

Hydronic Corporation

Air Driven Hydraulic Pumps and Intensifiers

P820 Installation, Use and Maintenance Manual

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Introduction

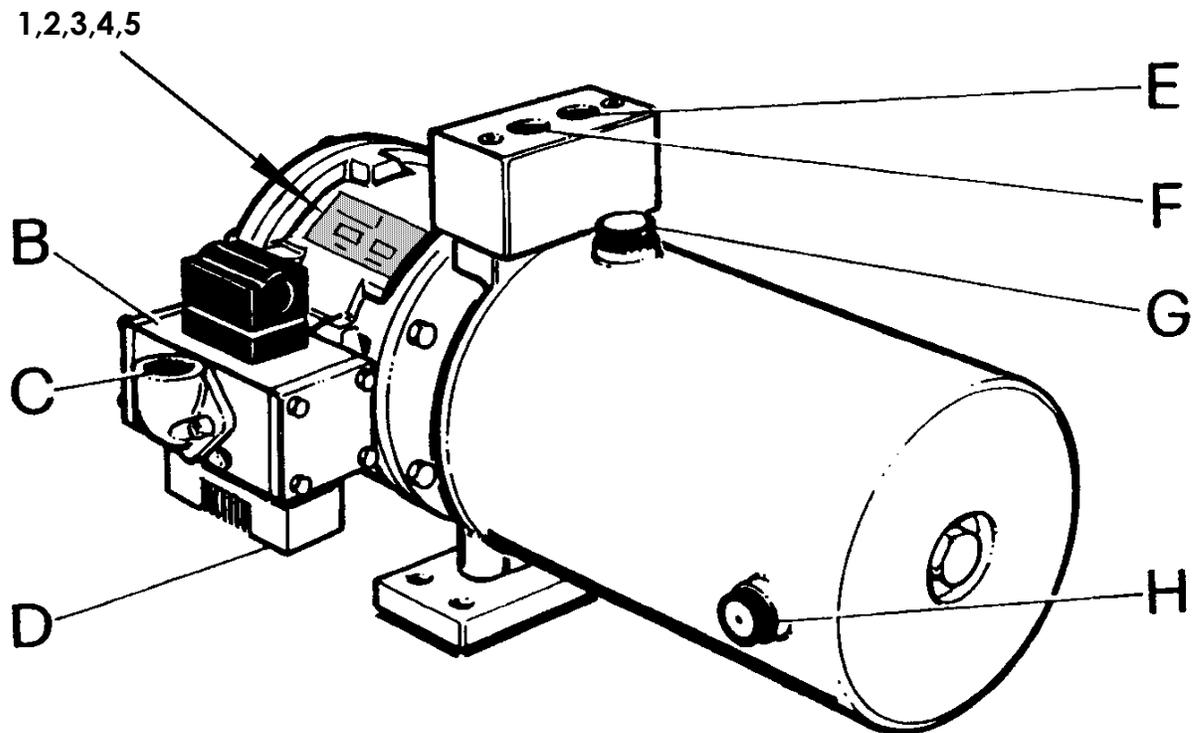
This handbook is intended to give the operator the basic instructions for the use and maintenance of the pump. The air hydraulic pump operator must read this handbook before putting the pump into operation. After correctly installing the pump, keep this manual stored in a safe place. If you have difficulty in understanding any part of this handbook, contact Hydronic Corporation. Regular servicing and correct use of the pump are fundamental in obtaining optimum performance over its life. When contacting our service center, specify the pump model and serial number; this will help us to respond quickly and effectively.

Guarantee

Hydronic pumps are guaranteed both for the quality of materials used and for overall design. The warranty runs for six months of normal use at eight hours per day and five days per week. The warranty itself does not cover seals or defects arising out of operating with unsuitable fluids or at pressures above the specified maximum. The guarantee cannot cover pumps that may have been tampered with. Defective goods must be sent to Hydronic Corporation at Farmington Hills or to the distributor covering the area, freight pre-paid in either case. Any pump returned to us must be accompanied by a full written description of such faults or defects as have been discovered. Please also ensure that the pump's serial number is attached to the paperwork.

Identification Plate

- 1 Pump model and intensification ratio
- 2 Serial number pump
- 3 Maximum air pressure
- 4 Maximum working oil pressure allowed
- 5 Year of construction



Installation Guide

Pumps may be installed in a horizontal or vertical position for optimum functioning of suction and delivery valves. The round reservoir may be used horizontally and it is advised that the breather and sight glass be interchanged and/or the reservoir rotated to allow the breather to remain uppermost. The suction and return tubes inside the reservoir may also be rotated to ensure fluid is taken from, and returned to, the bottom of the reservoir in any given position.

The air inlet connection can be rotated at 90 ° and piping of not less than 3/8" bore should be used. 1/2" should be used if the pump is to be run at higher speeds for greater flows.

It is advisable to use or maintain:

- Hydraulic oil having viscosity of 150 to 250 SSU
- Oil temperature 32° F to 150° F
- Air temperature 40° F to 100° F
- Room temperature 40° F to 100° F

Obstructive icing of the silencer may occur under certain temperature/humidity conditions. This can be remedied by the addition of antifreeze oil for pneumatic equipment to a mist lubricator.

Compressed Air System

It will be advisable to fit an air filter/regulator unit having minimum flow capacity of 50 scfm with an air pressure gauge to ensure the pump has sufficient air energy to work correctly and provide the hydraulic performance you expect.

Hydraulic System

Valves, pipes, hoses and accessories should all correspond to maximum working pressure of the pump used and be of a size that will fulfill flow requirements.

Application

Hydronic air driven hydraulic pumps are designed for operating oil hydraulic circuits and to cover the widest range of requirements to the best advantage. The pump itself operates quite simply, using a known pressure intensification principle. A piston with a large surface area is actuated by compressed air. Attached to it is a piston with a smaller surface area, which is driven in a hydraulic chamber generating a high level of hydraulic pressure. The continuous pumping action is produced by the compressed air being switched by a special sealless spool valve. By regulating the compressed air supply pressure from 30 psi to 100 psi, the maximum hydraulic pressure can be adjusted by the ratio of the pump used. As the hydraulic load of the circuit increases and the oil pressure rises, the pump will slow down and eventually stop. In this way, the maximum load of the circuit will be maintained without air consumption.

Storage

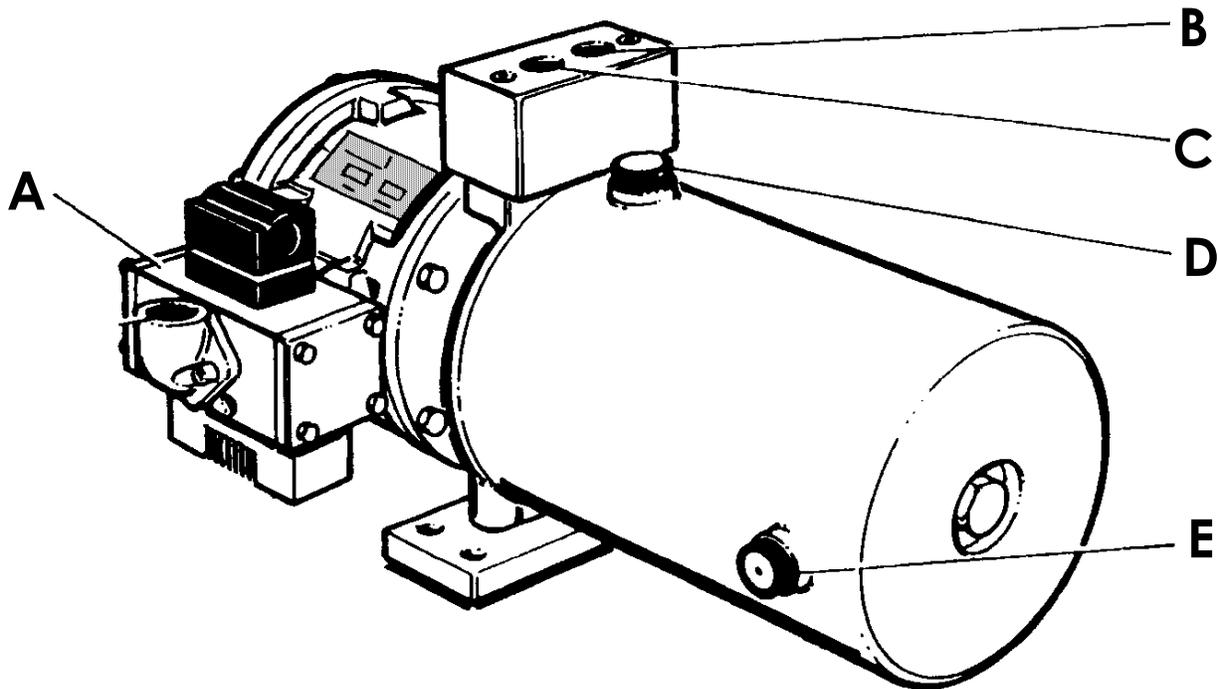
If the pump is to be kept out of use for a long period, clean the pump in general and drain the oil from the tank. Cover the pump and store it in a dry, well-protected place. It is advisable to wrap the pump in a plastic film. To put back into service, check all parts, fill tank with oil and try the pump out to ensure that it working properly. **This operation must be carried out by qualified personnel.**

Disposal

If the pump is to be scrapped, treat as a special type of waste. Dismantle it and divide it into materials of the same type and dispose of them in accordance with the local laws and regulations in your state.

Description of the standard pump components

- A Air valve
- B Oil outlet #8 SAE
- C Oil return #8 SAE
- D Oil filler plug
- E Oil level sight glass



Starting - Up

Oil pressure can be determined by regulation of the compressed air, bearing in mind multiplication ratio pre-selected for the pump itself.

The models are: P820 RATIO 1:5
P820 RATIO 1:10
P820 RATIO 1:20
P820 RATIO 1:30
P820 RATIO 1:40

For instance, when supplied with compressed air at 80 psi, the P820-5 will produce oil pressure of 80 x ratio, 400 psi. It should be remembered that actual efficiency produced by the pump is slightly less than given by the above theoretical calculation. This difference will not be noticed by a hydraulic gauge.

Having connected the compressed air supply at a low pressure, allow the pump to operate slowly until primed and oil comes through to the oil output port. Now shut off the air supply to the pump and securely connect the hydraulic circuit. Switch on the air supply again and allow the pump to run in order to bleed any air out of the hydraulic circuit.

Pump features:

- Standard manifolds and subplates are available with various configurations of SAE threaded ports for output and return as well as D03 interfaces.
- Optional rotation of the 1/2" NPT air inlet elbow in four positions.
- The pump itself works automatically and operates by way of an integral valve.
- The pneumatic drive section has graphite filled seals for minimum friction, no lubrication requirement and long life.
- The hydraulic section comprises an alloy steel pump casing, hard chrome plated piston rod and bronze filled seals.
- The suction side of the pump is equipped with a spring-loaded check valve. A spring-loaded outlet ball type check valve is incorporated in the hydraulic piston.

Fault Finding Chart

Fault	Cause	Remedy
1] Pump does not cycle or runs slowly.	1.1] Low pressure in compressed air line. 1.2] Formation of ice on the exhaust side. 1.3] Accumulation of waste in the silencer. 1.4] Blocked element in air filter/regulator.	1.1] Clear any blockage or restriction on the air line. 1.2] Shut off pump for a short time and drain off water from the filter. 1.3] Remove silencer, clean and replace. 1.4] Close down air-supply, dismantle and clean filter.
2] Pump loses air from silencer when stalled.	2.1] Worn valve or seal	2.1] Replace seal or valve.
3] Excess oil leakage from air silencer.	3.1] Worn hydraulic seal	3.1] Replace seal.
4] Pump cycles without pumping oil.	4.1] Blocked oil-intake 4.2] Bad connection on suction line.	4.1] Clean out filter. 4.2] Check for bad connections or air leaks on suction line.
5] Pump functions but only generates low pressure and does not stall at max. pressure.	5.1] Internal leakage in the circuit. 5.2] Suction valve seats damaged and leaking. 5.3] Output valve seats damaged and leaking. 5.4] Worn oil seal.	5.1] Find leak source and change valve. 5.2] Replace suction valve parts. 5.3] Replace output valve parts. 4.4] Replace seal.

Maintenance

Periodically release the condensation from the air filter. Replace the hydraulic oil every 1500 hours or whenever the oil is polluted.

Warning: Remember that repair work can only be made when pneumatic and hydraulic pressure has been released and you are sure that no pressure remains in the circuit.

Delivery of the pump

Transport

All the material shipped, including the detached parts, has been thoroughly checked before being consigned to the forwarding agent. The pump is shipped in double corrugated cardboard packaging, which assures protection of the product.

Unpacking

On receipt of the product, open the packaging and remove the pump. Take care not to damage any part of the pump. Make an initial check on the pump for damage in transit. In case of damage or if in doubt, do not use the pump and contact Hydronic Corporation or your distributor. The packaging [plastic bags, expanded polystyrene, nails, screws, wood, etc.] must not be left within reach of children since they are potential source of danger. Be sure to dispose of pollutant or non biodegradable materials in the correct way. Materials must be disposed of in accordance with the laws in force.

Approximate gross weight

P820 standard reservoir	33 lbs.
P828 large reservoir	44 lbs.

Contents of the package

The packaging will always contain the following:

- 1 x air driven hydraulic pump
- 1 x installation, use and maintenance manual

Original spare parts

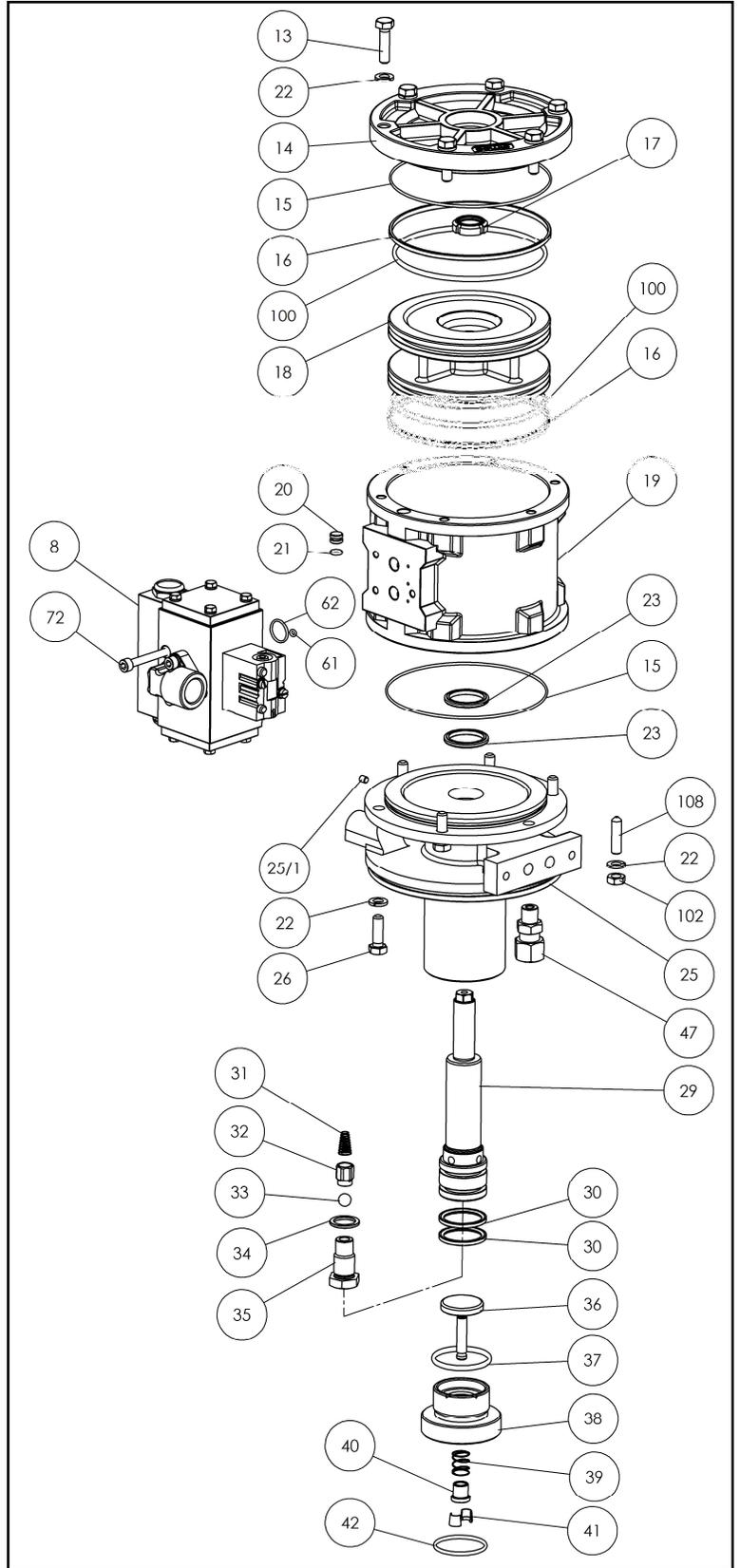
Parts orders must always be accompanied by the following information:

- A] The pump model B] The pump serial number C] The year of construction
(all this data is given on the nameplate)
- D] The part numbers E] The quantity required F] The name of the part
(All this data is given in the parts list)

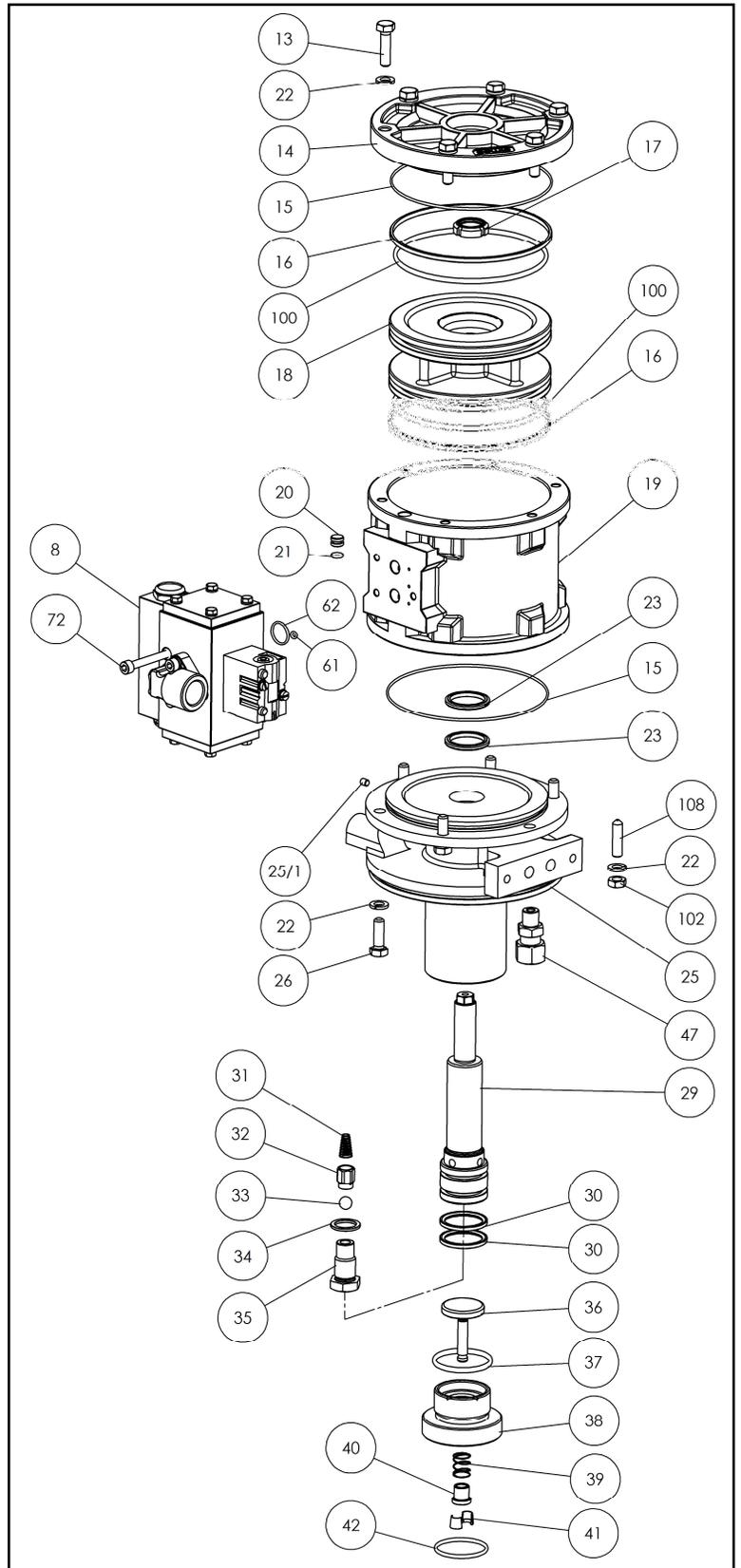
A clear and correct statement of this data will allow our after-sales service to respond quickly and appropriately. Every spare part must be replaced by professionally qualified staff. The manufacturer declines all responsibility for malfunctions or accidents deriving from any failure of the product when unqualified persons have made any attempt at repair.

Pump Valve

ITEM	CODE	DESCRIPTION	Qty
8	BH10026A	PILOT VALVE	1
13	3.094.0207	SCREW	6
14	5.086.0006	HEAD	1
15	* 3.051.0075	O-RING	2
16	* 3.051.0076	SEAL RING	2
17	3.045.0204	RING-NUT	1
18	5.068.0045	PISTON	1
19	5.018.0030	JACKET	1
20	5.084.0002	PLUG	2
21	* 3.051.0083	O-RING	2
22	3.072.0104	WASHER	12
23	* 3.051.0088	SEAL RING – Ratio 5:1	2
23	* 3.051.0086	SEAL RING – Ratio 10:1	2
23	* 3.051.0085	SEAL RING – Ratio 20:1	2
23	* 3.051.0234	SEAL RING – Ratio 30:1	2
23	* 3.051.0011	SEAL RING – Ratio 40:1	2
25	5.028.0030	PUMP BODY – Ratio 5:1	1
25	5.028.0029	PUMP BODY – Ratio 10:1	1
25	5.028.0028	PUMP BODY – Ratio 20:1	1
25	5.028.0057	PUMP BODY – Ratio 30:1	1
25	5.028.0027	PUMP BODY – Ratio 40:1	1
25/1	3.094.0411	SCREW	1
26	3.094.0208	SCREW	5
29	5.068.0049	PISTON – Ratio 5:1	1
29	5.068.0048	PISTON – Ratio 10:1	1
29	5.068.0047	PISTON – Ratio 20:1	1
29	5.068.0177	PISTON – Ratio 30:1	1
29	5.068.0046	PISTON – Ratio 40:1	1
30	* 3.051.0096	SEAL RING – Ratio 5:1	2
30	* 3.051.0094	SEAL RING – Ratio 10:1	2
30	* 3.051.0092	SEAL RING – Ratio 20:1	2
30	* 3.051.0173	SEAL RING – Ratio 30:1	2
30	* 3.051.0090	SEAL RING – Ratio 40:1	2
31	5.064.0028	SPRING – Ratio 5:1 & 10:1	1
31	5.064.0029	SPRING – Ratio 20:1, 30:1 & 40:1	1
32	5.046.0007	CENTERING BALL – Ratio 5:1 & 10:1	1
32	5.046.0006	CENTERING BALL – Ratio 20:1, 30:1 & 40:1	1
33	3.076.0006	BALL – Ratio 5:1 & 10:1	1
33	3.076.0002	BALL – Ratio 20:1, 30:1 & 40:1	1
34	* 3.052.0010	WASHER – Ratio 5:1 & 10:1	1



ITEM	CODE	DESCRIPTION	QTY
34	* 3.052.0003	WASHER – Ratio 20:1, 30:1 & 40:1	1
35	5.094.0303	SCREW – Ratio 5:1 & 10:1	1
35	5.094.0302	SCREW – Ratio 20:1, 30:1 & 40:1	1
36	5.066.0011	VALVE PIVOT	1
37	* 3.051.0127	O-RING – Ratio 5:1 & 10:1	1
37	* 3.051.0055	O-RING – Ratio 20:1, 30:1 & 40:1	1
38	5.028.0032	VALVE SEAT – Ratio 5:1 & 10:1	1
38	5.028.0031	VALVE SEAT – Ratio 20:1, 30:1 & 40:1	1
39	5.064.0030	SPRING	1
40	5.013.0008	CENTERING BALL	1
41	3.006.0006	SEMI-CONE	2
42	* 3.051.0079	O-RING	1
47	3.070.0006	CONNECTOR	1
61	* 3.051.0002	O-RING	2
62	* 3.051.0082	O-RING	2
72	3.094.0018	SCREW	3
100	* 3.051.0077	O-RING	2
102	3.031.0016	NUT	1
108	3.094.0404	SCREW	1



Air Valve

ITEM	CODE	DESCRIPTION	Qty
1	5.065.0052	BLOCK	1
2	* 3.051.0109	O-RING	2
3	* 3.051.0130	O-RING	8
4	3.094.0026	SCREW	3
5	4.091.0020	POWER VALVE	1
6	4.091.0028	PILOT VALVE	1
7	3.094.0061	SCREW	3
8	3.070.0096	SILENCER	1
9	3.070.0068	SILENCER	1
10	3.070.0028	PLUG	2

Seal Kits	Ratio	Code #
S820-5-N-SK	1:5	3.054.0028
S820-10-N-SK	1:10	3.054.0029
S820-20-N-SK	1:20	3.054.0030
S820-30-N-SK	1:30	3.054.0080
S820-40-N-SK	1:40	3.054.0034

