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PE45PEE4PRS	PE45LEE4CPRS
PE45YEE4CMPRS	PE45LEE4MPRS
PE45YEE4CPRS	PE45LEE4PRS
PE45YEE4MPRS	PE45PEE4CMPRS
PE45YSS4PRS	PE45PEE4CPRS

PE45 INFINITY TORQUE WRENCH SERIES

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DESCRIPTION

Infinity Series Electric / Hydraulic Torque Wrench Pumps

The Infinity Series, Infinite Stage Pump (ISP) hydraulic pumps are designed to have a maximum of 690 bar (10,000 psi) at a flow rate of 737 cc/min (45 cu. in/min). All pumps come fully assembled, less fluid, and ready for work.

Universal Motor

The universal motor pump, shown in Figure 1, offers a lightweight and portable hydraulic pump option. Weight can be up to 40 kg (88 lbs).

Universal motor pumps come with a 5.7L (1.5 Gal) capacity hydraulic reservoir.

The motor is a 1.3 kW (1.8 HP) average, 115/230 VAC (nominal), 50 / 60 Hz single-phase. Current draw can be up to 17 Amps at 115V and 8.5 Amps at 230V and the sound level is rated at 87-92 dB. Operating temperatures range is -25°C to +50°C (-13°F to 122°F). (If temperatures are at extremes of the operating range, it is recommended to use hydraulic fluids that are rated for those temperatures. It is recommended that you use the cooling fan option for elevated ambient temperature or continuous duty.



Figure 1.
PE45 Series Pump

CONTROL VALVES

Max. Capacity: 690 Bar (10,000 psi)

	Description	Motor	Control Switch	Pendant	Use with	Valve No.
	Equipped with 2-position/4-way solenoid valve.	1.3 kW (1.3 HP) average 50/60 Hz, nominal 115 VAC, single-phase	Remote motor	See Figure 3. SPX Part No. 3000554	Hydraulic Torque Wrench	2002108 2-position/4-way, pump mounted, solenoid operated
	Valve Function		Diagrams			
2-position/ 4-way	<p>Advance Position: (Solenoid "A") Pressure to "A" port, "B" port to tank</p> <p>Retract Position: (De-energized Solenoid "A") Pressure to "B" port, "A" port to tank</p> <p>NOTE: All ports OPEN to tank during transition between valve positions.</p>					
2-position/ 2-way (Idle Valve)	<p>Advance position: Idle Valve CLOSED (S2 Energized) Pressure to "A" port, "B" port to tank</p> <p>Retract Position: Idle Valve CLOSED (S2 Energized) Pressure to "B" port, Idle Valve port to tank</p> <p>Idle Position: Idle Valve OPEN (S2 De-energized) "B" port to tank (through idle valve)</p>					

Table 1. Pump Configuration

SAFETY SYMBOLS AND DEFINITIONS

The safety signal word designates the degree or level of hazard seriousness.



DANGER: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION: Used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

IMPORTANT: Important is used when action or lack of action can cause equipment failure, either immediate or over a long period of time.

SAFETY PRECAUTIONS



WARNING: To prevent personal injury,



The following procedures must be performed by qualified, trained personnel who are familiar with this equipment. Operators must read and understand all safety precautions and operating instructions included with the pump. If the operator cannot read these instructions, operating instructions and safety precautions must be read and discussed in the operator's native language.



- These products are designed for general use in normal environments. These products are not designed for lifting and moving people, agri-food machinery, certain types of mobile machinery, or in special work environments such as: explosive, flammable, or corrosive. Only the user can decide the suitability of this product in these conditions or extreme environments. Hydraulic Technologies will supply information necessary to help make these decisions. Consult your nearest Hydraulic Technologies facility.



- Safety glasses must be worn at all time by the operator and anyone within sight of the unit. Additional personal protection equipment may include: face shield, goggles, gloves, apron, hard hat, safety shoes, and hearing protection.



- The owner of this tool must ensure that safety-related decals are installed, maintained, and replaced if they become hard to read.
- Shut OFF the motor before opening any connections in the system.

Pump



WARNING: To prevent personal injury,

- Do not exceed the hydraulic pressure rating noted on the pump nameplate or tamper with the internal high pressure relief valve. Creating pressure beyond rated capacities can result in personal injury.
- Retract the system before adding fluid to prevent overfilling the pump reservoir. An overfill can cause personal injury due to excess reservoir pressure created when tools are retracted.

Electric Motor



WARNING: To prevent personal injury,



- Electrical work must be performed and tested by a qualified electrician per local directives and standards.
- Disconnect the pump from the power supply and relieve pressure before removing the motor case cover or performing maintenance or repair.
- Check the total amperage draw for the electrical circuit you will be using. *For example: Do not connect a pump that may draw 25 amps to a 20 amp fused electrical circuit.*
- Never use an ungrounded power supply with this unit.
- Changing the voltage is an involved and, if incorrectly performed, hazardous procedure. Consult the manufacturer for specific information before attempting rewiring.
- Wire pump motors for counterclockwise rotation when viewed from the shaft end of the motor.



- Do not attempt to increase the power line capacity by replacing a fuse with another fuse of higher value. Overheating the power line may result in fire.
- Exposing electric pumps to rain or water could result in an electrical hazard.
- Avoid conditions that can cause damage to the power cord, such as abrasion, crushing, sharp cutting edges, or corrosive environment. Damage to the power cord can cause an electrical hazard.

Hoses



WARNING: To prevent personal injury,



- Before operating the pump, tighten all hose connections using the correct tools. Do not overtighten. Connections should be only secure and leak-free. Overtightening can cause premature thread failure or high pressure fittings to split at pressures lower than their rated capacities.
- Should a hydraulic hose rupture, burst, or need to be disconnected, immediately shut off the pump and shift the control valve twice to release pressure. Never attempt to grasp a leaking hose under pressure with your hands. The force of escaping hydraulic fluid could cause serious injury.



- Do not subject the hose to potential hazard, such as fire, sharp surfaces, heavy impact, or extreme heat or cold. Do not allow the hose to kink, twist, curl, or bend so tightly that the fluid flow within the hose is blocked or reduced. Periodically inspect the hose for wear, because any of these conditions can damage the hose and possibly result in personal injury.
- Do not use the hose to move attached equipment. Stress can damage the hose and possibly cause personal injury.
- Hose material and coupler seals must be compatible with the hydraulic fluid used. Hoses also must not come in contact with corrosive material such as creosote-impregnated objects and some paints. Consult the manufacturer before painting a hose. Never paint the couplers. Hose deterioration due to corrosive materials may result in personal injury.

Tools



DANGER: To prevent serious personal injury or death,

- This pump is designed for torque wrench applications and should never be used for lifting loads.
- Do not exceed rated capacities of the tools. Excess pressure may result in personal injury.
- Read and understand all safety and warning decals and instructions for devices attached.
- Inspect each tool and coupler before each shift or usage to prevent unsafe conditions from developing.
- Do not use tools if they are damaged, altered or in poor condition.
- Do not use tools with bent or damaged couplers or damaged port threads.
- Avoid pinch points or crush points that can be created by the tool.
- Never use extreme heat to disassemble a hydraulic tools. Metal fatigue and/or seal damage will result and can lead to unsafe operating conditions.
- The guide cannot cover every hazard or situation so always do the job with **SAFETY FIRST**.

IMPORTANT

- Keep the tool clean at all times.
- Use an approved, high-grade pipe thread sealant to seal all hydraulic connections. PTFE tape can be used if only one layer of tape is used and it is applied carefully (two threads back) to prevent the tape from being pinched by the coupler and broken off inside the pipe end. Any loose pieces of tape could travel through the system and obstruct the flow of fluid or cause jamming of precision-fit parts.
- Always use protective covers on disconnected quick couplers.

INITIAL SETUP

1. Remove all packing materials from the assembled unit.
2. Inspect the unit upon arrival. The carrier, not the manufacturer, is responsible for any damage resulting from shipment.

Filling the Pump Reservoir

Most pumps are shipped without hydraulic fluid in the reservoir. Hydraulic fluid may have been shipped in a separate container, but if hydraulic fluid is needed, use only approved Power Team hydraulic fluid rated at 47 cSt @ 38°C (215 SUS @ 100°F). If low temperature requirements are needed, use hydraulic fluid 5.1 cSt @ 100°C (451 cSt @ -40°C).

1. Clean the area around the filler cap to remove debris. Debris in the hydraulic fluid can damage the polished surfaces and precision-fit components of this pump.
2. Remove the filler cap and insert a clean funnel with a filter.
3. Fill the reservoir with hydraulic fluid to 1.3–3.8 cm (0.5–1.5 in.) from the cover plate or to fill line.
4. Replace the filler cap. Verify the breather-hole is open, if applicable.

Hydraulic Connections

1. Clean the areas around the fluid ports of the pump and tools.
2. Clean all hose ends, couplers or union ends.
3. Remove the protective covers from the hydraulic fluid outlets.
4. Connect the hose assembly to the hydraulic fluid outlet, and couple the hose to the tool.

Electric Motor Operation

1. Refer to Table 2. Minimum Recommended Gauge Table. Connect the motor to a power supply. Never run the motor on long, light gauge extension cords.

Caution: To prevent equipment damage,

- **The correct voltage is required for the pump to operate. Verify the voltage rating on the pump motor name plate matches the outlet or power source you are using. Low voltage may cause: an overheated motor; a motor that fails to start under load; motor surging when trying to start; or a stalled motor before maximum pressure is reached.**
 - **Check the voltage at the motor with the pump running at full pressure.**
2. Start the pump and shift as required.
 3. Turn off the pump when not in use.

AMPS at Maximum Hyd. Pressure	Electrical Cord Size AWG (mm ²) 3.2 Volt Drop Length of Electrical Cord							
	mm ²				AWG			
	0-8 m	8-15 m	15-30 m	30-46 m	0-25 ft	25-50 ft	50-100 ft	100-150 ft
6	0.75	1	1.5	2.5	18	16	14	12
10	0.75	1.5	2.5	4	18	14	12	10
14	1	2.5	4	6	16	12	10	8
18	1.5	2.5	6	6	14	12	8	8
22	1.5	4	6	10	14	10	8	6
26	2.5	4	6	10	12	10	8	6
30	2.5	4	10	16	12	10	6	4

Table 2. Minimum Recommended Gauge Table

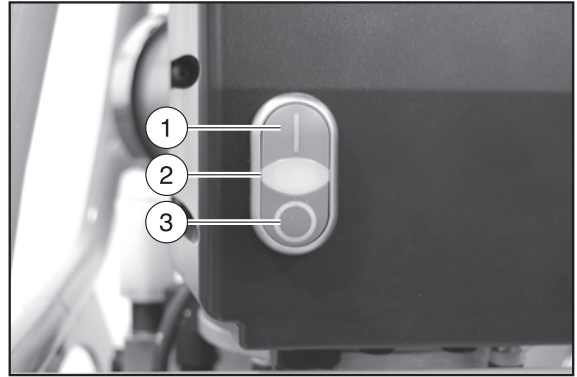
Bleeding Air from the System

After all connections are made, the hydraulic system must be bled of any trapped air. With no load on the system and the pump vented and positioned higher than the hydraulic device, cycle the system several times. Check the reservoir fluid level and fill to correct level with Hydraulic Technologies hydraulic fluid as necessary. If there is a problem contact Hydraulic Technologies Technical Support. To locate a Hydraulic Technologies Authorized Hydraulic Service Center, contact your nearest Power Team facility or www.SPXBOLTINGSYSTEMS.com.

OPERATING INSTRUCTIONS

Motor Control Operation

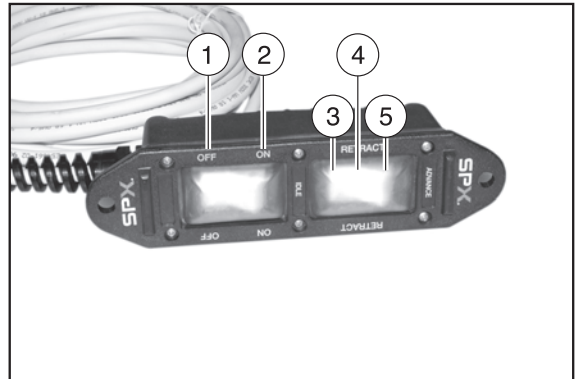
1. Connect the power cord to an appropriate power source.
2. Refer to Figure 2. Press the START (green) switch. Lamp (white) will illuminate.



Item	Description
1	Start (Green)
2	Lamp (White)
3	Stop (Red)

Figure 2.
Motor Control Switch

3. Refer to Figure 3. Press the ON/OFF rocker switch to ON.
4. Press and hold the ADVANCE/RETRACT/IDLE rocker switch to the ADVANCE position. Release when tool has reached the end of its stroke.
5. When the ADVANCE/RETRACT/IDLE is released, the switch defaults to RETRACT. The pump is factory preset to 103 bar (1,500 psi) during RETRACT.
6. Pressing the ADVANCE/RETRACT/IDLE rocker switch to IDLE allows hydraulic fluid to cycle through the pump back to the tank and the motor will shut off.



Item	Description
1	OFF Position
2	ON Position
3	Idle Position
4	Retract Position
5	Advance Position

Figure 3.
Pendant Control

Adjusting The Pressure Regulating Valve

1. The pump must be completely connected. Press the START (green) rocker switch.
2. Using the pendant, press the ON/OFF rocker switch to ON.
3. Press and hold the ADVANCE/RETRACT/IDLE rocker switch to the ADVANCE position to start the motor and build pressure.
4. Rotate pressure regulating valve to the desired pressure. Clockwise increases pressure, counterclockwise decreases pressure.
5. When the desired pressure is achieved, cycle the system again to verify correct pressure setting.
6. Using the pendant press the ON/OFF rocker switch to OFF.
7. Press the OFF (red) switch on the control box.

PERFORMANCE SPECIFICATIONS

Pump	Motor RPM (Output)	Amp Draw at 690 Bar (10,000 PSI) (115V)	Amp Draw at 690 Bar (10,000 PSI) (230V)	dB A at Idle and 690 Bar (10,000 PSI)
PE45	4,500	17	8.5	92

Table 3. Drive Unit Requirements

Pump	Max. Pressure Output Bar (PSI)	Fluid Delivery* L/min (cu. in./min. @)			
		50 Bar (750 PSI)	70 Bar (1,000 PSI)	345 Bar (5,000 PSI)	690 Bar (10,000 PSI)
PE45	690 (10,000)	8.5 (523)	7.9 (483)	1.4 (86)	0.8 (46)

* Typical delivery. Actual flow varies with field conditions.

Table 4. Fluid Pressure Chart

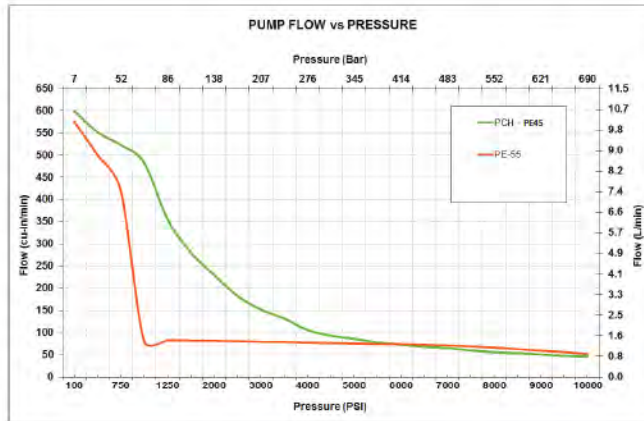


Figure 4. ISP Typical Flow Curve

GENERAL MAINTENANCE



WARNING: To prevent personal injury,



- Disconnect the unit from the power supply before performing maintenance or repair procedures.
- Repairs and maintenance are to be performed in a dust-free area by a qualified technician.

System Evaluation

The components of your hydraulic system — pump, hoses, and couplings — all must be:

- Rated for the same maximum operating pressure.
- Correctly connected.
- Compatible with the hydraulic fluid used.

A system that does not meet these requirements can fail, possibly resulting in serious injury. If you are in doubt about the components of your hydraulic system, contact Hydraulic Technologies Technical Support.

Inspection

Keep a dated and signed inspection record of the equipment. Before each use, the operator or other designated personnel should visually inspect for the following conditions:

- Excessive wear, bending, damage, or insufficient thread engagement.
- Leaking hydraulic fluid.
- Loose bolts, cap screws, or pipe plugs.
- Bent or damaged couplers or port threads.

Periodic cleaning



WARNING: Contamination of the hydraulic fluid could cause the valve to malfunction.

Establish a routine to keep the hydraulic system as free from debris as possible.

- Seal unused couplers with protective covers.
- Keep hose connections free of debris.
- Keep the breather-hole in the filler cap clean and unobstructed.
- Use only Power Team hydraulic fluid. Replace hydraulic fluid as recommended, or sooner if the fluid becomes contaminated. Never exceed 300 hours of use between fluid changes.

Hydraulic Fluid Level

1. Check the fluid level in the reservoir after each 10 hours of use. The fluid level should be 1.3–3.8 cm (0.5–1.5 in.) from the cover plate or to the FILL LINE when all cylinders are retracted.
2. Drain, flush, and refill the reservoir with an approved Power Team hydraulic fluid after 300 hours of use. The frequency of fluid changes depends upon general working conditions, severity of use, the overall cleanliness and care given to the pump. Fluid should be changed more frequently when the system is not operated regularly indoors.

Draining and Flushing the Reservoir

1. Clean the pump exterior.
2. Remove the drain plug and drain the reservoir. When drained install the drain plug.
3. Remove the filler cap and insert a clean funnel with a filter.
4. Fill the reservoir with hydraulic fluid to 1.3–3.8 cm (0.5–1.5 in.) from the cover plate.
5. Connect the hydraulic hoses to the fittings.
6. Bleed the air from the system. Refer to Bleeding Air from the System.
7. Cycle the pump for 1–2 minutes.
8. Disconnect the motor and pump assembly.
9. Remove the drain plug and drain the reservoir. When drained install the drain plug.
10. Remove the reservoir gasket. Refer to the Reservoir Gasket Replacement procedure.
11. Clean the inside of the reservoir.
12. See Figure 5. Replace the inlet suction filters. (4 qty.)
13. Place the pump and motor assembly (with new gasket) on the reservoir. Tighten the screws to 7–9 Nm (60–80 in/lb).
14. Fill the reservoir with Power Team hydraulic fluid 47 cSt @ 38°C (215 SUS @ 100°F). If low temperature requirements are needed, use hydraulic fluid 5.1 cSt @ 100°C (451 cSt @ -40°C).

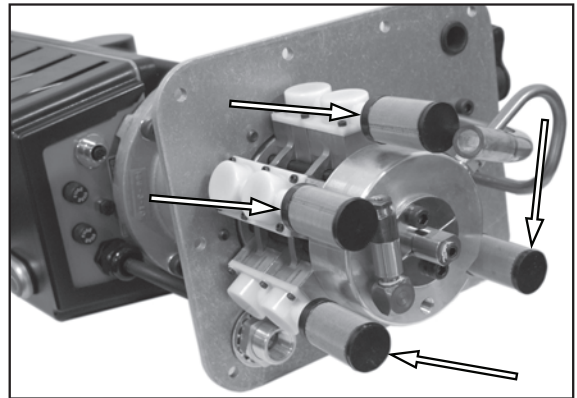


Figure 5.
Inlet Suction Filters

Adding Hydraulic Fluid to the Reservoir

1. Disconnect the power supply.
2. Clean the entire area around the filler cap.
3. See Figure 6. Remove the filler cap, and install a clean funnel with a filter.
4. Use only Power Team hydraulic fluid 47 cSt @ 38°C (215 SUS @ 100°F). If low temperature requirements are needed, use hydraulic fluid 5.1 cSt @ 100°C (451 cSt @ -40°C).

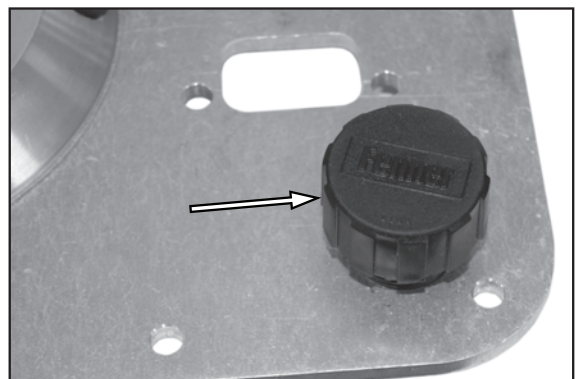


Figure 6.
Filler Cap

Hose Connections



CAUTION: To prevent personal injury from leaking hydraulic fluid, seal all hydraulic connections with a high-quality, non-hardening, pipe thread sealant.



Pipe thread sealant tape can be used to seal hydraulic connections if only one layer of tape is used. Apply tape carefully, two threads back, to prevent it from being pinched by the coupler and broken off inside the system. Loose pieces of tape could travel through the system and obstruct the flow of fluid or cause interference of precision-fit parts.

Storage

Store the unit in a dry, well-protected area where it will not be exposed to corrosive vapors, debris, or other harmful elements. If a unit has been stored for an extended period of time, it must be thoroughly inspected before it is used.

Checking Brushes on Universal Motors

To help prevent premature failure of the armature, check the brushes periodically:

1. Remove the motor brushes. Refer to Motor Brush Replacement.
2. See Figure 7. The brush assemblies must be replaced if they are 4.7 mm (3/16") or less.
3. Install brush assemblies, brush holder caps, and metal brush cover plates.

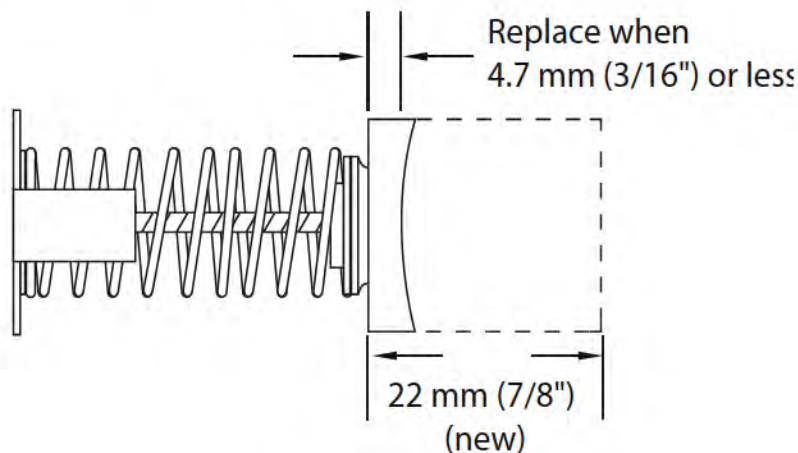


Figure 7.
Brush Inspection

TROUBLESHOOTING GUIDE



WARNING: To prevent personal injury,

- Repair work or troubleshooting must be performed by qualified personnel who are familiar with this equipment.
- Disconnect the power supply before removing the electrical cover. Electrical work should be performed by a qualified electrician.
- Check for system leaks by using a hand pump to apply pressure to the suspect area. Watch for leaking fluid and follow it back to its source. Never use your hand or other body parts to check for a possible leak.



Notes:

- For a detailed parts list or to locate a Hydraulic Technologies Authorized Hydraulic Service Center, contact your nearest Power Team facility.
- Plug the outlet ports of the pump when checking for leakage to determine if the leakage is in the pump, in the cylinder, or in the tool.

Problem	Cause	Solution
Electric motor does not run.	1. Pump not turned ON.	1. Position switch to <i>START</i> position.
	2. Unit is not plugged in.	2. Plug in unit.
	3. No voltage supply.	3. Check line voltage. Check reset button on power panel.
	4. Worn brushes.	4. Replace brushes.
	5. Circuit breaker tripped because total amperage draw too high for existing circuit.	5. Use an alternate circuit or have a qualified electrician add an additional circuit.
	6. Overheated motor (single-phase motor). Magnetic starter disengaged (three-phase motor). Thermal protector open.	6. Wait for motor to cool before restarting. Reset thermal protector. (Single-phase motor will reset automatically.)
	7. Faulty thermal protector (single-phase motor). Faulty magnetic starter (three-phase motor).	7. Replace defective parts.
Electric motor will not shut off.	1. Defective motor controls.	1. Disconnect unit from power supply; contact a Hydraulic Technologies Service Center.
Electric motor stalls, surges, overheats, or will not start under load.	1. Low voltage	1. Refer to electric motor information in <i>Initial Setup</i> section.
	2. Electrical cord size too small.	2. Refer to electrical cord chart in <i>Initial Setup</i> section.
Electrical overload protector keeps tripping.	1. Wired incorrectly.	1. Disconnect unit from power supply; have qualified electrician review motor and circuit wiring.
Pump delivers excess fluid pressure.	1. Faulty pressure gauge.	1. Replace gauge.
	2. Relief valve set incorrectly.	2. Contact a Hydraulic Technologies Service Center.

TROUBLESHOOTING GUIDE CONTINUED

Problem	Cause	Solution
Pump is not delivering fluid, or delivers only enough fluid to advance connected components partially or erratically or operation to slow.	1. Fluid level too low.	<i>1. Add fluid, refer to filling the pump reservoir in Initial Setup section.</i>
	2. Loose-fitting coupler to component.	<i>2. Verify quick-disconnect couplings are completely coupled. Couplers may need to be replaced because ball check does not stay open due to wear.</i>
	3. Air in system.	<i>3. Refer to Initial Setup in this manual to bleed air from system.</i>
	4. Air leak in suction line.	<i>4. Check and tighten suction line.</i>
	5. Debris in pump or filter plugged.	<i>5. Clean pump filter. If problem persists, disconnect from power supply contact authorized Hydraulic Technologies service center.</i>
	6. Cold fluid or fluid too heavy. (Hydraulic fluid is of a higher viscosity than necessary.)	<i>6. Drain, flush, and refill reservoir using a lighter weight fluid. Refer to General Maintenance section.</i>
	7. Vacuum in reservoir.	<i>7. Clean plugged vent in filler cap.</i>
Pump builds pressure but cannot maintain pressure.	1. Fluid leakage.	<i>1. Look for external leaks. If no fluid leakage is visible, the problem is internal. Seal leaking pipe fittings with pipe sealant.</i>
	2. Leaking pressure switch seal.	<i>2. Replace pressure switch.</i>
Pump does not build to full pressure.	1. Faulty pressure gauge.	<i>1. Replace pressure gauge.</i>
	2. Check for external leakage.	<i>2. Seal faulty pipe fittings with pipe sealant.</i>
	3. Check external pressure regulator. Check relief valve setting.	<i>3. Refer to Adjusting the Pressure Regulating Valve.</i>
Erratic action	1. Air in system.	<i>1. Check for leaks. Refer to bleeding procedure.</i>
	2. Internal leakage in attached components.	<i>2. Refer to manufacture's information for attached component.</i>
	3. Attached component sticking or binding.	<i>3. Refer to manufacture's information for attached component.</i>
	4. Malfunctioning valve.	<i>4. Verify connections. Contact authorized Hydraulic Technologies Service Center.</i>

REPAIR PROCEDURES

Fuse Replacement

1. Disconnect power cord from power source.
2. See Figure 8. Remove the fuse holder.
3. Replace the fuse.
 - 115V Pumps: 15A TIME DELAY 250VAC
5x20mm Fuse
 - 230V Pumps: 10A TIME DELAY 250VAC
5x20mm Fuse
4. To install, reverse the removal procedure.

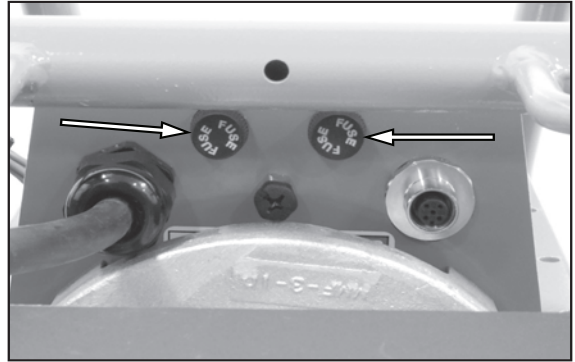


Figure 8.

External Fuse Holder

Motor Brush Replacement

1. Disconnect power cord from power source.
2. See Figure 9. Remove the brush assembly cap seal.

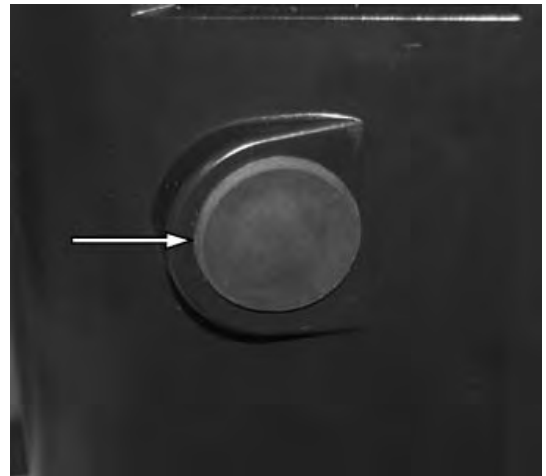


Figure 9.

Cap Seal

3. See Figure 10. Use a screwdriver to remove the brush holder cap.
4. Remove the brush.
5. To install, reverse the removal procedure.

NOTE: Apply a small amount of grease (Part No. 2001672) to the lip of the cap seal to aid in installation.



Item	Description
2007886	Brush Assembly (2) Required

Figure 10.

Brush Holder

Electrical Cover and Switch Removal and Installation

1. Disconnect power cord from power source.
2. See Figure 11. Remove the 10 screws.
3. Position the electrical cover aside.

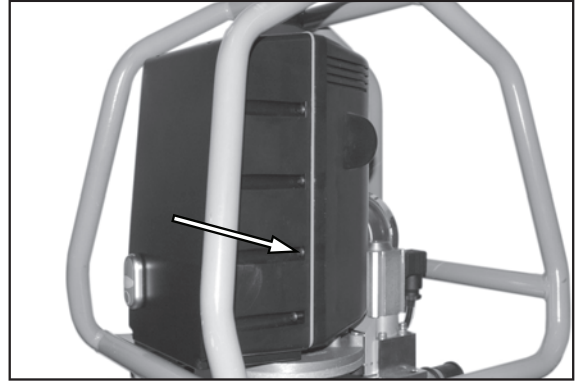


Figure 11.
Electrical Cover Screws

4. See Figure 12. If necessary, pry up on the release and remove the switch assembly.
5. Position the switch assembly with the release towards the top of the electrical cover and push to install the switch.
6. Position the cover and install the screws. Tighten the screws securely and evenly.

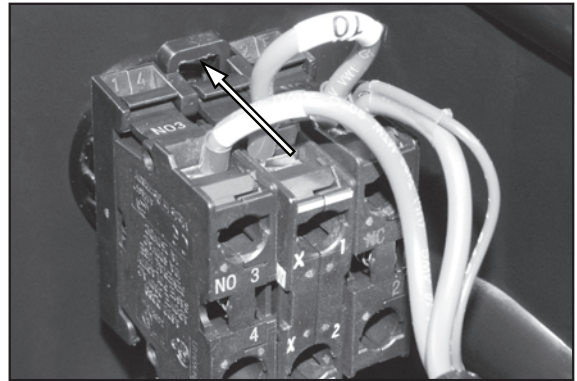
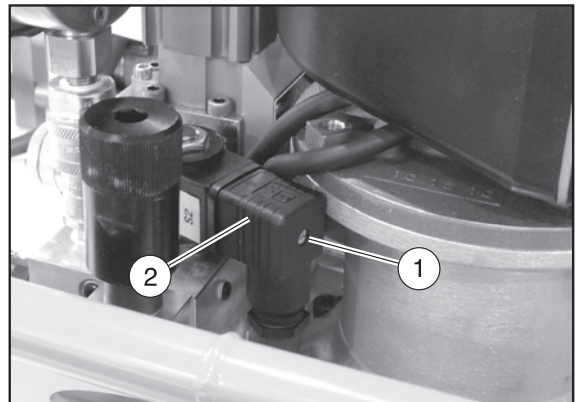


Figure 12.
Switch Removal

Motor Housing Removal and Installation

1. Remove the electrical cover. See Electrical Cover Removal and Installation.
2. See Figure 13. Loosen the solenoid coil screw and disconnect the plug. Do not remove the screw from the connector.



Item	Description
1	Screw
2	Plug

Figure 13.
Solenoid Coil Connector

3. See Figure 14. Remove the four motor bolts. (Two on each side.)

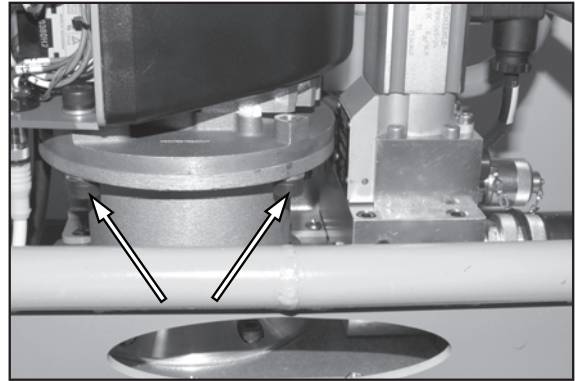


Figure 14.
Motor Bolts

4. See Figure 15. Rotate the motor.

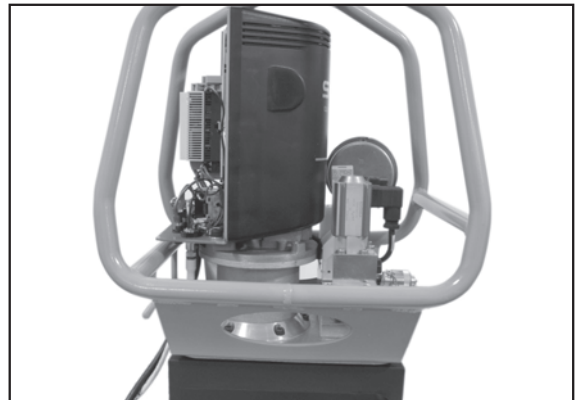


Figure 15.
Rotate the Motor

5. See Figure 16. Remove the two screws and the motor housing.
6. To install, reverse the removal procedure. Tighten the motor bolts to 6.8 Nm (60 in/lb). Tighten the cover screws securely and evenly.



Figure 16.
Motor Cover Screws

Cord, Electrical Supply

1. Remove the electrical cover. See Electrical Cover Removal and Installation.
2. See Figure 17. Loosen the cordgrip.

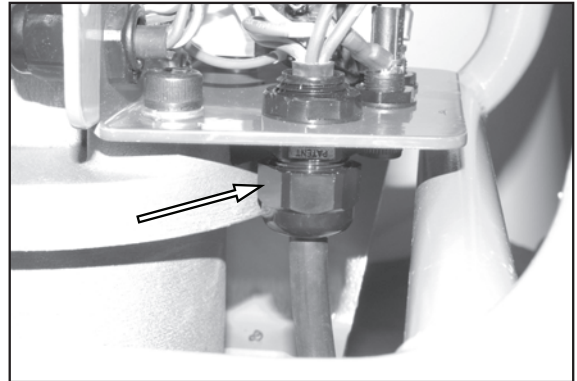


Figure 17.
Cordgrip

3. See Figure 18. Disconnect the two power wires.

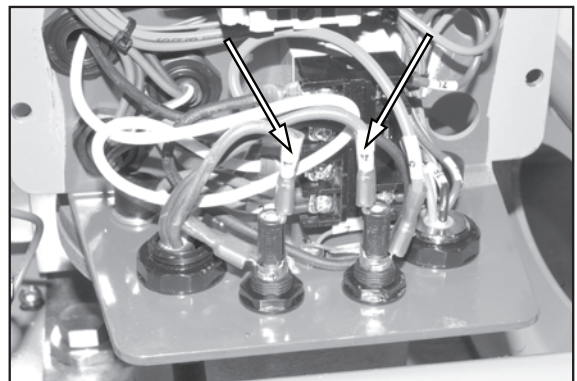


Figure 18.
Power Cord Connection Location

4. See Figure 19. Remove the ground screw.
5. Remove the cord.
6. Insert the cord through the electrical bracket.
7. Position (GN/Y) ground wire and install ground screw.
8. Connect the two power lines to the appropriate fuse holder.
9. Install the electrical cover. See Electrical Cover Removal and Installation.

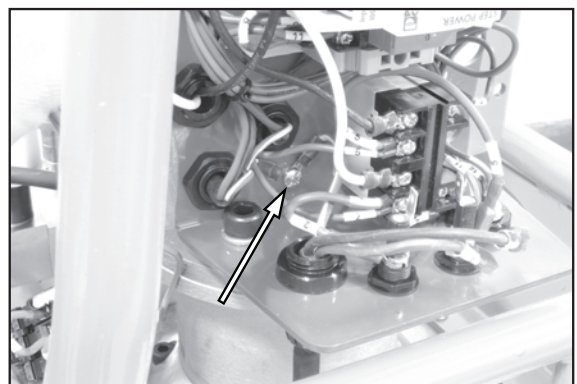
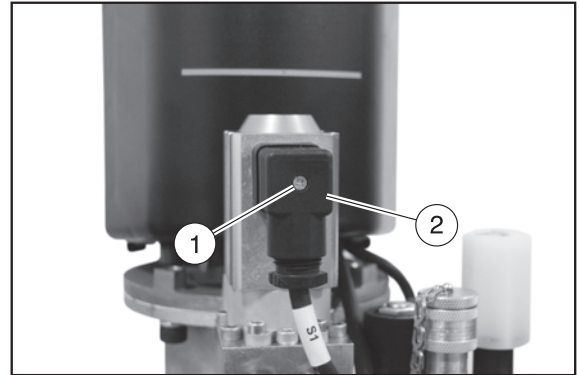


Figure 19.
Ground Screw Location

Electrical Bracket Assembly

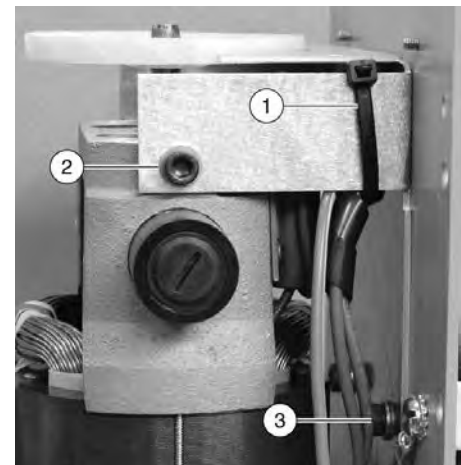
1. Remove the motor housing. See Motor Housing Removal and Installation.
2. See Figure 20. Loosen the 2-position/4-way valve plug screw and disconnect the plug.



Item	Description
1	Screw
2	Plug

Figure 20.
2-Position/4-Way Valve

3. See Figure 21. Remove the baffle bracket.
 - a. Remove the tie strap.
 - b. Remove the two baffle bracket to motor bolts (one each side).
 - c. Remove the two baffle bracket to electrical bracket bolts.



Item	Description
1	Tie Strap
2	Baffle Bracket to Motor Bolts
3	Baffle Bracket to Electrical Bracket Bolts

Figure 21.
Baffle Bracket

4. See Figure 22. Disconnect the three motor wires.
5. Remove the electrical bracket assembly.

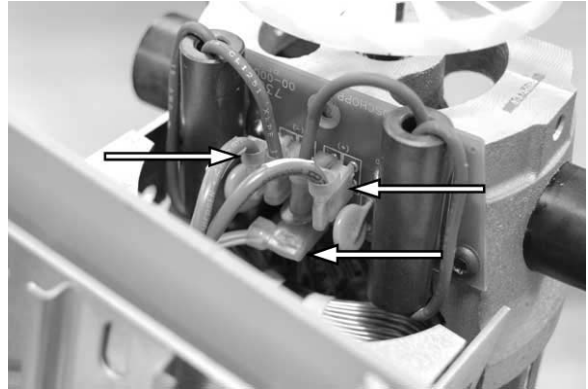


Figure 22.
Motor Wires

Roll Cage Removal and Installation

1. Disconnect power cord from power source.
2. See Figure 23. Remove and discard the eight screws.

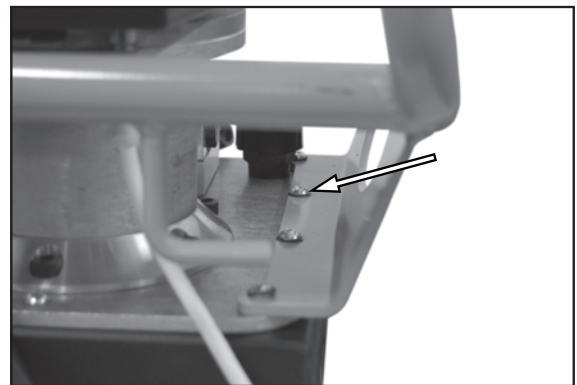


Figure 23.
Roll Cage Screws

3. See Figure 24. Loosen the hydraulic coupler and remove the pressure gauge and install the protective cover.
4. Carefully slide the roll cage towards the rear and raise up at an angle to remove.
5. To install, reverse the removal procedure.
6. Install new screws and tighten the screws to 7–9 Nm (60–80 in/lb).

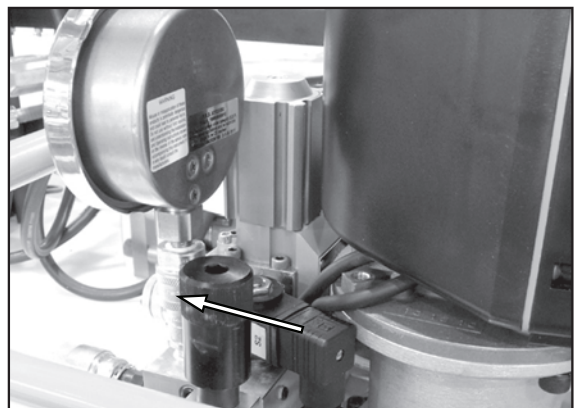
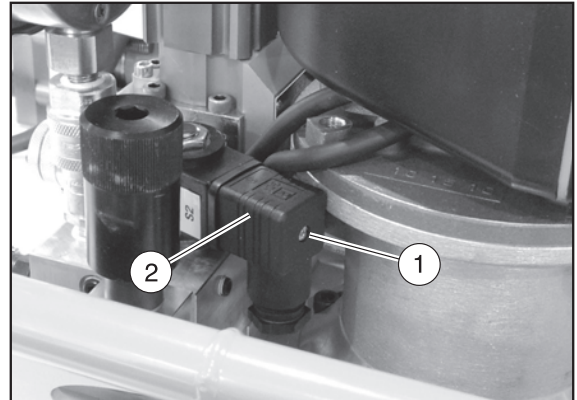


Figure 24.
Gauge Removal

Universal Motor Removal and Installation

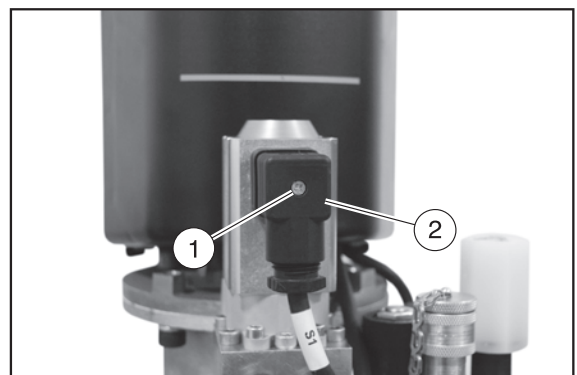
1. Remove the roll cage. See Roll Cage Removal and Installation.
2. See Figure 25. Loosen the solenoid coil screw and disconnect the plug. Do not remove the screw from the connector.



Item	Description
1	Screw
2	Plug

Figure 25.
Solenoid Valve

3. See Figure 26. Loosen the 2-position/4-way valve plug screw and disconnect the plug.



Item	Description
1	Screw
2	Plug

Figure 26.
2-Position/4-Way Valve

4. See Figure 27. Remove the four motor bolts. (Two on each side).

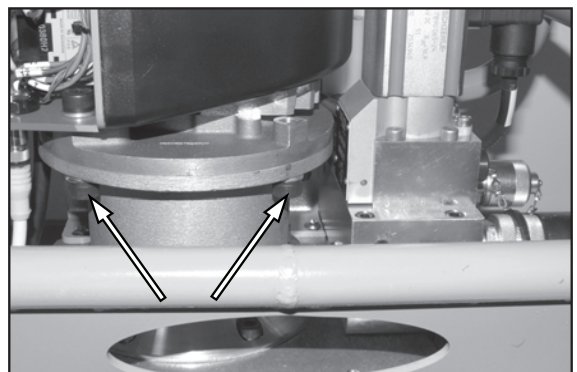


Figure 27.
Universal Motor Bolts

5. See Figure 28. Remove the two screws and the motor housing.



Figure 28.
Motor Cover Screws

6. See Figure 29. Do not damage the electrical wires. Remove the two electrical bracket bolts.

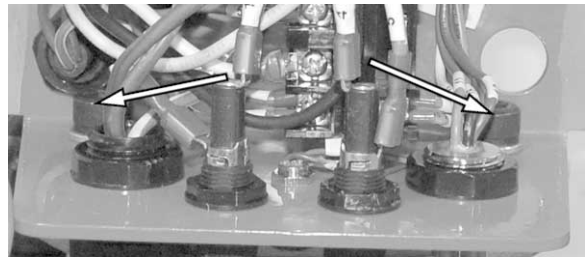


Figure 29.
Electrical Bracket Bolts

7. See Figure 30. Remove the two baffle bracket to motor bolts (one each side) and position aside the electrical bracket.
8. Remove the universal motor.
9. To install, reverse removal procedure. Tighten the bolts to 6.8 Nm (60 in/lb).

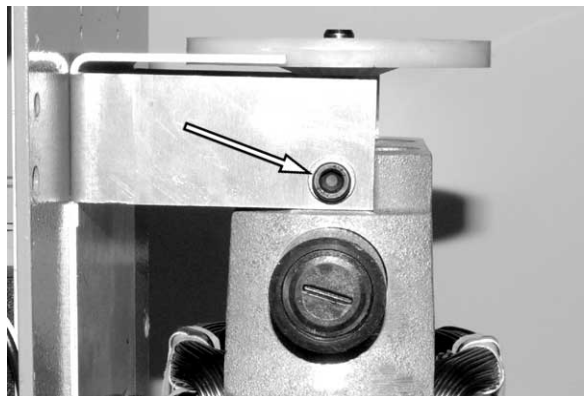


Figure 30.
Baffle Bracket

Motor Mount Removal and Installation

1. Remove the universal motor. See Universal Motor Removal and Installation.
2. See Figure 31. Remove the six motor mount bolts and the mount.

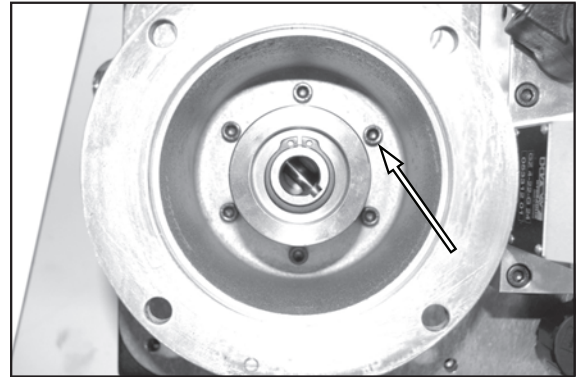


Figure 31.
Motor Mount Bolts

3. See Figure 32. The orientation of the motor mount holes is very important. Position the mount so the holes are located as shown. To install, reverse the removal procedure. Tighten motor mount bolts in a star pattern and torque to 6.8 Nm (60 in/lbs).

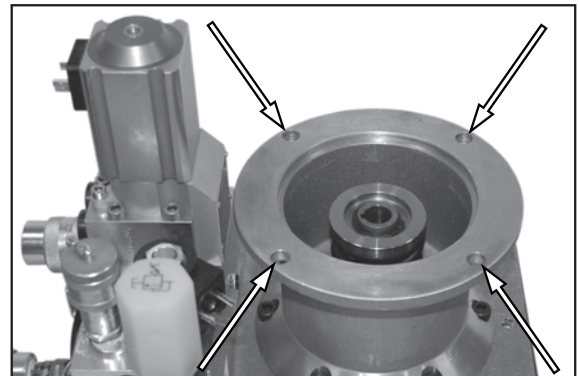


Figure 32.
Motor Mount Orientation

ISP Motor Adapter Removal and Installation

1. Remove the motor mount. See Motor Mount Removal and Installation.
2. See Figure 33. Remove the six adapter bolts and the adapter.
3. See Figure 34. Remove the gasket and clean the

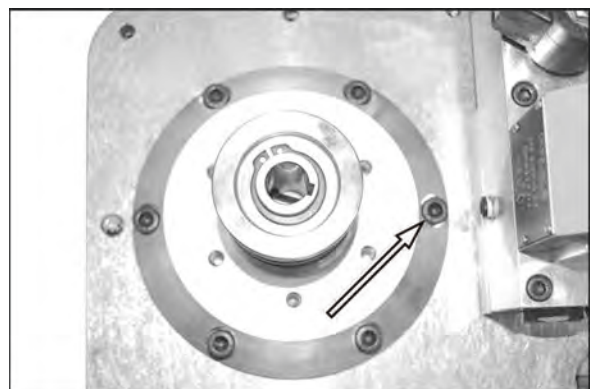


Figure 33.
Motor Adapter

gasket surfaces.

4. To install, reverse the removal procedure. Tighten the bolts in a star pattern and torque to 6.8 Nm (60 in/lbs).

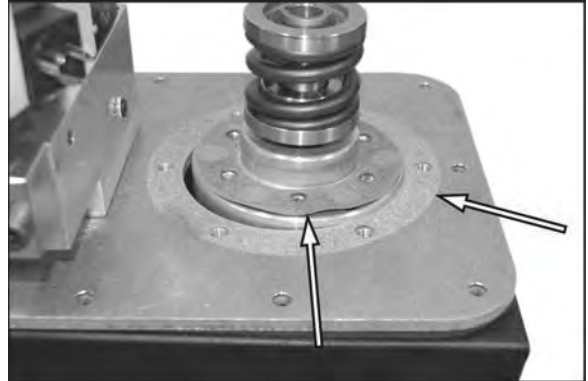


Figure 34.

Motor Adapter Gasket

Motor Shaft Square Key Removal and Installation

1. Remove the universal motor assembly. See Universal Motor Assembly Removal and Installation.
2. See Figure 35. Remove the square key.
3. To install, reverse the removal procedure.

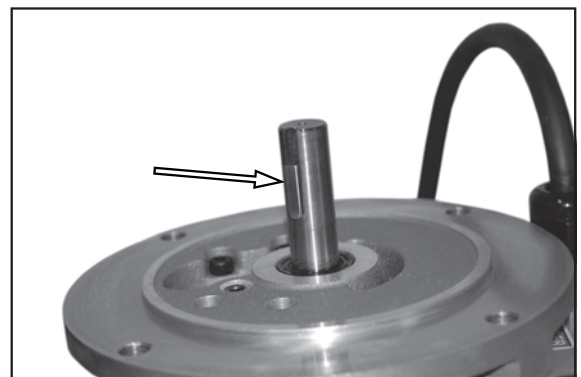


Figure 35.

Square Key

Pressure Limiting Valve Removal and Installation

1. Remove the roll cage. See Roll Cage Removal and Installation.
2. See Figure 36. Remove the two pressure-limiting valve bolts and the valve.

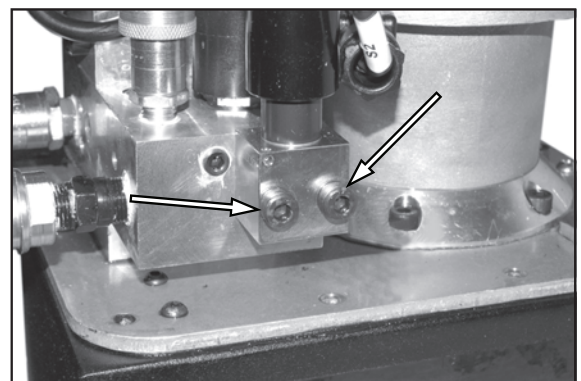


Figure 36.

Pressure-Limiting Valve Bolts

3. See Figure 37. Inspect and if necessary, replace the o-rings.
4. Apply thread lock to the bolt threads.
5. To install, reverse the removal procedure. Tighten the bolts to 34 Nm (300 in/lbs).

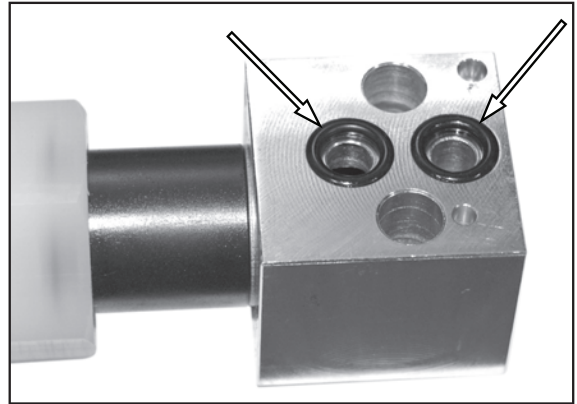
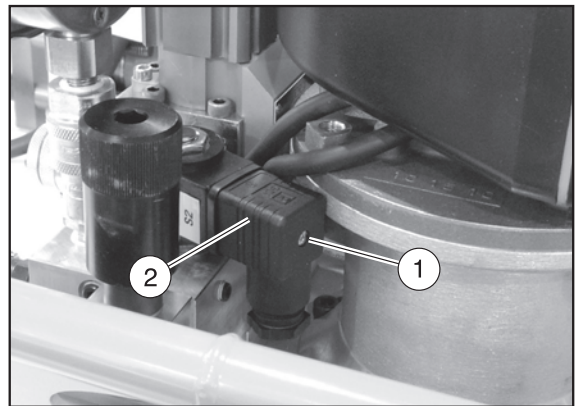


Figure 37.
O-Rings

Solenoid Coil Removal and Installation

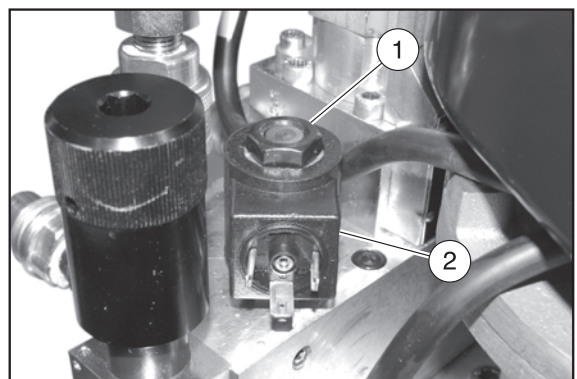
1. See Figure 38. Loosen the solenoid coil screw and disconnect the plug. Do not remove the screw from the connector.



Item	Description
1	Screw
2	Plug

Figure 38.
Solenoid Coil Connector

2. See Figure 39. Remove the solenoid coil nut and the solenoid coil.
3. To install, reverse the removal procedure. Tighten the nut to 4.5–5 Nm (40–45 in/lbs).



Item	Description
1	Solenoid Coil Nut
2	Solenoid Coil

Figure 39.
Solenoid Coil

2-Way Cartridge Valve Removal and Installation

1. Remove the solenoid coil. See Solenoid Coil Removal and Installation.
2. See Figure 40. Remove the 2-way cartridge valve.

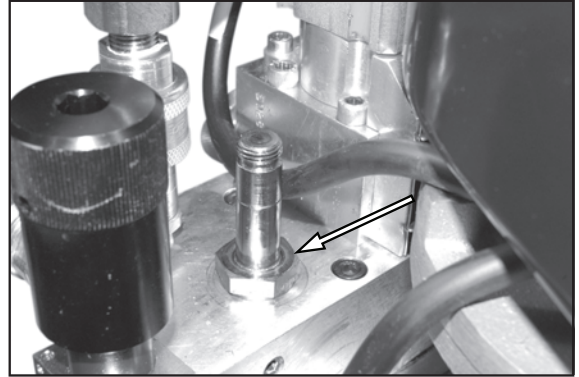


Figure 40.
2-Way Cartridge Valve

3. See Figure 41. Inspect the 2-way cartridge valve o-ring. Replace if necessary. To install, reverse the removal procedure. Tighten the nut to 20.5 Nm (15 ft/lbs).

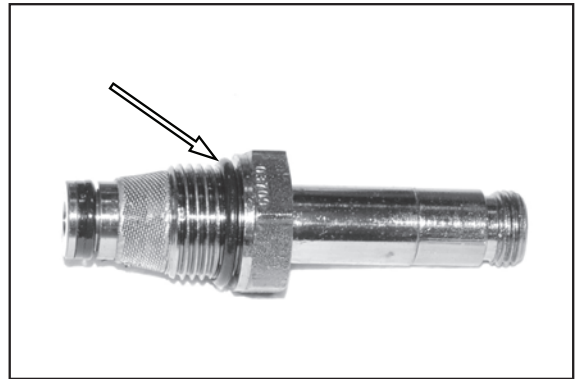
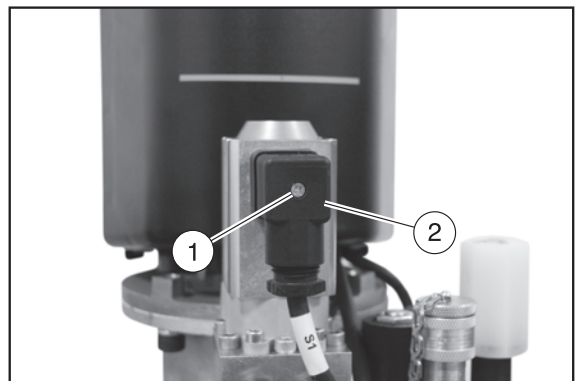


Figure 41.
2-Way Cartridge Valve O-Ring

2-Position/4-Way Valve Removal and Installation

1. See Figure 42. Loosen the 2-position/4-way valve plug screw and disconnect the plug. Do not remove the screw from the connector.



Item	Description
1	Screw
2	Plug

Figure 42.
Directional Valve Connector

2. See Figure 43. Loosen the five 2-position/4-way valve bolts. The bolts are captured and part of the assembly.

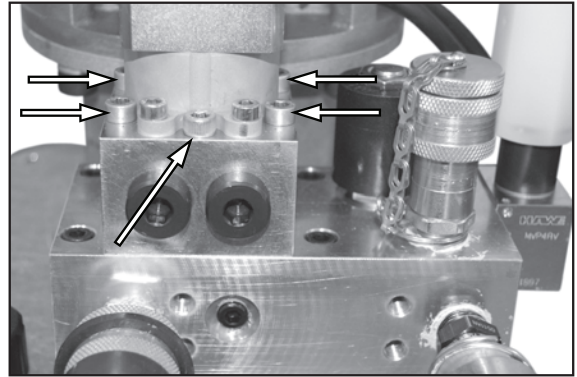


Figure 43.
2-Position/4-Way Valve Bolts

3. See Figure 44. Remove the 2-position/4-way valve. Clean and inspect the o-rings. Replace as necessary.
4. To install, reverse the removal procedure.

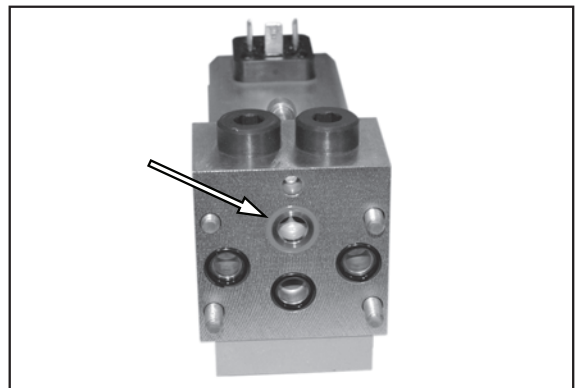


Figure 44.
2-Position/4-Way Valve O-Rings

Valve Manifold Removal and Installation

1. See Figure 45. Remove the pressure gauge.

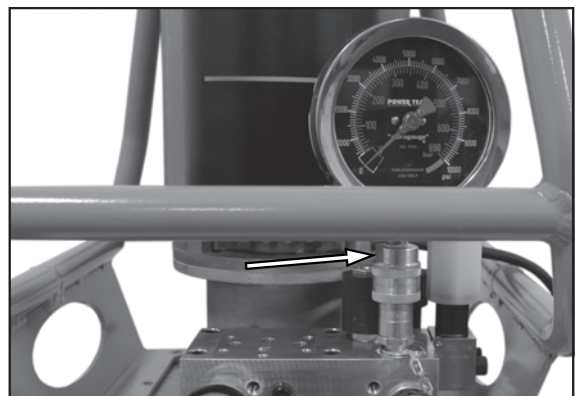
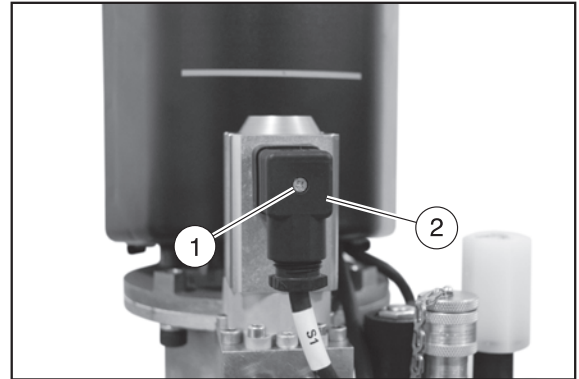


Figure 45.
Pressure Gauge

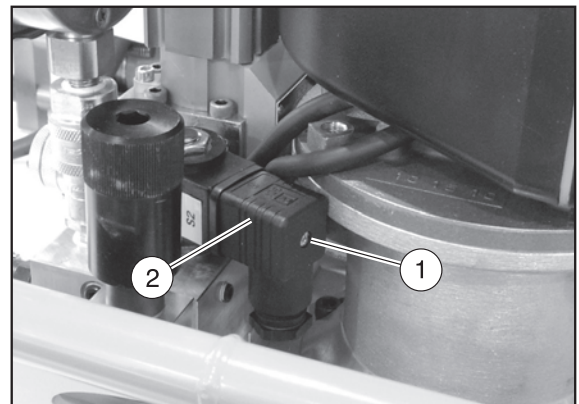
- See Figure 46. Loosen the 2-position/4-way valve plug screw and disconnect the plug. Do not remove the screw from the connector.



Item	Description
1	Screw
2	Plug

Figure 46.
Directional Valve Connector

- See Figure 47. Loosen the solenoid coil screw and disconnect the plug. Do not remove the screw from the connector.



Item	Description
1	Screw
2	Plug

Figure 47.
Solenoid Coil Connector

4. See Figure 48. Remove the 4 manifold bolts.
5. Remove the valve manifold.

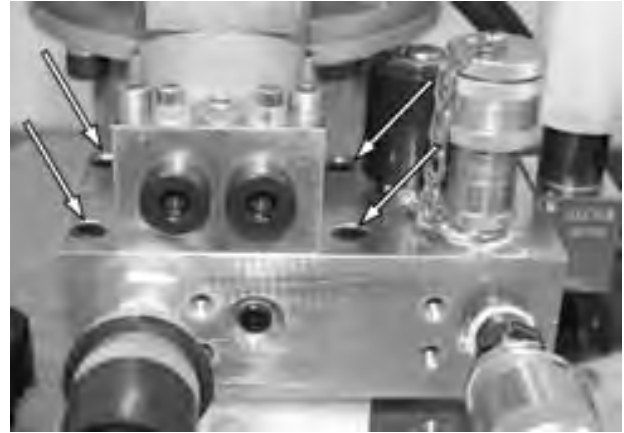
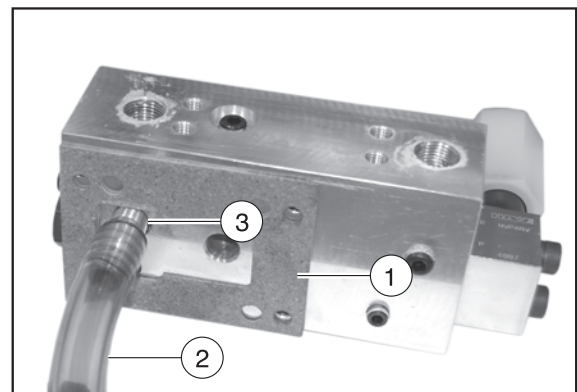


Figure 48.
Valve Manifold Bolts

6. See Figure 49. Remove the gasket, low pressure hose, and fitting.
7. Clean and inspect gasket surfaces and o-rings. Replace as necessary.
8. To install, reverse the removal procedure.



Item	Description
1	Gasket
2	Low Pressure Hose
3	Fitting

Figure 49.
Manifold Gasket

Reservoir Gasket Replacement

1. See Figure 50. Remove the drain plug and drain the fluid from the reservoir.
2. Remove the roll cage. Refer to Roll Cage Removal and Installation.

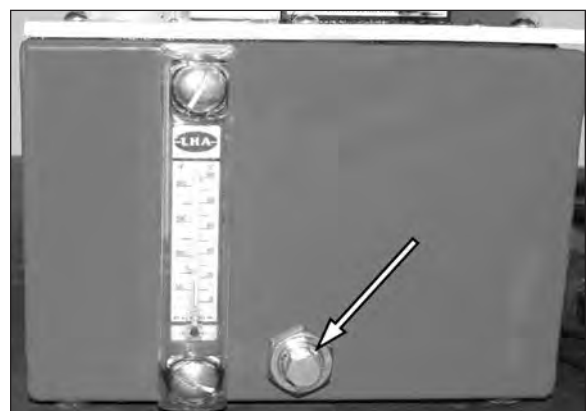


Figure 50.
Drain Plug

3. See Figure 51. Remove and discard the screws holding the cover plate.
4. Lift the motor and pump assembly from the reservoir.

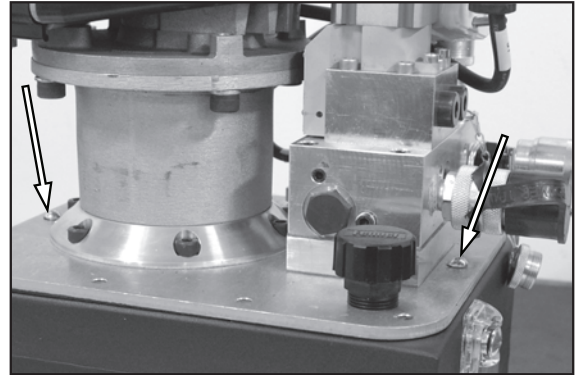


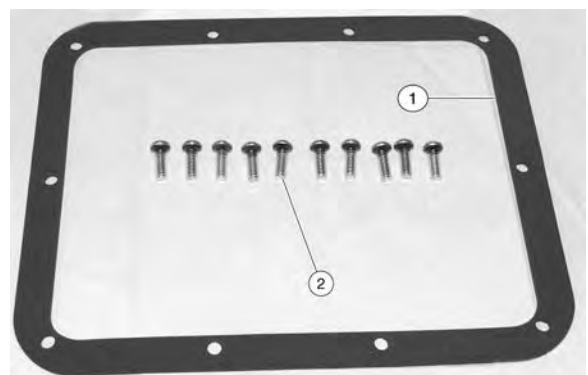
Figure 51.
Reservoir Screws

5. See Figure 52. Remove and discard the reservoir gasket.
6. Clean the gasket surfaces.



Figure 52.
Gasket Location

7. See Figure 53. Position the new gasket on the reservoir with the adhesive side down.
8. New screws and gasket must be used. To install, reverse the removal procedure. Tighten the screws to 7–9 Nm (60–80 in/lb).



Item	Description
1	Gasket 40164
2	Screws 10177

Figure 53.
Gasket and Screws

Thermometer Replacement

1. Remove the reservoir gasket. Refer to the Reservoir Gasket procedure.
2. See Figure 54. Remove the two screws and the thermometer.
3. Clean the surfaces and install new o-rings.
4. To install, reverse the removal procedure.

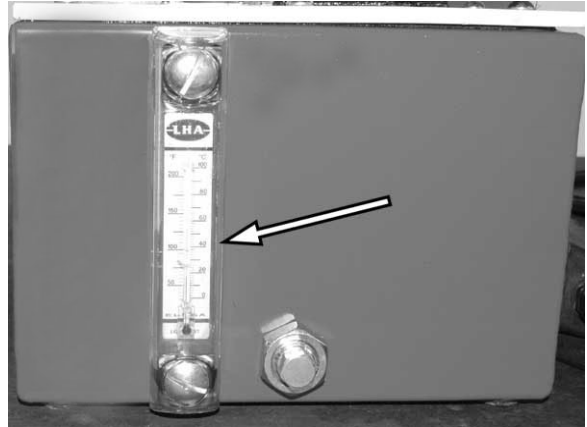


Figure 54.
Thermometer Assembly

Inlet Suction Filter Replacement

1. Remove the reservoir gasket. See Reservoir Gasket Removal and Installation.
2. See Figure 55. Remove the inlet suction filters.
3. To install, reverse the removal procedure.

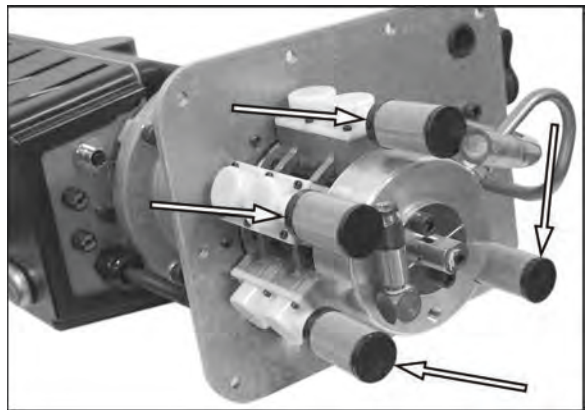


Figure 55.
Filter Location

Return Hose Removal and Installation

1. Remove the valve assembly. See valve assembly.
2. See Figure 56. Remove the hose.
3. To install, reverse the removal procedure.

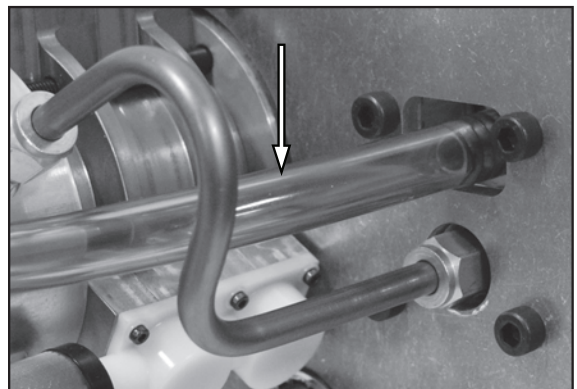


Figure 56.
Hose Location

High Pressure Tube Removal and Installation

1. Remove the reservoir gasket. See the Reservoir Gasket procedure.
2. See Figure 57. Loosen the two compression fittings and remove the high pressure tube.
3. To install, reverse the removal procedure.

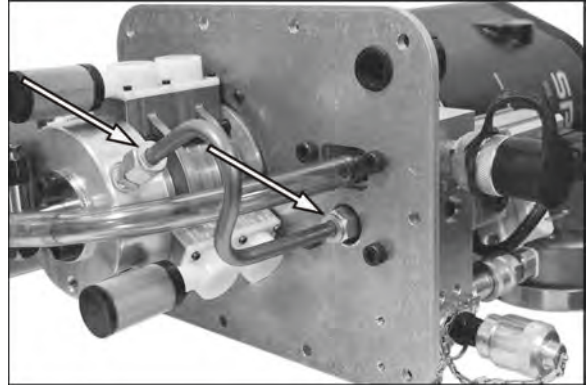
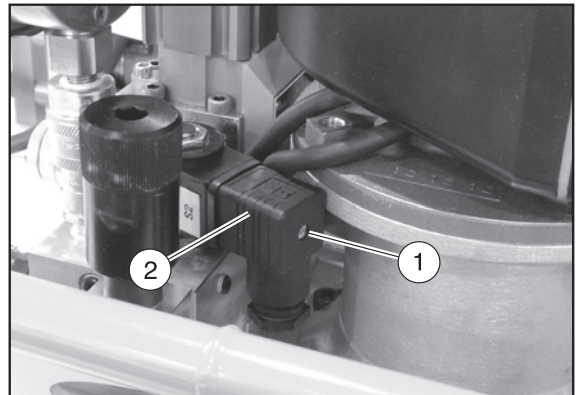


Figure 57.
High Pressure Tube

Valve Mounting Block and Gasket Removal and Installation

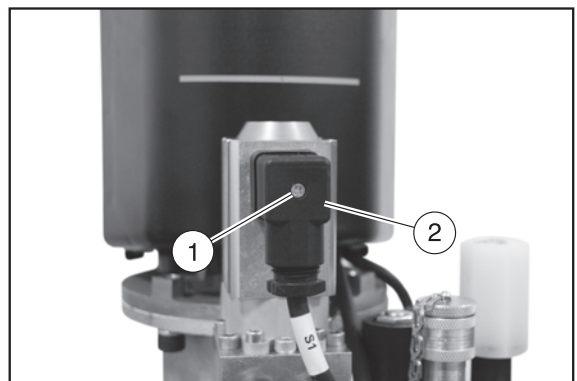
1. Remove the roll cage. See Roll Cage Removal and Installation.
2. See Figure 58. Loosen the solenoid coil screw and disconnect the plug. Do not remove the screw from the connector.



Item	Description
1	Solenoid Coil Screw
2	Plug

Figure 58.
Solenoid Coil Connector

3. See Figure 59. Loosen the 2-position/4-way valve plug screw and disconnect the plug.



Item	Description
1	Screw
2	Plug

Figure 59.
2-Position/4-Way Valve

4. See Figure 60. Remove the four manifold assembly bolts and remove the manifold assembly.
5. Remove the reservoir gasket. See the Reservoir Gasket procedure.

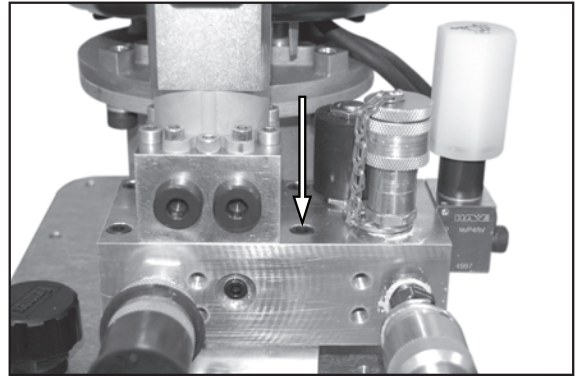


Figure 60.
Valve Assembly

6. See Figure 61. Loosen the two compression fittings and remove the high pressure tube.

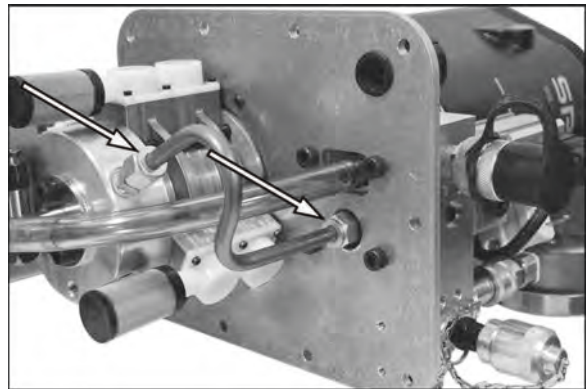


Figure 61.
High Pressure Tube

7. See Figure 62. Remove the four valve mounting block bolts and the mounting block.
8. Remove the gasket and clean the gasket surface.
9. To install, reverse the removal procedure. Torque the bolts to 6.8 Nm (60 in/lbs).

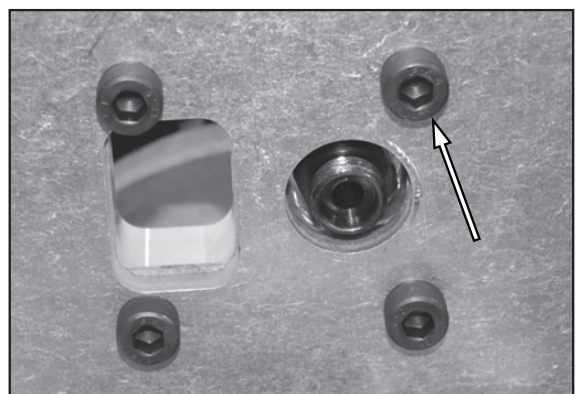
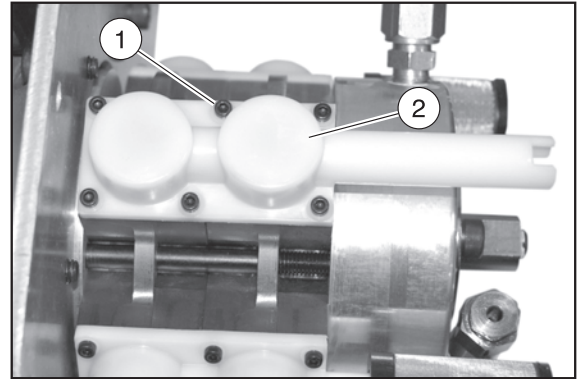


Figure 62.
Valve Mounting Block

Inlet Suction Fitting Removal and Installation

1. Remove the inlet suction filter. See Inlet Suction Filter Removal and Installation.
2. See Figure 63. Remove the six inlet suction fitting screws and the fitting.



Item	Description
1	Screws
2	Inlet Suction Fitting

Figure 63.
Inlet Suction Fitting

3. See Figure 64. If necessary, replace the two o-rings.
4. To install, reverse the removal procedure. Tighten the screws evenly.

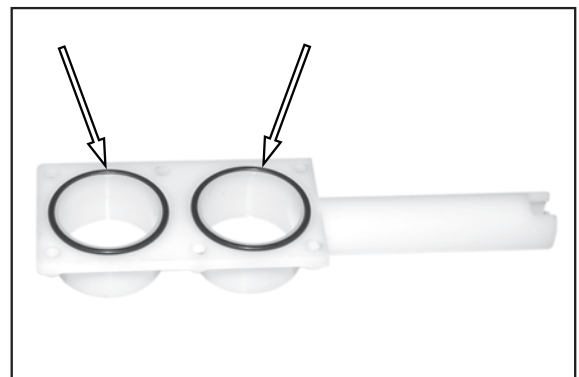


Figure 64.
O-Rings

Connector Valve Removal and Installation

1. Remove the valve mounting block. See Valve Mounting Block Removal and Installation.
2. See Figure 65. Remove the connector valve.
3. To install, reverse the removal procedure.

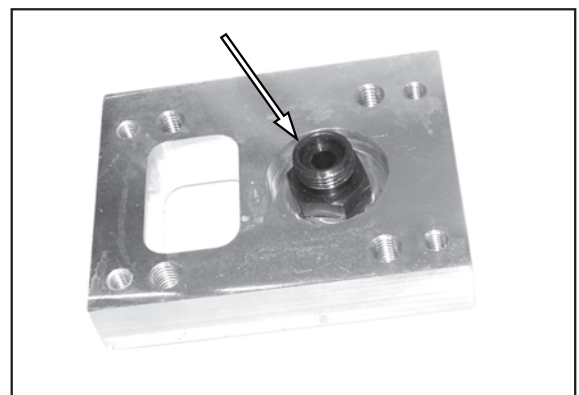


Figure 65.
Connector Valve

Pump Fitting Removal and Installation

1. Remove the high pressure tube. See High Pressure Tube Removal and Installation.
2. See Figure 66. Remove the pump fitting.

CAUTION: Sealant tape or non-hardening sealer can be used to seal hydraulic connections if only one layer of tape is used. Apply tape carefully, two threads back, to prevent it from being pinched by the coupler and broken off inside the system. Loose pieces of sealant could travel through the system and obstruct the flow of fluid or cause jamming of precision-fit parts.

3. Install sealant tape or non-hardening sealer to the gauge.
4. To install, reverse the removal procedure.

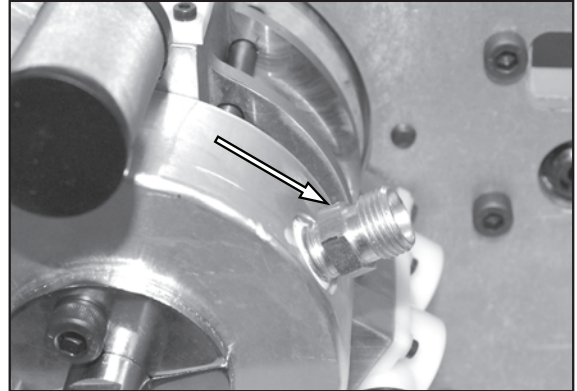
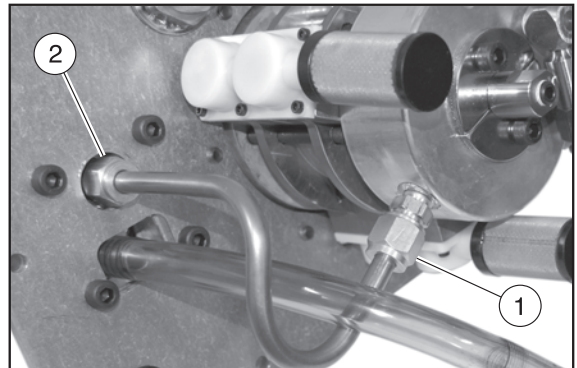


Figure 66.
Pump Fitting

Cartridge Pump Assembly Removal and Installation

1. Remove the motor mount. See Motor Mount Removal and Installation.
2. Remove the reservoir gasket. See the Reservoir Gasket procedure.
3. See Figure 67. Disconnect the high pressure tube fitting at the pump and loosen the other end.
4. Remove the pump and gasket, and clean the gasket surfaces.



Item	Description
1	Diso nnet
2	Loosen

Figure 67.
High Pressure Tube Fitting

5. See Figure 68. With the cartridge pump assembly positioned so the high pressure tube can be connected, position the assembly in the reservoir cover.



Figure 68.
Motor Alignment to
Pressure Tube

6. See Figure 69. The orientation of the motor mount holes is very important. Position the mount so the holes are located as shown. Install the motor mount bolts.
7. Tighten the motor mount bolts in a star pattern and torque to 6.8 Nm (60 in/lbs).

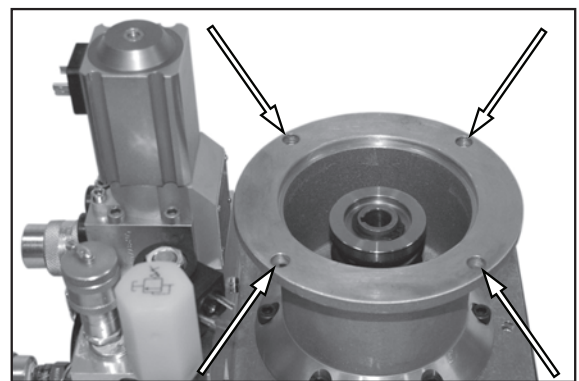


Figure 69.
Motor Mount Orientation

Reservoir Cover Removal and Installation

1. Remove the cartridge pump assembly. See Cartridge Pump Assembly Removal and Installation.
2. See Figure 70. Loosen the two compression fittings and remove the high pressure tube.

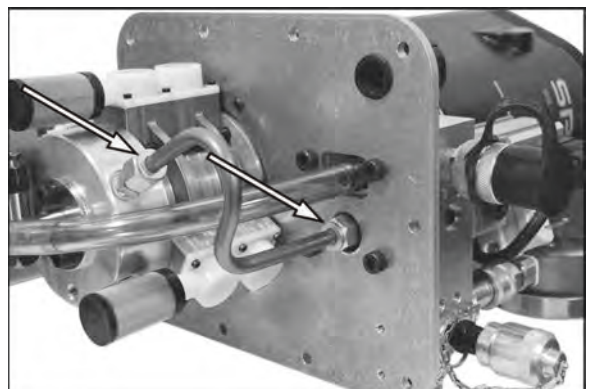


Figure 70.
High Pressure Tube

3. See Figure 71. Remove the four manifold assembly bolts and remove the manifold assembly.

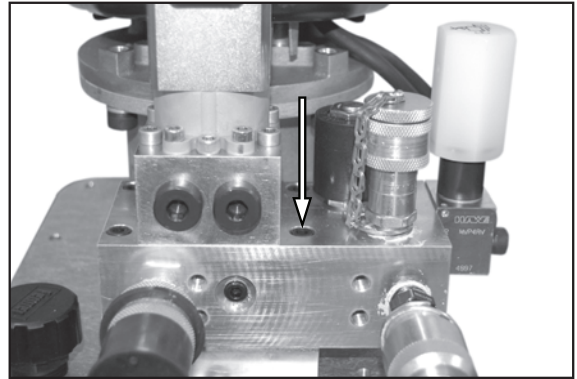


Figure 71.
Valve Assembly

4. See Figure 72. Remove the six adapter bolts and the adapter.

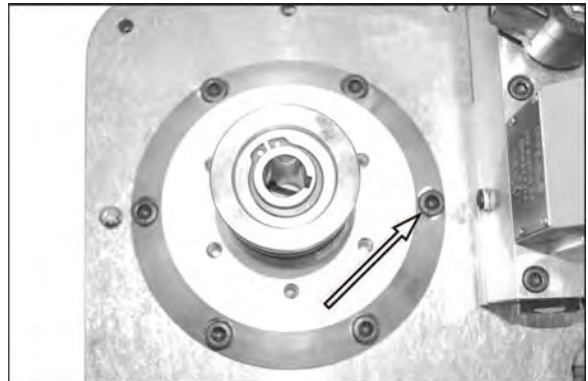


Figure 72.
Motor Adapter

5. See Figure 73. Remove the gasket and clean the gasket surfaces.

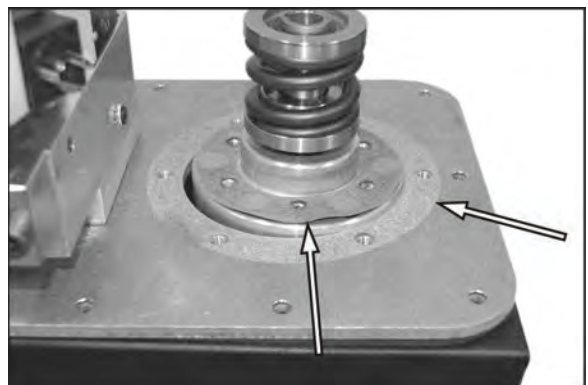


Figure 73.
Motor Adapter Gasket

6. See Figure 74. Remove the filler cap.
7. To install, reverse the removal procedure.

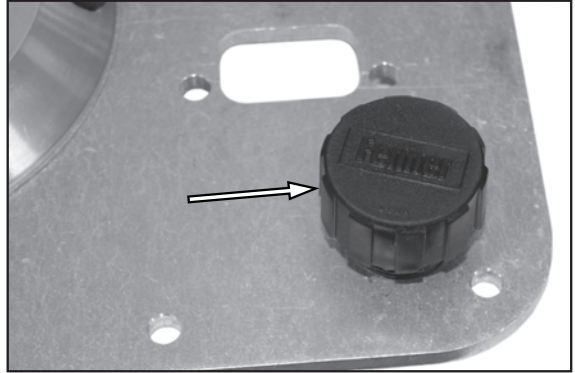
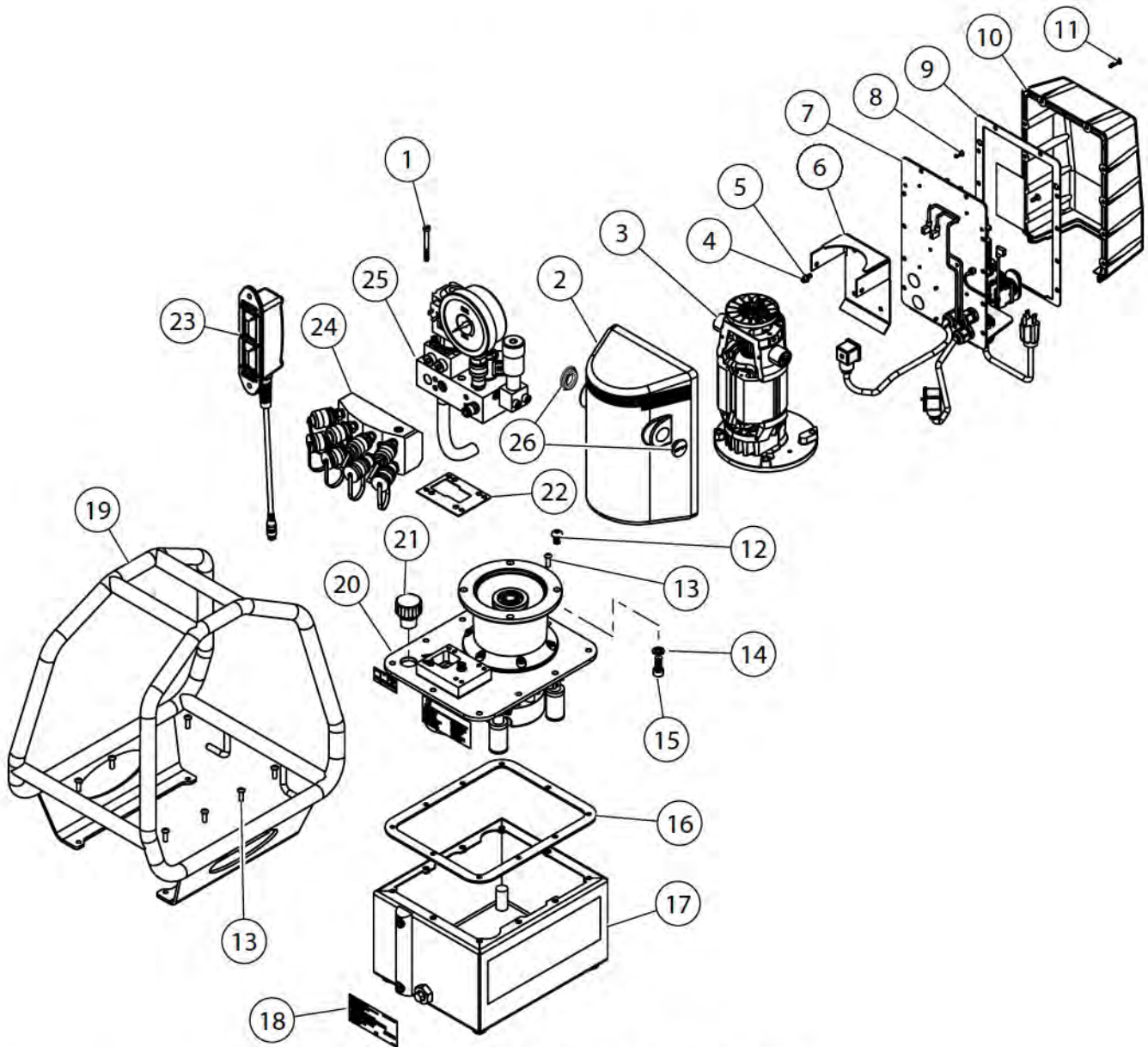


Figure 74.
Filler Cap

PARTS LIST

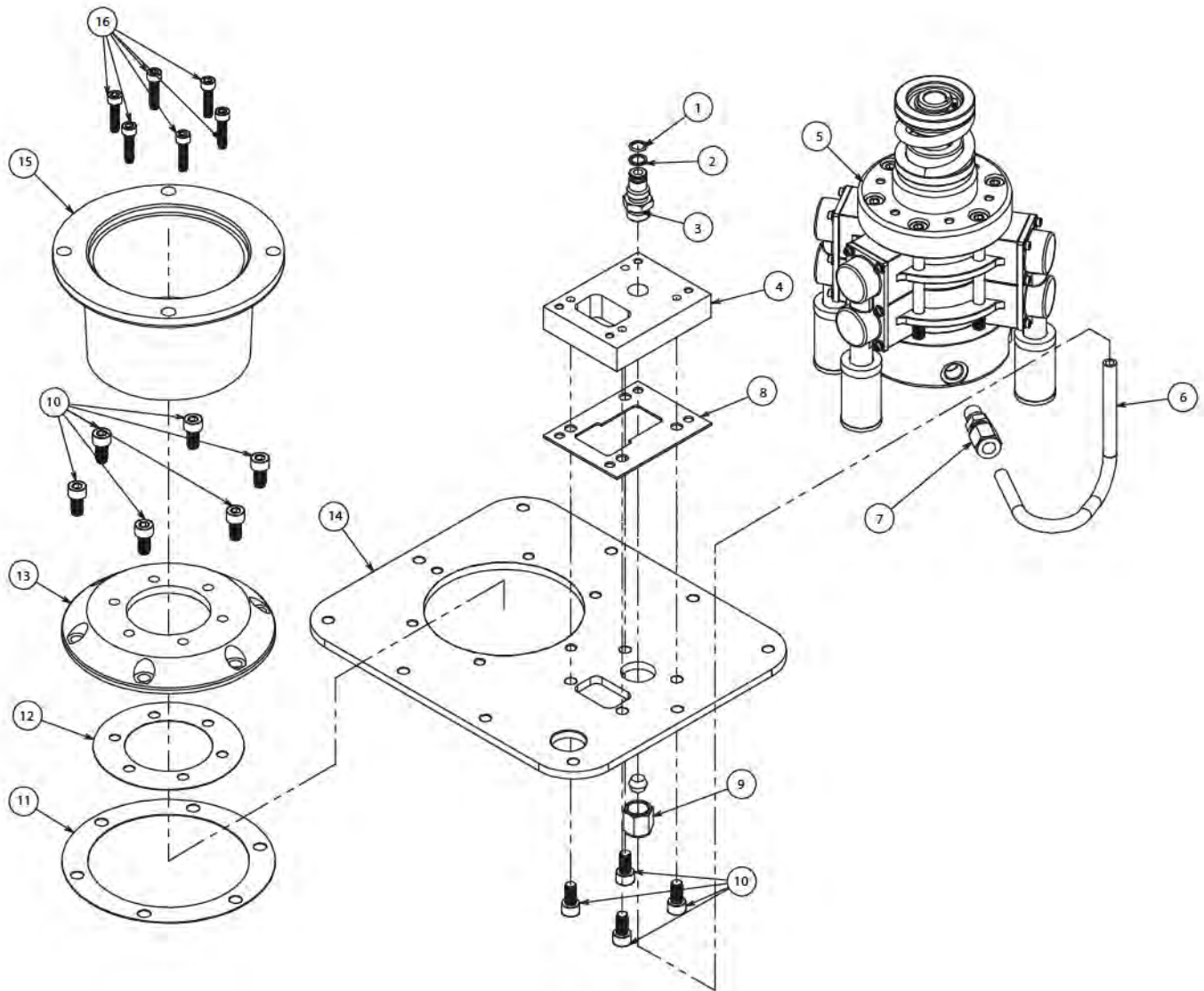


PE45 Series Assembly Parts List

Item No.	No. Req'd	Part No.	Description
1	4	2002137	M6X1 x 60mm SHC C12.9 ST Screw
2	1	2002120	Motor Housing
3	1	2002110	110V - E 1.7HP 115V 50/60Hz 1PH 56C Motor
		2002111	230V - E 1.9HP 230V 50/60Hz 1PH 56C Motor
4	6	2002085	M6X1 x 12mm SHC C12.9 ST Screw

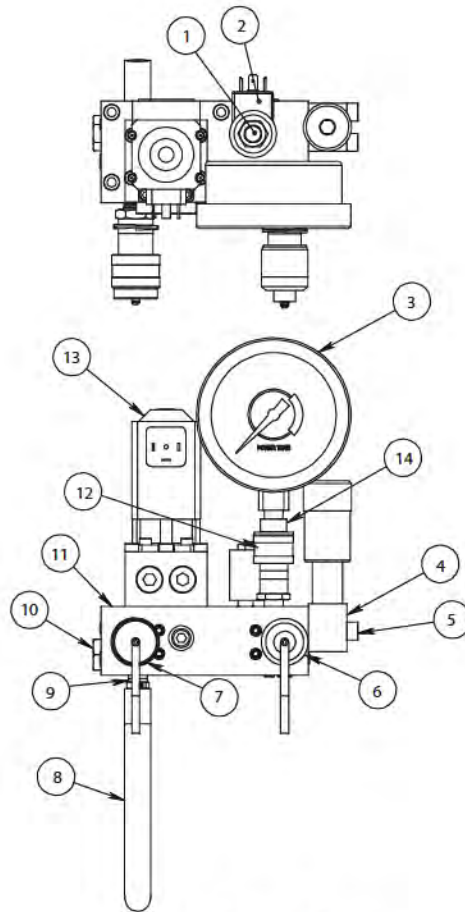
PE45 Series Assembly Parts List

Item No.	No. Req'd	Part No.	Description
5	6	10244	0.258 x 0.489 x 0.045 Lock Washer
6	1	2002114	Baffle Bracket
7	1	3000567	115/230V 50/60Hz Electrical Bracket Assembly
8	2	2002113	M5X0.8 x 14mm CSK C10.9 St Screw
9	1	2002252	Gasket
10	1	2002116	Electrical Bracket Cover
11	10	2002117	M5X0.8 x 20mm BHC C10.9 ST Screw
12	2	2002331	SCREW, M10X1.5 16MM BHC 10.9 ST
13	10	10177	Round 1/4-20 x 0.75 Screw
14	6	2002160	18.1mm x 10.7mm Lock Washer
15	6	2002118	M10X1.5 x 18mm SHC C12.9 ST Screw
16	1	40164	Reservoir Gasket
17	1	3000568	Reservoir 3.00 Gal Horizontal Center Aluminum Rectangle Assembly
18	1	1000467	DECAL, PLAS CERT CE US RECT 4.75IN
19	1	2002115	Roll Cage
20	1	3000564	Pump Assembly-Cover Plate
21	1	1683-AB	Breather Plastic 3/4 NPT (filler cap)
22	1	2001627	Gasket
23	1	3000554	Torque Wrench Pendant Assembly
24	1	3000577	4-Port Manifold Interface Assembly
25	1	3000578	4-Port Manifold Base Assembly (3000566 for single port use)
26	2	2007876	Cap Seal, 1.063 DIA.
	2	2007886	Brush (not shown)
	2	10806	Cap, Brush holder (not shown)
	1	2001672	GREASE, SSP-1212, 1ML SERVICE PACKET (not shown)



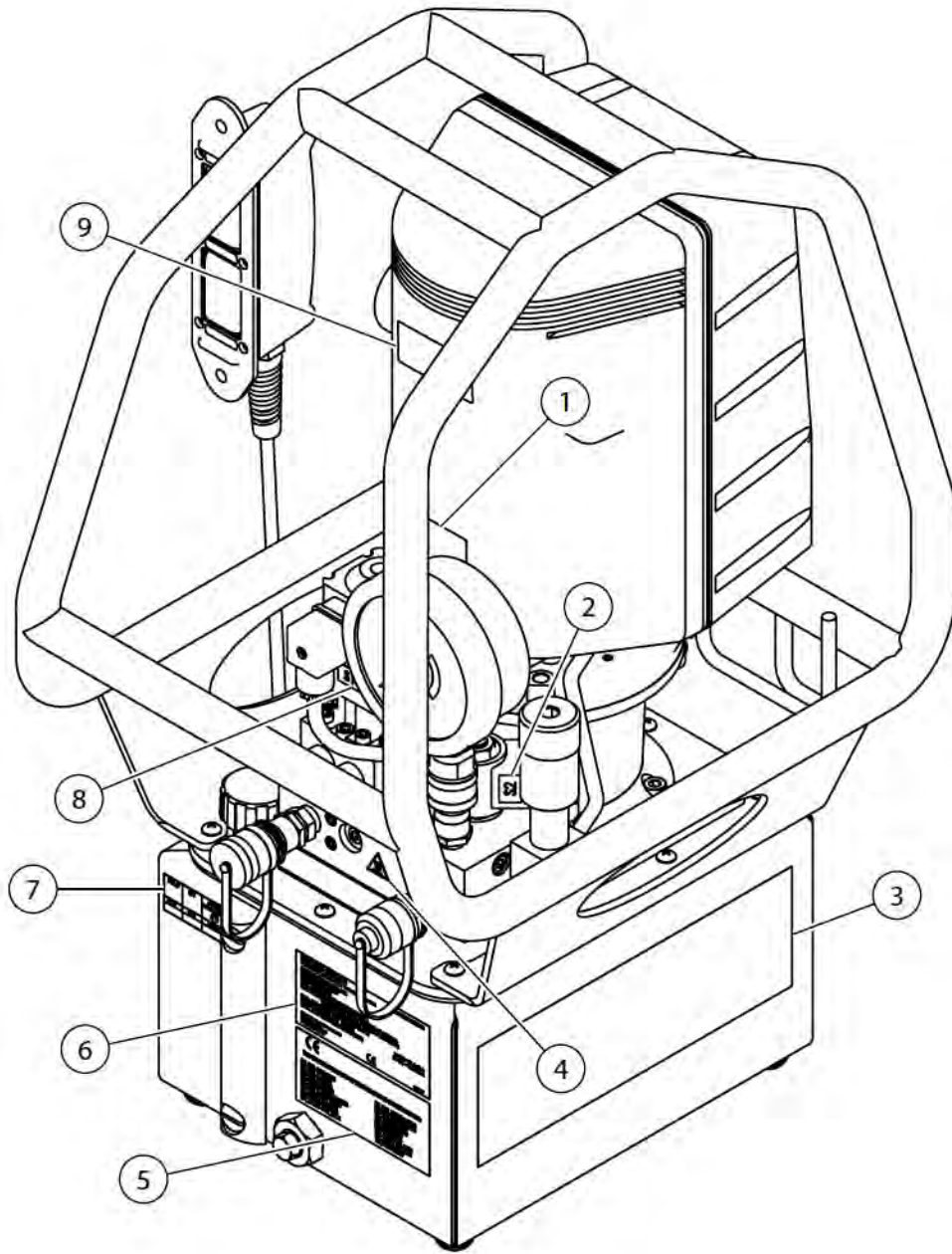
Pumps Parts List

Item No.	No. Req'd	Part No.	Description
1	1	10268	O-ring (-012) 0.364ID x 0.070 Nitrile 70
2	1	11863	Backup 0.500 x 0.375 Washer
3	1	20787	Valve Connector
4	1	2001636	Valve Mounting Block
5	1	3000565	Cartridge Pump Assembly
6	1	2001618	3/8 High Pressure Tube
7	1	10661	Straight 1/4 NPTF M x 3/8 Tube Fitting
8	1	2001627	Gasket
9	1	10431	Nut 5/8-18 F (3/8 OD Tube) Fitting
10	10	2001606	SHC M8 - 1.25 x 16mm Screw
11	1	2001578	Adapter to Coverplate Gasket
12	1	35266	Pump to Cover Gasket
13	1	2001576	Motor Adaptor
14	1	2002112	Reservoir Cover
15	1	2001022	Motor Mount
16	6	2001601	SHC M6 - 1.00 x 25mm Screw



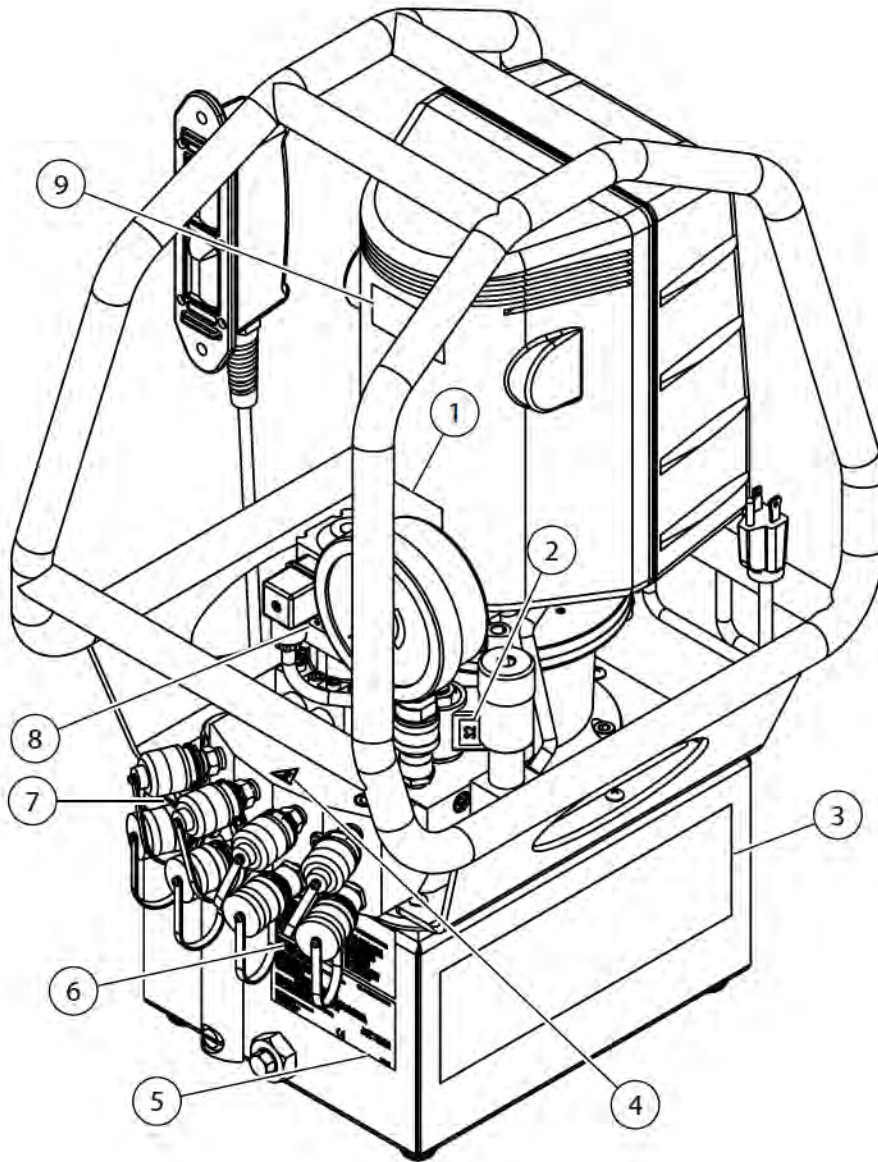
Valve Parts List

Item No.	No. Req'd	Part No.	Description
1	1	VF-4011	2 Way NO Cartridge Valve
2	1	EF-1085	24VDC Hirschmann Solenoid Coil
3	1	9062	10,000 PSI, 4" Diameter, Calibratable Gauge
4	1	2000980	Pressure Limiting Valve
5	2	2001611	M8-1.25 X 40mm SHC Screw
6	1	25599	QD 3/8INT NPTF X 1/4 Hose Coupler
7	1	25600-1	Hydraulic 3/8" NPTF F Coupler
8	0.58	2002105	Raw Material Hose Clear Vinyl 1/2ID
9	1	2002106	Straight 1/4 NPT M x 1/2 ID Hose Fitting
10	1	RV-11	110 bar (1500 psi) Retract Relief Valve
11	1	2002109	Valve Manifold
12	1	251410	Quick Coupler
13	1	2002108	2-position 4-way Valve
14	1	251411	Quick coupler, Male



Decal Location, PE45 Series w/o Manifold

Item No.	No. Req'd	Part No.	Description
1	1	1000607	DECAL, PLAS INFO DNGR US RECT 3.0IN
2	1	1000285	DECAL, S1 S2 & PS
3	2	1000464	DECAL, SPX BOLTING SYSTEMS
4	4	1000371	DECAL, BURN HAZARD/HOT SURFACE, ISO
5	1	1000467	DECAL, CE PERFORMANCE, PCHE, For PE45LEE4PRS
	1	1000468	DECAL, CE PERFORMANCE, PCHE, For PE45PEE4PRS
	1	1000476	DECAL, CE PERFORMANCE, PCHE, For PE45PEE4PRS
6	1	2002391	DECAL. PLAS CERT CE US RECT 4.75IN
7	1	1000663	DECAL. PLAS CERT CE US RECT 1.73IN
8	1	1000285	DECAL, S1 S2 & PS
9	1	1000808	DECAL, PLAS INFO CAUT US RECT 3.0IN



Decal Location, PE45 Series w/Manifold

Item No.	No. Req'd	Part No.	Description
1	1	1000607	DECAL, PLAS INFO DNGR US RECT 3.0IN
2	1	1000285	DECAL, S1 S2 & PS
3	2	1000464	DECAL, SPX BOLTING SYSTEMS
4	4	1000371	DECAL, BURN HAZARD/HOT SURFACE, ISO
5	1	1000469	DECAL. PLAS CERT CE US RECT 4.75IN, For PE45LEE4MPRS
	1	1000470	DECAL. PLAS CERT CE US RECT 4.75IN, For PE45PEE4MPRS
	1	1000624	DECAL. PLAS CERT CE US RECT 4.75IN, For PE45YEE4MPRS
6	1	2002391	DECAL, CE PERFORMANCE, PCHE
7	1	1000663	DECAL. PLAS CERT CE US RECT 1.73IN
8	1	1000285	DECAL, S1 S2 & PS
9	1	1000808	DECAL, PLAS INFO CAUT US RECT 3.0IN

SCHEMATICS

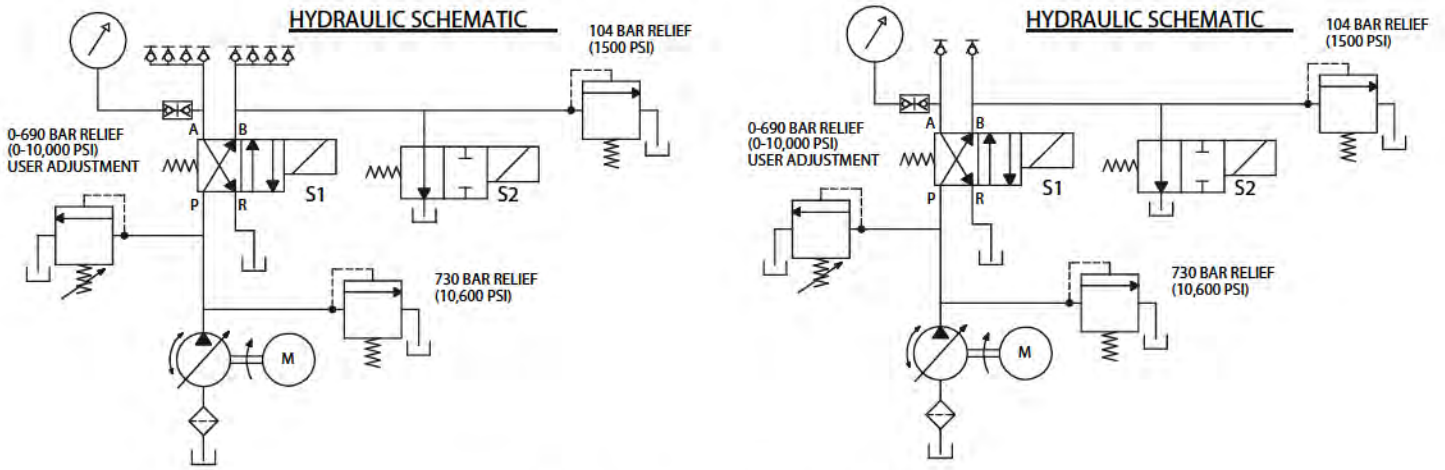


Figure 81. PE45 Hydraulic Schematic

IEC ELECTRICAL SCHEMATIC

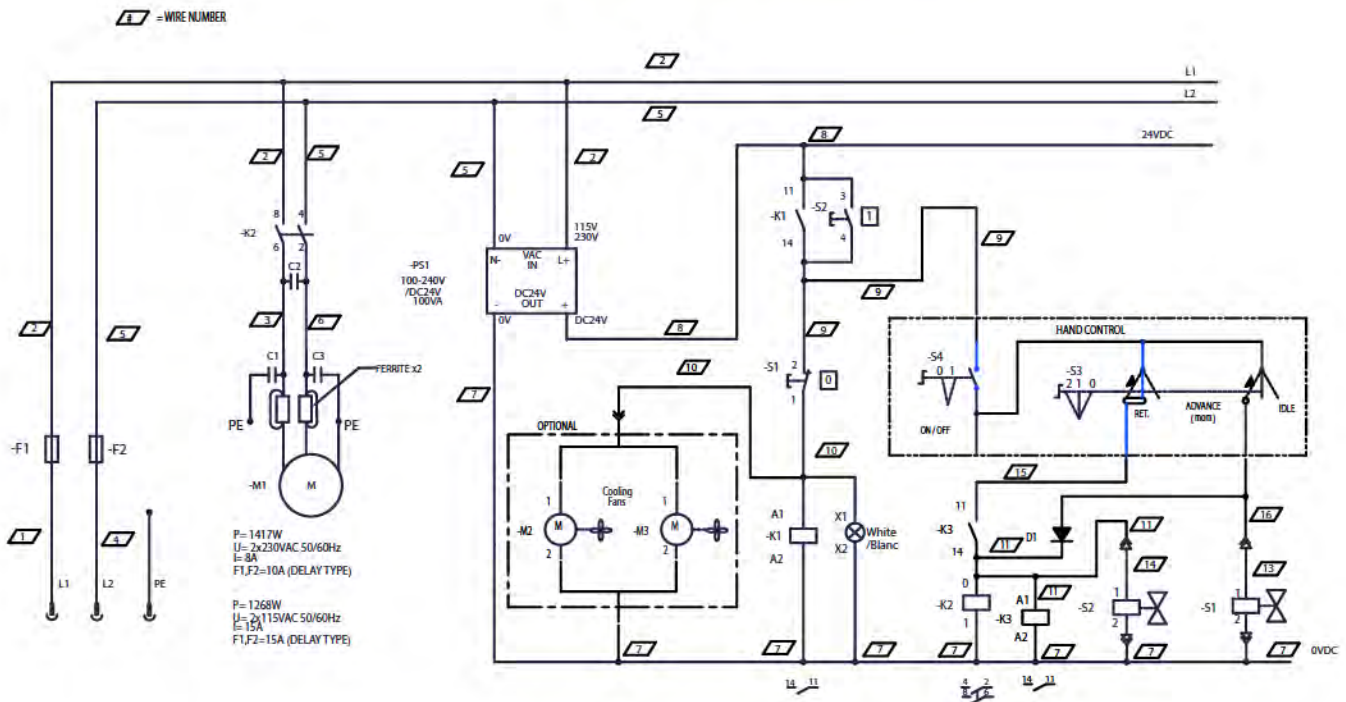


Figure 80. PE45 Electrical Schematic

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California Proposition 65 Warning

This product contains or may contain chemical(s)
known to the state of California to cause cancer
or other reproductive effects.

DECLARATION OF CONFORMITY

EC DECLARATION OF CONFORMITY



We declare that our Electrically powered hydraulic pump assemblies Models: PE45LEE4CMPRS, PE45LEE4CPRS, PE45LEE4MPRS, PE45LEE4PRS, PE45PEE4CMPRS, PE45PEE4CPRS, PE45PEE4MPRS, PE45PEE4PRS, PE45YEE4ACPRS, PE45YEE4CMPRS, PE45YEE4CPRS, PE45YEE4MPRS, PE45YEE4PRS

To which this declaration relates are in conformity with the following:

<u>EN, EN-ISO, ISO standards</u>	<u>Title</u>
Per the provisions of the EMC Directive	2004/108 EC
EN_61000-4-2:2001	Electromagnetic Discharge Immunity test
EN_61000-4-3:2001	Radiated, Radio Frequency, Electromagnetic Field Immunity test
EN_61000-4-4:2001	Electrical Fast Transient / Burst Immunity test
EN_61000-4-5:2001	Surge immunity test
EN_61000-4-6:2001	Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields
EN_61000-4-11:2001	Voltage Dip and Interrupt test
EN55011_2007	Industrial, Scientific and Medical (ISM) Radio Frequency Equipment-Electromagnetic Disturbance Characteristics-Limits and Methods of Measurement

<u>EN, EN-ISO, ISO standards</u>	<u>Title</u>
Per the provisions of the Machinery Safety Directive	2006/42 EC
EN_ISO 12100-1	Basic concepts, general principles for design - Part 1 Basic terminology, methodology
EN_ISO 12100-2	Basic concepts, general principles for design - Part 2 Technical Principles
EN ISO 14121-1:2007	Safety of machinery - Risk assessment - Part 1 Technical principles
EN 4413:2010	Hydraulic Fluid Power – general rules and safety requirements for systems & their components
EN ISO 13849-1:2006	Safety-related parts of control systems - Part 1
EN ISO 13849-2:2008	Safety-related parts of control systems - Part 2
EN 61310-2:2007	Safety of machinery - Indication, marking and actuation – Part 2 Requirements for marking

<u>EN, EN-ISO, ISO standards</u>	<u>Title</u>
Per the provisions of the Low Voltage Directive	2006/95 EC
EN_60204-1	Safety of Machinery –Electrical equipment of machines –Part 1 General requirements

<u>EN, EN-ISO, ISO standards</u>	<u>Title</u>
Per the provisions of the Noise Emission in the Environment by Equipment for Use Outdoors Directive	2000/14 EC
EN_3200L0014	Noise emission in the environment for use outdoors
ISO 3744:1994	Sound Power Level Measurements

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We, the undersigned, hereby declare that the equipment specified conforms to the above European Communities Directive(s) and Standard(s).

The Netherlands April 19, 2012

Christophe Bouvet, Managing Director

Andreas J. Klemm, Appl.Eng. Manager

