



# **MODEL GB7**

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## **GROUT PUMP**

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**OPERATION & MAINTENANCE MANUAL  
YEAR 2000**



## **Whyte-Hall (Australia) Pty Limited**

Unit 2/81-83 Station Road  
Seven Hills, 2147  
PO Box 425  
Seven Hills NSW, Australia 2147

Phone: +61 (02) 9838 4420  
Fax: +61 (02) 9838 4460  
Email: [info@whyte-hall.com](mailto:info@whyte-hall.com)  
Web: [www.whyte-hall.com](http://www.whyte-hall.com)

# **INDEX**

## **SECTION**

<b>1. INTRODUCTION</b>	<b>3</b>
<b>2. SPECIFICATIONS</b>	<b>3</b>
<b>3. INSTALLATION</b>	<b>4</b>
<b>4. OPERATION</b>	<b>6</b>
<b>5. FLUSHING &amp; CLEANING PUMP</b>	<b>8</b>
<b>6. CLEARING BLOCKAGES</b>	<b>8</b>
<b>7. SERVICING AND AIR MOTOR DISASSEMBLY</b>	<b>9</b>
<b>8. TESTING</b>	<b>11</b>
<b>9. PARTS BREAKDOWN</b>	<b>12</b>

## **1. INTRODUCTION**

### **The GB7 Grout Pumps**

The *GB7 series Grout Pumps* are high performance robust pumps, specifically designed to meet the rugged and demanding conditions within the mining and construction industries.

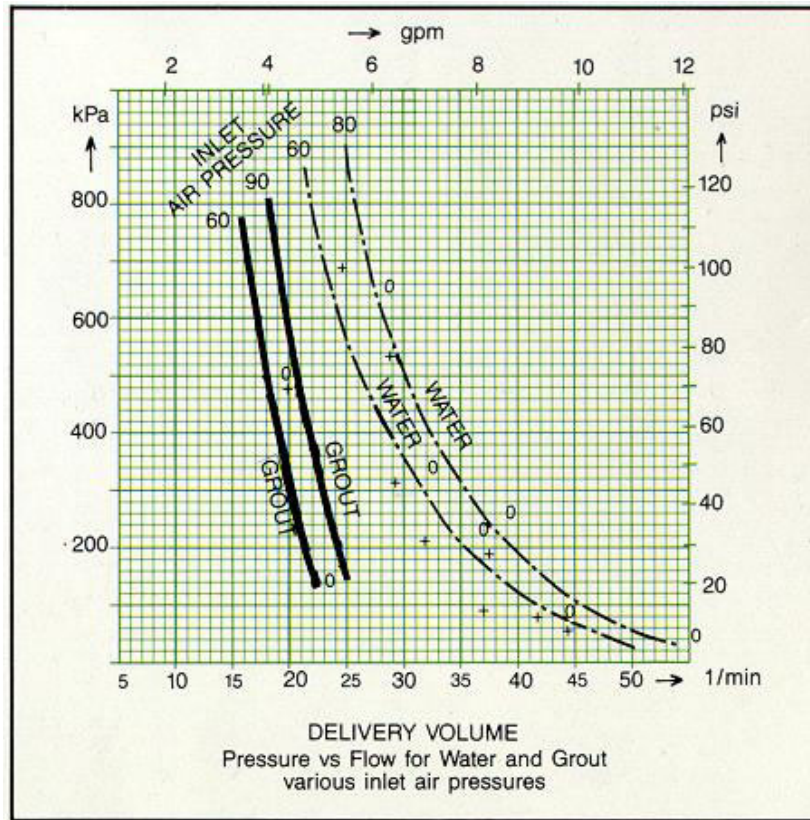
Various mixtures, such as grout, water/cement, gunite type materials are delivered via a 25mm (1") or 32mm (1¼") hose.

- 1.1 The Operation & Maintenance Manual.  
The information contained in this document is only intended to be a guide in assisting in the safe operation of the *GB7 Grout Pump*. Information quoted is a general recommendation only. At all times proper safe work practices should be observed, all Statutory guidelines and regulations should be met when operating the *GB7 Grout Pump*.

## **2. SPECIFICATIONS**

- 2.1 The *GB7 Grout Pump* is constructed of Fire Retardant Anti-Static materials and has been specifically designed for use in hazardous work environments such as Underground Coal Mines.
- 2.2 The following specifications are an extract of tests performed by a leading Australian University.
- ♦ Air Consumption  
Water only @ 60 P.S.I      51m<sup>3</sup>/hr (30 CFM)
  - ♦ Pump Performance  
Rate pumping - Water      53lt/min (12 GPM)  
Rate pumping - Grout      23lt/min ( 5 GPM)
  - ♦ Maximum Discharge  
Maximum Pump Pressure 14MPa (2000 P.S.I.)

### 2.3 Performance Graph (Figure 1.0)



## 3. INSTALLATION

In order to ensure the maximum performance and life from the *GB7 Grout Pump* it is essential that the following points be strictly observed.

- 3.1 Remove the *GB7 Grout Pump* from its packaging and ensure all packaging and fastening materials are removed from the unit.
- 3.2 This unit may be operated in any work environment provided adequate airline lubrication is supplied. As the *GB7 Grout Pump* piston is totally enclosed and sealed it can be used in any environment within the temperature limits of 12°C to +80°C.



3.3            MAXIMUM working pressure 7bar (100 p.s.i.).

3.4            Air Supply & Circuit

The Air supplied to the *GB7 Grout Pump* must be clean and relatively dry. An airline filter and lubricator should be fitted in the air supply line and located before the first control valve of the system.

If the rated performance of the unit is to be obtained all valves, hoses and pipework of the air supply must be of adequate size. Valves should be sited as close as possible to the *GB7 Grout Pump*.

3.5            To ensure peak performance at all times it is recommended a  $\frac{3}{4}$ " bore airline is supplied to the unit. Coupled via Type 'A' claw coupling.

The air supply should be capable of supplying a minimum of 14.5lt/sec (31CFM) @ 415kPa(60p.s.i.).

3.6            Before final connection to the *GB7 Grout Pump*, blow out all airlines to remove loose scale, swarf, dirt, moisture or abrasive dust, which may be present, squirt a few drops of oil into the units inlet port.

3.7            Airline Filtration

Use a 64 micron filter.

The airline filter should be drained regularly and the element examined for signs of clogging.

GB7 GROUT PUMP

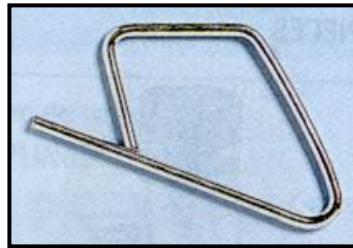
## 4. OPERATION

This unit should only be operated by persons suitably qualified to do so. It is always advisable to test the pump using water prior to pumping grout or other mediums.

4.1 Place the pump upright in a container of water, 20lt. Minimum.

4.2 Ensure the unit is securely fastened in place.

4.3 Secure the airline in place using the recommended air supply configuration given in Section 3. Always secure the coupling with a Safety locking Pin (Type A) or other suitable locking assemblies.



4.4 Observe hearing protection warning and wear suitable Eye protection should any spraying be done.



**WARNING:- Serious personal injury may occur if the correct safety equipment is not worn while operating this machine.**

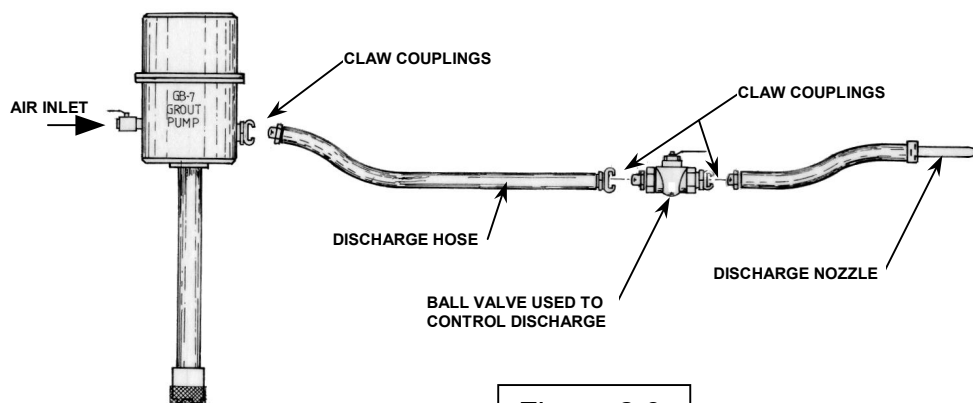


Figure 2.0



- 4.5 Connect the delivery and discharge hoses to the pump, before opening the compressed airline ensure the valve on the discharge end of the discharge hose is open and the hose is secured or being held by the operator.
- 4.6 Slowly open the air supply valve. The pump should begin to run smoothly. Run the pump until water flows from the discharge hose.
- 4.7 Turn off the air supply to the pump.
- 4.8 Close the valve on the discharge end of the discharge hose.
- 4.9 Restart the pump via the air supply valve. The pump should stall immediately. Ensure there are no leaks from the upper body of the pump.

**CAUTION:- In this mode the pump can build 2000 Psi between the pump and the discharge valve.**

To commence pumping slowly open the discharge valve, the pump should begin to pump smoothly again.  
The pump can be operated as a remote unit, simply by opening and closing the discharge valve.

- 4.10 Shut off the air supply to the pump and ensure all the pressure has been released from the discharge hose.  
To empty the water from the pump, turn the grout pump upside down. Open the discharge hose and drain hose.
- 4.11 Mix the grout/cement mixture making sure all lumps are removed, especially from corners and sides of container.
- 4.12 Place the pump base into the mixture and follow steps 4.2 to 4.10 as required to operate the pump. It may be necessary to initially hand feed mixture into the foot valve.

**WARNING:- IF THE PUMP IS NOT BEING USED FOR MORE THAN FIVE (5) MINUTES, REMOVE THE PUMP FROM MIXTURE AND FLUSH WITH WATER.**

GB7 GROUT PUMP



## **5. FLUSHING & CLEANING PUMP**

To ensure the *GB7 Grout Pump* is ready for trouble free operation and peak performance the following steps should be followed when cleaning the pump.

- 5.1 Place the pump into a container of water and start the pump following the basic operation steps in section 4.6 to 4.10.
- 5.2 It is advisable to stall and quickly open the discharge valve a number of times while flushing the pump, this ensures the pump and hoses are totally clean and free of buildup.
- 5.3 Use the pressurized water to hose down and clean the pump and mixing equipment.
- 5.4 Turn off the pump.
- 5.5 Ensure air supply has been cut off.
- 5.6 Disconnect hoses and remove the pump from the container. Drain pump by turning it upside down.

## **6. CLEARING BLOCKAGES**

This section is a guide to assist with potential blockages that may occur while operating the pump.

- 6.1 If a blockage occurs follow the steps listed below.
- 6.2 Shut off the air supply to the pump. Disconnect air supply hose and discharge hose.
- 6.3 Remove sieve (Part No. SPE095) and clean.
- 6.4 Unscrew Foot Valve Assembly (Part No. SPE094) and clean.
- 6.5 Unscrew and remove the Riser Tube (Part No. SPE088) and clean.
- 6.6 Clean the piston head assembly (Part No. SPE009)





- 6.7 Clean and flush Pump discharge port.
- 6.8 Reassemble the above and test the pump with water as explained in section 4.

## **7. SERVICING AND AIR MOTOR DISASSEMBLY**

This section is a general guide to assist with the Servicing and the general maintenance of the *GB7 Grout Pump*.

- 7.1 Carry out steps in section 6.3 to 6.5.
- 7.2 Pull the Displacement Rod (Part No. SPE072) as far as it will go and unscrew the Lock Nut (Part No. SPE086).
- 7.3 Push the Piston (Part No. SPE054) to the upside of the Stroke.
- 7.4 Unscrew the Cap Nut (Part No. SPE078) out of the Cylinder head (Part No. SPE049).
- 7.5 Grip the Trip Rod (Part No. SPE025) with padded pliers, screw Cap Nut off the Trip Rod.
- 7.6 Remove screws (Part No. SPE038), holding the Cylinder Part No. SPE049 to the Base. Carefully pull Cylinder straight up off the Piston (Part No. SPE054). Do not tilt the Cylinder, as it may damage the Cylinder wall.
- 7.7 Pull the Piston (Part No. SPE054), complete with displacement rod (SPE072) out of the Base (Part No. SPE030).
- 7.8 Check polished surfaces of the Piston (Part No. SPE054), Displacement Rod (Part No. SPE072) and Cylinder wall (Part No. SPE049) for marks and/or scratches. Replace parts if necessary.
- 7.9 Hold the Piston (Part No. SPE054) in a suitable vice. (preferably a padded vice) Push down on the Shuttle Toggle (Part No. SPE042) until it snaps down the Toggle Arms (Part No. SPE062). Remove the Lock Wires (Part No. SPE056), unscrew the top Valve Stem Locknuts (Part No. SPE047), unscrew the Valve Stems (Part No.

GB7 GROUT PUMP



- SPE070) out of the Grommets (Part No. SPE046) and the bottom Lock Nuts (Part No. SPE047).
- 7.10 Take the Inlet Valve Seals (Part No. SPE069) off the Valve Stems (Part No. SPE070), compress them firmly checking for cracks. Replace if necessary.
- 7.11 Carefully remove the Toggle Rockers (Part No. SPE044), Spring (Part No. SPE045), Toggle Shuttle (Part No. SPE042), Toggle Arm (Part No. SPE062), Shuttle Bar (Part No. SPE058) and Trip Rod (Part No. SPE025) from the Piston (Part No. SPE054).
- 7.12 Check the Shuttle Bar (Part No. SPE058) is firmly supported by the Spring Clips (Part No. SPE041), but slides in and out easily. Replace if necessary.
- 7.13 Check the Exhaust Valves (Part No. SPE059) for cracking. You should also check around the exhaust and inlet ports on the Piston (Part No. SPE054) for pitting. Replace if necessary.
- 7.14 Unscrew the Throat Nut (Part No. SPE076) in the base (Part No. SPE030), replace the U-Seal (Part No. SPE073) and Wiper Seal (Part No. SPE0777).

**Caution:- WHEN REFITTING THE THROAT NUT (Part No. SPE076), DO NOT OVERTIGHTEN.**

- 7.15 Reassemble parts (Reverse order to the above).
- 7.16 When reassembling the valve mechanism must be adjusted so there is a 3mm clearance between the inlet seal (Part No. SPE069) and it's seat (the underside of the Piston Part No. SPE054) As shown in figure-3

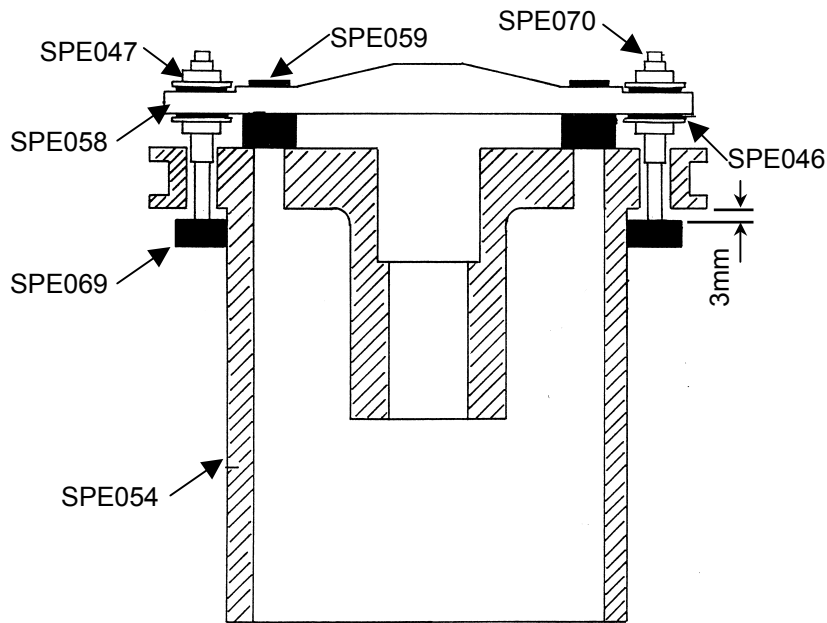


Figure 3.0

## 8. TESTING

This section is a general guide to assist with the testing of the *GB7 Grout Pump* to ensure maximum performance is achieved.

- 8.1 Set the pump up for testing as outlined in section 4.1 to 4.10.
- 8.2 The pump should run at low speed without jerking, if not, check the "O"Rings (Part No. SPE061 & SPE066) for wear. Check the correct size has been used.
- 8.3 Delivery rate at fast speed should be reasonably even, if not, check the Foot Valve (Part No. SPE093).
- 8.4 Run the pump to stall condition. (This done by closing off the outlet end of the discharge hose).
- 8.5 The Check the pressure in the discharge hose on the up and down stroke of the piston. Pressure readings should as follows.

◆ Piston up stroke	5000 kPa
◆ Piston Down stroke	3000 kPa

- 8.6 The pump must not leak air on the top or bottom of it's stroke, if it does, check the "O" rings (Part No. SPE061 & SPE066) and check the bore of the Cylinder (Part No. SPE049).
- 8.7 The pump must have a sharp change over at the top and bottom of the Piston stroke. If not, check the Inlet Valves (Part No. SPE069) and the outlet valve (Part No. SPE059).

## **9. PARTS BREAKDOWN**

### **9.1 GB7 Grout Pump parts list.**

<b>Part No.</b>	<b>Item No.</b>	<b>Description</b>	<b>Qty/each</b>
SPE011	1	Ball Pump Piston	1
SPE013	2	Seat (Throflow)	1
SPE016	3	Body Piston	1
SPE025	4	Trip Rod	1
SPE030PCI	5	Base C.I.	1
SPE033	6	Adaptor Riser Tube	1
SPE035	7	Cover Plate	2
SPE036	8	Screw Coverplate	12
SPE038P	9	Screw Cylinder Plastic	8
SPE038A	10	Screw Cylinder (25mm)	8
SPE039	11	Washer Cylinder	16
SPE040-1	12	Screw Spring Clip	2
SPE041	13	Spring Clip	2
SPE042	14	Shuttle Toggle	1
SPE043	15	Pin Toggle	2
SPE044	16	Rocker Toggle	2
SPE045	17	Spring	2
SPE046	18	Grommet	2
SPE047	19	Locknut Valve Stem	4
SPE049P	20	Cyclinder	1
SPE054CI	21	Piston	1
SPE056	22	Lockwire	2
SPE058	23	Shuttle Bar	1
SPE059	24	Exhaust Valve	2
SPE061	25	O' Ring Air Piston	1
SPE062	26	Arm Toggle	2
SPE064	27	O' Cylinder Seal	1
SPE066	28	O' Ring Base Seal	2
SPE067	29	O' Ring Adaptor	1
SPE068	30	Rubber Washer Tube	1
SPE069	31	Inlet Valve	2
SPE070	32	Valve Stem	2
SPE072	33	Displacment Rod	1
SPE073	34	'U' Seal c/w 'O' Ring	1
SPE076	35	Throat Nut	1

SPE077	36	Wiper Seal	1
SPE078	37	Cap Nut	1
SPE079	38	'O' Ring Cap Nut	1
SPE083	39	'O' Foot Valve	1
SPE084	40	Conrod	1
SPE085	41	Locknut Piston Head	1
SPE086	42	Locknut Rod	1
SPE088	43	Riser Tube (SQ. Thread)	1
SPE089	44	Ball Inlet	1
SPE090	45	Ball Stop	1
SPE093	46	FootValve (SQ. Thread)	1
SPE095	47	Sieve Inlet	1
SPE096	48	Pin Sieve Lock	2
SPE305A	49	One Piece Cup Seal	1
SPE319	50	1-1/4" BSP Male Type 'A' Coupling	1
SPE322	51	BSP Ball Valve 20mm	1
WH918	52	3/8" BSP Minsup Cooupling	1
SPE322-1	53	3/4" x 3/8" BSP Male Nipple	1

9.2 **GB7 Grout Pump Service Repair Seal Kit (Part No. SPE310)**

Part No.	ITEM	DESCRIPTION	Qty/ea.
SPE046	18	Grommet	2
SPE059	24	Exhaust Valve	2
SPE061	25	O' Ring Air Piston	1
SPE064	27	O' Cyclinder Seal	1
SPE066	28	O' Ring Base Seal	2
SPE067	29	O' Ring Adaptor	1
SPE068	30	Rubber Washer Tube	1
SPE069	31	Inlet Valve	2
SPE073	34	'U' Seal c/w 'O' Ring	1
SPE077	36	Wiper Seal	1
SPE079	38	'O' Ring Cap Nut	1
SPE083	39	'O' Foot Valve	1
SPE305A	49	One Piece Cup Seal	1

9.3 **GB7 Grout Pump Piston Head Assembly (Part No. SPE009)**

Part No.	ITEM	DESCRIPTION	Qty/ea.
SPE016	03	Body Piston (ThruFlow)	1
SPE011	01	Ball Pump Piston	1
SPE305a	49	One Piece Cup Seal	1
SPE013	02	Seat (ThruFlow)	1

9.4 **GB7 Grout Pump Foot Valve Assembly (Part No. SPE094)**

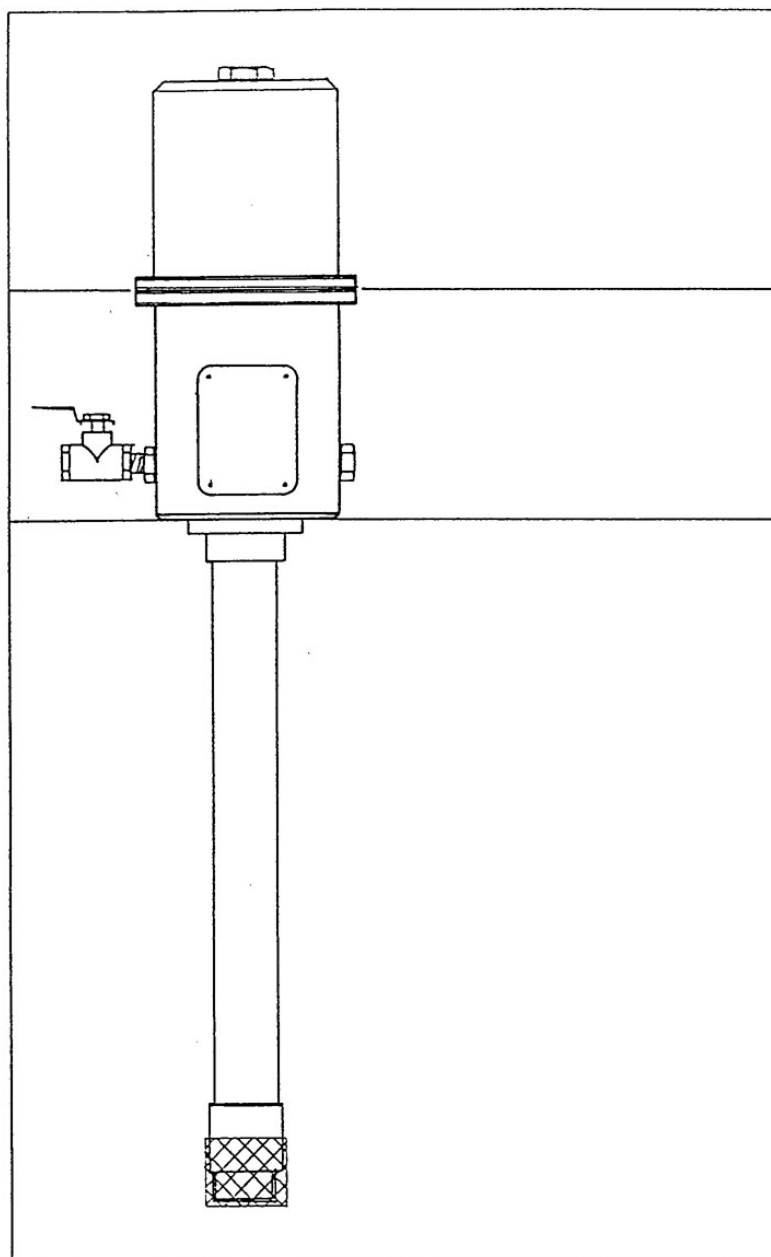
Part No.	ITEM	DESCRIPTION	Qty/ea.
SPE083	39	'O' Ring Foot Valve	1
SPE090	45	Ball Stop	1
SPE089	44	Ball Inlet	1
SPE093	46	Foot Valve	1
SPE096	48	Pin Sieve Lock	1
SPE095	47	Sieve Inlet	1

## **10. GB7 GROUT PUMP** **ASSEMBLY SCHEMATIC**

SECTION 1

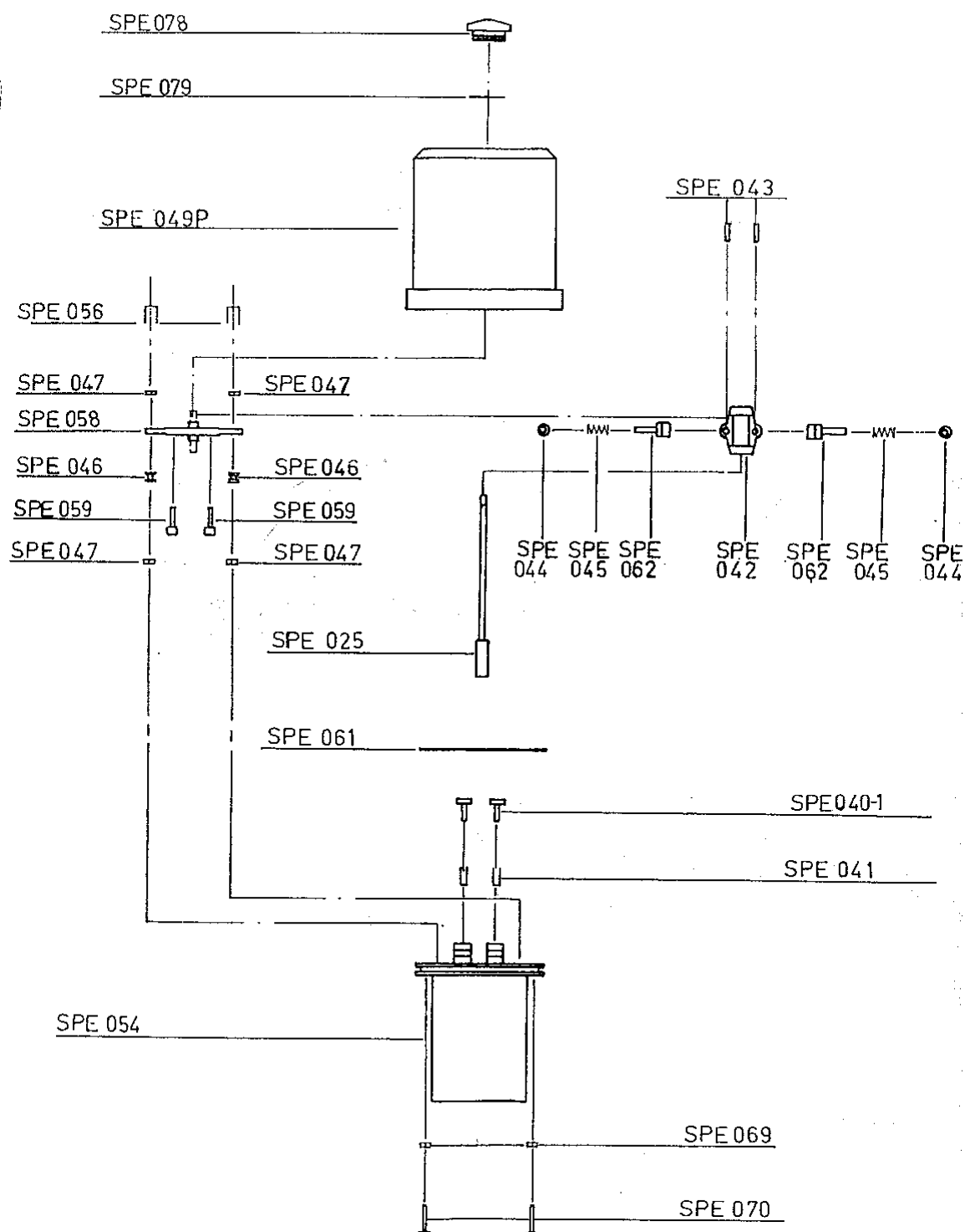
SECTION 2

SECTION 3

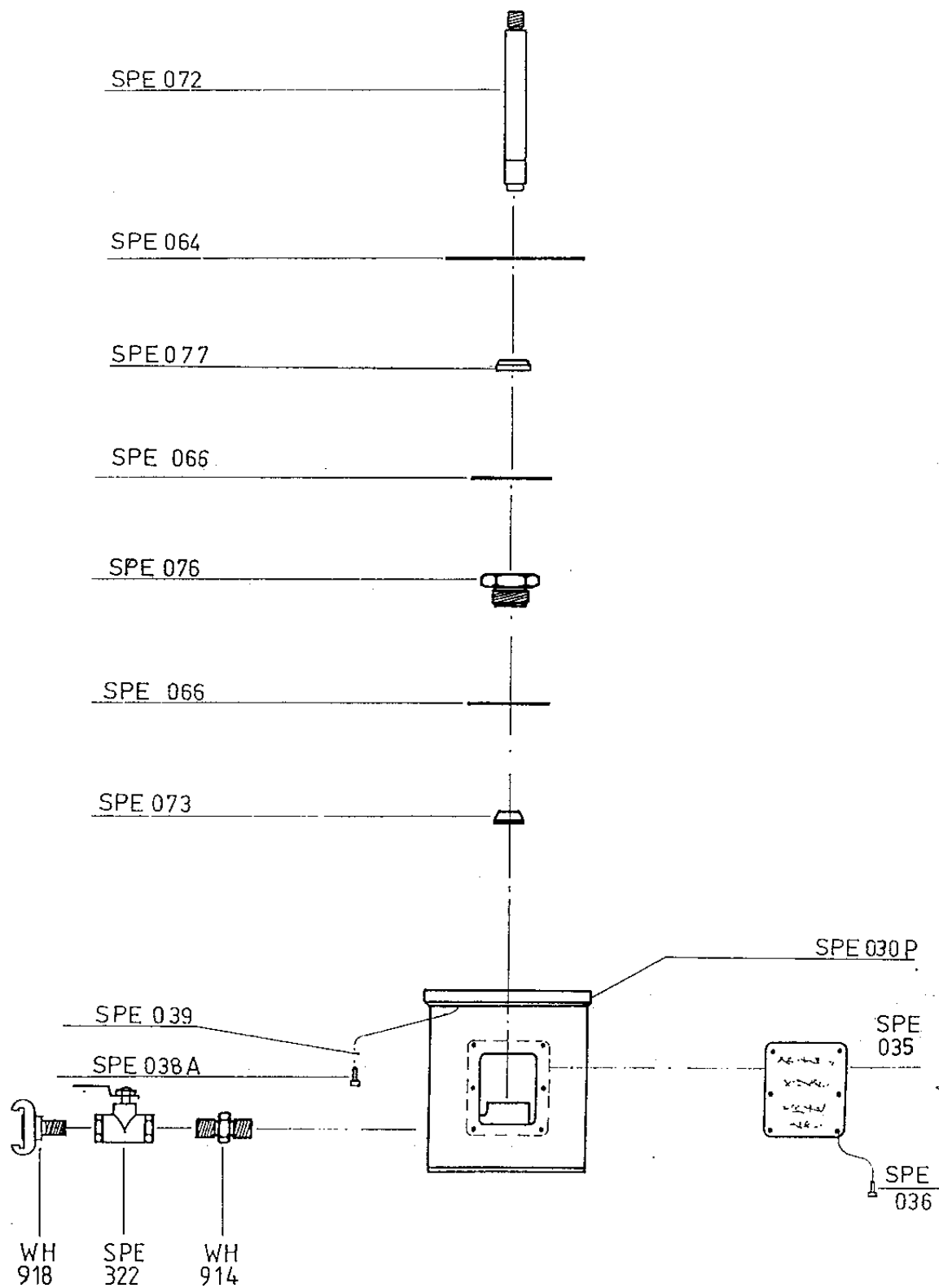


PARTS LIST

## SECTION 1

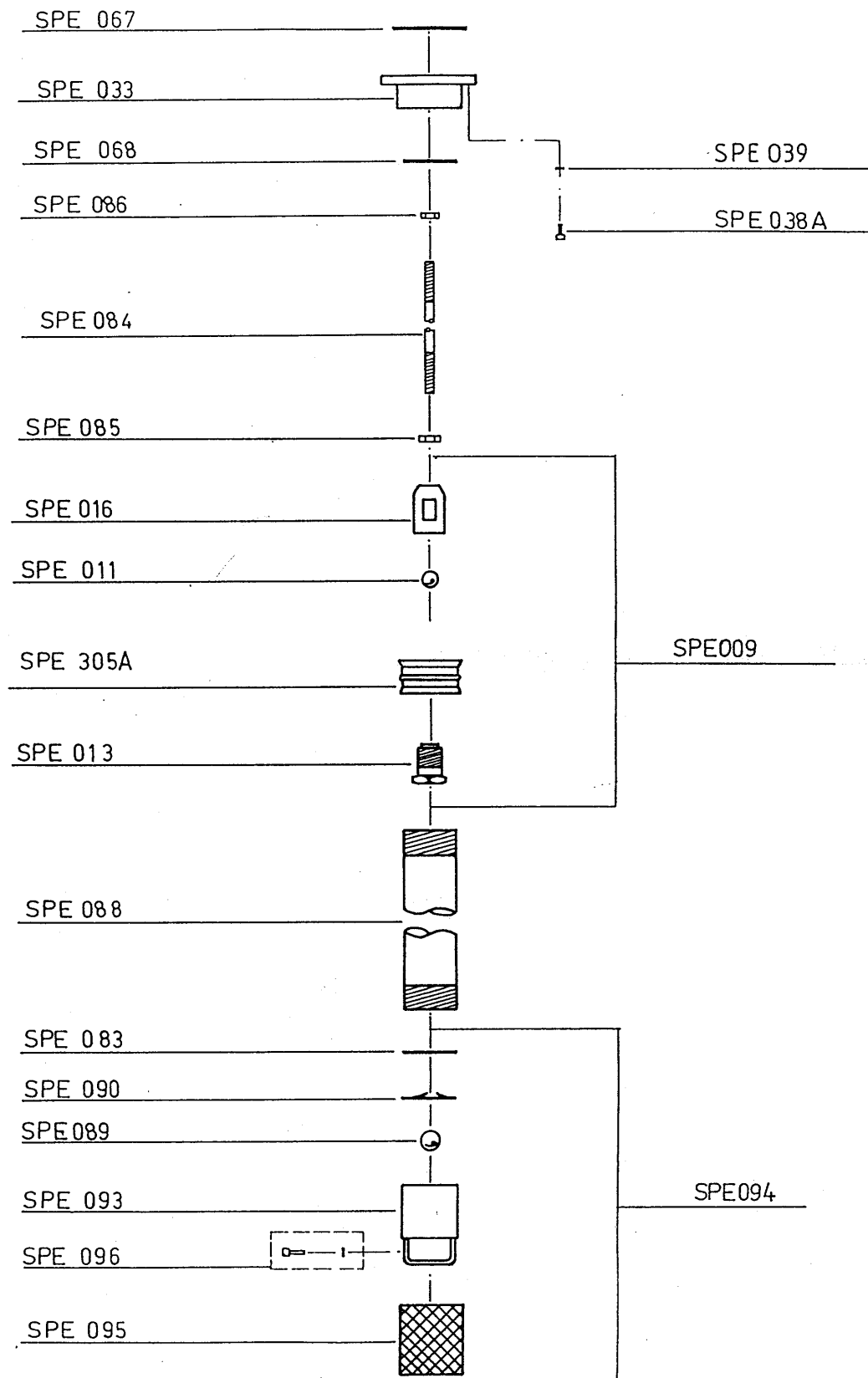


## SECTION 2





### SECTION 3



STEEL VERSION

SECTION 5

"CONFIGURATION"  
 DIVORCED SECTION

