

S H A W

HYDRASTUMPER 50

**TRACTOR-MOUNTED
TREE EXTRACTOR**

ASSEMBLY & OPERATING INSTRUCTIONS

SPARE PARTS LIST

ON-THE-FARM ASSEMBLY

On-the-farm assembly is greatly simplified if the following procedure is adopted.

1. Fit the main frame onto the 3-point linkage of a tractor. Fit the feet and stays to the frame.
2. Lay the complete subframe face down behind the tractor with the lower end nearest the main frame. Take the lower arm, which is colour-coded BLUE and relate the blue spot to the spot on the subframe. Fit the pivot pins with washers between frame and arm.
3. With the subframe still face down connect the lower arm to the main frame, using a spreader if necessary.
4. Fit the upper arm to the main frame, relating the GREEN spot to the spot on the frame. This arm may then be lifted up and back towards the tractor, out of the way of the assemblers.
5. Stand the subframe up and connect the top arm.

HYDRAULIC CONNECTIONS

Lifting Rams

The control valve bracket should be fitted to the main frame and clamped in a position near the top of the quadrant. Fit the adhesive control label to the plate so that it reads from the tractor; this will show which lever controls the main lifting rams.

The lower hose from the appropriate section of the control valve (left section viewed from the rear) should be connected to the rear distribution block on the main frame, which in turn is connected to the top of the lifting rams. The block and the ram are colour-coded with a

WHITE spot. The other connections on the valve and rams are then connected in the same way.

Jaw Rams

The right-hand section of the control valve actuates the tree-gripping rams. The lower connection on the valve should be connected to the lower manifold, which in turn is connected to the inside connections on the gripping rams. The outside connections on the gripping rams are then connected in the same way.

Main Lifting Rams

Should be fitted with connectors and grease nipples nearest the tractor. The middle position to be used for single ram lifting and both outside positions for twin ram lifting. The extra power ram is added in the middle position when required.

HYDRASTUMPER To Tractor Hydraulic Connections

The side fitting on the control valve containing the relief valve (marked with the "blow off" pressure) is the inlet cover. This should be connected to the Tipping Trailer Hydraulic connector, direct to the lift arm isolator valve or to the auxiliary pump. (Dependent upon the type of tractor and equipment fitted.)

The opposite side fitting (the outlet cover) is connected via the return hose to a return connector (if fitted) or to the oil filler plug which may be drilled (19/32nds) and tapped 3/8" BSP to receive a banjo fitting or 3/8" BSP connector.

When the hydraulics are connected for the first time a careful check must be made to ensure that the pairs of ram cylinders (where applicable) are working in parallel, and that the movement of the rams agrees with the information on the control valve label.

The machine should be fitted to the tractor lift arms and top link in the position which brings the machine closest to the tractor without fouling

the tractor tyres or mudguard fittings. If a cab is fitted, check the clearance of the control valve bracket in the machine raised position.

The hydraulic oil level of the operating tractor should be "topped up" after the initial fitting. **THIS IS IMPORTANT.**

OPERATING THE HYDRASTUMPER

The machine should be raised on the lift arms and the feet lowered to the horizontal position and the stays refitted.

Reverse the machine up to the tree to be extracted, so that the jaws are located either side of the tree. The machine should then be lowered to the ground. The jaws may then be closed on the tree and the lift cylinders engaged.

Care should be taken to ensure that both feet engage the ground equally. On sloping ground the machine will work most satisfactorily by being reversed directly up the slope to engage the tree.

When the lift arms are fully extended, the tractor lift arms can usually be raised. The initial tractor movement should be rearwards except when extracting small trees.

If the front wheels of the tractor leave the ground when the lift cylinders are engaged, extend the top link to ensure that the rear of the feet are on the ground.

If the front wheels continue to rise when lifting additional front-end weight should be added. Extended front weight frames may be used to improve the cantilever effect without increasing the amount of weight carried.

The extra power lifting kit (for the HS 50) is only suitable for use on tractors of 70 B.H.P. or more, when fitted with a substantial amount of front-end weight.

The front wheels **MUST** be kept on the ground when **EXTRACTING** with this power.

Extension feet should be fitted when operating in soft ground.

INSTALLATION AND OPERATION OF CONTROL VALVE

The Control Valve has been designed to operate with the minimum of maintenance, and field servicing is normally confined to the replacement of oil seals, cleaning of ancillary valves, or the replacement of pre-set assemblies.

The most common cause of premature wear and malfunctioning of hydraulic system components is the ingress of contaminant, so the following points should always be observed:

1. Change or clean system filters as recommended by the manufacturer.
2. Use a clean container and clean oil when topping up or changing oil.
3. Observe a high standard of cleanliness when servicing parts.

A good quality mineral-base oil must be used, preferably containing additives to resist corrosion, foaming and oxidation.

SERVICING

1. Sections

The Control Valve has been designed in sections to facilitate the economical replacement of a damaged section and three studs are used to secure the sections between their end covers.

Figure (2) shows a typical assembly, exploded for clarity to show the intersection 'O' ring seals.

In the event of the replacement of a section or intersection seals 4 & 5 becoming necessary, stand the valve upright on a clean surface with the inlet cover uppermost.

This will ensure that all 'O' ring grooves are on the uppermost surface of each section and will facilitate re-assembly. Remove the three Nuts 1. and Washers 2. from the Assembly Studs 3. and remove section by section, marking each section for identification to ensure correct positioning when re-assembling.

On re-assembly ensure that all faces are clean and the 'O' rings are correctly positioned in their grooves. Ensure that the plug located in each section between the service ports is not disturbed as one stud passes through each of these plugs. Replace the 3 nuts and washers finger tight and then reposition the valve assembly horizontally on a flat surface to ensure correct alignment of the mounting feet before finally tightening evenly to a torque of 15 lb/ft. Over-tightening will cause distortion and prevent easy movement of the finely matched spools within their bores.

2. Spools

Spools are individually matched to their bodies and not interchangeable. Servicing is therefore restricted to the replacement of worn seals if external leakage is evident, and this can be carried out in-situ if the installation permits access to each end of the spool. The seals are 'O' rings housed in grooves within the bore and these will be damaged by the spool unless the following sequence of instructions is followed. Figure (3) shows a typical double acting spool arrangement.

- a) Remove the spring housing which is secured by 2 screws and reveal the spring centring assembly.
- b) Unscrew the spring retaining screw from the spool.

- c) Remove the handle and then the handle bracket which is secured by 2 screws. Remove the wiper seal 1. Take care not to move the spool from its central or neutral position.
- d) Gently rotate and move the spool towards the handle end until the spring end 'O' ring 2 is uncovered within the body. Remove the 'O' ring. Do not replace.
- e) Gently rotate and move the spool away from the handle end to expose the 'O' ring 2 within the other end of the body. Remove and renew this 'O' ring.
- f) Gently rotate and move the spool towards the handle until the first 'O' ring groove is exposed. Fit a new 'O' ring 2 and move the spool to the central position.
- g) Clean and examine the wiper seal 1 and renew if damaged before replacing the handle bracket and handle. Take care not to move the spool from its central position.
- h) Replace the spring assembly, remove all traces of oil from the retaining screw threads and smear with 'Loctite Screw Lock' replace the screw. Replace the spring housing.
- i) Check for full and free spool movement.

3. **Main Relief Valve**

The main relief valve, which is housed in the inlet cover, is of the differential area poppet type and is pre-set by means of shims. The setting should not be altered as over-stressing of other mechanical and hydraulic components can result. Figure (4) shows the assembly.

Servicing is restricted to stripping and cleaning, replacement of external seals, or replacement of the complete assembly. Fitting of new springs should not be attempted. Malfunctioning, which will be apparent by loss of power, can result from internal leakage across the valve seat, or fatigue of the spring after a long period of use.

To examine the valve seat, first remove the spring cap which is the smaller of the two hexagon fittings, securely holding the larger hexagon with a good fitting spanner to prevent removal of the valve body. Take out the poppet valve and examine it and the seat within the valve body. Remove any foreign matter which has been trapped on the seat. The complete valve assembly must be renewed if this poppet valve seat is damaged.

Re-assemble with a torque loading 10-15 lb/ft.

PARTS LIST

HYDRASTUMPER 50 TREE EXTRACTOR

<u>FIG. 1 REF</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>PART N^o</u>
1	Main Frame		785001
2	Sub Frame		785002
3	Top Arm		785003
4	Lower Arm		785004
5	Ram Mounting Bracket L.H.		785005
6	Ram Mounting Bracket R.H.		785006
7	Jaw Pivot Shaft	2 off	785007
8	Jaw (open pattern)	2 off	785008
9	Jaw Ram	2 off	780009
10	Foot L.H.		780010
11	Foot R.H.		780011
12	Foot Brace	2 off	780012
13	Manifold	2 off	785013
14	Lifting Ram	2 off	780014
15	Arm Pivot Pin & Bolt	8 off	780015
16	Leg Pivot Pin & Bolt	4 off	780016
17	Ram cylinder Pivot Pin & Bolt		785017
18	Ram Rod Pivot Pin & Bolt		785018
19	Gripping Ram Pivot Pin & Bolt	2 off	785019
20	Control Box		780020
21	Hose 60" (supply from tractor or pump)		780021
22	Hose 64" (control to manifold)	2 off	785022
23	Jaw Ram Rod Pivot Pin & Lynch Pin	2 off	785023
24	Foot Brace Pin & Lynch Pin	4 off	780024
25	Arm and Foot Spacer Washer	12 off	780025
26	Hose Clamp & Set Pin	2 off	780026
27	Hose 30" (dist. block to lifting ram)	4 off	785027
28	Hose 27" (control to dist. block)	2 off	785028

29	Control Valve Bracket		780029
30	Bolt & Nut (ram bracket to subframe)	4 off	780030
31	Bolt & Nut (brace to ram bracket)	2 off	785031
32	Set Pin (brace to subframe)	4 off	785032
33	Brace	2 off	785033
34	Hose 60" (return to tractor)		780021
34	Hose 30" (return to tank)		785034
35	Leg	2 off	780035
	Tractor Lift Arm Pin & Lynch Pin	2 off	780036
	Arm Pivot Bushes pre-lubricated (fits in parts 785003 & 785004)	8 off	780037
	Jaw Pivot Bush (fits in part 785008)	4 off	780038
	Hydraulic Manifold Clamp	2 off	785039
	Hydraulic Manifold Clamp Bolt	2 off	785040
	Control Valve Bracket Bolt, Nut & Washer	2 off	780041
	Hose 18" (jaw ram to manifold)	4 off	785042
	Hexagon Adaptor 3/8" to 3/8" BSP		780043
	Blanking Plug 3/8" BSP	2 off	785044
	Seating Washer (copper) 3/8" BSP		780045
	Banjo & Bolt Assembly (with washers) 3/8" BSP		780046
	Distributor Block 3/8" BSP (welded to frame)	2 off	785047
	Threaded Connector 3/8" BSP (welded to manifold)	3 off	785048
	Root Claw (short)	2 off	785049
	Root Claw (long)	2 off	785050
	Hydraulic Tank (for power pack)		785051
	Filter Unit (tank top type)		785052
	P.T.O. Gear Box & Pump Unit (state make and serial numbers)		785060
	Return Hose (1 1/4" bore flexible)		785061
	Return Hose Clips	2 off	785062
	Jaw Pivot Shaft Bolt & Nut	4 off	780063
	Extension Feet Kit	2 off	785064

FIG 2. COMPLETE CONTROL VALVE

<u>REF</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>PART N°</u>
1	Nut 3/8" UNF	6 off	000512
2	Spring Washer	6 off	000275
3	Stud	3 off	000092
4	'O' Ring	9 off	000071
5	'O' Ring	3 off	000072
6	Outlet Cover	1 off	000006
7	Inlet Cover	1 off	000009
8	Section	2 off	720059

FIG 3. EACH SECTION

<u>REF</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>PART N°</u>
1	Wiper Seal	1 off	000231
2	'O' Ring	2 off	4600/2
3	Retaining Screw	1 off	000040
4	Spring	1 off	000038
5	Spring Housing	1 off	000005
6	Handle	1 off	000819
7	Handle Bracket	1 off	000004
8	Link	1 off	000013
9	Pin	1 off	000045

FIG 4. RELIEF VALVE - EACH VALVE

<u>REF</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>PART N°</u>
1	'O' Ring	1 off	000427
2	'O' Ring	1 off	000086
3	'O' Ring	1 off	000397
5	Spring	1 off	000764

6	Shim. .003"		000059
7	Shim. .020"		000122
8	Seal	1 off	000057
9	Relief Valve (complete)	1 off	000079

FIG 5. RAM ASSEMBLIES - EACH HYDRAULIC CYLINDER

<u>REF</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>PART N°</u>
1	Jaw Ram Cylinder	1 off	780009-01
2	Jaw Ram Rod	1 off	780009-02
3	Jaw Ram Head Bush	1 off	780009-03
4	Jaw Ram Rod Cap	1 off	780009-04
5	Jaw Ram Grease Nipples	2 off	780009-05
6	Jaw Ram Wiper Seal	1 off	780009-06
7	Jaw Ram Head Bush Seal	1 off	780009-07
8	Jaw Ram Head Bush 'O' Ring	1 off	780009-08
9	Jaw Ram Piston Seal	1 off	780009-09
10	Jaw Ram Bushes	3 off	780009-10
11	Jaw Ram Rod Nut	1 off	780009-11
12	Jaw Ram Piston Cap	1 off	780009-12
13	Jaw Ram Piston	1 off	780009-13
14	Jaw Ram Piston 'O' Ring	1 off	780009-14
	Lift Ram Cylinder	1 off	780014-01
	Lift Ram Rod	1 off	780014-02
	Lift Ram Head Bush	1 off	780014-03
	Lift Ram Rod Cap	1 off	780014-04
	Lift Ram Grease Nipples	1 off	780014-05
	Lift Ram Wiper Seals	1 off	780014-06
	Lift Ram Head Bush Seal	1 off	780014-07
	Lift Ram Head Bush 'O' Ring	1 off	780014-08
	Lift Ram Piston Seal	1 off	780014-09
	Lift Ram Bushes	3 off	780014-10
	Lift Ram Rod Nut	1 off	780014-11
	Lift Ram Piston Cap	1 off	780014-12
	Lift Ram Piston	1 off	780014-13

Lift Ram Piston 'O' Ring	1 off	780014-14
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N.B. The component number (Example: 01) is also the FIG.5 reference number. The full number (Example: 780014-01) must be quoted on a spares order.

Control Valve Mounting Bolts	3 off	720053
Hose Adaptors 3/4" - 3/8" BSP	2 off	720054
Hose Adaptor Washers 3/4" Bonded	2 off	720055
Hose Adaptors 1/2" - 3/8" BSP	2 off	720056
Extended		
Hose Adaptors 1/2" - 3/8" BSP	2 off	720057
Standard		
Hose Adaptor Washers 1/2" Bonded	4 off	720058

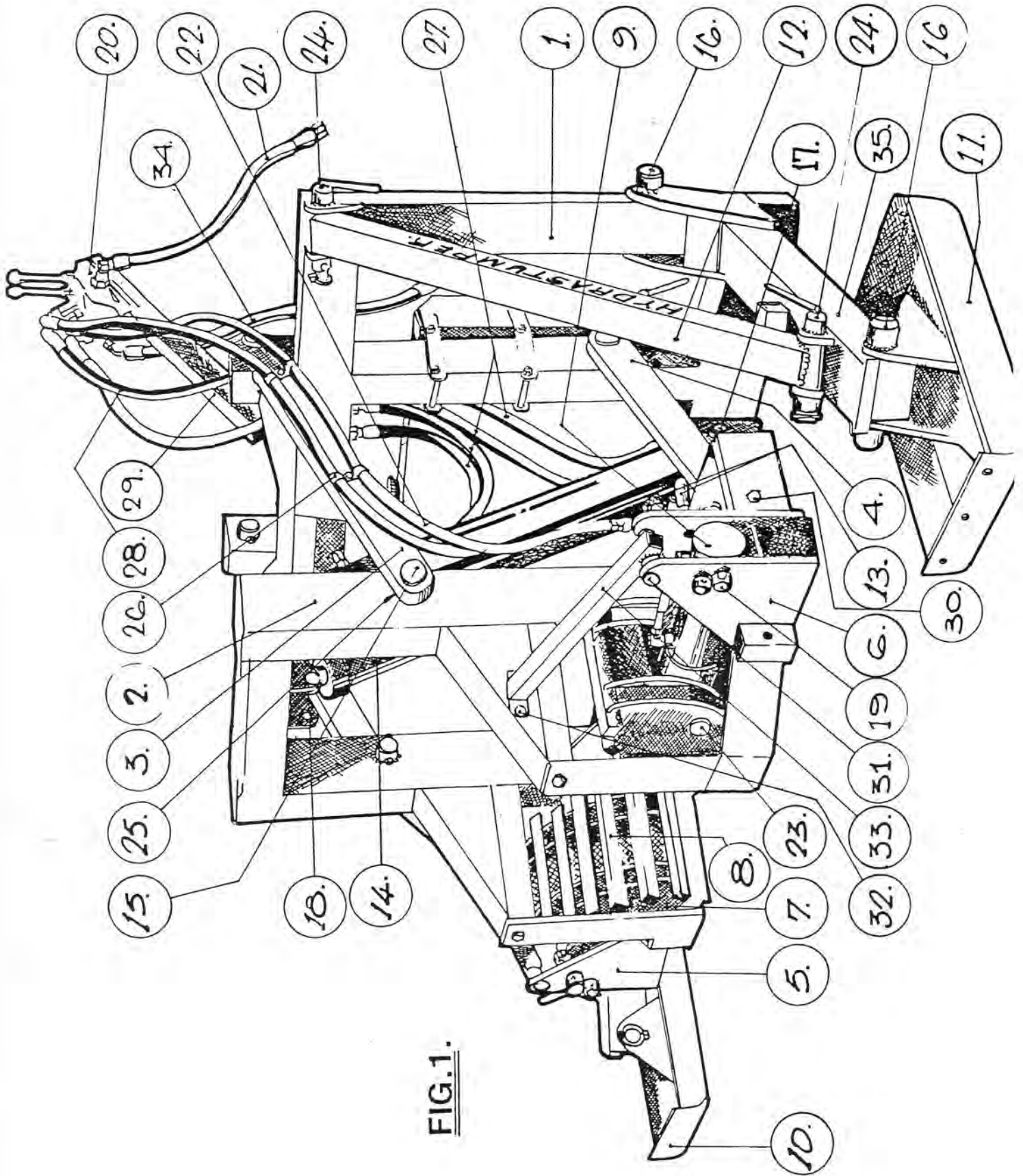


FIG.1.

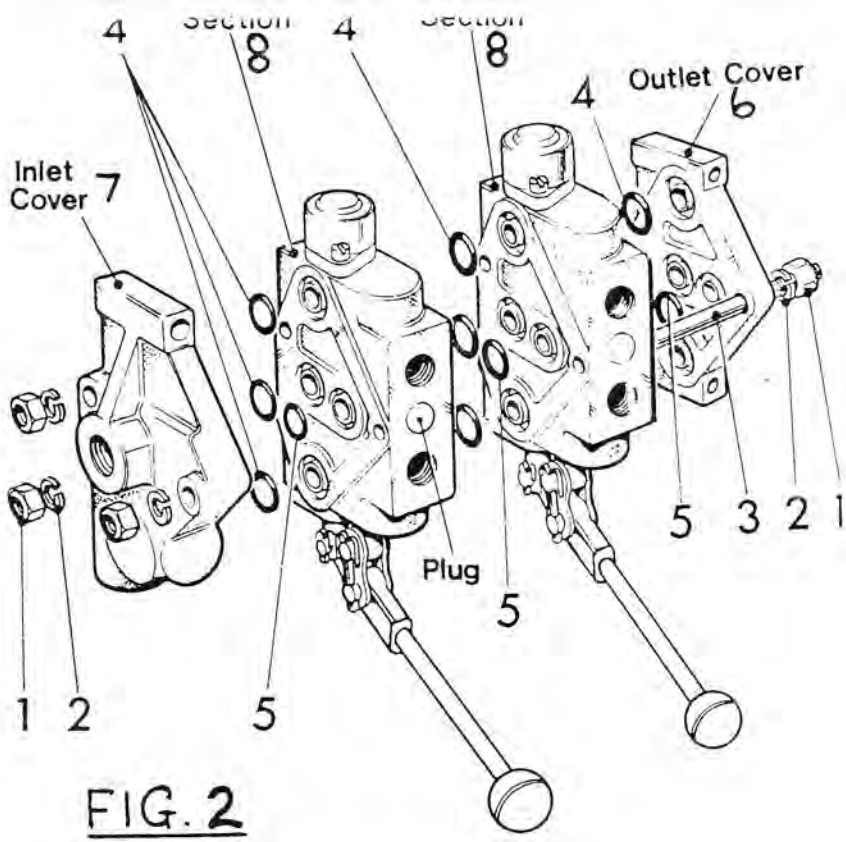


FIG. 2

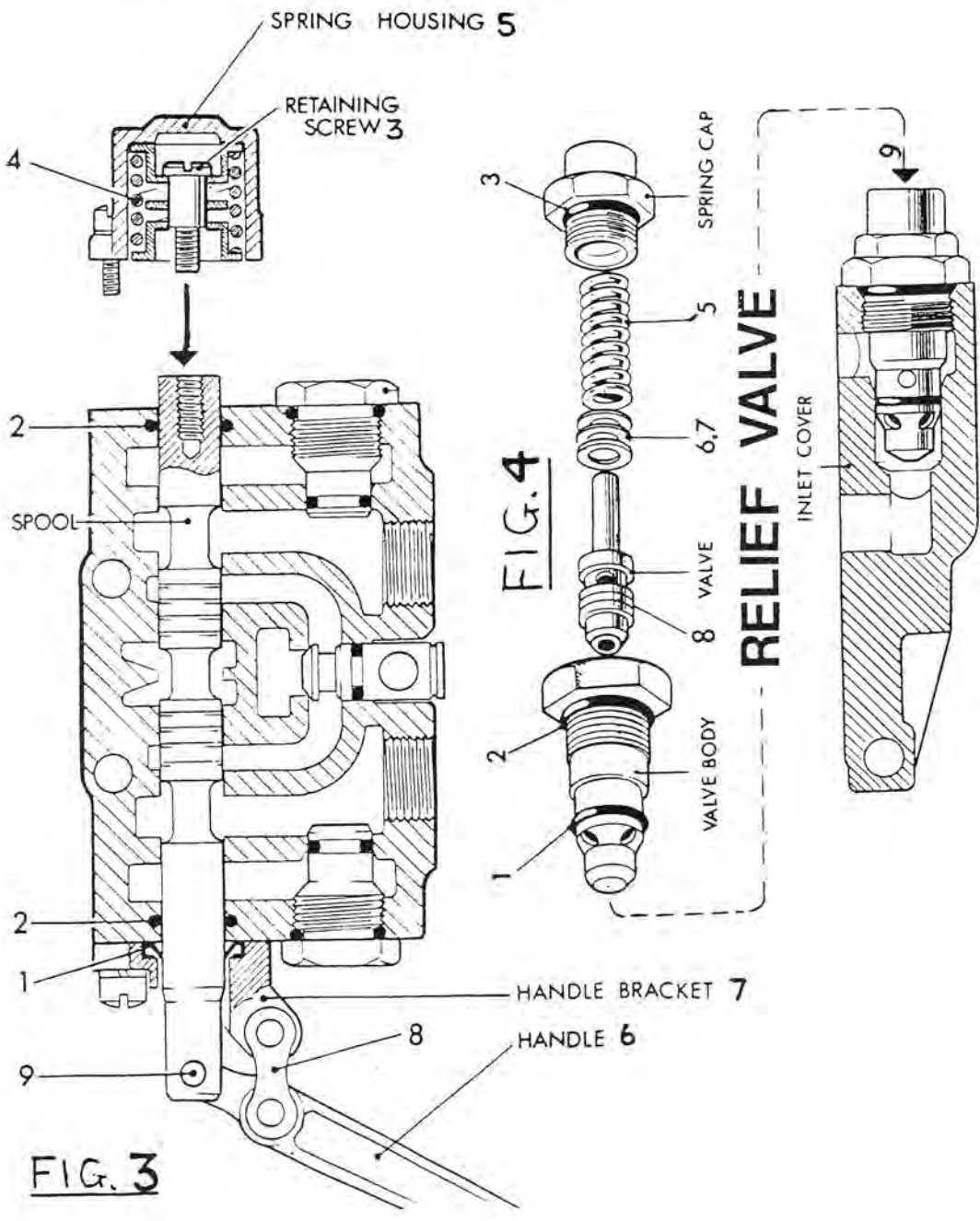


FIG. 3

This is a composite drawing and the port positions, as drawn, are not accurate for all assemblies.

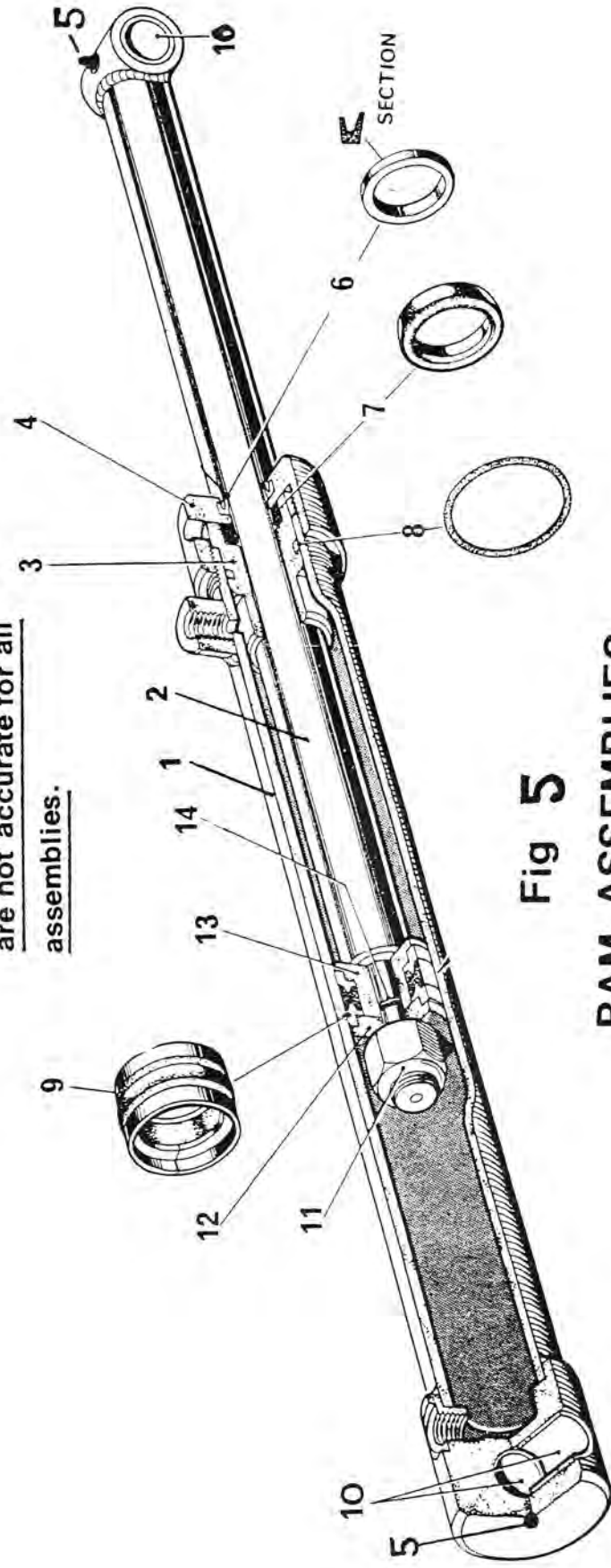


Fig 5
RAM ASSEMBLIES