



Operating Manual

NOZZLE MULTICLEAN

**LESLIE HARTRIDGE LTD.
BUCKINGHAM - TORONTO - MADRAS**

Leslie Hartridge Ltd.

**operating
manual**

**NOZZLE
MULTICLEAN**

BUCKINGHAM, ENGLAND

Telephone: Buckingham 3661

Telex: 83309

LIST OF CONTENTS

	Page
SPARE PARTS LIST	4
GENERAL INSTRUCTIONS	6
Receiving Machine	6
Selecting the Site	6
Installing the Machine	6
Oil Container	8
OPERATING PROCEDURE	8
Nozzle Body Adaptors	8
Cleaning the Nozzle	8
Magnifying Glass Attachment	9
MAINTENANCE	9
Pump	9
Nozzle Clamping Fingers	9
Air Valve	11
Air-Oil Non-Return Valve	11
Operating Shaft Return Spring Assembly	11
To Remove Shaft and Spring Assembly	11
To Refit Shaft and Spring Assembly	11
Spring Assembly Spacer Bushes and Washers	12

SPARE PARTS LIST

Ref.	Description	Spares Order No.	Qty.	Ref.	Description	Spares Order No.	Qty.
<u>FIG. 1 MAIN GROUP</u>				56	Spring Support Bush	UNC 72B	2
1	Clamp Finger Swivel Collar	UNC 46	2	57	Spacing Washer	UNC 72C	2/4
1	Clamp Finger Swivel Screw			58	Short Screw 1/4" x 2BA	UNC 74A	1
	1/2" x 4BA	UNC 47	2	59	Spring Housing	UNC 73B	1
1	Clamp Finger Swivel Washer	UNC 48	2	<u>FIG. 2 AIR VALVE</u>			
2	Clamp Finger Spring	UNC 50	1	1	Air Valve Ball	UNC 40	1
3	Clamp Finger (R.H.)	UNC 45A	1	2	Air Valve Plunger	UNC 30	1
3	Clamp Finger (L.H.)	UNC 45B	1	3	Air Valve Top Seal	UNC 28	1
4	Oil Pump Cam Key	UNC 70/1	1	4	Air Valve Banjo Complete		
5	Oil Pump Cam Dowel	UNC 71	1		with pipes	UNC 34	1
3	Oil Pump Cam	UNC 70	1	5	Air Valve Bottom Seal	UNC 29	1
7	Clamp Finger Housing	UNC 45	1	6	Air Valve Body	UNC 26	1
8	Air Valve Operating Collar	UNC 67	1	7	Air Valve Ball 1/4"	UNC 31	1
9	Air Valve Operating Screw			8	Air Valve Ball Spring	UNC 32	1
	5/8" x 2BA	UNC 68	1	<u>FIG. 3 OIL PUMP</u>			
9A	Air Valve Operating Lock Screw			1	Oil Pump Con Rod	UNC 6A	1
	3/8" x 2BA	UNC 69	1	2	Oil Pump Con Rod Guide	UNC 5	1
13	Air Inlet Connector	UNC 39	1	3	Oil Pump Cylinder	UNC 4	1
14	Outlet Flange	UNC 84	1	4	Oil Pump Piston 'O' Ring	UNC 9	1
15	Cover Spring	UNC 81	1	5	Oil Pump Fixing Screw 1/2" x 2BA	UNC 12	2
15	Cover	UNC 1	1	6	Oil Pump Piston	UNC 8	1
17	Cover Spindle	UNC 80	1	7	Oil Pump Return Spring	FP 31A	1
18	Operating Shaft Collar	UNC 61	1	8	Oil Pump Gauze	UNC 10A	1
18	Operating Shaft Collar Screw			9	Oil Pump Valve Plate	UNC 11	1
	1/2" x 1/4" BSF	UNC 62	1	<u>FIG. 4 NON-RETURN VALVE</u>			
19	Operating Shaft	UNC 60	1	1	Non-Return Valve Body	UNC 17/20	1
20	Operating Shaft Bush	UNC 75	2	2	Non-Return Valve Spring	UNC 21	1
21	Oil Pump Retaining Nut	UNC 7	1	3	Non-Return Valve Plunger	UNC 18	2
22	Air Valve Retaining Nut	UNC 7	1	4	Non-Return Valve 'O' Ring	UNC 19	2
23	Clamp Guide Post	UNC 55B	1	<u>FIG. 5 MAGNIFYING ATTACHMENT (HK.505)</u>			
24	Clamp Finger Adjusting Screw			1	Magnifying Housing	UNC 88B	1
	1/2" x 2BA	UNC 12	1	2	Magnifying Lens	UNC 88A	1
25	Clamp Finger Adjusting Lock Nut			3	Insulating Block	UNC 88E	1
	2BA	UNC 52	1	4	Lamp Clip	UNC 88F	2
26	Copper Filter	UNC 86	1		Lamp Clip Screw	UNC 88N	2
27	Nut Holder Spigot Nut	UNC 87	1	5	Reflector	UNC 88G	1
26	Body (Top Half)	UNC 2	1		Reflector Rivet		2
29	Pipe (Pump to Filter)	UNC 24D	1	6	12V Lamp	UNC 88H	1
30	Flexible Pipe	UNC 24E	1	7	Lens Retaining Clip	UNC 88L	2
31	Filter Carrier	UNC 24/1	1		Lens Retaining Clip Screw	UNC 88Q	2
32	Filter	HP 37A	1		Lens Retaining Clip Nut	UNC 88R	2
33	Filter Knurled Screw	UNC 24C	1		Lens Retaining Clip Washer	UNC 88S	2
34	Oil Pump Pipe Complete	UNC 15/16	1	8	Wire	UNC 88K	1
35	Non-Return Valve Assembly	See Sep. List	-	9	Locking Screw	EFP 10	1
37	Air Pipe (Not supplied Separately)	-	-	10	Holder	UNC 88D	1
36	Body Locating Dowel	UNC 85	2	11	Insulating Block Screw	UNC 88M	1
39	Drain Plug Body Washer	UNC 83D	1	<u>NOT ILLUSTRATED</u>			
40	Drain Plug Body	TM 2/1	1		Transformer for Magnifying		
41	Drain Plug Washer	UNC 83B	1		Attachment	UNC 88J	1
42	Drain Plug	TM 2/3	1		Extractor Plastic Pipe for		
-	Drain Plug Complete	TM 2	1		Fig.2 (44)	UNC 42	1
43	Body Bottom Half	UNC 3	1		Extractor Plastic Pipe Nipple for		
44	Extractor Pipe (Not supplied Separately)	-	-		Fig.2 (44)	UNC 43	1
45	Oil Pump Assembly	See Sep. List	-		Fixing Screw (To Bench)	UNC 77	2
46	Operating Handle Rod	UNC 65	1		Fixing Screw Nut	UNC 78	2
47	Air Valve Complete	See Sep. List	-		Fixing Screw Washer	UNC 79	2
48	Air Valve Inlet Pipe C/W Nuts	UNC 36	1				
49	Operating Handle Screw						
	1/2" x 1/4" BSF	UNC 62	1				
50	Operating Handle Boss	UNC 63	1				
51	Operating Handle Knob	UNC 66	1				
52	Long Screw 7/8" x 2BA	UNC 74	1				
53	Clamp Spring Collar	UNC 73A	1				
54	Clamp Spring	UNC 72A	1				
55	Spring Location Bush	UNC 53	1				

Hartridge Nozzle Multiclean

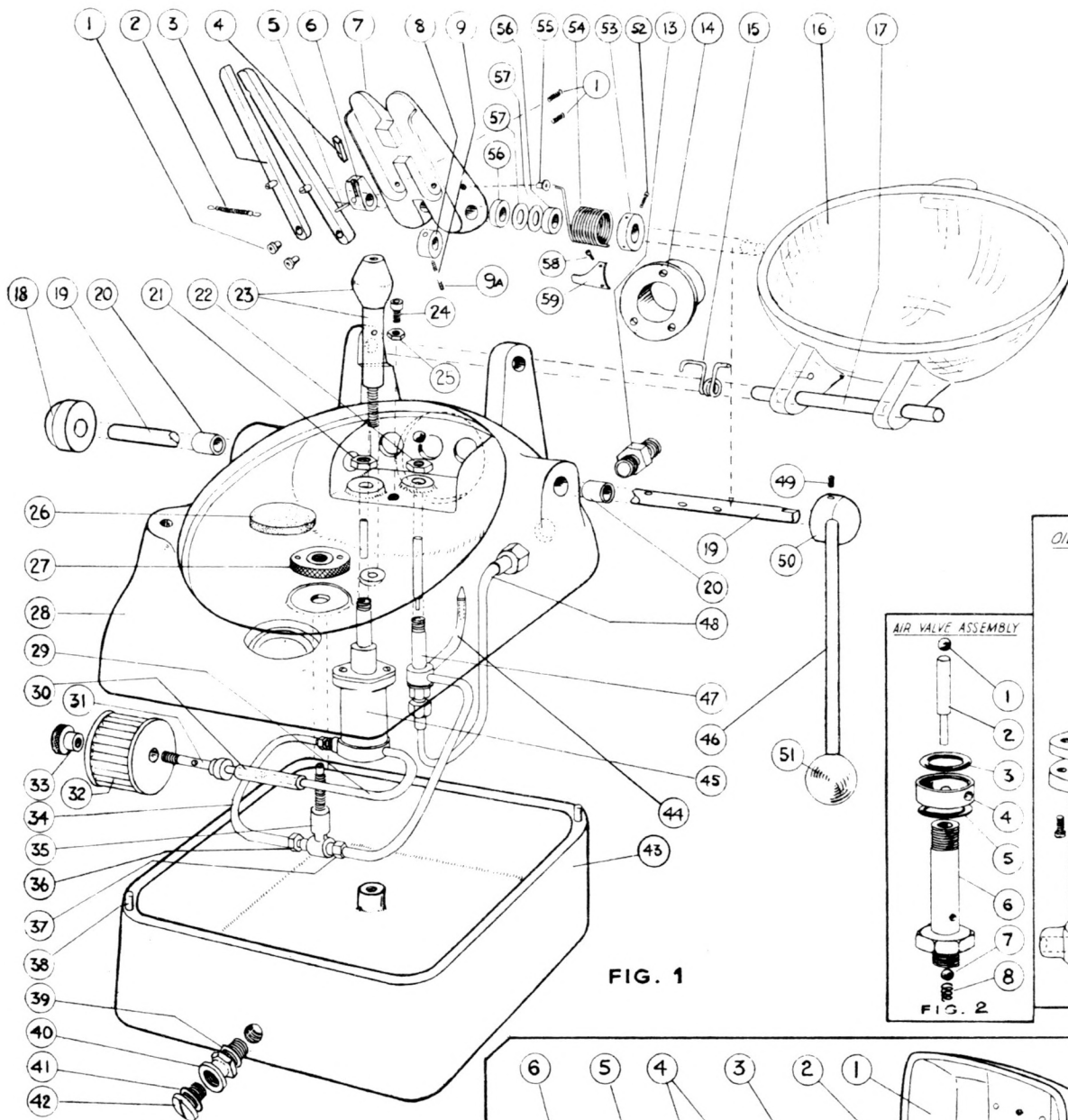
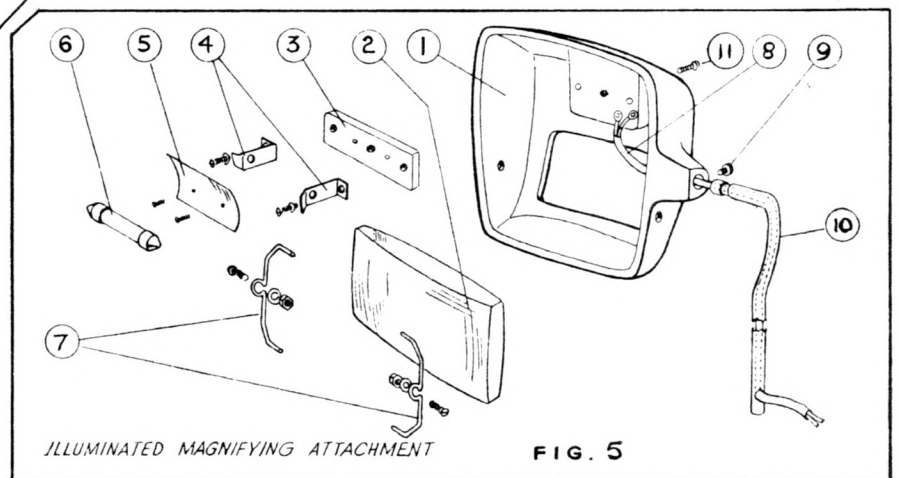
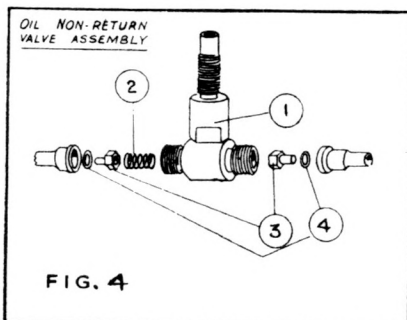
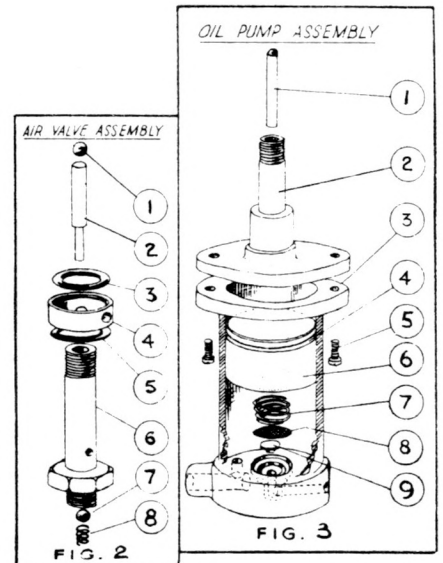


FIG. 1



GENERAL INSTRUCTIONS

The Hartridge Nozzle Multiclean has been developed to provide a machine capable of cleaning injector nozzle bodies quickly, efficiently and with proper protection to the operator.

It is a compact bench-mounted machine which automatically combines the process of oil and air cleaning into one simple operation. This double flushing action removes dirt, loose carbon and abrasives so efficiently that there is no reason for a nozzle failing in its test because of the retention of any foreign matter. Friction heating at the nozzle seat, dries it and guards against rust formation during storage.

RECEIVING THE MACHINE

Inspect the machine on receipt to ensure that no damage has occurred during transit. In the event of damage notify carrier and supplier within 3 days.

SELECTING THE SITE

The site selected for the machine should be clean and free from dust and dirt collection.

INSTALLING THE MACHINE

The Multiclean should be placed in a suitable position on a bench and, to allow sufficient clearance for draining, the front edge of the machine should be flush with the front edge of the bench.

A paper template is supplied to facilitate the 'marking-off' of the holes necessary to receive the securing studs.

The machine should be bolted to the bench with the two studs, nuts and washers supplied.

Suitable methods of connecting a vent pipe to the vent outlet at the rear of the machine are shown by the diagrams on the template sheet. If required, a rubber elbow and pipe clips can be supplied.

The small flexible tube which protrudes from the vent outlet must be inserted into the bore of the vent pipe. This tube is fitted with an air jet that induces a suction in the machine and extracts the fumes.

A compressed air line must be connected to the threaded connection at the rear of the machine.

If the normal pressure of the air line is in excess of approximately 80 p.s.i. (6 kg) an air regulator suitable for the air line pressure should be inserted in the air line, and the air pressure adjusted to 80 p.s.i. (6 kg). If water is present in the air line a suitable water filter should also be inserted.

Screw the control lever (removed for transit) into the hole in the control lever boss.

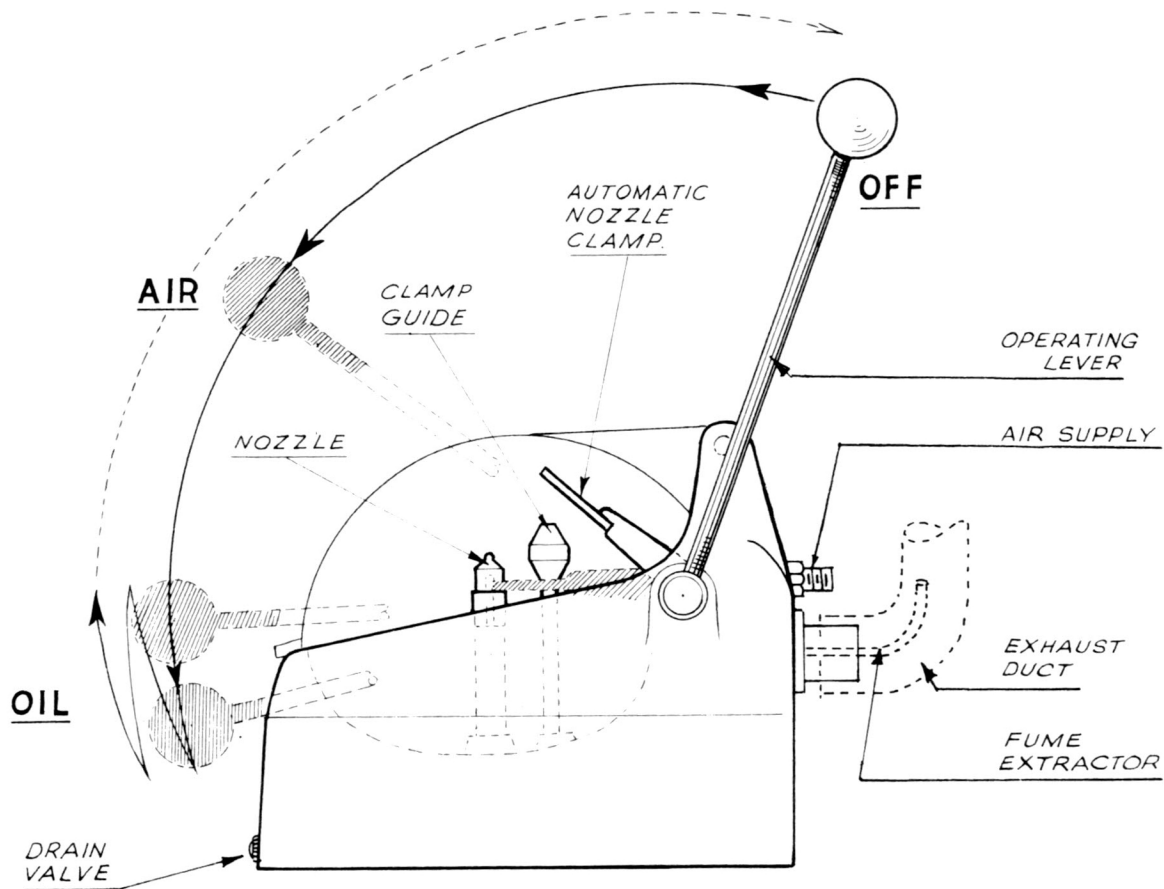
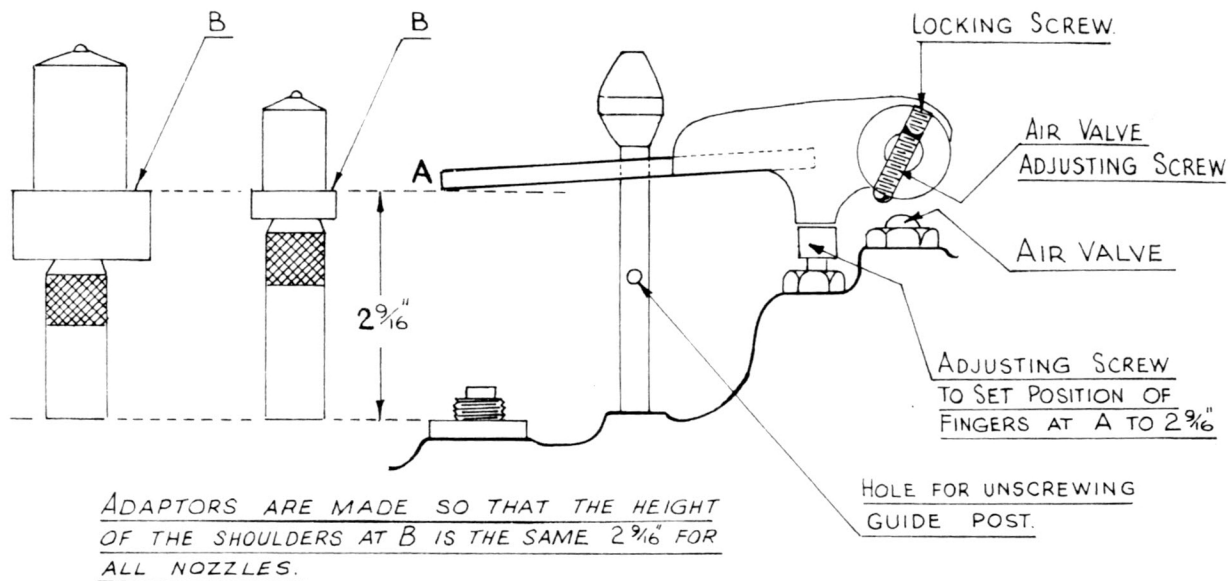


FIG. 6

OIL CONTAINER

Fill the container up to the bottom of the filter pad hole with cleaning fluid. Shell Fusus A, Mobil Certex 1102, B.P. Energol or alternatively paraffin (kerosene) to which some light lubricating oil has been added.

If the machine is in regular daily use, the oil container should be emptied and cleaned out once per week. The container is drained by removing the drain plug Fig. 1 (42) at the front of the machine.

Unscrew the guide post by inserting a suitable rod into the hole provided in the stem of the guide post Fig 6. Remove the guide post and lift off the top half of the cleaner. Thoroughly clean out the bottom half and refit the drain plug.

If in regular daily use, a new pump filter Fig. 1 (32) should be fitted every three months. To re-assemble the cleaner, locate the top half on the two dowel pins Fig. 1 (38) and replace the guide post Fig. 1 (23).

OPERATING PROCEDURE

NOZZLE BODY ADAPTORS

To enable nozzle bodies to be held in the correct position for cleaning, an adaptor is required to suit the type of body to be cleaned. For standard nozzle bodies these adaptors have an extended tube that discharges a jet of cleaning fluid or air directly across the body seat.

These adaptors are so made that the height of the body shoulder on which the clamping fingers rest is the same for all bodies, coinciding with the lowest position of the clamping fingers Fig. 1.

The machine is supplied with:-

	Part No.
One Nozzle Adaptor Carrier Plate	UNC 89/90
One Adaptor to suit standard 'R' and 'S' size short bodies, 5 mm bore, Gardner and Leyland	UNC 91
One Adaptor to suit standard 'S' and 'T' size short bodies, 6 mm bore	UNC 92
One Adaptor to suit standard 'S' size long stem bodies, 6 mm bore	UNC 93

Adaptors for other standard nozzles are available as follows:-

HK.511	Adaptor to suit 'U' size and Bendix bodies, 8 mm bore	UNC 94
HK.512	Adaptor to suit standard 'V' size bodies, 10 mm bore	UNC 95
HK.513	One Adaptor for Bendix bodies, 1/4" bore and One female Adaptor to suit Bendix nozzle tips	UNC 96 UNC 97
HK.517	Adaptor for long stem 'U' size nozzles	UNC 98
HK.518	Adaptor for Leyland 601 nozzles	UNC 99

For other types, please state nozzle details or forward a sample nozzle body.

CLEANING THE NOZZLE

Ensure that the operating lever is in the 'OFF' position Fig. 6.

Open the transparent cover.

Screw the appropriate adaptor on to the nozzle holder spigot. Place the nozzle in position and close the transparent cover.

If it is only required to clean the nozzle with air, depress the lever to the air position only Fig. 6. Hold the lever in this position for about three seconds, then return the lever to the "OFF" position. Open cover and remove the nozzle.

If it is required to clean the nozzle with oil and air, depress the lever to the lowest position and operate the pump with a few pumping strokes Fig. 6. Return the lever to the air position and hold lever at this position for about five seconds to clear all cleaning fluid from the nozzle and to allow the fumes under the cover to be extracted. This time period also allows friction drying of the nozzle seat.

THE LEVER MUST ALWAYS BE RETURNED TO THE "OFF" POSITION BY HAND. DO NOT ALLOW THE LEVER TO SPRING BACK.

MAGNIFYING GLASS ATTACHMENT (Cat. No. HK.505. Not supplied with machine)

This attachment Fig. 5 is intended to facilitate 'pricking-out' of nozzle spray holes. It is supplied complete with a 12 volt transformer which must suit the voltage of the supply mains. The transformer should be attached to the wall away from the cleaner. The two top outer terminals connected to a mains switch-socket and the top centre terminal to "earth". Two spare fuses will be found under the lower cover.

The lamp in the magnifying glass frame is a Tubular Festoon Car Lamp which must be 12 volt but not exceeding 6 watts consumption.

When not in use, the magnifying glass should be swivelled out of the way, to the left of the machine.

When required, open the transparent cover, swing the magnifying glass into position. To obtain the best view of the nozzle tips rotate the magnifying glass frame Fig. 5 (1) on the support tube Fig. 6 (10).

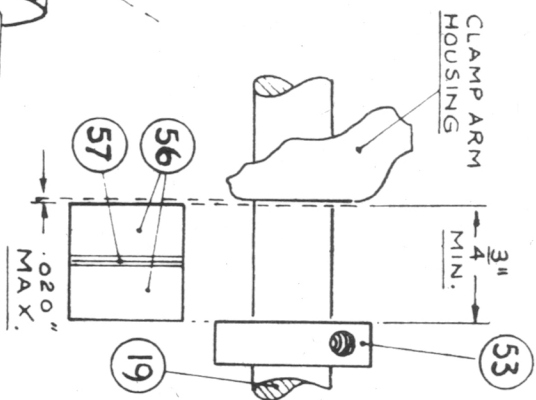
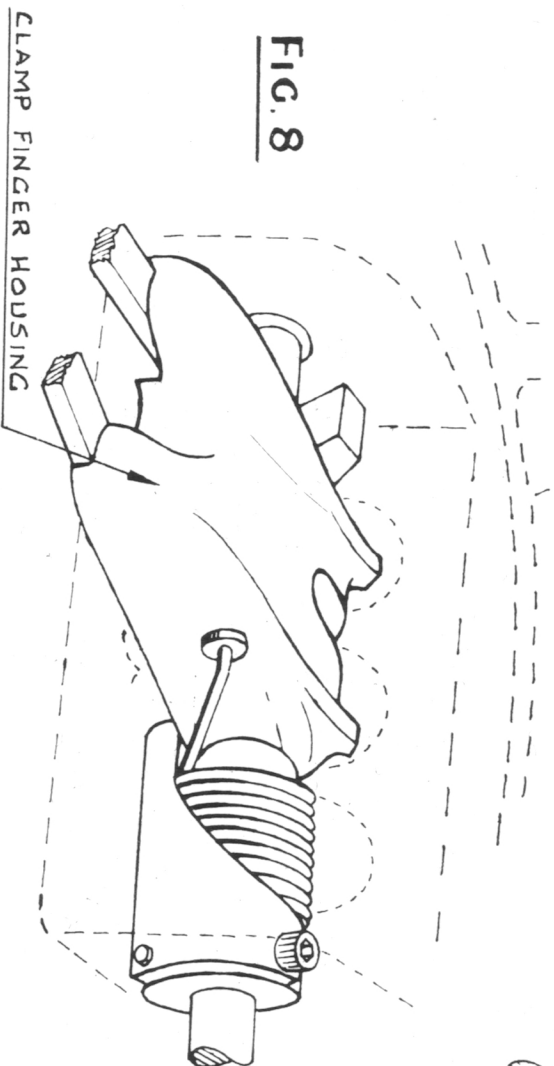
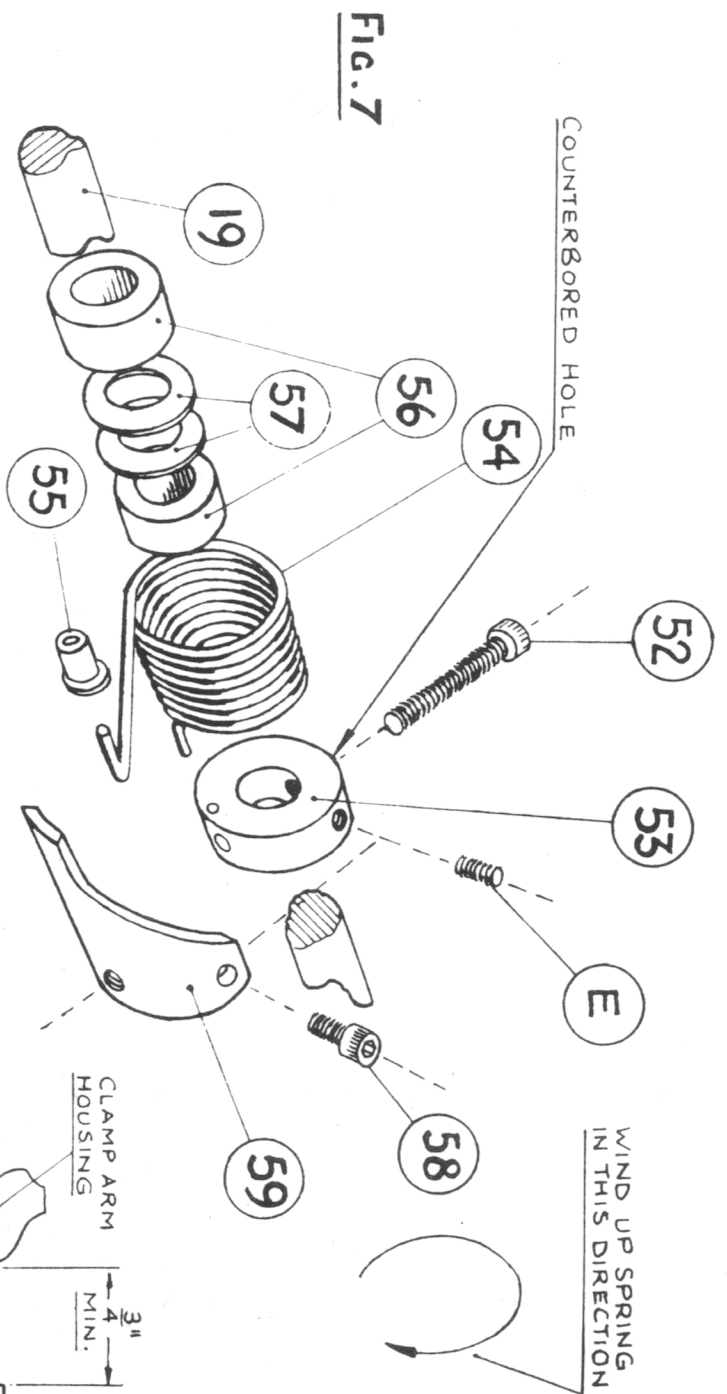
MAINTENANCE

PUMP

If the pump Fig. 1 (45) fails to operate when the lever is operated at the bottom of its stroke Fig. 6, this indicates that a new pump piston 'O' ring may be required or that the valve Fig. 3 (9) is leaking. Remove the top half of the cleaner, unscrew the two pump fixing screws Fig. 3 (5), extract the pump piston Fig. 3 (6), spring Fig. 3 (7), spring washer Fig. 3 (8) and valve Fig. 3 (9), clean and inspect the valve seat, if necessary renew the piston 'O' ring Fig. 3 (4), re-assemble pump and cleaner.

NOZZLE CLAMPING FINGERS

The downwards movement of the nozzle clamping fingers Fig. 1 (3) is limited by the position of the stop screw Fig. 1 (24). If this screw requires adjustment, loosen lock nut Fig. 1 (25) and adjust the stop screw so that the distance from the bottom face of the clamping fingers to the top face of the screwed spigot flange is $2\frac{1}{16}$ " , re-tighten lock-nut Fig. 1 (25). See also Fig. 6.



AIR VALVE

If the air valve Fig. 1 (47) fails to operate when the operating lever is depressed to the air position Fig. 6, this indicates that the air valve operating screw requires adjustment. This screw is locked in position by a locking screw Fig. 1 (9a). To re-adjust, remove locking screw Fig. 1 (9a), adjust the operating screw Fig. 1 (9), replace and re-lock locking screw Fig. 1 (9a). Care must be taken when adjusting the operating screw Fig. 1 (9) to ensure that the air valve is *closed* before the pump cam Fig. 1 (6) depresses the pump plunger. See also Fig. 6.

AIR-OIL NON-RETURN VALVE

If, when depressing the operating lever to the "air only" position Fig. 6, oil continues to be blown from the nozzle, this indicates that oil is entering the air pipe and that the air-oil valve 'O' rings Fig. 4 (4) require renewal. Remove the top half of the cleaner, unscrew the two pipe nuts Fig. 1 (36 and 37). Push out the small pistons Fig. 4 (3). Renew the two 'O' rings Fig. 4 (4), and re-assemble.

OPERATING SHAFT RETURN SPRING ASSEMBLY

Should it be necessary to replace the shaft return spring Fig. 7 (54) adopt the following procedure.

TO REMOVE SHAFT AND SPRING ASSEMBLY

Slacken grub screw in operating lever Fig. 1 (9) and remove operating lever Fig. 1 (50).

Remove pin Fig. 1 (5) from oil pump cam. Remove short screw Fig. 7 (58) and replace by a 2BA x 1/4" grub screw Fig. 7 (E). Tighten grub screw to prevent spring and collar unwinding dangerously.

Remove long screw Fig. 7 (52) and take off spring housing Fig. 7 (59). Release grub screw Fig. 7 (E) gradually and allow spring to unwind slowly. Slacken grub screw completely.

Withdraw shaft Fig. 1 (19) sufficiently to permit removal of spring collar and spring.

TO REFIT SHAFT AND SPRING ASSEMBLY

Ensure that spacer bushes Fig. 7 (56) and washers Fig. 7 (57) are in position on the shaft Fig. 1 (19).

Fit spring Fig. 7 (54) and spring collar Fig. 7 (53) to shaft and engage short end into spring collar ensuring that threaded hole in the spring collar is in front of counterbored hole (See Fig. 7).

Engage long end of spring into bush in clamp arm housing (see Fig. 8).

Insert long screw Fig. 7 (52) through hole in spring collar and through shaft to see that holes are in line. Tighten grub screw Fig. 7 (E) hard and withdraw long screw.

Refit operating handle Fig. 1 (50) and tighten operating handle grub screw Fig. 1 (49).

Wind up spring by turning operating handle one complete turn in an anti-clockwise direction and immediately re-insert long screw Fig. 7 (52).

Remove and discard grub screw Fig. 7 (E).

Insert short screw Fig. 7 (58) through spring housing Fig. 7 (59) and screw into spring collar in place of grub screw (E). Do not tighten at this stage.

Engage long screw into spring housing and tighten both screws.

Refit pin Fig. 1 (5) into oil pump cam Fig. 1 (6).

Adjust air valve if necessary in accordance with "Maintenance" instructions headed "AIR VALVE".

SPRING ASSEMBLY SPACER BUSHES AND WASHERS

If it is ever necessary to replace these bushes, dismantle spring assembly as above.

Refit spring collar Fig. 7 (53) and re-insert long screw Fig. 7 (52).

Measure the gap between spring collar face and clamp arm housing (see Fig. 9), and select bushes and sufficient washers to fill the gap leaving a maximum clearance of 0,020" but still permitting the bushes to rotate freely.

Remove spring collar and re-assemble spring assembly as above.

**DO NOT FORGET THAT A COMPLETE RANGE
OF MODERN FUEL INJECTION TEST AND
SERVICE EQUIPMENT IS ALSO PRODUCED BY
HARTRIDGE. FULL PARTICULARS ARE AVAILABLE
FROM OUR BUCKINGHAM SALES OFFICE**



List No.	HK 500-O
Edition	4-72