HYPRO®

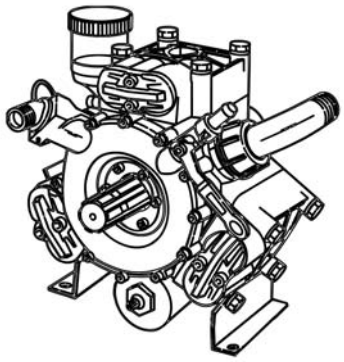
High Pressure Diaphragm Pumps

Form L-1383
5/06

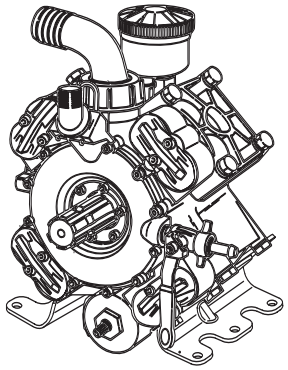
Installation, Operation, Repair and Parts Manual

Description

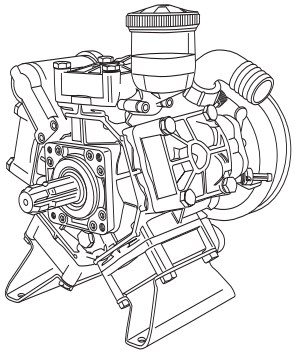
Hypro high pressure diaphragm pumps are recommended for spraying of herbicides, pesticides, liquid fertilizers and many other hard to handle fluids. Low-cost maintenance and almost wear-free operation make these pumps ideal for a wide variety of spraying jobs. Pressure and output are designed for optimum performance of medium to large-sized sprayers. Hypro high pressure diaphragm pumps are supplied with single or double-splined thru-shafts. Pumps include pulsation dampeners.



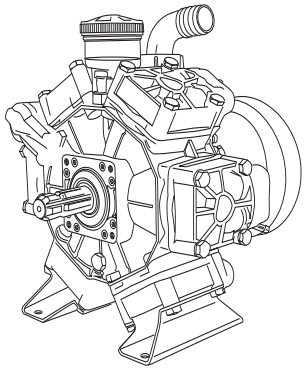
Model 9910-D813
Model 9910-D813GRGI
Max Flow: 21.4 gpm
Max Pressure: 725 psi
Max Speed: 550 rpm
3 diaphragms



Model 9910-D1064
Model 9910-D1064GRGI
Max Flow: 27.9 gpm
Max Pressure: 725 psi
Max Speed: 550 rpm
4 diaphragms



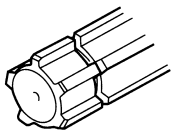
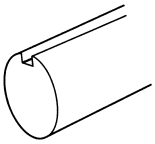
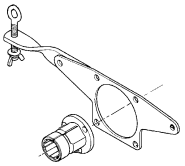
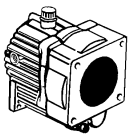
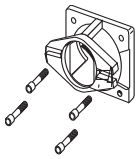
Model 9910-D1265
Max Flow: 33.3 gpm
Max Pressure: 725 psi
Max Speed: 550 rpm
5 diaphragms



Model 9910-D1516
Max Flow: 40 gpm
Max Pressure: 725 psi
Max Speed: 550 rpm
6 diaphragms

Drive Options

Order the appropriate shaft adapter kit or gear reduction unit for the drive option requirements. Refer to the chart below for proper selection. For proper installation of the gear reducer, refer to the installation instructions.

Pump Model	1-3/8" Male Splined PTO Shaft	1" Solid Shaft W/Keyway	1 3/8" Female Shaft w/ Torque Arm Bracket for PTO Drive	Gear Reduction Units for Gas Engine Drive	Hydraulic Motor Mounting Flange Klt
9910-D813	9910-KIT2200	9910-KIT2203	9910-KIT2204	9910-KIT1642 for 8-18 hp	9910-KIT5312
9910-D1064	9910-KIT2200	9910-KIT2203	9910-KIT2204	9910-KIT1642 for 8-18 hp	9910-KIT5312
9910-D1265	9910-KIT2200	9910-KIT2203	9910-KIT2204	9910-KIT1642 for 8-18 hp	9910-KIT5312
9910-D1516	N/A	N/A	N/A	N/A	N/A

Control Units

Control units are available for easy flow and pressure control of your sprayer system. These units include a pressure relief valve to control pressure, an oil-filled pressure gauge to monitor pressure, and outlet ball valves to control flow. Control Unit 9910-GS50GI can be remote mounted with Kit No. 9910-KIT1742. No additional kit is required for remote mounting Control Unit 9910-VDR50. Refer to the adjoining chart to select the proper control unit for your pump.

CONTROL UNIT MODEL	MAX GPM	MAX PSI	PUMP MODEL
9910-GS50GI	48	725	ALL MODELS
9910-VDR50	35	725	-D813, -D1064, and -D1265

General Safety Information

1. Use of a pressure relief device on the discharge side of pump is required to prevent damage from pressure build up if the discharge is closed or blocked while the power source is still running.
2. **WARNING: DO NOT pump flammable or explosive fluids such as gasoline, fuel oil, kerosene, etc. DO NOT use in explosive atmospheres. The pump should be used only with liquids that are compatible with the pump component materials. DO NOT pump asphalt, asphalt sealer, roofing compounds, concrete sealers or any two-step curing products. Personal injury may result, and the warranty will be void. If there are any questions, call the Hypro Applications toll-free number: 800-445-8360.**
3. Do not operate the pump above the recommended rpm.
4. Do not pump at pressures higher than the maximum recommended pressures for the pump (see Specifications).
5. Operate the pump between temperature ranges of 45^{O} to 140^{O} F.
6. Make certain that the power source conforms to the requirements of your equipment.
7. Provide adequate protection for guarding around the moving parts such as the shaft and pulleys.
8. Disconnect the power before servicing.
9. Release all pressure within the system before servicing any component.
10. Drain all liquids from the system before servicing.
11. Secure the discharge lines before starting the pump. An unsecured discharge line may whip, causing personal injury and/or property damage.
12. Check the hoses for weak or worn condition before each use. Make certain that all connections are tight and secure.
13. **Periodically inspect the pump and the system components. Perform routine maintenance as required (see Maintenance section).**
14. When wiring an electrically-driven pump, follow all electrical and safety codes, as well as the most recent National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).

General Safety Information Continued

15. **WARNING: Because of the risk of electrical shock, all wiring should be done by a qualified electrician.**

    WARNING: DO NOT handle a pump or pump motor with wet hands or when standing on a wet or damp surface, or while standing in water.

16. Do not operate a gasoline engine in an enclosed area. Be sure the area is well ventilated.

17. Use only pipe, hose and fittings rated for the maximum rated pressure of the pump or pressure that the pressure relief valve is set. Check with a local supplier for the proper pressure rating. Do not use *used* pipe!

18. Do not use these pumps for pumping water or other liquids for human or animal consumption.

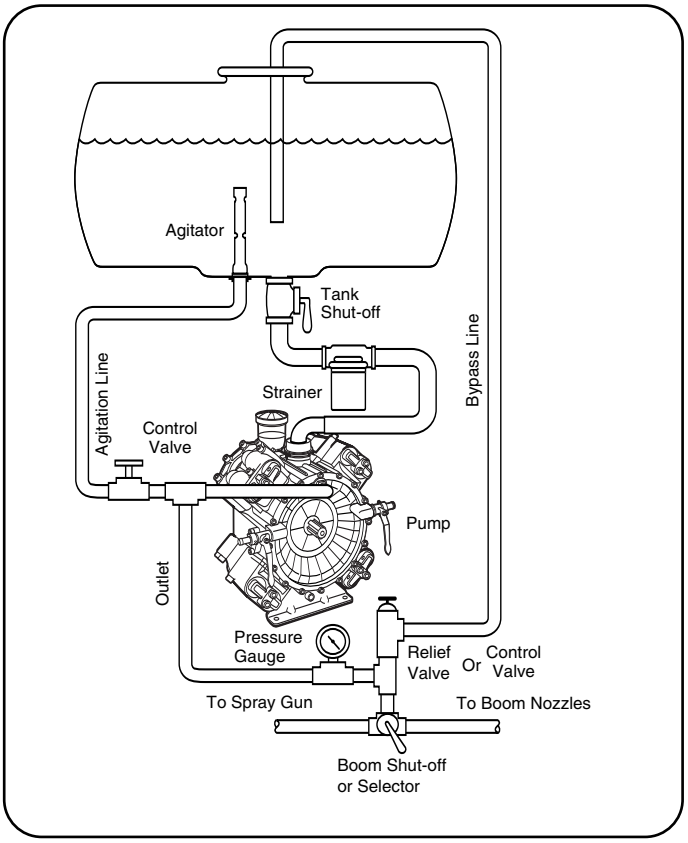
19. Do not pressure feed pump inlet.

Installation

1. Always mount the pump with oil sight tube in the upright position.
2. The correct type and size of hose are vital to good performance:
   a. Use good quality inlet hose, compatible with fluids being pumped and with good elasticity to reduce inlet water hammer or pulsation. Be sure that the hose is not too rigid but capable of operating at low vacuums without collapsing. The diameter of the inlet hose should be at least that of the pump inlet port size and preferably one size larger if the inlet line is longer than approximately 6 feet.
   b. Use only approved high pressure hose on the discharge side of the pump.
3. Most ports are provided with hose barb connections. Use good quality hose clamps, and tighten securely.

NOTE: Use only pipe, fittings, accessories, hose, etc. rated for the maximum pressure rating of the pump.

4. See the illustration for typical system hook-up. The diagram shows necessary components and accessories and their connections within the complete system.



Pump Operation Instructions

1. Be sure the oil is halfway up the clear oil sight tube. If necessary, fill to the correct level with Hypro Oil (Part Number 2160-0038). Hypro Oil is a specially formulated, high-grade, nondetergent, SAE 30 weight oil designed to prolong pump life.
2. Make sure the suction hose barb is tightly screwed onto the suction union, and that there are no air leaks on the inlet side of the pump.
3. Check the charge pressure on the pulsation dampener before starting the pump. The pressure is checked with a standard automotive air gauge. The pressure should be at approximately 20% of your operating spray pressure.
4. The relief valve bypass port should be connected back to the liquid tank unrestricted. Do not hook the bypass line back to the inlet port or inlet hose.
5. Always allow the pump to start under low pressure by putting the pressure release lever in the pump position.
6. Start the pump and run for approximately one minute at low pressure. Stop the pump and check the oil level in sight glass. Oil should be halfway up the sight glass. Add Hypro Oil (Part Number 2160-0038) if necessary.
7. Return the pressure release lever to the pressure position and adjust the pump to the desired pressure by changing the relief valve setting on the control unit, relief valve, or unloader.

Troubleshooting

SYMPTOM	PROBABLE CAUSE(S)	CORRECTIVE ACTION
The pump does not draw water.	One or more valves are seating improperly. Suction line is plugged or collapsed. Clogged strainer.	Remove valve and check for debris. Examine suction line. Clean strainer.
The liquid flow is irregular.	The charge in the pulsation damper is incorrect. One or more valves are seating improperly.	Check pressure in pulsation damper (approximately 20% of operating pressure). Remove valve and check for debris. Examine the valve seatings and clean them.
Output drops and the pump is noisy.	Oil level is too low.	Add oil to correct level (halfway up the sight tube).
Oil comes out of the discharge port or oil is a milky color.	One or more diaphragms split.	Remove manifold and heads. Drain oil and clean crankcase of water. Replace diaphragms, heads and manifold. Refill with **Hypro Oil (Part No. 2160-0038)**.

Hazardous Substance Alert

1. Always drain and flush the pump before servicing or disassembling for any reason (see instructions).
2. Always drain and flush pumps prior to returning unit for repair.
3. Never store pumps containing hazardous chemicals.
4. Before returning pump for service/repair, drain out all liquids and flush unit with neutralizing liquid. Then, drain the pump. Attach tag or include written notice certifying that this has been done. Please note that it is illegal to ship or transport any hazardous chemicals without United States Environmental Protection Agency Licensing.

Maintenance

1. After use, flush the pump with clean water.
2. Hypro diaphragm pumps come with oil in the crankcase. Hypro recommends changing oil after 40 hours of break-in operation and every three months or 500 hours, whichever comes first. Use Hypro Oil (part number 2160-0038). Hypro Oil is a specially formulated, high-grade, nondetergent, SAE 30 weight oil designed to prolong pump life.

   To drain the oil from the pump, remove the oil drain plug and rotate the shaft until the oil stops flowing out. To fill the pump with oil, slowly pour the oil into sight tube while turning the pump shaft. Turning the pump shaft purges all the air out of the crankcase. Always change oil when replacing diaphragms.
3. For winter storage or if a freezing condition will be encountered, flush pump with a 50/50 mixture of water and antifreeze.

Valve Replacement

Occasionally debris can cause the valves to not seat properly or damage the o-rings. To check for this problem, follow these steps.

1. Remove valve retainers and valve holders. With holders removed, the valves can readily be removed and checked for debris or wear. Check o-rings as well. See the parts list for appropriate valve and o-ring kits.
2. Replace the necessary parts and reassemble.

Diaphragm Replacement

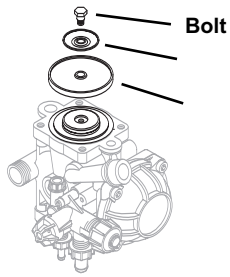


Figure 1

Diaphragm Replacement: D813, D1064, D1265, D1516

Change diaphragms every 500 hours or three months, whichever comes first.

1. Drain oil from crankcase (refer to Maintenance, p.4).
2. Remove pump head bolts and heads.
3. Remove the bolt securing the diaphragm (see Figure 1).
4. Remove the old diaphragm and the washer (see Figure 1).
5. Install a new diaphragm; then, turn the crankshaft to bring the piston to its down-stroke and seat the diaphragm into the sleeve groove.
6. Install the washer and bolts removed in steps 3 and 4. Refer to parts breakdown for proper torque.
7. Replace the pulsation dampener diaphragm by first bleeding the air from the dampener. Remove the bolts from the dampener cover and replace the diaphragm. Reassemble the cover in place and charge the dampener to 20% of the operating pressure.
8. Refill the crankcase with Hypro Oil (part number 2160-0038). Rotate the shaft to distribute the oil, and fill to proper level.

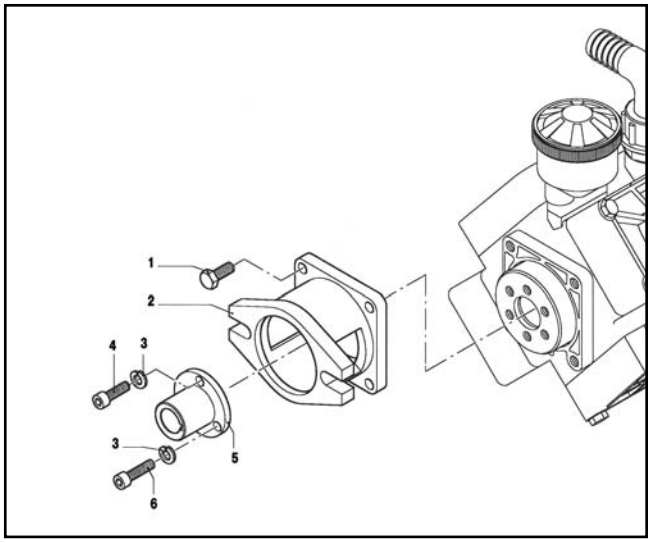


Figure 2. Hydraulic Motor-Mounting Flange Kit

Parts List for Flange Kit 9910-HYD5312

REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
1	9910-160670	Hex Bolt (10x25)	4
2	9910-6211	Flange	1
3	9910-200231	Lockwasher	3
4	9910-620470	Bolt (10x20)	3
5	9910-6682	Coupling	1
6	9910-160671	Bolt (10x25)	3

NOTE: When ordering parts, give QUANTITY, PART NUMBER, DESCRIPTION, and COMPLETE MODEL NUMBER. Reference numbers are used ONLY to identify parts in the drawing and are NOT to be used as order numbers.

Parts List for 9910-KIT2204, 9910-KIT2200 and 9910-KIT2203

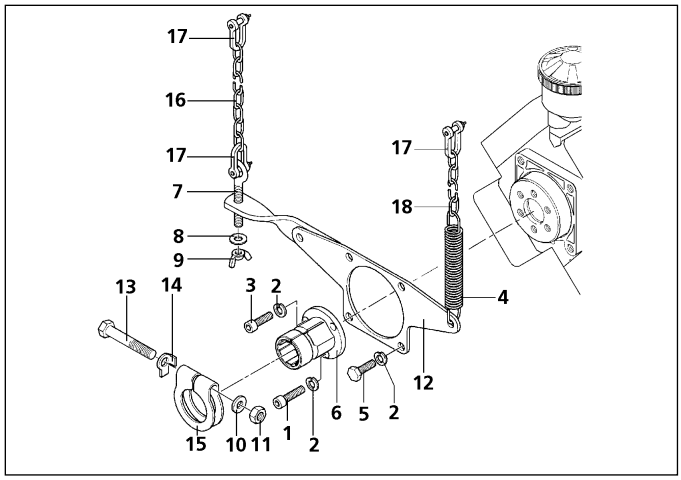


Figure 3. Female Splined Coupler Kit 9910-KIT2204 Installation

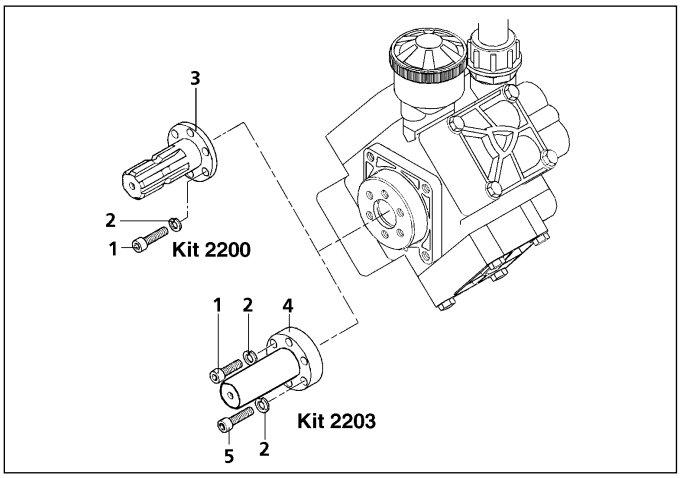


Figure 4. Male Splined Shaft Kit 9910-KIT2200 and Solid Shaft Kit 9910-KIT2203

Parts List for 9910-KIT2204

REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
1	9910-160671	Bolt	3
2	9910-200231	Washer	10
3	9910-620470	Bolt	3
4	9910-650380	Spring	1
5	9910-620340	Bolt	4
6	9910-620270	Shaft	1
7	9910-320630	Eye bolt	1
8	9910-320620	Washer	1
9	9910-320610	Wing nut	1
10	9910-320131	Washer	1
11	9910-320130	Nut	1
12	9910-650350	Pump bracket	1
13	9910-320170	Bolt	1
14	9910-500171	Washer	1
15	9910-500160	Clamp	1
16	9910-320640	Chain	1
17	9910-650340	Chain hook	4
18	9910-320641	Chain	1

Parts List for 9910-KIT2200 and 9910-KIT2203

REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
1	9910-160671	Bolt	3
2	9910-200231	Washer	6
3	9910-620240	Shaft, 6 spline	1
4	9910-621600	Shaft, 1 inch	1
5	9910-620470	Bolt	3

Shaft Adapter Kit Installation

Order appropriate shaft kit according to chart on page 2.

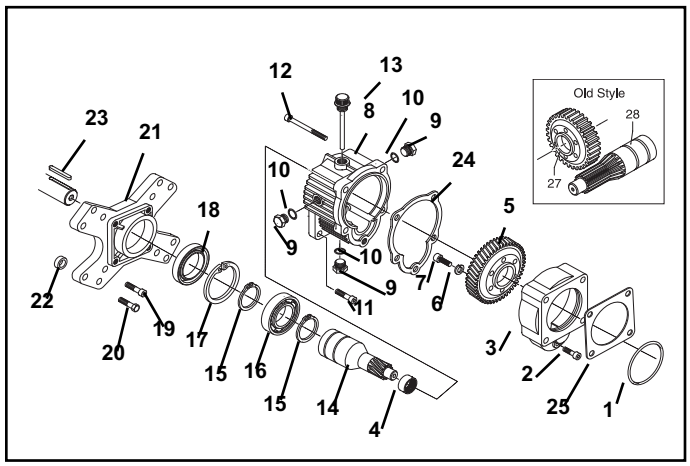
Female Splined Coupler Kit 9910-KIT2204 (See Fig. 3).

1. Install the splined shaft adapter (Ref. 6) onto the pump shaft and secure with three allen head bolts (Ref. 1) and three washers (Ref. 2).
2. Install the torque arm bracket over the shaft of the pump. Align the holes and secure with the four bolts (Ref. 5) and four washers (Ref. 2) placed in the top two holes in the bracket.
3. Position the clamp (Ref. 15) over the groove in the splined shaft adapter. Install the bolt (Ref. 13) into the clamp.
4. Slide the pump assembly onto the PTO shaft and secure by tightening the bolt (Ref. 13).
5. Attach chains to the bracket and secure to the tractor to prevent rotation of the pump during operation.

Solid Shaft Kit 9910-KIT2203
Male Splined Shaft Kit 9910-KIT2200 (See Fig. 4).

1. Install shaft adapter onto pump and secure with allen bolts and washers.

Parts List for Gear Reduction Kit 9910-KIT1642



REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
1	9910-620561	O-Ring	1
2	9910-180030	Bolt	1
3	9910-621000	Pump Adapter Flange	1
4	9910-620990	Bearing	1
5	9910-651620	Gear	1
6	9910-200231	Lock Washer	6
7	9910-160671	Bolt 1" Long	3
8	9910-620960	Gearbox Body	1
9	2406-0023	Plug	3
10	9910-740290	O-Ring	3
11	9910-540290	Bolt	4
12	9910-621010	Bolt	4
13	9910-1140370	Dipstick	1
14	9910-651610	Pinion Gear	1
15	9910-320240	Retaining Ring (Ext.)	2
16	9910-961780	Bearing	1
17	9910-961790	Retaining Ring (Int.)	1
18	9910-961800	Seal	1
19	9910-651000	Bolt	4
20	9910-961900	Bolt	4
21	9910-1320940	Engine Adapter Flange	1
22	9910-961770	Spacer	4
23	9910-650990	Key	1
24	9910-620950	Gasket	1
25	9910-650270	Gasket	1
27	9910-620980	Gear	1
28	9910-650400	Pinion Gear	1

Ref. No.	Description	Tightening Torque	
		In. Lbs.	Nm
2	Bolt	218.7	24.5
7	Bolt	171.4	19.6
9	Plug	171.4	19.6
11	Bolt	218.7	24.5
12	Bolt	218.7	24.5
19	Bolt	218.7	24.5
20	Bolt	218.7	24.5

Gear Reduction Kit 9910-KIT1642 Installation

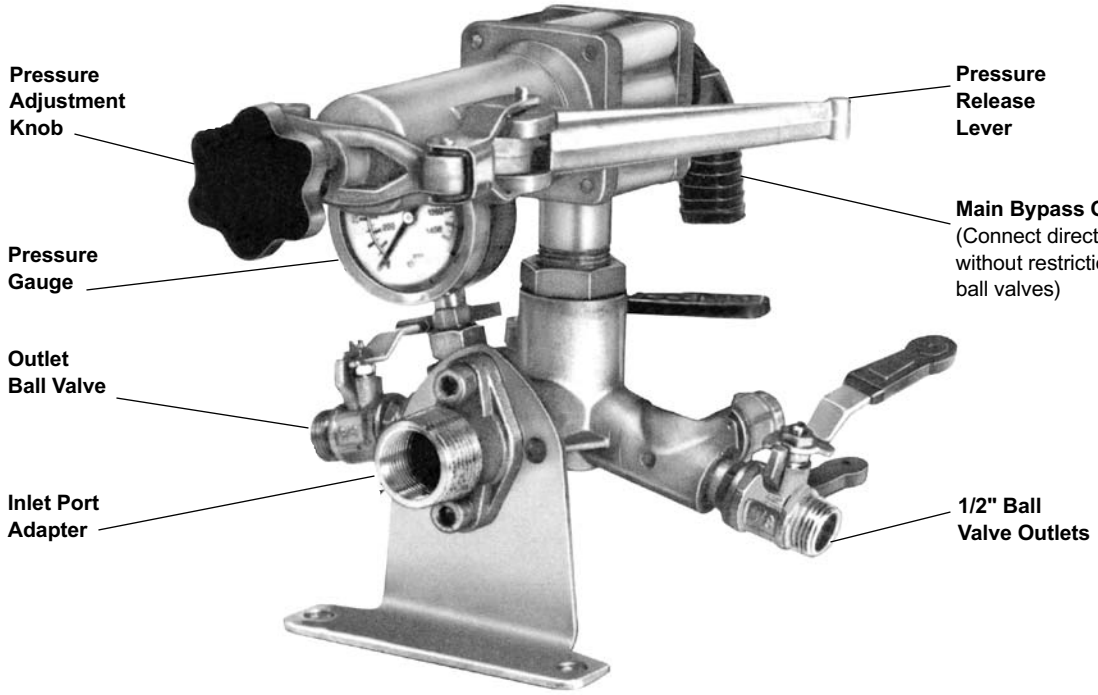
NOTE:
- Use support for all pumps that weigh 25 lbs. or more.
- Use Loctite 242 - Thread Locker, or equivalent, for complete assembly.
- The following reference numbers refer to the gearbox illustration above.

The 9910-KIT1642 gear reducer was designed for direct mounting the 9910-D813, -D1064 and -D1265 onto 8 - 18 hp gas engines with flange mount and 1" solid shafts.

1. On the 9910-D813, -D1064 and -D1265, the square metal plate must be removed from the shaft side of the pump. Lubricate the o-ring (Ref. 1) in the pump adapter flange (Ref. 3). Slip the flange over machined surface of casting of the brass spacer ring installed on the shaft of all the 9910-D813,-D1064 and -D1265 pumps.
2. Install the pump gear (Ref. 5) with pilot diameter of gear inserted into the inner-diameter of the pump shaft. Secure firmly onto the shaft using 10x25 mm allen head bolts (Ref. 7) and lock washers (Ref. 6).
3. Align holes in pump adapter flange (Ref. 3) with threaded holes in the pump body. Lubricate the gasket (Ref. 24) and place in position on gearbox body (Ref. 8). Install the gearbox body (Ref. 8) on the pump adapter flange (Ref. 3) and secure firmly with 10x75 mm allen head bolts (Ref. 12). Install the 8 x 20 mm allen head bolt (Ref. 2) and securely tighten.
4. Install the engine flange adapter (Ref. 21) raised side out to engine boss, using 5/16"x1"x 24 N.F. allen head bolts (Ref. 19). Lock firmly into place.
5. Insert the long key (Ref. 23) into engine shaft keyway. Align the keyway in the gear reducer input shaft (Ref. 14) and slide the pump and gear reducer onto the engine shaft.
6. Align the holes in gearbox body (Ref. 8) with the threaded holes in the engine flange adapter (Ref. 21). Insert the 8x25 mm allen head bolts (Ref. 11) through the gearbox body (Ref. 8) and thread into the engine flange adapter (Ref. 21). Securely tighten with the allen wrench provided.
7. Dipstick (Ref. 13) must always be installed or re-installed in the uppermost threaded hole of the gearbox body (Ref. 8). Both the plugs (Ref. 9) and dipstick (Ref. 13) are all interchangeable for gear reduction mounting convenience.
8. Fill the gear case with 90W gear lube. To properly fill, first tighten the bottom drain plug (Ref. 9); second, remove the side level plug (Ref. 9) and the dipstick (Ref. 13). Fill until the gear lube is no higher than the mark on the dipstick.
9. Replace and tighten the side level plug and the dipstick.

Control Unit 9910-GS50GI

The 9910-GS50GI control unit is designed for the control of pressures up to 725 psi and flows up to 48 gpm. It consists of an adjustable pressure relief valve, a manual pressure release lever, and three individual ball valve-controlled, 1/2" O.D., hose barb outlets.



Model 9910-GS50GI shown with Remote Mounting Kit No. 9910-KIT1742.

Installation

Remote Mounting* (Use Kit No. 9910-KIT1742)

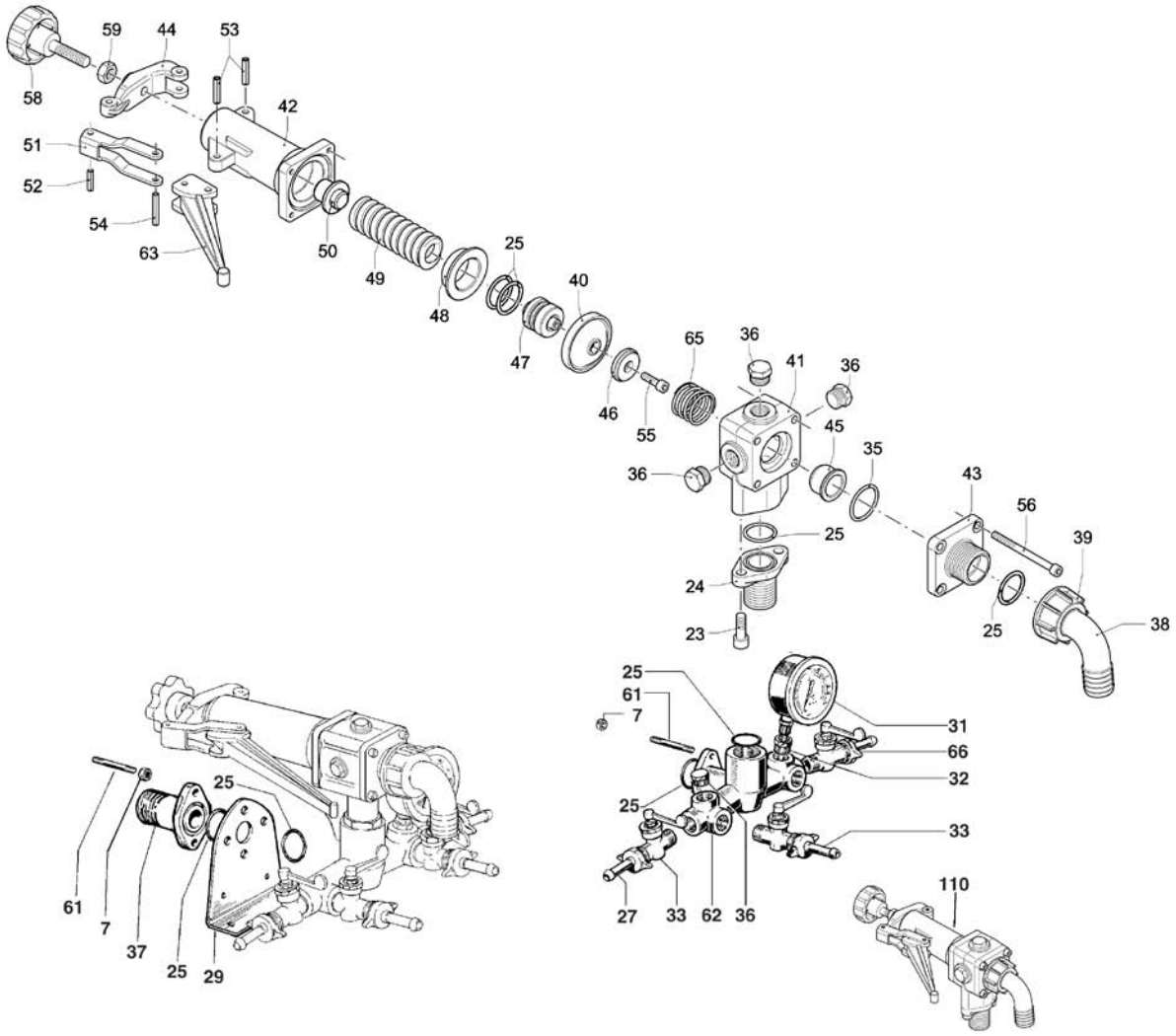
1. Remove the studs (Ref. 61) from the control unit body (Ref. 62).
2. Insert the lubricated o-rings (Ref. 25) into the groove of the relief valve body and the port adapter (Ref. 37).
3. Install the mounting bracket (Ref. 29) in the desired position and secure.
4. Mount the control unit and the port adapter on opposite sides of the mounting bracket and secure with studs (Ref. 61).
5. With a high pressure hose, connect the NPT fitting on the control unit to the NPT fitting on the discharge manifold of the pump.
6. Connect the bypass hose to the bypass port hose barb elbow (Ref. 38) and run it unrestricted back to the tank.
7. Connect the desired amount of lines to the outlet port hose barbs (Ref. 33). Unused ports can be shut off with the ball valve, or they can be plugged.

*Refer to the parts list on page 9 for part number references.

Operation

1. Refer to the pump operation instructions for the proper operation of the pump.
2. The control unit can be put into full bypass mode by lifting the pressure release lever into the up position.
3. With the pressure release lever in the down (pressure) position, pressure can be controlled with the adjustment knob at the end of the relief valve. Turning it clockwise will increase the operating pressure and turning it counterclockwise will decrease the pressure.
4. Flow can be controlled with the ball valves on each of the outlet ports.

Parts List for Control Unit 9910-GS50GI



REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
▪ 7	9910-380240	Nut	2
23	9910-620610	Bolt	2
24	9910-850711	Flange 3/4"	1
•▪25	9910-550350	O-Ring	6
26	9910-680330	Flange	1
27	9910-110131	Fitting 1/2"	3
▪29	9910-320406	Bracket	1
31	2640-0002	Pressure gauge (1500 PSI)	1
32	9910-130170	Pipe reducer	1
33	9910-130491	Right ball valve	2
35	9910-280220	O-Ring	1
• 36	9910-130171	Plug	3
37	9910-550393	Port adapter	1
▪38	9910-550370	Elbow, 90˚	1
39	9910-550242	Barb nut	1
40	9910-390743	Diaphragm, Viton	1
• 41	9910-680412	Valve body	1
42	9910-680423	Spring housing	1
43	9910-680432	Discharge flange	1
44	9910-680442	Tension adj. support	1
45	9910-680460	Valve seat retainer	1
46	9910-680470	Valve seat	1
• 47	9910-680480	Valve piston	1
• 48	9910-680490	Piston valve seat	1

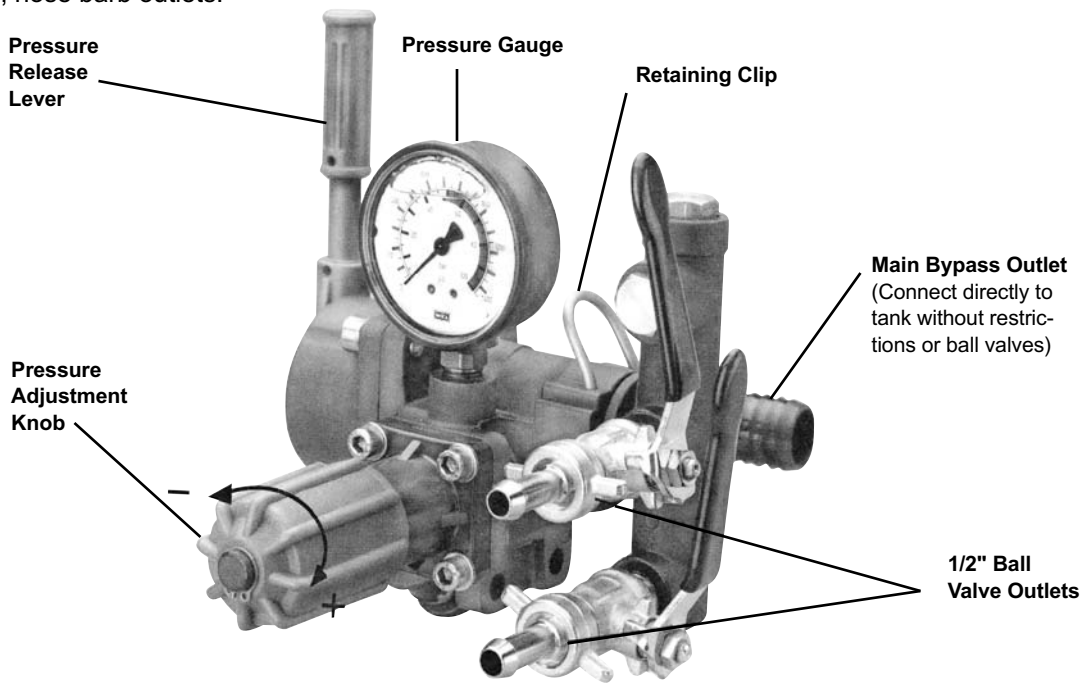
REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
49	9910-680500	Regulating spring	1
50	9910-680510	Spring guide	1
51	9910-680520	Lever guide	1
52	9910-680530	Lever guide pin	1
53	9910-680540	Support pin	2
54	9910-680550	Roll pin	1
55	9910-680700	Bolt	1
• 56	9910-680570	Bolt	4
58	9910-660130	Control knob	1
59	9910-180150	Nut	1
61	9910-720390	Stud	2
▪ 62	9910-680400	Control unit body	1
63	9910-680452	Control lever	1
65	9910-320420	Spring	1
66	9910-130492	1/2" barb ball valve	1
• 110	9910-689060	Complete reg valve	1

• Repair Kit No. 9910-KIT1732 consists of: six Ref. 25, one Ref. 35, one Ref. 40, one Ref. 45, one Ref. 46, one Ref. 55, and one Ref. 65.

▪ Remote mounting kit 9910-KIT1742 consists of: two Ref. 7, one Ref. 25, one Ref. 29, one Ref. 37, and two Ref. 61.

Control Unit 9910-VDR50

The Model 9910-VDR50 Control Unit is designed for the control of pressures up to 725 psi and flows to 35 gpm. It consists of an adjustable pressure relief valve, a manual pressure release lever, and two individual ball valve-controlled, 1/2" O.D., hose barb outlets.



Installation

Direct Mounting*

1. Locate the pump discharge manifold. With o-rings (Ref. 13) lubricated and in position on selector housing inlet (Ref. 17), plug into the discharge manifold of the pump. Lock into place with the retainer clip (Ref. 10) and cotter pin (Ref. 53).
2. Connect the bypass hose to the bypass port hose barb elbow (Ref. 1), and run it unrestricted back to the supply tank.
3. Connect the desired number of high pressure outlet hoses to the outlet hose barbs (Ref. 56). The unused hose barb can be shut off with the ball valves provided.

NOTE: For all discharge hoses, use hose with an operating pressure rating that is equal or greater than the maximum pressure rating of the pump.

Remote Mounting*

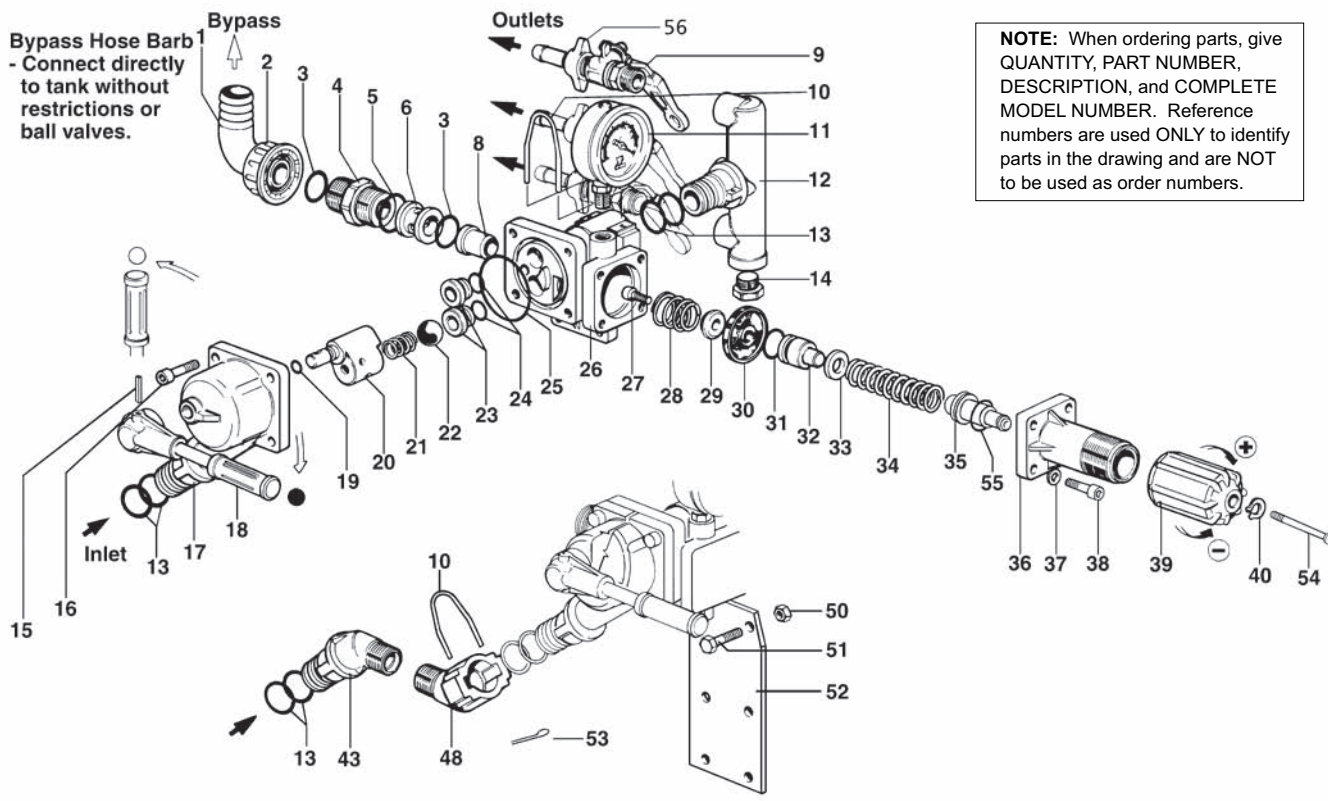
1. Install the mounting bracket (Ref. 52) in the desired position and secure.
2. With the o-rings (Ref.13) lubricated and in position on the selector housing inlet (Ref. 17), assemble into the 3/4" (M) NPT female adapter (Ref. 48). Lock in place with the retainer clip (Ref. 10) and cotter pin (Ref. 53).
3. With o-rings (Ref. 13) lubricated and in position on the 3/4" (M) NPT male adapter (Ref. 43), slip into the pump discharge manifold. Lock in place with the retainer clip (Ref. 1) and the cotter pin (Ref. 53).
4. With high pressure hose, connect the NPT fitting on the discharge manifold of the pump with the NPT fitting on the control unit.
5. Connect the bypass hose to the bypass hose barb elbow (Ref.1), on the control unit and run it unrestricted back to the tank.
6. Connect the desired number of high pressure outlet hoses to the outlet hose barbs (Ref. 56). Unused hose barbs can be shut off with the ball valves provided.

*Refer to the parts list on page 11 for part number references.

Operation

1. Refer to the pump operation instructions for the proper operation.
2. The control unit can be put into full bypass mode by turning the pressure release lever (Ref. 18) counterclockwise as far as it will go.
3. With the pressure release lever (Ref. 18) rotated clockwise to pressure position, pressure can be adjusted by rotating the pressure adjustment knob (Ref. 39) clockwise for more pressure or counterclockwise for less pressure.
4. Flow can be controlled by ball valves on each of the outlet ports.

Parts List for Control Unit 9910-VDR50

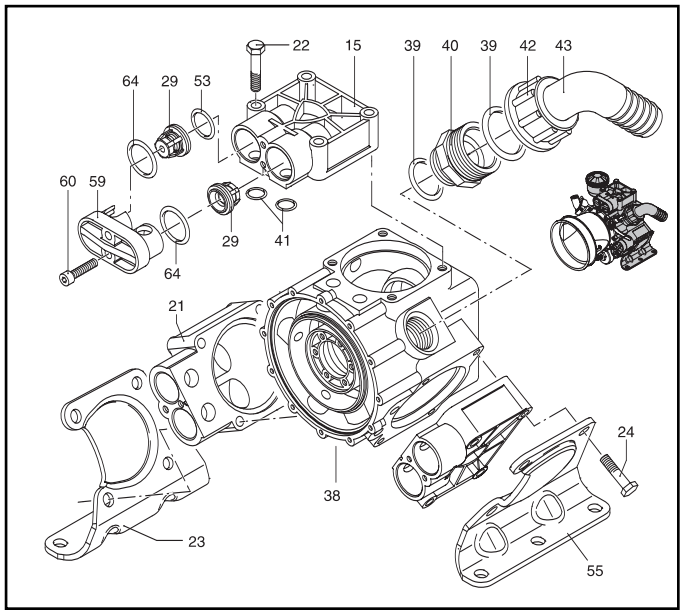


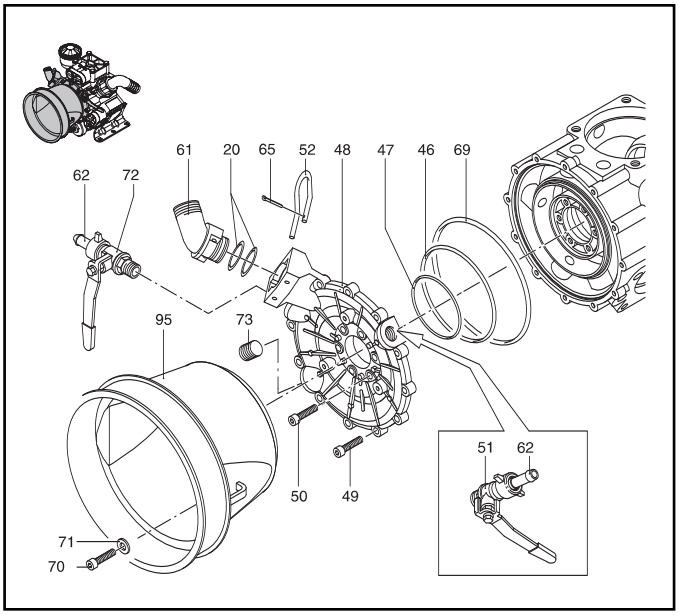
NOTE: When ordering parts, give QUANTITY, PART NUMBER, DESCRIPTION, and COMPLETE MODEL NUMBER. Reference numbers are used ONLY to identify parts in the drawing and are NOT to be used as order numbers.

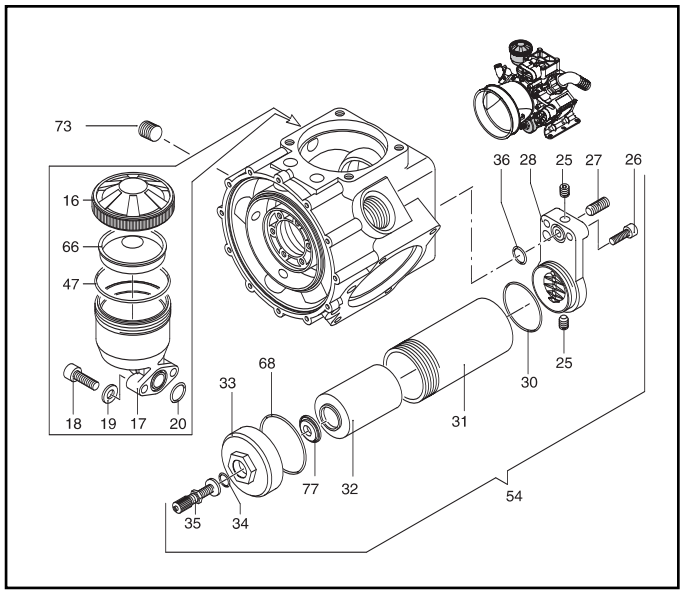
REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
1	9910-550370	Hose Barb	1
2	9910-550242	Nut	1
3	9910-550350	O-ring	2
4	9910-1040780	Port Adapter	1
5	9910-550040	O-ring	1
6	9910-1040670	Spacer	1
8	9910-1040660	Valve Seat	1
9	9910-130491	Ball Valve w/o hose barb assy.	2
10	9910-1040690	Retainer Clip	2
11	9910-550545	Gauge	1
12	9910-1040680	Outlet Manifold	1
13	9910-390180	O-ring	8
14	9910-130171	Plug	2
15	9910-1040820	Pin	1
16	9910-180030	Bolt	4
17	9910-1040720	Selector Housing	1
18	9910-1040730	Pressure Release Lever	1
19	9910-1080200	O-ring	1
20	9910-1040700	Selector Body	1
21	9910-850680	Spring	1
22	9910-850660	Ball	1
23	9910-850650	Seat	2
24	9910-740290	O-ring	2
25	9910-1040710	O-ring	1
26	9910-1040600	Main Body	1

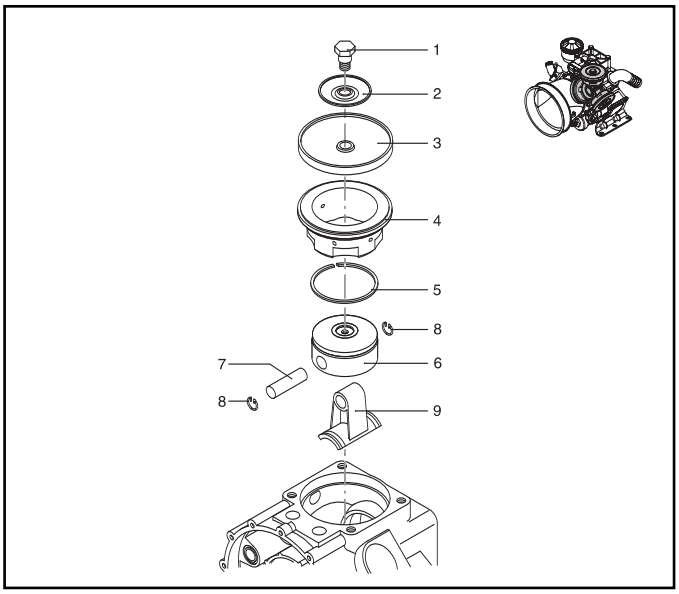
REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
27	9910-680560	Bolt	1
28	9910-1040650	Spring	1
29	9910-1040640	Valve Cap	1
30	9910-1040630	Diaphragm	1
31	9910-880830	O-ring	1
32	9910-1040620	Piston	1
33	9910-850440	Spacer	1
34	9910-1040830	Spring	1
35	9910-394770	Spring Guide	1
36	9910-1040610	Spring Guide Body	1
37	9910-550331	Washer	4
38	9910-780330	Bolt	4
39	9910-394790	Knob	1
40	9910-480550	Snap Ring	4
43	9910-1040761	3/4" (M) NPT Male Adapter	1
48	9910-1040771	3/4" (M) NPT Female Adapter	1
49	9910-550210	1" Straight Hose Barb	1
50	9910-390270	Nut	2
51	9910-180370	Bolt	2
52	9910-850690	Mounting Bracket	1
53	9910-1040950	Cotter Pin	2
54	9910-1150650	Bolt	1
55	9910-770130	O-ring	1
56	9910-110130	Hose barb assembly 1/2"	2

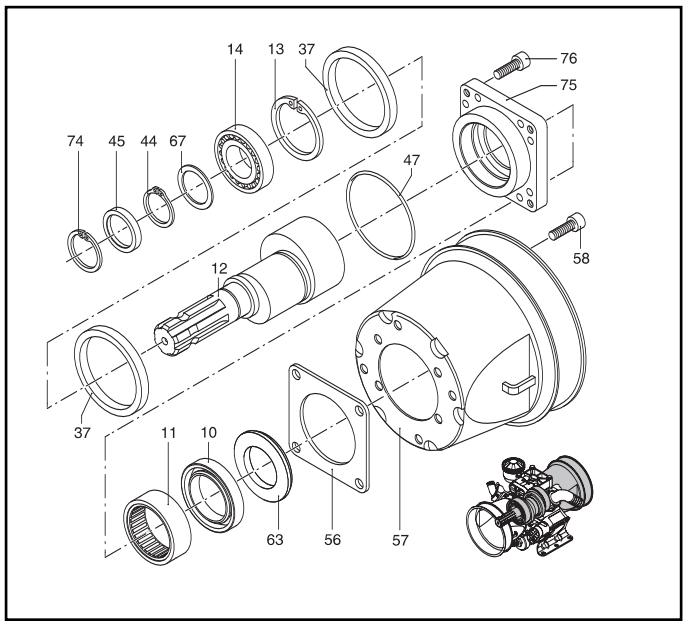
Parts Illustrations for Model 9910-D813











Parts List for Model 9910-D813

REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
1	9910-580360	Retaining bolt	3
2	9910-1040180	Retaining bolt washer	3
3	9910-1040080	Diaphragm, Desmopan (Std.)	3
3A	9910-1040081	Diaphragm, Buna-N (Opt.)	3
3B	9910-104008T	Diaphragm, Buna-N with Teflon Coating (Opt.)	3
4	9910-1500080	Piston sleeve	3
5	9910-650190	Piston ring	3
6	9910-1040120	Piston	3
7	9910-1040070	Connecting pin	3
8	9910-1040270	Snap ring	6
9	9910-1800050	Connecting rod	3
10	9910-1400150	Shaft seal	1
11	9910-650200	Roller bearing	1
12	9910-1800200	Crankshaft	1
13	9910-161050	Retainer ring	1
14	9910-161060	Bearing	1
15	9910-1040551	Head-Right (DX)	2
16	9910-1800060	Oil cap	1
17	9910-680030	Oil reservoir	1
18	9910-680350	Bolt	2
19	9910-380241	Washer	2
20	9910-390180	O-ring	3
21	9910-1040552	Head-Left (SX)	1
22	9910-1480040	Bolt	8
23	9910-1800440	Left base	1
24	9910-750060	Bolt	4
25	9910-1040470	Plug	2
26	9910-320360	Bolt	2
27	9910-1040260	Plug (oil drain)	1
28	9910-1800290	Pulsation damper flange	1
29	9910-1409050	Valve assembly	6
30	9910-540360	O-ring	1
31	9910-1800280	Pulsation damper body	1
32	9910-1800300	Diaphragm	1
33	9910-1800270	Pulsation damper cap	1
34	9910-650542	O-ring	1
35	9910-1800350	Air Valve	1
36	9910-640070	O-ring	1
37	9910-1040340	Retaining ring	2
38	9910-1800140	Pump Body	1
39	9910-250310	O-ring	2
40	9910-540530	Threaded adapter	1
41	9910-770571	O-ring	6
42	9910-540540	Hose barb nut	1
43	9910-540550	Hose barb 1-1/2"	1
44	9910-1040570	Retainer ring	1
45	9910-1040050	Oil seal	1
46	9910-1800341	O-ring	1
47	9910-1040060	O-ring	3
48	9910-1800150	Manifold	1
49	9910-1040370	Bolt	12
50	9910-780060	Bolt	6
51	9910-130491	Outlet ball valve w/o barb	1
52	9910-1040690	Retainer clip	1
53	9910-620030	O-ring	6
54	9910-KIT1536	Pulsation damper assy	1
55	9910-1800430	Right base	1
56	9910-1400140	Flange	1
57	9910-1500350	Shield	1
58	9910-820670	Bolt	4
59	9910-1300190	Valve retainer	3
60	9910-620610	Bolt	6
61	9910-1040760	Outlet adapter (3/4" NPT)	1
62	9910-110131	Hose barb	2
63	9910-1400110	Flange	1
64	9910-540361	O-ring	6
65	9910-1040950	Cotter pin	1
66	9910-680040	Oil breather cap	1
67	9910-1040850	Washer	1
68	9910-650560	Dampener o-ring	1
69	9910-1400120	O-ring	1
70	9910-1343510	Bolt	3
71	9910-881710	Washer	3
72	9910-130492	Outlet ball valve w/ barb	1
73	9910-1800240	Plug	2
74	9910-1460490	Snap ring	1
75	9910-1800210	Flange	1
76	9910-180030	Bolt	8
77	9910-1800311	Plate	1

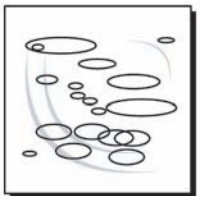
Ref. No.	Description	Tightening Torque	
		In. Lbs.	Nm
1	Bolt	262.5	29.4
22	Bolt	435.5	49.0
24	Bolt	320.8	36.1
26	Bolt	171.4	19.6
49	Bolt	87.5	9.8
50	Bolt	87.5	9.8
58	Bolt	87.5	9.8
60	Bolt	435.5	49.0
73	Plug	87.5	9.8
76	Bolt	87.5	9.8

9910-KIT2479 Diaphragm Kit Desmopan

Ref. No.	Qty.
3	3
32	1
41	6

9910-KIT1963 Valve Kit

Ref. No.	Qty.
29	6
64	6

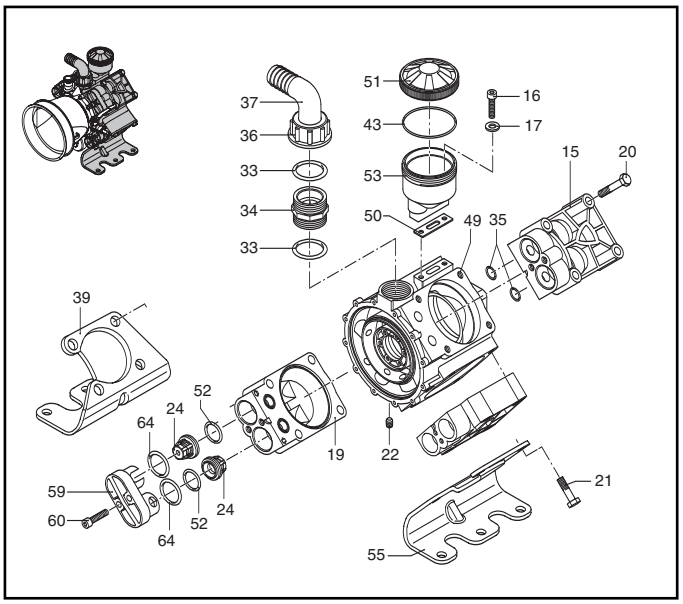


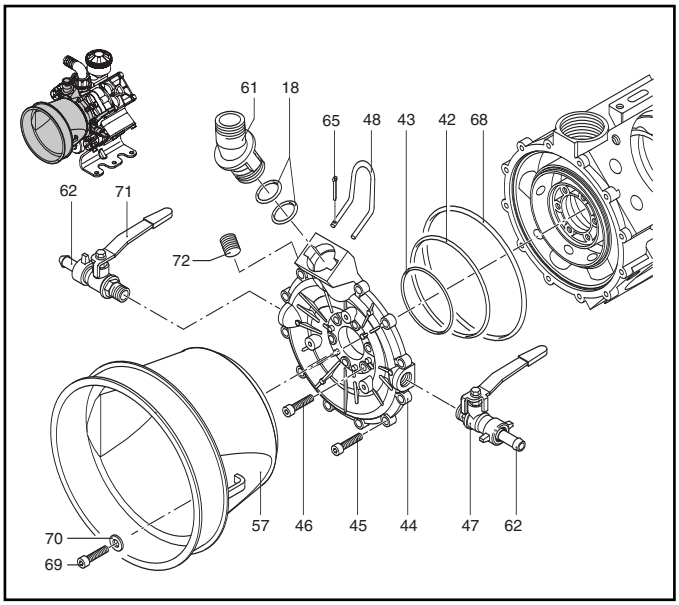
9910-KIT2376 O-Ring Kit

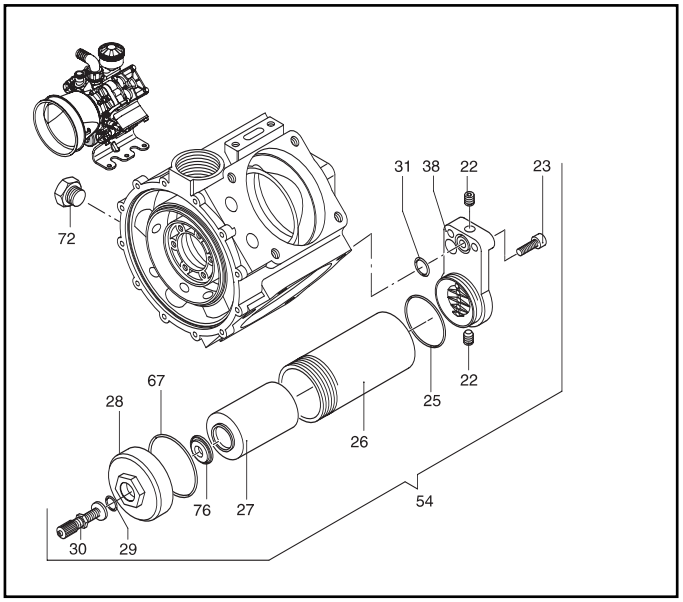
Ref. No.	Qty.
20	3
30	1
36	1
39	2
41	6
46	1
47	3
53	6
64	6
69	1

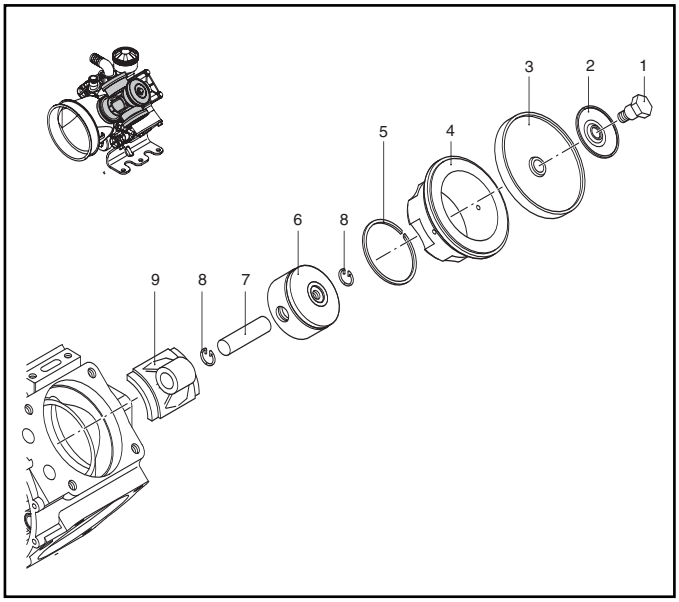
NOTE: When ordering parts, give QUANTITY, PART NUMBER, DESCRIPTION, and COMPLETE PUMP MODEL NUMBER. Reference numbers are used ONLY to identify parts in the drawing and are NOT to be used as order numbers.

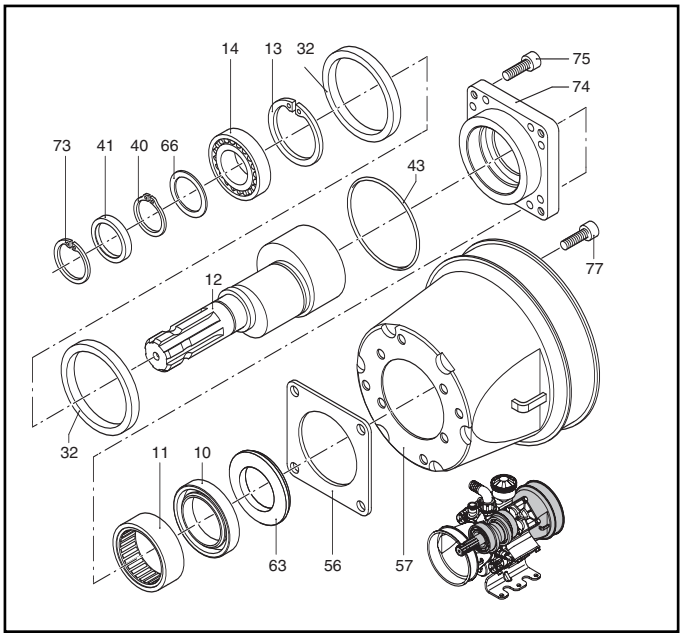
Parts Illustrations for Model 9910-D1064











Parts List for Model 9910-D1064

REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
1	9910-580360	Retaining bolt	4
2	9910-1040180	Retaining bolt washer	4
3	9910-1040080	Diaphragm, Desmopan (Std.)	4
3A	9910-1040081	Diaphragm, Buna-N (Opt.)	4
3B	9910-104008T	Diaphragm, Buna-N with Teflon Coating (Opt.)	4
4	9910-1500080	Piston sleeve	4
5	9910-650190	Piston ring	4
6	9910-1040120	Piston	4
7	9910-1040070	Connecting pin	4
8	9910-1040270	Snap ring	8
9	9910-1800050	Connecting rod	4
10	9910-1400150	Shaft seal	1
11	9910-650200	Roller bearing	1
12	9910-1800200	Crankshaft	1
13	9910-161050	Retainer ring	1
14	9910-1800170	Bearing	2
15	9910-1040551	Head-Right (DX)	2
16	9910-680350	Bolt	2
17	9910-380241	Washer	2
18	9910-390180	O-ring	2
19	9910-1040552	Head-Left (SX)	2
20	9910-1480040	Bolt	8
21	9910-750060	Bolt	8
22	9910-1040470	Plug	3
23	9910-320360	Bolt	2
24	9910-1409050	Valve assembly	8
25	9910-540360	O-ring	1
26	9910-1800280	Pulsation damper body	1
27	9910-1800300	Diaphragm	1
28	9910-1800270	Pulsation damper cap	1
29	9910-650542	O-ring	1
30	9910-1800350	Air Valve	1
31	9910-640070	O-ring	1
32	9910-1040340	Retaining ring	2
33	9910-250310	O-ring	2
34	9910-540530	Threaded Adapter	1
35	9910-770571	O-ring	8
36	9910-540540	Hose barb nut	1
37	9910-540550	Hose barb 1-1/2"	1
38	9910-1800290	Mount	1
39	9910-1820080	Left base	1
40	9910-1040570	Retaining ring	1
41	9910-1040050	Oil seal	1
42	9910-1800341	O-ring	1
43	9910-1040060	O-ring	3
44	9910-1800150	Manifold	1
45	9910-1040370	Bolt	12
46	9910-780060	Bolt	6
47	9910-130491	Outlet ball valve w/o barb	1
48	9910-1040690	Retainer clip	1
49	9910-1820040	Pump body	1
50	9910-750040	Gasket	1
51	9910-1800060	Black cap	1
52	9910-620030	O-ring	8
53	9910-750030	Oil reservoir	1
54	9910-KIT1538	Pulsation damper assy	1
55	9910-1820070	Right base	1
56	9910-1400140	Flange	1
57	9910-1500350	Shield	2
58	9910-820670	Bolt	4
59	9910-1300190	Valve retainer	4

REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
60	9910-620610	Bolt	8
61	9910-1040760	Outlet adapter (3/4" NPT)	1
62	9910-110131	Hose barb	2
63	9910-1400110	Flange	1
64	9910-540361	O-ring	8
65	9910-1040950	Cotter pin	1
66	9910-1040850	Washer	1
67	9910-650560	Dampener o-ring	1
68	9910-1400120	O-ring	1
69	9910-1343510	Bolt	3
70	9910-881710	Washer	3
71	9910-130492	Outlet ball valve w/ barb	1
72	9910-1800240	Plug	2
73	9910-1460490	Snap ring	1
74	9910-1800210	Flange	1
75	9910-180030	Bolt	8
76	9910-1800310	Plate	1
77	9910-820670	Bolt	4

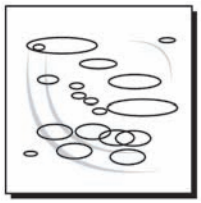
Ref. No.	Description	Tightening Torque	
		In. Lbs.	Nm
1	Bolt	262.5	29.4
16	Bolt	87.5	9.8
20	Bolt	435.5	49.0
21	Bolt	320.8	36.1
23	Bolt	171.4	19.6
45	Bolt	87.5	9.8
46	Bolt	87.5	9.8
60	Bolt	171.4	19.6
72	Plug	87.5	9.8
75	Bolt	87.5	9.8
77	Bolt	87.5	9.8

9910-KIT2480 Diaphragm Kit Desmopan

Ref. No.	Qty.
3	4
27	1
35	8

9910-KIT1964 Valve Kit

Ref. No.	Qty.
24	8
64	8

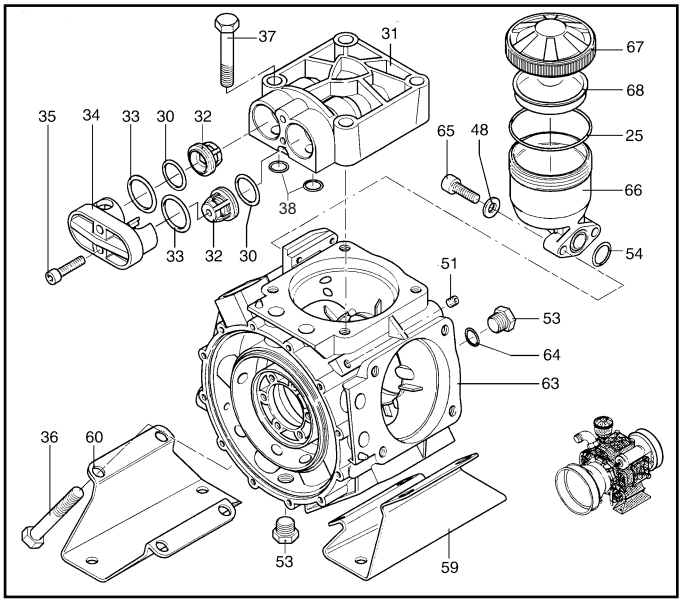


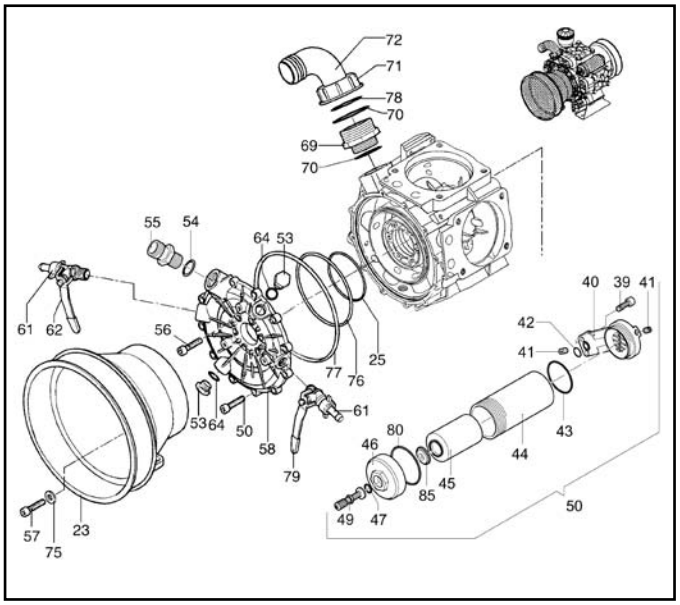
9910-KIT2378 O-Ring Kit

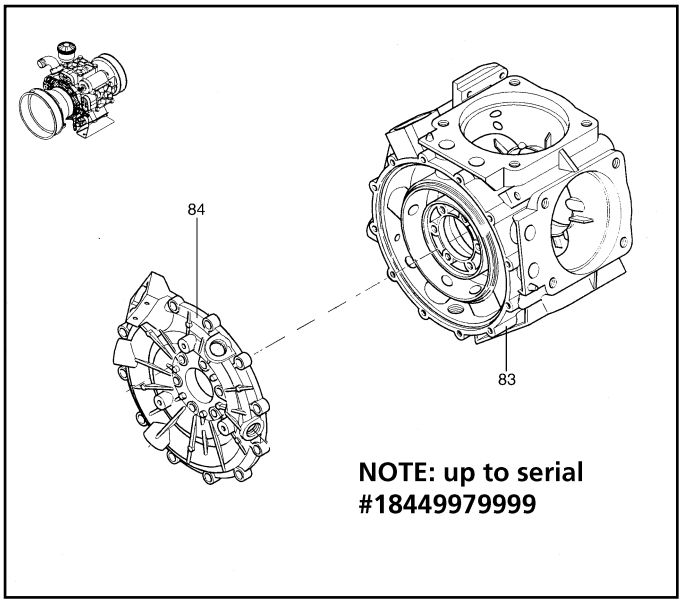
Ref. No.	Qty.
18	2
25	1
31	1
33	2
35	8
42	1
43	3
52	8
64	8
68	1

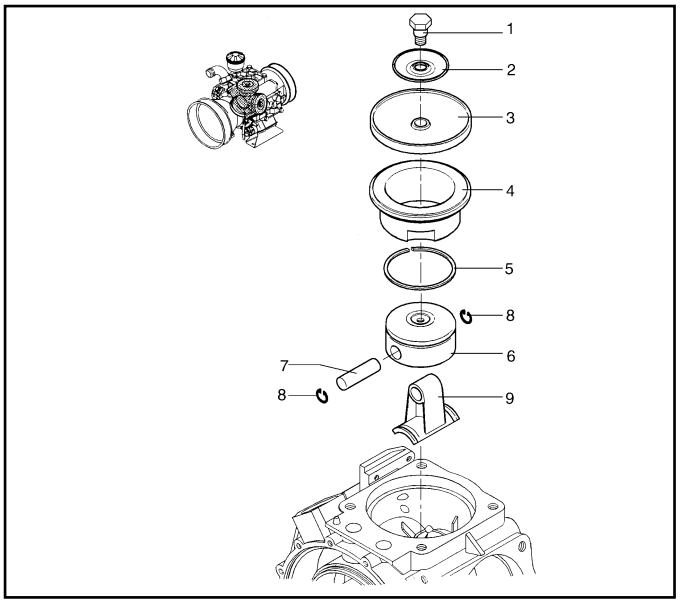
NOTE: When ordering parts, give QUANTITY, PART NUMBER, DESCRIPTION, and COMPLETE PUMP MODEL NUMBER. Reference numbers are used ONLY to identify parts in the drawing and are NOT to be used as order numbers.

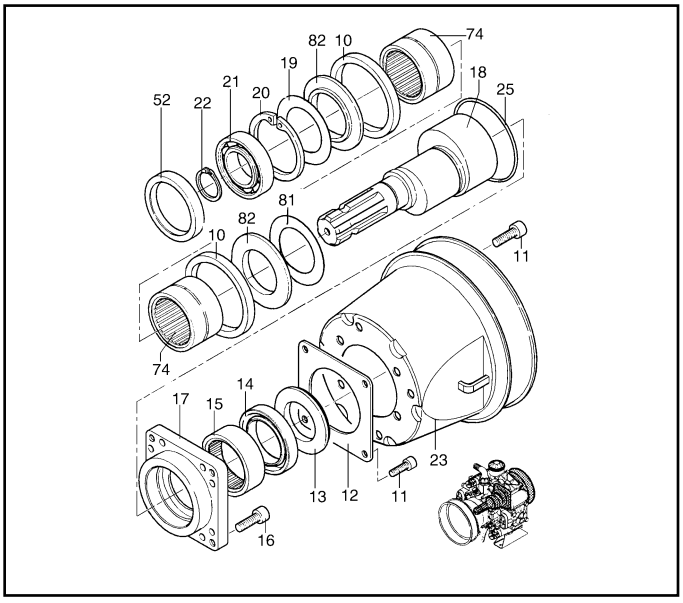
Parts Illustrations for Model 9910-D1265











Parts List for Model 9910-D1265

REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
1	9910-580360	Retaining bolt	5
2	9910-1040180	Diaphragm retainer washer	5
3	9910-1040080	Diaphragm-Desmopan (Std.)	5
3A	9910-1040081	Diaphragm-Buna-N (Opt.)	5
3B	9910-104008T	Diaphragm, Buna-N with Teflon Coating (Opt.)	5
4	9910-1500080	Piston sleeve	5
5	9910-650190	Piston ring	5
6	9910-1040120	Piston	5
7	9910-1040070	Connecting pin	5
8	9910-1040270	Snap ring	10
9	9910-1840110	Connecting rod	5
10	9910-1500181	Retaining ring	2
11	9910-820670	Bolt	4
12	9910-1400140	Flange	1
13	9910-1400110	Support washer	1
14	9910-1400150	Seal	1
15	9910-650200	Needle bearing	1
16	9910-180030	Bolt	8
17	9910-1400040	Flange	1
18	9910-1400320	Crankshaft	1
19	9910-1400090	Spacer	1
20	9910-161050	Retainer ring	1
21	9910-1409010	Bearing	1
22	9910-1040570	Retainer ring	1
23	9910-1500470	Shield	1
24	9910-1400030	Flange	1
25	9910-1040060	O-ring	3
26	9910-160740	Seal ring	1
27	9910-1500290	Bearing	2
28	9910-1500310	Spacer	1
29	9910-1400310	Shaft	1
30	9910-620030	O-ring	10
31	9910-1040551	Head-Right (DX)	2
31	9910-1040552	Head-Left (SX)	3
32	9910-1409050	Valve assembly	10
33	9910-540361	O-ring	10
34	9910-1300190	Valve retainer	5
35	9910-620610	Bolt	10
36	9910-1400260	Bolt	16
37	9910-1500240	Bolt	4
38	9910-770571	O-ring	10
39	9910-320360	Bolt	2
40	9910-1800320	Mount	1
41	9910-1040470	Plug	2
42	9910-640070	O-ring	1
43	9910-540360	O-ring	1
44	9910-1800280	Pulsation damper body	1
45	9910-1800300	Diaphragm	1
46	9910-1800270	Pulsation damper cap	1
47	9910-650542	O-ring	1
48	9910-380241	Washer	2
49	9910-1800350	Air valve	1
50	9910-KIT1538	Pulsation damper assembly	1
51	9910-770070	Plug	1
52	9910-1040050	Oil seal	1
53	2406-0023	Plug	5
54	9910-390180	O-ring	2
55	9910-850740	Threaded adapter (outlet)	1
56	9910-540290	Bolt	18
57	9910-1343510	Bolt	3
58	9910-1840140	Manifold	1
59	9910-1400050	Right base	1
60	9910-1400060	Left base	1
61	9910-110130	Hose barb 1/2"	2
62	9910-130491	Outlet ball valve w/o barb	1
63	9910-1840130	Pump body	1
64	9910-740290	O-ring	3

REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
65	9910-680350	Bolt	2
66	9910-680030	Oil reservoir	1
67	9910-1800060	Black cap	1
68	9910-680040	Oil breather cap	1
69	9910-540530	Threaded adapter	1
70	9910-250310	O-ring	2
71	9910-540540	Hose barb nut	1
72	9910-540550	Hose barb 1-1/2"	1
73	9910-1500320	Spacer	2
74	9910-1500170	Bearing	2
75	9910-881710	Washer	3
76	9910-851360	O-ring	1
77	9910-1400290	O-ring	1
78	9910-390210	O-ring	1
79	9910-130492	Outlet ball valve w/barb	1
80	9910-650560	Dampener o-ring	1
81	9910-1500100	Spacer	1
82	9910-1500150	Spacer	2
83	9910-1400011	Pump body	1
84	9910-1400280	Manifold	1
85	9910-1800310	Plate	1

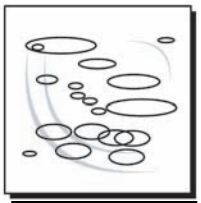
Ref. No.	Description	Tightening Torque	
		In. Lbs.	Nm
1	Bolt	304.8	34.3
11	Bolt	171.4	19.6
16	Bolt	171.4	19.6
35	Bolt	171.4	19.6
36	Bolt	435.5	49.0
37	Bolt	435.5	49.0
39	Bolt	171.4	19.6
53	Plug	171.4	19.6
56	Bolt	171.4	19.6
57	Bolt	171.4	19.6
65	Bolt	87.5	9.8

9910-KIT2100 Diaphragm Kit Desmopan

Ref. No.	Qty.
3	5
38	10

9910-KIT2024 Valve Kit

Ref. No.	Qty.
30	10
32	10
33	10

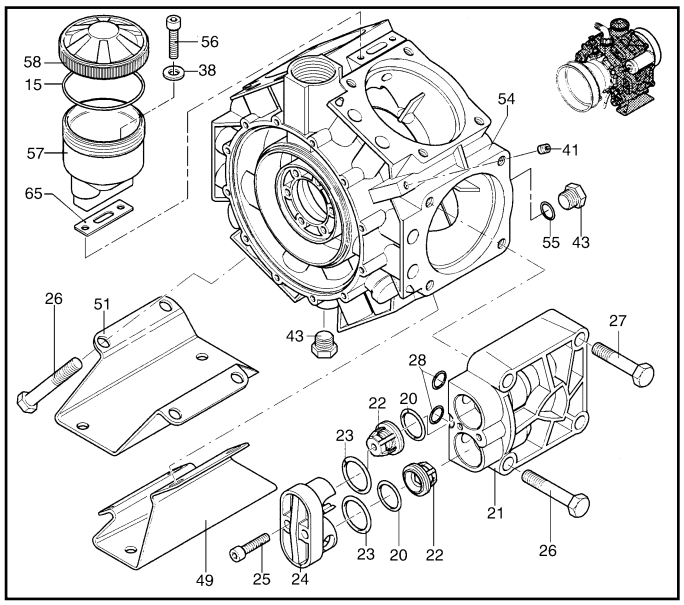


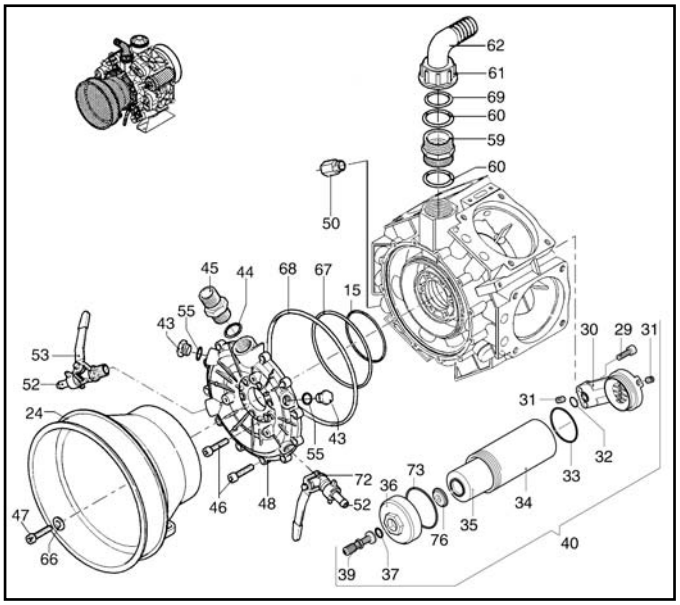
9910-KIT2347 O-Ring Kit

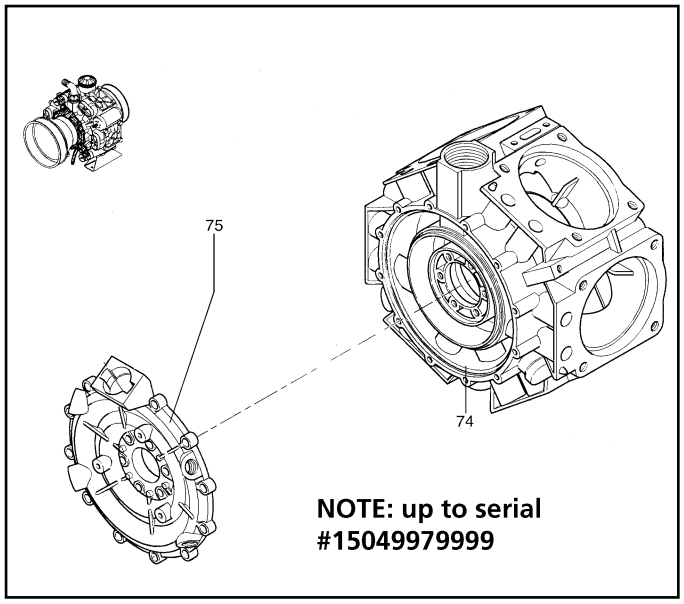
Ref. No.	Qty.
25	3
30	10
33	10
38	10
42	1
43	1
54	2
64	3
70	2
76	1
77	1
78	1

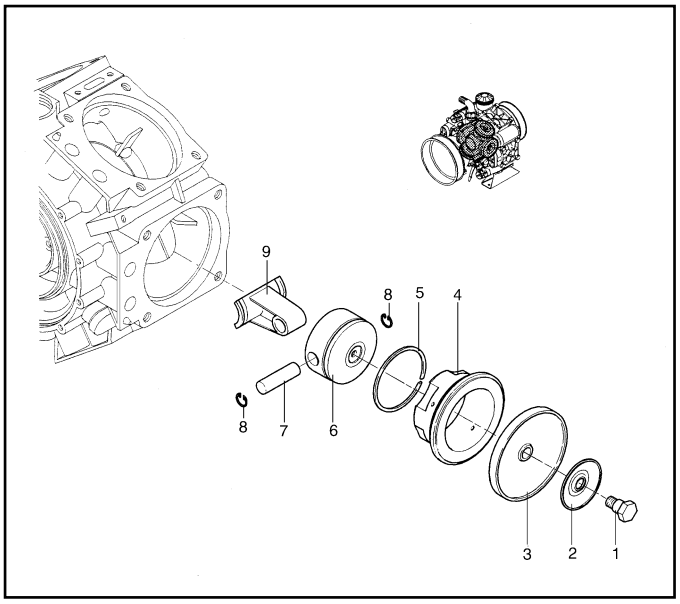
NOTE: When ordering parts, give QUANTITY, PART NUMBER, DESCRIPTION, and COMPLETE PUMP MODEL NUMBER. Reference numbers are used ONLY to identify parts in the drawing and are NOT to be used as order numbers.

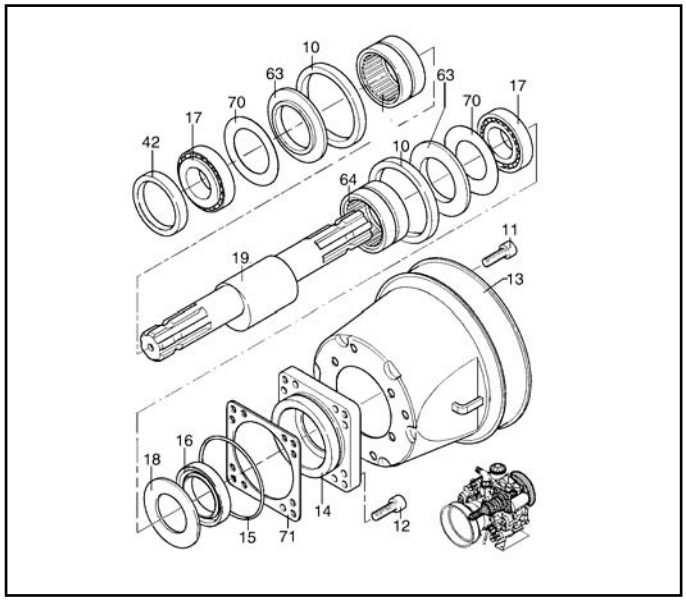
Parts Illustrations for Model 9910-D1516











Parts List for Model 9910-D1516

REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
1	9910-580360	Retaining bolt	6
2	9910-1040180	Diaphragm retainer washer	6
3	9910-1040080	Diaphragm, Desmopan (Std.)	6
3A	9910-1040081	Diaphragm, Buna-N (Opt.)	6
3B	9910-104008T	Diaphragm, Buna-N with Teflon Coating (Opt.)	6
4	9910-1500080	Piston sleeve	6
5	9910-650190	Piston ring	6
6	9910-1040120	Piston	6
7	9910-1040070	Connecting pin	6
8	9910-1040270	Snap ring	12
9	9910-1500160	Connecting rod	6
10	9910-1500181	Retaining ring	2
11	9910-820670	Bolt	4
12	9910-180030	Bolt	8
13	9910-1500470	Shield	1
14	9910-1400030	Flange	1
15	9910-1040060	O-ring	3
16	9910-160740	Oil seal	1
17	9910-1500290	Bearing	2
18	9910-1500310	Spacer	1
19	9910-1400310	Crankshaft	1
20	9910-620030	O-ring	12
21	9910-1040551	Head-Right (DX)	3
21	9910-1040552	Head-Left (SX)	3
22	9910-1409050	Valve assembly	12
23	9910-540361	O-ring	12
24	9910-1300190	Valve retainer	6
25	9910-620610	Bolt	12
26	9910-1500230	Bolt	20
27	9910-1500240	Bolt	4
28	9910-770571	O-ring	12
29	9910-320360	Bolt	2
30	9910-1800320	Mount	1
31	9910-1040470	Plug	2
32	9910-640070	O-ring	1
33	9910-540360	O-ring	1
34	9910-1800280	Damper body	1
35	9910-1800300	Diaphragm	1
36	9910-1800270	Cap	1
37	9910-650542	O-ring	1
38	9910-380241	Washer	2
39	9910-1800350	Air valve	1
40	9910-KIT1538	Pulsation damper assembly	1
41	9910-770070	Plug	1
42	9910-1040050	Oil seal	1
43	9910-880530	Plug	2
44	9910-390180	O-ring	1
45	9910-850740	Threaded adapter	1
46	9910-540290	Bolt	18
47	9910-1343510	Bolt	3
48	9910-1840140	Manifold	1
49	9910-1500040	Right base	1
50	2406-0023	Plug	1
51	9910-1500050	Left base	1
52	9910-110130	Hose barb 1/2"	2
53	9910-130491	Outlet ball valve w/o barb	1
54	9910-1500480	Pump body	1
55	9910-740290	O-ring	3
56	9910-680350	Bolt	2
57	9910-750030	Oil reservoir	1
58	9910-1800060	Black cap	1

REF. NO.	PART NUMBER	DESCRIPTION	QTY. REQ'D.
59	9910-540530	Threaded adapter	1
60	9910-250310	O-ring	2
61	9910-540540	Hose barb nut	1
62	9910-540550	Hose barb 1-1/2"	1
63	9910-1500320	O-ring	2
64	9910-1500170	Bearing	2
65	9910-750040	Gasket	1
66	9910-881710	Washer	3
67	9910-851360	O-ring	1
68	9910-1400290	O-ring	1
69	9910-390210	O-ring	1
70	9910-1400090	Spacer	2
71	9910-1500330	Spacer (0.1 mm)	1
71	9910-1500340	Spacer (0.2 mm)	1
72	9910-130492	Outlet ball valve w/barb	1
73	9910-650560	Dampener o-ring	1
74	9910-1500011	Pump body	1
75	9910-1400280	Manifold	1
76	9910-1800310	Plate	1

Ref. No.	Description	Tightening Torque	
		In. Lbs.	Nm
1	Bolt	262.5	29.4
11	Bolt	87.5	9.8
12	Bolt	171.4	19.6
25	Bolt	171.4	19.6
26	Bolt	435.5	49.0
27	Bolt	435.5	49.0
29	Bolt	171.4	19.6
43	Plug	171.4	19.6
46/47	Bolt	87.5	9.8
50	Plug	171.4	19.6
56	Bolt	87.5	9.8

9910-KIT2113 Diaphragm Kit Desmopan

Ref. No.	Qty.
3	6
28	12

9910-KIT2053 Valve Kit

Ref. No.	Qty.
20	12
22	12
23	12

9910-KIT2349 O-Ring Kit

Ref. No.	Qty.
15	3
20	12
23	12
28	12
32	1
33	1
44	1
55	3
60	2
67	1
68	1
69	1

NOTE: When ordering parts, give QUANTITY, PART NUMBER, DESCRIPTION, and COMPLETE PUMP MODEL NUMBER. Reference numbers are used ONLY to identify parts in the drawing and are NOT to be used as order numbers.

Pump Performance for Series D813, D1064, and D1265

English Standard

Series D813	350 RPM		400 RPM		450 RPM		500 RPM		550 RPM	
PSI	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
0	14.7	2.2	17.0	2.5	18.2	2.9	19.7	3.5	21	3.6
435	13.5	4.1	15.5	4.6	17.3	5.3	19.0	5.9	19.6	6.3
580	13.4	5.3	15.2	6.0	17.1	6.8	18.3	7.6	19.2	8.1
725	13.3	6.4	14.9	7.4	16.9	8.4	17.8	9.3	18.7	9.9

Metric

Series D813	350 RPM		400 RPM		450 RPM		500 RPM		550 RPM	
BAR	L/M	HP	L/M	HP	L/M	HP	L/M	HP	L/M	HP
0	55.6	2.2	64.3	2.5	68.7	2.9	74.6	3.5	81	3.6
30	51.1	4.1	58.7	4.6	65.5	5.3	71.9	5.9	74.2	6.3
40	50.8	5.3	57.7	6.0	64.8	6.8	69.3	7.6	72.6	8.1
50	50.4	6.4	56.5	7.4	63.9	8.4	67.5	9.3	70.8	9.9

English Standard

Series D1064	350 RPM		400 RPM		450 RPM		500 RPM		550 RPM	
PSI	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
0	18.9	2.8	21.5	3.1	24.2	3.9	25.4	4.4	27.9	5.0
435	18.6	4.4	20.7	5.4	23.5	6.7	25.2	7.1	27.6	7.5
580	18.1	5.5	18.7	6.2	21.0	7.8	24.8	8.3	27.2	9.1
725	17.5	8.5	16.3	9.9	18.3	11.1	24.3	12.2	26.7	13.1

Metric

Series D1064	350 RPM		400 RPM		450 RPM		500 RPM		550 RPM	
BAR	L/M	HP	L/M	HP	L/M	HP	L/M	HP	L/M	HP
0	71.6	2.8	81.5	3.1	91.6	3.9	96.1	4.4	105.6	5.0
30	70.3	4.4	78.4	5.4	89.0	6.7	95.2	7.1	104.3	7.5
40	68.4	5.5	70.9	6.2	79.6	7.8	93.7	8.3	103.0	9.1
50	66.2	8.5	61.6	9.9	69.2	11.1	91.9	12.2	101.0	13.1

English Standard

Series D1265	350 RPM		400 RPM		450 RPM		500 RPM		550 RPM	
PSI	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
0	23.8	3.8	26.8	4.5	29.7	5.1	31.9	5.5	33.3	5.8
435	22.4	7.0	25.5	8.0	28.7	9.1	31.4	9.7	32.7	10.2
580	22.2	9.1	25.3	10.4	28.4	11.8	31.1	12.5	32.6	12.8
725	22.1	11.2	25.0	12.3	28.2	14.6	30.8	15.5	31.4	15.6

Metric

Series D1265	350 RPM		400 RPM		450 RPM		500 RPM		550 RPM	
BAR	L/M	HP	L/M	HP	L/M	HP	L/M	HP	L/M	HP
0	90.0	3.8	101.5	4.5	112.6	5.1	120.7	5.5	126.1	5.8
30	84.8	7.0	96.7	8.0	108.5	9.1	118.9	9.7	123.9	10.2
40	84.2	9.1	95.7	10.4	107.5	11.8	117.7	12.5	123.4	12.8
50	83.7	11.2	94.8	12.3	106.8	14.6	116.4	15.5	118.7	15.6

NOTE: "HP" is electrical horsepower. Consult your gas engine supplier for engine horsepower required.

Pump Performance for Series D1516

English Standard

Series D1516		350 RPM		400 RPM		450 RPM		500 RPM		550 RPM	
	PSI	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
	0	27.7	4.5	31.6	5.4	34.9	6.1	36.3	6.7	39.8	7.1
	435	26.4	8.2	30.4	9.6	33.9	10.8	35.9	11.5	39.5	12.0
	580	26.2	10.5	30.2	12.3	33.7	13.9	35.8	14.7	39.3	15.3
	725	26.0	12.9	29.9	15.1	33.5	16.9	35.7	17.9	38.4	18.6

Metric

Series D1516		350 RPM		400 RPM		450 RPM		500 RPM		550 RPM	
	BAR	L/M	HP	L/M	HP	L/M	HP	L/M	HP	L/M	HP
	0	104.7	4.5	119.7	5.4	132.0	6.1	137.5	6.7	150.6	7.1
	30	100.0	8.2	115.2	9.6	128.3	10.8	135.8	11.5	149.4	12.0
	40	99.1	10.5	114.2	12.3	127.7	13.9	135.6	14.7	148.6	15.3
	50	98.3	12.9	113.2	15.1	126.7	16.9	135.3	17.9	145.3	18.6

NOTE: "HP" is electrical horsepower. Consult your gas engine supplier for engine horsepower required.

NOTES

NOTES

Limited Warranty on Hypro Pumps and Other Hypro Products

Hypro warrants to the original purchaser of its products (the "Purchaser") that such products will be free from defects in material and workmanship under normal use for the period of one (1) year for all products except: oil crankcase plunger pumps will be free from defects in material and workmanship under normal use for the period of five (5) years, and accessories will be free from defects in material and workmanship under normal use for the period of ninety (90) days. In addition, Hypro warrants to the purchaser all forged brass pump manifolds will be free from defects in material and workmanship under normal use and from damage resulting from environmental conditions for the life of the pump.

"Normal use" does not include use in excess of recommended maximum speeds, pressures, vacuums and temperatures, or use requiring handling of fluids not compatible with component materials, as noted in Hypro product catalogs, technical literature, and instructions. This warranty does not cover freight damage, freezing damage, normal wear and tear, or damage caused by misapplication, fault, negligence, alterations, or repair that affects the performance or reliability of the product.

THIS WARRANTY IS EXCLUSIVE. HYPRO MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Hypro's obligation under this warranty is, at Hypro's option, to either repair or replace the product upon return of the entire product to the Hypro factory in accordance with the return procedures set forth below. **THIS IS THE EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.**

IN NO EVENT SHALL HYPRO BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, WHETHER FOR BREACH OF ANY WARRANTY, FOR NEGLIGENCE, ON THE BASIS OF STRICT LIABILITY, OR OTHERWISE.

Return Procedures

-All pumps or products *must* be flushed of *any* chemical (ref. OSHA Section 0910.1200 (d)(e)(f)(g)(h)) and hazardous chemicals *must* be labeled before being shipped* to Hypro for service or warranty consideration. Hypro reserves the right to request a Material Safety Data sheet from the Purchaser for any pump or product Hypro deems necessary. Hypro reserves the right to "disposition as scrap" pumps or products returned which contain unknown substances, or to charge for any and all costs incurred for chemical testing and proper disposal of components containing unknown substances. Hypro requests this in order to protect the environment and personnel from the hazards of handling unknown substances.

For technical or application assistance, call the **Hypro Technical/Application number: 1-800-445-8360.**
To obtain service or warranty assistance, call the Hypro Service and Warranty number: 1-800-468-3428;
or call the Hypro Service and Warranty FAX: (651) 766-6618.
Be prepared to give Hypro full details of the problem, including the following information:

1. Model number and the date and from whom you purchased your pump.
2. A brief description of the pump problem, including the following:
   - Liquid pumped. State the pH and any non-soluble materials, and give the generic or trade name.
   - Temperature of the liquid and ambient environment.
   - Suction lift or vacuum (measured at the pump).
   - Discharge pressure.
   - Size, type, and mesh of the suction strainer.
   - Drive type (gas engine/electric motor; direct/belt drive; tractor PTO) and rpm of pump.
   - Viscosity (of oil, or other than water weight liquid).
   - Elevation from the pump to the discharge point.
   - Size and material of suction and discharge line.
   - Type of spray gun, orifice size, unloader/relief valve.

Hypro may request additional information, and may require a sketch to illustrate the problem.
Contact the factory to receive a return material authorization before sending the product. All pumps returned for warranty work should be sent shipping charges prepaid to:

HYPRO
Attention: Service Department
375 Fifth Avenue NW
New Brighton, Minnesota 55112

* Carriers, including U.S.P.S., airlines, UPS, ground freight, etc., require specific identification of any hazardous materials being shipped. Failure to do so may result in a substantial fine and/or prison term. Check with your shipping company for specific instructions.

HYPRO®
Pentair Water
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