Service Bulletin

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GREAT HAMPTON STREET BIRMINGHAM 18

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Introduction of the Lucas 17W Windscreen Wiper Motor

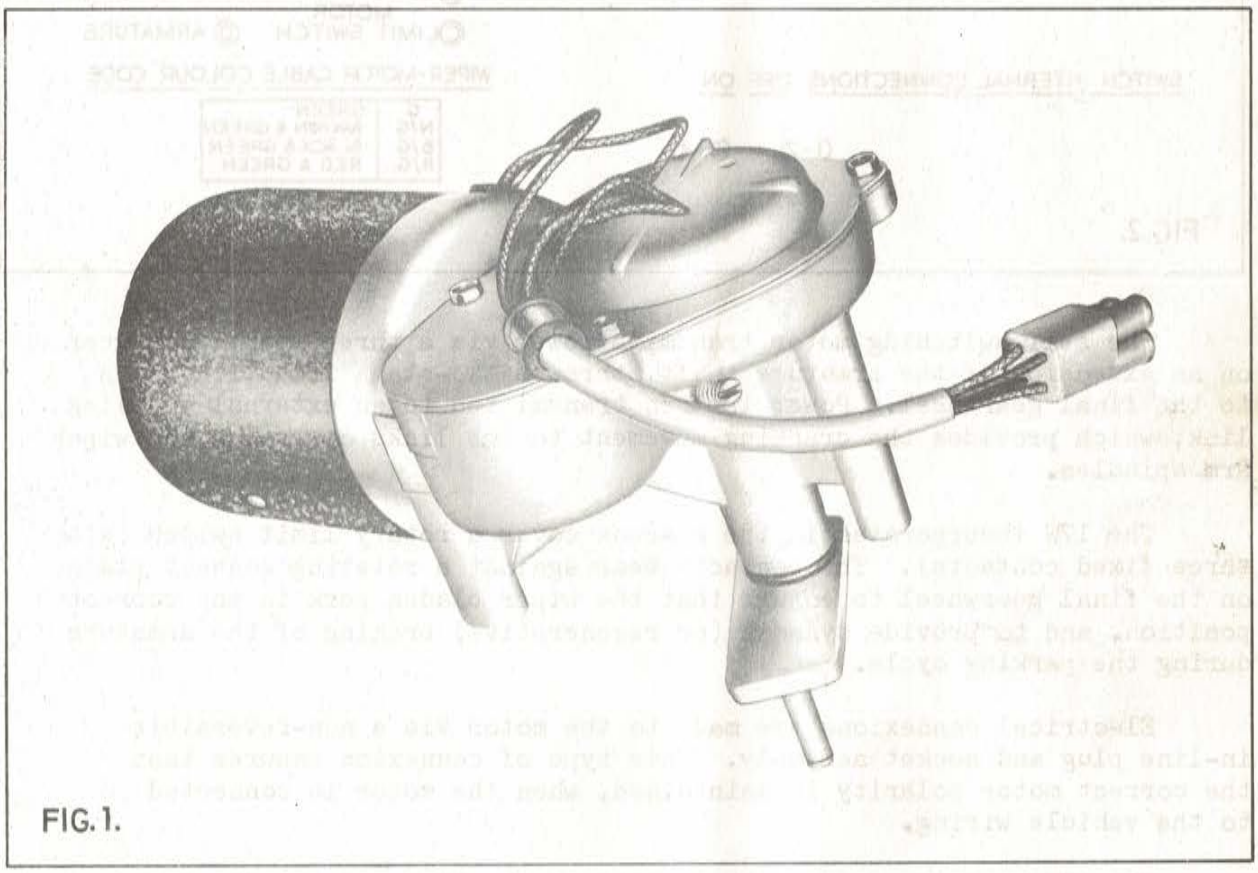
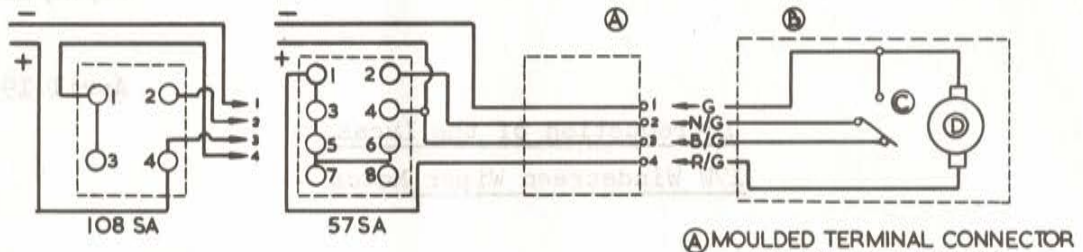


FIG. 1.

The Lucas 17W Windscreen Wiper has a permanent magnet field system. Power is conveyed to the wiper arms by means of a rotating crank and link-type mechanism. It is similar in appearance to the 5W, which it will ultimately replace.

17W WIPER WIRING DIAGRAM



Ⓐ MOULDED TERMINAL CONNECTOR ON CABLE HARNESS
Ⓑ TERMINAL CONNECTOR ON WIPER MOTOR
Ⓒ LIMIT SWITCH Ⓓ ARMATURE

SWITCH INTERNAL CONNECTIONS OFF ON

(1-2) (3-4)

WIPER-MOTOR CABLE COLOUR CODE

G	GREEN
N/G	BROWN & GREEN
B/G	BLACK & GREEN
R/G	RED & GREEN

FIG.2.

The self-switching motor transmits power via a three start worm gear on an extension of the armature shaft, through two-stage reduction gears to the final gearwheel. Power is then transmitted to an external coupling link, which provides the cranking movement to the links operating the wiper arm spindles.

The 17W incorporates in the gearbox cover a rotary limit switch (with three fixed contacts). The contacts bear against a rotating contact plate on the final gearwheel to ensure that the wiper blades park in the correct position, and to provide dynamic (or regenerative) braking of the armature during the parking cycle.

Electrical connexions are made to the motor via a non-reversible in-line plug and socket assembly. This type of connexion ensures that the correct motor polarity is maintained, when the motor is connected to the vehicle wiring.

The 17W motor is secured to a plate on the link and spindle frame-work by means of three self-locking screws.

TECHNICAL TEST DATA	12 volt	24 volt
Typical light running current (i.e. with link assembly disconnected) after 60 secs. from cold	1.2 Amps max.	0.7 Amps max.
Light Running speed after 60 secs. from cold	39 - 43 Rev/min.	
Armature End Play	(After tightening through bolts) 0.002" to 0.008" (0.05 to 0.2mm)	

Yoke Through Bolt Torque

Tighten to torque of 12-16 lbf in (0.138 - 0.184 kgf m)

Gearbox Spacing Ring

Tighten to torque of 10 lbf in (0.23 kgf m)

Brush Spring Pressure

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

Minimum Brush Lengths

Renew if worn to 3/16" (4.8mm)

Routine Maintenance

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

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

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

Servicing

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 :-

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.

If possible check this by substituting a pair of known good blades and check the operation, if this proves satisfactory then replacement blades are necessary.

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. Also 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 connexions are disconnected and an alternative supply source is applied it is essential that the correct polarity is observed. The Positive supply lead must be connected to the red/green cable and the Negative supply lead must be connected to the green cable.

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

If the motor does not run satisfactorilly or takes higher than normal current, then a fault is apparent and should be investigated. 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.

Dismantling Procedure

Mark the gearbox cover adjacent to the arrow head on the limit switch cover. This will allow the original setting of the limit switch to be determined on reassembly.

Remove the two yoke fixing through bolts and spring washers, and withdraw the yoke assembly from the gearbox. The armature may be withdrawn with the yoke, if it is not, carefully remove it.

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 by the exposed field magnets. Also ensure that during removal or replacement, the armature is not allowed to snap against the magnets, as they are brittle and easily damaged.

Remove the brushgear fixing screws and gearbox cover fixing screws, and remove the limit switch complete with connecting cables and brushgear plate.

Unscrew the main gearwheel lock-nut and remove the gearwheel and driving plate. A light tap on the nut before it is completely removed may be necessary to part the gearwheel from the shaft. The shaft and link assembly can then be withdrawn from underneath the gearbox. Take care not to lose the dished washer on the main gearshaft.

Finally, remove the intermediate gearwheel from its pivot pin.

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. Brushes and springs are designed to last the life of the motor. In the unlikely event of failure however, a complete service assembly is available for replacement.

Brush spring pressures can be checked with a push type spring gauge shown in Fig. 3.

The insulation of the armature windings should be tested by using a mains test lamp as shown in Fig.4. Lighting of the lamp indicates faulty insulation.

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

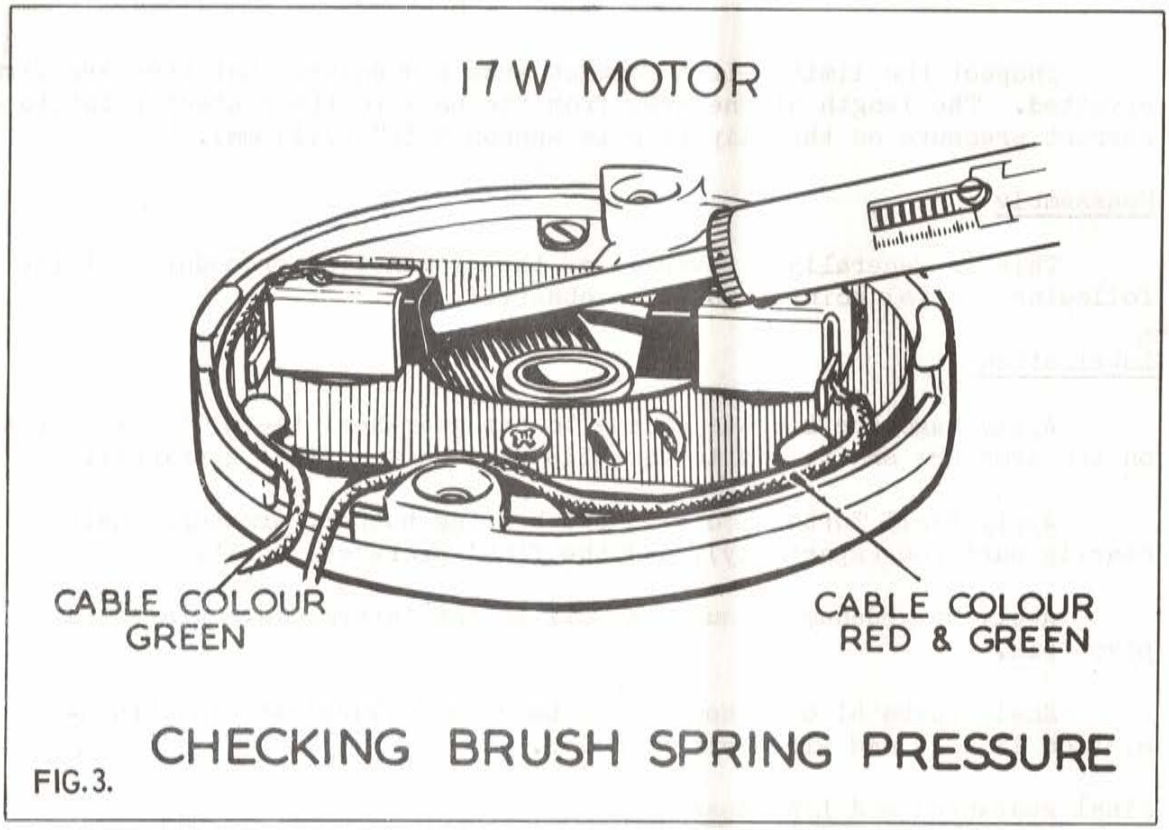


FIG. 3. CHECKING BRUSH SPRING PRESSURE

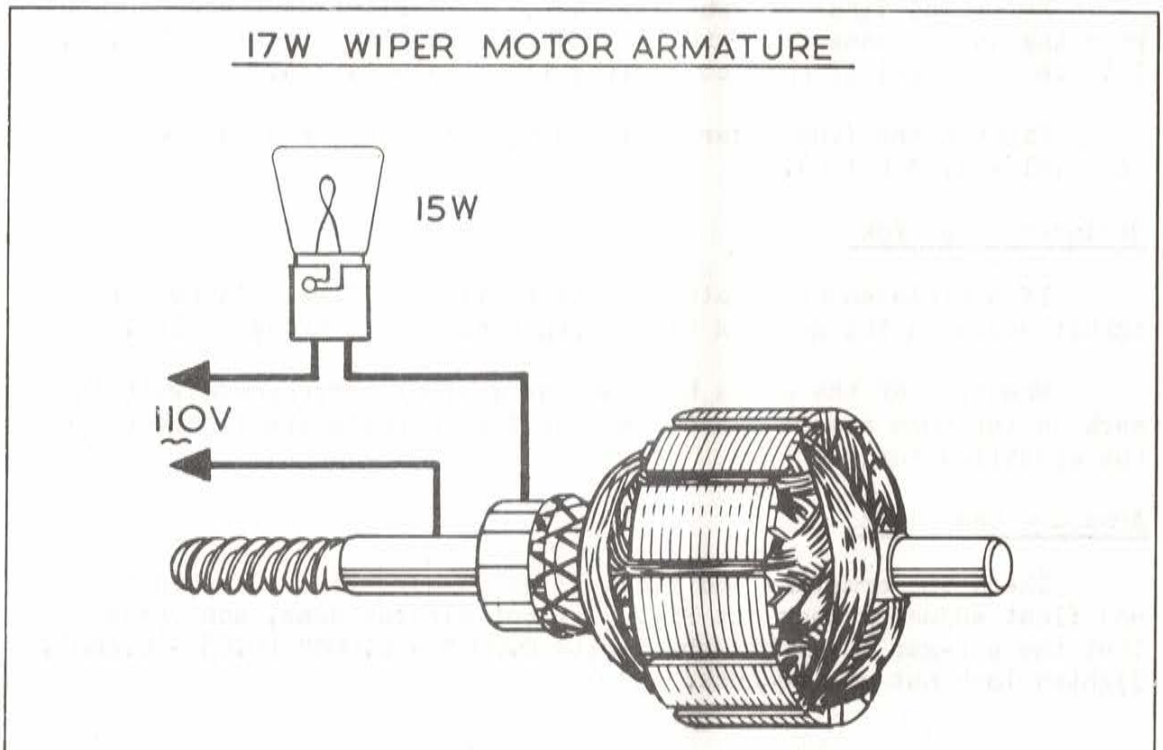


FIG. 4. ARMATURE INSULATION TEST

Inspect the limit switch contact arms and ensure that they are firmly rivetted. The length of the arms from the base to the contact point to ensure correct pressure on the slip ring is approx 9/32" (7.143mm).

Reassembly

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

Lubrication

Apply Ragosine Listate grease to the gearwheel teeth, the worm gear on the armature shaft, and to the slip ring on the final gearwheel.

Apply Shell Turbo 41 oil to the bearing bushes, armature shaft bearing surfaces (sparingly), and the final gearwheel shaft.

Apply Molybdenum Di-sulphide oil to the intermediate gearwheel pivot pin.

Shell Turbo 41 oil should also be used to lubricate the transmission linkage and wiper arm spindles.

Final gearwheel and Link Assembly

Ensure that the dished washer is fitted onto the shaft, concave side (larger diameter) towards the gearbox casting.

Refit the final gearwheel with the slip ring outer edge segment pointing in the same direction as the external coupling link Fig. 5. This is essential if correct parking is to be obtained.

Tighten the final gearwheel fixing nut to a torque of 80 - 90 lbf in (0.91 - 1.03 kgf m).

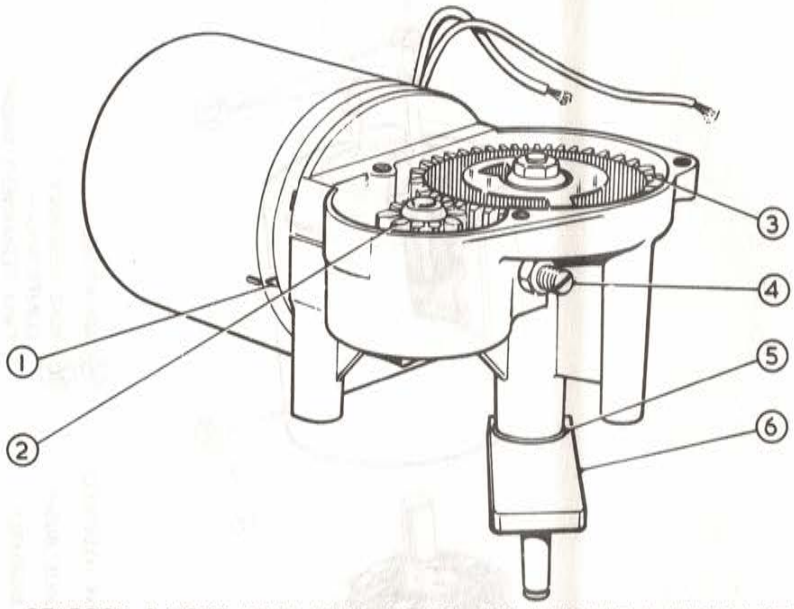
Replacement of Yoke

If a replacement armature is to be fitted, first slacken the thrust screw in the gearbox before tightening the through bolts.

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.

Armature End Float

Check the armature end float after re-assembly. Slacken the end float adjuster lock nut Fig. 5 if not already done, and check that the air-gap is within the limits 0.002" - 0.008" (0.05 - 0.2mm). Tighten lock nut and recheck.

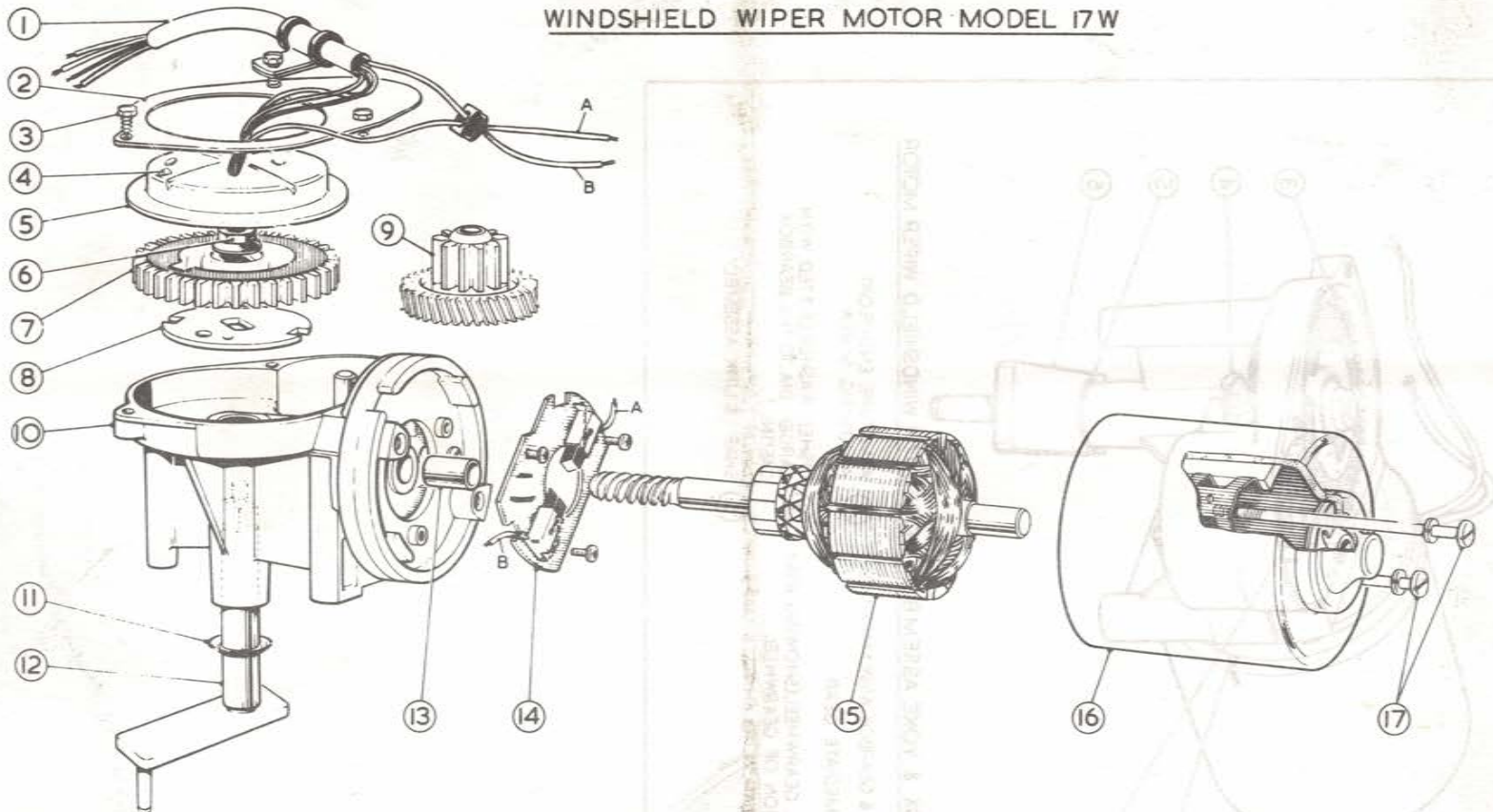


GEARBOX & YOKE ASSEMBLY MODEL 17W WINDSHIELD WIPER MOTOR

1. YOKE & GEARBOX ASSY. MARKINGS
2. INTERMEDIATE GEAR
3. FINAL GEARWHEEL (SHOWING ASSY. POSITION OF GEARWHEEL IN RELATION TO SHAFT & LINK)
4. ARMATURE END-FLOAT ADJUSTING SCREW
5. DISHED WASHER (FITTED WITH LARGER DIA. TO THE GEARBOX CASTING)
6. SHAFT & LINK ASSEMBLY

FIG.5.

WINDSHIELD WIPER MOTOR MODEL 17W



1. CABLE ASSEMBLY (WIRING TO CONNECTOR PLUG)
2. GEARBOX COVER
3. GEARBOX COVER FIXING SCREW
4. ARROW HEAD MARKING (LIMIT-SWITCH SETTING)
5. LIMIT-SWITCH COVER
6. LOCKNUT (FINAL GEARWHEEL)
7. FINAL-GEARWHEEL MOULDING ASSY.
8. DRIVING PLATE FINAL GEARWHEEL
9. INTERMEDIATE GEAR
10. GEARBOX
11. DISHED WASHER
12. SHAFT & LINK ASSEMBLY
13. POROUS BRONZE BUSH
14. BRUSHGEAR ASSEMBLY COMPRISING:- INSUL PLATE & BRUSH BOXES, BRUSHES, SPRINGS & FIXING SCREWS
15. ARMATURE
16. YOKE ASSEMBLY COMPRISING:- TWO PERMANENT MAGNET POLES & RETAINING CLIPS, & SELF-ALIGNING BEARING BUSH
17. YOKE FIXING SCREWS

FIG. 6.