaft into a position that provides a maximum of 0.25 mm (0.010 in) clearance between the retaining ring and the bearing bush shoulder.

FUSE BOX



RR622M

AUXILIARY FUSE PANEL—(applicable to Air conditioning only)

Fuse No.	Colour Code	Fuse Value	Circuit Served	Ignition Key Controlled
A1	Yellow	20 amp	Air Conditioning fan—option	IGN
A2	Yellow	20 amp	Air Conditioning fan—option	IGN
A3	Tan	5 amp	Air Conditioning Compressor clutch—option	IGN
A4	Yellow	20 amp	Air Conditioning Blower Motor—option	IGN
A5	—	—	Spare	—
A6	—	—	Spare	—

MAIN FUSE PANEL

Fuse No.	Colour Code	Fuse Value	Circuit Served	Ignition Key Controlled
1	Brown	7.5 amp	RH headlamp dipped beam	—
2	Brown	7.5 amp	LH headlamp dipped beam	—
3	Brown	7.5 amp	RH headlamp main beam	—
4	Brown	7.5 amp	LH headlamp main beam	—
5	Tan	5 amp	RH side and panel lamps	—
6	Tan	5 amp	LH side lamps	—
7	Blue	15 amp	Front wash/wipe motor	Aux
8	Yellow	20 amp	Heater motor	Aux
9	Blue	15 amp	Heated rear screen	Ign
10	Violet	3 amp	Electric mirror heating element—option	Ign
11	Blue	15 amp	Interior lights, under bonnet illumination, clock, headlamp flash, horns	Ign
12	Red	10 amp	Rear fog guard (from dipped headlamps)	—
13	Blue	15 amp	Directional indicators, stop lights, reverse lights, electric mirror motors	Ign
14	Blue	15 amp	Auxiliary circuit to trailer	—
15	Blue	15 amp	Auxiliary driving lamps	—
16	Red	10 amp	Rear wash/wipe motor	Aux
17	Yellow	20 amp	Cigar lighters (front and rear)	Ign
18	Red	10 amp	Fuel pump	Ign
19	Red	10 amp	Central door locking—option	—
20	White	25 amp	Electric window lifts—option	Aux

NOTE: **Radio/Cassette combination—option. An in-line type 7 amp fuse is incorporated into the power input lead of the unit.**

FUSE BOX—Main and Auxiliary

Remove and refit

Remaining

1. Disconnect the battery.
2. Remove the clip-on fuse box cover
3. Remove the fuses from the main and auxiliary fuse boxes.

   NOTE: The fuses in the six-way auxiliary fuse box will only be present when air-conditioning is fitted to the vehicle.

4. Remove the single screw securing the top auxiliary fuse box to the fuse box surround.
5. Unclip the opposite end of the fuse box.
6. Remove the two screws securing the main fuse box to the lower centre fascia panel.
7. Withdraw the auxiliary fuse box surround.
8. Manoeuvre the main and auxiliary fuse box to enable them to be withdrawn through the fuse box aperture.
9. Remove the leads from the fuse boxes, by inserting a small screwdriver into each fuse socket to depress the small retaining tab on the back of the lucar connections, withdraw the leads from the rear of the fuse box.

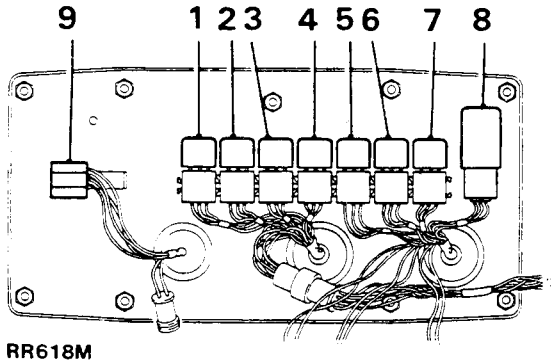
Refitting

10. Reverse the removal instructions ensuring that all leads are refitted to the correct fuse socket (refer to main circuit diagram).

NOTE: When refitting the leads to the fuse box, the retaining tabs on the back of the lucar connectors must be in their raised position to prevent the leads being pushed out of the rear of the fuse box when the fuse is refitted.

RELAYS—Identification

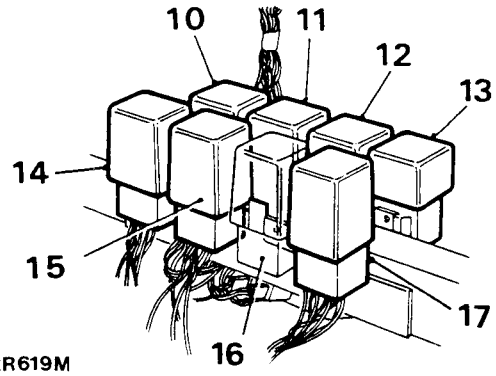
Incorporated in the vehicle electrical circuits are several relays, some of which are located behind the lower fascia panel attached to the steering column support bracket. The remaining relays are located in the engine compartment attached to the closure panel, these relays are accessible having removed the black protective cover.



RR618M

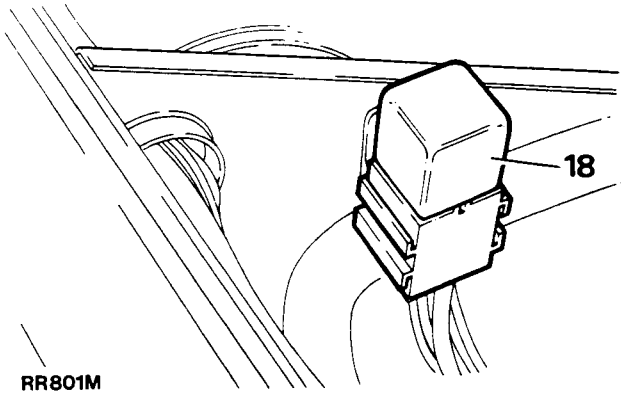
Closure panel viewed from the engine compartment. (RH drive vehicle illustrated—LH drive is a mirror image of RH drive).

NOTE: Refer to fuel injection section of manual (Book 2) for full information E.F.I. related to relays.



RR619M

Viewed from inside the vehicle with the lower fascia removed.



RR801M

Fuel cut-off relay (carburetter models only) located in the engine compartment attached to the left hand valance stiffener bracket.

RELAY	CIRCUIT DIAGRAM ITEM NUMBER	COLOUR
1. Air conditioning controlled fan relay	9. On air conditioning circuit diagram	Natural
2. Air conditioning relay (ignition controlled)	10. Air conditioning circuit diagram	Natural
3. Compressor clutch relay	8. On air conditioning circuit diagram	Natural
4. Fan relay	7. On air conditioning diagram	Natural
5. Starter solenoid relay	122. On main circuit diagram	Natural
6. Heated rear window relay	126. On main circuit diagram	Natural
7. Brake failure warning check relay	103. On main circuit diagram	Natural
8. Headlamp wash timer unit	73. On main circuit diagram	Natural
9. Ignition pick-up point	—	—
10. Hazard and flasher relay	96. On main circuit diagram	Blue
11. Voltage sensitive switch	— (only fitted to vehicles with air conditioning or split charge facility)	Yellow
	5. On split charge circuit diagram	
	129. On main circuit diagram	
12. Interior lamp delay	38. On main circuit diagram	Red
13. Auxiliary driving lamps relay	43. On main circuit diagram	Natural
14. Rear wiper delay	136. On main circuit diagram	Black
15. Rear wiper relay	138. On main circuit diagram	Black
16. Speed warning unit (Saudi only)		Green
17. Front wiper delay	78. On main circuit diagram	Black
18. Fuel cut off relay (carburetter models)	121. On main circuit diagram	Natural

RELAYS—(Mounted on the engine compartment closure panel).

Remove and refit

Removing

1. Lift the bonnet.
2. Disconnect the battery.
3. Remove the bolt securing the relay protective cover, located on the front of the engine compartment closure panel.
4. Remove the cover.
5. Pull the appropriate relay off its multi-plug.

Refitting

6. Reverse the removal procedure.

RELAYS—(Mounted on the steering column support bracket).

Remove and Refit

Removing

1. Disconnect the battery.
2. Remove the six screws securing the lower fascia panel.
3. Lower the fascia panel, disconnect the electric leads from the dimming control switch and remove the fascia panel.
4. Locate the appropriate relay on the relay mounting bracket, carefully pull the relay off the multi-plug.

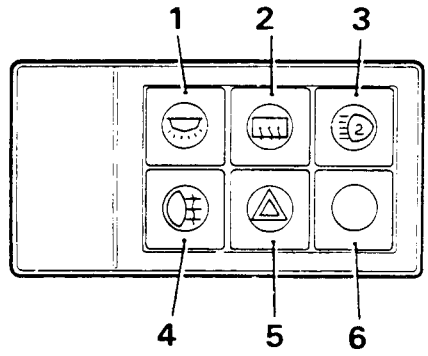
Refitting

5. Reverse the removal procedure.

AUXILIARY SWITCH PANEL

The auxiliary switch panel contains four 'push-push' type switches (five when auxiliary driving lamps are fitted) which incorporate integral symbols for identification.
(The sixth switch aperture is fitted with a blank cover, which is removable, to facilitate the fitting of an extra switch if required).
The symbols are illuminated by two bulbs which become operational when the vehicle lights are on.

The heated rear screen and hazard warning switches (2 and 5) are also provided with individual warning lights, illuminated when the switches are operated.



RR627M

1. Interior roof and tailgate lights.
2. Heated rear screen.
3. Auxiliary driving lamps—option.
4. Rear fog guard lamps.
5. Hazard warning.
6. Blank.

AUXILIARY SWITCH PANEL

Remove and Refit

Removing

1. Disconnect the battery.
2. Carefully prise the auxiliary switch panel surround away from the centre console.
3. Withdraw the switch panel as far as the electrical leads will permit.
4. Unclip the multi-plugs at the rear of the switches by depressing the retaining lugs.
5. Pull the plugs from the switches.
6. Remove the switch assembly complete.

NOTE: If necessary each individual switch can now be removed as follows.

7. Depress the small retaining lugs on the top and bottom of the switch and push the switch(es) through the front of the switch surround.

Refitting

8. Reverse the removal procedure.

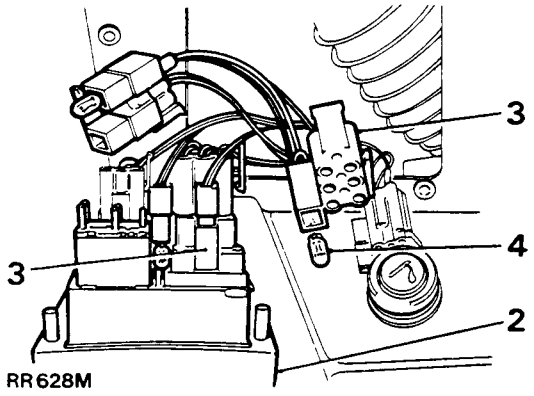
NOTE: To aid identification and location of mutli-plug to switch a coloured plastic tab is attached to each switch body which corresponds with an appropriate coloured multi-plug.
The switches if removed, should always be refitted in their original position.

Continued

Auxiliary switch panel warning lights—bulb replacement (switches 2 and 5).

To replace either bulb

1. Disconnect the battery.
2. Carefully prise the switch panel surround away from the centre console.
3. Unclip the multi-plug from the rear of the appropriate switch and disconnect the plug.
4. The warning light bulb is located in the multi-plug and is removed by pulling the bulb from its location.
5. Renew the bulb and refit the multi-plug.



RR628M

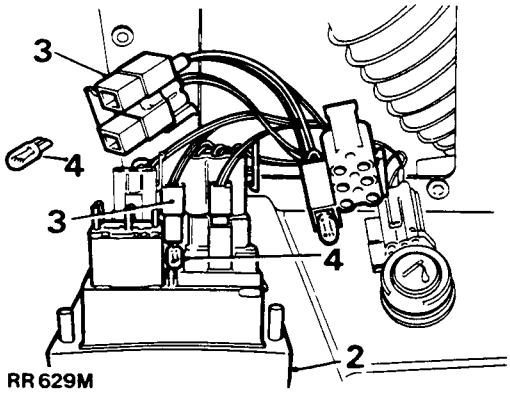
6. Press the auxiliary switch panel back into the centre console.
   Red bulb—Hazard warning/Amber bulb—Heated rear screen. The correct bulb type is a 12-volt 1.2-watt 'wedge' base (capless).

Auxiliary switch panel illumination

To replace either bulb

The auxiliary panel green illumination bulbs are located in the rear fog and hazard warning multi-plugs, each bulb is positioned in the centre of a group of four switches.

1. Disconnect the battery.
2. Carefully prise the switch panel surround away from the centre console to give access to the multi-plugs at the rear of the switches.
3. Unclip and pull the multi-plug from the rear of the appropriate switch.
4. Pull the green illumination bulb from its location.



RR629M

5. Renew the bulb and refit the multi-plug.
6. Press the auxiliary panel surround back into the centre console.

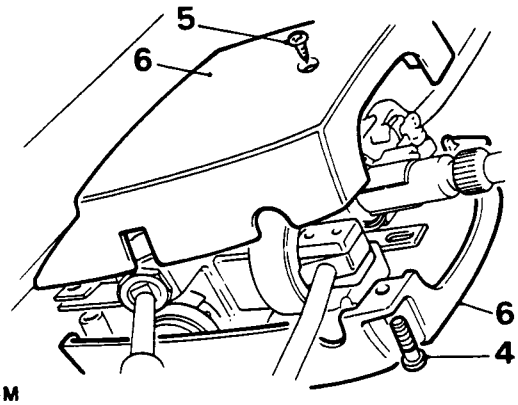
The correct bulb type is a 12-volt 1.2-watt 'wedge' base (capless).

IGNITION STARTER SWITCH

Remove and refit

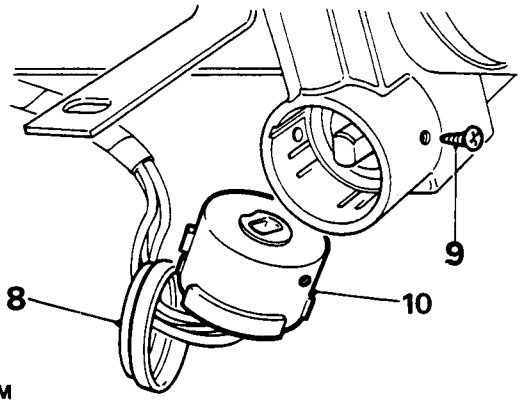
Removing

1. Disconnect the battery.
2. Remove the steering wheel centre cover.
3. Remove the lower fascia panel.
4. Remove the four screws securing bottom shroud to top shroud.
5. Remove the single screw securing top shroud to switch housing bracket.
6. Remove top shroud and lower the bottom shroud.



RR503M

7. Disconnect the ignition switch cable at the multi-plug.
8. Remove the rubber cover protecting the switch.
9. Remove the single screw securing the ignition/starter switch to the housing.
10. Withdraw the switch.



RR504M

Refitting

11. Reverse the removal procedure.

STEERING COLUMN CONTROLS

The steering column switch layout has been standardised for left- and right-hand drive vehicles and is as follows:—

LEFT-HAND CONTROLS

Lower switch—Main lighting switch.
Upper switch—Main and dipped beam, direction indicators and horn.

RIGHT-HAND CONTROLS

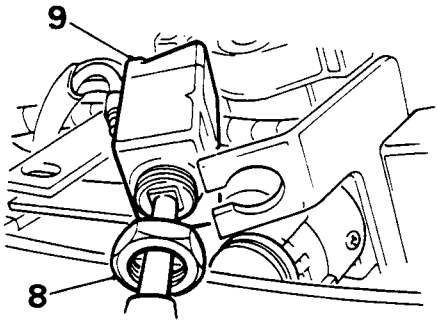
Lower switch—Rear screen programmed/wash/wipe.
Upper switch—Windscreen programmed wash/wipe.

MAIN LIGHTING SWITCH

Remove and refit

Removing

1. Disconnect the battery.
2. Remove the steering wheel centre cover.
3. Remove the lower fascia panel.
4. Remove the four screws securing bottom shroud to top shroud.
5. Remove the single screw securing top shroud to switch housing bracket.
6. Remove top shroud, and lower the bottom shroud.
7. Disconnect cables at snap connectors.
8. Loosen the switch retaining lock-nut.
9. Slide switch unit away from its bracket.



RR505M

Refitting

10. Reverse the removal procedure.

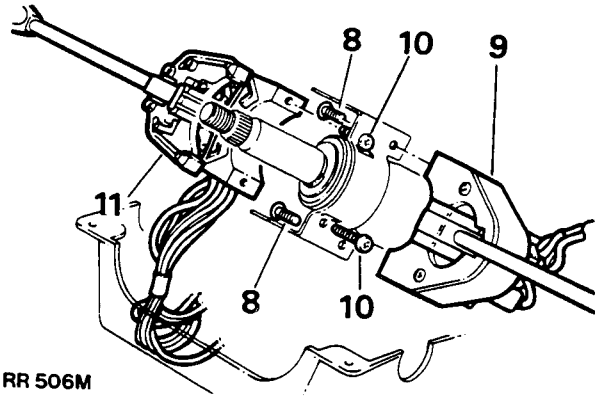
WINDSCREEN PROGRAMMED WASH WIPE SWITCH

MAIN AND DIPPED BEAM, DIRECTION INDICATORS AND HORN SWITCH

Remove and refit

Removing

1. Disconnect the battery.
2. Remove the steering wheel centre cover.
3. Remove the lower fascia panel.
4. Remove the four screws securing the bottom shroud to the top shroud.
5. Remove the single screw securing the top shroud to the switch housing bracket.
6. Remove the top shroud and lower the bottom shroud.
7. Disconnect the electrical leads at the multi-plugs.
8. Remove the two screws securing the windscreen wash/wipe switch to the column switch bracket.
9. Remove the switch to give access to the screws securing the main and dipped beam switch.
10. Release the two screws securing the upper switch to the switch bracket.
11. Slide the switch and bracket off the steering column.



RR 506M

Refitting

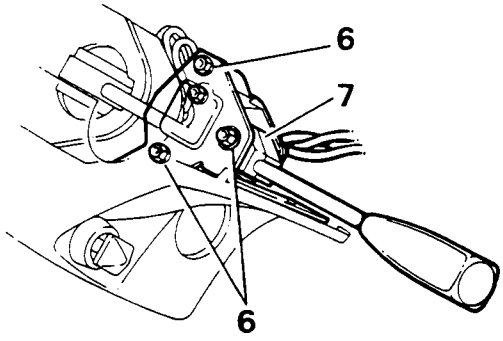
12. Reverse the removal procedure.

REAR SCREEN PROGRAMMED WASH WIPE SWITCH

Remove and refit

Removing

1. Disconnect the battery.
2. Remove the steering wheel centre cover.
3. Remove the lower fascia panel.
4. Remove the top and bottom shroud (refer to main and dipped beam switch removal and refit-items 4 to 7).
5. Disconnect the electrical leads at the multi-plug.
6. Remove the four small bolts securing the switch to the switch mounting bracket.
7. Remove the switch from the bracket.



RR 507M

Refitting

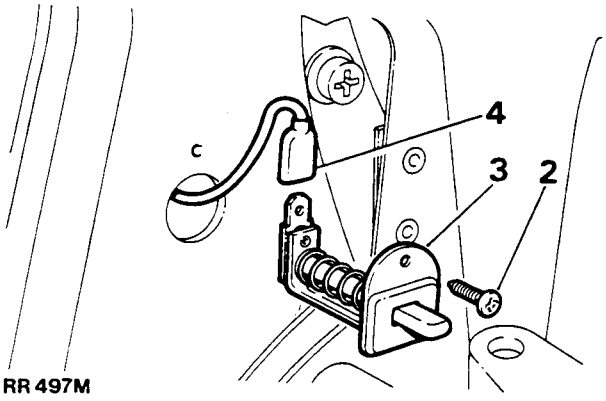
8. Reverse the removal procedure.

DOOR PILLAR SWITCH

Remove and refit

Removing

1. Disconnect the battery.
2. Remove screw securing switch to door pillar.
3. Withdraw switch.
4. Disconnect electrical lead from connector blade.



RR 497M

Refitting

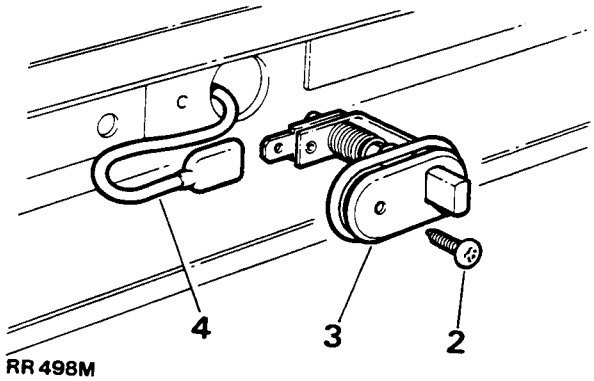
5. Reverse removal procedure.

REAR TAILGATE SWITCH

Remove and refit

Removing

1. Disconnect the battery.
2. Remove the single screw securing the switch to the tailgate aperture.
3. Withdraw the switch.
4. Disconnect the electrical lead.



RR 498M

Refitting

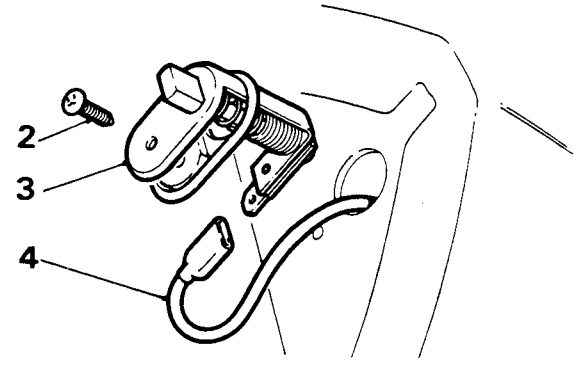
5. Reverse the removal procedure.

UNDER BONNET ILLUMINATION SWITCH

Remove and refit

Removing

1. Disconnect the battery.
2. Remove the single screw securing the switch to the decker panel.
3. Withdraw the switch.
4. Disconnect the electrical lead.



RR499M

Refitting

5. Reverse the removal procedure.

CIGAR LIGHTER—radio housing

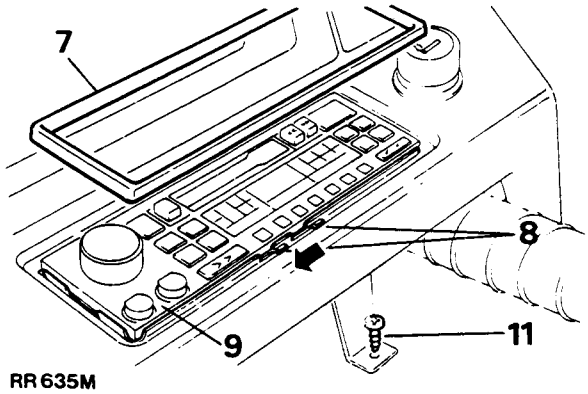
Remove and refit

Removing

1. Disconnect the battery.
2. Remove the High/Low range gear knob.
3. Remove the main gearbox knob.
   Manual gearbox versions—unscrew the knob.
   Automatic gearbox versions—See Automatic gear selector panel illumination.
4. Remove the cubby box liner and release the handbrake cable from the handbrake lever, prise the inset panel out of the floor mounted console.
   Automatic gearbox versions—Pull the two illumination bulbs from the selector panel.
5. Release the cubby box from its four floor mounted fixings.
6. Raise the front of the cubby box and console assembly and ease the unit away from the radio housing.

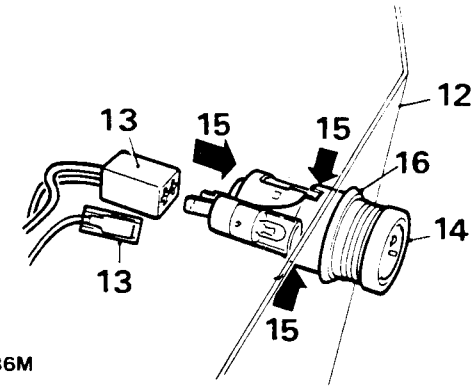
NOTE: It is necessary to remove the radio from its housing to facilitate easy removal of the radio console. The radio is removed as follows.

7. Carefully prise the outer surround away from the radio.
8. Slide the retaining clip to the left.
9. Lift the radio out of the housing.
10. Disconnect the electrical connections and aerial plug from the rear of the radio.
11. Remove the single screw securing the housing to the top of the gearbox tunnel.



RR635M

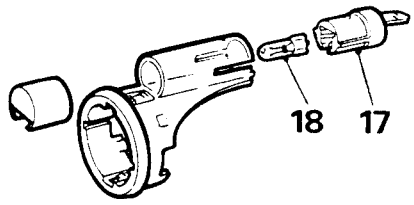
12. Pull the housing away from the lower fascia.
13. Disconnect the electrical leads at the rear of the cigar lighter.
14. Remove the push in switch from the lighter outer body.
15. Depress the outer plastic surround where denoted by the arrows and push the outer body through the surround.
16. Manoeuvre the plastic surround and remove it from the radio housing.



RR636M

CIGAR LIGHTER ILLUMINATION—Bulb replacement

17. Remove the bulb holder from the plastic surround.
18. Pull the bulb from the holder. The correct bulb type is a 12v 1.2 watt wedge base (capless).



RR637M

Refitting

19. Reverse the removal procedure.

CIGAR LIGHTER—Cubby Box

The rear cigar lighter is located in the bottom of the cubby box, access to the rear of the lighter is gained through heater/air vent duct below the rear ashtray.
Follow instructions 13 to 16 of CIGAR LIGHTER —radio housing to remove the lighter from the cubby box.

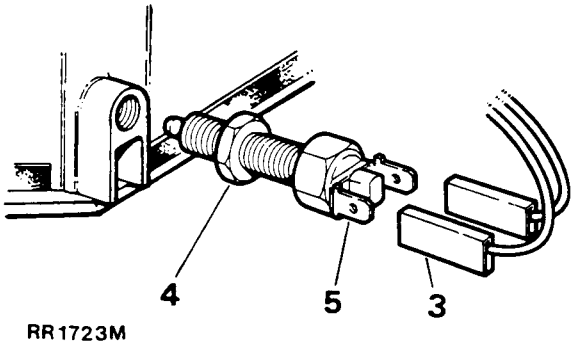
REVERSE LIGHT SWITCH—MANUAL GEARBOX (5 SPEED)

Remove and refit

Removing

The reverse light switch is located at the rear of the gear selector housing and is accessible from underneath the vehicle.

1. Drive vehicle onto a ramp.
2. Disconnect the battery.
3. From underneath the vehicle, disconnect the electrical leads.
4. Release the locknut securing the switch in position.
5. Unscrew the reverse light switch from the gear selector housing.



RR1723M

Refitting

NOTE: The reverse light switch will require re-setting on reassembly.

6. Select reverse gear.
7. Connect a 12-volt supply to either of the switch terminals.
8. Connect a test lamp to the remaining terminal.
9. Screw the switch into the housing until the test lamp is illuminated. Rotate the switch a further half-turn.
10. Tighten the locknut to secure the switch in position.
11. Re-connect the switch electrical leads.
12. Re-connect the battery.
13. Drive the vehicle off the ramp.

REVERSE LIGHT SWITCH—START INHIBITOR SWITCH

Automatic gearbox

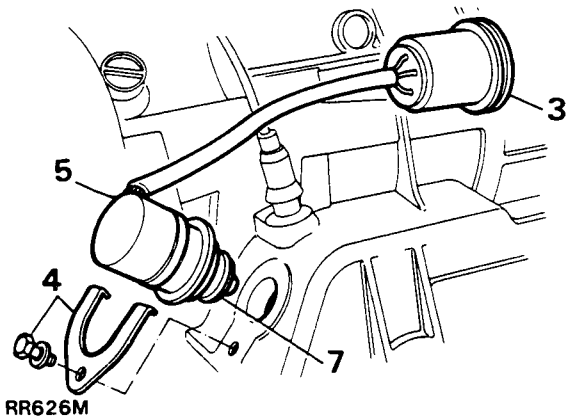
Remove and refit

The reverse light switch is an integral part of the start inhibitor switch and is located on the left-hand side of the gearbox above the front of the gearbox sump and is accessible from beneath the vehicle.

Continued

Removing

1. Drive the vehicle onto a suitable ramp.
2. Disconnect the battery.
3. Disconnect the multi-plug.
4. Release the clamp bolt and remove the clamp.
5. Withdraw the switch from its location.



RR626M

Refitting

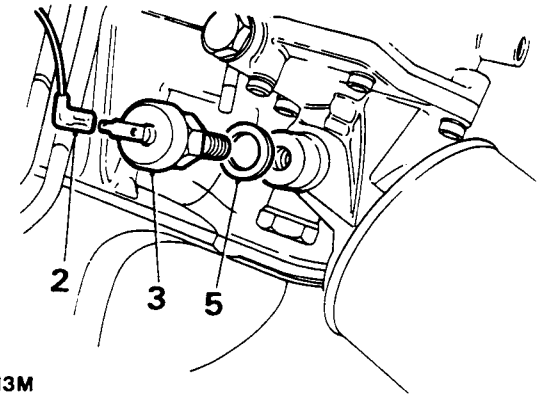
6. Reverse the removal instructions.
7. Fit a NEW 'O' ring to the switch.

OIL PRESSURE WARNING SWITCH

Remove and refit

Removing

1. Disconnect the battery.
2. Disconnect the electrical lead from the switch.
3. Unscrew the switch unit.
4. Remove switch and sealing washer.



RR513M

Refitting

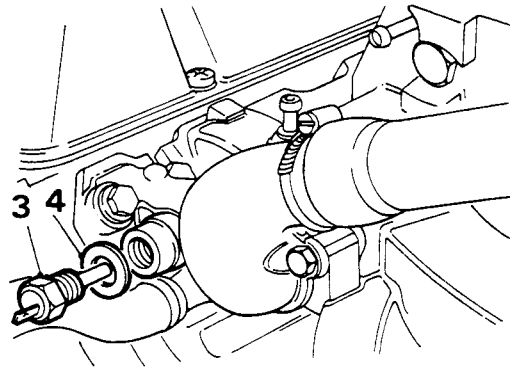
5. Reverse the removal procedure, using a NEW sealing washer.

COOLANT TEMPERATURE TRANSMITTER —Carburetter Models only

Remove and refit

Removing

1. Disconnect the battery.
2. Disconnect the electrical lead from the transmitter and the air cleaner hose.
3. Remove the transmitter from the inlet manifold.



RR514M

Refitting

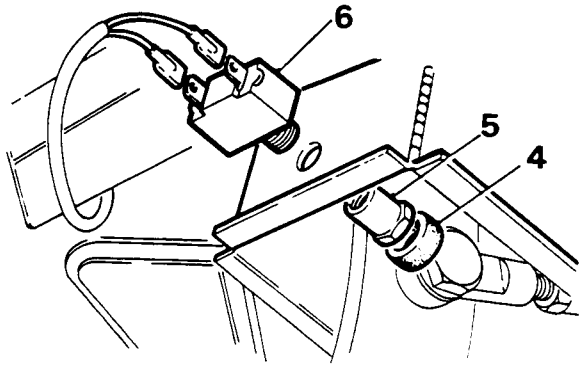
4. Reverse the removal procedure, using a NEW joint washer.

STOP LIGHT SWITCH

Remove and refit

Removing

1. Disconnect the battery.
2. Remove the lower fascia panel.
3. Depress the foot brake.
4. Remove the rubber protector from switch (where fitted).
5. Remove the hexagon nut.
6. Withdraw the switch.
7. Disconnect the electrical leads.



RR509M

Refitting

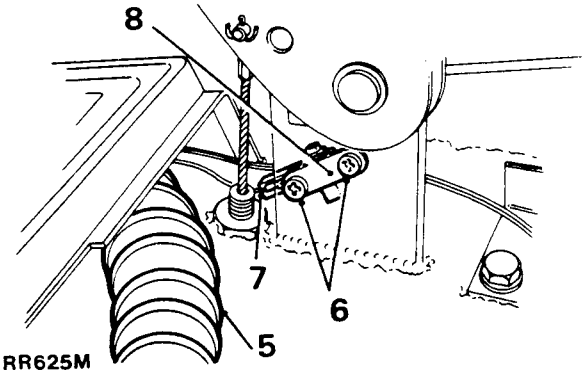
8. Reverse the removal procedure.

HANDBRAKE WARNING SWITCH

Remove and refit

Removing

1. Disconnect the battery.
2. Apply the handbrake.
3. To gain access to the warning switch located on the side of the handbrake mounting bracket, it is necessary to remove the cubby box liner.
4. Remove the four screws securing the cubby box liner and lift out the liner.
5. Carefully pull the rear warm air flow hose away from the side of the handbrake mounting bracket to give access to the two screws securing the switch in position.
6. Remove the two screws.
7. Manoeuvre the switch around the front of the handbrake mounting bracket and disconnect the electrical lead.
8. Withdraw the switch.



RR625M

Refitting

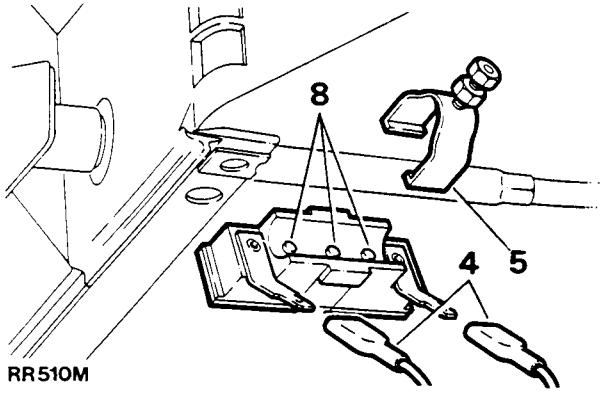
9. Reverse the removal procedure.

CHOKE WARNING LIGHT SWITCH—Carburetter Versions only

Remove and refit

Removing

1. Disconnect the battery.
2. Remove the six screws securing the lower fascia panel.
3. Remove the lower fascia panel to give access to the rear of the upper fascia.
4. Remove the two electrical leads from the switch.
5. Remove the screw and clip securing the switch to the choke cable and slide the clip off the switch.
6. Remove the switch.



RR510M

Refitting

7. Reverse the removal procedure.
8. Ensure that the three pegs on the switch locate in the corresponding holes on the choke outer cable.

EXTERIOR DRIVING MIRRORS—4 DOOR ONLY

1. The mirror housing is hinged vertically and should be set in one of the two fixed angle positions provided to suit the respective left or right side mirror location.
2. Additionally, for safety and convenience, the mirror housing is designed to fold completely forwards or rearwards against the vehicle body.

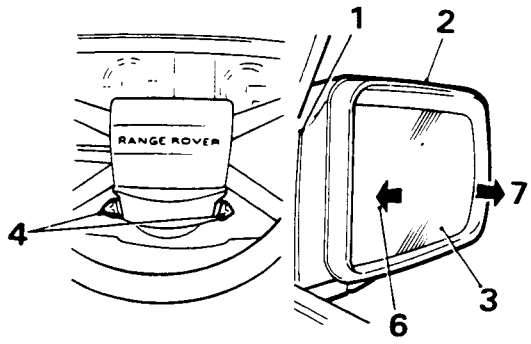
NOTE: Flat mirrors are fitted to Australian vehicles.

Setting the mirror—manual version

3. The glass angle is finely adjusted by moving it vertically or horizontally as required.

Setting the mirror—electrically operated

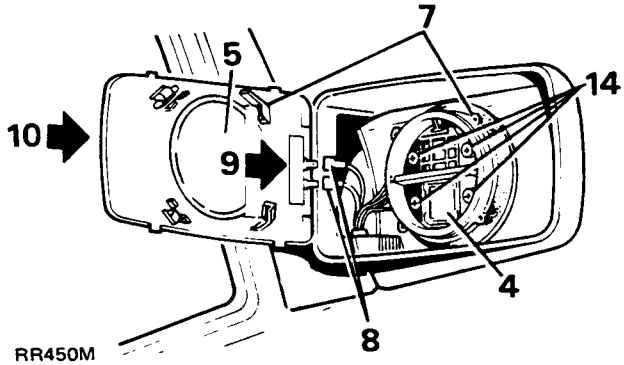
4. Fine adjustment is controlled by an electric motor inside the mirror housing. This is operated by individual finger-tip operated controls fitted on either side of the steering column lower cover. To adjust, move the head of the appropriate control to the left, right, up or down as required. The mirror selected will respond accordingly.
5. The mirror also incorporates a demist facility, activated by operation of the rear window demist switch.



RR521M

Renewing the mirror glass—manual and electric versions

6. Press the inner (wider) end of the glass inwards to its full extent.
7. Insert the fingers under the outer (narrower) end of the glass, and pull outwards until the glass is released from its four retaining clips.
8. On electrical versions disconnect the two demister leads attached to back of the glass unit.



RR450M

9. To replace the glass, locate the inner (wider) end of the glass in the mirror housing first.
10. Carefully press the outer (narrower) end of the glass inwards until it is safely held by its four retaining clips.
11. Reset the fine adjustment as required.

EXTERIOR DRIVING MIRRORS

ELECTRIC MOTORS

Remove and Refit

Removing

12. Disconnect the battery.
13. Remove the mirror glass, as described in items 6 to 8.
14. Remove the four self-tapping screws securing the motor assembly to the mirror body.

Continued

15. Manoeuvre the motor assembly to reveal the electrical connections on the rear of the motor.
16. Pull the leads from the rear of the motor assembly.

Refitting

17. Reverse operations 12 to 16, ensuring that the electrical leads are correctly refitted (see electric mirror, circuit diagram).

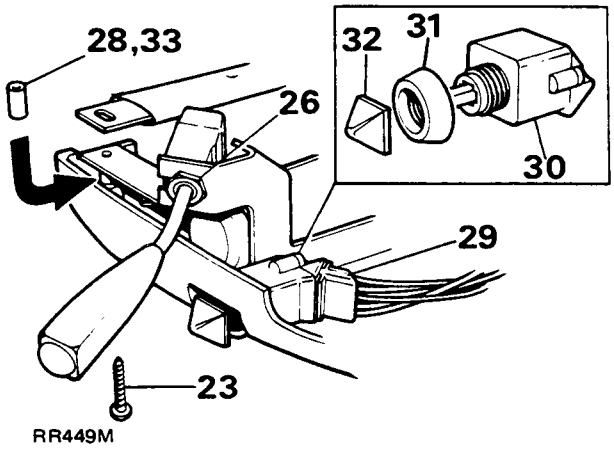
EXTERIOR DRIVING MIRRORS– FINGERTIP CONTROLLED SWITCHES

Remove and Refit

Service tool: 18G 1014 Extractor for steering wheel.
18G 1014-2 Adaptor pins.

Removing

18. Disconnect the battery.
19. Release the screw retaining the centre cover to the steering wheel and remove the cover.
20. Remove the retaining nut and washer securing the steering wheel.
21. Remove the steering wheel using the correct service tool.
22. Remove the lower fascia panel by releasing the six securing screws.
23. Remove the four screws securing the bottom shroud to the top shroud.
24. Remove the single screw securing the top shroud to the switch housing bracket.
25. Remove the top shroud.
26. Release the light switch locknut and remove the switch from the mounting bracket.
27. Manoeuvre the bottom shroud to clear the ignition switch/steering lock assembly.



28. Retrieve the small spacing collar located on the forward left hand side of the bottom shroud.
Note: It is important that the spacing collar is refitted on assembly.
29. Pull the multi-plug from the rear of the fingertip controlled mirror switch.
30. Carefully prise off the fingertip button at the operating end of the switch.
31. Unscrew the black plastic retaining collar securing the switch to the bottom shroud.
32. Remove the switch from the shroud.

Refitting

33. Reverse operations 18 to 32, ensuring that the black spacing collar is refitted.

NOTE: To prevent damage to the electrical wiring within the top and bottom shroud, the leads should be arranged carefully to avoid contact with mating faces on re-assembly.

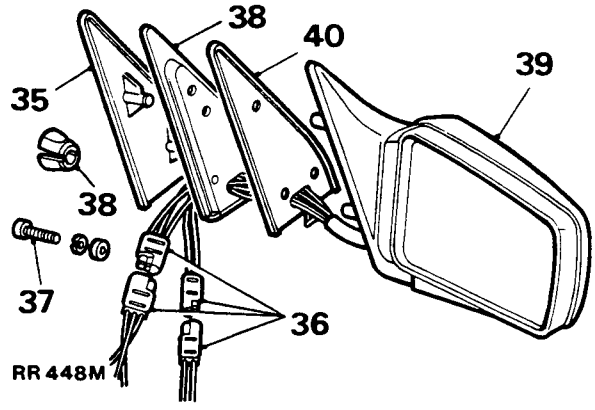
EXTERIOR DRIVING MIRRORS

COMPLETE ASSEMBLY

Remove and Refit

Removing

34. Disconnect the battery.
35. Carefully prise off the interior finisher plate to reveal the three securing screws and electric wiring.
36. Disconnect the two electrical plugs (one two pin, one three pin).
37. Supporting the exterior mirror assembly remove the three securing screws (with plain and spring washer).
38. Pull the inner mounting plate away from the inner door frame complete with the two retaining clips.
39. Detach the mirror assembly from the outer door frame.
40. Remove the sealing rubber.



Refitting

41. Reverse the operations 34 to 40.

NOTE: To prevent damage to the electrical wiring do not push the leads down inside the door casing.

INSTRUMENT ILLUMINATION
ELECTRONIC DIMMING CONTROL

The electronic dimming control switch is located on the lower fascia panel adjacent to the steering column. Rotate the control upwards to fully illuminate the instruments and downwards to reduce intensity.
The dimming control unit also controls the clock, heater and cigar lighter illumination.

Remove and refit

Removing

1. Disconnect the battery.
2. Remove the lower fascia panel by releasing the six securing screws.
3. Disconnect the dimming control multi-plug.
4. Remove the two screws securing the dimmer control switch to the under-side of the lower fascia panel.

Refitting

Reverse operations 1 to 4.

INSTRUMENT BINNACLE
WARNING LIGHT SYMBOLS


Direction indicator — left turn (green)


Direction indicator — right turn (green)

Park brake on — Australia only (red)


Headlamp main beam on (blue)


Trailer connected — flashes with direction indicators (green)


Rear fog guard lamps on (amber)


Ignition on (red)


Automatic gearbox oil temperature high (red)


Engine oil pressure, low (red)


Cold start, engaged (amber)


Fuel indicator, low (amber)


Differential lock engaged (amber)


Transmission handbrake on — except Australia (red)


Brake padwear (amber)

Brake fluid pressure, failure (red)

NOTE: The ignition and engine oil pressure symbols will be automatically illuminated when the ignition is switched on and extinguished when the engine is running. The brake fluid pressure symbol will also be illuminated while the ignition key is being held over to actuate the starter, confirming that the warning circuit is functioning correctly.

Continued

RENEWAL OF PANEL AND WARNING LIGHT BULBS

1. Disconnect the battery.
2. Unclip the back of the cowl from the instrument binnacle to give access to the panel and warning light bulbs in the back of the instrument case.
3. Remove the appropriate bulb holder unit by rotating it anti-clockwise and withdrawing it.

NOTE: The No charge ignition warning light, identified by its red coloured bulb holder, is of a higher wattage and is the only bulb which can be pulled from its holder and replaced independently.

4. Fit a new bulb holder unit and rotate clockwise to lock in position. The correct bulb type is a 1.2 watt bulb/holder unit, except the ignition bulb which is 2 watt wedge base type.
5. Refit the cowl and reconnect the battery.

NOTE: If difficulty is experienced in changing bulbs, due to the limited space available the instrument binnacle fixings should be removed to enable the binnacle to be raised above the fascia as far as other connections permit. See 'Instrument Binnacle removal' below for details of binnacle mounting bracket fixing.

INSTRUMENT BINNACLE

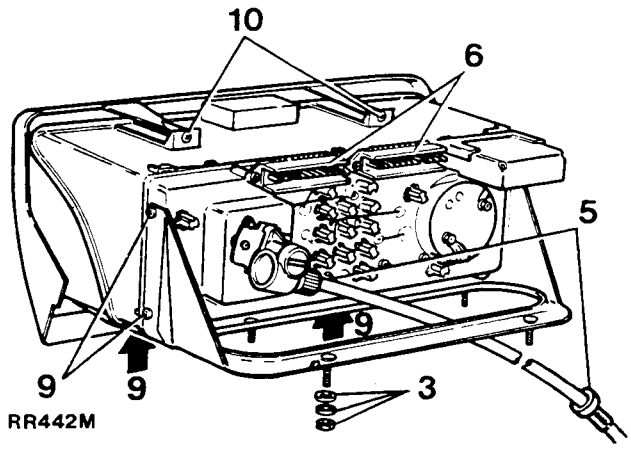
Remove and refit

Remove

1. Disconnect the battery.
2. Remove the lower fascia by releasing the six retaining screws.
3. Remove the four nuts (with spring and plain washers) from under the top fascia rail which secure the instrument binnacle to the vehicle.
4. Unclip the binnacle cowl, from the rear, to provide access to the two-part speedometer cable.
5. Disconnect the two-part speedometer cable from the speedometer drive on the back of the instrument case. Alternatively, from under the top fascia rail, release the cable connector ring at the intermediate clamped connection. This is located some 470 mm. (18.5 in.) from the speedometer drive. This connection is provided to facilitate separate renewal of either the upper or lower part of the cable in service.
6. Disconnect the two multi-plugs from the printed circuit connectors.
7. Lift the instrument binnacle from the top fascia rail and transfer it to the workbench.

Refitting

8. Reverse the removal instructions 1 to 7.



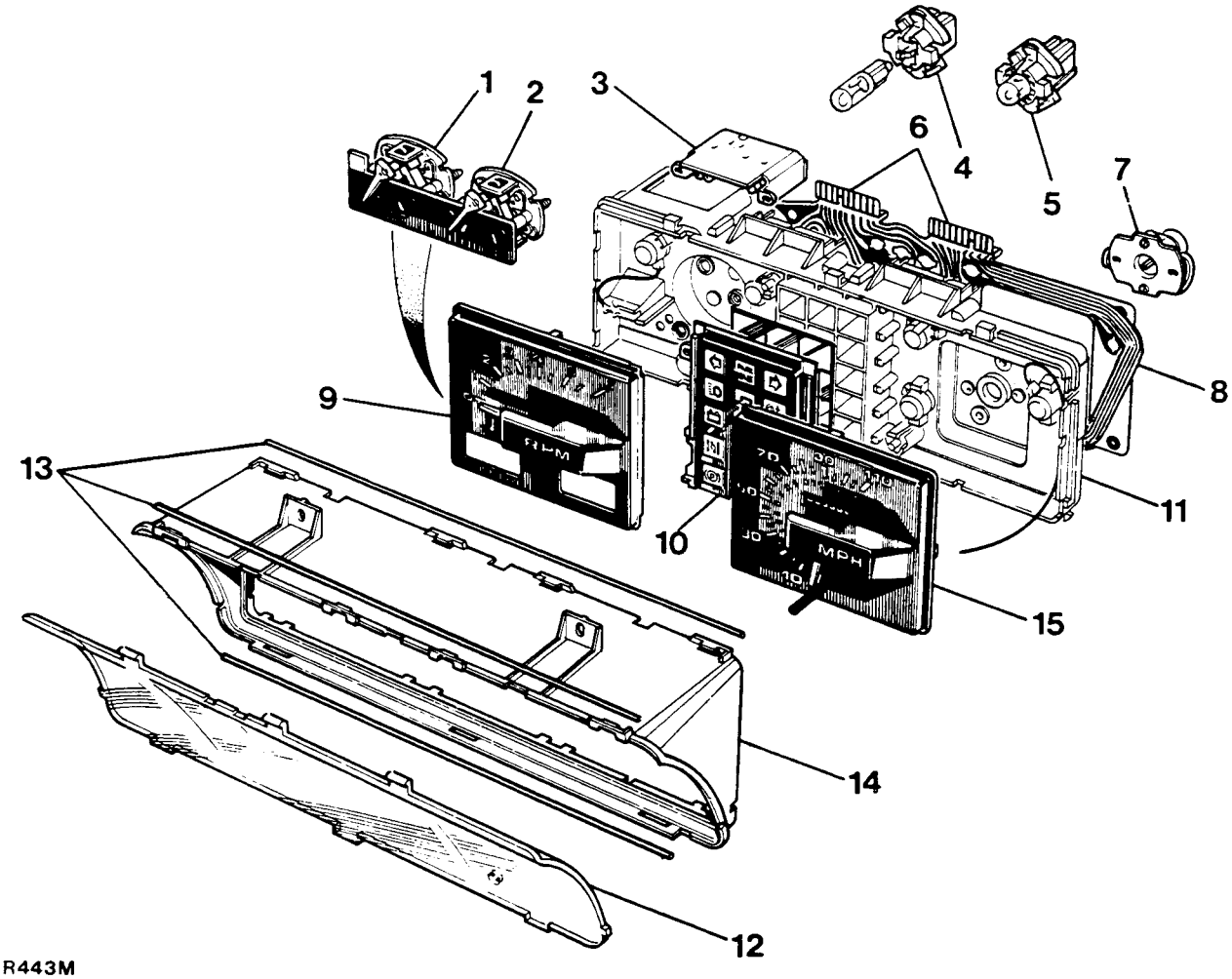
NOTE: On LHD vehicles, where an over-speed buzzer is fitted, the intermediate speedometer cable connections are threaded and retain a sensor unit between the two parts of the cable.
A lead from the sensor unit is connected to a black two-pin socket (black and white leads) below the binnacle, above the steering column area. The adjacent buzzer will be audible at approximately 120 kph. (75 mph.).

Removing Instrument Pack

9. Having removed the instrument binnacle from the vehicle, detach the binnacle mounting bracket. This is secured to the instrument case by two screws and to the bottom of the binnacle bezel by two smaller screws.
10. Remove the two screws retaining the top of the bezel to the front housing and detach the bezel.
11. Separate the instrument case from the binnacle housing by releasing the two wire clips.
12. Detach the curved lens from the binnacle housing by releasing the wire clip at the top.

Refitting Instrument Pack to Binnacle

13. Reverse removal instructions 9 to 12.



RR443M

Instrument Pack

1. Fuel gauge
2. Temperature gauge
3. Voltage stabiliser
4. Ignition warning bulb (with separate red holder unit)
5. Panel/warning lights bulb/holder
6. Printed circuit input tags (for harness connection)
7. Speedometer drive unit
8. Printed circuit
9. Tachometer
10. Warning lights panel
11. Instrument case (front)
12. Curved lens
13. Wire connecting clips
14. Binnacle housing
15. Speedometer

Continued

Renewing panel and warning lamp bulbs

14. Remove the appropriate bulb holder unit from the back of the instrument case by rotating the bulb holder anti-clockwise and withdrawing it.

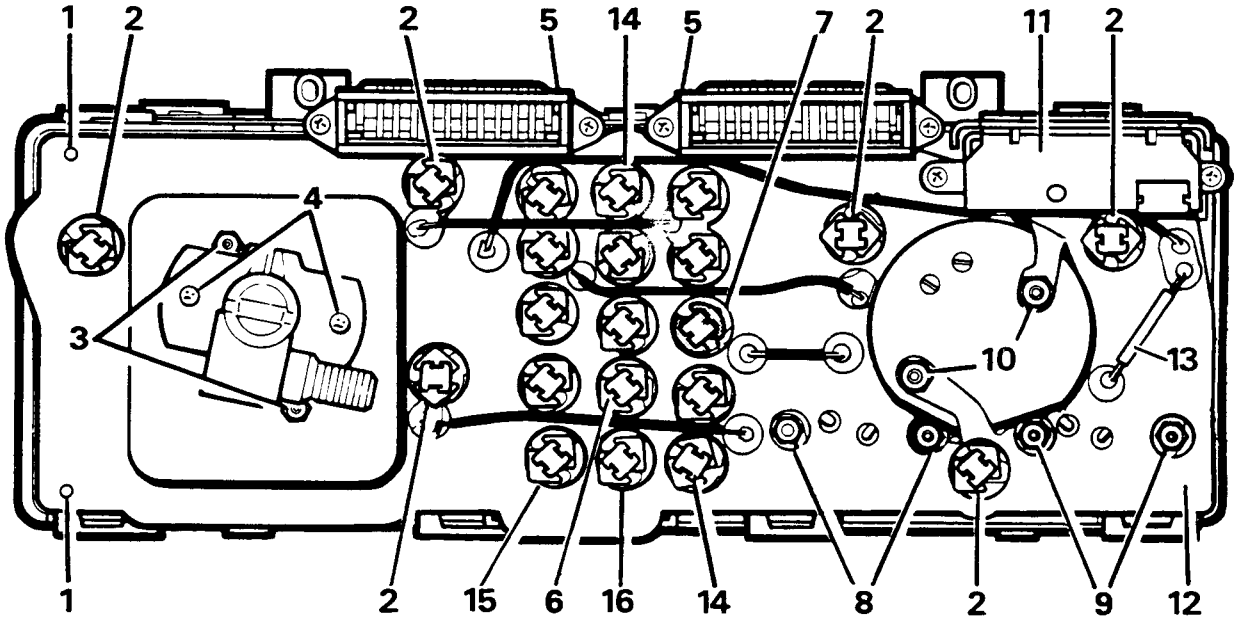
    NOTE: The No charge ignition warning light, identified by its red coloured bulb holder is of a higher wattage and is the only bulb which can be separated from its holder and replaced independently.

15. Fit a new bulb holder unit to the printed circuit and rotate clockwise to lock in position.
    The correct bulb type is a 1.2 watt bulb/holder, except the ignition bulb which is 2 watt wedge base type.

Removing printed circuit

16. Remove the two tachometer nuts (with washers) to release the printed circuit connecting tags.
17. Remove the four nuts (with washers) securing the fuel and temperature gauges to release the printed circuit from the fixing studs.
18. Release the two screws retaining the multi-function unit and lift off to release the printed circuit connecting tag.
19. Remove the two harness connectors, retained by four screws, to release the printed circuit tags.
20. Carefully ease the printed circuit from its four locating pegs.

Continued

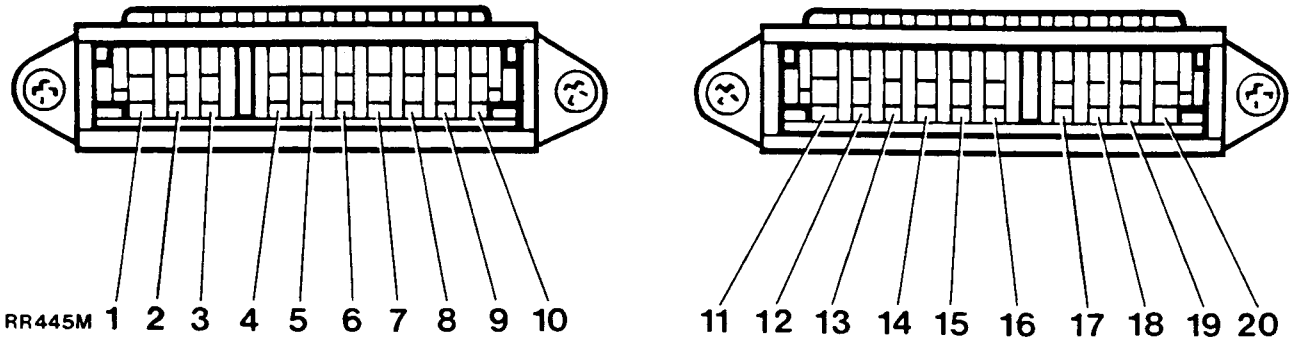


RR617M

Instrument case (back)

1. Locating pegs
2. Panel light bulbs
3. Speedometer securing screws
4. Speedometer drive securing screws
5. Harness connectors
6. Warning light bulbs
7. No charge warning light bulb (red holder)
8. Temperature gauge securing nuts
9. Fuel gauge securing nuts
10. Tachometer securing nuts
11. Multi-function unit
12. Printed circuit
13. Pull-up resistor—high temperature gearbox oil
14. Park/hand brake
15. Brake failure
16. Brake pad wear

PRINTED CIRCUIT HARNESS CONNECTIONS

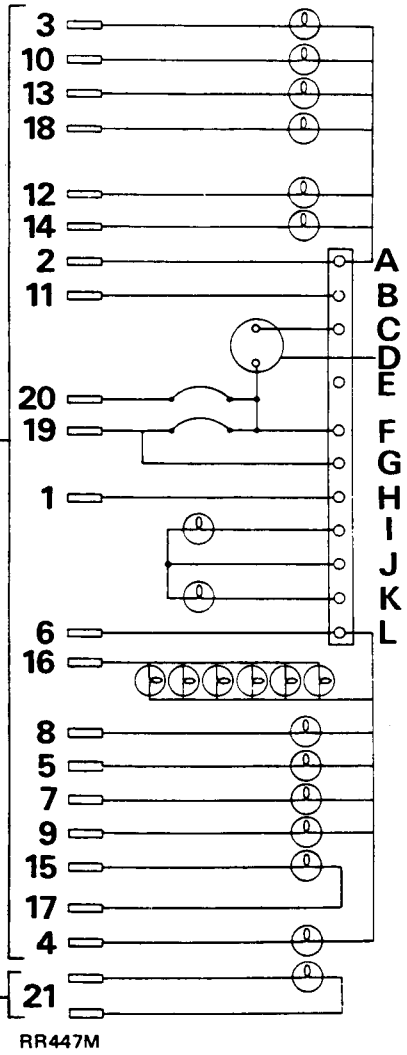


(Sequence of connections viewed from back of instrument case.)

CIRCUIT SERVED

Tacho signal 1
Ignition switch 12v+ 2
Ignition warning light 3
Trailer warning light 4
Main beam warning light 5
Earth 6
Direction indicators left hand 7
Rear fog warning light 8
Direction indicators right hand 9
Oil pressure warning light 10
High oil temperature warning light (Auto gearbox) 11
Cold start warning light 12
Differential lock warning light 13
Brake failure warning light 14
Brake pad wear warning light 15
Panel illumination warning light 16
Brake pad wear warning light 17
Park brake warning light 18
Fuel tank gauge 19
Coolant temperature gauge 20

Additional wired circuit on RHD vehicles for alternative Australian park brake warning light symbol. Connected to a black two-pin socket (white & black/pink leads) located under the binnacle, above the steering column area. 21



RR447M

MULTI-FUNCTION UNIT CONNECTIONS

A — 12v+ supply
B — Input to high oil temp warning light circuit
C — Tacho drive
D — Tachometer
E — Spare
F — 10v+ stabilised
G — Input to low fuel warning light circuit
H — Tacho signal
I — Low fuel warning light
J — 12v+ protected
K — High oil temperature warning light
L — Earth

Continued

Refitting the Printed Circuit

21. Reverse the removal procedure, items 16 to 20.
22. Ensure that the fuel and temperature gauge mounting studs are correctly located before pressing the printed circuit on to its four locating pegs.

Removing Tachometer

23. Carefully prise the needle shroud from the tachometer and disconnect the fibre optic element underneath the shroud.
24. Remove the two nuts (with washers) at the back of the instrument case which retains the tachometer and release the printed circuit tags.
25. Slacken the four nuts retaining the fuel and temperature gauges and carefully manoeuvre the tachometer from the front of the instrument case.

Refitting the Tachometer

26. Reverse the removal procedure, items 23 to 25.

Removing Fuel and Temperature Gauge Unit

27. Carefully prise the needle shroud from the tachometer and disconnect the fibre optic element underneath the shroud.
28. Remove the two nuts (with washers) retaining the tachometer and release the printed circuit tags.
29. Remove the four nuts (with washers) retaining the fuel and temperature gauges and carefully manoeuvre the tachometer, fuel and temperature gauge unit from the front of the instrument case.

Refitting the Fuel and Temperature Gauges

30. Locate the fuel and temperature gauge unit in the instrument panel but **do** not fit the washers and nuts at this stage.
31. Feed the fibre optic element through the aperture in the tachometer then locate the tachometer in the instrument panel.
32. Position the printed circuit tags over the two tachometer studs, fit the washers and fit and tighten the retaining nuts.
33. Fit the washers to the four fuel and temperature gauge studs and fit and tighten the retaining nuts.

Removing the Speedometer and Speedometer Drive Unit

34. Carefully prise the needle shroud from the speedometer and disconnect the fibre optic element underneath the shroud.
35. Remove the two hexagonal headed screws (with washers) at the back of the instrument case which retain the speedometer.
36. Carefully remove the speedometer from the front of the instrument case.
37. To release the speedometer drive unit, remove the two self-tapping screws securing it to the back of the instrument case.

Refitting the Speedometer and Speedometer Drive Unit

38. Reverse the removal procedure items 34 to 37 ensuring that the rubber gasket is fitted behind the speedometer drive unit.

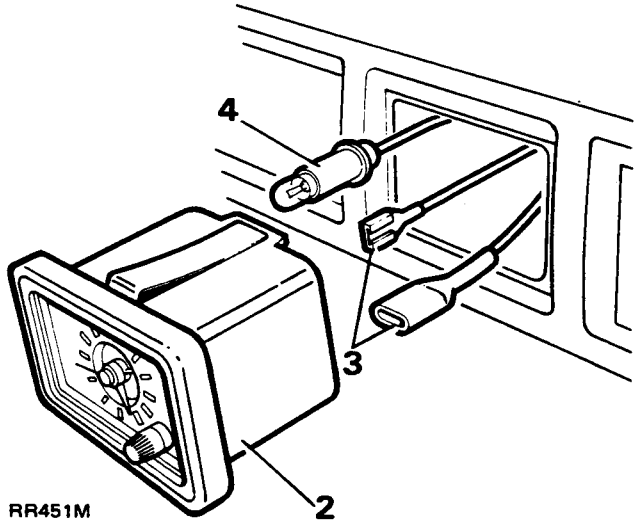
CLOCK

Remove and refit

Removing

1. Disconnect the battery.
2. Carefully prise the clock out of the fascia panel to reveal the electrical connections.
3. Disconnect the two electrical leads.
4. Remove the illumination lead complete with holder and bulb.

NOTE: The clock is illuminated by a 2-watt bayonet type bulb.



Refitting

5. Reverse the removal procedure.

SPEEDOMETER CABLE ASSEMBLY

The speedometer cable is a two part assembly, consisting of an upper cable, connected to the rear of the binnacle and a lower cable connected to the speedometer drive housing at the rear of the transfer gearbox. The two cables are joined by a connector ring behind the lower fascia, this connection is provided to facilitate separate renewal of either the upper or lower part of the cable in service.

To remove the upper cable refer to instrument binnacle removal.

Lower Speedometer cable

Remove and refit

Removing

1. Disconnect the battery.
2. Remove the lower fascia panel by releasing the six retaining screws.
3. Release the cable connector ring between the upper and lower cables and withdraw the cable and grommet from the bulkhead.
4. Remove the single nyloc nut and clamp securing the cable to the speedometer drive housing at the rear of the transfer gearbox.
5. Release the cable from the two retaining clips.

   NOTE: On left-hand-drive vehicles with automatic gearbox the speedometer cable is secured by a further two clips located above the cross-member attached to the chassis side-member.

6. Withdraw the cable from the speedometer drive housing.

Refitting

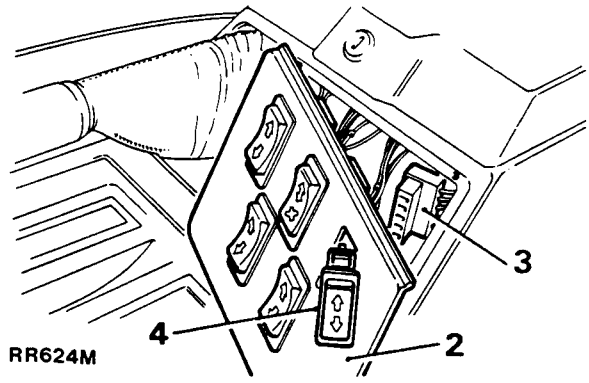
7. Reverse the removal procedure.

WINDOW LIFT SWITCHES

Remove and refit

Removing

1. Disconnect the battery.
2. Carefully prise the window lift switch surround away from the front of the cubby box.
3. Disconnect the multi-plug at the rear of the switch(es).
4. Apply pressure to the rear of the switch to push it through the surround.



Refitting

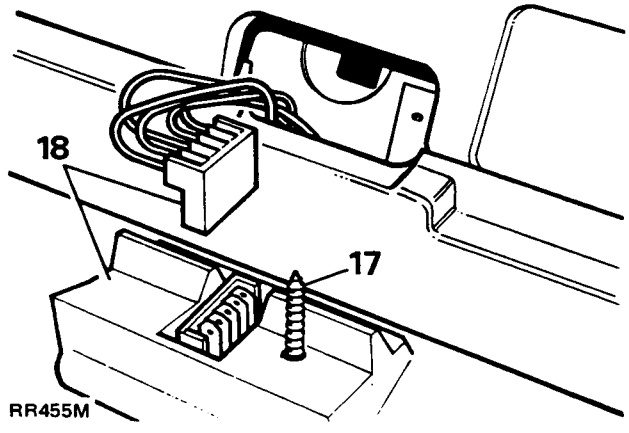
5. Reverse the removal procedure.

WINDOW LIFT MOTOR—Rear doors

Remove and refit

Removing

15. Ensure the side door glass is in its fully closed position and secure it with adhesive tape.
16. Disconnect the battery.
17. Remove the arm-rest/door-pull finisher to reveal the two securing screws.
18. Remove the two screws (with plain washers) and detach the arm-rest/door-pull from the inner door panel. To enable the arm-rest/door-pull to be removed from the door, the window operating switch multi-plug must be disconnected from the rear of the switch.

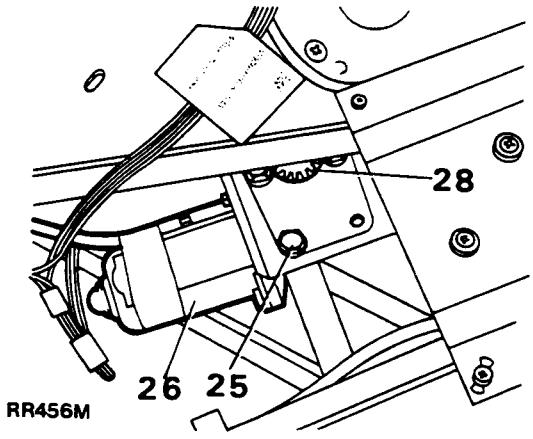


NOTE: At this stage the window operating switch can be removed by applying a little pressure to the rear of the switch to push it through the door-pull handle.

19. Remove the interior handle finisher button to reveal the screws retaining the handle surround.

Continued

20. Remove the screw and detach the handle surround from the door trim pad.
21. Remove the door trim pad by inserting a screwdriver between the trim pad and inner door panel, gently prising out the six plastic securing clips from their respective holes in the inner door panel.
22. Displace the bottom half of the plastic weather sheet to reveal the window lift motor.
23. Release the lift motor wiring harness from the retaining clips.
24. Disconnect the lift motor harness snap connections from the main door harness.
25. Supporting the lift motor release the three bolts securing the motor to the inner door panel.
26. Withdraw the lift motor from the lower aperture in the inner door panel.



RR456M

Refitting

27. Reverse operations 15 to 26.
28. Ensure the lift motor drive gear is engaged and correctly aligned with the window lift linkage before fitting the securing bolts.

WINDOW LIFT MOTOR—Front doors

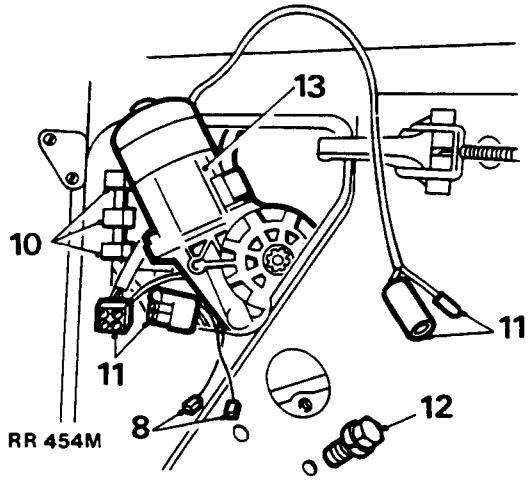
Remove and refit

Removing

1. Ensure that the side door glass is in its fully closed position and secure it with adhesive tape.
2. Disconnect the battery.
3. Detach the arm-rest/door-pull finisher to reveal the two securing screws.
4. Remove the two screws (with plain washers) to enable the arm-rest/door-pull to be detached from the inner door panel.
5. Remove the interior door handle finisher button to reveal the screw retaining the handle surround.
6. Remove the screw and detach the handle surround from the inner door panel.
7. Detach the inner door trim pad by inserting a screwdriver between the trim pad and inner door panel gently prising out the nine plastic securing clips from their respective holes in the inner door panel.
8. Disconnect the two radio speaker connections behind the trim pad, remove the trim pad complete with speaker.

NOTE: At this stage the speaker can be removed by releasing the four nuts (with plain washers) located on the back of the trim pad.

9. Peel back the front top corner of the plastic weather sheet to reveal the window lift motor.
10. Release the window lift motor wiring harness from the three retaining clips to allow the harness to be pulled out of the aperture at the front of the inner door panel.
11. Disconnect the window lift motor multi-plug from the main door harness.
12. Supporting the motor, remove the three securing bolts.
13. Withdraw the motor through the top front aperture of the door.



RR 454M

Refitting

14. Reverse operations 1 to 13.

NOTE: Ensure that the drive gear is engaged and correctly aligned with the window lift linkage before fitting the securing bolts.

ELECTRICALLY OPERATED CENTRAL DOOR LOCKING SYSTEM

An electrically operated central door locking system is fitted as an option on four door models.

Locking or unlocking the drivers door from outside by key operation, or from inside by sill knob automatically locks or unlocks all four doors.

Front and rear passenger doors can be independently locked or unlocked from inside the vehicle by sill knob operation but can be overidden by further operation of the drivers door locking control.

On rear doors only a child safety lock is provided which can be mechanically pre-set to render the interior door handles inoperative.

Failure of an actuator will not affect the locking of the remaining three doors. The door with the inoperative actuator can still be locked or unlocked manually.

NOTE: The door lock actuator units contain non-serviceable parts. If a fault should occur replace the unit concerned with a new one.

Before carrying out any maintenance work disconnect the battery.

FRONT DOOR ACTUATOR UNITS

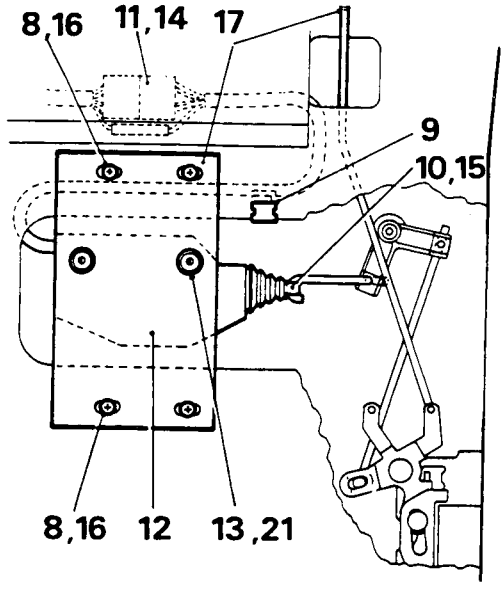
Remove and refit

Removing

1. Ensure the window is in its fully closed position.
2. Remove the arm-rest/door-pull finisher to reveal the two retaining screws.
3. Remove the interior door handle finisher button to reveal the screw retaining the handle surround.
4. Release the screw and remove the handle surround from the interior door trim pad.

   NOTE: On models fitted with manually operated side door windows it is necessary to remove the window regulator handle to enable the trim pad to be removed.

5. Release the door trim pad by inserting a screwdriver between the trim pad and the inner door panel, gently prising out the nine plastic clips from their respective holes around the edges of the trim pad.
6. Disconnect the two speaker connections inside the door and remove the door trim pad complete with speaker.
7. Peel back the top of the plastic weather sheet at the rear of the inner door panel to expose the lock actuator unit.
8. Remove the four screws (with plain washers) securing the lock actuator mounting plate to the inner door panel.
9. Release the clip retaining the electrical cable.
10. Manoeuvre the actuator assembly to detach the operating rod 'eye' from the hooked end of the actuator link on the door lock.
11. Withdraw the actuator assembly from the door until the electrical cable is pulled out of its channel sufficiently to expose the connectors which can then be detached.
12. Remove the actuator assembly from the door.
13. The actuator unit may be changed if necessary by removing the two rubber mounted screws which secure it to the mounting plate.



RR369M

Refitting

14. Locate the actuator assembly in the inner door panel and fit the electrical cable connectors. The cable, and connectors, are pulled back into the channel from the font end and the cable clip refitted.
15. Manoeuvre the actuator assembly to engage the operating rod 'eye' on the hooked actuator link.
16. Loosely fit the actuator mounting plate to the inner door panel with the four screws, setting the mounting plate in the centre of the slotted holes.
17. Ensure that manual operation of the sill locking control is not restricted by the operation of the actuator operating rod and vice versa, resetting the mounting plate as necessary.
18. Reconnect the vehicle battery.
19. Check that electrical operation of the door lock occurs when the sill locking control is moved through half of its total movement. Reset the mounting plate if necessary and tighten the four screws.

    NOTE: The above adjustment ensures that the full tolerance on the switching operation is utilised.

REAR DOOR ACTUATOR UNITS

Remove and refit

Instructions as for front doors with the following exceptions:

20. No radio speaker is involved.
21. The electrical cable and plug is retained to the inner door panel by two spring clips and is immediately accessible through the large aperture in the door.
22. Instruction 19 does not apply to rear actuator units which are not fitted with switches.

NOTE: If necessary the lock actuator may be detached from its mounting plate to facilitate the removal of the lock actuator from the connector rod inside the door panel.

FUEL TANK GAUGE UNIT

Remove and refit

Service tool–18G 1001 Locking spanner

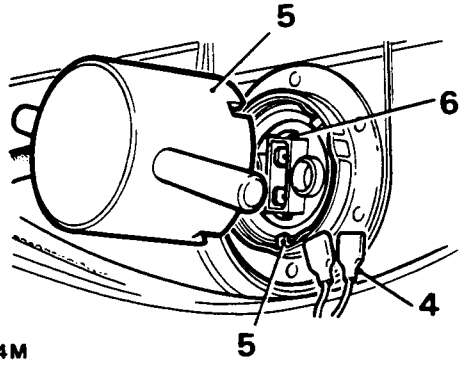
Removing

1. Disconnect the battery.

   NOTE: Ensure the fuel level is below the level of the gauge unit.

2. Chock the front wheels, raise the rear wheels clear of the ground and support the vehicle on stands.

3. Remove the left side rear wheel to provide easy access to the gauge unit which is fitted in the side of the fuel tank.
4. Disconnect the electrical leads from the gauge unit.
5. Using tool 18G 1001 release the tank unit locking ring.
6. Remove the gauge unit and sealing washer.



RR634M

Refitting

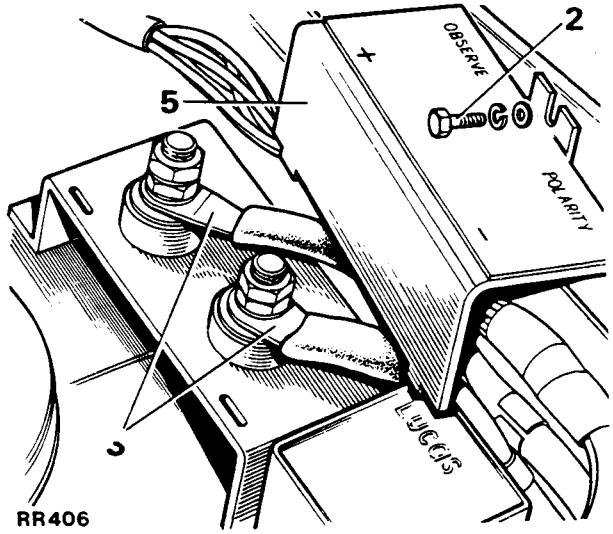
7. Fit a **NEW** sealing washer and locate the gauge unit in the tank ensuring that the notch in the periphery of the gauge unit locates with the register in the gauge aperture of the tank.

8. Refit the electrical leads.
   Green/Black lead to top terminal.
   Black lead to lower terminal.
9. Reverse the removal procedure.

SPLIT CHARGING FACILITY—OPTION

The circuit provides an additional source of electrical supply allowing separate charging and discharging of an additional battery for auxiliary equipment without affecting the charge state of the vehicle's main battery.
A terminal bracket, heavy duty relay and cables are fitted on the left hand front wing valance adjacent to the power steering reservoir.
The additional battery, leads and fixing clamps are **not** included in the option.
The split charging system is controlled by a voltage sensitive switch which energises the relay when the ignition voltage exceeds a pre-set level, thus supplying current to the positive terminal on the terminal bracket. Conversely, if the ignition voltage falls below the pre-set level the split charging circuit will cut out.

NOTE: The split charge facility is not available on fuel injection models.



RR406

To operate split charging system

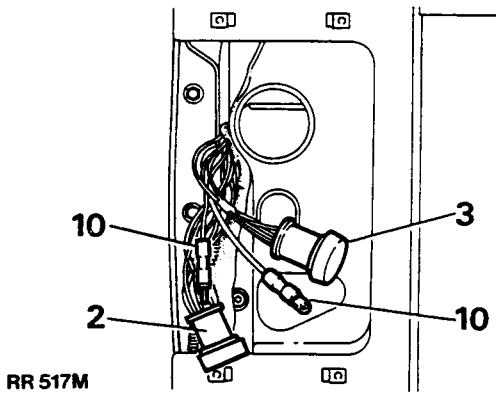
1. Install the additional battery.
2. Remove the fixing bolt securing the terminal bracket cover.
3. Ensure that the positive and negative leads are correctly connected to the terminals and the battery in accordance with the markings on the terminal bracket cover.
4. Start the engine. As soon as the alternator is charging the vehicle battery and the voltage exceeds the pre-set level the split charge function will operate.
5. After charging replace terminal bracket cover.

TRAILER SOCKET—OPTION

Incorporated in the vehicle electrical circuit is a facility for fitting a seven pin trailer lighting socket.
The pick-up point is located behind the left-hand rear tail light cluster and is accessible by removing the tail light assembly.
The pick-up point consists of a seven pin pre-wired plug, a separate auxiliary fused line feed and reverse light lead.

1. Disconnect the battery.
2. Remove the rear tail light assembly and disconnect the electrical plug.
3. Remove the protective cap from the trailer pick-up point plug.
4. Feed a seven core cable (fitted with a pre-wired plug to one end—suitable for connection to pick-up point) down between the inner and outer body panels through the rear light aperture.
5. Feed the cable alongside the existing rear lighting harness.
6. Pull the cable through the aperture between the chassis side member and fuel tank.
7. Fit two retaining clips to the cable and secure it to the rear end cross member.
8. Connect the electrical leads to the vehicle trailer socket. (Refer to current trailer wiring regulations).
9. Secure trailer socket to the tow bar.
10. If it is necessary to provide a line feed and reverse light feed, provision is made for this by the presence of two extra leads in the rear light aperture. Means of identification are as follows:

    Fused auxiliary line feed—**Pink lead**
    Reverse light feed—**Green/Brown lead**

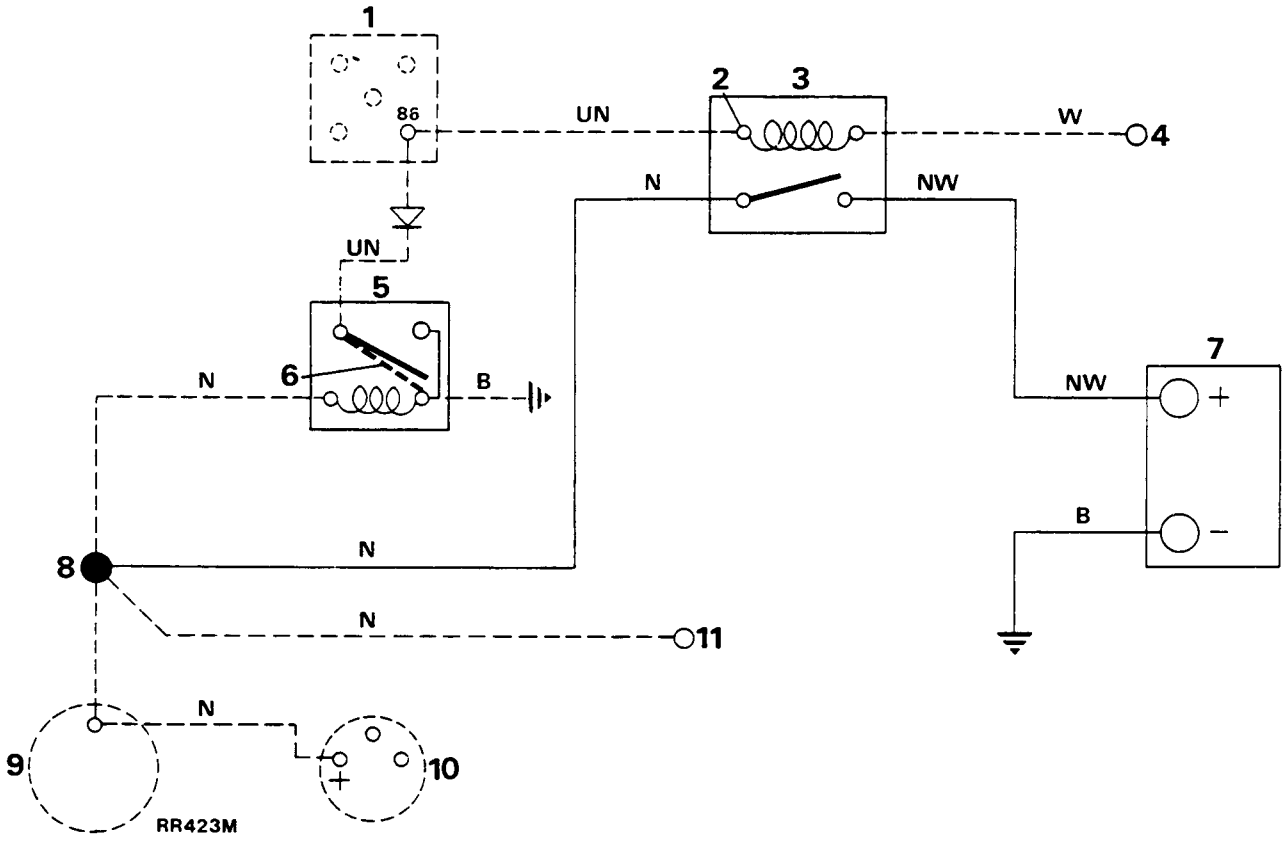


RR 517M

11. Refit rear tail light.
12. Reconnect the battery.

Notes

ELECTRICAL EQUIPMENT—CIRCUIT DIAGRAMS

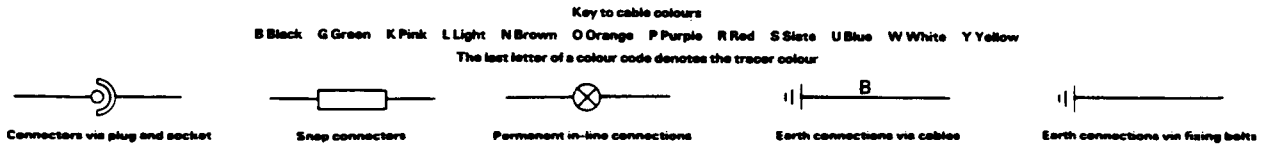


OPTIONAL ELECTRICAL EQUIPMENT—RANGE ROVER 2- AND 4-DOOR MODELS

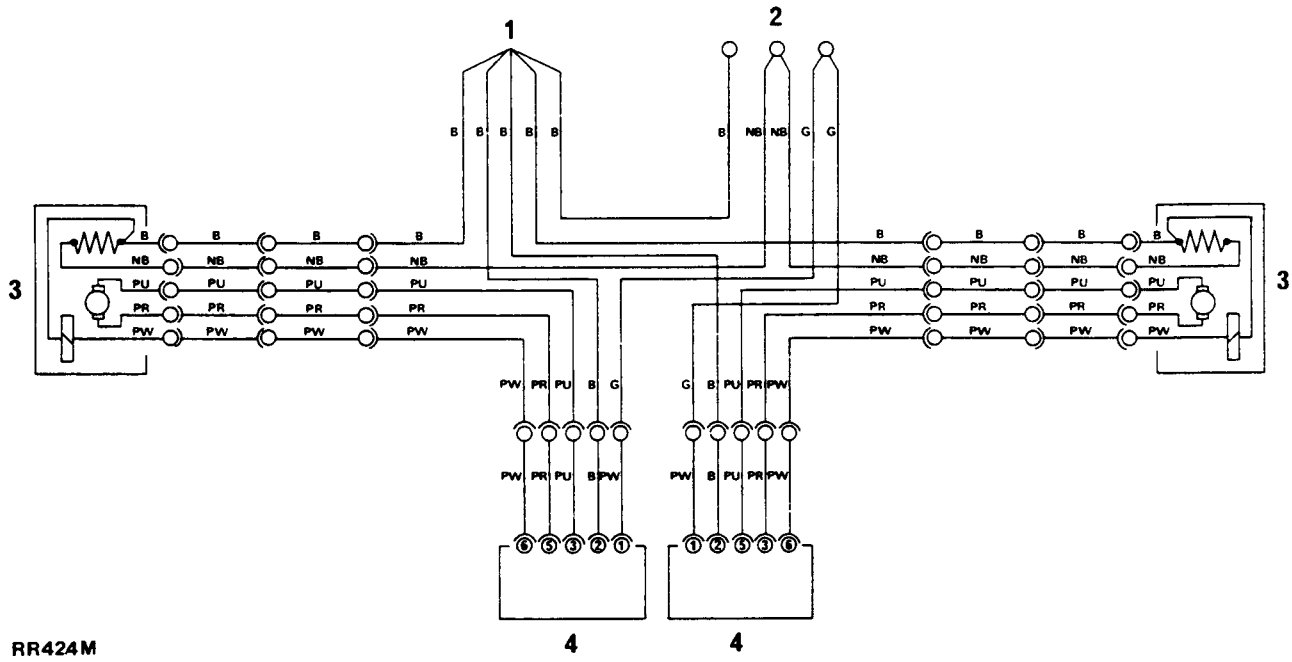
Split Charge Circuit Diagram

1. Heated rear window relay
2. Pick-up point for split charge relay (items 106 and 125 on main circuit diagram)
3. Split charge relay
4. Fuse box
5. Voltage sensitive switch
6. Link wire (removed from plug when voltage sensitive switch is fitted)
7. Terminal box auxiliary battery
8. Terminal post
9. Starter motor
10. Alternator
11. Vehicle battery

NOTE: Chain dotted lines indicate existing parts.



OPTIONAL ELECTRICAL EQUIPMENT—RANGE ROVER 4-DOOR MODELS



RR424M

Electric Mirrors Circuit Diagram

1. Clinch
2. Main cable connections (item 75 on main circuit diagram)
3. Mirrors
4. Mirror switches

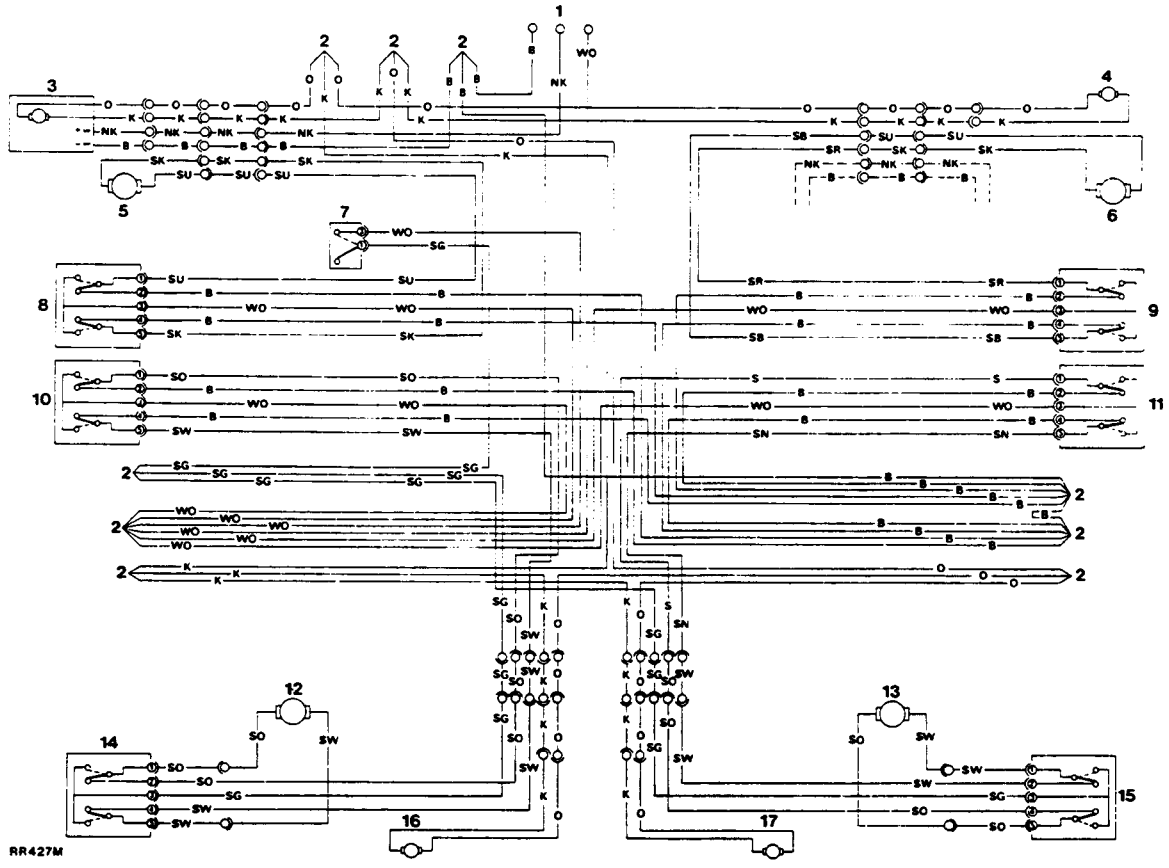
Key to cable colours

B Black G Green K Pink L Light N Brown O Orange P Purple R Red S Slate U Blue W White Y Yellow

The last letter of a colour code denotes the tracer colour

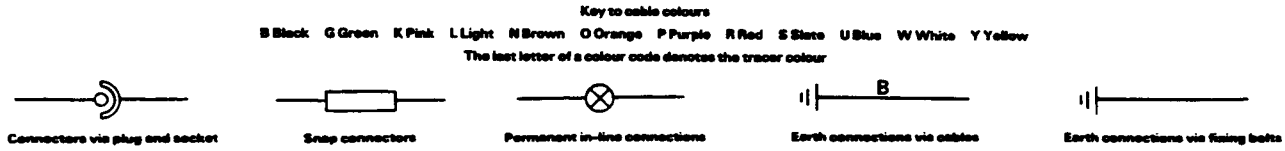
Connectors via plug and socket | Snap connectors | Permanent in-line connections | Earth connections via cables | Earth connections via fixing bolts

OPTIONAL ELECTRICAL EQUIPMENT—RANGE ROVER 4-DOOR MODELS



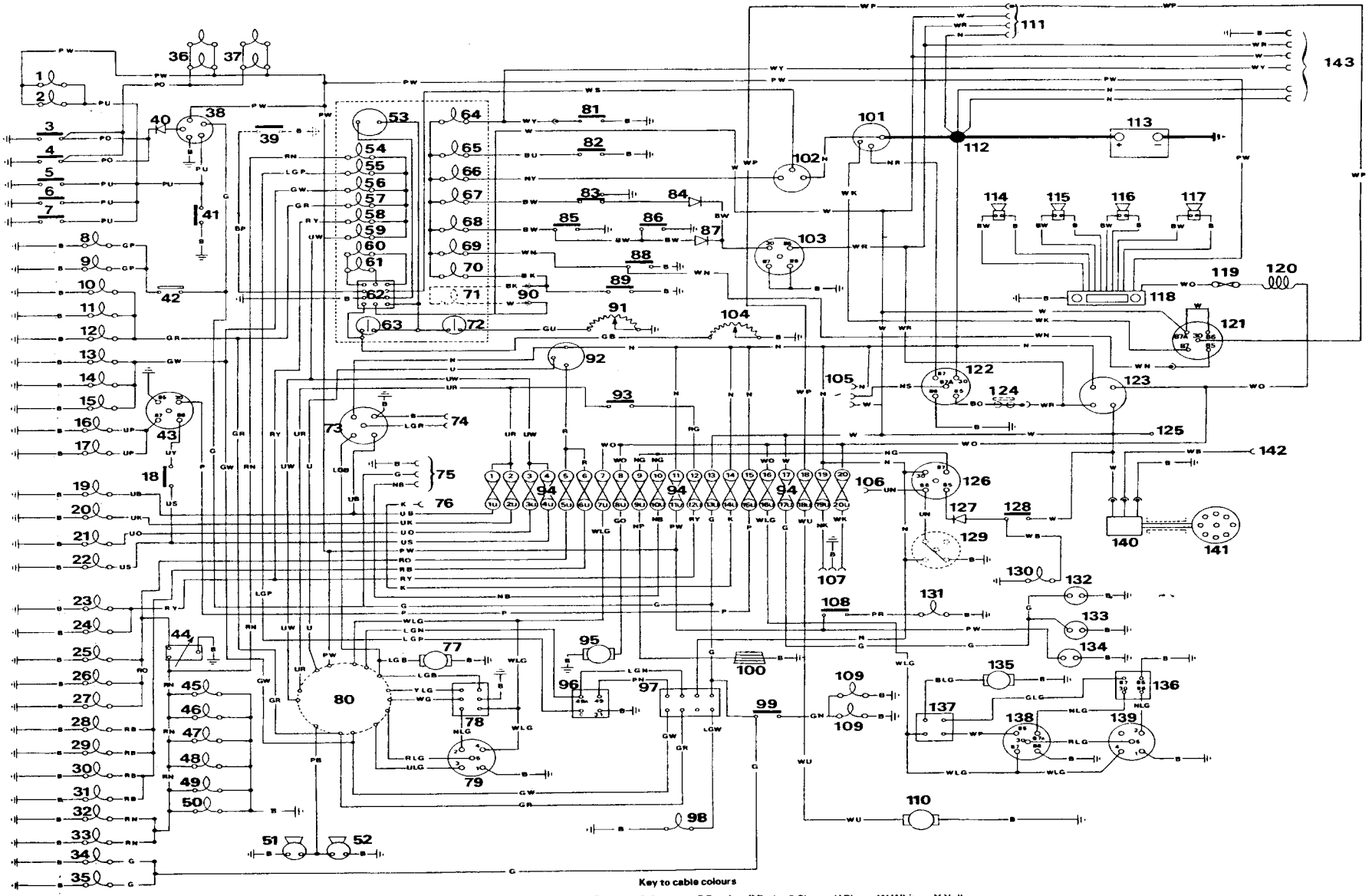
Window Lifts and Door Locks Circuit Diagram

1. Main cable connections (item 107 on main circuit diagram)
2. Clinches
3. Switch unit central door locking (drivers door)
4. Lock unit central door locking (front passenger door)
5. Window lift motor left-hand front
6. Window lift motor right-hand front
7. Isolator switch
8. Window lift switch left-hand front
9. Window lift switch right-hand front
10. Window lift switch left-hand rear
11. Window lift switch right-hand rear
12. Window life motor left-hand rear
13. Window lift motor right-hand rear
14. Window lift switch left-hand rear door
15. Window lift switch right-hand rear door
16. Lock unit central door locking left-hand rear
17. Lock unit central door locking right-hand rear



CIRCUIT DIAGRAM LEGEND—1986 onwards

1. Front interior lamp
2. Rear interior lamp
3. LH front door switch
4. RH front door switch
5. Tailgate switch
6. LH rear door switch
7. RH rear door switch
8. RH stop lamp
9. LH stop lamp
10. LH front indicator lamp
11. LH rear indicator lamp
12. LH side repeater lamp
13. RH front indicator lamp
14. RH rear indicator lamp
15. RH side repeater lamp
16. RH auxiliary driving lamp
17. LH auxiliary driving lamp
18. Auxiliary driving lamp switch
19. RH headlamp dip
20. LH headlamp dip
21. RH headlamp main
22. LH headlamp main
23. RH rear fog lamp
24. LH fog lamp
25. RH number plate lamp
26. RH side lamp
27. RH tail lamp
28. LH number plate lamp
29. LH side lamp
30. LH tail lamp
31. Radio illumination
32. Switch illumination
33. Switch illumination
34. Automatic selector illumination
35. Automatic selector illumination
36. LH door lamps
37. RH door lamps
38. Interior lamp delay
39. Automatic transfer oil temperature switch
40. Diode
41. Interior lamp switch
42. Stop lamp switch
43. Auxiliary lamps delay
44. Rheostat
45. Front cigar lighter illumination
46. Clock illumination
47. Heater illumination
48. Heater illumination
49. Heater illumination
50. Heater illumination
51. LH horn
52. RH horn
53. Tachometer
54. Instrument illumination (6 bulbs)
55. Trailer warning
56. RH indicator warning light
57. LH indicator warning light
58. Rear fog warning light
59. Head lamp warning light
60. High transfer oil temperature warning light
61. Low fuel warning light
62. Multi-function unit in binnacle
63. Fuel indicator gauge
64. Cold start warning light—(carburetter versions only)
65. Differential lock warning light
66. Ignition warning light
67. Brake failure warning light
68. Brake pad wear warning light
69. Oil pressure warning light
70. Park brake warning light
71. Park brake warning light (Australia)
72. Water temperature gauge
73. Headlamp wash timer (option)
74. Headlamp wash pump (option)
75. Head electric mirrors (option)
76. Trailer socket (option)
77. Front screen wash
78. Front wiper delay
79. Wiper motor
80. Steering column switches
81. Cold start warning lamp switch (carburetter only)
82. Differential lock switch
83. Brake failure switch
84. Diode
85. Front brake pad wear
86. Rear brake pad wear
87. Diode
88. Oil pressure switch
89. Park brake switch
90. Pick-up point-park brake warning light (Australia)
91. Water temperature transducer
92. Light switch
93. Rear fog lamp switch
94. Main fuse box
95. Heater motor and switch unit
96. Flasher unit
97. Hazard switch
98. Hazard warning lamp
99. Reverse lamp switch
100. Heated rear screen
101. Starter solenoid
102. Alternator
103. Brake failure warning lamp check relay
104. Fuel tank unit
105. Air conditioning (option)
106. Split charge relay (option)
107. Electric windows and central door locking (option)
108. Under bonnet illumination switch
109. Reverse lamps
110. Fuel pump
111. Pick-up point for petrol ignition wiring
112. Terminal post
113. Battery
114. LH rear speaker (option)
115. RH rear speaker (option)
116. LH front speaker
117. RH front speaker
118. Radio (option)
119. Radio fuse
120. Radio choke
121. Fuel shut-off relay (carburetter models only)
122. Starter solenoid relay
123. Ignition start switch
124. Start inhibitor switch (Automatic)
125. Split charge relay (option)
126. Heated rear window relay
127. Diode
128. Heated rear window switch
129. Voltage switch (option)
130. Heated rear window warning lamp
131. Bonnet lamp
132. Cigar lighter (dash)
133. Cigar lighter (cubby box)
134. Clock
135. Rear screen wash motor
136. Rear wiper delay
137. Rear wash wipe switch
138. Rear wiper relay
139. Rear wiper motor
140. Constant energy unit
141. Distributor
142. Ignition pick-up point (petrol injection only)
143. Not used



Key to cable colours

B Black G Green K Pink L Light N Brown O Orange P Purple R Red S Slate U Blue W White Y Yellow

The last letter of a colour code denotes the tracer colour

RR611M

Connectors via plug and socket

Snap connectors

Permanent in-line connections

Earth connections via cables

Earth connections via fixing bolts

Notes