SECTION J-8
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EQUIPMENT

VOLUME 2

WORKSHOP INSTRUCTIONS

WINDSCREEN WIPERS

MODEL DL2

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WINDSCREEN WIPER

MODEL DL2

1. GENERAL

(*a*) Model DL2 link type windscreen wipers comprise motor, linkage and spindle units forming a single assembly on a rigid mounting plate, unlike previous link and cable rack designs in which the motor and spindle units or wheel-boxes have been separately mounted components. The motor portion, of which both single-speed and two-speed versions are made, is essentially as that used to power cable rack windscreen wiper model DR2 and, like the latter, carries a self-switching mechanism in the gearbox. The instructions given in section J-5 for later versions of model DR2 therefore apply largely to this portion of model DL2. A detail difference between the two designs is that model DL2, when wound for 12-volt operation, has the built-in thermo-magnetic circuit breaker as fitted in model DR3. This device will protect the motor under both hot and cold stall-current conditions.

(*b*) Power is transmitted from the armature shaft extension, through a single-stage worm reduction gear, to an output shaft carrying a short continuously rotating crank. The length of this crank determines the amount of oscillatory movement imparted to the linkage mechanism and hence controls the angle of wipe of the blades on the windscreen. The wiper arms are driven by spindle units which, like the output shaft of the motor, also carry a small crank. The actual arrangement of links connecting the rotating output crank with the spindle unit cranks depends on where the motor is mounted. With two-spindle unit installations having the motor mounted centrally above or below the windscreen, the output crank usually (though not necessarily) drives two links—one to the crank of each spindle unit. On the other hand, when a motor is mounted toward one side of the windscreen the drive is taken through a primary link to one of the spindle units and thence through a secondary link to the crank of the second spindle unit. In a three-spindle unit installation an additional secondary link is used, the primary link normally being taken to the crank of the centre spindle unit.

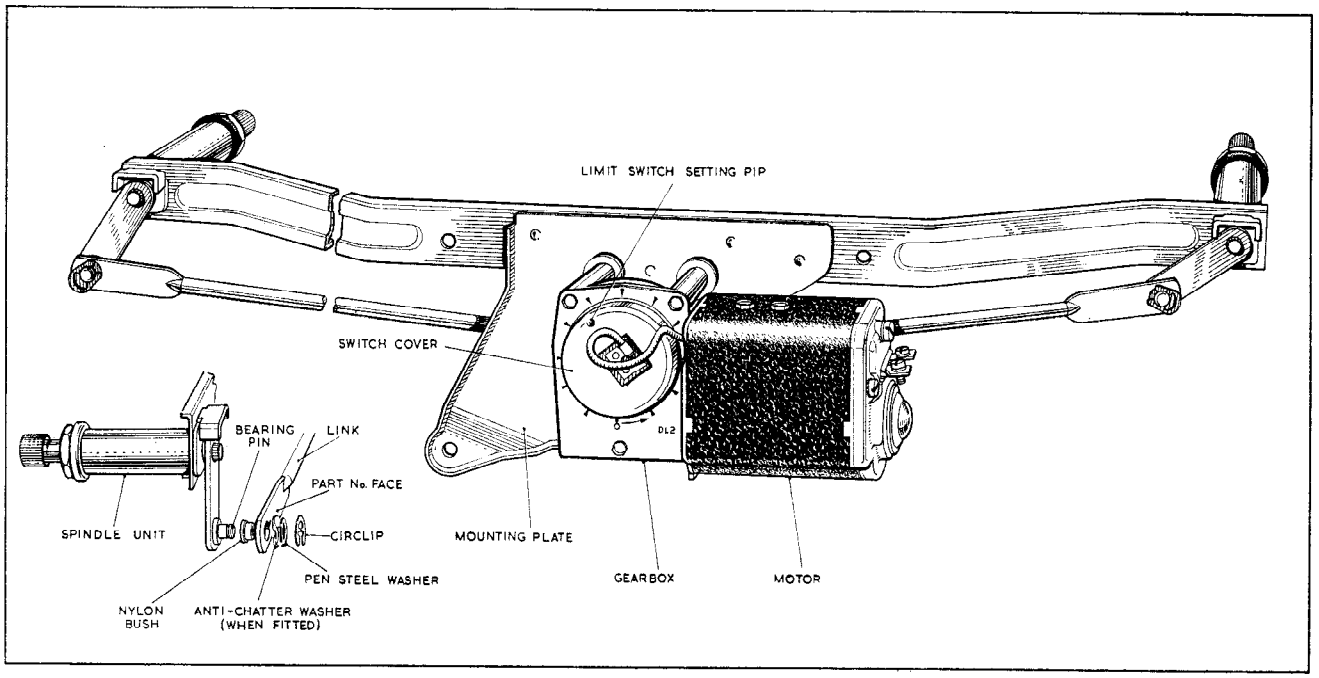

Fig. 1.
Typical double-primary link wiper, with details of spindle unit coupling

The spindle unit cranks are either of equal length, when symmetric areas of windscreen are wiped, or are of dissimilar lengths when asymmetric wiping is obtained. In those installations having a "clap-hands" motion of the blades, the crank of one of the spindle units is inverted.

Link bearing pins normally operate in replaceable nylon bushings but in some installations steel ball joints are used.

2. MAINTENANCE

The gearbox interior and the link pins are lubricated with Ragosine Listate grease during assembly and require no further attention until the unit is dismantled for general overhaul.

Efficient wiping is dependent upon having a clean windscreen and wiper blades in good condition. See also Section J-5 Para. 2.

3. TEST DATA

(*a*) MOTOR AND GEARBOX

	6-volt units	*12-volt units*	*24-volt units*
(*i*) Current consumption of motor 60 seconds after switching on (with wiper arms withdrawn from spindle units) :			
Normal speed	5.8—6.8 amp.	3.0—3.7 amp.	1.2—1.6 amp.
High speed	5.1—6.1 amp.	2.2—2.9 amp.	0.8—1.2 amp.
(*ii*) Normal speed stall torque (applied 60 seconds after switching on	975 oz.-in. (0.702 kg.-m.)	975 oz.-in. (0.702 kg.-m.)	975 oz.-in. (0.702 kg.-m.)
(*iii*) Revolutions per minute of output crank 60 seconds after switching on (with wiper arms withdrawn from spindle units) :			
Normal speed	44—48 r.p.m.	44—48 r.p.m.	44—48 r.p.m.
High speed	58—68 r.p.m.	58—68 r.p.m.	58—68 r.p.m.
(*iv*) Minimum voltage at which motor should run when bench testing	1.5 volts	3.0 volts	6.0 volts
(*v*) Resistance in ohms at 60°F. (15.5°C.) of armature winding, measured between adjacent commutator segments	0.07—0.09 ohm	0.29—0.35 ohm	1.3—1.6 ohms
(*vi*) Resistance in ohms at 60°F. (15.5°C.) of field winding ...	2.1—2.3 ohms	8.0—9.5 ohms	30—34 ohms
(*vii*) Resistance of 'Ferry' wire wound on field coils of two-speed motors	2.0—2.2 ohms	9.5—11.0 ohms	35—40 ohms
(*viii*) Pressure of brushes against commutator	125—140 g. (4.4—4.93 oz.)	125—140 g. (4.4—4.93 oz.)	125—140 g. (4.4—4.93 oz.)
(*ix*) Armature end play	0.004"—0.008" (0.1—0.2 mm.)	0.004"—0.008" (0.1—0.2 mm.)	0.004"—0.008" (0.1—0.2 mm.)

(*b*) THERMO-MAGNETIC CIRCUIT BREAKER

(*i*) Test procedure (applicable only to built-in circuit breaker fitted in 12-volt units) : Connect motor to 12-volt supply and keep this voltage constant throughout test. Under stall-current conditions, circuit breaker contacts should open within 35 to 240 seconds of switching on.

Note : Special factory equipment is used in production for assembling circuit breaker to yoke. This component is therefore not normally regarded as suitable for individual replacement. However, if replacement of complete motor is impractical, resetting as in 3(*b*) (*ii*) below may be attempted.

(*ii*) Method of setting ... ... (Not adjustable in situ) Remove circuit breaker from motor yoke and, with suitable tool, bend moving contact blade carrier (ribbed steel strip) at necked point, using the projections provided for this purpose. Refit circuit breaker to yoke and retest as in 3(*b*) (*i*) above.

(*c*) SPINDLE UNIT END PLAY

For checking purposes only ; not adjustable.

(*i*) Peened-over type ... ... 0.003″ (max.) (0.076 mm.)

(*ii*) Circlip-secured type ... ... 0.020″ (max.) (0.508 mm.)

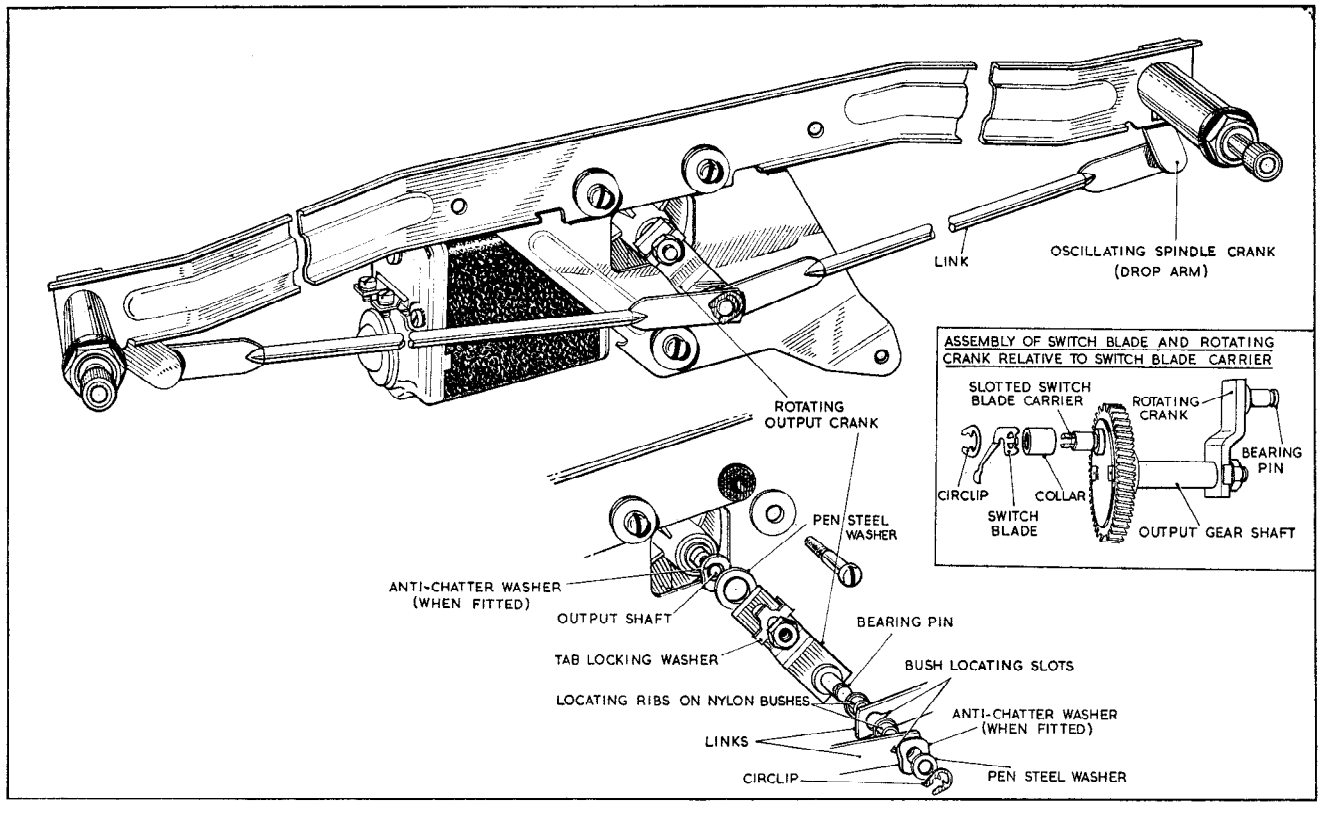

Fig. 2.

Typical double-primary link wiper, with details of output crank coupling and (inset) output gear shaft assembly

4. MISCELLANEOUS NOTES ON SERVICING

(*a*) MOTOR AND GEARBOX

(*i*) As stated in Para. 1 (*a*), much of the information given in Section J-5 of this Manual for later versions of windscreen wiper model DR2 applies also to the motor and gearbox portion of Model DL2. All references therein to cable rack and tubing must, of course, be ignored.

(*ii*) A brush arm retainer in the form of a comb-shaped fibre plate below the terminal assembly is fitted to DL2 (and DR2) motors. This retainer must be withdrawn in order to disengage the brush gear assembly.

(*b*) LINKAGE MECHANISMS

(*i*) Links must operate quietly and must not touch either each other or the mounting plate.

(*ii*) The Part Number of each link is stamped on one of the flattened ends. When assembling the links, the stamped ends must be coupled to (and face away from) the spindle unit cranks or drop arms.

(*iii*) Nylon bushes have a moulded projection which must engage with a corresponding keying slot in the links.

(*iv*) Bearing pins and other pressure surfaces should be smeared with Ragosine Listate grease before assembly.

(*v*) The contact surface of the limit switch should be lightly smeared with Ragosine Listate.

(*vi*) When the motor unit is assembled to the mounting plate, the securing screws must be fully tightened up to the shoulders.

(*vii*) When fitting the rotating crank to the motor output shaft, care must be taken to see that the driving flats correctly engage, that the tab washer is locked over and that the pen steel washer is not trapped between the rotating crank and the shoulders of the output shaft.
Correct positioning of the rotating crank on the output shaft with respect to the slotted switch blade carrier is shown in Fig. 2 (inset) together with the correct assembly of the switch blade to the carrier.

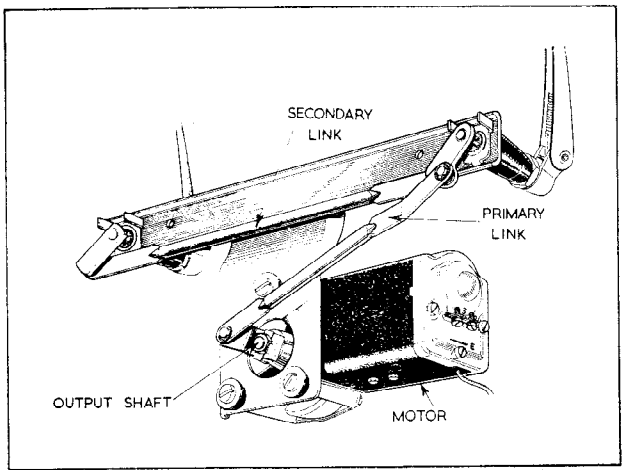

Fig. 3.
Typical wiper with primary and secondary links