

**WIPERS AND WASHERS**

**Description**

**Headlamp power wash**

A headlamp power wash is fitted as standard equipment on Vogue models and as an optional extra on other models. The power wash is actuated when the windscreen washer control is used with the headlamps illuminated.

**Washer reservoir**

A combined underbonnet washer reservoir supplies the windscreen, tailgate glass and headlamp power wash. Three separate supply pipes are used with an electric pump for each facility.

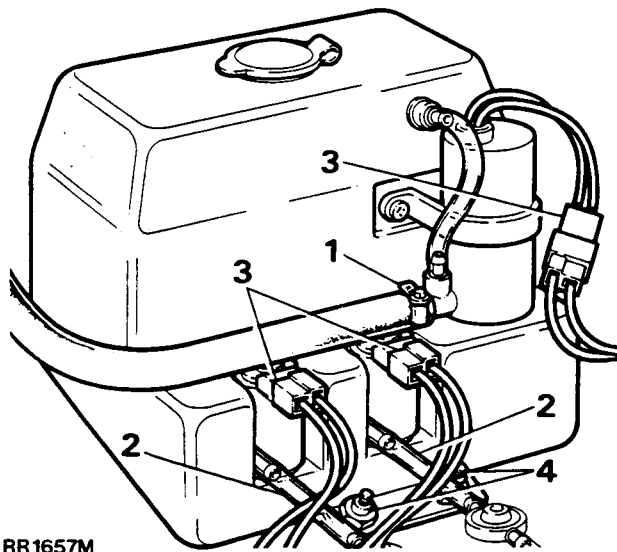
**NOTE:** See Electrical Section for wiring diagram.

**WASHER RESERVOIR**

**Remove and refit**

**Removing**

1. Slacken the hose-clip and remove the power wash hose.
2. Disconnect the tubing from the washer pumps.



3. Disconnect the electrical leads from the pumps.
4. Remove the three securing bolts from below and withdraw the reservoir.

**Refitting**

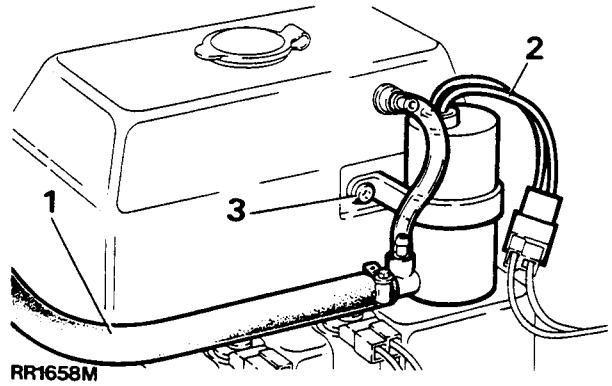
5. Reverse instructions 1 to 4.

**POWER WASH PUMP**

**Remove and refit**

**Removing**

1. Disconnect the hose from the power wash pump.
2. Disconnect the electrical leads from the pump.



3. Remove two screws and withdraw the power wash pump.

**Refitting**

4. Reverse instructions 1 to 3.

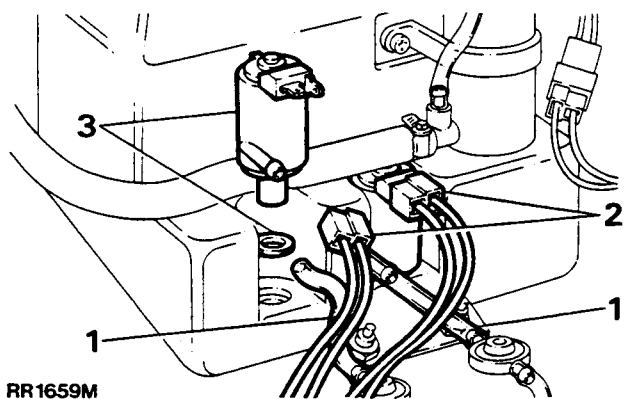
**WINDSCREEN WASHER PUMP**

**TAILGATE GLASS WASHER PUMP**

**Remove and refit**

**Removing**

1. Disconnect the washer tubing from the pump.
2. Disconnect the electrical leads from the pump.



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3. Pull the top of the pump away from its location in the reservoir and remove the pump. Note the position of the sealing gasket in the reservoir.

#### Refitting

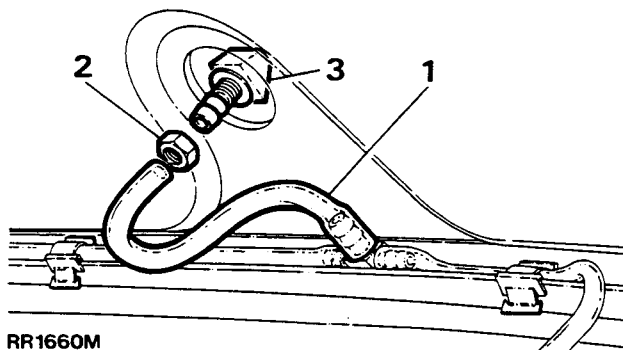
4. Reverse instructions 1 to 3.

### WINDSCREEN WASHER JETS

#### Remove and refit

##### Removing

1. Disconnect tubes from the jets.
2. Remove the locknut and washer securing jet to bonnet.



3. Remove jet.

#### Refitting

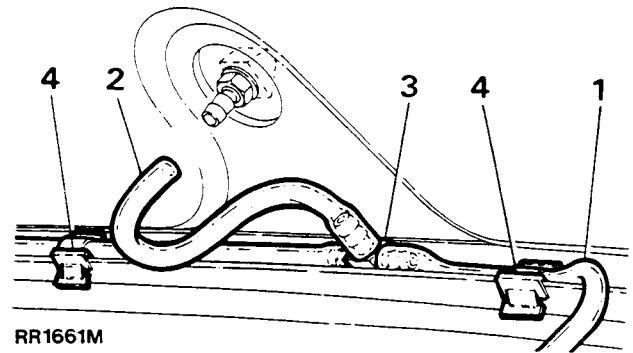
4. Reverse instructions 1 to 3.

### WINDSCREEN WASHER TUBES

#### Remove and refit

##### Removing

1. Disconnect tubing from reservoir pump.
2. Disconnect tubing from washer jets.
3. Disconnect tubing from three-way tee piece.
4. Release tubing from edge clips.



#### Refitting

5. Reverse the removal procedure.

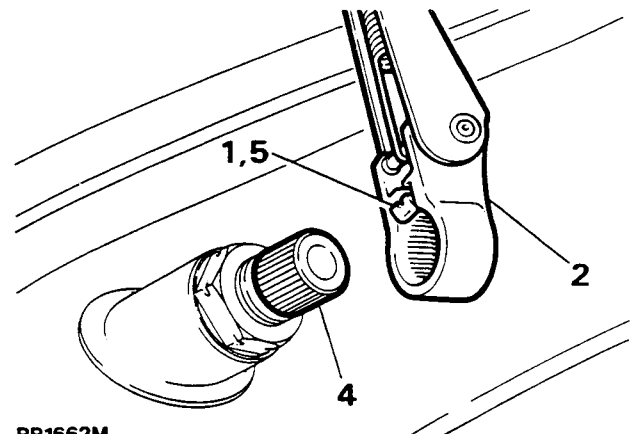
**NOTE:** A non-return valve is fitted between the washer motors and jets. Ensure that this valve is correctly fitted when replacing the washer tubes.

### WIPER ARMS

#### Remove and refit

##### Removing

1. Hold back the small spring clip which retains the wiper arm on the spindle boss, by means of a suitable tool.
2. Gently prise off the wiper arm from the spindle boss.



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#### Refitting

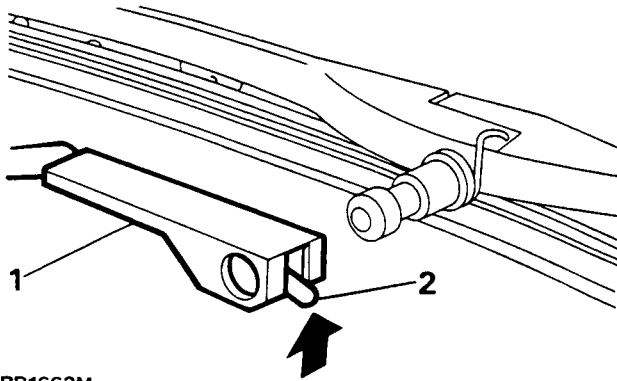
3. Allow the motor to move to the 'park' position.
4. Push the arm on to the boss, locating it on the splines so that the wiper blades are just clear of the screen rail.
5. Ensure that the spring retaining clip is located in the retaining groove on the spindle boss.

**WIPER BLADES**

**Remove and refit**

**Removing**

1. Pull the wiper arm away from the glass.
2. Lift the spring clip and withdraw the blade from the arm.



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**Refitting**

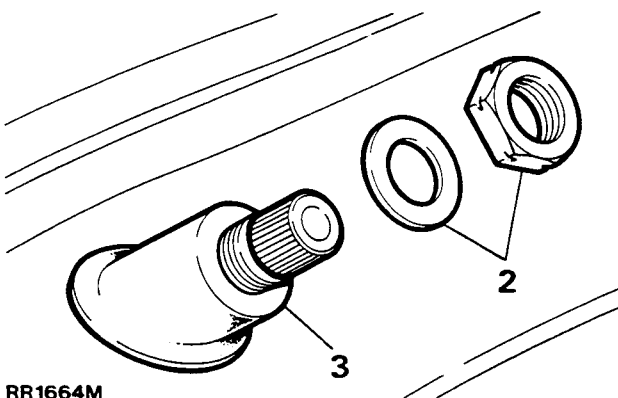
3. Reverse instructions 1 and 2.

**WINDSCREEN WIPER MOTOR, LINKAGE AND WHEEL BOXES**

**Remove and refit**

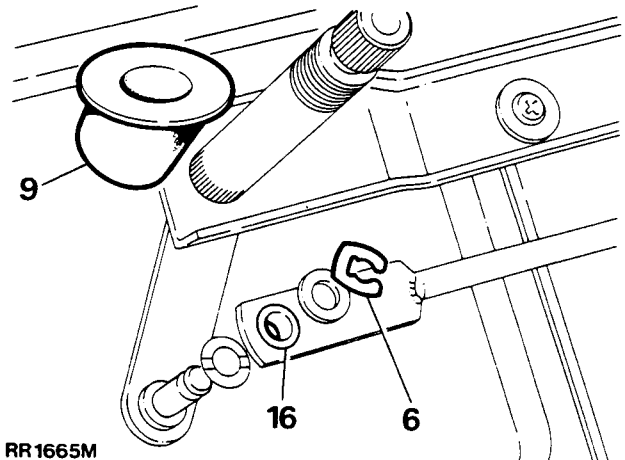
**Removing**

1. Remove wiper arms.
2. Remove locknuts from wheel boxes.
3. Remove grommet from wheel boxes.



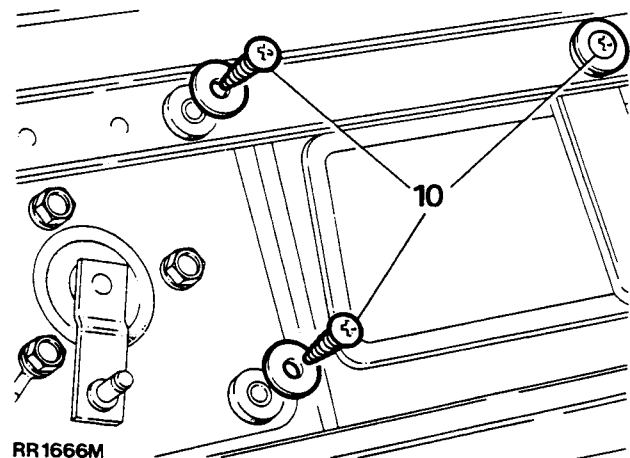
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4. Remove bonnet.
5. Remove front decker panel.
6. Remove the spring clips securing the primary links to the wheelbox spindle links.
7. Remove the spring clips securing the primary links to the motor crank.
8. Remove the primary links.
9. Remove the lower grommet from the wheelboxes.



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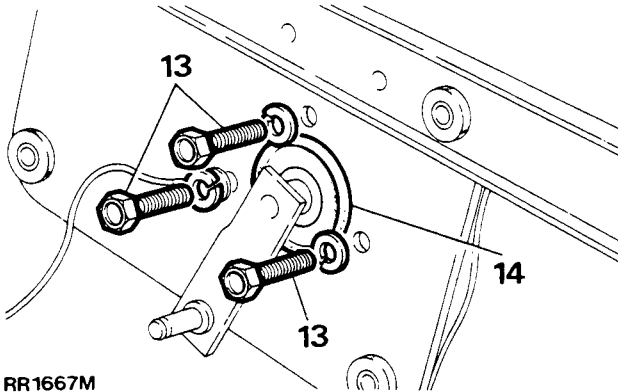
10. Remove the screws securing the motor and linkage assembly to the bulkhead.
11. Gently ease the unit out of its mounting aperture and disconnect the electrical leads at the plug and socket.
12. Withdraw the unit.



RR1666M

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13. Remove the three bolts securing the motor to the mounting plate.
14. Separate the motor from the mounting plate by pulling the motor crank through the grommet.



RR1667M

### Refitting

15. Reverse the removal procedure.
16. When replacing the primary links ensure that they are mounted with the bushes on the inside, that is, towards the wiper motor. The shorter primary link is mounted on the drivers' side.
17. Replace the front decker panel.
18. Replace the bonnet.
19. Replace the wiper arms.

### WIPER MOTOR CHECKING

**NOTE:** These instructions apply to both Windscreen and Tailgate glass wiper motors.

If unsatisfactory operation of the wiping equipment is experienced, a systematic check to determine the origin of the fault should be carried out as follows:

1. Check the blades for signs of excessive friction. Frictional blades will greatly reduce the wiping speed of the motor and cause increased current draw which may damage the armature. Check by substitution.
2. Check the motor light running current and speed with the motor coupling link disconnected from the wiper spindle transmission linkage. Connect a first grade moving coil ammeter in series with the motor supply and measure the current consumption when the motor is switched on. Check the operating speed by timing the speed of rotation of the motor coupling link. The results should compare with the figures given in the technical data.

**NOTE:** If the vehicle wiring connections are disconnected and an alternative supply source is applied it is essential that the correct polarity is observed.

Failure to observe this will cause the motor to rotate in the reverse direction, which may result in the limit switch contacts being damaged.

3. If the motor does not run satisfactorily or takes higher than normal current, then a fault is apparent and should be investigated.
4. If the current consumption and speed of the motor are satisfactory, then a check should be carried out for proper functioning of the transmission linkage and wiper arm spindles.

**NOTE:** Service parts are not available for the windscreen wiper motor with the exception of the rotary connecting link.

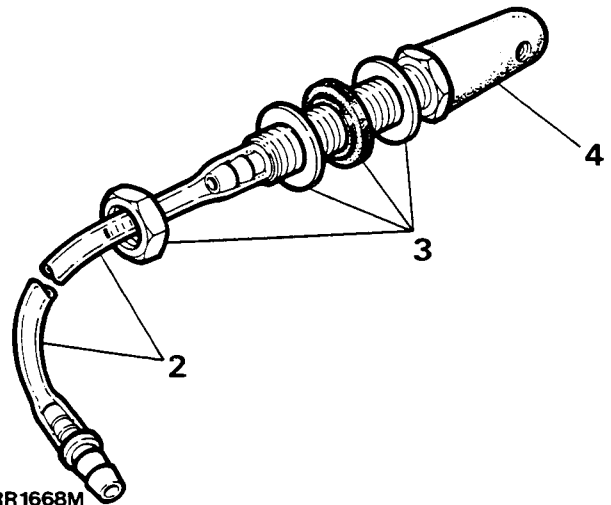
The complete unit must be renewed in the event of a failure.

### TAILGATE GLASS WASHER JET

#### Remove and refit

#### Removing

1. Lower or remove the headlining rear section to gain access to the jet securing nut and washer tube connection.
2. Disconnect the washer tube, and remove the grommet. Drain away any water in the tube to avoid damaging the trim.



RR1668M

3. Hold the base of the jet and remove the nut and washer.
4. Withdraw the washer jet from outside the vehicle.

#### Refitting

5. Reverse instructions 1 to 4 as appropriate.

**TAILGATE GLASS WASHER TUBE**

**Remove and refit**

**Removing**

1. Remove the rear headlining.
2. Disconnect the washer tube from the pump and washer jet.
3. Secure a length of strong cord to the rear end of the tube. On withdrawing the tube, the cord will follow the route of the tube through the body trim.
4. Remove the tube by feeding it in stages towards the engine compartment.

**Refitting**

5. Reverse instructions 1 to 4 securing the cord to the tube and using it to draw the tube through the body trim.

**TAILGATE GLASS WIPER MOTOR**

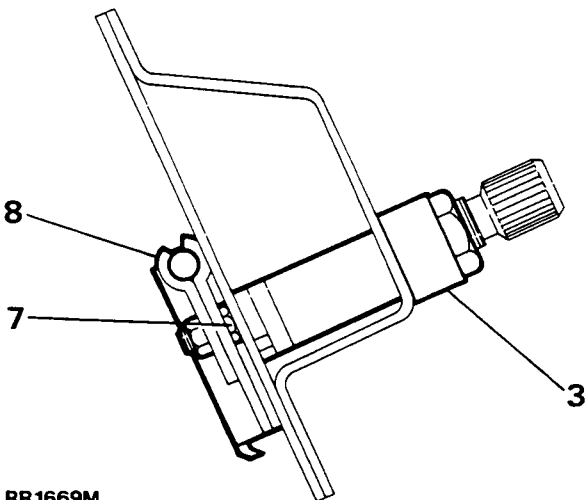
**Remove and refit**

Wiper wheelbox remove and refit instructions 1 to 8 and 11.

Wiper rack remove and refit instructions 1 to 10 and 11.

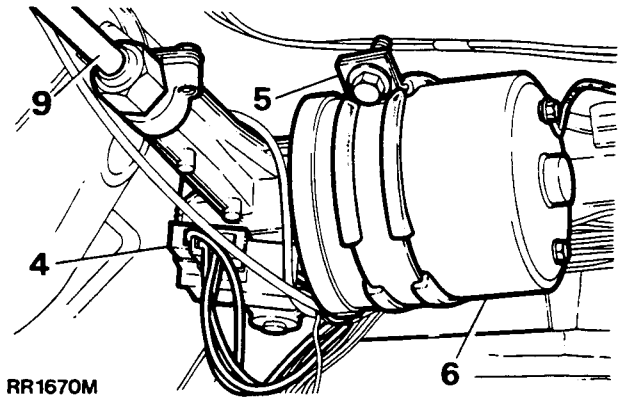
**Removing**

1. Lower or remove the headlining rear section to gain access to the wiper motor assembly.
2. Remove the wiper arm and blade.
3. Remove one nut and spacer to release the wiper wheelbox from the body.



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4. Disconnect the electrical leads from the wiper motor, including the earth lead.
5. Support the wiper motor and remove the bolt and bracket.
6. Withdraw the wiper motor from the body, complete with rack tube and wheelbox.



RR1670M

7. Slacken two bolts and nuts on the wheelbox to release it from the rack.
8. Slide the wheelbox and end rack tube off the rack.
9. Unscrew the rack tube nut and slide the tube off the rack.
10. Remove the wiper motor gearbox cover and withdraw the rack.

**Refitting**

11. Reverse instructions 1 to 10, ensuring that the wheelbox is correctly located on the rack before tightening the two wheelbox bolts and nuts.

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## TAILGATE GLASS WIPER MOTOR

## Overhaul

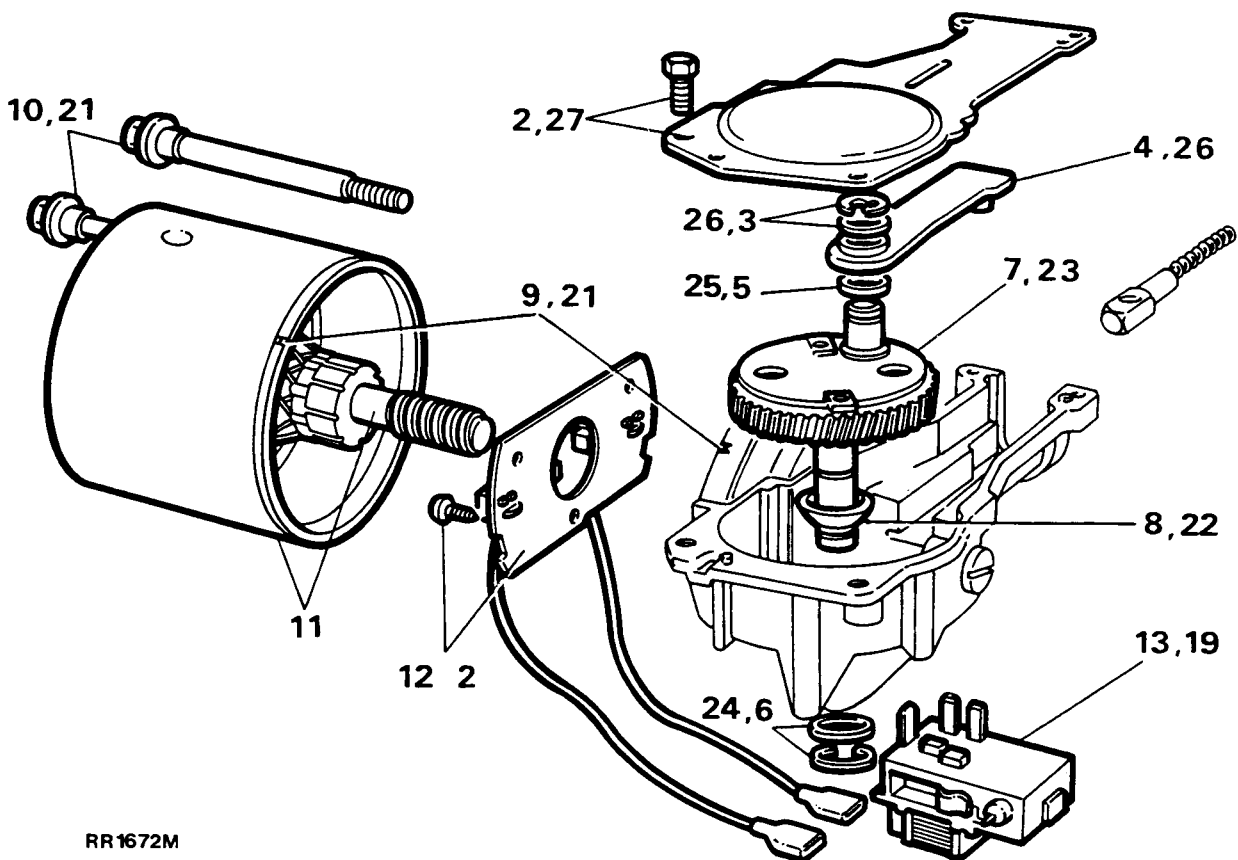
## Dismantle

1. Remove the wiper motor and drive from the vehicle.
2. Remove the wiper motor gearbox cover.
3. Remove the circlip and plain washer securing the connecting rod.
4. Withdraw the connecting rod.
5. Withdraw the flat washer.
6. Remove the circlip and washer securing the shaft and gear.
7. Clean any burrs from the gear shaft and withdraw the gear. Do not detach the crankpin mounting plate.
8. Withdraw the dished washer.
9. Note the alignment marks on the yoke and gearbox. To ensure correct rotation of the motor, the mark on the yoke must be adjacent to the arrow-head marked on the gearbox case.

10. Remove the yoke securing bolts.
11. Withdraw the yoke and armature.
12. Remove the brush gear assembly.
13. Remove the limit switch.

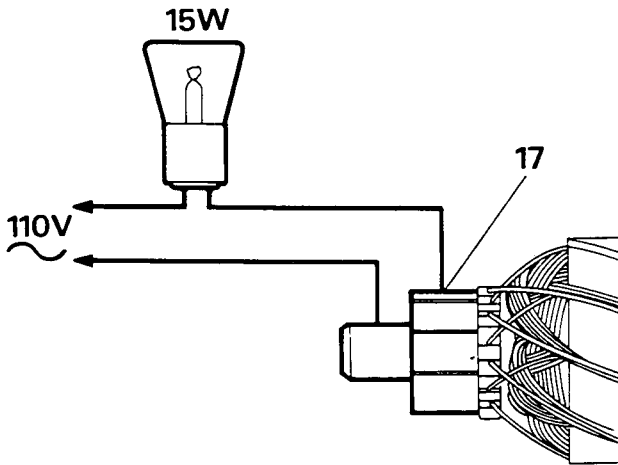
## INSPECTION AND TEST

14. Check the brushes for excessive wear, if they are worn to 4,8mm (0.190 in) in length, fit a new brush gear assembly.
15. Using a push type gauge, check that the brush spring pressure is 170gf (6ozf) when the bottom of the brush is level with the bottom of the slot in the brush box. Fit a new brush gear assembly if the springs are not satisfactory.
16. Check the armature windings for open or short circuit using armature testing equipment.



RR1672M

17. Test the armature insulation using a 110V, 15W test lamp. Lighting of the lamp indicates faulty insulation. Renew the armature if faulty.



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22. Fit the dished washer beneath the gear wheel with the concave side towards the gear wheel.
23. Fit the gear wheel to the gearbox.
24. Secure the gear wheel shaft with the plain washer and circlip.
25. Fit the larger flat washer over the crankpin.
26. Fit the connecting rod and secure with the smaller plain washer and circlip.
27. Fit the gearbox cover and secure with the retaining screws.
28. Connect the electrical leads between the wiper motor and limit switch.
29. To adjust the armature shaft end-float, hold the yoke vertically with the adjuster screw uppermost. Carefully screw-in the adjuster until resistance is felt, then back-off one quarter turn.

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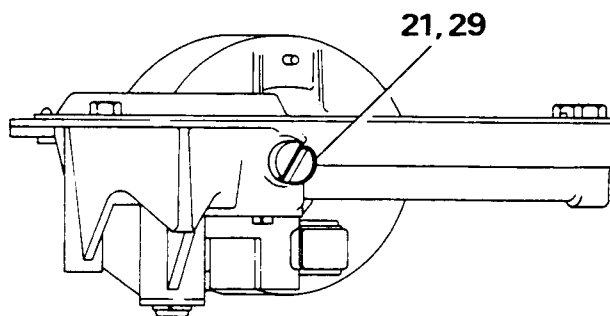
18. Examine the gear wheel for damage or excessive wear.

### ASSEMBLE

Use Ragosine Listate Grease to lubricate the gear wheel teeth, armature shaft worm gear, connecting rod and pin, cable rack and wheelbox gear wheels.

Use Shell Turbo 41 oil sparingly to lubricate the bearing bushes, armature shaft bearing journals, gear wheel shaft and wheelbox spindles. Thoroughly soak the felt washer in the yoke bearing with oil.

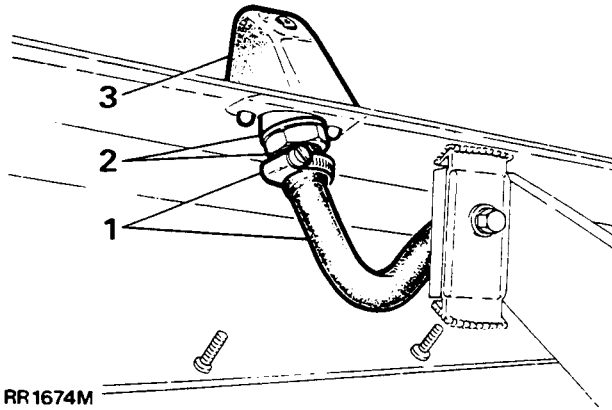
19. Fit the limit switch.
20. Fit the brush gear assembly.
21. Fit the armature and yoke to gearbox using alignment marks, secure with the yoke retaining bolts tightening to the correct torque. If a replacement armature is being fitted slacken the thrust screw to provide end-float for fitting the yoke.



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**HEADLAMP POWER WASH JET****Remove and refit****Removing**

1. Disconnect the hose from the power wash jet.
2. Remove the nut securing the jet to the bumper.
3. Remove the power wash jet.

**Refitting**

4. Reverse instructions 1 to 3.

**POWER WASH HOSE****Remove and refit****Removing**

1. Disconnect the hoses from the jets and the washer pump.
2. Release the clips locating the hose.
3. Remove the power wash hose.

**Refitting**

4. Reverse instructions 1 to 3 ensuring the pipe run is correct.
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