SECTION M–3
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LUCAS

Quality

EQUIPMENT

WORKSHOP INSTRUCTIONS

SCREENJET

MODEL 4SJ

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SCREENJET
MODEL 4SJ

1. GENERAL

Model 4SJ ScreenJet is an electrically operated unit comprising a small permanent-magnet motor driving a centrifugal pump through a 3-piece Oldham type coupling. The motor is remote controlled from a pushbutton and is energised for as long as the push-button is depressed. The general construction can be seen in Fig. 1 where the unit is shown dismantled. The container is moulded in high density polythene.

2. ROUTINE MAINTENANCE

(*a*) When the water level falls to the top of the pump unit, refill the container with clean water up to the base of the filler neck. One measure (10 c.c.) of Lucas 'Crystal Clear' ScreenJet fluid may be added to help dissolve greasy smears and to remove insect deposits from the windscreen.

(*b*) Keep the container free from sediment and the gauze filter and the jet nozzles clear.

3. TEST DATA

(*a*)	Nominal voltage of unit	12	24
(*b*)	Maximum current consumption	2.0 amp.	1.25 amp.
(*c*)	Resistance between commutator segments ...	2.8—3.1 ohm	10.6—11.7 ohm
(*d*)	Minimum water delivery pressure	4.5 p.s.i. (0.32 kg./sq.cm.)	4.5 p.s.i. (0.32 kg./sq.cm.)
(e)	Minimum water delivery per second	3.5 c.c.	3.5 c.c.
(*f*)	Container capacity	1.1 litres	1.1 litres
(*g*)	Usable quantity of water	1 litre	1 litre
(*h*)	Diameter of nozzle orifice	.025"—.028"	.025"—.028"

4. SERVICING

(*a*) TESTING IN POSITION

(i) Testing with a voltmeter

Connect a suitable direct current voltmeter to the motor terminals, observing the polarity as indicated on the moulded housing. Operate the pushbutton. If a low or zero voltage is indicated, the 'A4' fuse, pushbutton and external connections should be checked and corrected as necessary.

If the voltmeter gives a reversed reading, the connections to the motor must be transposed.

If supply voltage is registered at the motor terminals but the unit fails to function, an open-circuit winding or faulty brushgear can be suspected. Dismantle the motor, as described in paragraph 4 (b).

(ii) Checking the external tubes and nozzles

If the motor operates but little or no water is delivered to the screen, the external tubes and nozzles may be blocked.

Remove the external plastic tube from the short connector on the container cover and, after checking that the connector tube is clear, operate the pushbutton switch.

If a jet of water is ejected, check the external tubes and nozzles for damage or blockage.

If no water is ejected, proceed as in paragraph 4 (a) (iii) below.

(iii) Testing with an ammeter

Connect a suitable direct current ammeter in series with the ScreenJet motor and operate the pushbutton. If the motor does not operate but the current reading exceeds that shown in paragraph 3 (b), remove the motor, as described in paragraph 4 (b) (i) and (ii), and check that the pump impeller shaft rotates freely.

If the shaft is difficult to turn, the water pump unit must be replaced.

If the shaft turns freely, the fault lies in the motor, which must be dismantled as described in paragraph 4 (b), and its component parts inspected.

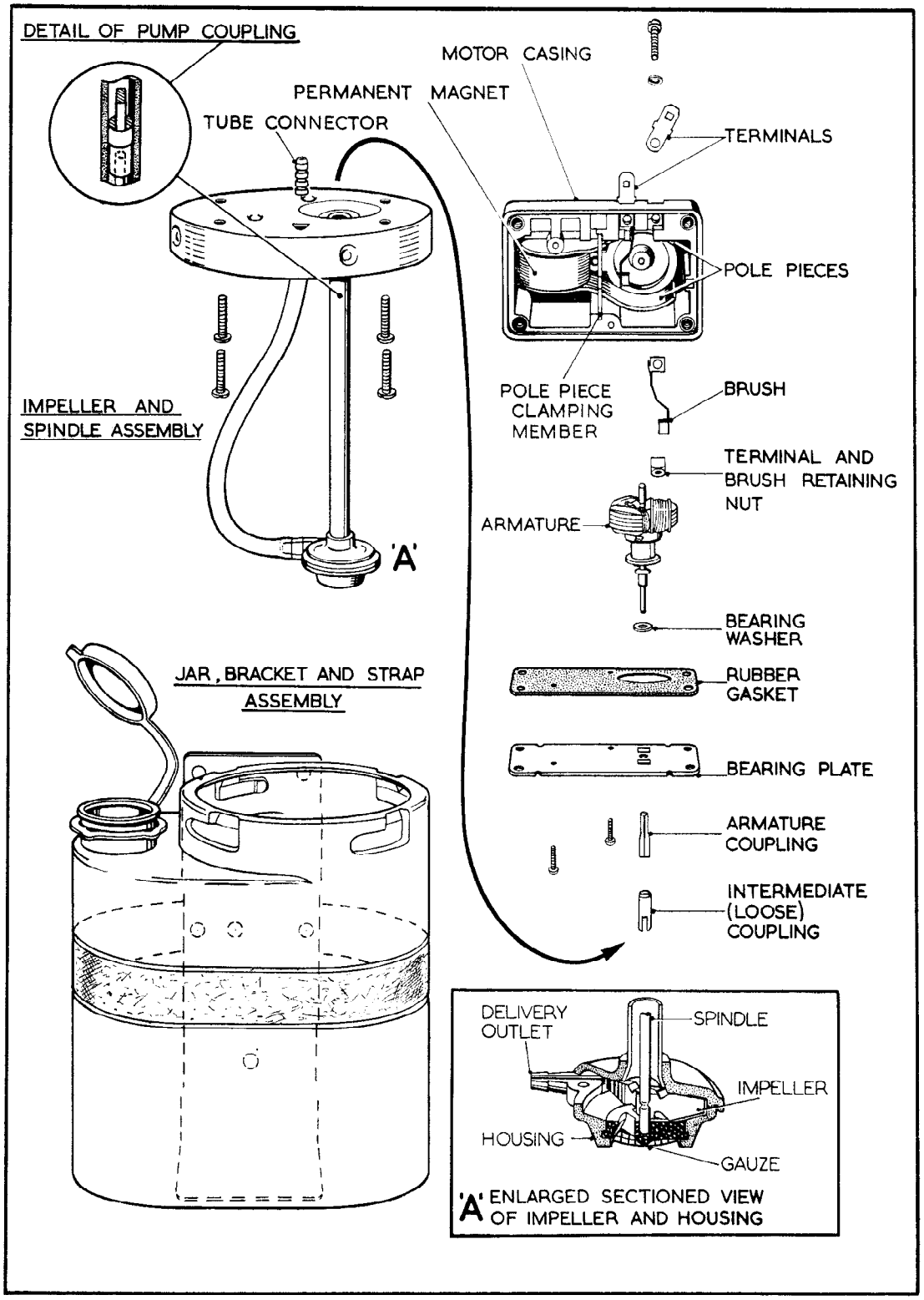
DETAIL OF PUMP COUPLING
MOTOR CASING
PERMANENT MAGNET
TUBE CONNECTOR
TERMINALS
POLE PIECES
POLE PIECE CLAMPING MEMBER
BRUSH
IMPELLER AND SPINDLE ASSEMBLY
'A'
TERMINAL AND BRUSH RETAINING NUT
ARMATURE
BEARING WASHER
JAR, BRACKET AND STRAP ASSEMBLY
RUBBER GASKET
BEARING PLATE
ARMATURE COUPLING
INTERMEDIATE (LOOSE) COUPLING
DELIVERY OUTLET
SPINDLE
IMPELLER
HOUSING
GAUZE
'A' ENLARGED SECTIONED VIEW OF IMPELLER AND HOUSING

Fig. 1.

(*b*) DISMANTLING

(*i*) Disconnect the external tube and electrical connections and remove the cover from the container.

(*ii*) Remove the four self-tapping screws from the underside of the cover and pull away the motor unit.

Take care not to lose the loose intermediate coupling which connects the armature coupling to the pump spindle coupling.

(*iii*) Remove the two self-tapping screws from the bearing plate.

The bearing plate and rubber gasket can now be removed.

(*iv*) Remove the two terminal screws.

The terminal nuts and brushes can be removed and the armature withdrawn.

Take care not to lose the bearing washer which fits loosely on to the armature shaft.

(*v*) The pole assembly should not normally be disturbed. If, however, its removal is necessary, make careful note of its position relative to the motor housing. The narrower pole piece is adjacent to the terminal locations.

Also, the position of the pole clamping member should be observed. When fitted correctly, it locates on both pole pieces but, if fitted incorrectly, pressure is applied to one pole piece only.

(*c*) BENCH TESTING

If the motor has been overheated, or if any part of the motor housing is damaged a replacement motor unit must be fitted.

(*i*) *Armature*

If the armature is damaged, or if the windings are loose or badly discoloured, a replacement armature must be fitted.

The commutator must be cleaned with a fluffless, petrol-moistened cloth or, if necessary, by polishing it with a strip of very fine glass paper.

The resistance of the armature winding should be checked with an ohm meter. The resistance between commutator segments should be in accordance with para. 3 (c).

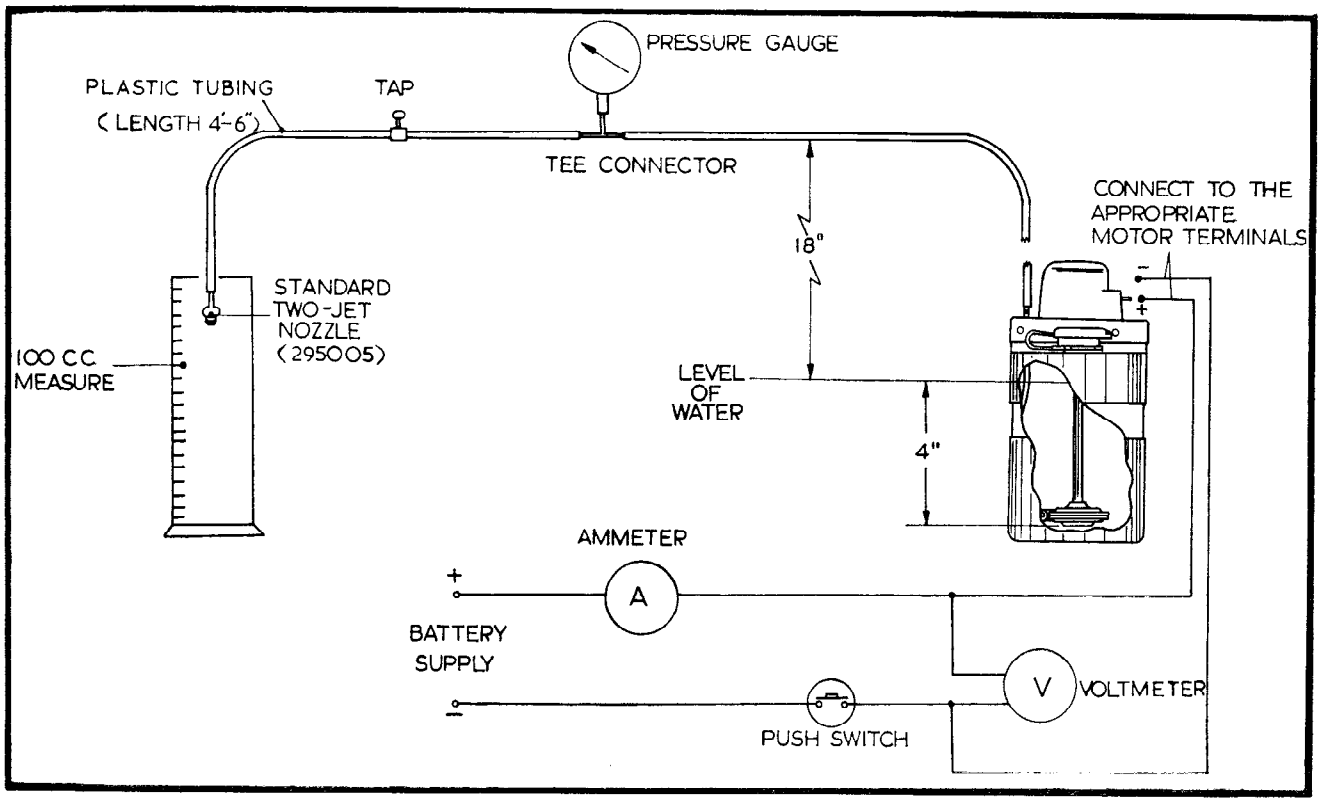

Fig. 2.

(*ii*) *Brushes*

If the carbon is less than $\frac{1}{16}$" (1.59 mm.) long, a new brush must be fitted.

Check that the brushes bear firmly against the commutator.

(*d*) REASSEMBLING

Reassembly of the unit is the reversal of the dismantling procedure. The following points should be observed :

(*i*) Make sure that the bearing recess in the motor housing is filled with Rocol Molypad molybdenised grease. Remove excessive grease from the face of the bearing boss.

(*ii*) Check that the pole piece assembly does not rock and that the pole pieces are firmly located on the circular spigot. Ensure that both the pole piece assembly and the clamping member are the right way round, see para. 4 (b) (v).

(*iii*) Before replacing the motor unit on the cover, ensure that the armature coupling is pushed fully home, i.e., until the crimp reaches the end of the shaft. Also check that the intermediate coupling is in place in the impeller spindle tube.

Note : The larger of the two slots in the intermediate coupling is towards the pump unit.

(e) PERFORMANCE TESTING

Equipment required :

D.C. supply of appropriate voltage

D.C. voltmeter, first grade, moving coil

0–3 amp. D.C. ammeter

0–15 lb. per sq. in. (0–1 Kg/sq. cm.) pressure gauge

Pushbutton with normally open contacts

Two-jet nozzle (295005)

On-off tap

100 c.c. capacity measure

4′ 6″ (1.37 m.) length of plastic tubing.

(*i*) Connect up the equipment as shown in Fig. 2. The water level in the container must be 4″ (101.6 mm.) above the base of the pump assembly. The pressure gauge and nozzle must be 18″ (457.2 mm.) above the water level.

(*ii*) Open the tap.

(*iii*) Depress the pushbutton for approximately 5 seconds and check the voltmeter reading, which should be the same as the supply voltage. On releasing the switch, immediately close the tap to ensure that the plastic tubing remains charged with water.

(*iv*) Empty the measuring cylinder.

(*v*) Open the tap and operate the push switch for precisely 10 seconds after which period release the switch and close the tap.

During the 10-second test the current and pressure values should be in accordance with paragraph 3 and at least 35 c.c. of water should have been delivered.