SECTION J-6
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LUCAS

Quality

EQUIPMENT

VOLUME 2

WORKSHOP INSTRUCTIONS

WINDSCREEN WIPER

MODEL FW2

JOSEPH LUCAS LTD · BIRMINGHAM 19 · ENGLAND

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WINDSCREEN WIPER

MODEL FW2

1. GENERAL

The wiper is mounted on or near the windscreen surround. It can be fitted to a vehicle having an adjustable windscreen.

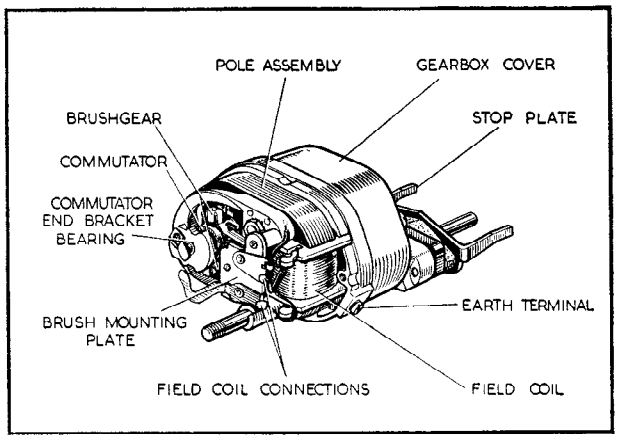

Fig. 1
Wiper with motor cover removed

The unit includes a central die-cast plate with a motor and gearbox situated on opposite sides. The armature shaft transmits the drive to the gearbox through a brass bearing located in the plate. The gearbox has a pressed steel cover and the motor a cast alloy cover.

The motor has a wound armature and a two-pole shunt wound field system. The field coil is wound on a nylon former, the laminated iron core of which is extended to form two pole pieces. The commutator end bracket incorporates a self-aligning porous-bronze bearing.

At the gearbox, the drive is taken from the armature shaft through a two-stage reduction gear to a connecting rod. This connecting rod converts the rotary motion of the gearing into the oscillating motion required by the wiping spindle, by operating a crank or oscillating pinion and sector gear. A crank is used to obtain angles of wipe up to 120° and an oscillating pinion and sector gear are used when angles of wipe

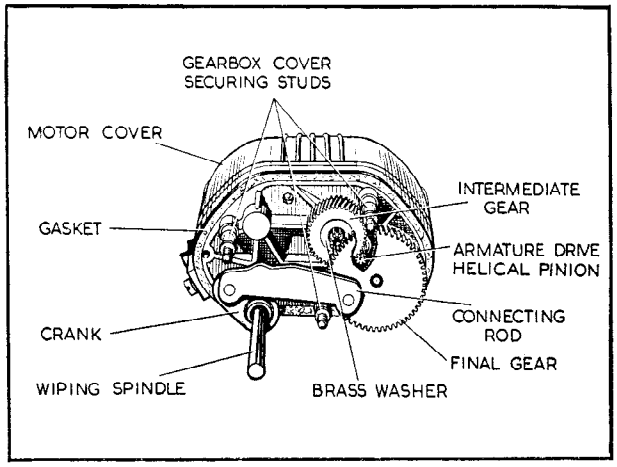

Fig. 2(a)
Gearbox incorporating a crank

from 130° upwards are required. The wiping spindle is driven via a dog clutch which can be disengaged for hand wiping and parking.

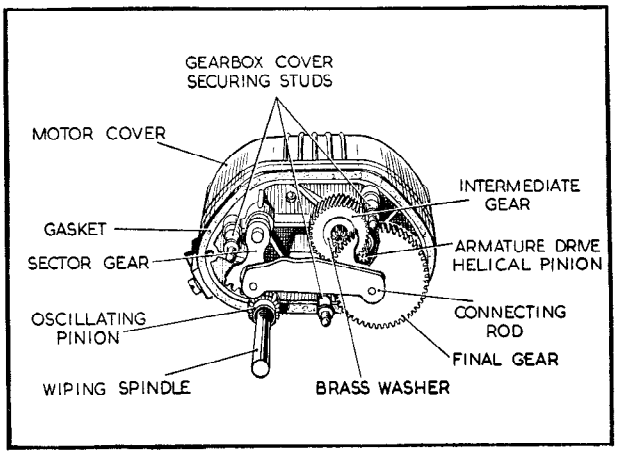

Fig. 2(b)
Gearbox incorporating an oscillating pinion and sector gear

To start the wiper, pull out the handle and turn it to disengage the switch lever and to bring the wiper blade on the windscreen; turn the switch to its vertical position. To stop, turn the switch to the horizontal

position, pull out the handle and turn the end of the handle into the recess in the switch lever.

2. MAINTENANCE

(a) Occasionally inspect the rubber wiper blades which, after long service, become worn and should be renewed.

(b) Methylated spirits (de-natured alcohol) should be used to remove tar spots and other stains from the windscreen. It has been found that the use of some silicone and wax-based polishes for this purpose can be detrimental to the wiper blades.

(c) The gearbox is packed with grease during manufacture and, in normal service, needs no further lubrication.

3. TEST DATA

	12-*volt*	24-*volt*
(*a*) Wiping Speed ...	44—52 c.p.m.	44—52 c.p.m.
(*b*) Light running current ... ... (arm and blade removed)	1.8—2.1 amp.	0.9—1.1 amp.
(*c*) Stall current ...	4.0—5.4 amp.	2.3—3.1 amp.
(*d*) Resistance between adjacent commutator segments ...	1.95—2.3 ohms	7.4—8.7 ohms
(e) Field resistance ...	11.5—12.5 ohms	42—45 ohms

4. SERVICING

(a) CHECKING CURRENT CONSUMPTION

If the wiper fails to operate, or operates unsatisfactorily, check the light running current. To do this, unscrew the collet nut and remove the wiper arm, connect an 0—10 amp. moving coil ammeter in the wiper circuit, switch on the wiper and note the current being supplied. Refer to para. 3(b) and proceed as follows:

(i) Wiper takes no current

Examine the fuse protecting the wiper circuit.

If the fuse has 'blown,' examine the wiring of all circuits protected by that fuse. Renew all cables which are worn or chafed and, if necessary, fit protective sleeving over them to prevent a recurrence of the fault. If the external circuits are found to be in order, replace the fuse with one of the recommended size then dismantle the motor and examine the component parts, see para. 4(b) and 4(c).

If the fuse is intact, examine the wiper circuit for faulty connections. If the connections are in order, dismantle the motor and examine the component parts.

(ii) Wiper takes abnormally low current

Check that normal battery voltage is applied to the

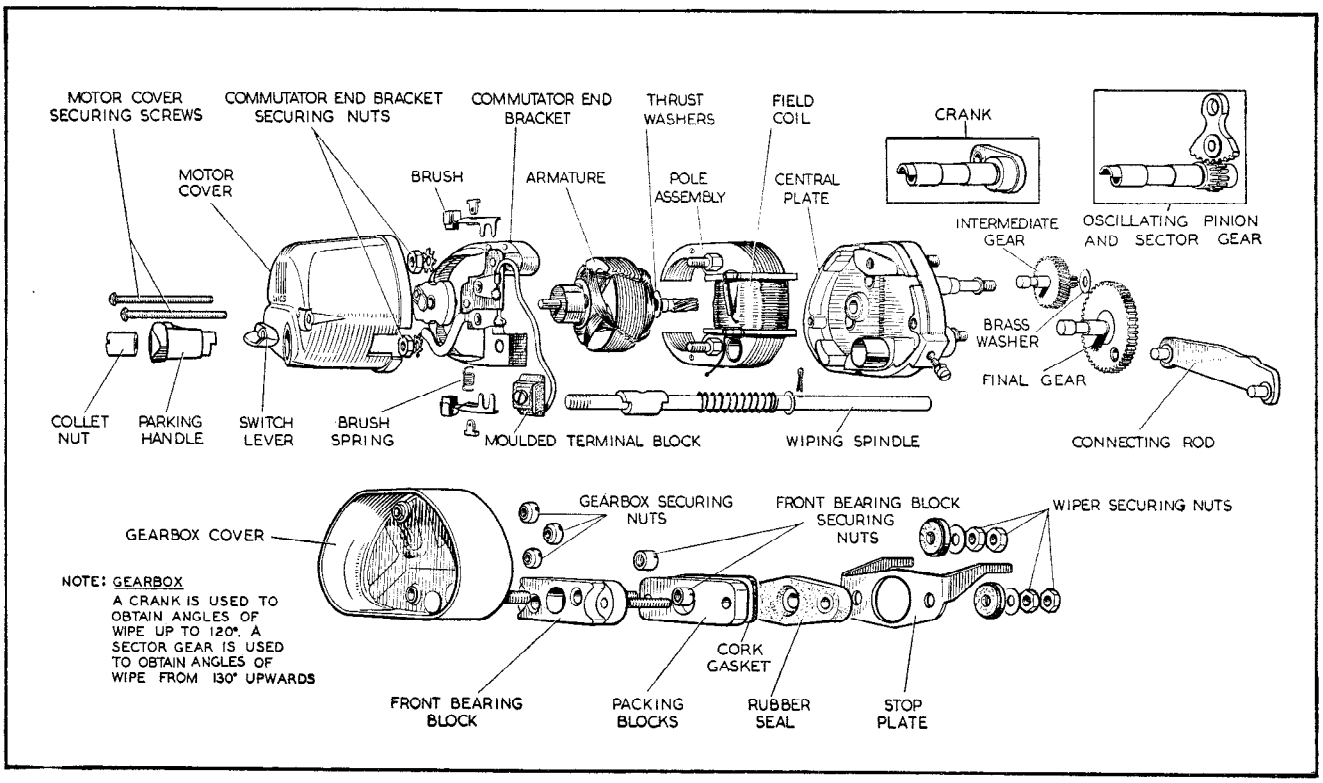

Fig. 3
Dismantled view of wiper

wiper terminals. If the voltage is low, check the condition of the battery and wiper circuit connections.

If the voltage is correct, dismantle the wiper motor and examine the component parts, see para. 4(b) and 4(c).

(*iii*) *Wiper takes abnormally high current*

Dismantle the motor and examine the component parts, see para. 4(b) and 4(c).

(*iv*) *Wiper takes normal current*

Check the condition of the wiper blade and then refit the wiper arm to the wiping spindle to give the correctly positioned area of wipe.

(b) DISMANTLING

(*i*) Unscrew the collet nut on the wiper arm and withdraw the arm from the wiping spindle.

(*ii*) Disconnect the electrical connections to the motor.

(*iii*) Unscrew the wiper securing nuts and withdraw the washers, stop plate and rubber seal.

(*iv*) Remove the wiper from the vehicle.

(*v*) Remove the cork gasket (when fitted) and the packing block(s).

(*vi*) Unscrew the securing nuts and withdraw the front bearing block.

(*vii*) Press back the wiping spindle spring, take out the C-ring or split pin, and withdraw the washer and spring. Withdraw the spindle complete with parking handle.

Dismantling the gearbox

(*viii*) Unscrew the three nuts and remove the gearbox cover.

(*ix*) Withdraw the connecting rod, crank or oscillating pinion and sector gear, final gear and intermediate gear. Note that a thin pen-steel washer is located below the final gear and a brass washer above the intermediate gear.

Dismantling the motor

(*x*) Unscrew the two securing screws and withdraw the motor cover. Press the moulded terminal block off the motor cover.

(*xi*) Unsolder the two field coil connections at the brush mounting plate.

(*xii*) Unscrew the two commutator end bracket securing nuts and remove the washers.

(*xiii*) Lift off the commutator end bracket complete with brushgear.

(*xiv*) Remove the brushgear from the commutator end bracket.

(*xv*) Lift out the armature and thrust washers.

(*xvi*) Unscrew the two pole assembly securing studs and remove the pole assembly.

(c) EXAMINING THE COMPONENT PARTS

(*i*) *Armature*

The commutator must be clean and have a polished appearance. Clean the commutator with a petrol-moistened cloth or, if necessary, with a strip of very fine emery cloth. Ensure that the spaces between the commutator segments are free from carbon and copper dust.

Check the resistance between adjacent commutator segments with an ohm meter and compare with the values given in para. 3(d).

(*ii*) *Field coil*

Check the resistance of the field coil and compare with the value given in para. 3(e).

(*iii*) *Brushgear*

Refit new brushes if the old ones are badly worn. Ensure that the brushes bear firmly on the commutator.

(d) REASSEMBLING

(*i*) Before reassembling, the following components should be lubricated, using the lubricants recommended:

Bearings (except commutator end bracket bearing)

Grease liberally with Duckhams HBB.

Armature shaft (drive end)

Smear with Oiline BBB or a light machine oil.

Gear teeth

Smear with Duckhams Keenol KG25 grease.

Rubber seal recess

Fill with Duckhams KG20 grease.

Intermediate gear shaft

Apply a film of Ragosine 'Molybdenised Non-Creep Oil.'

Commutator end bracket

If a replacement commutator end bracket is fitted, the bearing must be soaked in Oiline BBB for at least 24 hours immediately before assembling.

(*ii*) Reassembling is, in the main, a reversal of the dismantling procedure given in para. 4(b).

Before refitting the armature in its bearing in the central plate, refit the brushgear to the commutator end bracket and locate the armature in the commutator end bracket bearing.

After tightening the nuts securing the commutator end bracket, check that the armature is free to rotate.

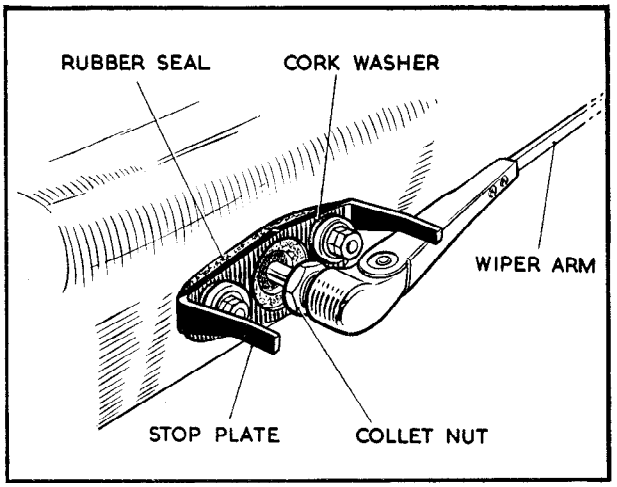

Fig. 4
Collet fixing of arm to wiping spindle

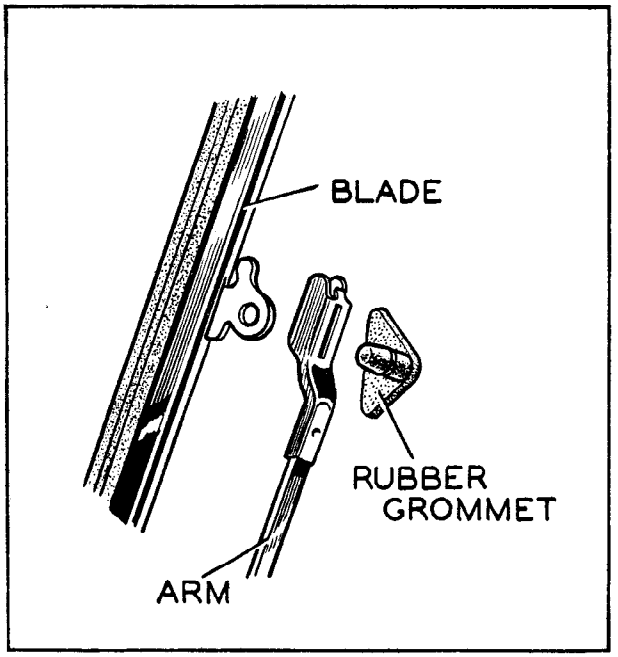

Fig. 5
Rubber grommet blade fixing

5. FITTING AND SETTING WIPER ARM AND BLADE

The wiper arm is secured to the spindle by a screw-on collet nut.

To remove the wiper arm, unscrew the collet nut and withdraw the arm from the spindle.

When fitting a wiper arm, position the wiper arm on the wiping spindle to give the correct area of wipe on the windscreen and tighten up the collet nut.

The wiper blade is secured to the wiper arm by one of two methods.

(i) Rubber grommet fixing

A tongue on the wiper blade passes through a slot in the wiper arm and is secured there by a rubber grommet.

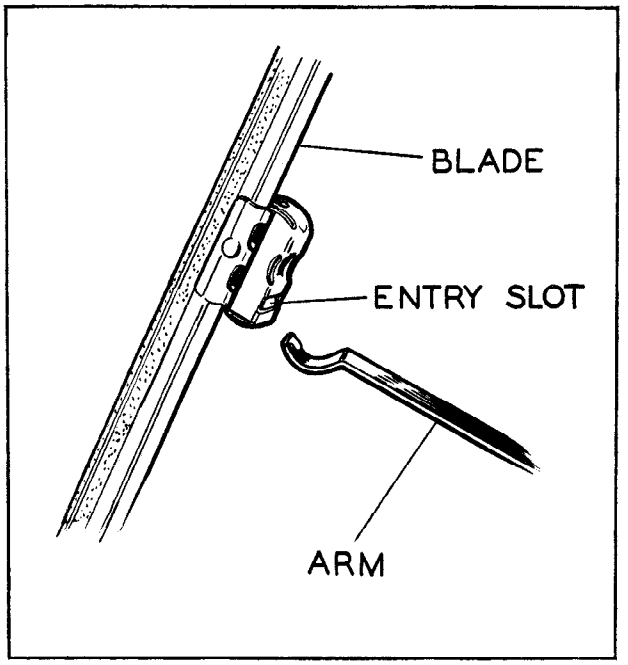

Fig. 6
Wrist-action blade fixing

(ii) Wrist-action fixing

The end of the wiper arm is curved and this enters a slot in the wiper blade and clips in position.