



HYDRAULIC TECHNOLOGIES

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Form No. 102959

Parts List & Operating Instructions for:

649303
649304

MODEL B
ELECTRIC HYDRAULIC PUMP
Max. Capacity: 10,000 PSI

Read and carefully follow these instructions before installation and use of this pump. Most problems with new equipment are caused by improper operation and installation.

SAFETY PRECAUTIONS



WARNING

- All WARNING statements must be carefully observed to help prevent personal injury.

Hydraulic Hose

- Before operating this pump, tighten all hose connections using the proper tools. Do not overtighten the connections. Connections need only be tightened securely and leak-free. Overtightening may cause premature thread failure or high pressure fittings to split at pressures lower than their rated capacities.
- Should a hydraulic hose ever burst, rupture, or need to be disconnected, immediately shut off the pump. Never attempt to grasp a leaking hose under pressure with your hands. The force of the 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 signs of 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 cylinders are retracted.

Cylinder

- Do not exceed rated capacities of the cylinders. 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.

Electrical Supply

- Do not use an ungrounded (two-prong) extension cord.
- Avoid conditions which could create an electrical hazard.
- If the power cord is damaged or wiring exposed, replace or repair immediately.

Safety Precautions (Continued)

Electrical Supply

- Check the voltage rating on the pump motor name plate to be certain the outlet you are using is of the proper voltage.
- Correct voltage is required for pump to operate properly.
- Low voltage may cause the following: ■ overheated motor; ■ motor fails to start under load; ■ motor surging when trying to start; ■ motor stalls before maximum pressure is reached.
- Always check the voltage at the motor with the pump running at full pressure.
- Never run the motor on long, light gauge extension cords.

SET-UP

Electric Motor



WARNING: To help avoid possible personal injury,

- Any electrical work must be done by a qualified electrician.
- Disconnect the power supply before removing the motor casing cover or performing repairs or maintenance.
- Changing the voltage on this unit is an involved, and if improperly performed, hazardous procedure. Consult the manufacturer for specific information before attempting any rewiring.

Hydraulic Connections

1. Clean all areas around the oil ports of the pump and cylinders.
2. Inspect all threads and fittings for signs of wear or damage, and replace as needed.
3. Clean all hose ends, couplers or unions ends.
4. Remove the thread protectors from the hydraulic oil outlets. Connect the hose assembly to the hydraulic oil outlet, and couple the hose to the cylinder. **IMPORTANT: Seal all external pipe connections with a high grade, non-hardening thread sealant.** Teflon tape can also be used to seal hydraulic connections if only one layer of tape is used. Apply the tape carefully, two threads back, to prevent it from being pinched by the coupler and broken off inside the system. Any loose pieces of tape could travel through the system and obstruct the flow of oil or cause jamming of precision-fit parts.

Filling the Reservoir

NOTE: This pump has been shipped without oil in the reservoir. High-grade approved hydraulic fluid has been shipped with the pump in separate containers. If additional oil is required, use only high-grade, approved hydraulic fluids.

1. Remove the filler cap and insert a funnel with a filter. Using the hydraulic fluid provided fill the reservoir to 1" from the fill hole. Remove funnel and replace the filler cap.

PUMP OPERATION

Priming the Pump

When operating the pump for the first time:

1. After filling the pump reservoir and checking that the hose connections are secure, place the valve in the neutral position, plug the electric motor into a sufficient power supply and start the pump by switching the toggle to the run position.
2. Disconnect a hose from the system and route it back to the pump reservoir. Run the pump until a steady flow of oil is observed free of suspended air bubbles. Reconnect the hose to the system.
3. Cycle the pump several times, extending and retracting the cylinder(s) fully to eliminate air from the system. For more complete instructions refer to the section titled "Bleeding Air from the System."
4. Retract the cylinder(s) and check the reservoir oil level. It should be 1" from the filler vent cap. Add hydraulic fluid if necessary.

PREVENTIVE MAINTENANCE

NOTE: Any repairs of servicing that requires dismantling the pump must be performed in a dirt-free environment by a qualified technician.

Bleeding Air from the System

Upon initial startup or after prolonged use, a significant amount of air may accumulate within the hydraulic system. This entrapped air can cause the cylinder to respond slowly or behave in an unstable manner. To remove the air, run the system through several cycles (extending and retracting cylinders) free of any load. **NOTE: The cylinder must be at a lower level than the pump to allow air to be released through the pump reservoir.**

Inspecting the Hydraulic Fluid Level

Check the oil level in the reservoir periodically. With all cylinder(s) retracted, the oil level should be 1" from the filler cap. Drain, clean and replenish the reservoir with a high-grade, approved hydraulic fluid 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 cap clean and unobstructed at all times.
5. Equipment connected to the pump must be kept clean.
6. Use only approved 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 pump assembly to the reservoir. Remove the pump assembly from the reservoir. Do not damage the gasket, filter or relief valve.
2. Drain the reservoir of all fluid. Refill half full with clean hydraulic fluid.
3. Place the pump assembly back onto the reservoir and secure with two machine screws assembled on opposite corners of the housing.
4. Run the pump for several minutes. Remove the two cover screws and lift off the pump assembly again. Drain and wipe out the reservoir with a clean, lint-free cloth.
5. Fill the reservoir with high-grade, approved hydraulic fluid to 1" from the filler cap. Place the pump assembly (with gasket) on the reservoir and install the screws. Tighten securely and evenly.

Adding Oil to the Reservoir

1. Cylinder(s) must be fully retracted and the motor off when adding oil to the reservoir.
2. Clean the entire area around the filler cap before removing the filler cap.
3. Use a clean funnel with filter when adding oil.
4. Use only high-grade, approved hydraulic fluids.
5. Fill to 1" from the filler cap.

TROUBLE-SHOOTING GUIDE



WARNING:

- To help prevent personal injury, any repair work or trouble-shooting must be done by qualified personnel familiar with this equipment.
- Use the proper gauges and equipment when trouble-shooting.

NOTE:

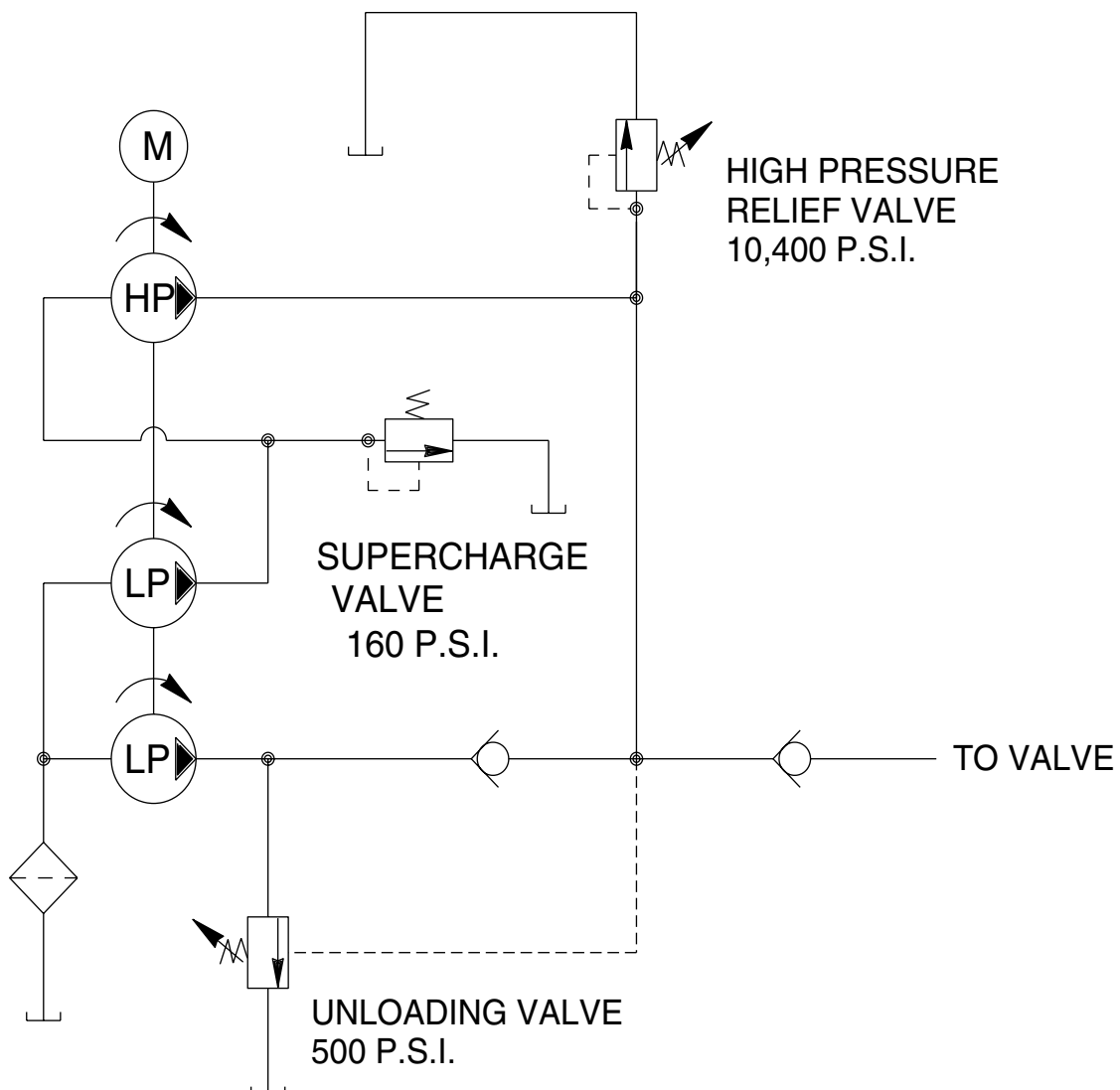
- It is best to check for leaks by using a hand pump and applying pressure to the suspect area without the motor running. Watch for leaking oil and follow it back to its source.
- Plug the outlet ports of the pump when checking for leakage to determine if the leakage is in the pump or in the cylinder or tool.

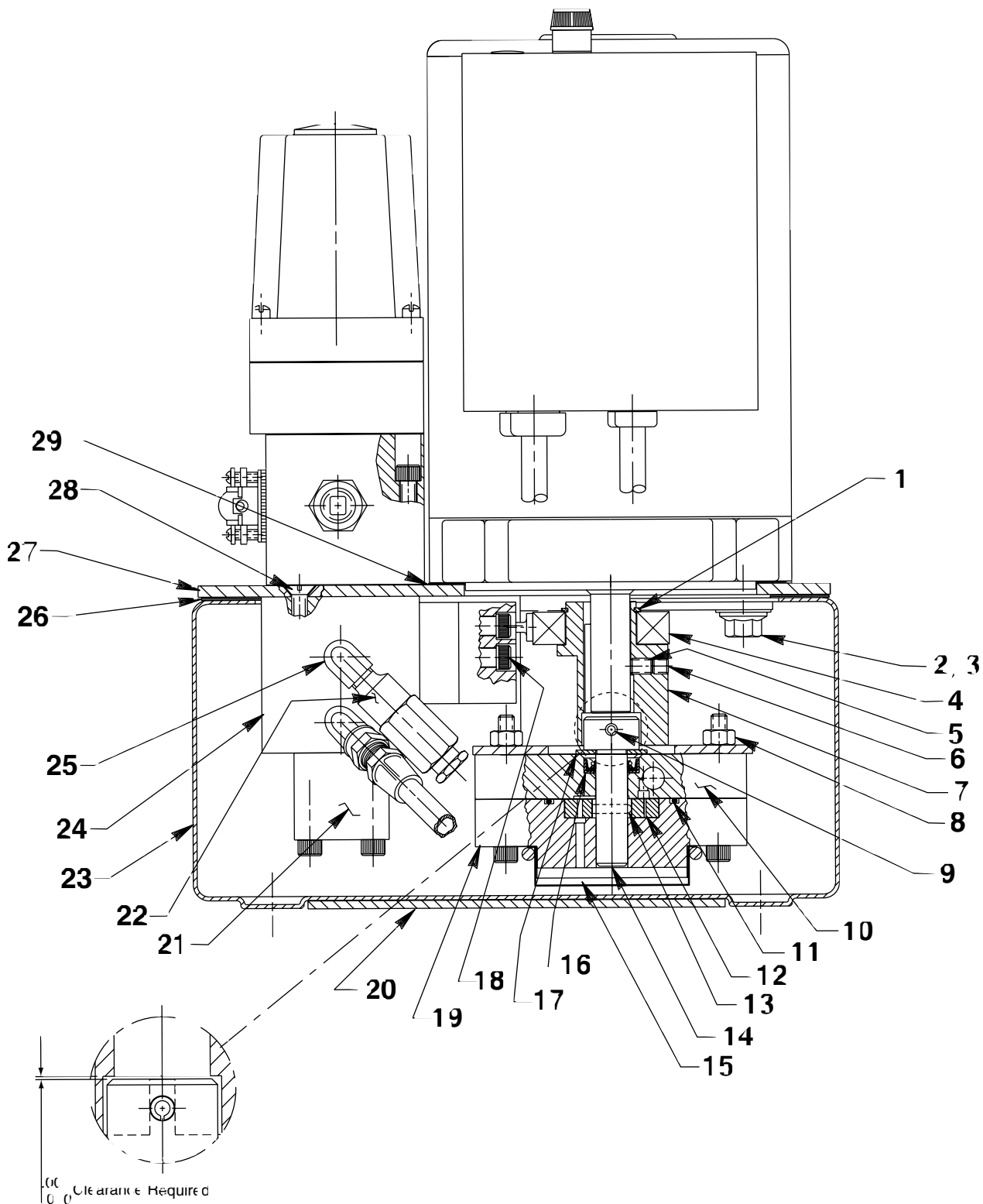
PROBLEM	CAUSE	
Pump is not delivering oil or delivers only enough oil to advance cylinder(s) partially or erratically.	- Oil level too low. - Loose-fitting coupler to cylinder. - Air in system. - Air leak in suction line. - Dirt in pump or filter plugged. - Oil is bypassing through a double-acting cylinder. - Cold oil or oil is too heavy (Hydraulic oil is of a higher viscosity than necessary). - Relief valve or low pressure unloading valve out of adjustment. - Reservoir capacity is too small for the size of the cylinder(s) used. - Defective directional valve. - Sheared drive shaft key(s). - Vacuum in reservoir.	- With all cylinders retracted, fill reservoir to 1" of fill hole. - Check quick-disconnect couplings to cylinders. Inspect couplers to ensure that they are completely coupled. Occasionally couplers have to be replaced because the ballcheck does not stay open due to wear. - Bleed the system. - Check and tighten suction line. - Pump filter should be cleaned and, if necessary, pump should be dismantled and all parts inspected and cleaned. - By removing the cylinder and capping the hoses, the pump and valve can be checked. Observe if pump holds pressure. - Change to lighter oil. - Adjust as needed. - Use smaller cylinder(s) or larger reservoir. - Inspect all parts carefully and replace if necessary. - Replace. - Check for plugged vent in breather cap.

PROBLEM	CAUSE	SOLUTION
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. If using a double-acting cylinder, remove it from the system to ensure that the leak is not in the cylinder. 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 Trouble-shooting Guide.	1. Seal leaking pipe fittings with pipe sealant. 2. Clean, reseal or replace flow control valve parts. If the internal check valve(s) are leaking, the pump must be dismantled and the seat areas repaired, poppets replaced, etc.
Pump will not build full pressure	1. Check for external leakage. 2. Check the relief valve setting. 3. Look for internal leakage in double-acting cylinders. 4. Check for leaks in the flow control valve. 5. Inspect the pump for internal leakage. Check high pressure pump inlet or outlet ball checks. 6. Sheared key(s).	1. Seal faulty pipe fitting with pipe sealant. 2. Lift the pump from the reservoir, but keep the filter immersed in oil. Note the pressure reading when the relief valve begins to open. If functioning normally, it should start to leak off at relief valve pressure. 3. Remove the cylinder from the pump. If the pump builds full pressure, the cylinder is defective. 4. Clean and reseal 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 reseal if necessary. Inspect for damage and replace parts if necessary, then reassemble. 6. Replace.

PROBLEM	CAUSE	SOLUTION
Cylinder(s) will not retract.	1. Check the system pressure; if the pressure is zero, the control valve is releasing pressure and the problem may be in the cylinder(s), mechanical linkage connected to cylinder(s), 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. Relief valve not properly set.	1. Adjust the relief valve.

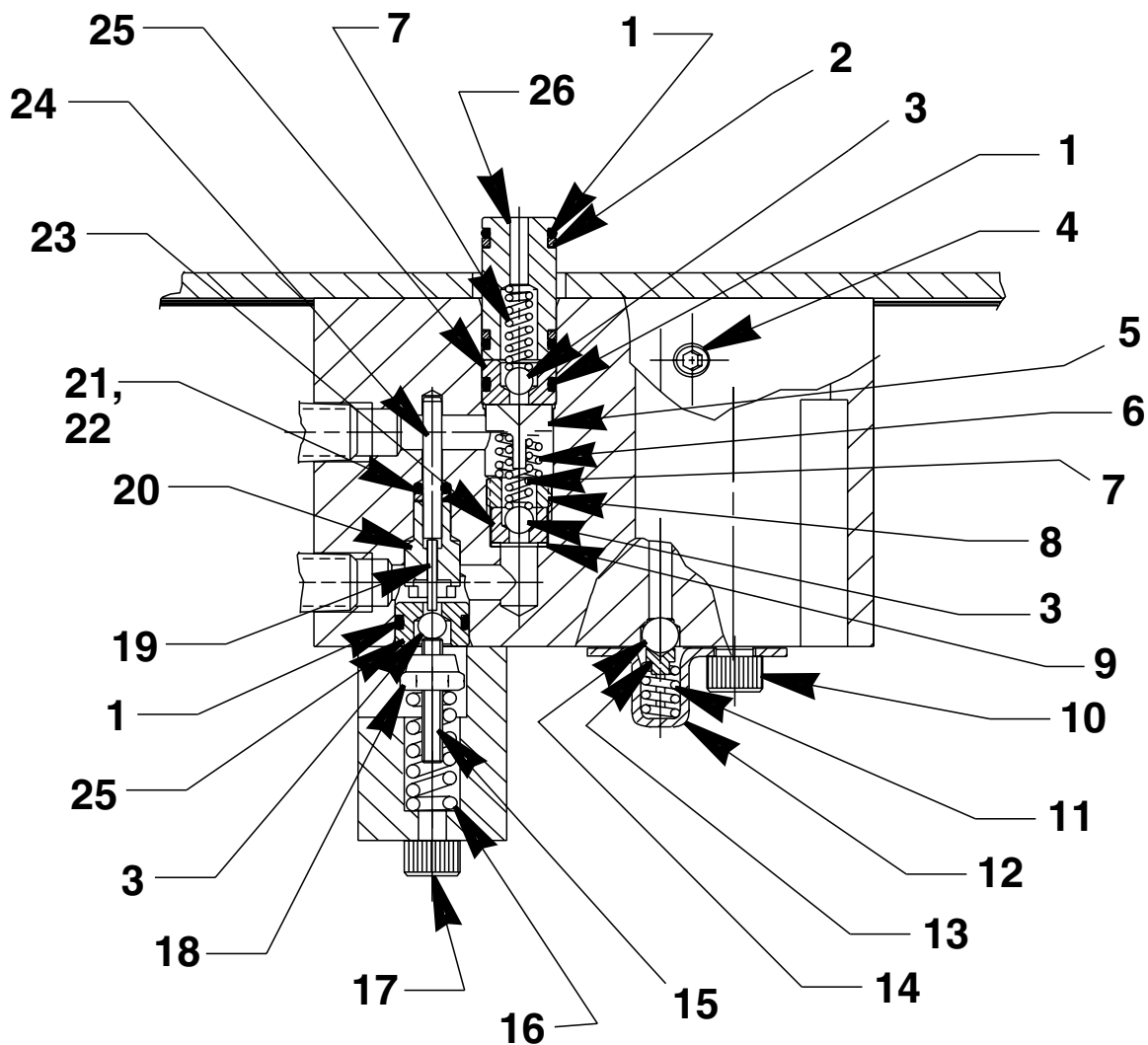
HYDRAULIC SCHEMATIC



**PARTS LIST
PUMP SIDE VIEW**

Item No.	Part No.	No. Req'd	Description
1	209798	1	Ring, Retain Ext (1.18 x .052)
2	213663	4	Screw, Flg Hex Hd (3/8-16 x 1)
3	10258	4	Washer, Plain (.82 x .41; Torque to 230/250 in. lbs.)
4	209805	1	Bearing, Ball
5	10136	1	Screw, Hex Set (1/4-20 x 1/4 Lg; Torque to 60/80 in. lbs.)
6	10519	1	Screw, Hex Set (1/4-20 x 3/8 Lg; Torque to 60/80 in. lbs.)
7	420840	1	Eccentric
8	10199	2	Nut, Hex (1/4-20)
9	12298	1	Pin, Roll (.19 x 1.50)
10	64623	1	Housing, Upper Gerotor
11	10922	1	O-ring (2.12 x 1.93 Nitrile)
12	304826	1	Set, Gerotor
13	209794	1	Pin, Gerotor Drive
14	350940	1	Shaft, Gerotor
15	21846	1	Support, Filter
16	304830	1	Seal, Oil (.88 x .50 Nitrile)
17	12595	1	Washer, Brass (1.13 x .51)
18	10022	4	Screw, Soc Hd (1/4-20 x 1-1/2; Torque to 180/200 in. lbs.)
19	64580	1	Housing, Gerotor Lower
20	420948	1	Pad, Rubber (Apply 3M adhesive #08031 to bottom of reservoir and pad.)
21	350930	1	Block, Retaining
22	21278	1	Valve, Relief (10000 P.S.I.)
23	64665OR9	1	Reservoir
24	64612	1	Body, Check
25	13229	1	Fitting, Elbow (90 Deg. 1/8 NPTF)
26	420931	1	Gasket, Reservoir
27	64666BK2	1	Plate, Cover
28	11529	2	Screw, Flat Hd (1/4-20 x 3/4)
29	351060	1	Gasket, Motor Base

HIGH PRESSURE PUMP ASSEMBLY

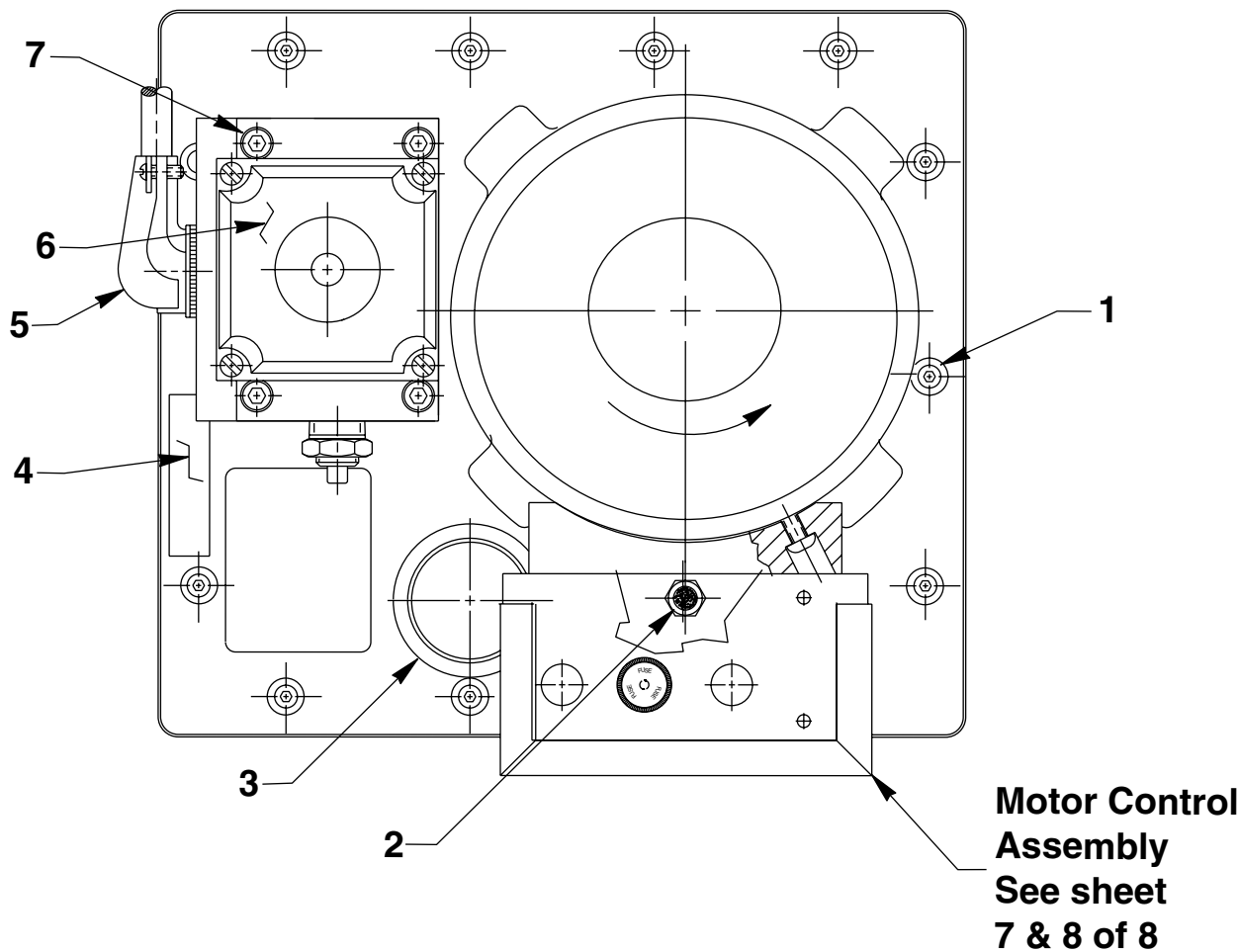


Item No.	Part No.	No. Req'd	Description	Item No.	Part No.	No. Req'd	Description
1	10268	4	O-ring (1/2 X 3/8 X 1/16)	12	350577	1	Spring Retainer
2	11863	2	Backup Washer (1/2 X 3/8 X 1/16)	13	200796	1	Adapter
3	12223	3	Ball (3/16 Dia.)	14	10374	1	Steel Ball (7/32 Dia.)
4	15130	1	Plug (1/16 NPTF)	15	251067	1	Set Screw (Unloading valve; #10-24 UNC x 1" Lg.)
5	251601	1	Outlet Ball Stop	16	14484	1	Compression Spring (3/8 O.D. X 1" Lg.)
6	10444	1	Compression Spring (3/16 I.D. X 13/32 Lg.)	17	10854	2	Cap Screw (1/4-20 UNC X 1-3/4" Lg.; Torque to 60/80 in. lbs.)
7	10445	2	Compression Spring (5/32 O.D. X 3/4 Lg.)	18	207405	1	Locknut (10-24 UNC)
8	209797	1	Hollow Lock Screw (7/16-20 UNF-3A; Torque to 110/130 in. lbs.)	19	251611	1	Dowel Pin (1/2 x 3/8 x .049)
9	10442	1	Washer (3/8 X 1/4 X 1/32)	20	251068	1	Guide
10	10002	1	Cap Screw (1/4-20 UNC X 3/8 Lg.; Torque to 60/80 in. lbs.)	21	17797	1	O-ring (1/4 X 1/8 X 1/16)
11	15691	1	Compression Spring (1/4 O.D. X 5/8 Lg.)	22	214992	1	Backup Ring (15/64 x 1/8 x 3/64)
				23	209787	1	Replaceable Seat
				24	16471	1	Dowel Pin (1/8 dia. x 1" Lg.)
				25	251065	2	Replaceable Seat
				26	251581	1	Bushing

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Rev. Date: 27 Feb. 1998

TOP VIEW



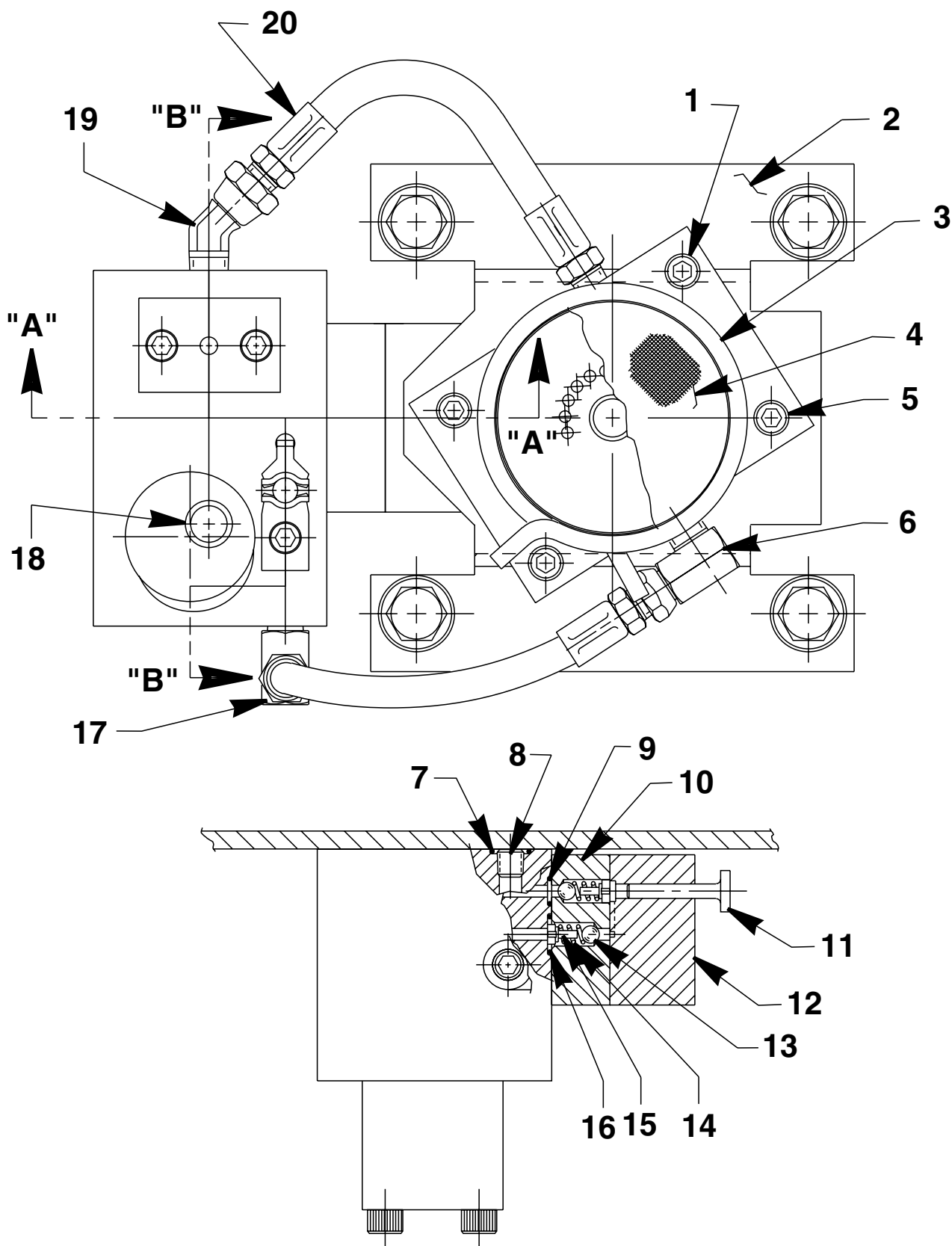
Item No.	Part No.	No. Req'd	Description
1	15911	14	Screw, Button Hd (1/4-20 x 5/8; Torque to 60/80 in. lbs.)
2	251599	1	Cap, Filler Breather
3	350925	1	Cap, Filler Breather
4	213695	1	Decal, Intermittent Duty
5	11144	1	Connector, 90 Degree Elbow
6	42621	1	Valve, Solenoid 3 Way 115V (For 649304)
	44084	1	Valve, Solenoid 3 Way 220V (For 649303)
7	10856	4	Screw, Soc Hd (1/4-20 x 2-1/2)

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

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

Additional questions can be directed to our Technical Services Department.

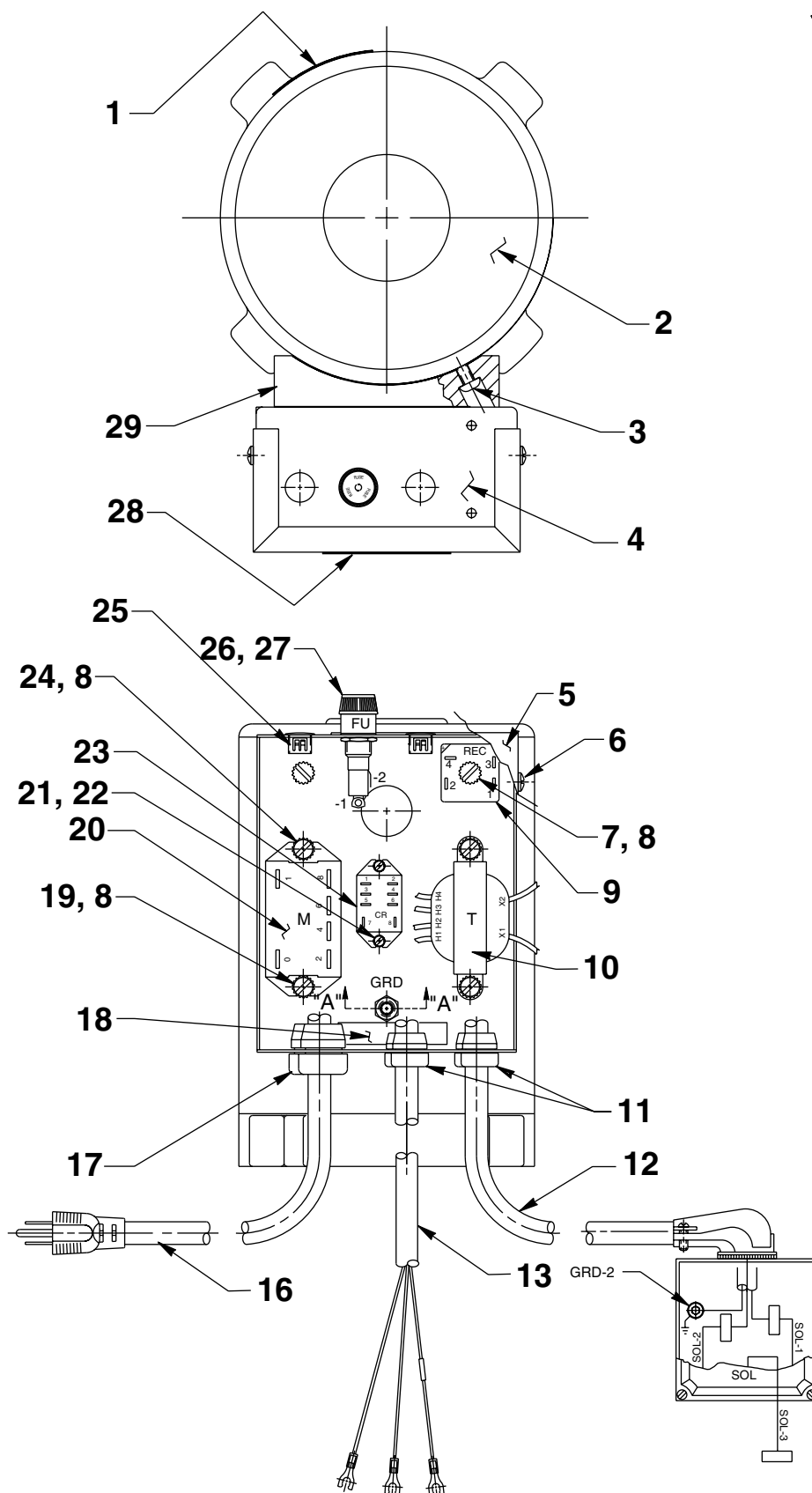
BOTTOM VIEW AND SECTION A-A



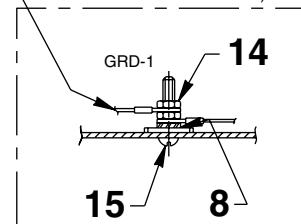
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Item No.	Part No.	No. Req'd	Description
1	10022	2	Cap Screw (1/4-20 UNC X 1-1/2" Lg.; Torque to 60/80 in. lbs.)
2	58481	1	Gerotor Housing Bracket
3	11461	1	Hose Clamp
4	21608	1	Filter
5	10890	2	Cap Screw (1/4-20 X 2" Lg.; Torque to 60/80 in. lbs.)
6	14440	1	90° Elbow Fitting
7	15279	1	O-ring (1/2 X 3/8 X 1/16)
8	15130	1	Plug (1/16 NPTF)
9	10265	1	O-ring (5/16 X 3/16 X 1/16)
10	45559	1	Block
11	305526	1	High Pressure Piston
12	45866	1	Block
13	12223	2	Ball (3/16 Dia.)
14	10445	2	Compression Spring (5/32 O.D. X 3/4 Lg.)
15	24549	2	Ball Guide
16	14763	1	O-ring (7/16 X 5/16 X 1/16)
17	13229	1	Elbow
18	250630	1	Drain Tube
19	251800	1	Elbow Fitting
20	304819	2	Hose Assembly

MOTOR & CONTROL ASSEMBLY 110/115 Volt



POWER CORD GROUND
(MUST BE ISOLATED BETWEEN
NUTS AND CAN BE AT
TOP OR BOTTOM OF STACK.)



NOTE: SERRATED LOCK WASHER
MUST BE ADJACENT TO
METAL BOX. MORE WASHERS
CAN BE USED IF DESIRED.

VIEW "A-A"

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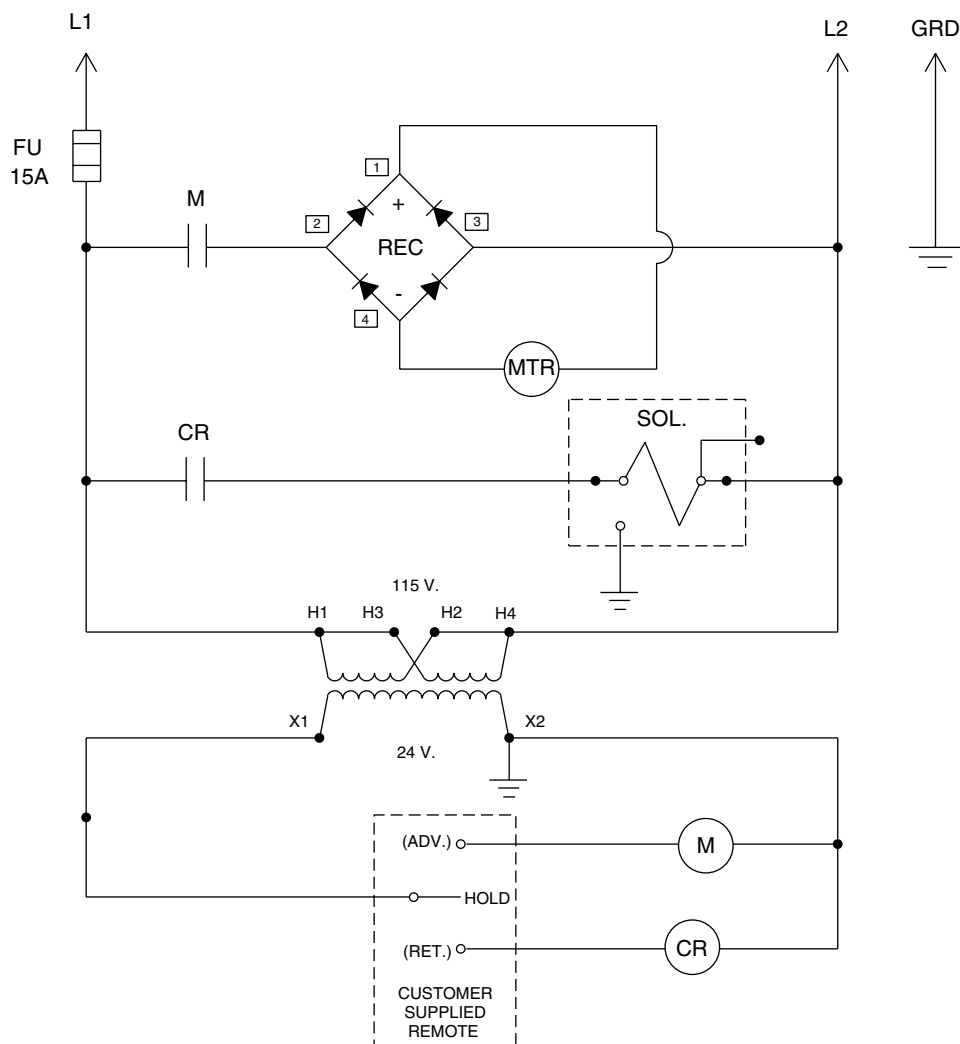
Item No.	Part No.	No. Req'd	Description	Item No.	Part No.	No. Req'd	Description
1	351024	1	Decal Vanguard 30 Series	16	25229	1	Cord, 8'Lg. 115V (14/3 SJTO)
2	*420838BK2	1	Motor, Elec 115V 60 HZ	17	210112	1	Bushing, Strain Relief
3	12316	2	Screw, Pan Hd (10-24 x 5/8)	18	205189	1	Decal, Label Ground
4	59025BK2	1	Box, Electrical Control	19	10164	2	Screw, Round Hd (10-24 x 3/8)
5	42576BK2	1	Cover, Control Box	20	251638	1	Relay, General Purpose
6	11141	4	Screw, Pan Hd (6-20 x 3/8)	21	10159	2	Screw, Round Hd (6-32 x 5/16)
7	252872	1	Screw, Round Hd (10-32 x 5/8)	22	15906	2	Washer, Tooth Ext (.31 x .15)
8	11108	7	Washer, Tooth Ext (.40 x .20)	23	251046	1	Relay, General Purpose
9	251050	1	Rectifier	24	12909	3	Screw, Round Hd (10-32 x 1/4)
10	251049	1	Transformer	25	17782	2	Plug, Snap
11	15993	2	Bushing, Strain Relief	26	18292	1	Holder, Fuse
12	12293	2.5 Ft.	Cable (16/3 SJTO)	27	252288	1	Fuse, 15 AMP 250 V
13	12908	30 Ft.	Cable (18/3 SJTO)	28	200188	1	Decal, Warning Important
14	10197	2	Nut, Hex (10-24)	29	420962	1	Adapter, Mounting
15	11856	1	Screw, Round Hd (10-24 x 1)				

* Note: For replacement brushes, order (2) #252958.

ELECTRICAL SCHEMATIC - 115 V.

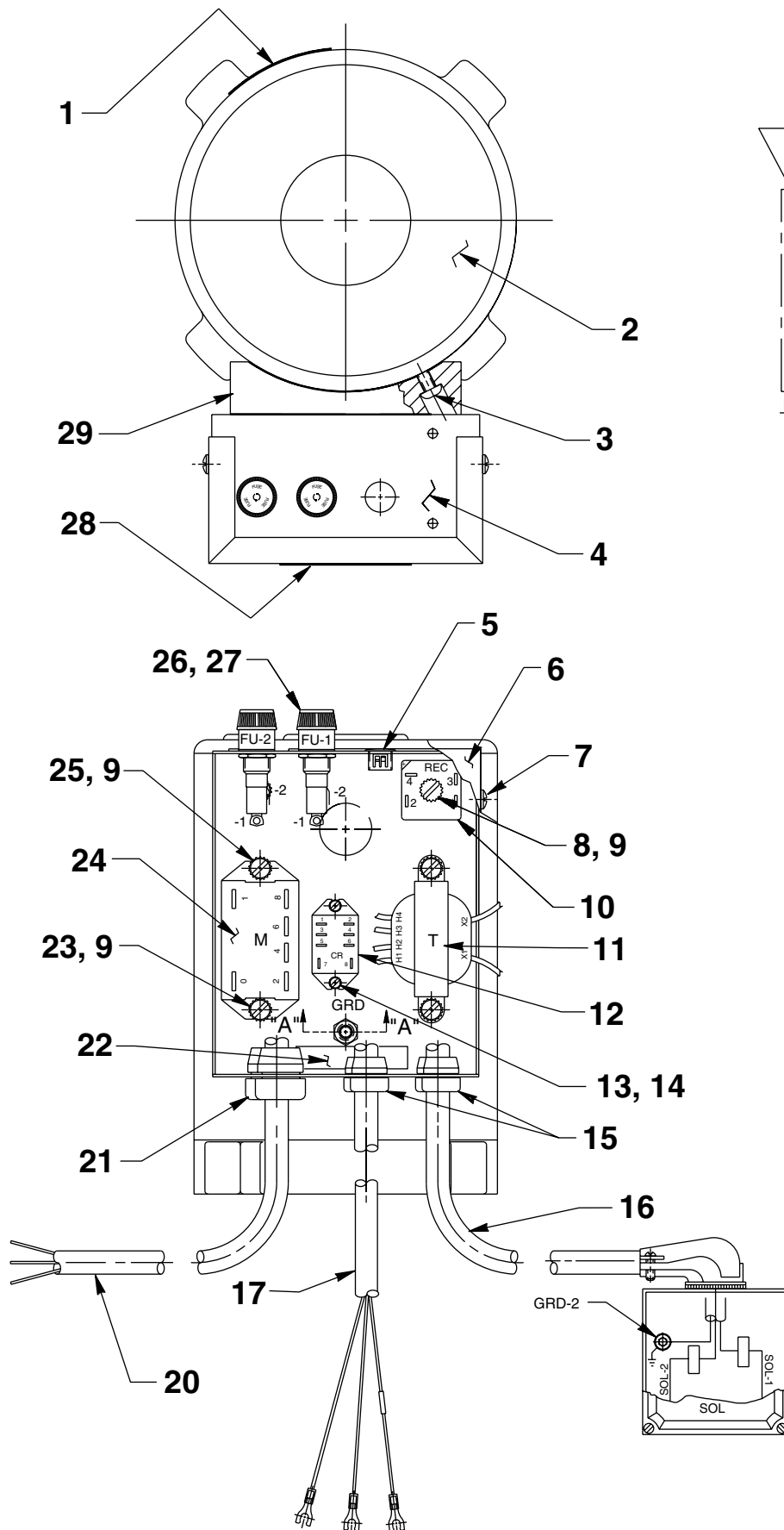


WARNING: To help avoid personal injury, all electrical work must be done by a qualified electrician.

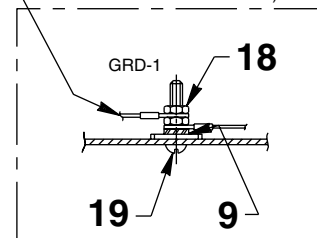


MOTOR & CONTROL ASSEMBLY

220/230 Volt



POWER CORD GROUND
(MUST BE ISOLATED BETWEEN
NUTS AND CAN BE AT
TOP OR BOTTOM OF STACK.)



NOTE: SERRATED LOCK WASHER
MUST BE ADJACENT TO
METAL BOX. MORE WASHERS
CAN BE USED IF DESIRED.

VIEW "A-A"

Item No.	Part No.	No. Req'd	Description	Item No.	Part No.	No. Req'd	Description
1	351024	1	Decal Vanguard 30 Series	16	12293	2.5 Ft.	Cable (16/3 SJTO)
2	*420838BK2	1	Motor, Elec 115V 60 HZ	17	12908	30 Ft.	Cable (18/3 SJTO)
3	12316	2	Screw, Pan Hd (10-24 x 5/8)	18	10197	2	Nut, Hex (10-24)
4	59025BK2	1	Box, Electrical Control	19	11856	1	Screw, Round Hd (10-24 x 1)
5	17782	2	Plug, Snap	20	308752	8 Ft.	Cable (14/3 SJTO)
6	42576BK2	1	Cover, Control Box	21	210112	1	Bushing, Strain Relief
7	11141	4	Screw, Pan Hd (6-20 x 3/8)	22	205189	1	Decal, Label Ground
8	252872	1	Screw, Round Hd (10-32 x 5/8)	23	10164	2	Screw, Round Hd (10-24 x 3/8)
9	11108	7	Washer, Tooth Ext (.40 x .20)	24	251638	1	Relay, General Purpose
10	251050	1	Rectifier	25	12909	3	Screw, Round Hd (10-32 x 1/4)
11	251049	1	Transformer	26	18292	1	Holder, Fuse
12	251046	1	Relay, General Purpose	27	252873	2	Fuse, 10 AMP 250 V
13	10159	2	Screw, Round Hd (6-32 x 5/16)	28	200188	1	Decal, Warning Important
14	15906	2	Washer, Tooth Ext (.31 x .15)	29	420962	1	Adapter, Mounting
15	15993	2	Bushing, Strain Relief				

* Note: For replacement brushes, order (2) #252961.



WARNING: To help avoid personal injury, all electrical work must be done by a qualified electrician.

ELECTRICAL SCHEMATIC - 230 V.

