

LUCAS

Quality

EQUIPMENT

VOLUME 2

WORKSHOP INSTRUCTIONS

WINDSCREEN WIPERS

MODELS CW1, CW2 AND CWX



JOSEPH LUCAS LTD • BIRMINGHAM 19 • ENGLAND

Printed in England

LUCAS WORKSHOP INSTRUCTIONS

WINDSCREEN WIPERS

MODELS CW1, CW2 AND CWX

1. GENERAL

These windscreen wipers are mounted on the windscreen surround or on the windscreen itself. They will be found fitted chiefly to sports cars, commercial vehicles and other vehicles with a folding or opening windscreen. The switch and a lever for parking or hand wiping are mounted on the wiper. The normal method of fixing is by two threaded studs, but some wipers are supplied with a long threaded spindle bearing to give single hole fixing.

The differences between the three models are slight, and concern mainly the position of mounting: model CW1 is designed for top of screen fixing and the CW2 for the bottom of the screen, while model CWX can be fitted in either position and used as a service replacement for the two earlier models. The wiping angles also differ: models CW1 and CWX wipe through 150°, and model CW2 through 130°. Wipers with special angles of wipe are also supplied to customers' requirements.

The motor consists of a three-pole armature running in a two-pole shunt wound field. The drive is taken from the motor spindle by a series of gears to a crank which converts the rotary motion of the armature into the reciprocating motion required by the wiper arm.

To start the wiper pull out the parking handle and turn it to disengage the switch lever and bring the wiper blade into the operating position. Move the switch to the "on" position. To switch off, move the switch to the "off" position, pull out the parking handle and turn it until the pin on the handle engages with the switch lever.

2. ROUTINE MAINTENANCE

The wiper requires no maintenance in normal service. The gearbox is packed with grease before assembly. A lubricator is provided for the armature spindle, and very occasionally a few drops of thin machine oil may be added to lubricate the bearing.

3. TEST DATA

	6 volt	12 volt
(a) Normal current consumption ...	3.0—4.0 amps.	1.8—2.5 amps.
(b) Stall current ...	4.5—5.5 amps.	2.7—4.0 amps.
(c) Armature resistance (between two commutator segments) ...	0.9—1.2 ohms.	4.4—4.8 ohms.
(d) Field resistance (each coil) ...	1.5—1.6 ohms.	8.0—9.0 ohms

4. SERVICING

If the wiper fails to operate, or operates unsatisfactorily, switch on the wiper and note the current being supplied to the motor, either on the instrument panel ammeter or preferably on a moving coil ammeter, 0—20 amps., connected in the wiper circuit. Then proceed as follows:—

(a) WIPER TAKES NO CURRENT

Examine the fuse protecting the wiper circuit. If it has blown, examine the wiring of the wiper circuit and of all other circuits protected by the fuse for evidence of chafed leads or short circuits. Replace any leads that are badly worn or chafed, if necessary fitting protective sleeving over the leads to prevent a recurrence of the fault.

If the fuse is intact, disconnect the cables from the terminals of the wiper motor and connect the wiper direct to a battery of suitable voltage. Operation of the wiper under these conditions proves that there must be a broken lead or loose connection in the wiper circuit.

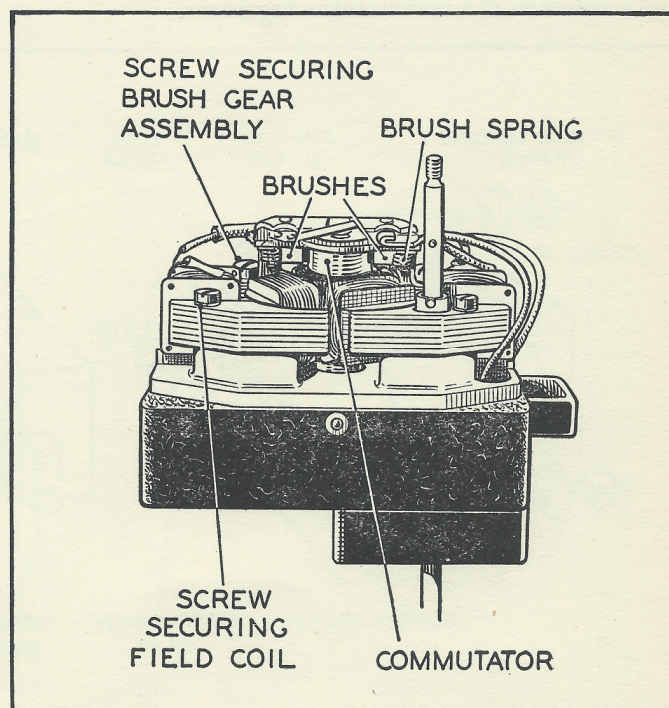


Fig. 1

Wiper with cover removed



LUCAS WORKSHOP INSTRUCTIONS

Remove the parking handle. Unscrew the two cover fixing screws and remove the cover of the wiper. See that the switch control moves freely, and that the brass contacting strips remain closed when the cover is removed; if they are dirty clean them with fine emery cloth. Examine the wiring of the motor and resolder any connections that are loose or broken.

(b) WIPER TAKES ABNORMALLY LOW CURRENT

First ensure that the battery is not discharged and that all connections in the wiring to the wiper are clean and tight.

If the current is that normally taken by the field coils only (0.75 amperes for 12 volt models and 2 amperes for 6 volt) a fault in the armature, commutator or brushgear must be suspected.

(i) See that the carbon brushes are clean and move freely in their holders. If the brush springs are weak, and do not hold the brushes firmly in contact with the commutator, new springs must be fitted. Remove the brushes and examine them: fit replacements if the brushes are badly worn. If the brushes are dirty or greasy clean them with a petrol-moistened cloth.

(ii) Clean the commutator with a petrol-moistened cloth, and carefully remove any carbon dust from between the segments. If the commutator is badly scored or burnt, remove the armature (see Para 4(e) below), mount it in a lathe and take a very light cut off the surface of the commutator with a sharp tool. Do not remove any more metal than is necessary, and take care to clean all metallic swarf and dust from the slots between the commutator segments.

(iii) The armature windings can be checked by removing the brushes from their holders and then measuring the resistance between two segments of the commutator. If the armature is in good condition this resistance should be within the limits given in Para. 3. The insulation between the commutator segments and the body of the wiper should also be checked.

If these tests prove the armature to be faulty it must be removed as described in Para. 4(e) below and a replacement fitted.

A similar procedure can be followed to check the field coils.

(c) WIPER TAKES ABNORMALLY HIGH CURRENT

The normal current consumption of the wiper lies between 1.8 and 2.5 amperes for 12 volt models and between 3 and 4 amperes for 6 volt models. If the current consumption as shown by the test ammeter is greatly in excess of this value, the armature windings, commutator or gearbox mechanism may be at fault.

First check that stiffness in the bearings or gearbox mechanism does not prevent the free rotation of the armature, if necessary dismantling the mechanism as described below and renewing any damaged components. Lubricate the armature spindle with a small quantity of thin machine oil.

Remove the cover of the wiper and examine the internal connections, brushgear and commutator for signs of a short circuit. See that a bent or damaged cover is not touching parts of the brushgear or wiring.

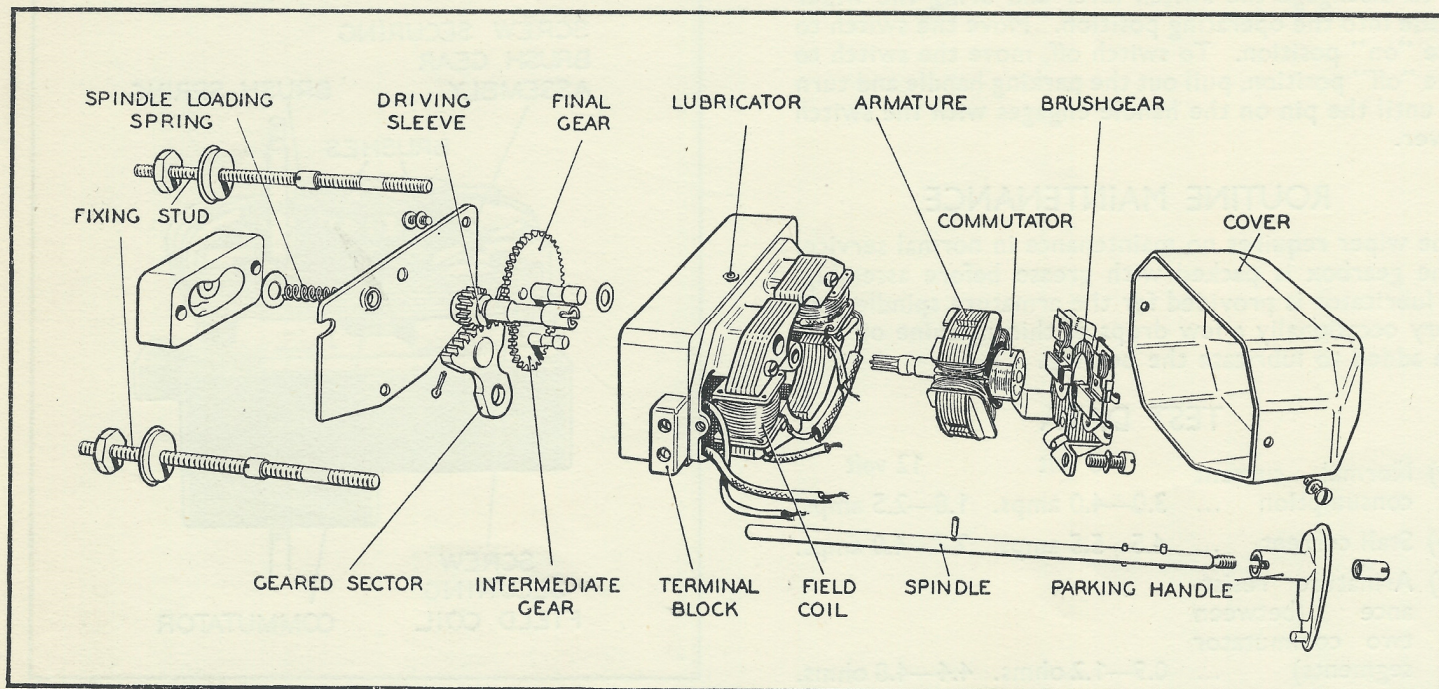


Fig. 2
Wiper, dismantled



LUCAS WORKSHOP INSTRUCTIONS

Clean the commutator, taking especial care to remove all traces of carbon or metallic dust from between the commutator segments.

Check the resistance of the armature and the field coils. If the resistance is appreciably below the figure given in Para. 3 it is probable that the windings are at fault, and a new armature or field coil assembly must be fitted.

(d) WIPER OPERATES BUT DOES NOT DRIVE WIPER ARM

If the motor is heard to operate but does not drive the wiper arm, first ensure that the arm is firmly secured to the wiper spindle. Then dismantle the gearbox and drive mechanism as described below, renewing any faulty components.

(e) DISMANTLING

(i) Remove the wiper from the car and remove the packing blocks, sealing washers, etc., from the fixing studs. Note carefully the arrangement of these components, as their incorrect reassembly might result in water working through the fixing holes and penetrating to the interior of the wiper.

(ii) Unscrew the two threaded fixing studs, which also secure the packing block and bearing assembly to the wiper. (On wipers with single hole fixing, this assembly is secured by means of two screws). Remove the parking handle and the wiper cover, which is secured by two screws.

(iii) Unsolder the four connections from the tags on the brushgear assembly. Note the arrangement of these connections to ensure correct reassembly. Open the tag by which the cable between the field coils is secured to the brushgear assembly.

Hold back the brush springs with a bent piece of wire, and remove the brushes. By removing the two securing screws the complete brushgear assembly can be removed from the motor.

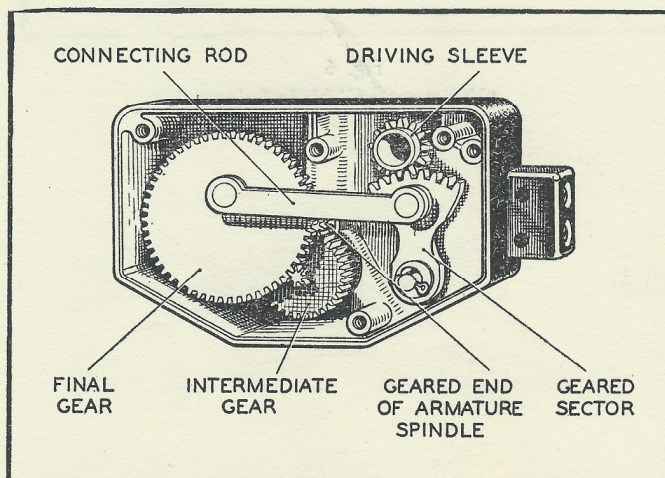


Fig. 3

Wiper gearbox with cover removed

(iv) Pull the armature out of the motor. Take care not to lose the fibre washer on its spindle. Withdraw the two field coil securing screws and remove the field coil assemblies from the motor body.

(v) Drive out the pin securing the spindle loading spring and washer. Remove the spindle from the motor side of the wiper.

(vi) Withdraw the two screws securing the gearbox cover plate and remove the plate.

(vii) Remove the split pin and washer securing the geared sector, and pull the sector and connecting rod out of the gearbox.

NOTE : Before doing this the sector and the gear on the driving sleeve must be marked to ensure correct meshing on reassembly, as otherwise the parking and wiping positions of the arm will be incorrect.

(viii) The driving sleeve, final gear and intermediate gear can now be pulled out of the gearbox.

(f) REASSEMBLY

Reassembly of the wiper is a reversal of the dismantling process. The following points should be kept in mind:

(i) See that the geared sector and the geared end of the driving sleeve are correctly engaged, according to the marks made on them when dismantling.

(ii) When refitting the field coil assemblies do not tighten the securing screws until the armature and brushgear have been refitted. There is a certain amount of play in the securing holes, by which the field coil assemblies can be adjusted so that there is no risk of their being fouled by the armature.

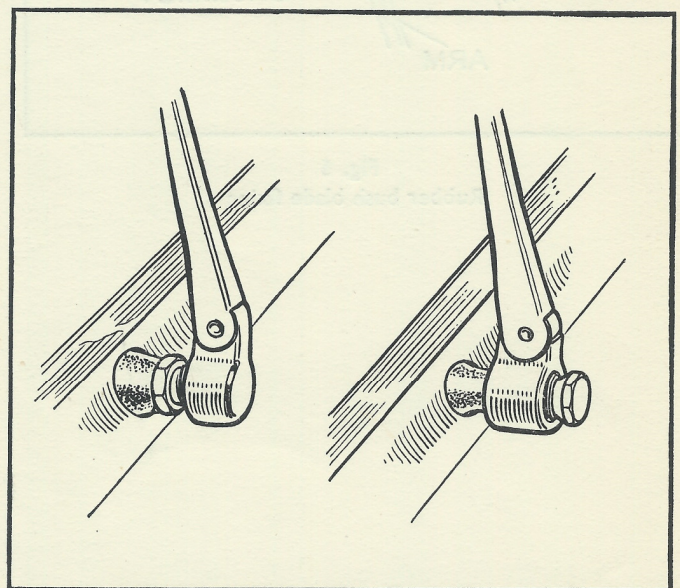


Fig. 4

Collet fixing of arm to wiper spindle



LUCAS WORKSHOP INSTRUCTIONS

(iii) If the pin, by which the drive from the sleeve is transmitted to the wiper spindle, is worn or distorted so that the drive will not correctly engage, it should be tapped out and replaced by a short length of $\frac{1}{16}$ in. mild steel. If the corresponding slot in the driving sleeve is worn, the sleeve must be replaced.

(iv) Before refitting the gearbox cover plate, the gearbox must be packed with zinc oxide grease. A small amount of thin machine oil should be applied to the armature bearing lubricator.

5. ARMS AND BLADES

The wiper arm is fixed to the spindle by means of a collet. This may take either of the forms shown, the hexagonal headed nut serving to tighten the collet. When fitting an arm, do not fully tighten the collet nut until the arm is positioned to wipe over the correct area of the screen and the blade lies unobtrusively at the edge of the screen when parked.

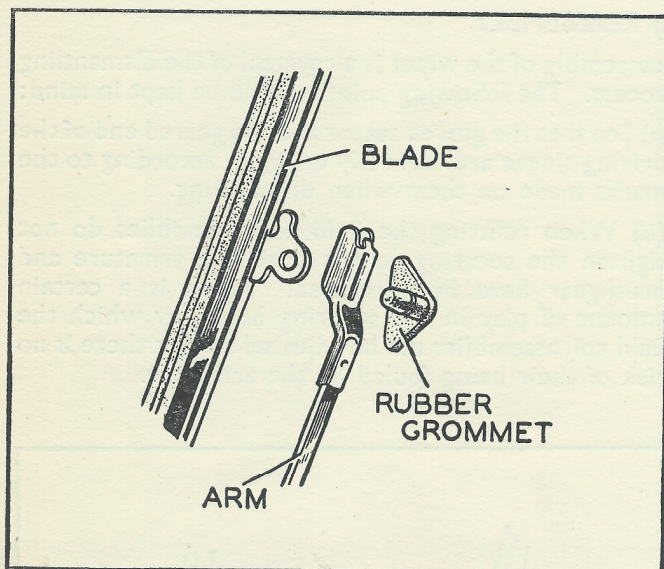


Fig. 5
Rubber bush blade fixing

The blade is secured to the wiper arm either by a tongue on the blade, which passes through a slot on the blade and is secured by a rubber bush, or by a curved "wrist" on the end of the arm which clips into a slot in the blade.

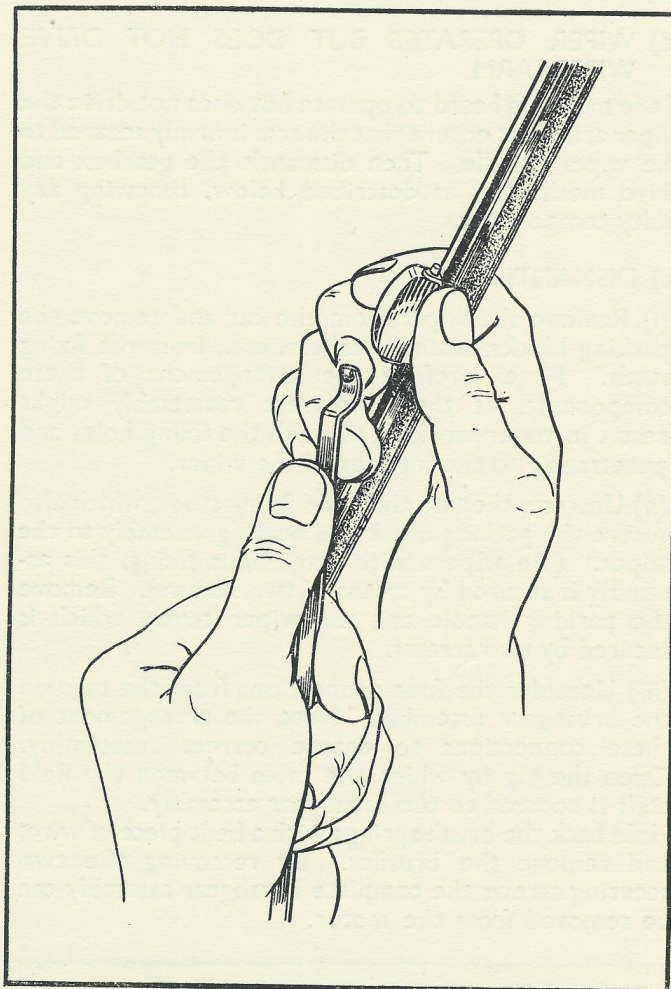


Fig. 6
"Wrist-action" blade fixing