Service Bulletin

JOSEPH LUCAS (SALES & SERVICE) LTD.
GREAT HAMPTON STREET BIRMINGHAM 18

SB/AC/122

DECEMBER 1967

INTRODUCTION OF THE LUCAS MODEL

14W WINDSCREEN WIPER MOTOR

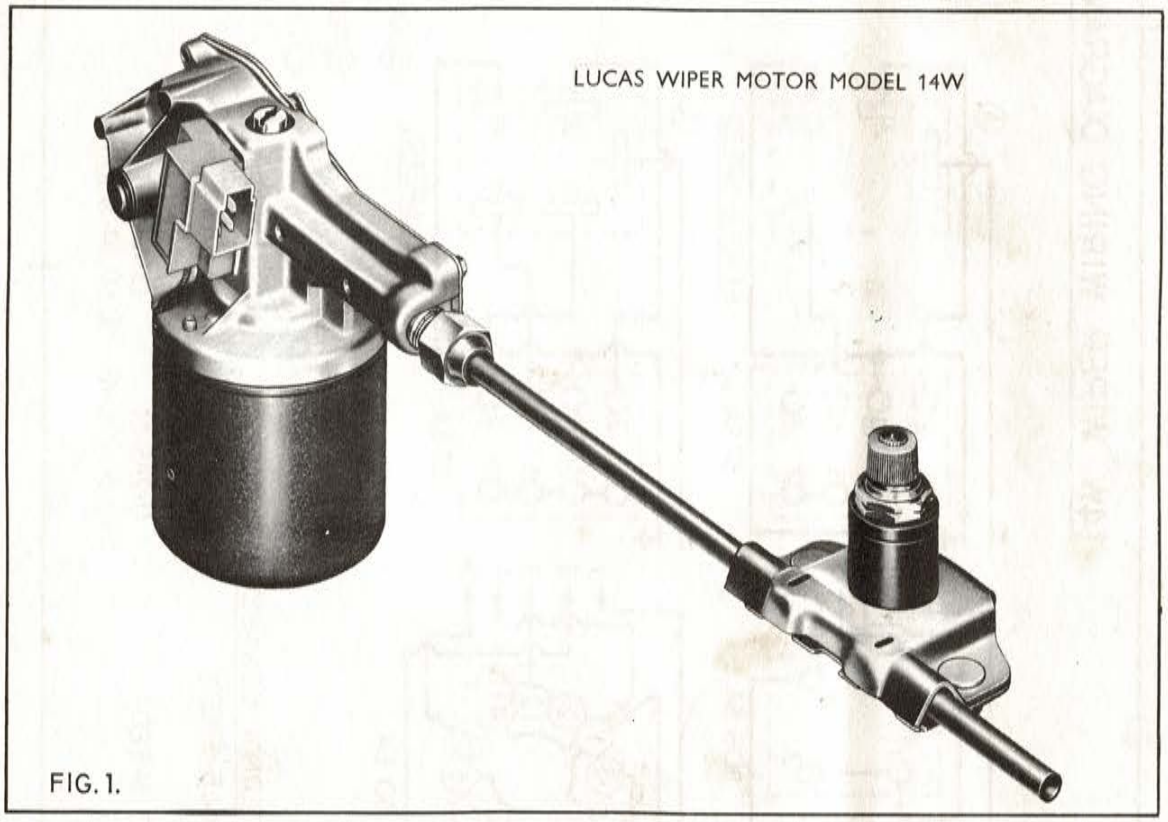


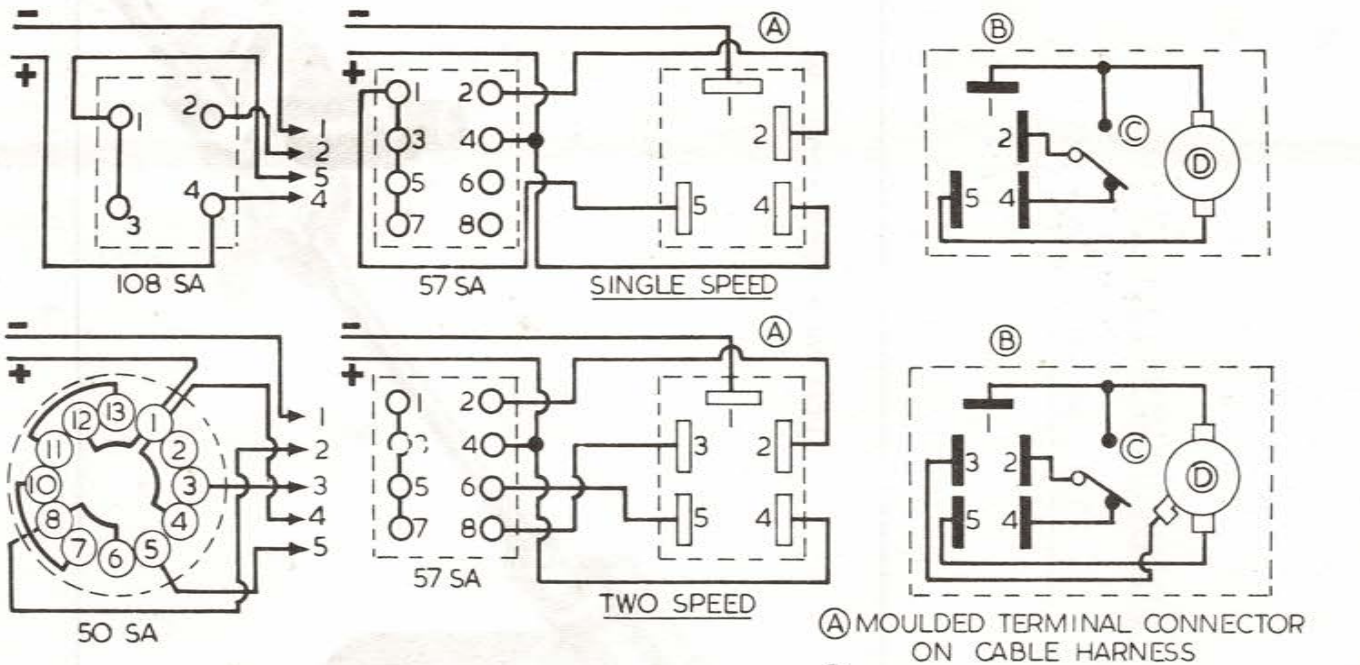
FIG. 1.

DESCRIPTION

The Lucas 14W windscreen wiper motor is the latest in the series of permanent magnet field motors and is intended to supersede the present DR3A in its low power form and the 6WA and 12W in its high power form.

The important new features first introduced in the 12W are incorporated in this model, these include, a permanent magnet field system consisting of two ceramic magnets housed in a cylindrical yoke, the application of

14W WIPER WIRING DIAGRAM



SWITCH INTERNAL CONNECTIONS	OFF	NORMAL SPEED	HIGH SPEED
57 SA (SINGLE SPEED)	(1-2)(5-6)	(3-4)(5-6)	— —
108 SA	(1-2)	(3-4)	— —
57 SA(TWO SPEED)	(1-2)(5-6)	(3-4)(5-6)	(3-4) (7-8)
50 SA	(1-2) (5-6)(10-11)	(13-1) (4-5) (8-10)	(12-13) (3-4) (7-8)

FIG.2.

dynamic braking to the armature during the parking cycle, and the commutator located adjacent to the single start worm gear formed on the extended end of the armature shaft.

A simplified method of parking and applying dynamic braking to the armature is effected by a new design of limit switch which is associated with the terminal assembly as a separate unit screwed to the underside of the gearbox casting. Two stage contacts inside the switch are operated by means of a plunger which protrudes through a hole in the gearbox. This is actuated by a cam on the underside of the moulded gearwheel.

Electrical connexion is made to the motor via the flat bladed terminal assembly mentioned above, and a non reversible socket connected to the associated wiring.

This type of connexion reduces the possibility of the battery supply polarity being reversed to the motor, which would result in reversing the rotation of the motor.

Power is transmitted from the gearbox via a standard $\frac{1}{4}$" (6.35mm) cable rack to drive the wheelboxes. To handle the available power, throated gear wheelboxes must be used.

The motor is produced in single or two-speed form and as mentioned before, high or low power form according to the application. To provide two-speed requirements, the brush box plate is fitted with a third brush to which the armature positive feed is switched when the higher speed is required.

A retaining strap with rubber sleeve is positioned round the motor yoke for fixing purposes and the assembly is tightened onto a rubber pad by two bolts. This arrangement varies according to the application but will allow the motor to be fitted to either side of the vehicle, so that further positioning of the motor can be made by rotation of the yoke prior to tightening the strap bolts.

14W Parking Cycle - Description

Figure 2 illustrates the 14W motor circuit using the two common switches used for this application in single and two speed forms.

With the panel control switch in the 'ON' position the parking and braking switch is inoperative. Under these conditions the armature will receive battery current direct and will therefore rotate.

With the panel control switch in the 'Park' or 'OFF' position the motor will continue to operate under the automatic control of the limit switch first stage contacts. When the wiper blades reach the required park position the cam on the underside of the gearwheel actuates the plunger and the first stage contacts open. The motor is then switched off. Subsequent to the first stage contacts opening but before the end of the parking cycle the second stage contacts close when the plunger reaches the higher point on the cam. This results in the armature being short-circuited. Dynamic braking therefore takes place and the parking cycle is rapidly completed.

continued..

Motors are available to give parking with either cable rack extended or with cable rack retracted.

The parking position is controlled by the position of the crank pin in relation to the gearwheel moulding.

Figure 3 illustrates the alternative positions (180° apart) of the crank pin mounting plate.

Technical Test Data

	12 Volt	24 Volt
Typical light running current (i.e. with cable rack disconnected) after 60 seconds from cold.	1.5 Amp at 13.5v (normal speed) 2.0 Amp at 13.5v (high speed)	0.8 Amp at 27v (normal speed) 1.0 Amp at 27v (high speed)
Light running speed after 60 seconds from Cold at 13.5volts (12v units) and 27.0 volts (24v units)	46 - 52 rev/min (normal speed) 60 - 70 rev/min (high speed)	

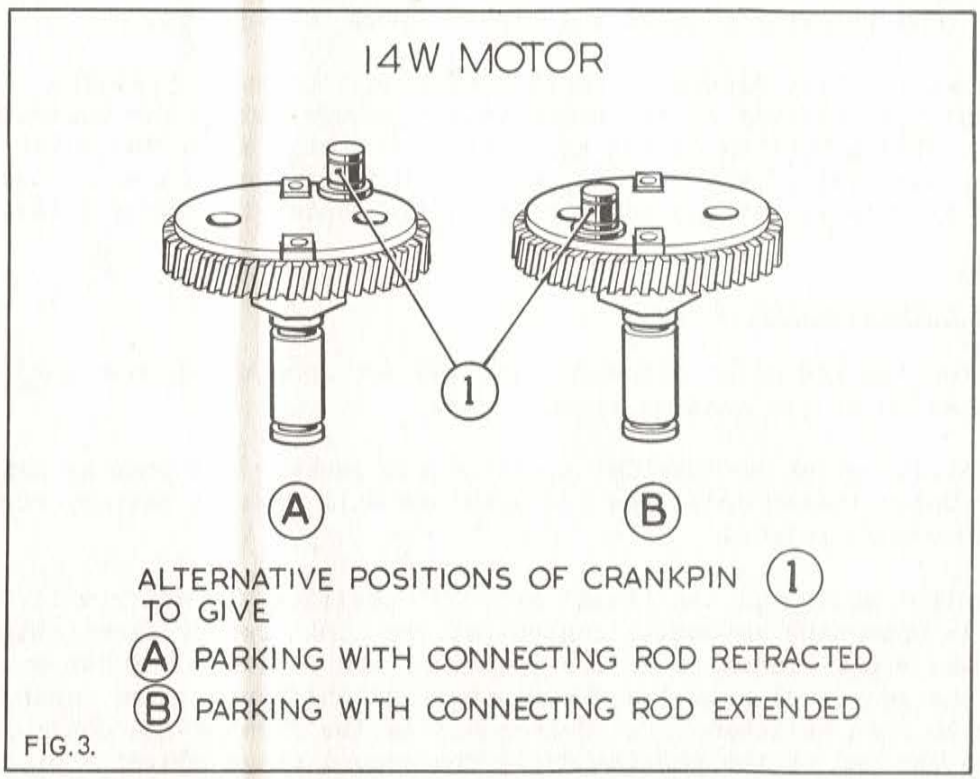


FIG.3.

Armature End-Play (After tightening through bolts)

0.004" to 0.008" (0.1016 to 0.2032mm)

Yoke Through Bolt Torque

Tighten to torque of 20lbf.in (0.23kgf.m)

Brush Spring Pressure

5 - 7 oz f (150-210gf) with brush at the bottom of slot in the brush box.

Minimum Brush Lengths

3/16" (4.8mm) main brushes, or if narrow part of third brush (2 speed models) is worn to full width of brush.

Routine Maintenance

All bearings are adequately lubricated during manufacture and require no maintenance.

Oil, tar spots or similar deposits should be removed from the windshield with methylated spirits (denatured alcohol). Silicone or wax polishes must not be used for this purpose.

Efficient wiping is dependent upon keeping wiper blades in good condition. Worn or perished blades are readily removed for replacement.

Dismantling Procedure

Remove the four gearbox cover fixing screws and lift off the cover.

Remove the circlip and flat washer securing the connecting rod to the crank-pin, and withdraw the connecting rod. Take care not to lose the flat washer positioned beneath the rod.

Remove the circlip and flat washer from the main gear shaft, and remove the fraze with a smooth file to prevent possible damage to the gear shaft bearing. Withdraw gear from the gearbox taking care not to lose the dished washer fitted beneath.

Unscrew the two yoke fixing bolts and carefully remove in turn the yoke assembly and the armature.

NOTE:

Ensure that the working area near the motor is clean. Protect the inside of the yoke from foreign matter that would normally be attracted

continued...

by the exposed field magnets. Ensure that during removal or replacement, the armature does not snap against the magnets and damage them.

Remove the screws which secure the brushgear and the terminal and switch unit, and detach both assemblies from the gearbox linked together by the connecting cables.

Bench Testing

Examine all parts for signs of damage or wear and check that brush spring pressures and brush lengths are in accordance with the test data.

Brush spring pressures can be checked with a push type spring gauge shown in figure 4.

The armature should be tested for insulation soundness by using a mains test lamp figure 5. Lighting of the lamp indicates faulty insulation.

Armature testing equipment should be used for checking the windings for open and short circuits.

Re-Assembly

This is generally a reversal of the dismantling procedure but the following special points should be observed.

Lubrication

Apply Ragosine Listate grease to - the main gear teeth, cam, and armature shaft worm gear, the crosshead and crosshead slide, the connecting rod pin and top of the connecting rod.

Apply Shell Turbo 41 oil to - the armature shaft bearing surfaces (sparingly), the main gear shaft, and to the crank pin. Throughly soak the felt oiler in the yoke bearing.

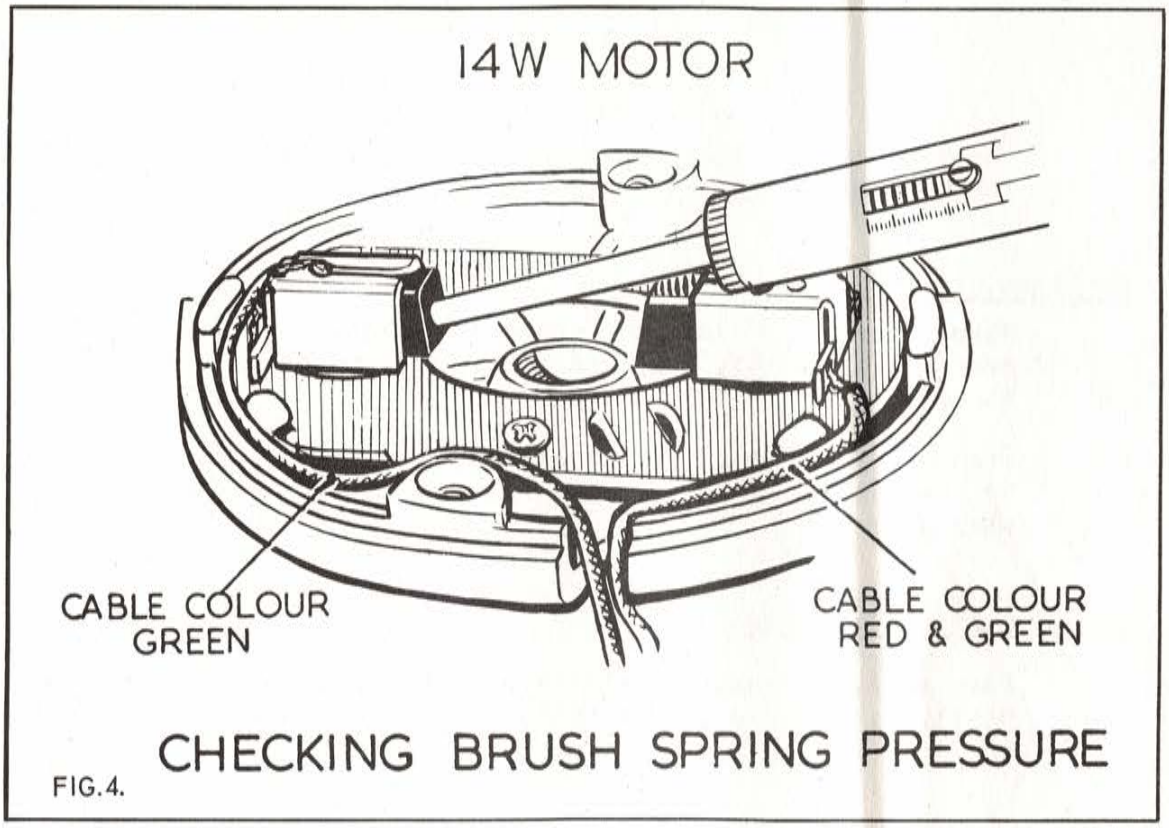
Replacement of Yoke

Ensure that the arrow head on the gearbox corresponds with the mark on the yoke assembly and that the fixing bolts are tightened to the specified torque.

Thrust Disc and Felt Oiler Washer (Yoke Bearing)

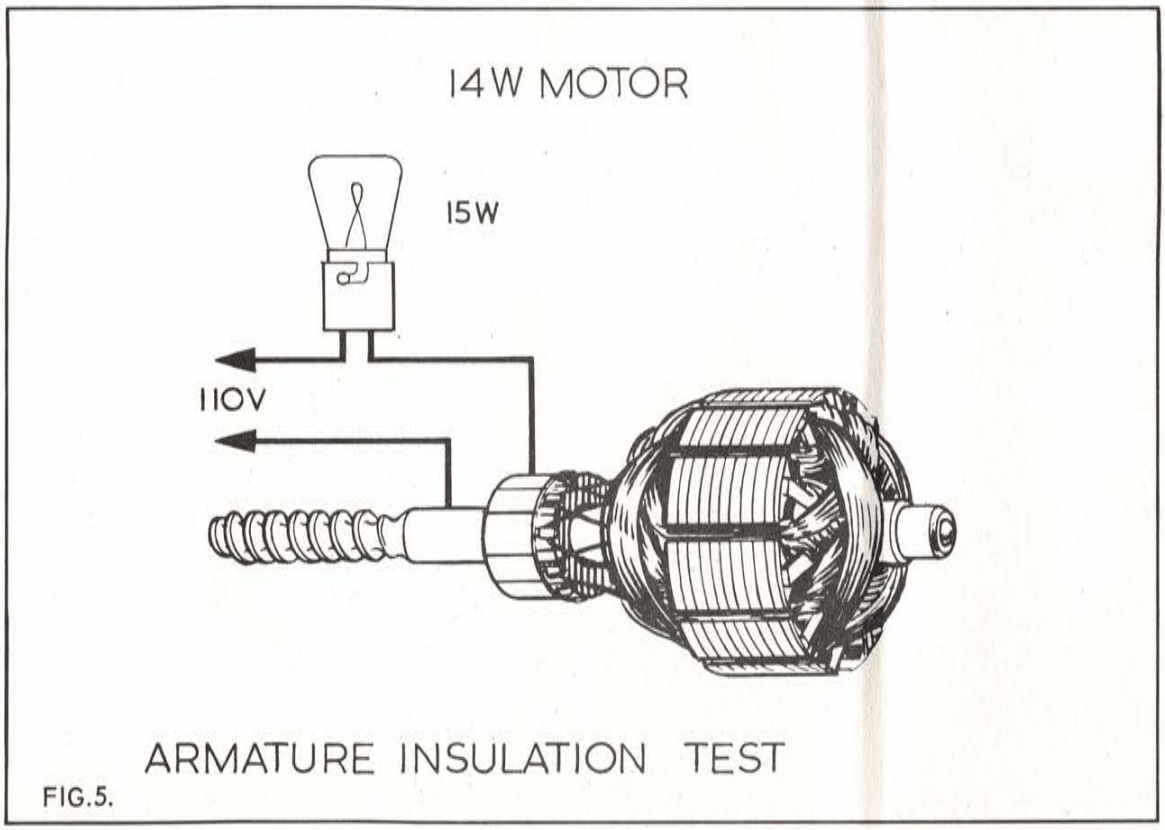
The thrust disc must be positioned inside the yoke bearing with the concave side towards the end face of the bearing, followed by the felt washer which must have a hole in the centre to allow

continued...



CHECKING BRUSH SPRING PRESSURE

FIG.4.



ARMATURE INSULATION TEST

FIG.5.

the captive ball bearing in the armature shaft to contact the thrust disc.

Replacement of Armature

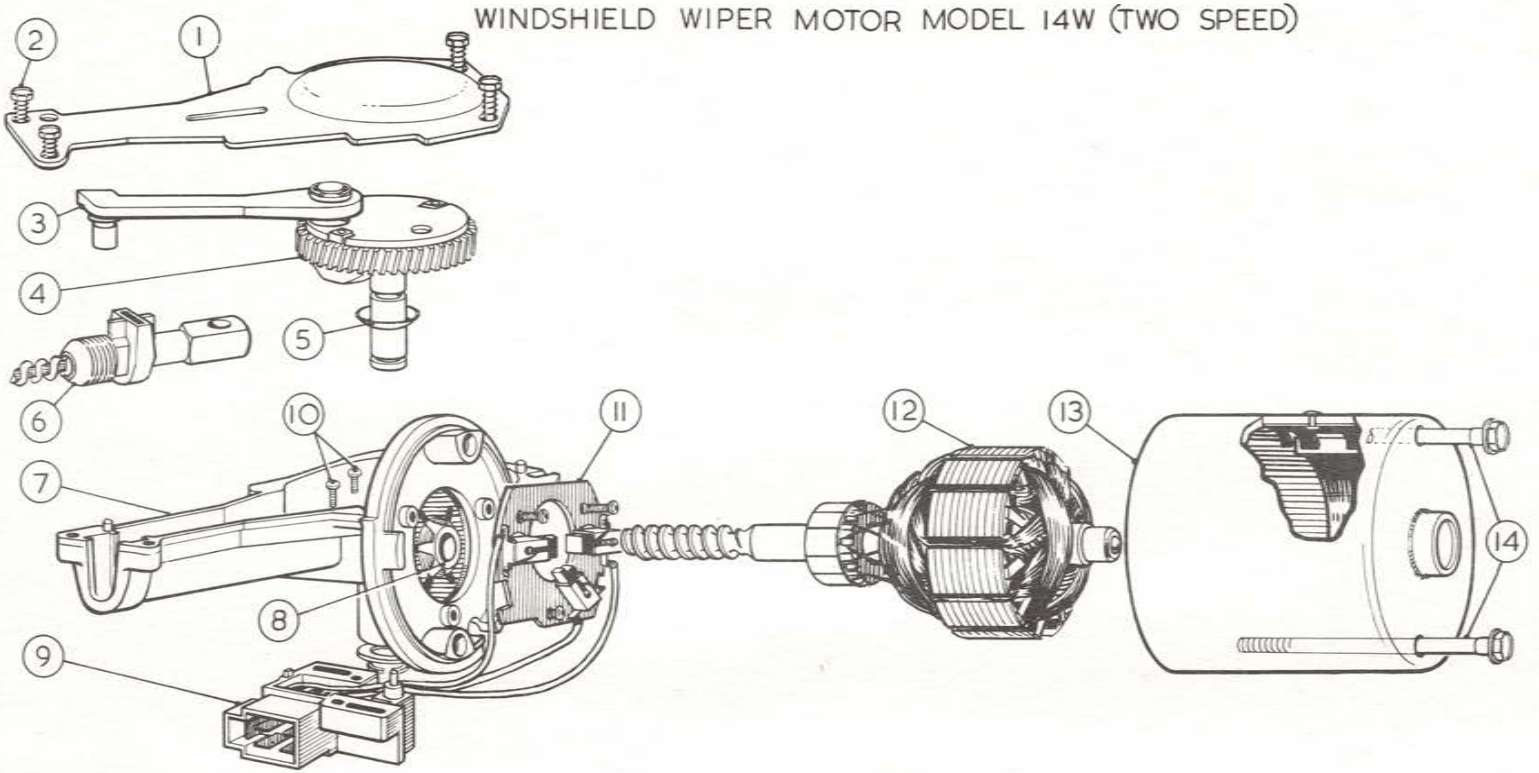
When fitting a replacement armature use the adjustable thrust screw with locknut, supplied in the kit and check for correct end-float.

The end-float should remain unchanged if the original armature is re-fitted, but it is advisable to slacken the thrust screw when assembling.

Replacement of Main Gear

Care should be taken in fitting the dished washer on the gear shaft, so that the concave side is towards the gearwheel.

WINDSHIELD WIPER MOTOR MODEL 14W (TWO SPEED)



1. GEARBOX COVER
2. SCREW (GEARBOX COVER FIXING)
3. CONNECTING ROD
4. SHAFT & GEAR
5. DISHED WASHER
6. CABLE RACK WITH CROSSHEAD & OUTER CASING FERRULE
7. GEARBOX
8. SELF-ALIGNING BEARING BUSH
9. LIMIT SWITCH ASSEMBLY
10. SCREWS (LIMIT SWITCH FIXING)
11. BRUSHGEAR, COMPRISING: INSUL. PLATE & BRUSHBOXES, BRUSHES, SPRINGS, FIXING SCREWS
12. ARMATURE
13. YOKE ASSEMBLY, COMPRISING: TWO PERMANENT-MAGNET POLES & RETAINING CLIPS & ARMATURE BEARING BUSH
14. BOLTS (YOKE FIXING)

FIG.6.