WINDSCREEN WIPER MODEL DR3

ADDITION OF MODELS 6W AND 6WA

Supplementary Information to Sections J-7 and J-1, Part B, Pages 4 & 6

General Features

Two new cable rack drive windscreen wipers, models 6W and 6WA, have been developed for applications requiring greater driving torques at the wheelboxes than are available from models DR3 and DR3A. Whilst using the same armature and field system, the increased torque (6W, 1,500 oz.–in. : DR3, 975 oz.–in.) has been obtained by substituting the worm and single stage gearing, as used in models DR3 and DR3A, for two stage spur gearing, the first stage being helical and the second stage straight. Both gears are moulded from the polyacetal resin 'Delrin'—a plastics material similar to 'Nylon' but having a higher impact strength and better machining qualities—while the meshing pinions are of steel. To accommodate the increased transmission load, the wheelbox gear teeth are cut to allow a greater area of contact with the cable rack helix. The wheelboxes are known as 'throated-gear' wheelboxes. Like the final gear in the gearbox, the gear in the wheelboxes is of greater diameter than that used in DR3 installations and has 32 teeth.

Note : Wheelboxes fitted with the older 27 or 32-tooth plain gears or with the later 27-tooth throated gear must not be used in conjunction with 6W or 6WA installations.

As in previous DR installations, the cable rack passes through protective metal tubing running between the gearbox and the first wheelbox, and also between the two wheelboxes, with an extension piece after the second wheelbox.

Model 6W, like model DR3, has a thermostatically protected two-speed motor which, on the panel switch being turned to the position 'Park', reverses and causes a special pivoted coupling between the crank pin and connecting rod to rotate through 180° and displace the crosshead travel, thus bringing the wiper blades off the screen and actuating an adjustable limit switch in the gearbox to bring the motor to rest.

Model 6WA has, like model DR3A, a non-reversing motor that may be wound for single-speed, two-speed or variable speed operation, and may or may not be fitted with a limit switch to bring the wiper blades to rest at the edge of the windscreen. Unlike some DR3A units, however, all 6WA units are thermostatically protected.

Limit Switches fitted to Models 6WA and DR3A

The limit switch fitted in the later production of models 6WA and DR3A is of the type shown in SECTION J–5 ISSUE 2 Figs. 1(a) and 3 for model DR2. Earlier 6WA and DR3A units were built having the crosshead-actuated lever switch, as used in models DR3 and 6W. Instructions for setting each type of switch are as described in SECTION J–5 paragraphs 4(d) (i) and (iii), respectively. When reassembling a unit having a limit switch of the DR2 type, a smear of Ragosine Listate 225 grease or of petroleum jelly must be applied to the fixed contact sector which is riveted to the underside of the domed cover.

Amendment

Para. 3 line 4

For : " . . . off . . . "

Read : " . . . to the edge of . . . "

The crosshead-actuated type of switch requires no lubrication but the contact surfaces should be inspected and, if necessary, cleaned.

Servicing

In general, the information given in SECTION J–7 and supplements applies also to models 6W, 6WA and DR3A. Constructional details of model 6W can be seen by referring to the illustration at the end of this supplement while, for convenience, test data covering 6, 12 and 24-volt versions of models DR3, DR3A, 6W and 6WA has been combined and tabulated in the style adopted for other recent issues.

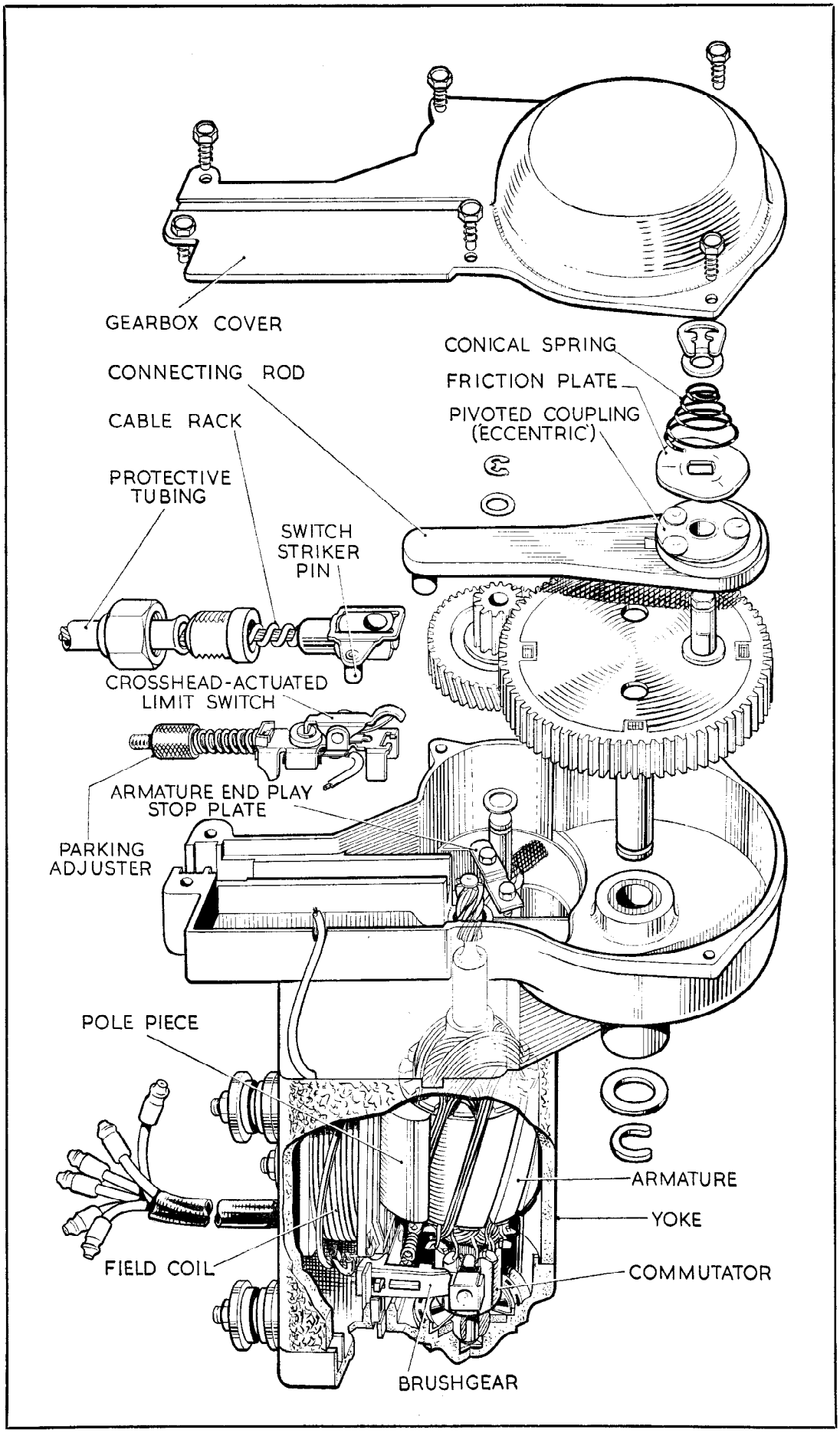
TEST DATA

	6-volt units	*12-volt units*	*24-volt units*
(*i*) Current consumption of motor 60 seconds after switching on (cable rack disconnected) :			
Normal speed	7.4 amp. (max.)	3.4 amp. (max.)	1.7 amp. (max.)
High speed	5.6 amp. (max.)	2.6 amp. (max.)	1.3 amp. (max.)
(*ii*) Stall torque (applied after 60 seconds of light running) :			
6W and 6WA ...	... 1500 oz.-in. (on 6.15 volts) (1.08 kg.–m.)	1500 oz.-in. (on 12.25 volts) (1.08 kg.–m.)	1500 oz.-in. (on 24.5 volts) (1.08 kg.–m.)
DR3 and DR3A ...	... 975 oz.-in. (on 6.15 volts) (0.705 kg.–m.)	975 oz.-in. (on 12.25 volts) (0.705 kg.–m.)	975 oz.-in. (on 24.5 volts) (0.705 kg.–m.)
(*iii*) Revolutions per minute of final gear 60 seconds after switching on (with rack disconnected) :			
Normal speed	44—48 r.p.m.	44—48 r.p.m.	44—48 r.p.m.
High speed (when applicable)	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 (6W, 6WA) 1.5—1.8 ohms (DR3, DR3A)

	6-volt units	*12-volt units*	*24-volt units*
(*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
Resistance of rheostat in 89SA switch (for controlling variable-speed, non-reversing motors) ...	—	9.0—11.0 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 :*			
6W and 6WA	0.003″—0.008″ (0.07—0.20 mm.)	0.003″—0.008″ (0.07—0.20 mm.)	0.003″—0.008″ (0.07—0.20 mm.)
DR3 and DR3A	0.008″—0.012″ (0.2—0.3 mm.)	0.008″—0.012″ (0.2—0.3 mm.)	0.008″—0.012″ (0.2—0.3 mm.)
(*x*) Wheelbox end play :			
Plain gear type ... ... (not suitable for models 6W and 6WA)	0.003″ (0.076 mm.) max. Adjustable, in later (pressed steel) pattern only, by bending tongue in gear cover plate or, with cover plate screwed firmly in position, by giving spindle a light tap at boss end. Earlier (pressed steel) pattern, 0.003″—0.015″ (0.076—0.38 mm.) non-adjustable.		
Throated gear type	0.003″ (0.076 mm.) max. Adjusted before leaving Works by tapping at boss end. No subsequent adjustment should be necessary.		
(*xi*) Maximum permissible force required to move cable rack in protective outer tubing (blades away from windscreen and rack disconnected at gearbox) ...	6 lb. (2.7 kg.)	6 lb. (2.7 kg.)	6 lb. (2.7 kg.)

*Obtainable in models DR3 and DR3A by turning back the adjusting screw in the side of the gearbox $\frac{1}{6}$ to $\frac{1}{4}$ of a turn from solid contact with the thrust pad. The end play in some units is obtained during manufacture by an automatic process involving counterboring of the gearbox casting. The screw is cheese-headed and has no locking nut. The head of the screw usually lies in a recess machined during the automatic setting operation. When replacing the armature of such a unit, this screw must be replaced by the screw and locknut which is available for manual setting in service.

It is not possible to give equivalent information for adjusting the armature end play of models 6W and 6WA due to the springy nature of the stop plate. The screw (hexagon headed and adjacent to crosshead guide channel) can, however, be suitably adjusted by observation. There must be no deflection of the stop plate due to contact with the armature spindle. With the correct end play, it should be possible to hear the armature moving axially when a motor is shaken sharply in the hand.



Windscreen Wiper, model 6W, dismantled