WINDSCREEN WIPER LINKAGE AND MOTOR

Description

The screen wiper assembly comprises a drive motor, reduction gearbox, linkage and drive boxes. The wiper motor comprises a rotary armature in a static field provided by two ceramic permanent magnets forming part of the yoke assembly. A three brush assembly and commutator, route driving current to the armature. Two diametrically opposed brushes are for normal wiper speed and a stepped third brush, to which the positive supply is transferred, is for high speed.

Inside the gearbox a worm gear integral with the armature driving shaft drives a moulded gear wheel and shaft. At the outer end of the shaft, a rotary link couples the motor drive to the linkage which transfers the drive to the drive boxes and arms.

An end-of-stroke parking arrangement is incorporated in the gearbox. This switches off the motor and then connects an electrical circuit to provide regenerative braking of the armature to ensure consistent parking of the wiper blades.

To Remove

Disconnect the battery.

Disconnect the washer pipes at the wiper arms, remove wiper arms after removing securing nuts.

Raise and secure the bonnet.

Remove seven cross-head screws and washers securing the air intake panel, remove panel.

To Remove Linkage

Remove nut securing rotary link to wiper drive shaft, ease link off drive shaft.

Note: Always clamp the rotary link with a suitable tool before slackening or tightening the securing nut, otherwise damage to the gear wheel may result.

Remove two straps securing washer pipes at drive boxes.

Unscrew the two setscrews and spring washers securing each drive box.

Push the drive boxes through the mounting plates and withdraw linkage assembly.

To Remove Wiper Motor

Remove nut securing rotary link to wiper drive shaft, ease link off drive shaft.

Note: Always clamp the rotary link with a suitable tool before slackening or tightening the securing nut, otherwise damage to the gear wheel may result.

Disconnect five pin plug.

Remove three setscrews and spring washers securing wiper motor, remove motor.

To Dismantle

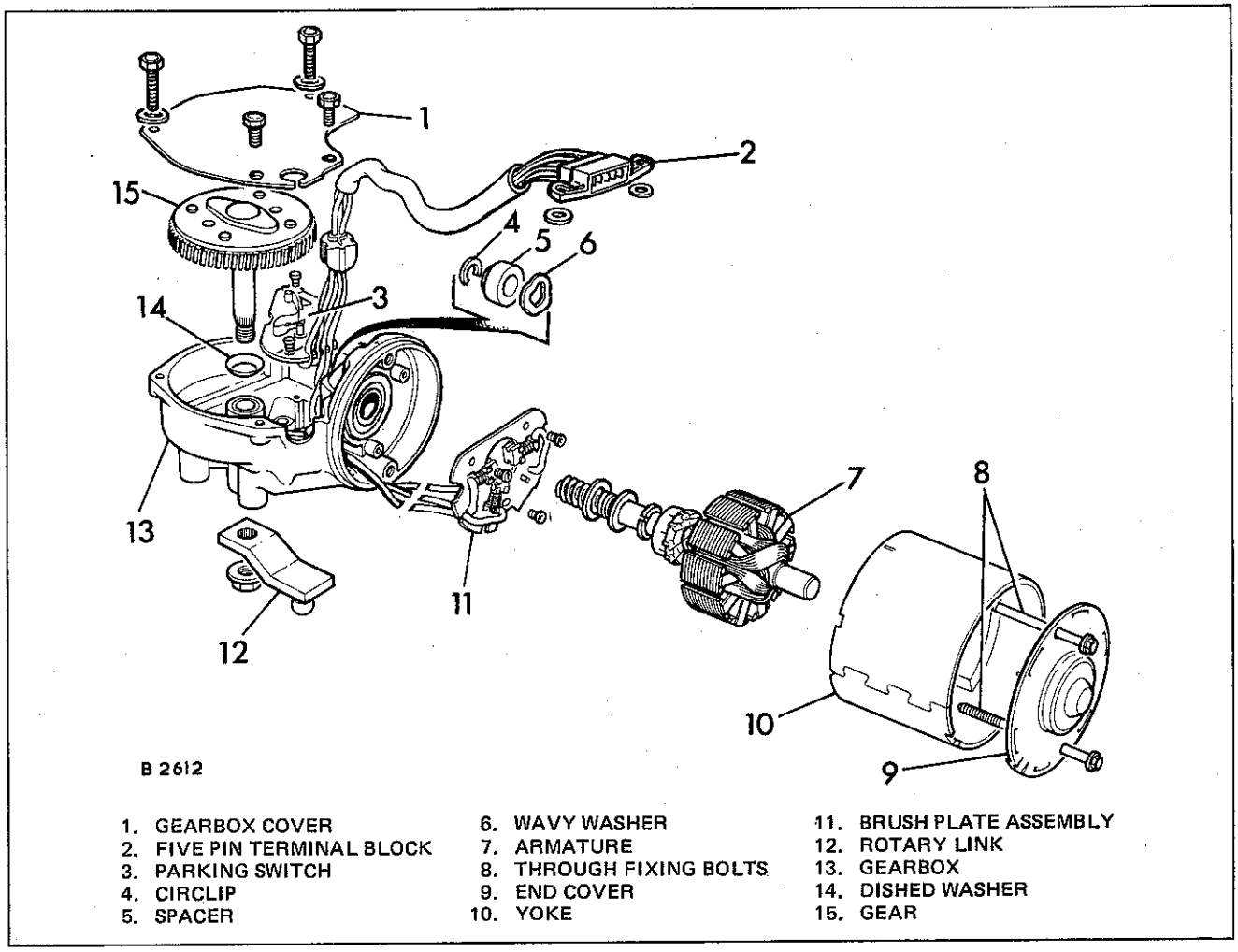
Remove two short setscrews followed by two long setscrews and four washers securing terminal block, remove gearbox cover and displace terminal block.

Pull out the gear and shaft assembly taking care not to loose the dished washer.

Match mark end cover, yoke and body if no alignment marks are evident.

Unscrew and remove the two through bolts and withdraw the yoke and end cover.

Remove the circlip adjacent to the worm gear (gear box side) of the armature shaft.



1. GEARBOX COVER
2. FIVE PIN TERMINAL BLOCK
3. PARKING SWITCH
4. CIRCLIP
5. SPACER
6. WAVY WASHER
7. ARMATURE
8. THROUGH FIXING BOLTS
9. END COVER
10. YOKE
11. BRUSH PLATE ASSEMBLY
12. ROTARY LINK
13. GEARBOX
14. DISHED WASHER
15. GEAR

Fig. 1 *Wiper motor details*

Withdraw the armature from the gearbox, collect spacer and wavy washer from the gearbox.

Do not remove brush plate assembly or parking switch unless they require renewal.

Inspection

Examine all components for signs of damage or wear and renew as necessary.

Clean the brush plate assembly, check that the brushes conform with the limits specified in Data. Ensure the brushes move freely.

Using a petrol-moistened lint-free cloth, clean the commutator.

Check that the surface of the commutator is smooth and free from pitting or burning. The commutator may be skimmed lightly to restore the surface. Ensure that the intersegment spaces are clear of debris.

Using a Growler, check the armature for short-circuited windings.

Using a 12 V dc supply with the negative side connected to one test prod and the positive side connected via a suitable range voltmeter to a second prod, check for open-circuited windings. Apply the prods to adjacent commutator segments until all segments have been checked. All voltmeter readings should be similar. A low or zero reading across adjacent segments indicates that one or more adjacent windings are open-circuited.

Using a 110 V ac supply with a 15 watt test lamp in series, check the armature insulation by applying one test prod to the commutator segments and the other prod to the armature shaft.

If the lamp lights the armature is faulty and should be renewed.

Check the moulded gear wheel and teeth for wear or damage, renew as necessary.

To Renew the Brush Plate Assembly

Remove the two screws securing the parking switch.

Remove the three screws securing the brush plate assembly.

Cut brush leads adjacent to brush plate and withdraw parking switch and cables from the gearbox. Discard the original brush plate.

Trim the parking switch leads to the dimensions shown in Fig. 2.

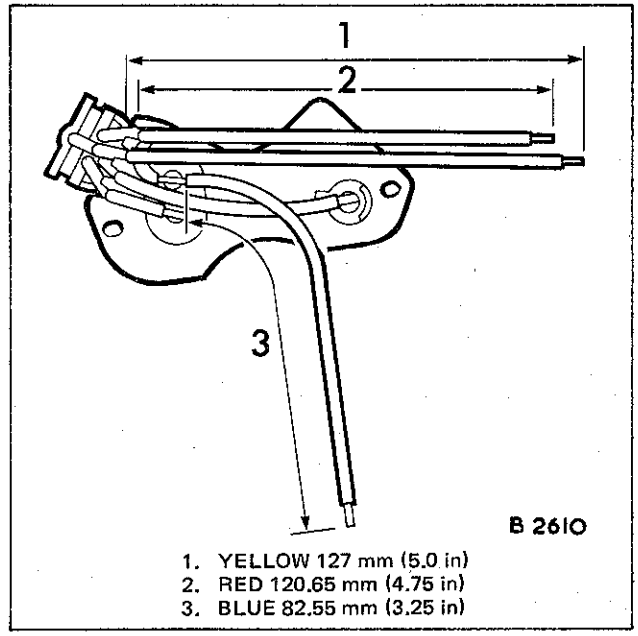
Position switch in gearbox, pushing the brush leads through the aperture in the gearbox housing. Slip heat shrink sleeves provided over free ends of leads.

Join leads from new brush plate to the free ends of the original leads (colour to colour) using high temperature resin cored solder.

Position sleeves over soldered connections and heat shrink to insulate joints.

Using two screws secure the parking switch in the gearbox.

Using three screws secure the brush plate in position.



1. YELLOW 127 mm (5.0 in)
2. RED 120.65 mm (4.75 in)
3. BLUE 82.55 mm (3.25 in)

Fig. 2 *Parking switch lead dimensions*

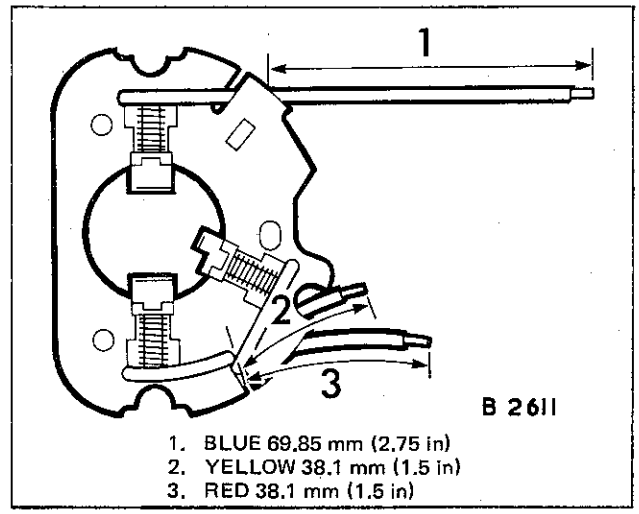
To Renew the Parking Switch

Remove the two screws securing the parking switch.

Remove the three screws securing the brush plate.

Cut leads adjacent to parking switch and withdraw brush plate and leads. Discard original parking switch.

Trim brush gear leads to dimensions shown in Fig. 3.



1. BLUE 69.85 mm (2.75 in)
2. YELLOW 38.1 mm (1.5 in)
3. RED 38.1 mm (1.5 in)

Fig. 3 *Brush lead dimensions*

Fit new parking switch, connect the cables and refit brush plate as detailed under Brush Plate Assembly.

To Re-assemble

This is a reversal of the dismantling procedure noting the following:

Apply Ragosine Listate or Shell Retinax "A" grease to the gear teeth, worm gear on the armature shaft, output shaft and switch cam. Apply Shell Turbo 41 oil sparingly to the bearings in the end cover and gearbox housings. Remove any surplus.

Ensure that the match marks or alignment marks are lined up.

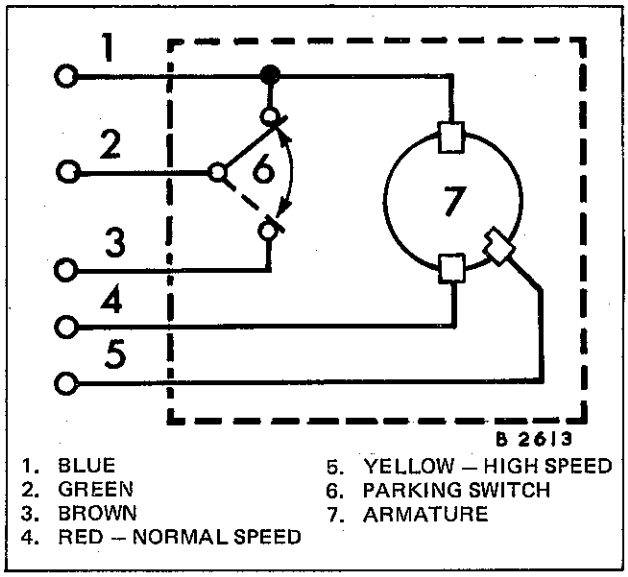


Fig. 4 *Wiper motor wiring details*

To Refit

Position the linkage in the cab structure. Push the drive boxes through the mounting plates and secure with setscrews and spring washers.

Temporarily refit the wiper arms and position the blades in the "Parked" position.

Position the wiper motor and secure with three setscrews and spring washers.

Reconnect the five pin plug.

Reconnect the battery.

Operate wiper and switch off, this ensures motor is in parked position.

Fit the rotary link onto the wiper motor spindle and secure with the nut, torque tightened to Data figure.

Note: The centre line of the rotary link and linkage arm must be in a straight line. A clamp should be used on the linkage arm and rotary link to prevent damage to the gear wheel during tightening.

Remove the wiper arms.

Refit the air intake panel and secure with seven cross-head screws and washers.

Secure the washer pipes at each drive box.

Refit the wiper arms and connect the washer pipes.

Operate the wipers and check that the blades are not fouling base of windscreen.