POWER TEAM
HYDRAULIC TECHNOLOGIES

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Form No. 102906

Parts List &
Operating Instructions
for:

697650

MODEL A
ELECTRIC TWO-STAGE HYDRAULIC PUMP

Read and carefully follow these instructions. Most problems with new equipment are caused by improper operation or installation.

SAFETY PRECAUTIONS

WARNINING: To help avoid personal injury,

Hydraulic Hose

- **Before operating the pump, all hose connections must be tightened using the proper tools. Do not overtighten. Connections need only be tightened securely and leak-free. Overtightening may cause premature thread failure or may cause high pressure fittings to split at pressures lower than their rated capacities.**
- **Should a hydraulic hose ever rupture, burst, or need to be disconnected, immediately shut off the pump and shift the control valve twice to release all 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, extreme heat or cold, sharp surfaces, or heavy impact. Do not allow the hose to kink, twist, curl or bend so tightly that the oil flow within the hose is blocked or reduced. Periodically inspect the hose for wear because any of these conditions can damage the hose and may result in personal injury.**
- **Do not use the hose to move attached equipment. Stress may damage the hose and 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 materials 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.**

Pump

- **Do not exceed the PSI hydraulic pressure rating noted on the pump nameplate or tamper with the internal high pressure relief valve. Creating pressure beyond rated capacities may result in personal injury.**
- **Before replenishing the oil level, retract the system to prevent overfilling the pump reservoir. An overfill may cause personal injury due to excess reservoir pressure created when the cylinders are retracted.**

Cylinder

- **Do not exceed the rated capacities of the cylinder. Excess pressure may result in personal injury.**
- **Do not set poorly-balanced or off-center loads on a cylinder. The load may tip and cause personal injury.**

Rev. 5 **Date: 18 June 1999**

Litho in USA

WARNING Cont'd

Power Supply (Electric)

- **Do not use an ungrounded (two-prong) extension cord with this unit.**
- **Avoid any conditions that could create an electrical hazard.**
- **Any electrical work must be done by a qualified electrician.**
- **If the power cord is damaged or wiring is exposed, replace or repair immediately.**
- **Changing the voltage on this motor is a complicated and, if not done correctly, dangerous procedure. Consult the manufacturer for specific information before attempting any rewiring. Rewiring voids CSA approval.**
- **Disconnect the power supply before removing the motor casing cover or performing repairs or maintenance.**
- **All voltages must be wired for CCW rotation when viewed from the lead end (top) of the motor.**
- **The line voltage must be the same as the voltage for which the pump is wired. *Ex: 110/115 volt pump plugged into 110/115 volt power source.***
- **Check the total amperage draw for the electrical circuit you will be using. *Ex: Do not plug a motor or motors that may draw 25 amps into a 20 amp fused electrical circuit.***
- **Do not attempt to increase the powerline capacity by replacing a fuse with another fuse of higher value. Overheating of the powerline and the possibility of a fire will result.**

OPERATING PROCEDURE

Filling the Reservoir

NOTE: This pump has been shipped without oil in the reservoir. A high-grade hydraulic oil has been shipped with the pump, and if additional oil is required, use only Power Team hydraulic fluids.

1. Clean the area around the filler cap to remove all dust and grit. Any foreign material in the oil can damage the polished surfaces and precision-fit components of this pump.
2. Retract all cylinders to the return position.
3. Remove the filler cap and insert a clean funnel with a filter. Fill the reservoir with hydraulic oil to within 2" of the cover plate. Replace the filler cap with the breather-hole OPEN.
4. Cycle the pump (with the cylinders attached) several times. Retract the cylinders and check the oil level in the pump reservoir.

Hydraulic Connections

1. Clean all the areas around the oil ports of the pump and cylinder.
2. Inspect all threads and fittings for signs of wear or damage, and replace as needed.
3. Clean all hose ends, couplers, or union ends.
4. Remove the thread protectors from the hydraulic oil outlets.
5. Connect the hose assembly to the hydraulic oil outlet, and couple the hose to the cylinder. Seal all hydraulic connections with a high quality, nonhardening thread sealant. Teflon tape can be used to seal hydraulic connections if only ONE layer of tape is used. Any loose pieces of tape could be pinched and broken off inside the pipe end, causing the tape to travel through the system and possibly obstruct the flow of oil. Remove old tape from both fittings (male & female) and leave the first thread exposed (no tape).

When operating the pump for the first time:

1. Check all valve and hose fittings to insure proper tightness, check the oil level in the reservoir, and plug in the pump motor.
2. Activate the pump, and advance and retract the cylinder(s).
3. Refer to section titled "Bleeding Air from the System."
4. Recheck the oil level in the reservoir; add oil if needed. The hydraulic system is now ready for full operatior.

PREVENTIVE MAINTENANCE

WARINING: To help prevent personal injury,

- **Disconnect the pump from the power source before performing maintenance or repair procedures.**
- **Repairs or maintenance must be performed in a dust-free area by a qualified technician.**

Bleeding Air from the System

Upon initial start up or after prolonged use, air can accumulate within the hydraulic system. This entrapped air can cause the system to respond slowly or behave in an unstable manner. To remove the air, loosen a fitting that is situated higher than the rest of the fittings in the system. Run the pump until a steady flow of oil free of suspended air bubbles is observed. Tighten the fittings.

Inspecting the Hydraulic Fluid Level

Check the oil level in the reservoir periodically. The oil level should come to within 2" of the pump cover plate with all cylinders retracted. Drain, flush and replenish the reservoir with Power Team hydraulic oil yearly or more often if necessary. The frequency of oil change will depend upon the general working conditions, severity of use and overall cleanliness and care given the pump.

Maintenance Cleaning

1. Keep the outer surface of the pump as free from dirt as possible.
2. Protect all unused couplers.
3. Keep all hose connections free of dirt and grime.
4. Keep the filler plug clean and unobstructed at all times.
5. Equipment connected to the pump must be kept clean.
6. Use only Power Team hydraulic fluids in this pump. Change as recommended.

Draining and Cleaning the Reservoir

IMPORTANT: Clean the pump exterior before the pump interior is removed from the reservoir.

1. Remove the screws that fasten the motor and pump assembly to the reservoir. **IMPORTANT: Lift the pump and motor off the reservoir carefully to avoid damaging the gasket or any internal components.**
2. Clean the inside of the reservoir and fill half full with clean Power Team hydraulic fluid.
3. Place the pump and motor assembly back onto the reservoir and secure with two machine screws assembled on opposite corners of the housing. **IMPORTANT: Connect a hose to the pressure port on the valve. Place the other end of the hose into the oil filler plug hole.**
4. Run the pump for several minutes. Then disconnect the motor and pump assembly, and drain and clean the inside of the reservoir.
5. Fill the reservoir with Power Team hydraulic fluid. Place the pump and motor assembly (with gasket) on the reservoir and install all the screws. Tighten securely and evenly.

Adding Oil to the Reservoir

1. Cylinder(s) must be fully retracted and the power supply disconnected when adding oil to the reservoir.
2. Clean the entire area around the filler plug before removing the filler plug.
3. Use a clean funnel with filter when adding oil.
4. Use only Power Team hydraulic fluids.

TROUBLESHOOTING GUIDE

IMPORTANT: Any repair work or troubleshooting should be performed by qualified personnel familiar with this equipment. Use the proper gauges and equipment when toubleshooting.

NOTE:

- **It is best to check for system leaks by using a hand pump and applying pressure to the suspect area without the motor running. Watch for leaking oil and follow it back to its source.**
- **Plug the outlet ports of the pump when checking for leakage to determine if the leakage is in the pump or if it is in the cylinder or tool.**
- **Refer to the parts list, hydraulic schematic and electrical schematic when using this troubleshooting guide.**

PROBLEM	CAUSE	SOLUTION
Foaming oil.	1. Oil level too high.	1. Lower oil level to approximately 2" below top of cover plate.
Electric motor does not run. **WARNING: Disconnect power supply before removing cover. Any electrical work should be performed by a qualified electrician.**	1. Unit is not plugged in. 2. No voltage supply. 3. Broken lead wire or defective power cord plug. 4. Defective switches. 5. Defective remote switch. 6. Circuit breaker tripped because total amperage draw too high for existing circuit. 7. Overheated motor. 8. Faulty thermal protector. 9. Defective motor.	1. Plug in unit. 2. Check line voltage. Check reset button on power panel. 3. Replace defective parts. 4. Check switches. 5. Repair or replace remote switch. 6. Add an additional circuit or use alternate circuit. 7. Wait for motor to cool before restarting. Thermal protector will reset automatically. 8. Replace. 9. Replace or repair motor.
Pump does not build full pressure.	1. Faulty pressure gauge. 2. Check for external leakage. 3. Check the relief valve setting. 4. Check for leaks in the solenoid valve. 5. Inspect the pump for internal leakage. Check high pressure pump inlet or outlet ball checks. 6. Sheared key(s).	1. Calibrate gauge. 2. Seal any faulty pipe fitting with pipe sealant. 3. Lift the pump from the reservoir but keep the filter immersed in oil. Note the pressure reading when the relief valve begins to open up. If functioning normally, it should start to leak off at relief valve pressure. 4. Clean and reseat, or replace parts. 5. Same procedure as above but look for leaks around the entire inner mechanism. If there are no visible leaks, the high pressure pump subassembly may be leaking. Remove all parts. Check the valve head assembly body for any damage to the seat area. Clean and reseat if necessary. Inspect for damage and replace parts if necessary, then reassemble. 6. Replace.

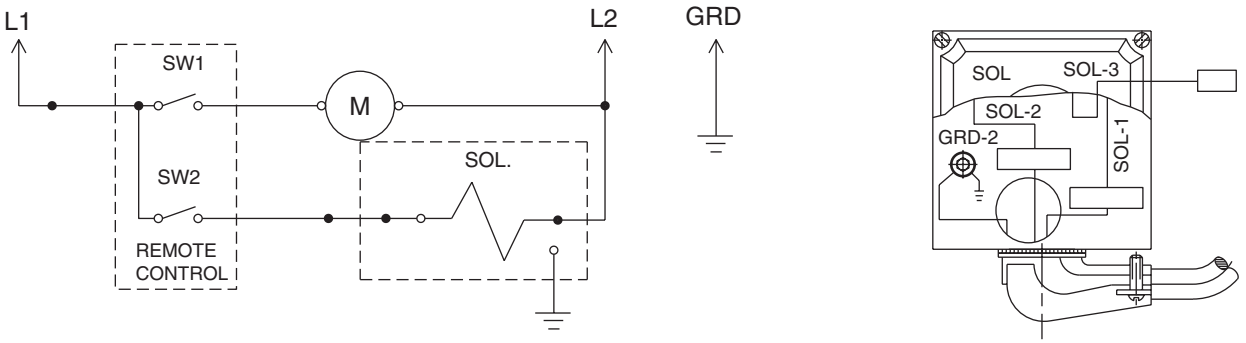
TROUBLESHOOTING GUIDE CONTINUED -

PROBLEM	CAUSE	SOLUTION
Pump is not delivering oil or delivers only enough oil to advance cylinder(s) partially or erratically.	1. Oil level too low.	1. Fill reservoir to within 2" of filler plug with all cylinders retracted.
	2. Loose fitting coupler to cylinder.	2. Check quick-disconnect couplings to cylinders. Inspect couplers to insure that they are completely coupled. Occasionally couplers have to be replaced because the ballcheck does not stay open due to wear.
	3. Air in system.	3. Bleed the system.
	4. Dirt in pump or filter plugged.	4. Pump filter should be cleaned and if necessary, pump should be dismantled and all parts inspected and cleaned.
	5. Cold oil or oil is too heavy (Hydraulic oil is of a higher viscosity than necessary).	5. Change to lighter oil.
	6. Relief valve or low pressure unloading valve out of adjustment.	6. Readjust as needed.
	7. Reservoir capacity is too small for the size of the cylinder(s) used.	7. Use smaller cylinder(s) or larger reservoir
	8. Defective directional valve.	8. Inspect all parts carefully and replace if necessary.
	9. Release poppet not seating in solenoid valve.	9. Actuate UP and DOWN buttons simultaneously on remote to flush foreign material or dismantle, inspect, and clean.
		10. Replace.
	10. Sheared drive shaft key(s).	11. Refer to electrical schematic on motor.
	11. Motor rotating in wrong direction.	12. Check for plugged vent in filler plug.
	12. Vacuum in reservoir.	13. Repair or replace Gerotor pump.
	13. Low pressure pump worn.	
Pump builds pressure but cannot maintain pressure.	1. Check to see if there are any external leaks. If no oil leakage is visible, the problem is internal.	1. Reseal leaking pipe fittings with pipe sealant.
	2. To test for a leaking control valve, lift the pump from the reservoir but keep the filter in the oil. Remove the drain line to see if the oil is leaking from the valve. If the valve is not leaking, the internal check valve could be leaking. Refer to the note concerning checking for oil leaks at the beginning of this Troubleshooting Guide.	2. Clean, reseat or replace flow control valve parts. If the internal check valve is leaking, the check valve must be dismantled and the seat area repaired, poppet replaced, etc.

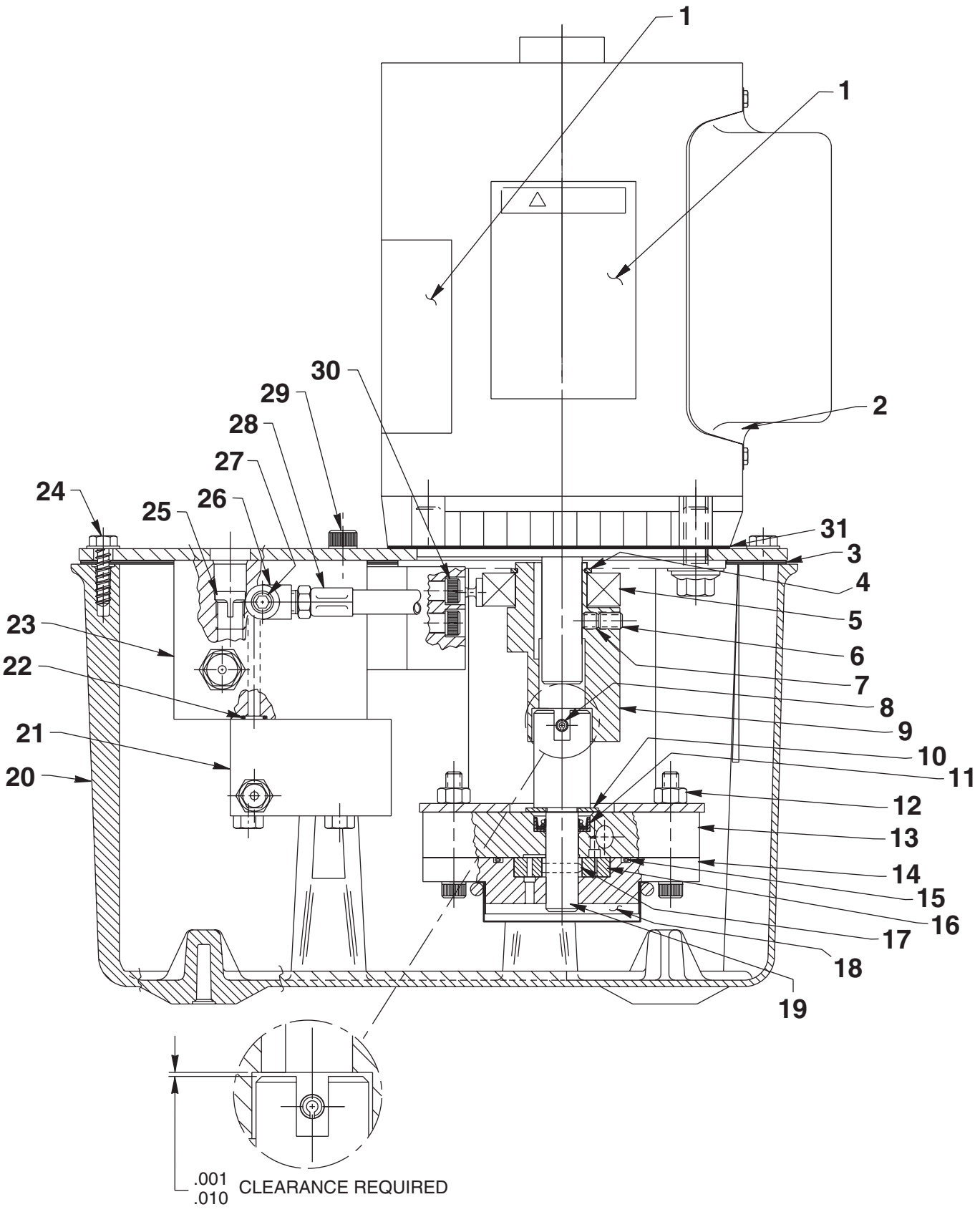
TROUBLESHOOTING GUIDE CONTINUED -

PROBLEM	CAUSE	SOLUTION
Automatic valve does not build full pressure.	1. Pilot pressure is too low. 2. Defective or oversize seat on automatic valve.	1. Increase pilot pressure. 2. Replace ball and seat.
Automatic valve does not release pressure.	1. Sticking piston. 2. High pressure oil is leaking past the lo-to-hi pressure check. This oil leaks back to the piston in the automatic valve keeping the piston closed.	1. Remove, clean and polish. 2. Seat the ball check. Inspect and replace any faulty components.
Cylinder(s) do not retract.	1. Check the system pressure; if the pressure is zero, the solenoid valve is releasing pressure and the problem may be in the cylinder, (mechanical linkage connected to cylinders), or quick-disconnect couplings. 2. Defective valve.	1. Check the cylinders for broken return springs and check couplers to ensure that they are completely coupled. Occasionally couplers have to be replaced because one check does not stay open in the coupled position. 2. Check valve operation and inspect parts. Replace if necessary.
Pump delivers excess oil pressure.	1. Check pressure gauge. 2. Relief valve not properly set.	1. Calibrate gauge. 2. Reset the relief valve.

ELECTRICAL SCHEMATIC



PARTS LIST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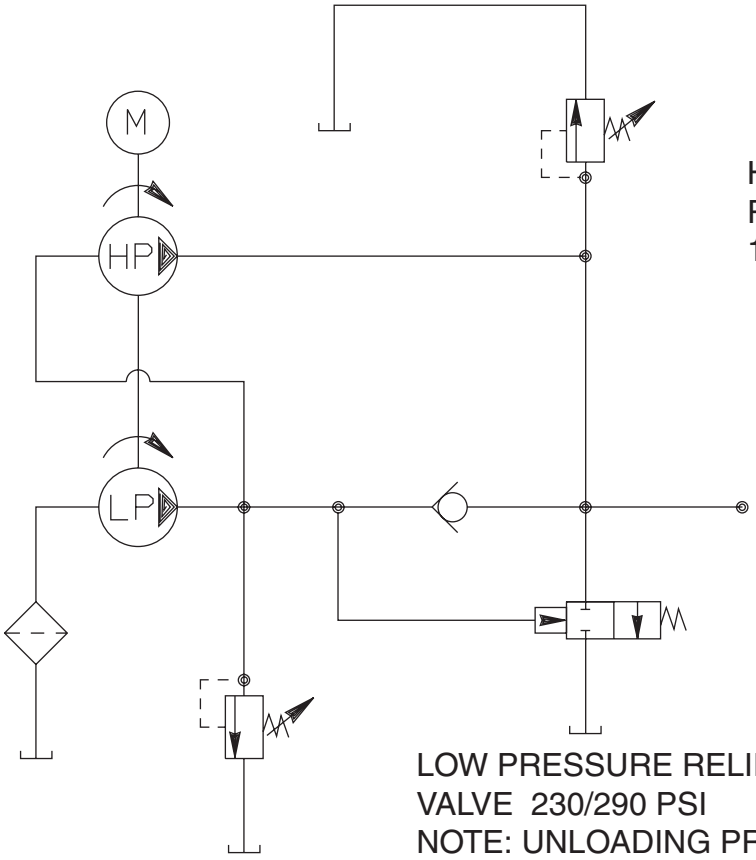
CLEARANCE REQUIRED

Item No.	Part No.	No. Req'd	Description
1	***200188**	1	Important Decal
2	**59314**	1	Electric Motor
3	***40164**	1	Gasket
4	**209798**	1	Retaining Ring
5	**209805**	1	Ball Bearing
6	**10519**	1	Set Screw (1/4-20 UNC X 3/8 Lg.; Torque to 60/80 in. lbs.)
7	**10136**	1	Set Screw (1/4-20 UNC x 1/4 Lg.; Torque to 60/80 in. lbs.)
8	**10973**	1	Roll Pin (3/16 Dia. X 1-1/4 Lg.; Note: Locate slot as shown.)
9	**45596**	1	Eccentric
10	**12595**	1	Washer (1-1/8 X 1/2 X .077 Thk.)
11	***304830**	1	Oil Seal
12	**10199**	2	Hex Nut (1/4-20 UNC)
13	**61170**	1	Housing
14	**61169**	1	Gerotor Housing
15	***10922**	1	O-ring (2-1/8 X 1-15/16 X 3/32)
16	**304826**	1	Gerotor
17	**209794**	1	Gerotor Drive Pin
18	**21846**	1	Filter Support
19	**304835**	1	Drive Shaft
20	**61165**	1	Reservoir
21	**52167**	1	Block
22	***10266**	1	O-ring (3/8 X 1/4 X 1/16)
23	**61167**	1	Body
24	**209799**	14	Cap Screw (1/4-10 X 7/8 Lg. Self-tapping; Torque to 50/60 in. lbs.)
25	**209795**	1	Outlet Ball Stop
26	**19463**	1	Tee
27	**10427**	1	Pressure Plug (1/8 NPTF)
28	**304819**	1	Hose Assembly
29	**10030**	1	Cap Screw (5/16-18 UNC X 3/4 Lg.; Torque to 220/240 in. lbs.)
30	**10022**	4	Screw (1/4-20 UNC X 1-1/2 Lg.; Torque to 180/200 in. lbs.)
31	**351060**	1	Gasket (Between motor and cover plate)

Part numbers marked with an asterisk (*) are contained in Repair Kit No. 300430.

HYDRAULIC SCHEMATIC



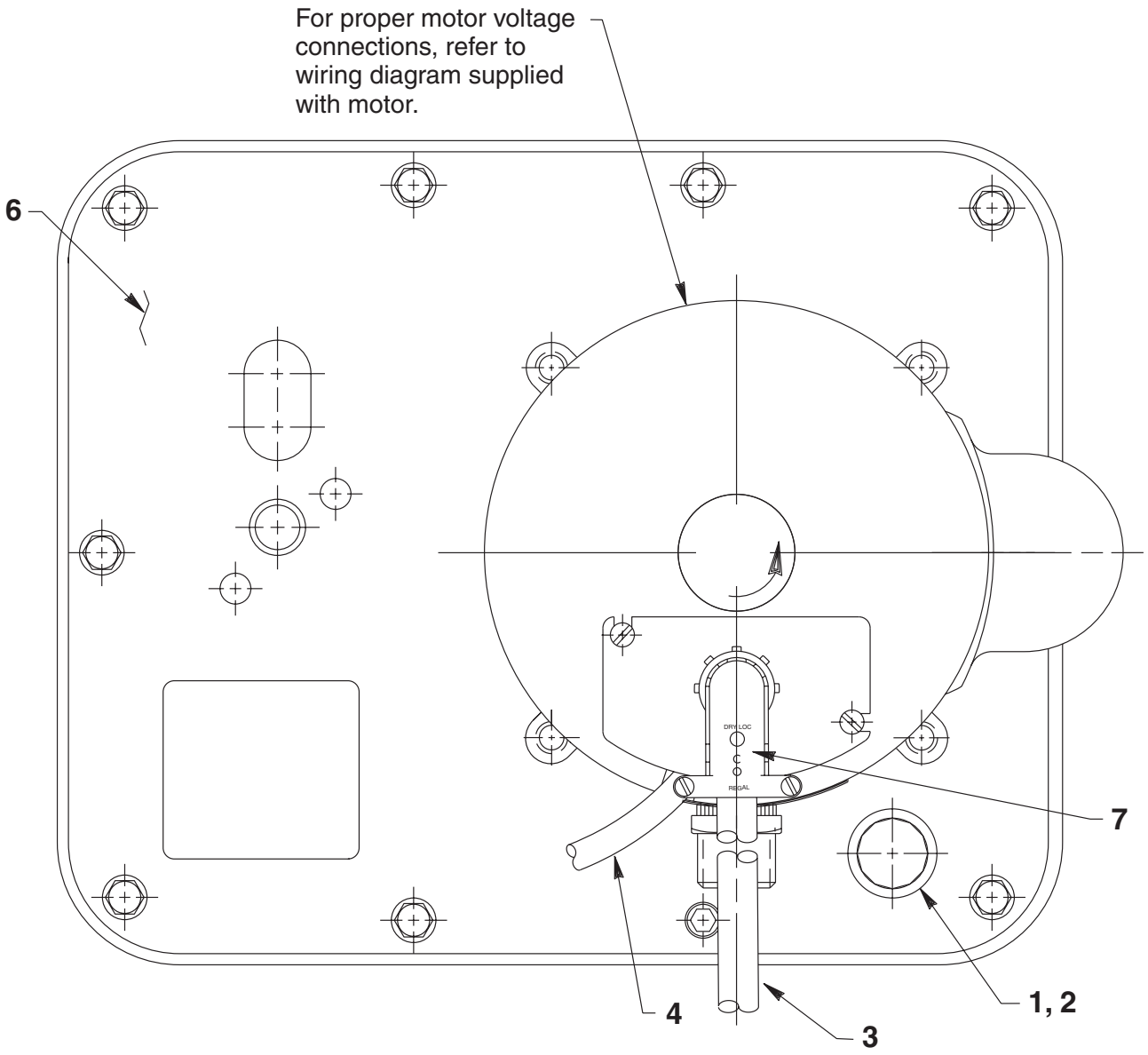
HIGH PRESSURE
RELIEF VALVE
10,100/10,700 PSI

OUTLET

AUTOMATIC
VALVE

LOW PRESSURE RELIEF
VALVE 230/290 PSI
NOTE: UNLOADING PRESSURE
MEASURED AT 19463 FITTING

TOP VIEW



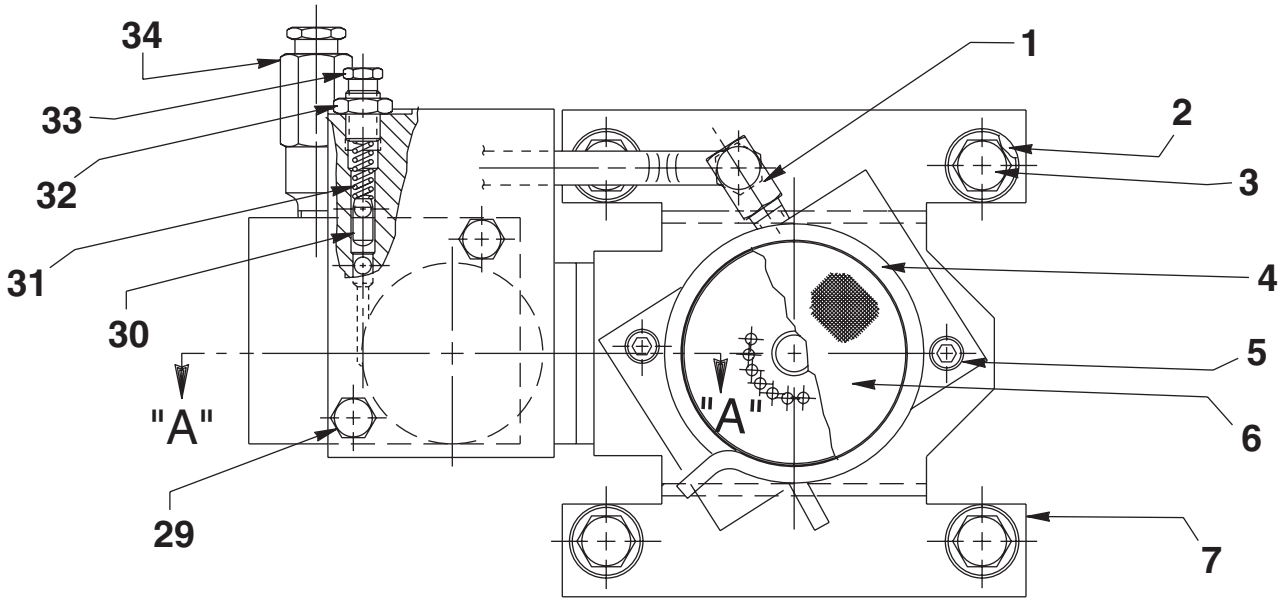
Item No.	Part No.	No. Req'd	Description
1	**20937**	1	Vent Cap
2	**200415**	1	Rubber Gasket
3	**307439**	20 ft.	Electrical Cable (12/3 SJTO)
4	**12908**	17"	Electrical Cable (18/3SJTO)
6	**66218BK2**	1	Cover Plate
7	**11144**	1	90° Elbow Connector

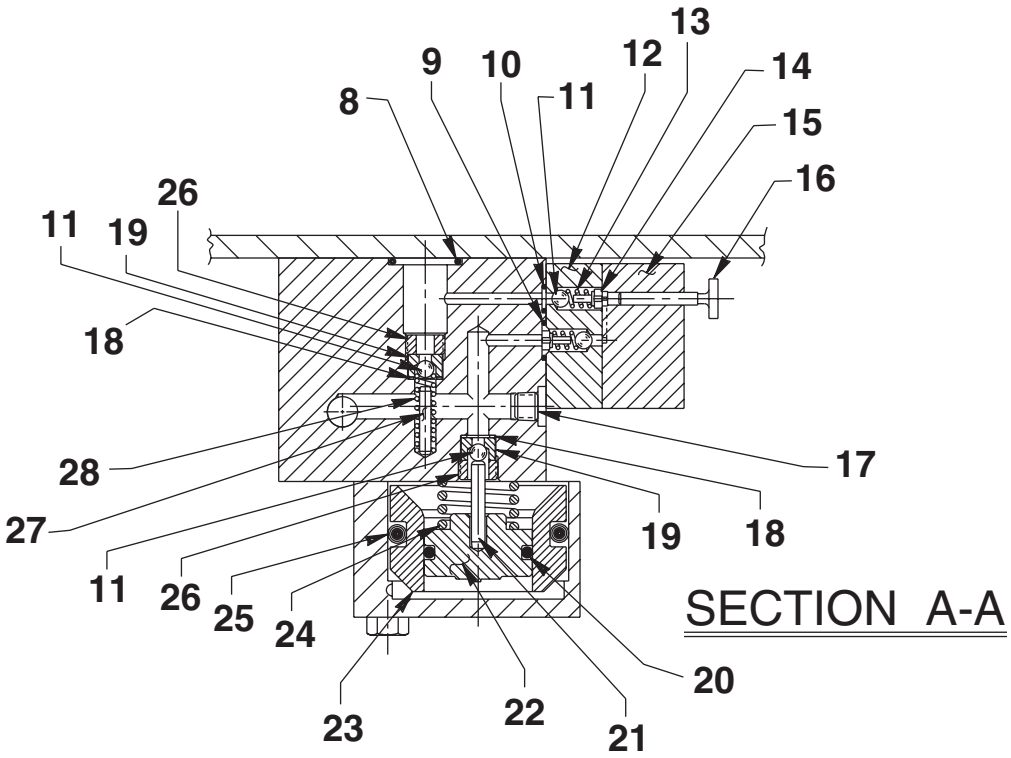
PARTS INCLUDED BUT NOT SHOWN

16896	1	Electrical Plug

Note: Shaded areas and removal of Item #5 (211594) reflect last revision(s) made to this form.

BOTTOM VIEW & SECTION A-A





SECTION A-A

Item No.	Part No.	No. Req'd	Description
1	**14440**	1	90° Elbow Fitting
2	**10258**	4	Washer (For 3/8 bolt)
3	**213663**	4	Cap Screw (3/8-16 UNC X 1" Lg.; Torque to 230/250 in. lbs.)
4	**11461**	1	Hose Clamp
5	**10854**	2	Cap Screw (1/4-20UNC X 1-3/4Lg.; Torque to 60/80 in. lbs.)
6	**21608**	1	Filter
7	**52174**	1	Pump Mounting Bracket
8	***10273**	1	O-ring (13/16 X 5/8 X 3/32)
9	***14763**	1	O-ring (7/16 X 5/16 X 1/16)
10	***10265**	1	O-ring (5/16 X 3/16 X 1/16)
11	***12223**	4	Ball (3/16 Dia.)
12	**45559**	1	Block
13	***10445**	2	Compression Spring (5/32 O.D. X 3/4 Lg.)
14	**24549**	2	Ball Guide
15	**45586**	1	Block
16	**305526**	1	Piston
17	**15130**	1	Plug (1/16 NPTF)
18	***10442**	2	Washer (3/8 X 1/4 X 1/32)
19	***209787**	2	Replaceable Seat
20	**10279**	1	O-ring (1-1/4 x 1" x 1/8)
21	**211843**	1	Dowel Pin (Note: Install with radius end out.)
22	**420036**	1	Piston
23	**350053**	1	Sleeve
24	***16346**	1	Spring (1" O.D. X 7/8 Lg.)
25	***10283**	1	O-ring (2" X 1-5/8 X 3/16)
26	**209797**	2	Hollow Lock Screw (7/16-20 UNF-3A; Torque to 180/200 in. lbs.)
27	**12149**	1	Pin
28	***16057**	1	Compression Spring (3/16 O.D. X 1" Lg.)
29	**13037**	2	Cap Screw (1/4-20 UNC X 2" Lg.; Torque to 40/50 in. lbs.)
30	**211080**	1	Pin (Note: Install tapered end toward spring.)
31	***11221**	1	Spring (1/4 O.D. X 1" Lg.)
32	**10386**	1	Nut (3/8-24 UNF)
33	***29786**	1	Valve Adjusting Screw
34	**21278**	1	Relief Valve Assembly (Set at 10,100/10,700 PSI)

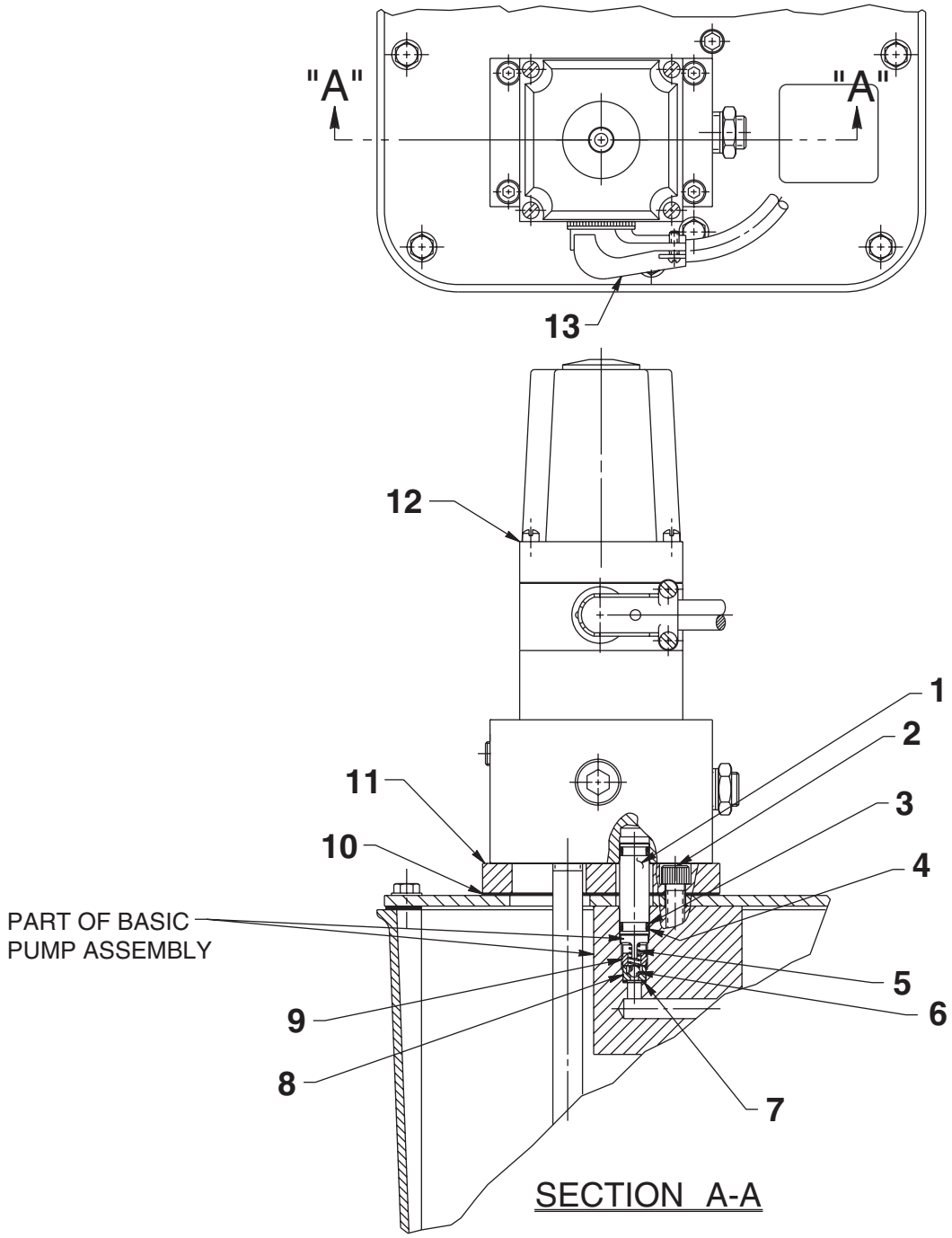
Part numbers marked with an asterisk (*) are contained in Repair Kit No. 300430.

Refer to any operating instructions included with this product for detailed information about opertion, testing, disassembly, reassembly, and preventive maintenance.

Items found in this parts list have been carefully tested and selected. **Therefore: Use genuine Power Team replacenent parts!**

Additional questions can be directed to our Technical Services Department.

VALVE CONNECTIONS



Item No.	Part No.	No. Req'd	Description
1	**2089809**	1	Coupling
2	**10030**	2	Screw (5/16-18 UNC X 3/4 Lg.; Torque to 220/240 in. lbs.)
3	**11863**	2	Backup Washer (1/2 X 3/8 X 1/16)
4	**10268**	2	O-ring (1/2 X 3/8 X 1/16; Nitrile)
	11439	2	O-ring (1/2 X 3/8 X 1/16; Viton)
	17716	2	O-ring (1/2 X 3/8 X 1/16; EPR)
5	**211797**	1	Compression Spring (5/32 O.D. X 5/8 Lg.)
6	**12223**	1	Ball (3/16 Dia.)

Item No.	Part No.	No. Req'd	Description
7	**10442**	1	Copper Washer (3/8 X 1/4 X 1/32)
8	**209787**	1	Replaceable Seat
9	**209797**	1	Hollow Lock Screw (Torque to 180/200 in. lbs.)
10	**200395**	1	Gasket
11	**52165**	1	Manifold
12	**421355**	1	Solenoid Valve (See Form No. 100445)
13	**11144**	1	90° Elbow Connector