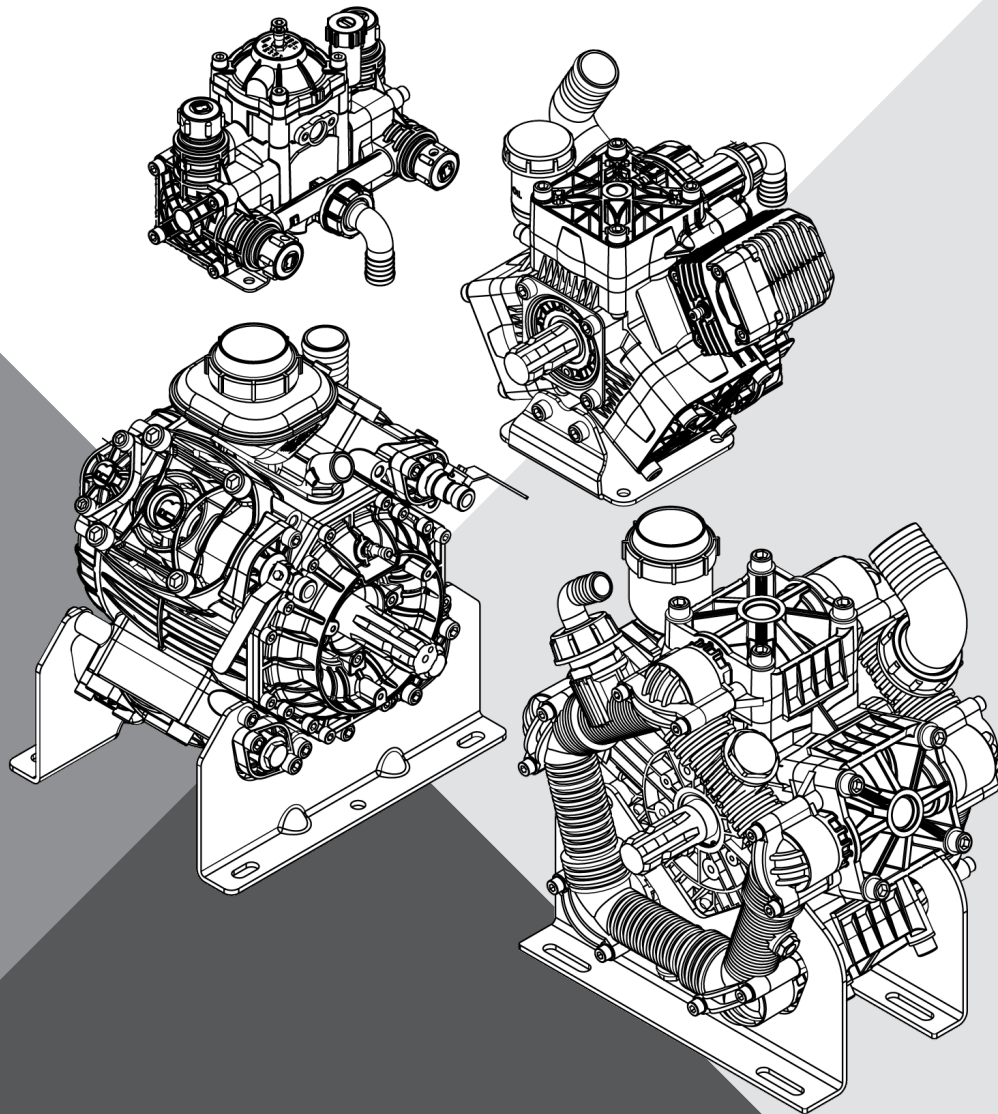




# DIAPHRAGM PUMPS



## INSTALLATION AND OPERATION MANUAL

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# TABLE OF CONTENTS

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Safety Information .....	3
General Information .....	5
Installation and Operations .....	6
Maintenance .....	8
Low Pressure 15 Bar	
Performance & Specifications .....	10
Installation .....	11
Replacement Parts List.....	12
Medium Pressure 20-40 Bar	
Performance & Specifications .....	18
Installation .....	20
Replacement Parts List.....	24
High Pressure 50 Bar	
Performance & Specifications .....	32
Installation .....	33
Replacement Parts List.....	34
Troubleshooting.....	38
Warranty.....	40

# SAFETY INFORMATION

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**Save these instructions:** This manual contains important instructions that should be followed during installation, operation, and maintenance of the product.

## SAFETY SYMBOLS

**⚠ CAUTION** Caution is used to indicate the presence of a hazard, which will or may cause minor injury or property damage if the notice is ignored

**⚠ WARNING** Warning denotes that a potential hazard exists and indicates procedures that must be followed exactly to either eliminate or reduce the hazard, and to avoid serious personal injury, or prevent future safety problems with the product.

**⚠ DANGER** Danger is used to indicate the presence of a hazard that will result in severe personal injury, death, or property damage if the notice is ignored.

**⚠** This is the safety alert symbol. When you see this symbol on your pump or in this manual, look for one of the following signal words and be alert to the potential for personal injury.

The word **NOTE** indicates special instructions that are important but not related to hazards

## CALIFORNIA PROPOSITION 65 WARNING

**⚠ WARNING** This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

## PACKAGING INSPECTION

When the unit is received, look for any product damage as you unpack the item. If any damage is present or parts are missing, do not attempt to operate pump. Use this manual to determine that all parts are properly installed. If you are in doubt, do not operate the pump.

Before you start first, refer to local codes to ensure safety and regulatory compliance.

## GENERAL SAFETY

Carefully read and follow all safety instructions in this manual and on the unit itself. Failure to comply with the safety instructions could result in personal injury and/or property damage!

Know the pump application, limitations, and potential hazards. Follow all applicable local and state codes and regulations.

Keep safety labels in good condition, replacing any missing or damaged labels.

Personal Safety:

- ◆ Wear safety glasses at all times when working with pumps.
- ◆ Keep work area clean, uncluttered and properly lighted. Replace all unused tools and equipment.
- ◆ Keep visitors at a safe distance from work area.
- ◆ Make workshop child-proof with padlocks, master switches, and by removing starter keys.

**⚠ DANGER** Do not pump flammable or explosive fluids such as gasoline, fuel oil, kerosene, etc. Do not use in explosive atmospheres. Do not pump asphalt sealer, roofing compounds, concrete sealers, or any two-step curing products. The pump should only be used with liquids compatible with the pump materials. Failure to follow this notice can result in severe personal injury and/or property damage and will void the product warranty.

Never use your hand to check the condition of hydraulic lines or hoses. If hydraulic fluid penetrates the skin, get medical attention immediately. Failure to get proper medical attention may result in loss of limb or life. The safest way to check hydraulic lines is by holding a piece of cardboard next to the hydraulic line or hose.

**⚠ WARNING** The sound pressure level of the pump may exceed 80dBA. Observe all safety precautions when operating the pump within close proximity for extended periods by wearing hearing protectors. Extended exposure to elevated sound levels will result in permanent loss of hearing acuteness, tinnitus, tiredness, stress, and other effects such as loss of balance and awareness.

Verify that pump shaft rotates freely prior to engaging the pump drive.

## SAFETY INFORMATION

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- ◆ Do not pump at pressures higher than the maximum recommended pressure.
- ◆ Operate the pump between a temperature ranges of 45° to 140°F [7° to 60°C].
- ◆ Make certain that the power source conforms to the requirements of your equipment.
- ◆ Provide adequate protection in guarding around the moving parts such as shafts and pulleys.
- ◆ Disconnect the power before servicing.
- ◆ Release all pressure within the system before servicing any component.
- ◆ Drain all liquids from the system before servicing.
- ◆ Secure the discharge line before starting the pump. An unsecured discharge line may whip, resulting in personal injury and/or property damage.
- ◆ Check all hoses for weak or worn condition before each use. Make certain that all connections are tight and secure.
- ◆ Periodically inspect the pump and the system components. Keep free of debris and foreign objects.
- ◆ Perform routine maintenance as required (see maintenance).
- ◆ 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) requirements.
- ◆ Use only pipe, hose, and hose fittings rated for maximum rated pressure of the pump or the pressure at which the pressure relief valve is set at. Do not use used pipe.
- ◆ Do not use these pumps for pumping water or other liquids for human or animal consumption.
- ◆ Do not pressure feed pump inlet.
- ◆ Do not touch an operating motor. Modern motors can operate at high temperatures.
- ◆ Do not handle pump or pump motor with wet hands or when standing on wet or damp surface, or in water.

### HAZARDOUS SUBSTANCE ALERT

1. Always drain and flush 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

# GENERAL INFORMATION

---

## DESCRIPTION AND USES

Hypro Diaphragm pumps are intended for creating or boosting dynamic pressure for non-food purposes with clean and approved fluids in a watery solution which are compatible with the materials of the pump at temperatures between 45° to 140°F [7° to 60°C].

## INTENDED USES

Hypro pressure diaphragm pumps are recommended for spraying 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 small to large-sized sprayers.

Any uses outside of those specified in this manual are considered misuses and are prohibited. Contact Hypro technical service with any questions regarding specific acceptable uses.

### The pump cannot be used with:

- ◆ Watery solutions whose viscosity and density exceed those of water.
- ◆ Chemical solutions for which compatibility with the materials the pump is made is not known.
- ◆ Sea water or water with a high concentration of salt.
- ◆ Fuels and lubricants of all kinds and types.
- ◆ Inflammable liquids or liquefied gases.
- ◆ Food-grade liquids.
- ◆ Solvents and diluents of all kinds and types.
- ◆ Paints of all kinds and types.
- ◆ Liquids at temperatures lower than 7°C or higher than 60°C.
- ◆ Liquids containing granules or solids in suspension.
- ◆ The pump must not be used in places where there are particular conditions, such as corrosive or explosive atmospheres, for example.

## MISUSES

Hypro centrifugal pumps are designed to operate effectively within the specified speed, pressure and environmental ranges. Going outside of these ranges will void the warranty and could cause damage to property, serious injury, or death.

- ◆ Do not run the pump faster than the maximum specified speed.
- ◆ Do not run the pump higher than the maximum specified pressure.
- ◆ Do not run pumps when the liquid has exceeded the maximum or minimum temperature limit.
- ◆ Do not pump non-approved liquids.
- ◆ Do not pump water or other liquids for human consumption.
- ◆ Do not operate any Hypro pump under the influence of drugs or alcohol.
- ◆ Do not run the pump dry.
- ◆ Do not run the pump hydraulic motor higher than the specified RPM, pressure or flow.
- ◆ Do not run the pump without adequate suction filter.

# INSTALLATION AND OPERATION

## PUMP PLUMBING

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

1. Always mount pump with oil sight tube in upright position (See Figure 1).
2. The proper selection of hose type and size is vital to optimal performance
  - ◆ Use good quality inlet hose, compatible with the fluids being pumped and with good elasticity to reduce inlet water hammer or pulsation. Be sure that 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 6 feet [1.8meters].
  - ◆ Use only approved high pressure hose on the discharge side of pump.
3. Most ports are provided with hose barb connections. Use good quality hose clamps and tighten them securely.
4. It is recommended to install strainer of 32 Mesh size having double flowrate of the pump at the suction side, to prevent diaphragm failures.

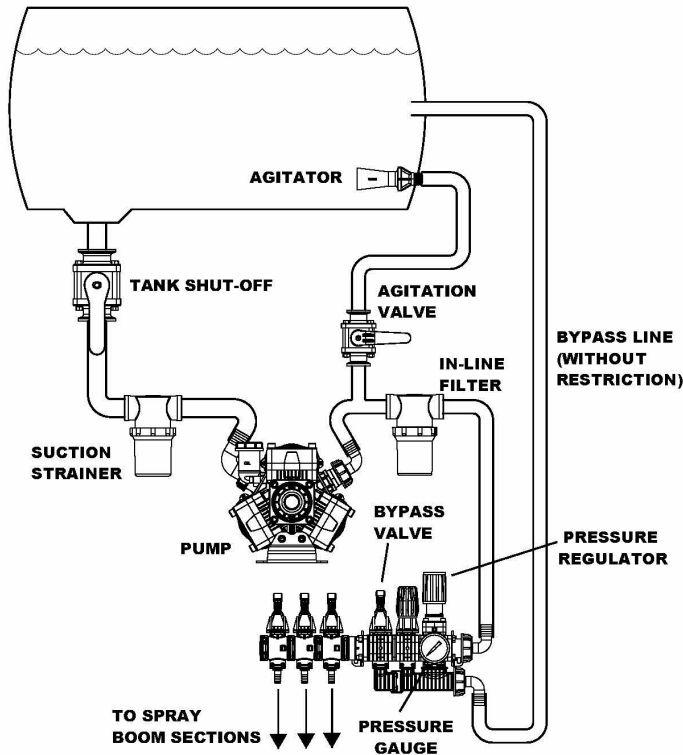


FIGURE 1

## SHAFT ADAPTER KIT INSTALLATION

Order the appropriate shaft kit according to the chart on Spec Sheet.

1. Mount shaft adapter (Ref. 1A for 9915-KIT1201, Ref 1B for 9915-KIT1202 and Ref. 1B for 9915-KIT1203) onto the pump shaft and secure with 3 bolts (Ref. 2) and 3 washers (Ref. 3).
2. Mount pump/base assembly securely to prevent movement.

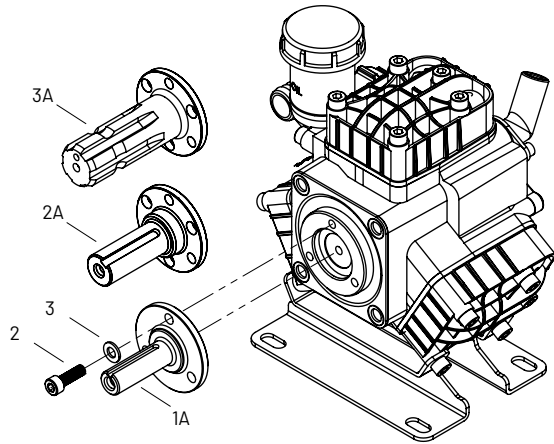


FIGURE 2

# INSTALLATION AND OPERATION

## OPERATION

1. Before start up check that oil is halfway up to 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, non-detergent, SAE 30 weight oil formulated 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 the maximum pressure that you will be operating the pump at. Exercise caution when checking pressure to avoid losing pre-charge.
4. The relief valve bypass port should be connected back to the liquid tank without restrictions. Do not hook bypass line back to the inlet port or inlet hose.
5. Allow the pump to start under low pressure by removing restrictions on the outlet of the pump. The restriction on the pump is removed by rotating the Pressure Release knob on the control unit, fully toward bypass arrow direction.
6. Check oil level daily while pump is running. Start the pump and let it run for approximately one minute at low pressure. Adjust Pressure Release knob to run pump at operating pressure and check the oil sight tub level again to be sure the oil level is correct. Add Hypro oil if necessary.
7. Adjust the pump to the desired pressure by changing the relief valve setting on the control unit, relief valve or unloader. All the outlet valve must be closed as shown in Figure 3.

First back out the pressure regulator adjustment knob to zero. Then rotate the Pressure Release knob to Pressure arrow direction. Adjust the pressure by rotating the relief valve adjustment knob to the desired pressure.

For all discharge hoses, use hose with an operating pressure rating equal to or greater than the maximum pressure rating of the pump. High pressure clamping should be used on all outlet hose connections.

**CAUTION** The bypass return outlet on all control units must be connected directly to the tank without restrictions or ball valves.

**WARNING** Always wear safety goggles when working with spring-loaded fasteners or devices.

**WARNING** During the first step, you are strongly advised to start the pump with the regulating valve knob turned to 0 pressure and with the lever in the by-pass position. Maintain this configuration for a couple of minutes so as to lubricate the internal components of the pump and allow the diaphragms to set in position before the pressure is increased.

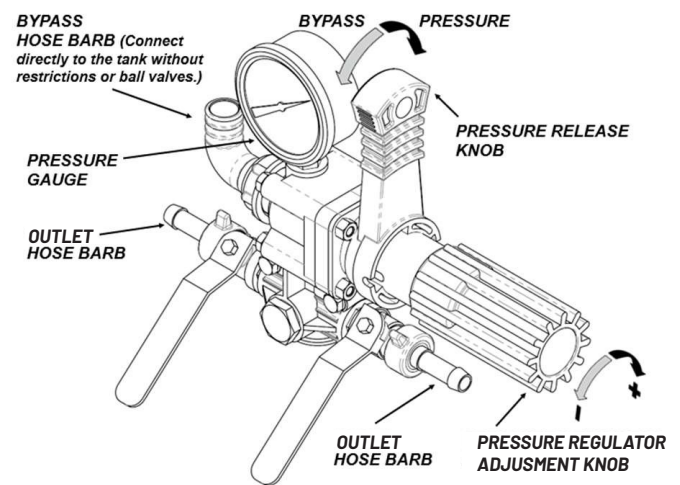


FIGURE 3

# MAINTENANCE

## MAINTENANCE SCHEDULE

REGULAR SERVICE PERIOD Performed at every indicated month or operating hour interval, whichever comes first.		First Use	Each Use	First month or 40 hours	Every 3 months or 500 hours	Every 6 months or 1000 hours
Crankcase Oil	Check Level	X	X			
	Replace			X	X	
Gearbox Oil	Check Level	X	X			
	Replace			X	X	
Pulsation Dampener Pressure (in models with dampeners)	Set to 20% of working PSI	X				
	Replace			X	X	
Diaphragms	Replace				X	
Valves	Check				X	
	Replace					X
O-rings	Check				X	
	Replace					X

## MAINTENANCE INSTRUCTIONS

1. After usage, 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, non-detergent, SAE 30 weight oil formulated to prolong pump life.

### To drain the oil:

1. Remove the drain plug and the oil sight glass covers, and rotate shaft until the oil stops flowing out. Re-install the drain plug.
2. For DP252 and DP302 Series, Remove the oil fill cap, turn the pump upside down and rotate the shaft until oil stops flowing out
3. To fill the pump with oil, slowly pour 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.
4. For winter storage or if a freezing condition will be countered, flush the pump with a 50/50 mixture of water and antifreeze.

**CAUTION** Fill oil to proper level in sight glass. Always make sure all the air is purged out of crankcase prior to operating.

### VALVE REPLACEMENT

Occasionally debris may cause improper seating of the valves or damage to the O-rings. To check for this problem, follow these steps.

Remove the pump manifolds or valve retainer. With removal of that, the valves can easily be removed and inspected for debris and wear. Replace valves, O-rings and manifolds.



# MAINTENANCE

## DIAPHRAGM REPLACEMENT

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

1. Drain oil from crankcase as instructed previously.
2. Remove pump head bolts and heads.
3. Remove the bolt securing the diaphragm (See Figure 4).
4. Remove the old diaphragm and the washer (See Figure 4).
5. Install a new diaphragm. Then turn the crankshaft to bring the piston to its mid-stroke and seat the diaphragm into the sleeve groove.
6. Install the washer and bolts removed in steps 3 and 4.
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.

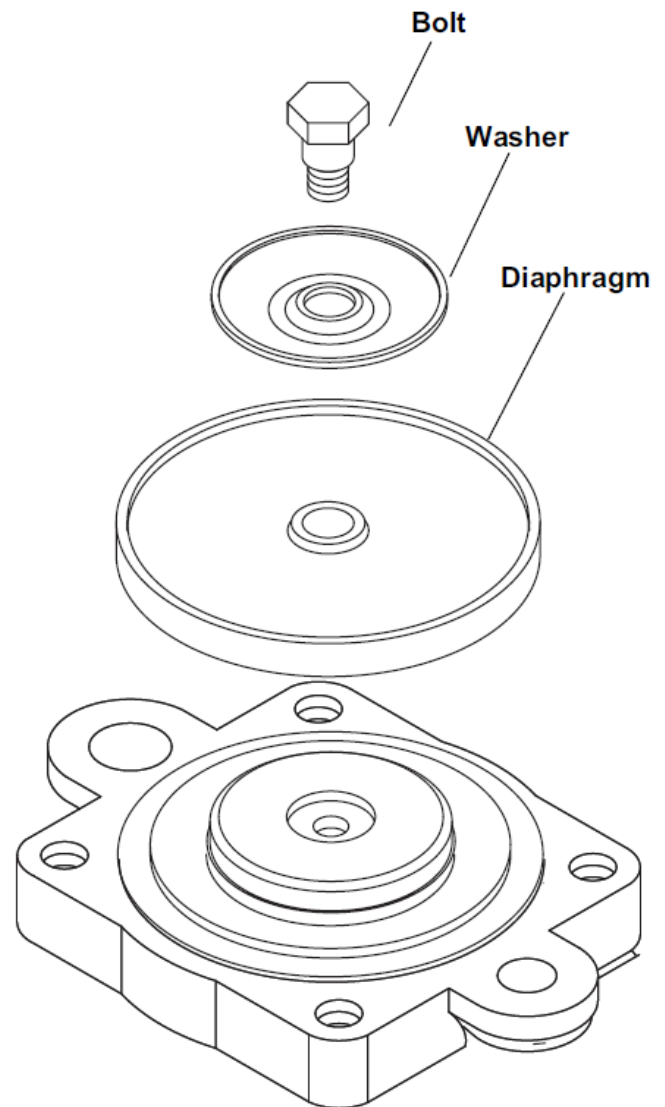
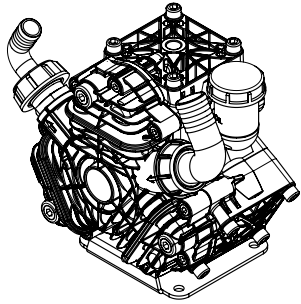
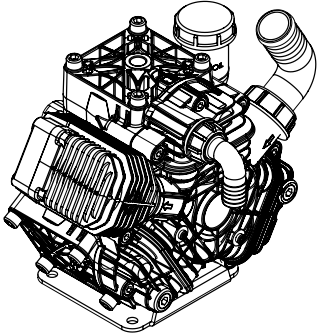


FIGURE 4

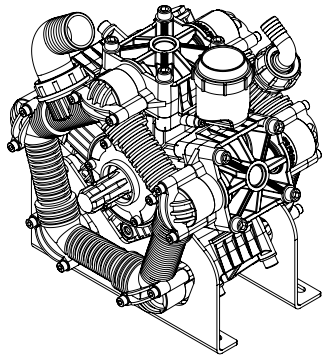
## DIAPHRAGM PUMP: LOW PRESSURE RANGE 15BAR



Model Number	"Max. Flow USGPM [LPM]"	"Max. Pressure PSI [BAR]"	"Max. Speed RPM"	"Power HP [KW]"	No. of Diaphragm
9915-DP803	21.7 [82]	218 [15]	550	3.2 [2.4]	3



Model Number	"Max. Flow USGPM [LPM]"	"Max. Pressure PSI [BAR]"	"Max. Speed RPM"	"Power HP [KW]"	No. of Diaphragm
9915-DP1003	26.8 [102]	218 [15]	550	4.0 [3.0]	3



Model Number	"Max. Flow USGPM [LPM]"	"Max. Pressure PSI [BAR]"	"Max. Speed RPM"	"Power HP [KW]"	No. of Diaphragm
9915-DP2505	63.9 [242]	218 [15]	550	9.5 [7.1]	5

### CONTROL UNITS

Control units are available for easy flow and pressure control of your sprayer system. These units include a manual dump valve and adjustable pressure relief valve to control pressure, a liquid-filled pressure gauge to monitor pressure, and shut-off valves to control flow. Control unit 9915-KIT1004 and 9915-KIT1005 can be remote mounted. Refer to the adjoining chart to select the proper control unit for your pump.

**Oil Capacity:** Oil crankcase capacities are approximate. Fill oil to proper level in sight glass. Always make sure all the air is purged out of crankcase prior to operating

Crankcase Oil Capacity	
Pump Model Series	"Capacity oz. [Litre]"
DP803	24 [0.7]
DP1003	24 [0.7]
DP2505	110 [3.25]

Control Unit Model Number	"Max. Flow USGPM [LPM]"	"Max. Pressure PSI [BAR]"	Pump Model
9915-KIT1004	42 [160]	290 [20]	DP803/DP1003
9915-KIT1005	69 [260]	218 [15]	DP2505

# LOW PRESSURE 15 BAR PERFORMANCE AND SPECIFICATIONS

## CONTROL UNIT KIT INSTALLATION

The control units are designed for control of pressure and flow rate. Use appropriate model (as specified in chart on page 10) to use with particular pump model and pressure/flow ranges.

**NOTE:** Hypro recommends a blue thread locking compound on all threaded fasteners that do not require lock washers.

### Remote Mounting

1. Locate control unit at desired position with mounting holes provided and secure with the bolts and nuts.
2. Use the high pressure hose to connect pump discharge port hose barb to the control unit inlet port.
3. Connect the bypass hose to the bypass hose barb, then run it unrestricted to the supply tank.
4. Connect the desired number of high pressure hoses to the outlet ports on the control valve. Unused Ports can be shut off with ball valves provided.

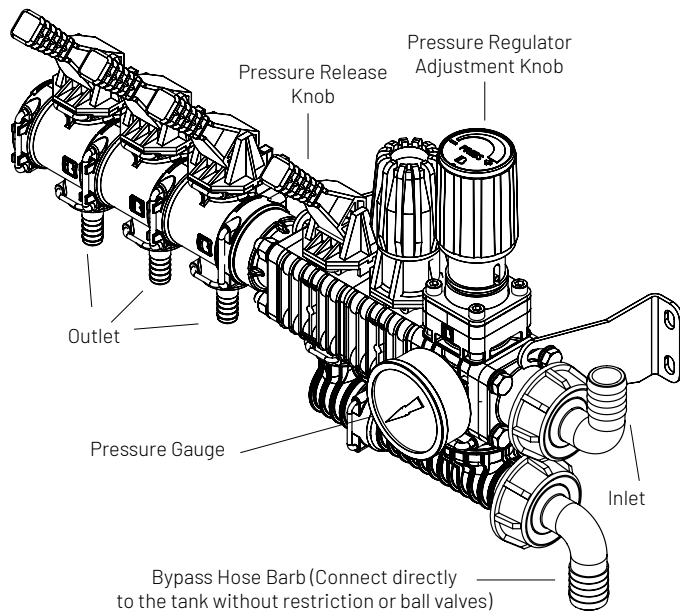


FIGURE 5: MODEL 9915-KIT1004

For all discharge hoses, use hose with an operating pressure rating equal to or greater than the maximum pressure rating of the pump. High pressure clamping should be used on all outlet hose connections.

**WARNING** Always wear safety goggles when working with spring-loaded fasteners or devices.

**WARNING** During the first step, you are strongly advised to start the pump with the regulating valve knob turned to 0 pressure and with the lever in the by-pass position. Maintain this configuration for a couple of minutes so as to lubricate the internal components of the pump and allow the diaphragms to set in position before the pressure is increased.

The restriction on the pump is removed by rotating the Pressure Release knob on the control unit, fully toward bypass arrow direction. First back out the pressure regulator adjustment knob to zero. Then rotate the Pressure Release knob to Pressure arrow direction. Adjust the pressure by rotating the relief valve adjustment knob to the desired pressure

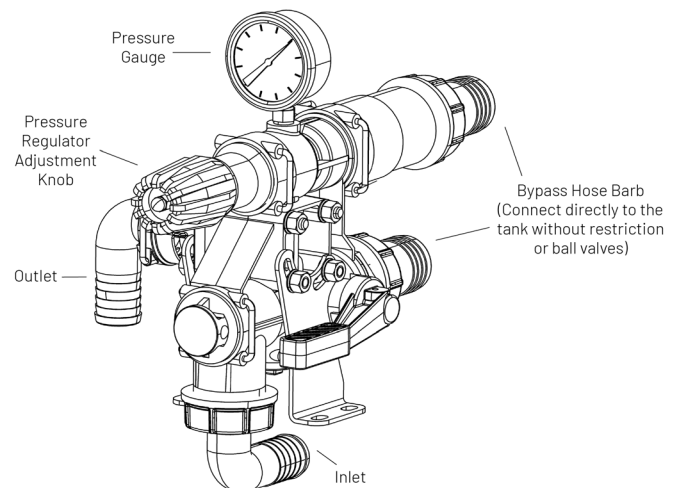


FIGURE 6: MODEL 9915-KIT1005

# LOW PRESSURE 15 BAR REPLACEMENT PARTS

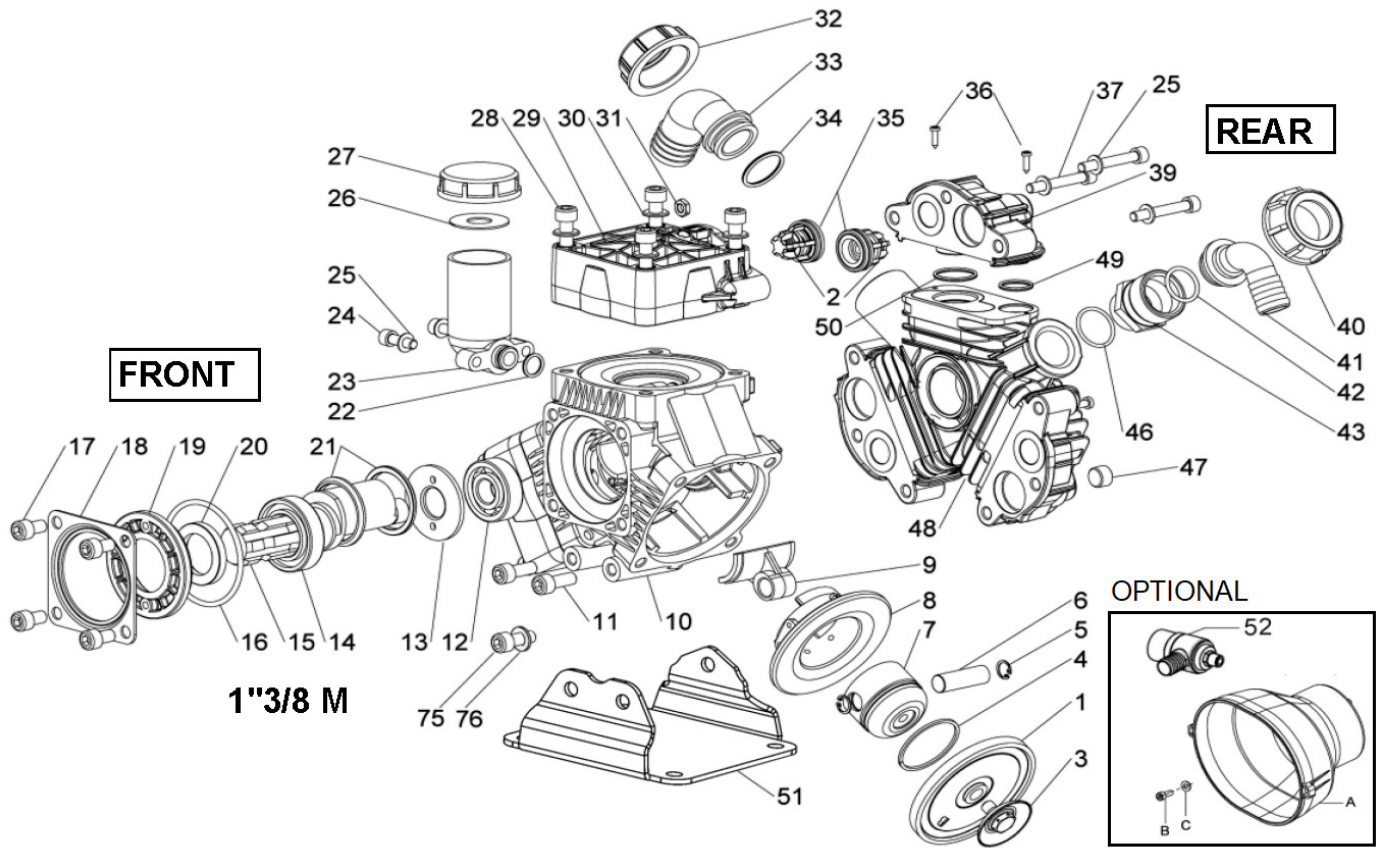


FIGURE 7: MODEL DP803

# LOW PRESSURE 15 BAR REPLACEMENT PARTS

## TORQUE CHART DP803

REF. No.	Qty.	N-m	ft.Lbs
3	3	25	18.5
43	1	20	14.8
47	3	"5 (LOXEAL 55-14)"	"3.7 (LOXEAL 55-14)"
24	2	5	3.7
37	9	10	7.4
17	4	44	32.5
36	6	3	2.2
11	3	44	32.5
75	1	40	29.5
28	12	30	22

Tolerance on Torque value: +0/-10%

## ACCUMULATOR PRESSURE DP803

"OPERATING PRESSURE PSI [Bar]"	"ACCUMULATOR PRESSURE PSI [Bar]"
29-73 [2-5]	29 [2]
73-145 [5-10]	29-73 [2-5]
145-290 [10-20]	73-102 [5-7]

## 9915-KIT2004

### KIT DIAPHRAGM DP803 DP1003

REF. No.	DESCRIPTION	QTY.
1	PRE-SET DURAMAX PISTON DIAPHRAGM	3
35	O-RING 3.53X28.17	6

## 9915-KIT2104

### KIT SERVICE VALVE DP803 DP1003

REF. No.	DESCRIPTION	QTY.
2	VALVE ASSY	6
35	O-RING 3.53X28.17	6

## 9915-KIT2204

### KIT REPAIR PUMP DP803 DP1003

REF. No.	DESCRIPTION	QTY.
16	O-RING 4.0x82	1
20	OIL SEAL DIA.35X52X7	1
35	O-RING DIA.3.53X28.17	6

# LOW PRESSURE 15 BAR REPLACEMENT PARTS

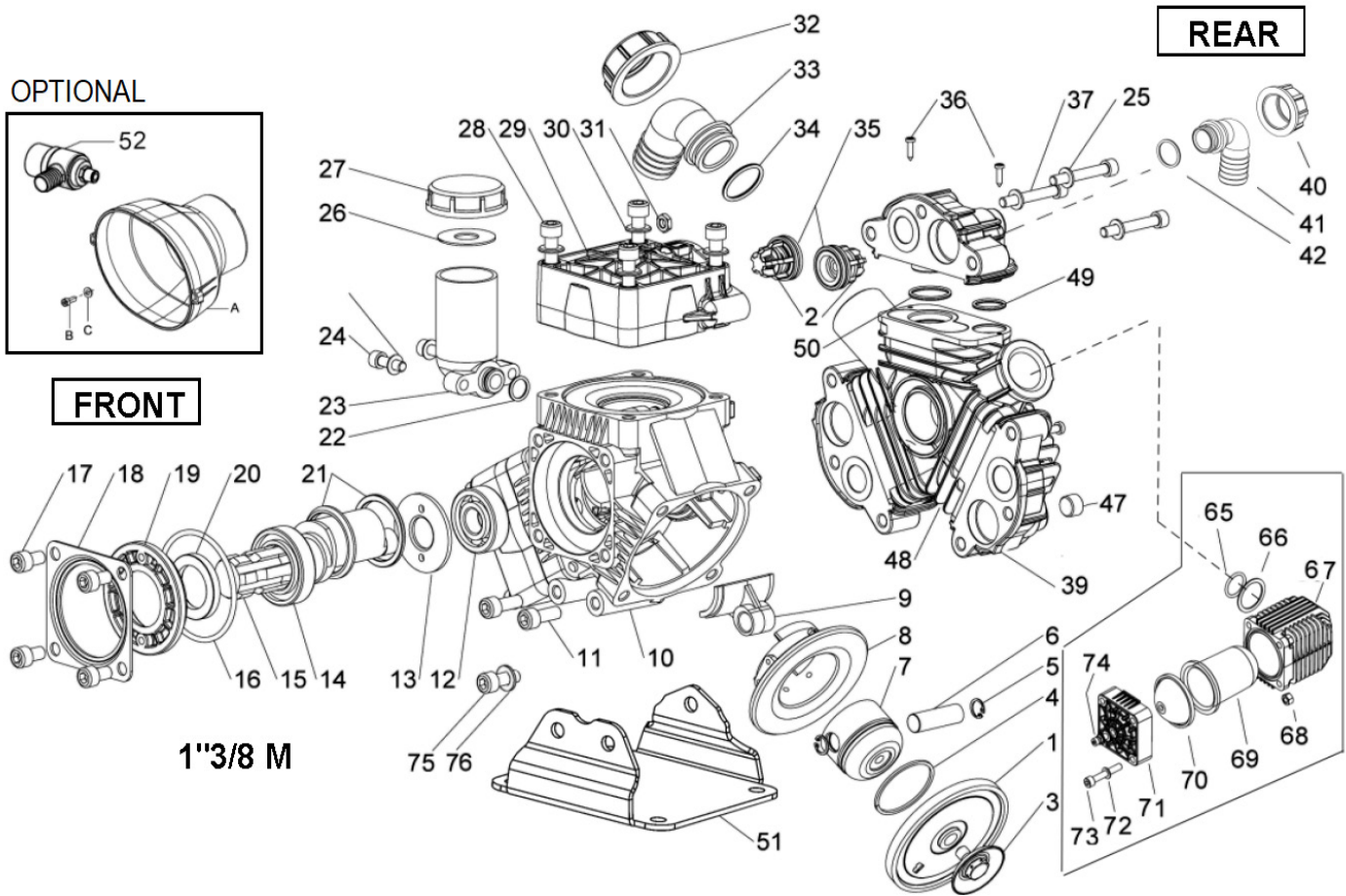


FIGURE 8: MODEL DP1003

## LOW PRESSURE 15 BAR REPLACEMENT PARTS

TORQUE CHART DP1003			
REF. No.	Qty.	N-m	ft.Lbs
3	3	25	18.5
47	3	5 (LOXEAL 55-14)	3.7 (LOXEAL 55-14)
24	2	5	3.7
37	9	10	7.4
17	4	44	32.5
36	6	3	2.2
11	3	44	32.5
75	1	40	29.5
28	12	30	22
Tolerance on Torque value: +0/-10%			

ACCUMULATOR PRESSURE DP1003	
"OPERATING PRESSURE PSI [Bar]"	"ACCUMULATOR PRESSURE PSI [Bar]"
29-73 [2-5]	29 [2]
73-145 [5-10]	29-73 [2-5]
145-290 [10-20]	73-102 [5-7]

9915-KIT2004		
KIT DIAPHRAGM DP803 DP1003		
REF. No.	DESCRIPTION	QTY.
1	PRE-SET DURAMAX PISTON DIAPHRAGM	3
35	O-RING 3.53X28.17	6

9915-KIT2104		
KIT SERVICE VALVE DP803 DP1003		
REF. No.	DESCRIPTION	QTY.
2	VALVE ASSY	6
35	O-RING 3.53X28.17	6

9915-KIT2204		
KIT REPAIR PUMP DP803 DP1003		
REF. No.	DESCRIPTION	QTY.
16	O-RING 4.0x82	1
20	OIL SEAL DIA.35X52X7	1
35	O-RING DIA.3.53X28.17	6

# LOW PRESSURE 15 BAR REPLACEMENT PARTS

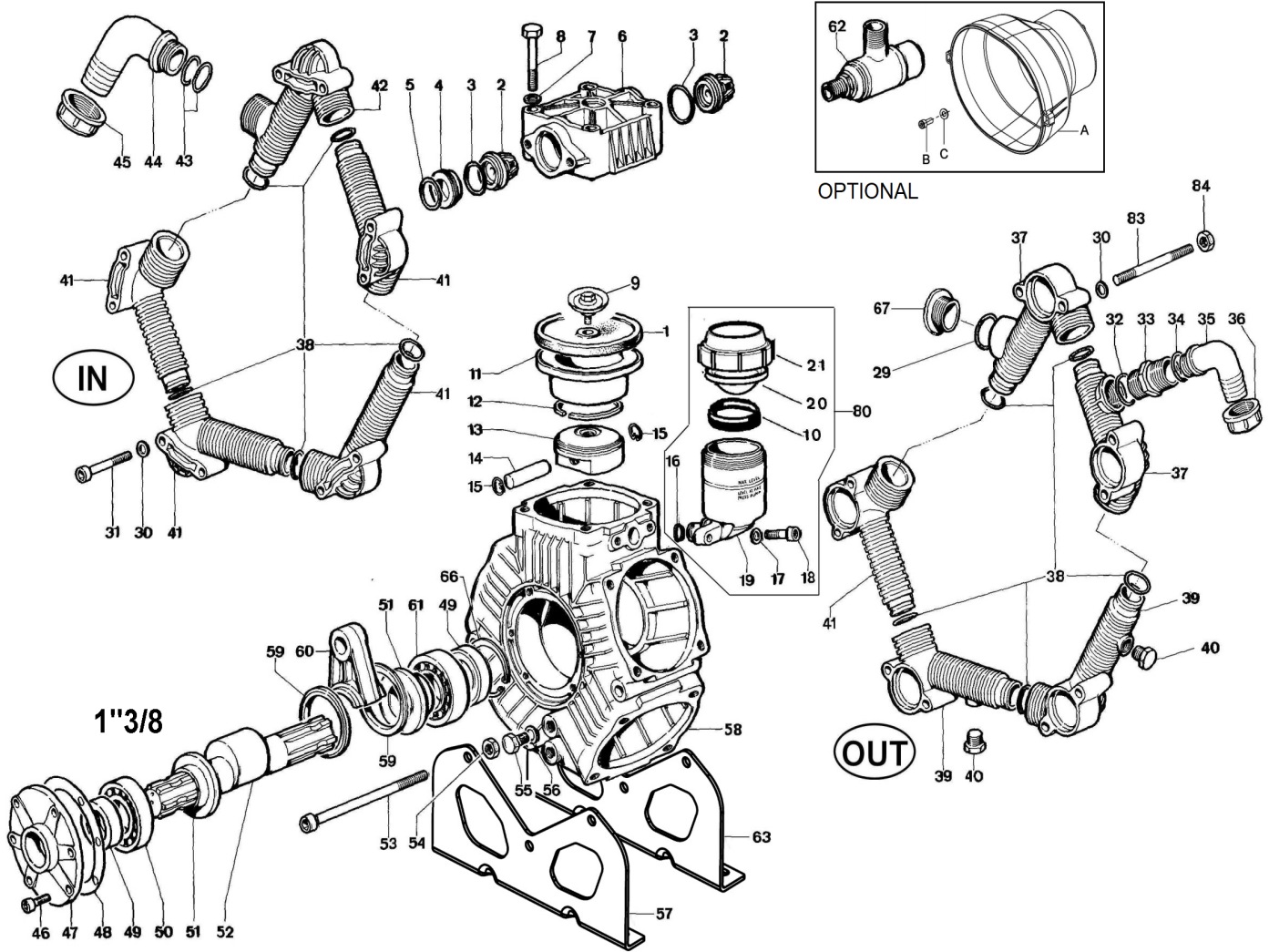


FIGURE 9: MODEL DP2505



## LOW PRESSURE 15 BAR REPLACEMENT PARTS

### TORQUE CHART DP2505

REF. No.	Qty.	N-m	ft.Lbs
9	5	25	18.4
40	2	20	14.8
18	2	5 (LOXEAL 24-18)"	3.7 (LOXEAL 24-18)"
55	1	8	5.9
46	6	40	29.5
64	2	22	16.3
31	20	22	16.3
53	3	10	7.4
8	20	40	29.5
91	4	40	29.5
83	20	10	7.4
84	20	10	7.4

Tolerance on Torque value: +0/-10%

### ACCUMULATOR PRESSURE DP2505

"OPERATING PRESSURE PSI [Bar]"	"ACCUMULATOR PRESSURE PSI [Bar]"
29-73 [2-5]	29 [2]
73-145 [5-10]	29-73 [2-5]
145-290 [10-20]	73-102 [5-7]

### 9915-KIT2005

#### KIT DIAPHRAGM DP2505

REF. No.	DESCRIPTION	QTY.
1	PRE-SET DURAMAX PISTON DIAPHRAGM	5
3	O-RING 4.5x40 VITON	10

### 9915-KIT2105

#### KIT SERVICE VALVE DP2505

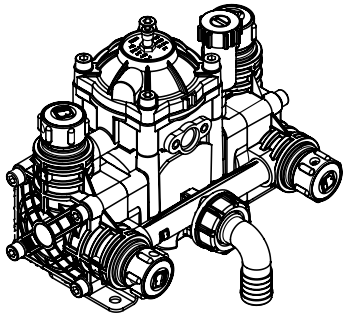
REF. No.	DESCRIPTION	QTY.
2	S.S. AISI 316 VALVE ASSY (STD.)	10
3	O-RING 4.5x40 VITON	10
5	O-RING 2.62x42.52 VITON	5

### 9915-KIT2205

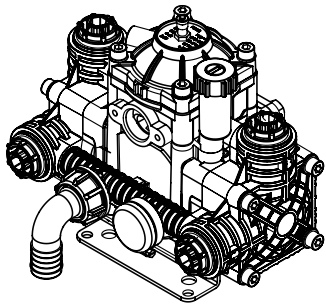
#### KIT REPAIR PUMP DP2505

REF. No.	DESCRIPTION	QTY.
3	O-RING 4.5x40	10
5	O-RING 2.62x42.52 VITON	5
38	O-RING 3.53x31.34 VITON	10
48	COVER GASKET	1
49	OIL SEAL DIA.35x52x7	2

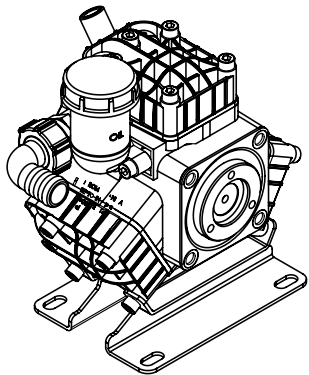
## DIAPHRAGM PUMP: MEDIUM PRESSURE RANGE 20 - 40BAR



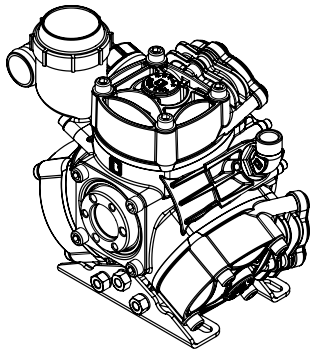
Model Number	"Max. Flow USGPM [LPM]"	"Max. Pressure PSI [BAR]"	"Max. Speed RPM"	"Power HP [KW]"	No. of Diaphragm
9915-DP252			650		
9915-DP252GRGI	6.3[24]	290[20]	3450	1.4[1.1]	2
9915-DP252GRGI58			3450		



Model Number	"Max. Flow USGPM [LPM]"	"Max. Pressure PSI [BAR]"	"Max. Speed RPM"	"Power HP [KW]"	No. of Diaphragm
9915-DP302			650		
9915-DP302AP-A	7.1[27]	290[20]	3450	1.6[1.2]	2
9915-DP302GRGI			3450		



Model Number	"Max. Flow USGPM [LPM]"	"Max. Pressure PSI [BAR]"	"Max. Speed RPM"	"Power HP [KW]"	No. of Diaphragm
9915-D303			650		
9915-D303GRGI	8.1[31]	580[40]	3600	3.2[2.4]	3
9915-D303AP-A			650		
9915-D403			550		
9915-D403GRGI	9.8[37]	580[40]	3000	3.9[2.9]	3
9915-D503			550		
9915-D503GRGI	13.5[51]	580[40]	3300	5.4[4.0]	3
9915-D503AP-A			550		



Model Number	"Max. Flow USGPM [LPM]"	"Max. Pressure PSI [BAR]"	"Max. Speed RPM"	"Power HP [KW]"	No. of Diaphragm
9915-DP503			550		
9915-DP503GRGI	13.5[51]	580[40]	3300	5.4[4.0]	3
9915-DP503AP-A			550		

## MEDIUM PRESSURE 20-40 BAR PERFORMANCE AND SPECIFICATIONS

### DRIVE OPTIONS

Order the appropriate shaft adapter kit or gear reduction unit for the drive option requirements. Refer to the adjoining chart for proper selection.

**Oil Capacity:** Oil crankcase capacities are approximate. Fill oil to proper level in sight glass. Always make sure all the air is purged out of crankcase prior to operating.

**Control Units:** Control units are available for easy flow and pressure control of your sprayer system. These units include a manual dump valve and adjustable pressure relief valve to control pressure, a liquid-filled pressure gauge to monitor pressure, and shut-off valves to control flow. Control unit can be remote mounted with remote mounting kit. Refer to the adjoining chart to select the proper control unit for your pump and remote mounting kits.

Model Number	3/4" Solid Shaft	1" Solid Shaft W/Keyway	1-3/8" Male Splined Shaft	Gear Reduction Unit for Gas Drive Engine
9915-DP252	N/A	N/A	N/A	Order gear reduced models
9915-DP302	9915-KIT1201	9915-KIT1202	9915-KIT1203	Order gear reduced models
9915-D303	9915-KIT1201	9915-KIT1202	9915-KIT1203	9915-KIT1103
9915-D403	N/A	9915-KIT1202	9915-KIT1203	9915-KIT1103
9915-D503	N/A	9915-KIT1202	9915-KIT1203	9915-KIT1105
9915-DP503	N/A	9915-KIT1202	9915-KIT1203	9915-KIT1105

Control Unit Model Number	"Max. Flow USGPM [LPM]"	"Max. Pressure PSI [BAR]"	Pump Model	Remote Mounting Kits
9915-KIT1001	7.9 [30]	290 [20]	DP252	9915-KIT1403
9915-KIT1002	10.5 [40]	580 [40]	D303/D403	9915-KIT1404
9915-KIT1003	24 [90]	580 [40]	DP503/D503	9915-KIT1405
9915-KIT1008	10.5 [40]	290 [20]	DP302	9915-KIT1406

Crankcase Oil Capacity	
Pump Model Series	"Capacity oz. [Litre]"
DP252	24 [0.7]
DP302	24 [0.7]
D303	20 [0.6]
D403	20 [0.6]
D503	17 [0.5]
DP503	17 [0.5]

## MEDIUM PRESSURE 20-40 BAR INSTALLATION

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### INSTALLATION INSTRUCTIONS FOR GEAR REDUCTION KIT 9915-KIT1103 (REFER TO FIGURE 10)

**NOTE:** Hypro recommends a blue thread locking compound on all threaded fasteners that do not require lock washers. Shaft key needs to be inspected occasionally and replaced if worn.

The 9915-KIT1103 gear reducer is designed for direct mounting diaphragm pumps (listed in chart on page 19) onto a 5 hp gasoline engine with a flange mounting and 3/4" solid shaft.

#### Assembly Instructions (Refer to Figure 10)

1. Take out from the pump the retaining ring sheet with the 4 corresponding fastening bolts.
2. Fasten the gear (Ref. 14) to the pump shaft by using the corresponding 3 bolts (Ref. 13) with torque 16.2lbf [22Nm].
3. Install the O-ring (Ref. 15) in the corresponding slot on the gear casing (Ref. 7), then fit the gear casing to the pump tightening the bolts M10x20 (Ref. 11) with torque 29.5lbf [40Nm].
4. Screw the oil drain plug (Ref. 9) with the proper washer (Ref. 8) and the oil sight (Ref. 12), then fill the gearbox casing with oil SAE 80-W90 up to the middle of the oil sight. Then install the oil filling plug (Ref. 10).
5. Insert the key (Ref. 2) the engine shaft and fit the centering ring (Ref. 1) on the gear casing.
6. Install the "pump-gearbox assy" on the engine and tighten the 4 corresponding bolts (Ref. 6) with torque 16.2lbf [22Nm].

### INSTALLATION INSTRUCTIONS FOR GEAR REDUCTION KIT 9915-KIT1105 (REFER TO FIGURE 11)

Hypro recommends a blue thread locking compound on all threaded fasteners that do not require lock washers. Shaft key needs to be inspected occasionally and replaced if worn.

The 9915-KIT1105 gear reducer is designed for direct mounting the diaphragm pumps (listed in chart on page 19) onto an 8 hp gasoline engine with a flange mounting and 1" solid shaft.

#### Assembly Instructions (Refer to Figure 11)

1. Take out from the pump the retaining ring locking sheet with the 4 corresponding fastening bolts.
2. Install the O-ring (Ref. 9) in the half casing slot (pump side) (Ref. 19), then fit to the pump with the 4 corresponding with the 4 copper washer (Ref. 18) and bolts (Ref. 8) with torque 29.5lbf [40Nm].
3. Fit the ring gear (Ref. 17) to the pump shaft by using the corresponding screws (Ref. 15) and the proper safety washers (Ref. 16) with torque 29.5lbf [40Nm] along with thread sealant. In case the gearbox is fixed by M8 screws (ref. 20-21-22), tightening torque is 16.2 lbf [22Nm].
4. Screw the oil sight (Ref. 14) in the lateral part of the gearbox casing (Ref. 12).
5. Apply sealant on the top of the 2 half casings and install the engine side assembly on the pump side assembly. Fit the paper gasket (Ref. 13) between the 2 assemblies and fasten the whole system with corresponding bolts (Ref. 10) with torque 16.2lbf [22Nm].
6. Insert the key (Ref. 1) onto the engine shaft, fit the pump-gearbox assy to the engine and tighten the 4 corresponding bolts 3/8" (Ref. 6) and spring washers (Ref. 5) with torque 29.5lbf [40Nm].
7. Fill the gearbox casing with SAE 80-W90 oil, up to the middle of the oil sight, then install the oil vent plug (Ref. 11).

# MEDIUM PRESSURE 20-40 BAR INSTALLATION

ENGINE SAE J609 3/4"

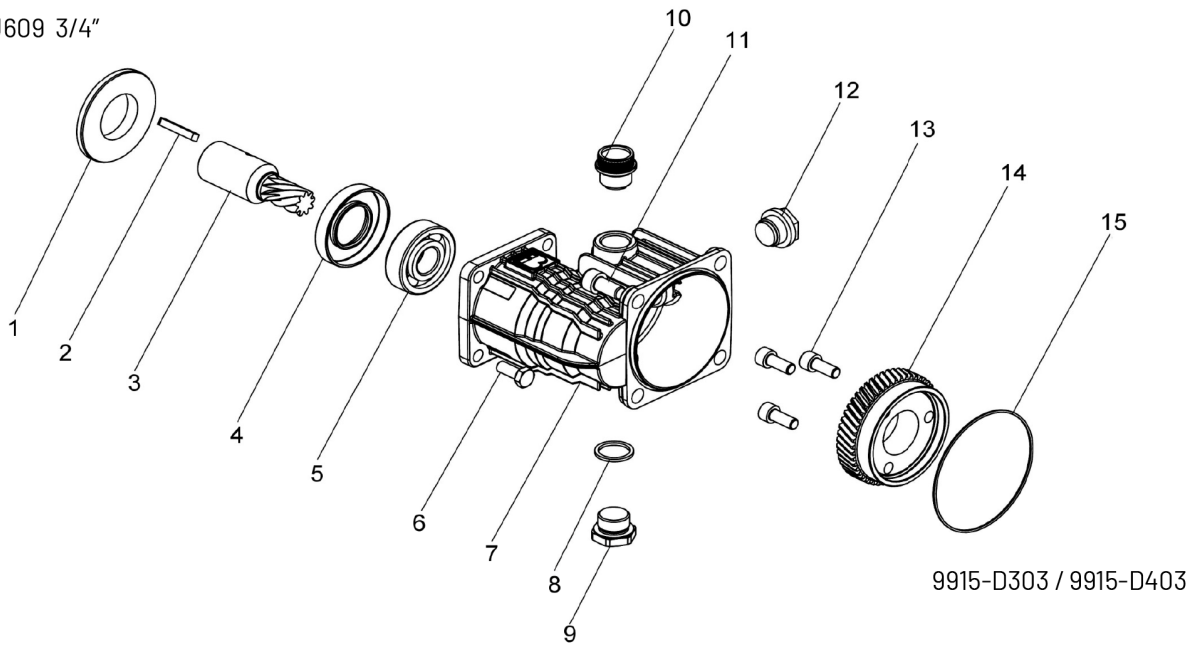


FIGURE 10: MODEL 9915-KIT1103

ENGINE SAE J609 1"

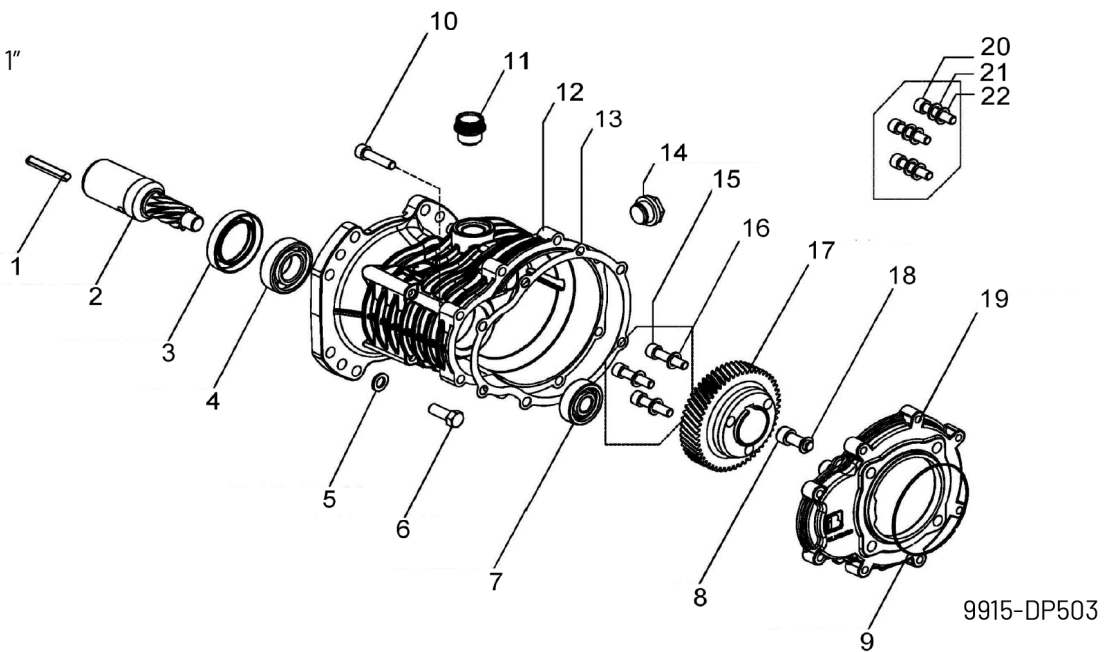


FIGURE 11: MODEL 9915-KIT1105

# MEDIUM PRESSURE 20-40 BAR INSTALLATION

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## CONTROL UNIT KIT INSTALLATION

The control units are designed for control of pressure and flow rate. Use appropriate model (as specified in chart on page 19) to mount on particular pump model and pressure/flow ranges. Some models are mounted directly to pump and some can be mounted remotely with mounting Kits as specified in chart on page 19.

Hypro recommends a blue thread locking compound on all threaded fasteners that do not require lock washers.

### Direct Mounting onto Pump

1. Locate the discharge flange port on the discharge manifold. Remove the nuts holding the flange manifold.
2. Remove the O-ring from the groove of the flange and install into the control unit flange.
3. Install the control unit onto the manifold where the discharge port had been previously. Use the nuts previously removed to secure the control unit.
4. Connect bypass hose to bypass hose barb and run unrestricted to supply tank.
5. Connect the desired number of high pressure hoses to the outlet hose barbs. Unused hose barbs can be shut off with ball valves provided.

### Remote Mounting with Mounting Kit

1. Locate and secure the mounting bracket provided with mounting kit in the desired position.
2. Place O-rings into groove of relief valve body and discharge flange provided with mounting kit.
3. Assemble the control unit and discharge flange onto the bracket and secure with the bolts and nuts provided.
4. Use the high pressure hose to connect pump discharge port hose barb to the control unit inlet port hose barb
5. Connect the bypass hose to the bypass hose barb, then run it unrestricted to the supply tank.
6. Connect the desired number of high pressure hoses to the outlet hose barbs on the control valve. Unused hose barbs can be shut off with ball valves provided.

For all discharge hoses, use hose with an operating pressure rating equal to or greater than the maximum pressure rating of the pump. High pressure clamping should be used on all outlet hose connections.

**⚠ WARNING** Always wear safety goggles when working with spring-loaded fasteners or devices.

**⚠ WARNING** During the first step, you are strongly advised to start the pump with the regulating valve knob turned to 0 pressure and with the lever in the by-pass position. Maintain this configuration for a couple of minutes so as to lubricate the internal components of the pump and allow the diaphragms to set in position before the pressure is increased.

The restriction on the pump is removed by rotating the Pressure Release knob on the control unit, fully toward bypass arrow direction.

First back out the pressure regulator adjustment knob to zero. Then rotate the Pressure Release knob to Pressure arrow direction. Adjust the pressure by rotating the relief valve adjustment knob to the desired pressure.

# MEDIUM PRESSURE 20-40 BAR INSTALLATION

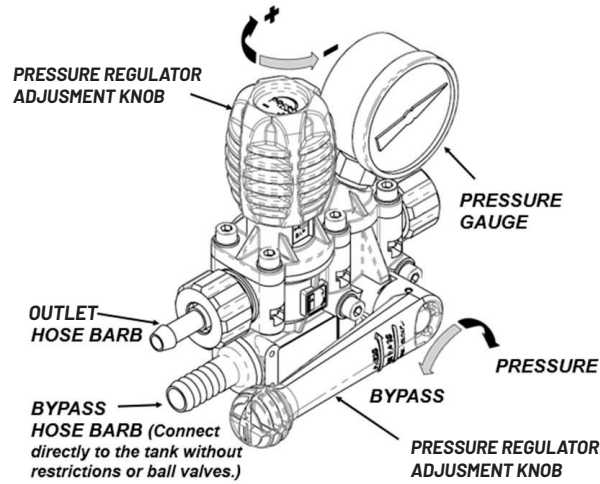


FIGURE 12: MODEL 9915-KIT1001

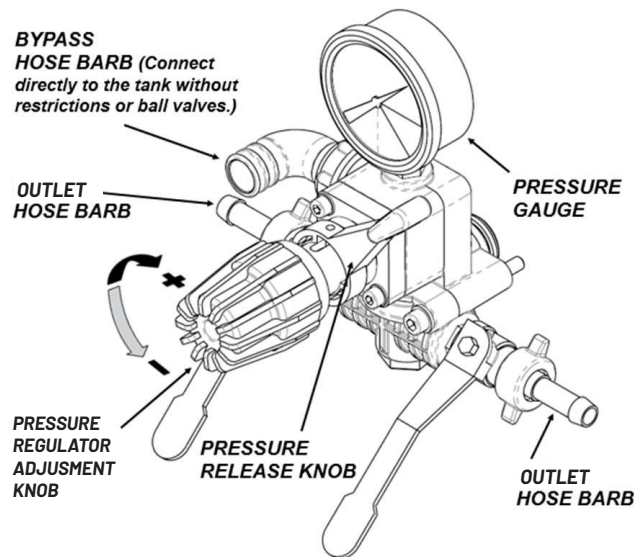


FIGURE 13: MODEL 9915-KIT1002 & 9915-KIT1008

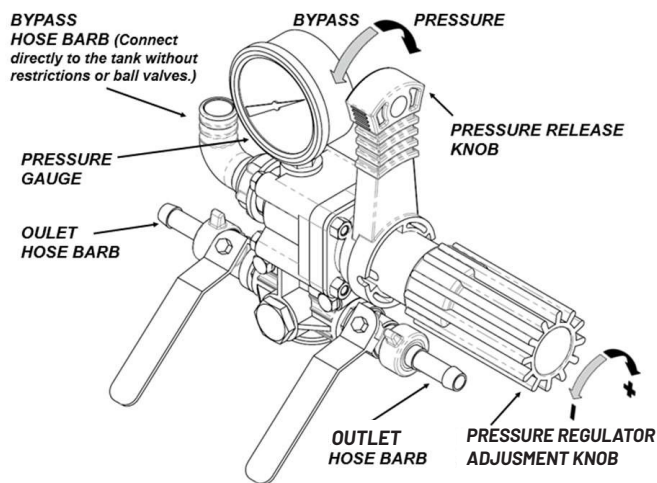
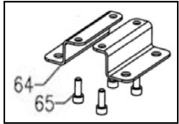


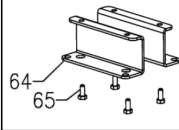
FIGURE 14: MODEL 9915-KIT1003

# MEDIUM PRESSURE 20-40 BAR REPLACEMENT PARTS

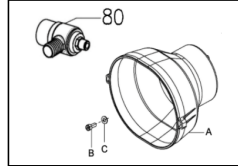
INCLUDED WITH DP252



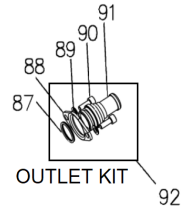
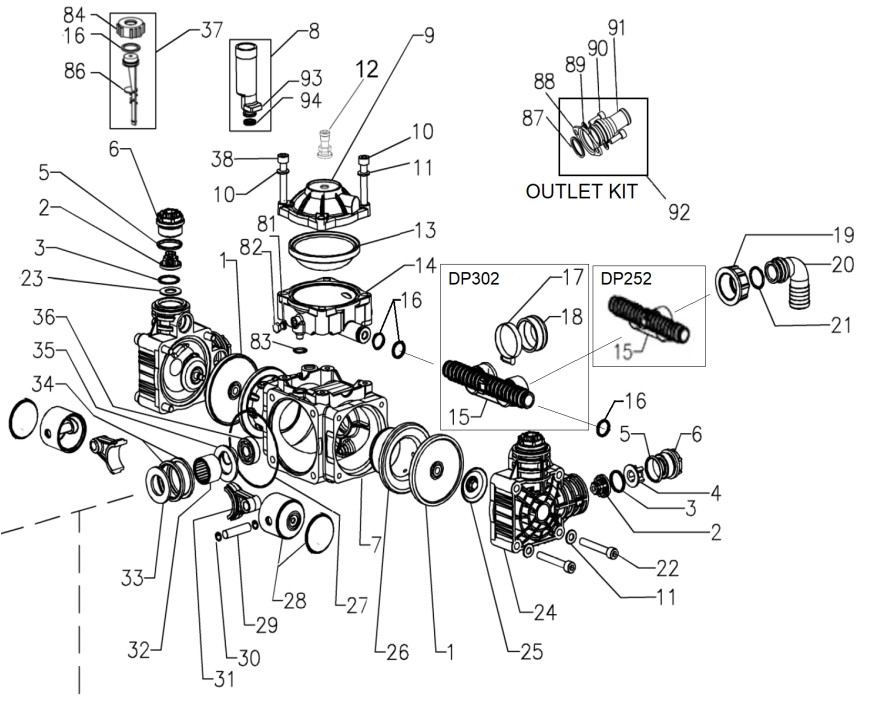
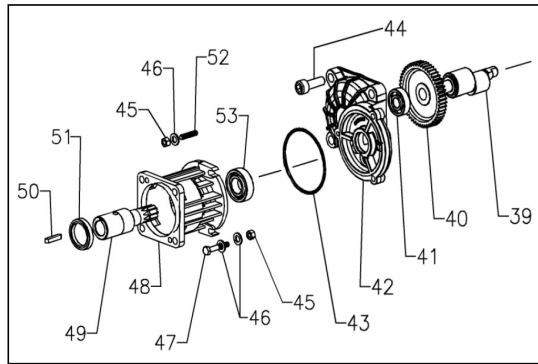
INCLUDED WITH DP302/DP302AP-A



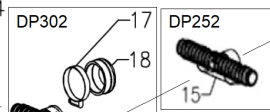
OPTIONAL



FOR GRGI MODELS (DP252/DP302)



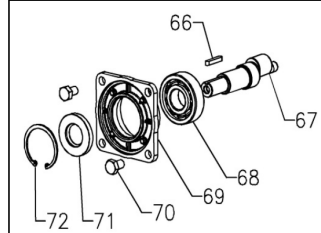
OUTLET KIT 92



DP302

DP252

FOR DP252 MODEL



FOR DP302/DP302AP-A MODEL

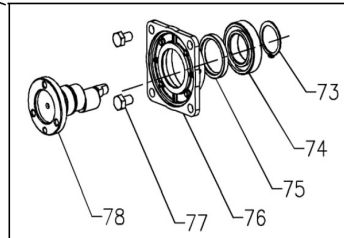


FIGURE 15: MODELS 9915-DP252, 9915-DP302



# MEDIUM PRESSURE 20-40 BAR REPLACEMENT PARTS

TORQUE CHART DP252 DP302			
REF. No.	Qty.	N-m	ft.Lbs
22	8	10	7.4
25	2	5	3.7
12	1	5	3.7
38	2	10	7.4
10	2	10	7.4
44	4	40	29.5
47	2	10	7.4
52	1	10	7.4
55	2	10	7.4
58	2	10	7.4
45	3	10	7.4
6	4	10	7.4
65	4	10	7.4
70	4	40	29.5
77	4	40	29.5

Tolerance on Torque value: +0/-10%

ACCUMULATOR PRESSURE DP252 DP302	
"OPERATING PRESSURE PSI [Bar]"	"ACCUMULATOR PRESSURE PSI [Bar]"
29-73 [2-5]	29 [2]
73-145 [5-10]	29-73 [2-5]
145-290 [10-20]	73-102 [5-7]

9915-KIT2001		
KIT DIAPHRAGM DURAMAX DP252 DP302		
REF. No.	DESCRIPTION	QTY.
1	PRE-SET DURAMAX PISTON DIAPHRAGM (STD.)	2
13	DAMPENER DIAPHRAGM	1
16	O-RING D.2.62X15.54	4
3	O-RING D.2.62X22.22	4
5	O-RING D.2.62X26.65	4

9915-KIT2101		
KIT SERVICE VALVE DP252 DP302		
REF. No.	DESCRIPTION	QTY.
2	VALVE ASSY	4
3	O-RING D.2.62X22.22	4
4	SPACER INLET VALVE	2
5	O-RING D.2.62X26.65	4

9915-KIT2201		
KIT REPAIR PUMP DP252 DP302		
REF. No.	DESCRIPTION	QTY.
3	O-RING	4
16	O-RING	5
27	O-RING	1
43	O-RING	1
81	O-RING	1
83	O-RING	1
94	O-RING	1

# MEDIUM PRESSURE 20-40 BAR REPLACEMENT PARTS

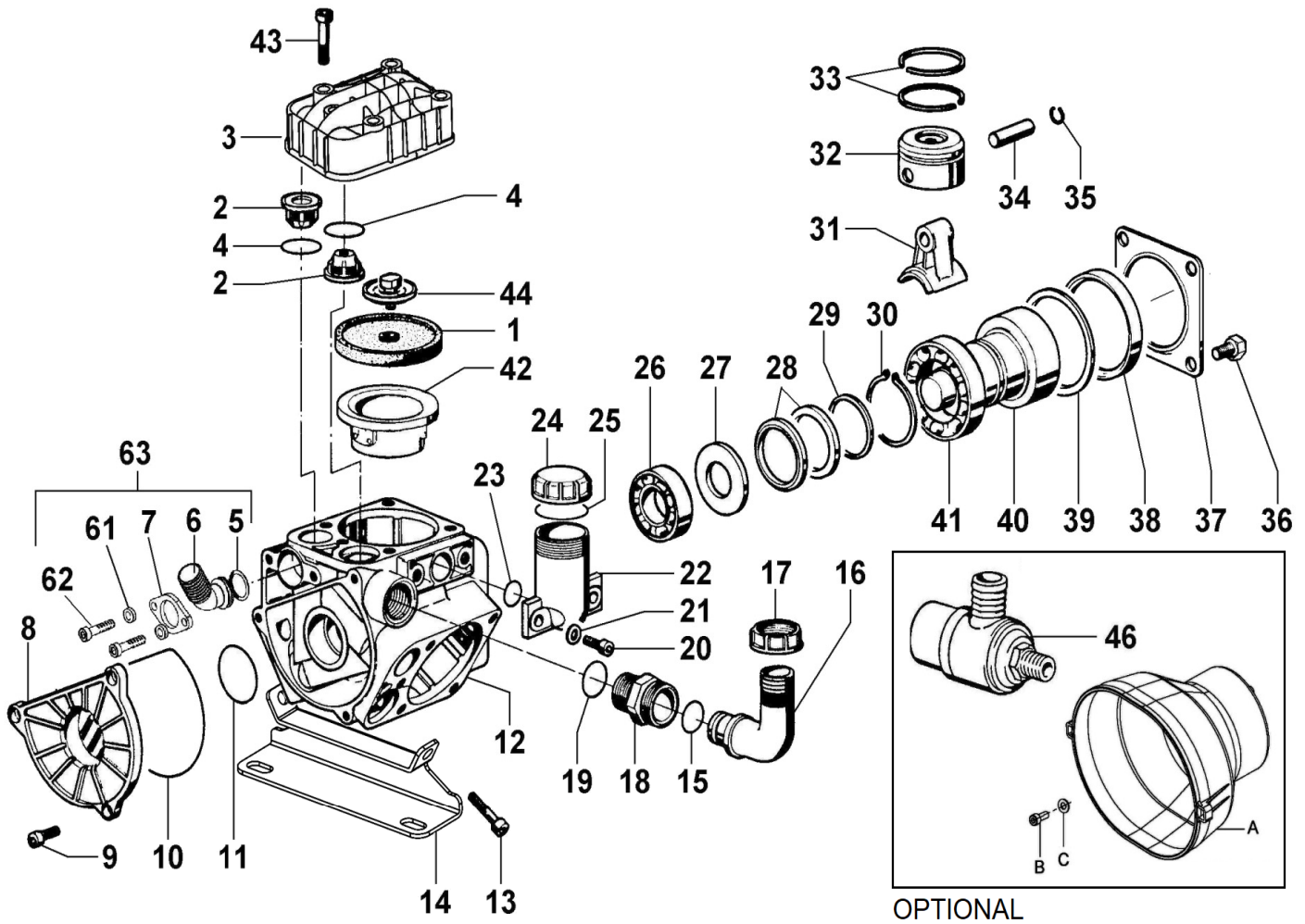


FIGURE 16: MODEL 9915-D303, 9915-D403

# MEDIUM PRESSURE 20-40 BAR REPLACEMENT PARTS

## TORQUE CHART D303, D403

REF. No.	Qty.	N-m	ft.Lbs
9	3	10	7.4
20	2	10	7.4
62	2	10	7.4
43	11	22	16.2
13	4	22	16.2
36	4	22	16.2
44	3	5	3.7

Tolerance on Torque value: +0/-10%

## 9915-KIT2002

### KIT DIAPHRAGM D303, D403

REF. No.	DESCRIPTION	QTY.
1	DURAMAX PISTON DIAPHRAGM	3
4	VALVE SEAL	6

## 9915-KIT2102

### KIT SERVICE VALVE D303, D403

REF. No.	DESCRIPTION	QTY.
2	VALVE ASSY	6
4	VALVE SEAL	6

## 9915-KIT2202

### KIT REPAIR PUMP D303, D403

REF. No.	DESCRIPTION	QTY.
4	VALVE SEAL	6
10	O-RING 2.62X101.27	1
11	O-RING 2.62X36.14	1
38	OIL SEAL DIA. 68X90X10	1

# MEDIUM PRESSURE 20-40 BAR REPLACEMENT PARTS

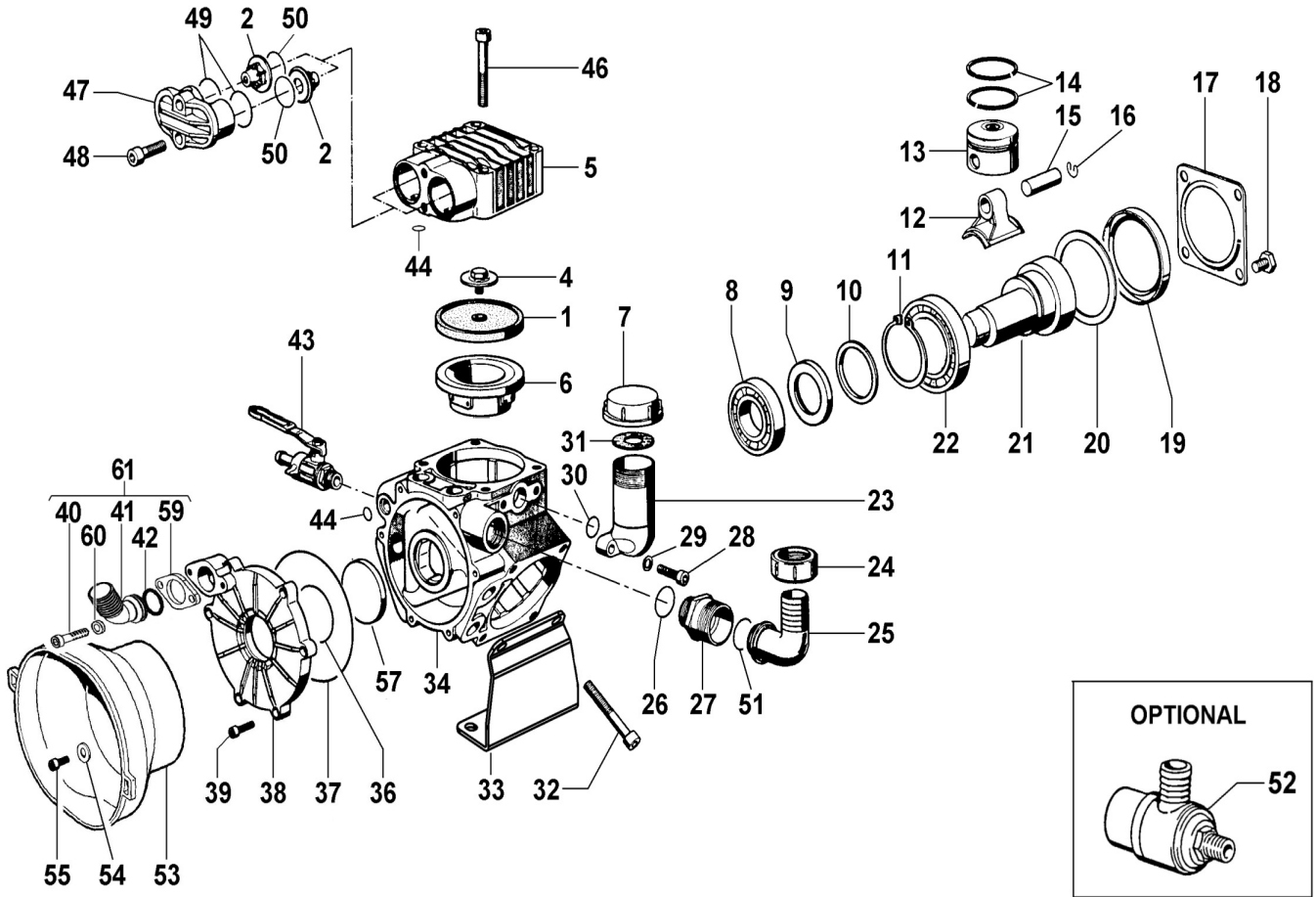


FIGURE 17: MODEL 9915-D503

# MEDIUM PRESSURE 20-40 BAR REPLACEMENT PARTS

## TORQUE CHART D503

REF. No.	Qty.	N-m	ft.Lbs
4	3	12	8.9
18	4	22	16.2
28	2	10	7.4
32	4	44	32.5
39	6	10	7.4
40	2	10	7.4
46	8	44	32.5
48	6	44	32.5

Tolerance on Torque value: +0/-10%

## 9915-KIT2008

### KIT DIAPHRAGM D503

REF. No.	DESCRIPTION	QTY.
1	DURAMAX PISTON DIAPHRAGM	3
44	O-RING 2.62X18.72	6

## 9915-KIT2108

### KIT SERVICE VALVE D503

REF. No.	DESCRIPTION	QTY.
2	VALVE ASSY	6
49	O-RING	6
50	O-RING	6

## 9915-KIT2208

### KIT REPAIR PUMP D503

REF. No.	DESCRIPTION	QTY.
19	OIL SEAL	1
36	O-RING	1
37	O-RING	1
44	O-RING 2.62X18.72	6
49	O-RING	6
50	O-RING	6

# MEDIUM PRESSURE 20-40 BAR REPLACEMENT PARTS

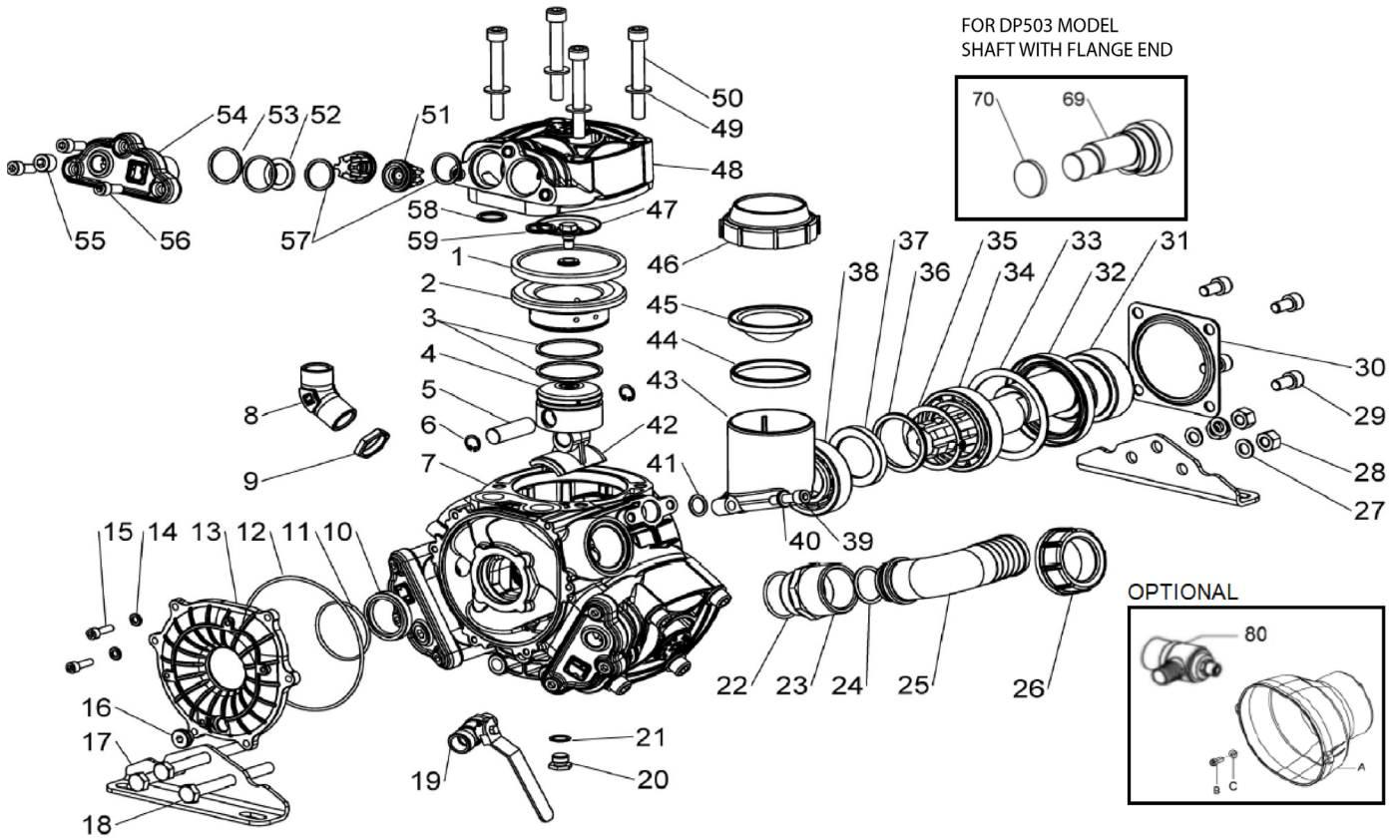


FIGURE 18: MODEL 9915-DP503

# MEDIUM PRESSURE 20-40 BAR REPLACEMENT PARTS

TORQUE CHART DP503			
REF. No.	Qty.	N-m	ft.Lbs
15	6	10	7.4
16	1	5	3.7
18	3	44	32.4
20	1	22	16.2
28	3	44	32.4
29	4	22	16.2
39	2	10	7.4
47	3	12	8.8
50	12	30	22.1
55	2	"5 (APPLY THREAD SEALANT)"	"3.7 (APPLY THREAD SEALANT)"
56	9	22	16.2
73	4	44	32.4

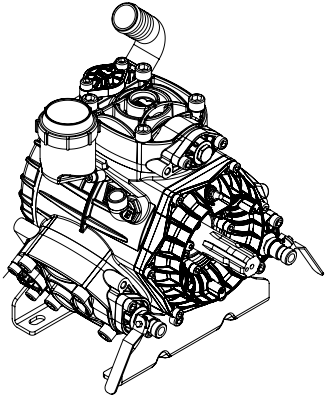
Tolerance on Torque value: +0/-10%

9915-KIT2003		
KIT DIAPHRAGM DP503		
REF. No.	DESCRIPTION	QTY.
1	PRE-SET DURAMAX PISTON DIAPHRAGM	3
58	O-RING 2.62X18.72	3
59	O-RING 2.62X20.24	3

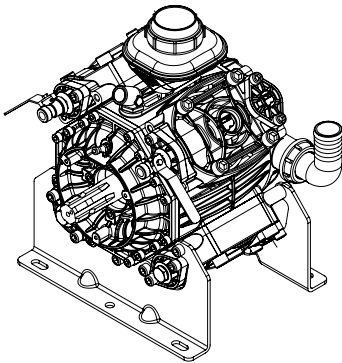
9915-KIT2103		
KIT SERVICE VALVE DP503		
REF. No.	DESCRIPTION	QTY.
51	VALVE ASSY	6
52	SPACER	3
53	O-RING 3.0X30	6
57	O-RING 2.62X25.07	6

9915-KIT2203		
KIT REPAIR PUMP DP503		
REF. No.	DESCRIPTION	QTY.
10	OIL SEAL	1
11	O-RING 2.62X53.65	1
12	O-RING 2.62X126.67	1
21	GASKET	1
32	OIL SEAL	1
53	O-RING 3.0X30	6
57	O-RING 2.62X25.07	6
58	O-RING 2.62X18.72	3
59	O-RING 2.62X20.24	3
70	COVER 47X7	1

## DIAPHRAGM PUMP: HIGH PRESSURE RANGE 50 BAR



Model Number	"Max. Flow USGPM [LPM]"	"Max. Pressure PSI [BAR]"	"Max. Speed RPM"	"Power HP [KW]"	No. of Diaphragm
9915-D1063	27.9 [106]	725 [50]	550	13.9 [10.4]	3



Model Number	"Max. Flow USGPM [LPM]"	"Max. Pressure PSI [BAR]"	"Max. Speed RPM"	"Power HP [KW]"	No. of Diaphragm
9915-D1504	38.8 [147]	725 [50]	550	19.3 [14.4]	4

### CONTROL UNITS

Control units are available for easy flow and pressure control of your sprayer system. These units include a manual dump valve and adjustable pressure relief valve to control pressure, a liquid-filled pressure gauge to monitor pressure, and shut-off valves to control flow. Control unit 9915-KIT1006 and 9915-KIT1007 can be remote mounted. Refer to the adjoining chart to select the proper control unit for your pump.

Control Unit Model Number	"Max. Flow USGPM [LPM]"	"Max. Pressure PSI [BAR]"	Pump Model
9915-KIT1006	40 [150]	725 [50]	D1063/D1504
9915-KIT1007			

### OIL CAPACITY

Oil crank case capacities are approximate. Fill oil to proper level in sight glass. Always make sure all the air is purged out of crankcase prior to operating.

Crankcase Oil Capacity	
Pump Model Series	Capacity oz. [Litre]
D1063	34 [1.0]
D1504	42 [1.25]



# HIGH PRESSURE 50 BAR INSTALLATION

## CONTROL UNIT KIT INSTALLATION

The control units are designed for control of pressure and flow rate. Use appropriate model (as specified in chart on page 32) to use with particular pump model and pressure/flow ranges.

**NOTE:** Hypro recommends a blue thread locking compound on all threaded fasteners that do not require lock washers.

## REMOTE MOUNTING

1. Locate control unit at desired position with mounting holes provided and secure with the bolts and nuts.
2. Use the high pressure hose to connect pump discharge port hose barb to the control unit inlet port.
3. Connect the bypass hose to the bypass hose barb, then run it unrestricted to the supply tank.
4. Connect the desired number of high pressure hoses to the outlet ports on the control valve. Unused Ports can be shut off with ball valves provided.

For all discharge hoses, use hose with an operating pressure rating equal to or greater than the maximum pressure rating of the pump. High pressure clamping should be used on all outlet hose connections.

**⚠ WARNING** Always wear safety goggles when working with spring-loaded fasteners or devices.

**⚠ WARNING** During the first step, you are strongly advised to start the pump with the regulating valve knob turned to 0 pressure and with the lever in the by-pass position. Maintain this configuration for a couple of minutes so as to lubricate the internal components of the pump and allow the diaphragms to set in position before the pressure is increased.

The restriction on the pump is removed by rotating the Pressure Release knob on the control unit, fully toward bypass arrow direction. First back out the pressure regulator adjustment knob to zero. Then rotate the Pressure Release knob to Pressure arrow direction. Adjust the pressure by rotating the relief valve adjustment knob to the desired pressure.

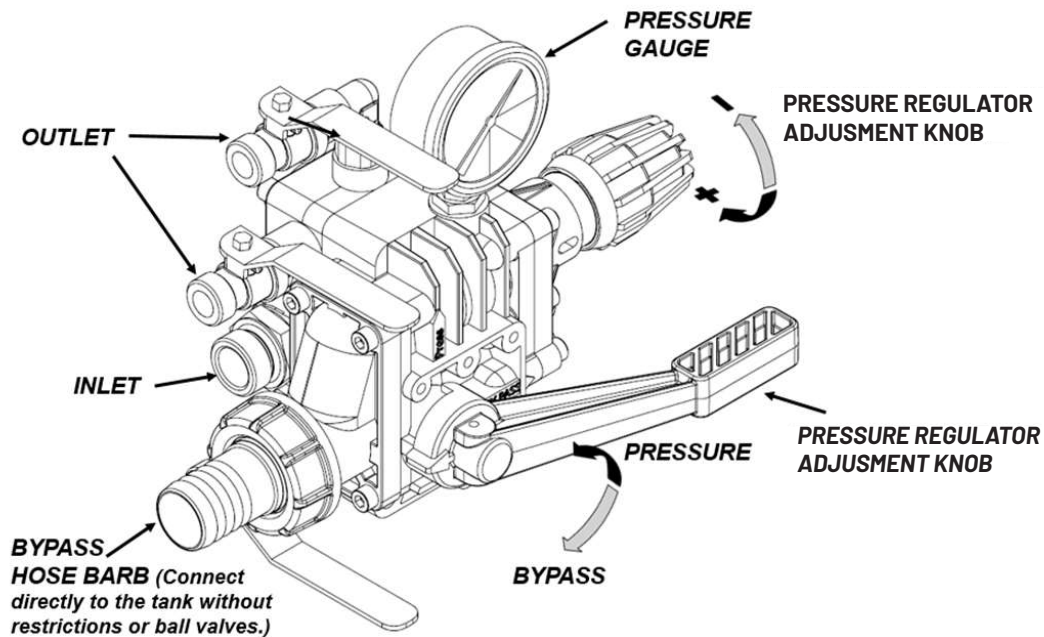


FIGURE 19: MODEL 9915-KIT1006

# HIGH PRESSURE 50 BAR REPLACEMENT PARTS

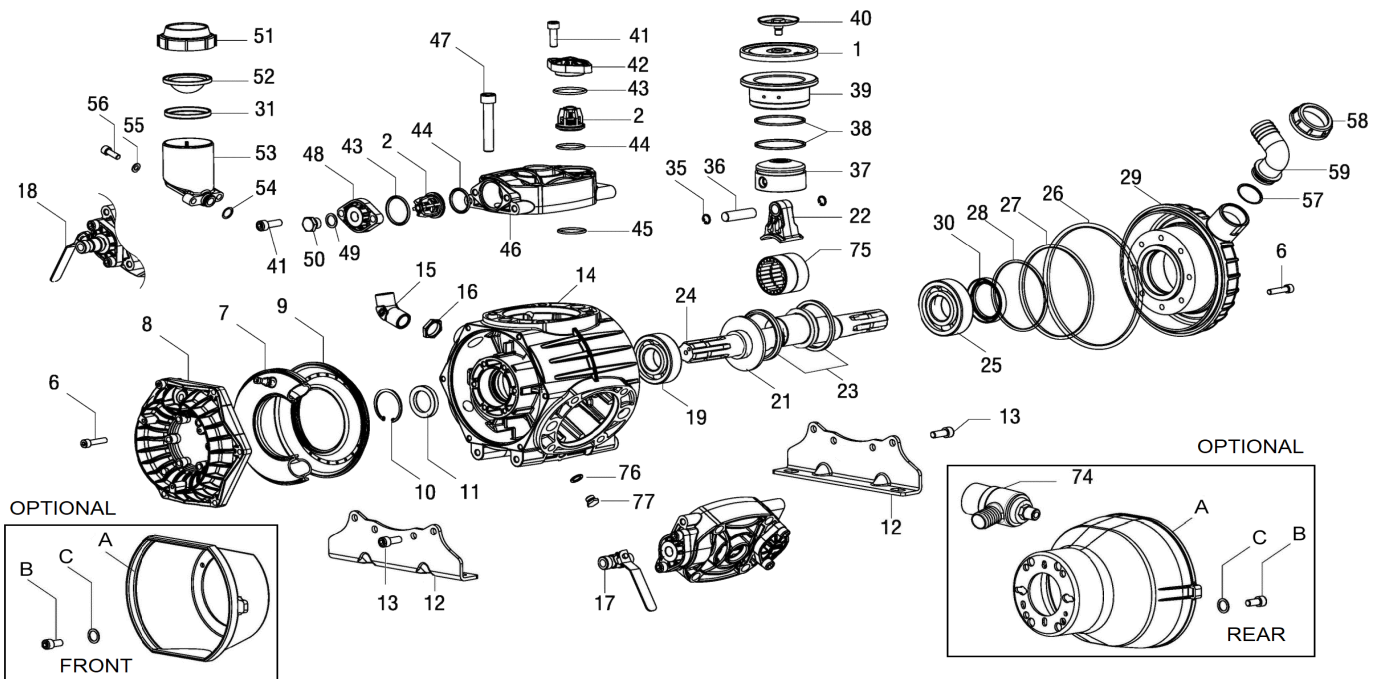


FIGURE 20: MODEL 9915-D1063

# HIGH PRESSURE 50 BAR REPLACEMENT PARTS

## TORQUE CHART D1063

REF. No.	Qty.	N-m	ft.Lbs
13	6	44	32.5
56	2	22	16.2
40	3	25	18.5
6	18	22	16.2
41	12	44	32.5
47	12	98	72.2

Tolerance on Torque value: +0/-10%

## ACCUMULATOR PRESSURE D1063

"OPERATING PRESSURE PSI [Bar]"	"ACCUMULATOR PRESSURE PSI [Bar]"
29-73 [2-5]	29 [2]
73-145 [5-10]	29-73 [2-5]
145-290 [10-20]	73-102 [5-7]
290-580 [20-50]	87-116 [6-8]

## 9915-KIT2006

### KIT DIAPHRAGM D1063

REF. No.	DESCRIPTION	QTY.
1	DESMOPAN PISTON DIAPHRAGM	3
7	NBR BALLASTER DIAPHRAGM	1
45	O-RING DIA.2,62x22,22	6

## 9915-KIT2106

### KIT SERVICE VALVE D1063

REF. No.	DESCRIPTION	QTY.
2	VALVES ASSEMBLY	6
3	O-RING 3.53x41.28	6
5	O-RING 3.53x32.93	6

## 9915-KIT2206

### KIT REPAIR PUMP D1063

REF. No.	DESCRIPTION	QTY.
11	OIL SEAL 40x52x7	1
26	O-RING 3.53x190.1	1
27	O-RING 2.62x126.67	1
28	O-RING 3.53x88.5	1
30	OIL SEAL 40x72x10	1
43	O-RING 3.53x41.28	6
44	O-RING 3.53x32.93	6
45	O-RING 2.62x22.22	6

# HIGH PRESSURE 50 BAR REPLACEMENT PARTS

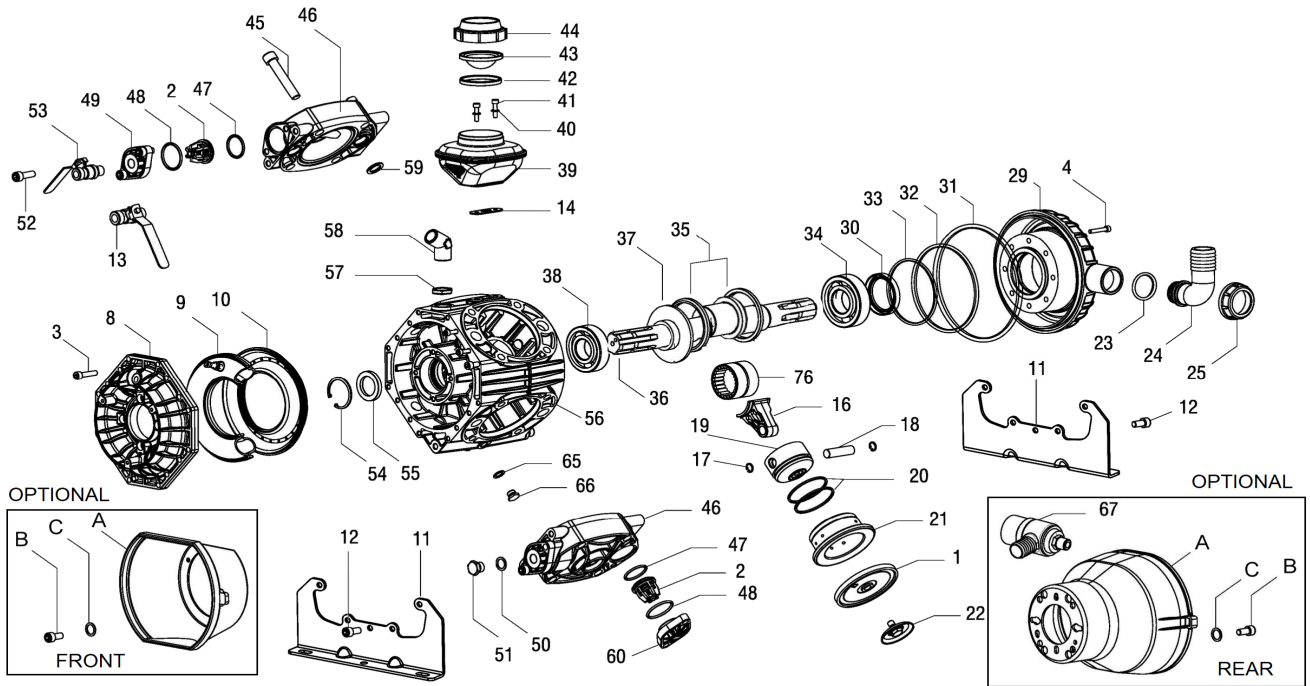


FIGURE 21: MODEL 9915-D1504

# HIGH PRESSURE 50 BAR REPLACEMENT PARTS

TORQUE CHART D1504			
REF. No.	Qty.	N-m	ft.Lbs
3	20	22	16.2
4	8	22	16.2
12	10	44	32.5
22	4	25	18.5
45	16	108	79.7
52	16	44	32.5
66	1	22	16.2

Tolerance on Torque value: +0/-10%

ACCUMULATOR PRESSURE D1504	
"OPERATING PRESSURE PSI [Bar]"	"ACCUMULATOR PRESSURE PSI [Bar]"
29-73 [2-5]	29 [2]
73-145 [5-10]	29-73 [2-5]
145-290 [10-20]	73-102 [5-7]
290-580 [20-50]	87-116 [6-8]

9915-KIT2007		
KIT DIAPHRAGM D1504		
REF. No.	DESCRIPTION	QTY.
1	DESMOPAN PISTON DIAPHRAGM	4
9	NBR BALLASTER DIAPHRAGM	1
59	O-RING DIA.2.62x22.22	8

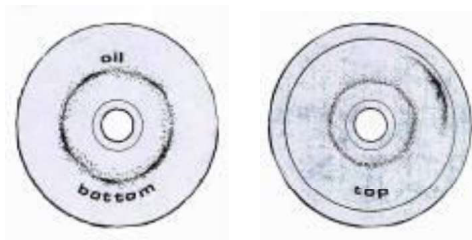
9915-KIT2107		
KIT SERVICE VALVE D1504		
REF. No.	DESCRIPTION	QTY.
2	VALVES ASSEMBLY	8
47	O-RING DIA.3,53x32,93	8
48	O-RING DIA.3,53x41,28	8

9915-KIT2207		
KIT REPAIR PUMP D1504		
REF. No.	DESCRIPTION	QTY.
30	OIL SEAL DIA.40x72x10 "VD"	1
31	O-RING DIA.3.53x190.10	1
32	O-RING DIA.2.62x126.67	1
33	O-RING DIA.3.53x88.5	1
47	O-RING DIA.3.53x32.93	8
48	O-RING DIA.3.53x41.28	8
55	OIL SEAL DIA.40x52x7	1
59	O-RING DIA.2.62x22.22	8

# TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
The pump does not draw water	One or more valves are seating improperly.	Remove valve and check for debris. Remove any debris found. Examine the valve seating and clean them.
	Suction line is plugged or collapsed. Clogged strainer	Examine and clean the suction line. Clean the strainer.
The liquid flow is irregular. The pump is noisy. The pressure gauge fluctuates.	The charge in the pulsation dampener is incorrect.	Check the pressure in the pulsation dampener. (It should be 20% of your spray pressure)
	One or more valves are seating improperly.	Remove valve and check for debris. Remove any debris found. Examine the valve seating and clean them.
	Pump is sucking air, or air hasn't been evacuated completely.	Start the pump with the gun open to evacuate the air.
Output drops and the pump is noisy	The oil level is too low.	Add oil to the correct level (halfway up the sight tube).
Oil comes out of the discharge port or oil is a milky color.	One or more diaphragms have split.	Remove the manifold and heads. Drain the oil and clean the crankcase of water. Replace the diaphragms, heads, and manifold. Refill with Hypro Oil (part number 2160-0038).
Oil comes out from the oil seal of the shaft.	Damaged or worn oil seal.	Replace the oil seal.
	Too much oil into the crankcase	Check the oil level and reset the correct one.
The pump fails to prime	Air sucked	Check the suction circuit
	Pressure adjusting valve in the "Press" position	Set the regulating valve in the "bypass" position.
The pump doesn't reach the required pressure	Valves have worn seals.	Check valves.
	Suction hose with air pockets or irregular elbows.	Check hose.
	Clogged stainer	Clean strainer
	R.P.M. too slow.	Make sure that the pump RPM correspond to the value indicated on the label

## Examples of diaphragms failures & causes



CIRCULAR FRACTURE ON PISTON SIDE OF DIAPHRAGM WHICH IS SAME DIAMETER AS PISTON  
POSSIBLE CAUSES:

1. BLOW-BY BETWEEN PISTON AND SLEEVE
2. SUCTION HAS TOO MUCH PRESSURE (EXCESSIVE HEAD)
3. LOW PUMP RPM
4. DELIVERY VALVE NOT SEALING
5. LOW OIL LEVEL IN PUMP



CHEMICAL INCOMPATIBLE WITH DIAPHRAGM MATERIAL  
POSSIBLE CAUSES:

1. FATIGUED AND WORN UNDERNEATH PISTON RETAINING DISC
2. DIAPHRAGM SWOLLEN AND SOFT
3. DIAPHRAGM SOFT AND SPONGY
4. INCREASE IN EXTERNAL DIAMETER



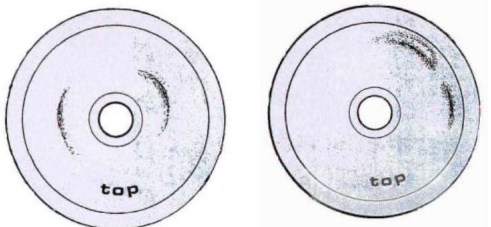
FRACTURE ON EXTERNAL DIAMETER, AND FATIGUE AND WORN UNDERNEATH PISTON RETAINING DISC  
POSSIBLE CAUSES:

1. FATIGUE BREAKAGE DIAPHRAGM WORN OUT



A STRAIGHT FRACTURE  
POSSIBLE CAUSES:

1. INCORRECT AIR BLEEDING, AIR TRAPPED UNDER DIAPHRAGM
2. BLOCKED SUCTION



TWO SMALL FRACTURES CORRESPONDING TO VALVE POSITION  
POSSIBLE CAUSES:

1. RESTRICTED SUCTION
2. PUMP RPM ABOVE SPECIFICATION
3. SUCTION VALVE NOT SEALING
4. CHEMICAL INCOMPATIBLE WITH DIAPHRAGM MATERIAL

**▲ WARNING** Too much oil creates pressure inside the crankcase, giving rise to possible leaks or rupturing the diaphragms owing to overpressure. For pump models without the oil drain plug, periodic oil changing must be carried out when the pump components are checked for wear, we recommend at the end of each season or after every 500 hours service. The oil is drained out by disassembling a head and relative piston sleeve.

# WARRANTY

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Hypro/SHURflo (hereafter, "Hypro") agricultural products are warranted to be free of defects in material and workmanship under normal use for the time periods listed below, with proof of purchase.

- Pumps: one (1) year from the date of manufacture, or one (1) year of use. This limited warranty will not exceed two (2) years, in any event.
- Accessories: ninety (90) days of use.

This limited warranty will not apply to products that were improperly installed, misapplied, damaged, altered, or incompatible with fluids or components not manufactured by Hypro. All warranty considerations are governed by Hypro's written return policy.

Hypro's obligation under this limited warranty policy is limited to the repair or replacement of the product. All returns will be tested per Hypro's factory criteria. Products found not defective (under the terms of this limited warranty) are subject to charges paid by the returnee for the testing and packaging of "tested good" non-warranty returns.

No credit or labor allowances will be given for products returned as defective. Warranty replacement will be shipped on a freight allowed basis. Hypro reserves the right to choose the method of transportation.

This limited warranty is in lieu of all other warranties, expressed or implied, and no other person is authorized to give any other warranty or assume obligation or liability on Hypro's behalf. Hypro shall not be liable for any labor, damage or other expense, nor shall Hypro be liable for any indirect, incidental or consequential damages of any kind incurred by the reason of the use or sale of any defective product.

## Return Procedures

All products must be flushed of any chemical (ref. OSHA section 1910.1200 (d) (e) (f) (g) (h)) and hazardous chemicals must be labeled/tagged before being shipped\* to Hypro for service or warranty consideration. Hypro reserves the right to request a Material Safety Data Sheet from the returnee for any pump/product it deems necessary. Hypro reserves the right to "disposition as scrap" products returned which contain unknown fluids. Hypro reserves the right to charge the returnee for any and all costs incurred for chemical testing, and proper disposal of components containing unknown fluids. Hypro requests this in order to protect the environment and personnel from the hazards of handling unknown fluids.

Be prepared to give Hypro full details of the problem, including the model number, date of purchase, and from whom you purchased your product. Hypro may request additional information, and may require a sketch to illustrate the problem.

Contact the appropriate Hypro Service Department to receive a Return Merchandise Authorization number (RMA#). Returns are to be shipped with the RMA number clearly marked on the outside of the package. Hypro shall not be liable for freight damage incurred during shipping. Please package all returns carefully. All products returned for warranty work should be sent shipping charges prepaid:

**US/Canada**  
HYPRO / PENTAIR  
Attention: Service Department  
375 Fifth Avenue NW  
New Brighton, MN 55112  
Service: 800-468-3428  
Fax: 651-766-6618  
Technical: 800-445-8360  
hypro.technical@pentair.com

**Europe**  
HYPRO EU Ltd.  
Station Road  
Longstanton  
Cambridge CB24 3DS UK  
Service/Technical:  
+44 1954 260097  
Fax: +44 1954 260245  
euagorders@pentair.com

**South America & Central America**  
Pentair Water do Brasil LTDA  
Av. Marginal Norte da Via  
Anhanguera, 53.700  
Jundiaí/SP - Brasil  
CEP 13206-245  
Tel: (11) 3378-5400  
vendas.pwdb@pentair.com

**All Other Regions**  
HYPRO / PENTAIR  
Attention: Service Department  
375 Fifth Avenue NW  
New Brighton, MN 55112  
Service: 800-468-3428  
Fax: 651-766-6618  
Technical: 800-445-8360  
hypro.technical@pentair.com

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



375 Fifth Avenue  
NW New Brighton, MN 55112 US  
Phone: (651) 766-6300, 800-424-9776  
Fax: 800-323-6496

pentair.com