

# Hydraulic Pump

M5783-00 & M5773-00



Tube & Pipe Cleaners ◦ Tube Testers ◦ Tube Plugs ◦ Tube Removal ◦ Tube Installation



## Operating and Maintenance Instructions



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# INTRODUCTION

Thank you for purchasing this Elliott product. More than 100 years of experience have been employed in the design and manufacture of this control, representing the highest standard of quality, value and durability. Elliott tools have proven themselves in thousands of hours of trouble-free field operation.

If this is your first Elliott purchase, welcome to our company; our products are our ambassadors. If this is a repeat purchase, you can rest assured that the same value you have received in the past will continue with all of your purchases, now and in the future.

If you have any questions regarding this product, manual or operating instructions, please call Elliott at +1 800 332 0447 toll free (USA only) or +1 937 253 6133, or fax us at +1 937 253 9189 for immediate service.

# SAFETY GUIDELINES

Read and save all instructions. Before use, be sure everyone using this machine reads and understands this manual, as well as any labels packaged with or attached to the machine.

## **WARNING**

When using electric tools, certain safety precautions are required to reduce the risk of electrical shock and personal injury.

## **WARNING**

To reduce the risk of injury, always unplug your machine before performing any maintenance. Never disassemble the machine or try to do any wiring on the electrical system. Contact Elliott for all repairs.

- Know Your Elliott Tool. Read this manual carefully to learn your tool's application and limitations as well as the potential hazards specific to this tool.
- Ground Your Elliott Tool. Always use properly grounded electrical outlets, and if using an extension cord, make sure that it is of the proper size for the electrical load and it is equipped with a ground wire and ground plug.
- Avoid Dangerous Environments. Do not use power tools in damp or wet locations
- Keep Work Area Clean and Well Lit. Cluttered, dark work areas invite accidents.
- Use Safety Equipment. Everyone in the work area should wear safety goggles or glasses with side shields complying with current safety standards.
- Use The Right Tools. Do not force a tool or attachment to do a job or operate at a speed it was not designed for.
- Use Proper Accessories. Use Elliott accessories only. Be sure accessories are properly installed and maintained.
- Check for Damaged Parts. Inspect guards and other parts before use. Check for misalignment, binding of moving parts, improper mounting, broken parts or any other conditions that may affect operation. If abnormal noise or vibration occurs, turn the tool off immediately and have the problem corrected before further use. Do not use a damaged tool. Tag damaged tools "Do Not Use" until repaired. A damaged part should be properly repaired or replaced by an Elliott service facility.
- Unplug Tool. Unplug tool when it is not in use, before changing accessories or performing recommended maintenance.
- Maintain Labels and Nameplates. These carry important information and will assist you in ordering spare and replacement parts. If unreadable or missing, contact an Elliott service facility for a replacement.

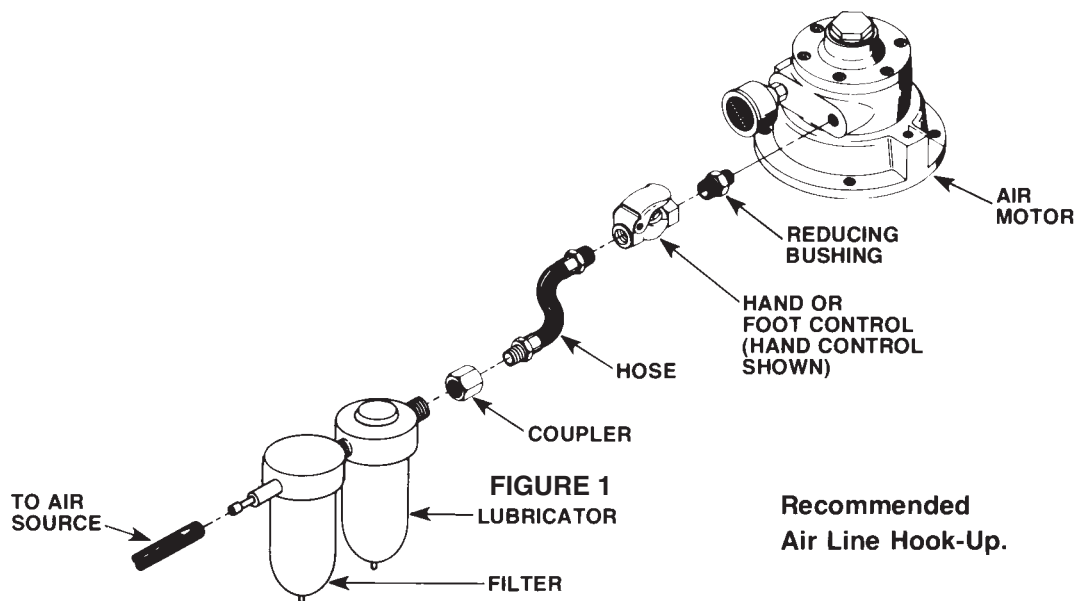
# SET-UP & OPERATION

## Motor Hook-up and Operation

**Universal Motor:** The universal motor is wired for 115 or 230 volts, 50/60 cycles according to the customer's request. **This motor cannot be rewired.**

**Air Motor:** Remove the thread protectors from the air inlet, and install the air supply fittings (not supplied) as shown in Figure 1. Air supply must be minimum 50 CFM and 80 PSI, with 100 PSI maximum.

**IMPORTANT:** Seal all external pipe 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. 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.



Recommended  
Air Line Hook-Up.

## Filling The Reservoir

**NOTE:** The pump has been shipped without oil in the reservoir. High-grade hydraulic oil has been shipped with the pump in a separate container. If additional oil is required, use a high-grade, approved hydraulic oil.

1. Clean the area around the filler cap to remove all dust and grit. Any dirt or dust in the oil can damage the polished surfaces and precision-fit components of the pump.
2. Retract all cylinders to the return position.
3. Remove the filler cap, and insert a clean funnel and filter. Fill with hydraulic oil to 1/2" from the top of the filler hole. Replace filler cap with the breather-hole in the filler cap open. Check the oil level gauge for the proper oil level.
4. Cycle the pump (with cylinders attached) several times. Retract the cylinders, and check the oil level in the pump reservoir again.

## 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. Connect the hose assembly to the hydraulic oil outlet, and couple the hose to the cylinder. Although a high-grade, non-hardening thread sealant is preferred, teflon tape may be used to seal hydraulic connections if only one layer of tape is used. Apply carefully 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 oil.

# SET-UP & OPERATION

## Valve Options

### Automatic Dump Valve

When the pressure switch setting is reached, the switch shuts off the motor. All pressure is automatically dumped. Turn the adjusting screw clockwise to increase pressure; turn the adjusting screw counterclockwise to decrease pressure. Refer to the section titled "Adjusting the Pressure Switch" for more information.

### Hydraulic Gauge (Optional)

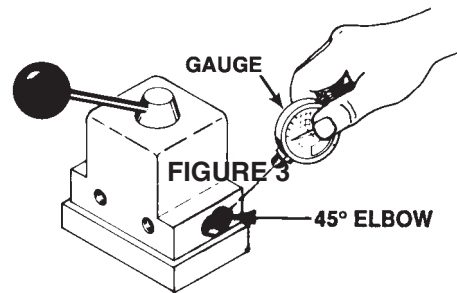
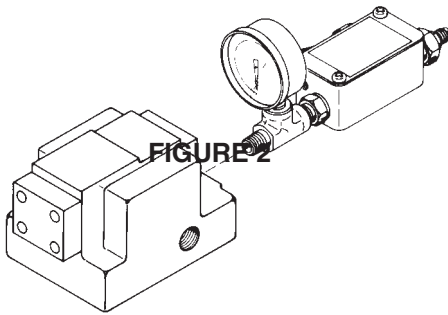
#### Automatic Dump Valve

To monitor line pressure when using an automatic dump valve, a tee fitting is used between the valve and the pressure switch to adapt a hydraulic gauge. See Figure 2.

To install a hydraulic gauge (refer to Figure 3):

1. Remove the pipe plug from the valve's gauge port.
2. Install a 45° elbow fitting.
3. Install the gauge into the 45° elbow fitting.

**NOTE: Seal all external pipe connections with a high-grade, non-hardening pipe sealant. Teflon tape can also be used to seal hydraulic connections if only one layer of tape is used. Apply the tape carefully to prevent it 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 oil.**



### Adjusting The Hydraulic Gauge

Locate the adjustment screw on the gauge (see Figure 4) and make adjustments as needed with a screwdriver. The adjustment screw is located on the lower right back rim of the gauge. You must reach under the portion of the shroud that the gauge is mounted in.

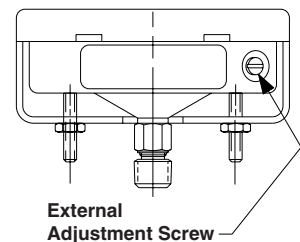
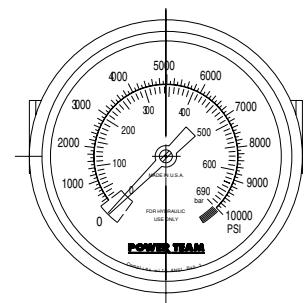


FIGURE 4

# SET-UP & OPERATION

## Reservoir Vent Air Filter (Optional)

1. Remove the filler cap, and insert either the 45° fitting or the straight fitting. Fasten o-ring end of fitting into pump.
2. If the 45° fitting is used, place the rubber spacer (included) on the top threaded portion. Then thread the air filter on and hand tighten.
3. If the straight fitting is used, thread the air filter on and hand tighten.

## Priming The Pump

When operating the pump for the first time:

1. Valve and hose connections must be tight, and the reservoir must be filled to the proper oil level. Start the motor.
2. Jog the pump several times to build pressure. If the pump doesn't build pressure, it may not be primed. 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. Run cylinder out to its full travel several times to eliminate air from the system. For more complete instructions, refer to the section titled "Bleeding Air From The System."
4. The pump is ready to be put into regular operation.

**IMPORTANT:** After eliminating trapped air from a large work-holding system, retract the cylinders and refill the pump reservoir to 1/2" from the top of the filler hole. Check the oil level gauge for the proper oil level.

## Adjusting The Pressure Regulating Controls

The pressure regulating valve and pressure switch are shown in Figure 5. The pressure regulating valve can be adjusted to bypass oil at a given pressure setting while the pump continues to run. The pressure switch can be adjusted to stop the pump at a given pressure setting. To ensure accuracy and low pressure differential (approx. 300 PSI) throughout the pressure range (1,000 to 10,000 PSI depending on the pump model), the pressure switch should be used with the pressure regulating valve. The pressure switch must be set at a pressure lower than the pressure regulating valve to work properly.

## Adjusting The Pressure Regulating Valve

**NOTE:** For easy adjustment of the pressure regulating valve, always adjust the pressure by *increasing* to the desired pressure setting.

1. Loosen the locknut on the pressure regulating valve (C), and back the adjusting screw (B) out a few turns with a screwdriver by turning in a counterclockwise direction. This will *decrease* the setting to a lower than desired pressure.
2. The pump must be completely connected. Set the motor control toggle switch on "Run" and push the "Start" button.
3. With the screwdriver, slowly turn the adjusting screw (B) in a clockwise direction. This gradually *increases* the pressure setting. When the desired pressure is reached, lock the adjusting screw in position by tightening the locknut.

### IMPORTANT:

- The pressure range is from 1,000 to 10,000 PSI depending on the pump model.
- The pressure switch must be set at a higher pressure than working range to prevent shut down during adjustment. It is also possible to bypass the pressure switch contacts by holding the start switch or remote control switch so that the motor runs continuously.

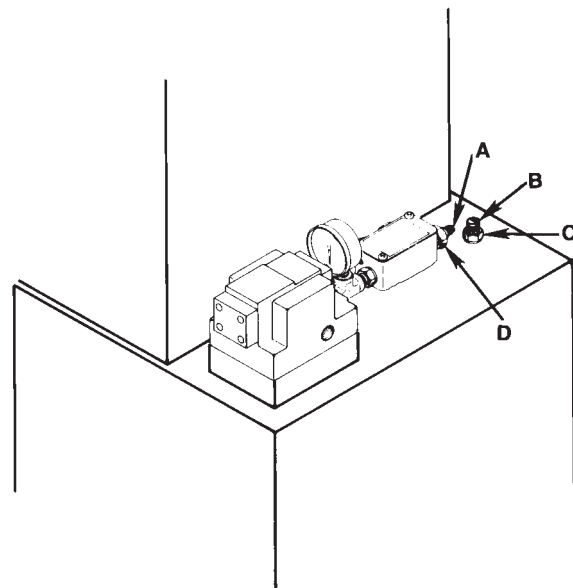


FIGURE 5



# SET-UP & OPERATION

## **Adjusting The Pressure Switch**

Generally, the pressure switch should be used with the pressure regulating valve. A pressure switch can be used *alone* for operating electrical devices such as motors, solenoids, relays, etc., which are located elsewhere in the circuit. Refer to Figure 5.

1. Loosen the locknut on the pressure switch (D), and turn adjusting screw (A) in a clockwise direction. This *increases* the pressure setting to a higher than desired pressure.
2. Adjust the pressure regulating valve to the desired pressure setting by using the procedure previously outlined.
3. With the pump running and bypassing oil at the desired pressure, slowly turn the pressure switch adjusting screw (A) in a counterclockwise direction, *decreasing* the pressure switch setting until the pump motor shuts off. Then lock the adjusting screw (A) in position by tightening the locknut.
4. Release pressure. Run the pump to check the pressure setting and cut-out of the motor. If may be necessary to make a second adjustment.

**NOTE: When the pressure switch setting is reached, the motor will shut off. However, the "coast" of the motor continues to deliver oil for a brief period. The pressure regulating valve bypasses this surplus oil, preventing it from going into the system. As a result, the pressure differential can be held to approximately 300 PSI.**

# MAINTENANCE

**WARNING:** To help prevent personal injury,

- Disconnect the pump 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.

## **Bleeding Air From The System**

Air can accumulate in the hydraulic system if the reservoir oil level is too low. This air causes the cylinder to respond in an unstable or slow manner. To remove the air:

1. The hydraulic cylinder(s) must be positioned on their side(s) with the couplers located upward.
2. Remove any load from the cylinder(s), and cycle the hydraulic system through several cycles (fully extend and retract the cylinders).

**IMPORTANT:** Some of the single-acting spring return cylinders have a cavity in the rod that forms an air pocket. This type of cylinder must be positioned upside down when the hydraulic system is bled.

## **Hydraulic Fluid Level**

1. Check the oil level in the reservoir after each 10 hours of use. Proper oil level is 1/2" from the top of the fill hole when all cylinders are retracted. Check the oil level gauge for the proper oil level.
2. Drain, flush, and refill the reservoir with an approved, high-grade hydraulic oil after approximately every 300 hours of use. The frequency of oil changes will depend upon the general working conditions, severity of use, and overall cleanliness and care given the pump.
3. Only use hydraulic oil, ASTM215 or equivalent.

## **Lubrication (Air Driven Motor Only)**

If the pump is operated on a continuous duty cycle or a maximum speeds for extended periods, an automatic air line oiler should be installed in the air inlet line as close to the pumping unit as possible. Set the unit to feed 1-3 drops of oil per minute (one drop for every 50-75 CFM of air) into the system, or refer to the pump manufacturer's instructions. Use SAE No. 10 oil.

## **Maintenance Cleaning**

1. Keep the pump's outer surface as free from dirt as possible.
2. Seal all unused couplers with thread protectors.
3. Keep all hose connections free of dirt and grime.
4. The breather-hole in the filler cap must be clean and unobstructed at all times.
5. Equipment connected to the pump must be kept clean.
6. Use only an approved, high-grade hydraulic oil in this pump. Change as recommended (every 300 hours).

# MAINTENANCE

## Draining And Flushing The Reservoir

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

1. Remove the ten screws fastening the motor and pump assembly to the reservoir. **IMPORTANT: Do not damage the gasket or pump the filter or pressure regulating valves when lifting the pump and motor off the reservoir. See Figure 6.**
2. Clean the inside of the reservoir and fill with a suitable flushing oil. Rinse the filter clean.
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:** The hydraulic flow control valve must be in the neutral position for the following step. If the pump is equipped with a valve that has only an advance or retract position, place the valve in the advance position, and connect a hose to the advance 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 an approved, high-grade hydraulic oil. Place the pump and motor assembly (with gasket) on the reservoir, and thread the ten screws. Tighten securely and evenly.

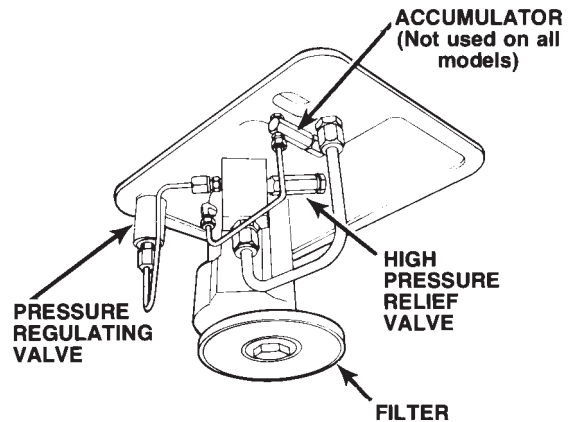


FIGURE 6

## 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. Check the oil level gauge for the proper oil level.
5. Use an approved, high-grade hydraulic oil (215 SSU @ 100° F) only.

## Sound Reduction

The electrically-powered hydraulic pump operates in the 90-95 dBA range. If further sound reduction is desirable, any of the following options will help reduce the sound level.

1. Install a pressure switch. It shuts the motor off automatically when maximum pressure is reached (holding cycle).
2. Use a 3450 RPM, 1-1/2 horsepower, 115 VAC, 60 Hz, 1-phase pumping unit.
3. Use a 3450 RPM, 1-1/2 horsepower, 230 VAC, 60 Hz, 3-phase pumping unit.
4. Install casters (two gallon reservoir only) to reduce the noise level.

## Checking Brushes On Universal Motors

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

1. Remove the metal brush cover plates.
2. Remove the brush holder caps and brush assemblies
3. The brush assemblies must be replaced if they are 1/8" long or less. See Figure 7.
4. Install brush assemblies, brush holder caps, and metal brush cover plates.

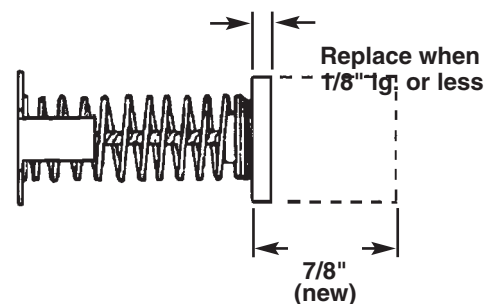
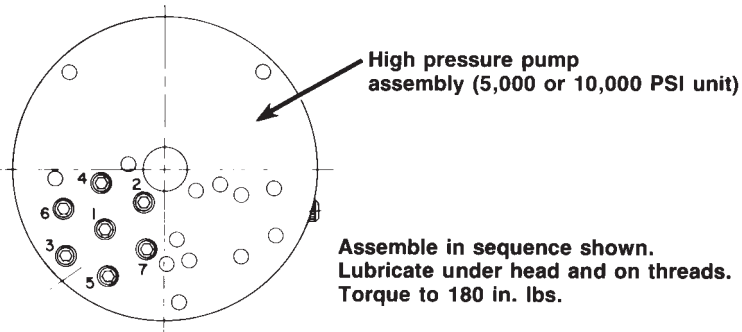


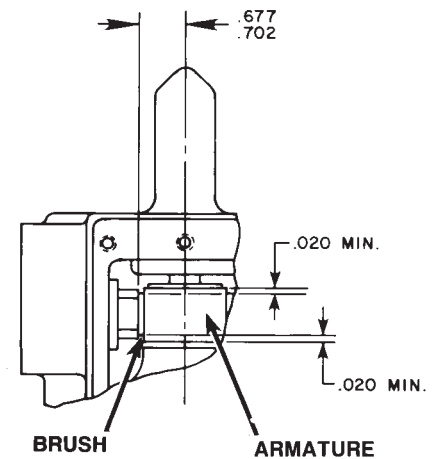
FIGURE 7

# REASSEMBLY SPECIFICATIONS

## HIGH PRESSURE PUMP ASSEMBLY BOLT TIGHTENING SEQUENCE

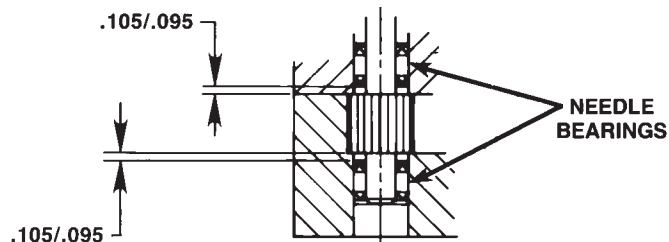


## BRUSH HOLDER & ARMATURE INSTALLATION SPECIFICATIONS



When replacing brushes or the armature, the dimensions shown must be as specified.

## NEEDLE BEARING INSTALLATION SPECIFICATIONS



When replacing the needle bearings on the drive gear of the basic pump, the dimensions shown must be as specified.


# TROUBLESHOOTING

 **WARNING**

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

**NOTE:**

- Depending on the type of pump, it is often 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.
- Refer to the Parts List included with your particular pump when using this troubleshooting guide.

PROBLEM	CAUSE	SOLUTION
<p> <b>WARNING: To help prevent personal injury, disconnect power supply before removing cover. Any electrical work should be performed by a qualified electrician.</b></p>	<ol style="list-style-type: none"> <li>1. Pump not turned ON.</li> <li>2. Unit is not plugged in.</li> <li>3. No voltage supply.</li> <li>4. Broken lead wire or defective power cord plug.</li> <li>5. Defective switches.</li> <li>6. Defective motor.</li> <li>7. Defective starter relay.</li> <li>8. Defective remote switch.</li> <li>9. Worn brushes.</li> <li>10. Circuit breaker tripped because total amperage draw too high for existing circuit.</li> <li>11. Overheated motor (single-phase motor only). Magnetic starter disengaged (three-phase motor only). Thermal protector open.</li> <li>12. Faulty thermal protector (single-phase motor). Faulty magnetic starter (three-phase motor).</li> </ol>	<ol style="list-style-type: none"> <li>1. Flip toggle switch to "Run" position.</li> <li>2. Plug in unit.</li> <li>3. Check line voltage. Check reset button on power panel.</li> <li>4. Replace defective parts.</li> <li>5. Check switches.</li> <li>6. Repair or replace motor.</li> <li>7. Replace defective parts.</li> <li>8. Repair or replace remote switch.</li> <li>9. Replace brushes.</li> <li>10. Add an additional circuit or use alternate circuit.</li> <li>11. Wait for motor to cool before restarting. Reset thermal protector (Single-phase motor will reset automatically.)</li> <li>12. Replace.</li> </ol>

# TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
<b>Pump is not delivering oil or delivers only enough oil to advance cylinder(s) partially or erratically (continued).</b>	1. Oil level too low.	1. Fill reservoir to 1/2" from top of filler hole with all cylinders retracted.
	2. Loose-fitting coupler to cylinder.	2. Check quick-disconnect couplings to cylinders. Inspect couplers to ensure that they are completely coupled. Occasionally couplers have to be replaced because the ball check does not stay open due to wear.
	3. Air in system.	3. Bleed the system.
	4. Air leak in suction line.	4. Check and tighten suction line.
	5. Dirt in pump or filter plugged.	5. Pump filter should be cleaned and, if necessary, pump should be dismantled and all parts inspected and cleaned.
	6. Oil is bypassing through the double-acting cylinder.	6. By removing the cylinder and capping the hoses, the pump and valve can be checked. Observe if pump holds pressure.
	7. Cold oil or oil too heavy (Hydraulic oil is of a higher viscosity than necessary).	7. Change to a lighter oil.
	8. Relief valve or low pressure unloading valve out of adjustment.	8. Adjust as needed.
	9. Reservoir capacity is too small for the size of the cylinder(s) used.	9. Use smaller cylinder(s) or larger reservoir.
	10. Defective directional valve.	10. Inspect all parts carefully and replace if necessary.
	11. Sheared drive shaft key(s)	11. Replace.
	12. Motor rotating in wrong direction.	12. 3450 RPM motor: Refer to electrical schematic on motor. 12,000 RPM motor: Reverse lead wires to brush holders. Air motor: Air line connected into wrong port.
	13. Vacuum in reservoir.	13. Check for plugged vent in filler plug.
	14. Low pressure pump worn.	14. Remove end cap from low pressure gear pump. Clean pump, and replace worn gears, shifting spool, body or end cap.

# TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
<b>Pump builds pressure but cannot maintain pressure.</b>	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>3. Leaking pressure switch seal.</li> </ol>	<ol style="list-style-type: none"> <li>1. Seal leaking pipe fittings with pipe sealant.</li> <li>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.</li> <li>3. Repair or replace seal.</li> </ol>
<b>Pump will not build full pressure.</b>	<ol style="list-style-type: none"> <li>1. Faulty pressure gauge.</li> <li>2. Check for external leakage.</li> <li>3. Check the external pressure regulator. Check the relief valve setting.</li> <li>4. Look for internal leakage in double-acting cylinders.</li> <li>5. Check for leaks in the flow control valve.</li> <li>6. Inspect the pump for internal leakage. Check high pressure pump inlet or outlet ball checks.</li> </ol>	<ol style="list-style-type: none"> <li>1. Calibrate gauge.</li> <li>2. Seal faulty pipe fitting with pipe sealant.</li> <li>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. If functioning normally, it should start to leak off at relief valve pressure.</li> <li>4. Remove the cylinder from the pump. If the pump builds full pressure, the cylinder is defective.</li> <li>5. Clean and reseal or replace parts.</li> <li>6. 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 if necessary, then reassemble.</li> </ol>

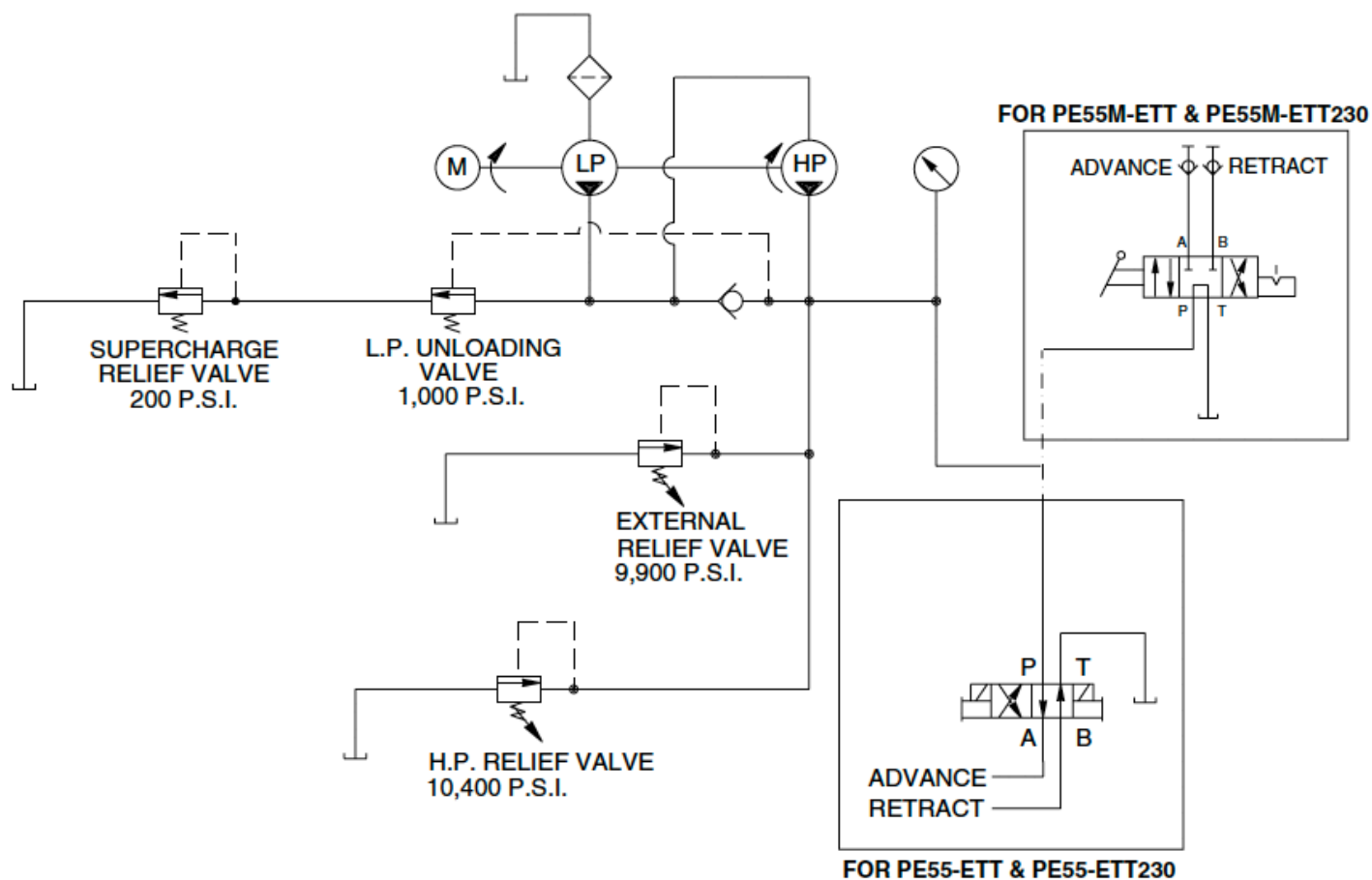
# TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
<b>Pump will not build full pressure. (Continued)</b>	<ol style="list-style-type: none"> <li>7. Sheared key(s).</li> <li>8. Inadequate air pressure (air motor only).</li> <li>9. Shifting spool seat and/or shifting spool poppet (located under high pressure pump assembly) worn.</li> <li>10. Shifting spool o-ring (located within shifting spool bore) worn or broken.</li> </ol>	<ol style="list-style-type: none"> <li>7. Replace.</li> <li>8. Increase air pressure.</li> <li>9. Clean and reseal or replace.</li> <li>10. With an o-ring pick, remove o-ring and backup washer through low pressure pump assembly end. Replace.</li> </ol>
<b>Cylinder(s) will not retract.</b>	<ol style="list-style-type: none"> <li>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.</li> <li>2. Defective valve.</li> <li>3. Inadequate air pressure (air motor model only).</li> </ol>	<ol style="list-style-type: none"> <li>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.</li> <li>2. Check valve operation and inspect parts. Replace if necessary.</li> <li>3. Increase air pressure.</li> </ol>
<b>Pump delivers excess oil pressure.</b>	<ol style="list-style-type: none"> <li>1. Faulty pressure gauge.</li> <li>2. Relief valve not properly set.</li> </ol>	<ol style="list-style-type: none"> <li>1. Calibrate gauge.</li> <li>2. Adjust the relief valve.</li> </ol>
<b>Cylinders will not extend or retract but pump achieves full pressure.</b>	<ol style="list-style-type: none"> <li>1. Hose Connector not properly seated or pressurized.</li> </ol>	<ol style="list-style-type: none"> <li>1. Disconnect hoses, relieve pressure in hoses by depressing ball into a rag on floor. To relieve pressure in female connector insert wooden dowel into fitting, wrap a rag around connector and tap with a hammer.</li> </ol>



# PARTS & DIAGRAMS

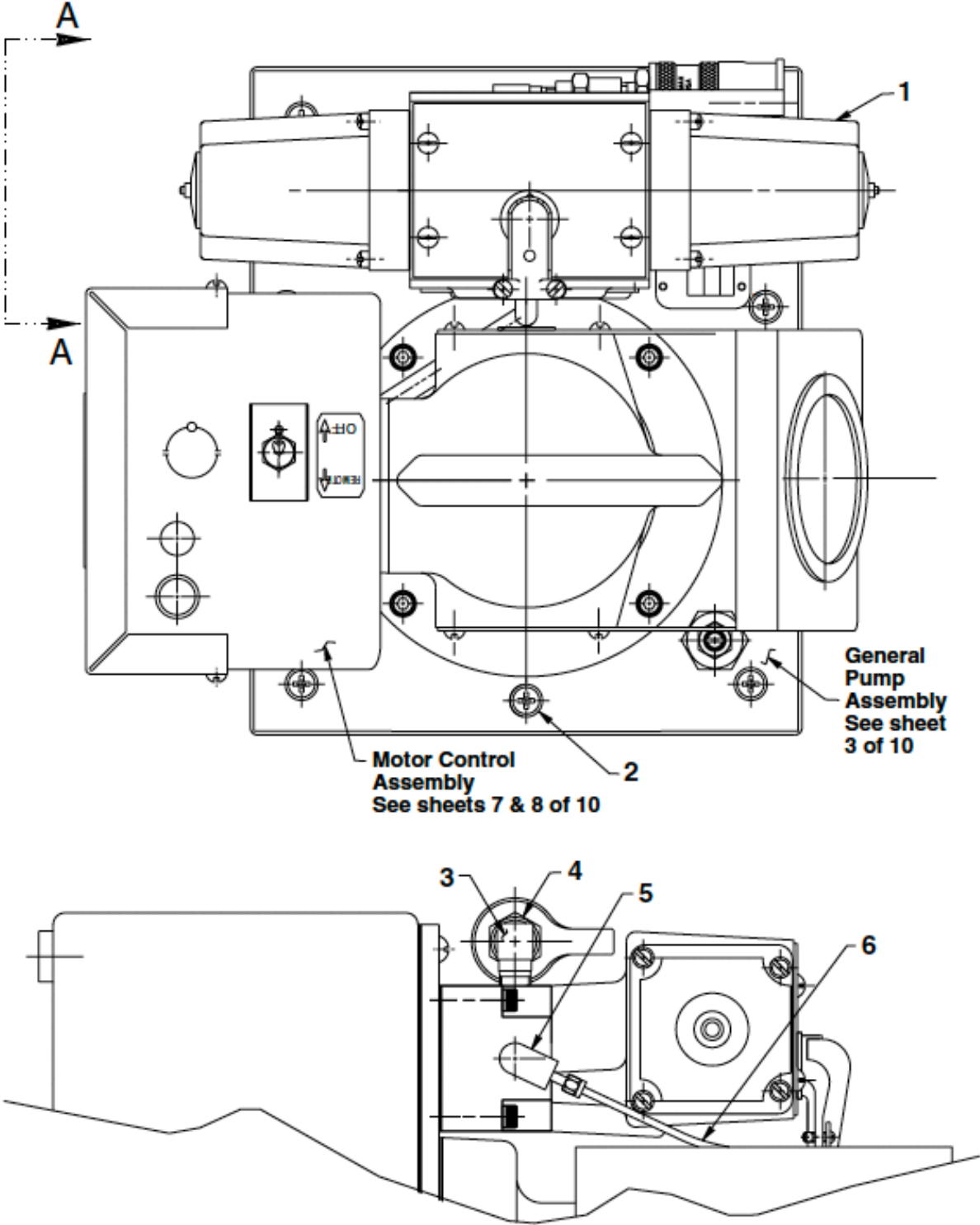
## Hydraulic Schematic



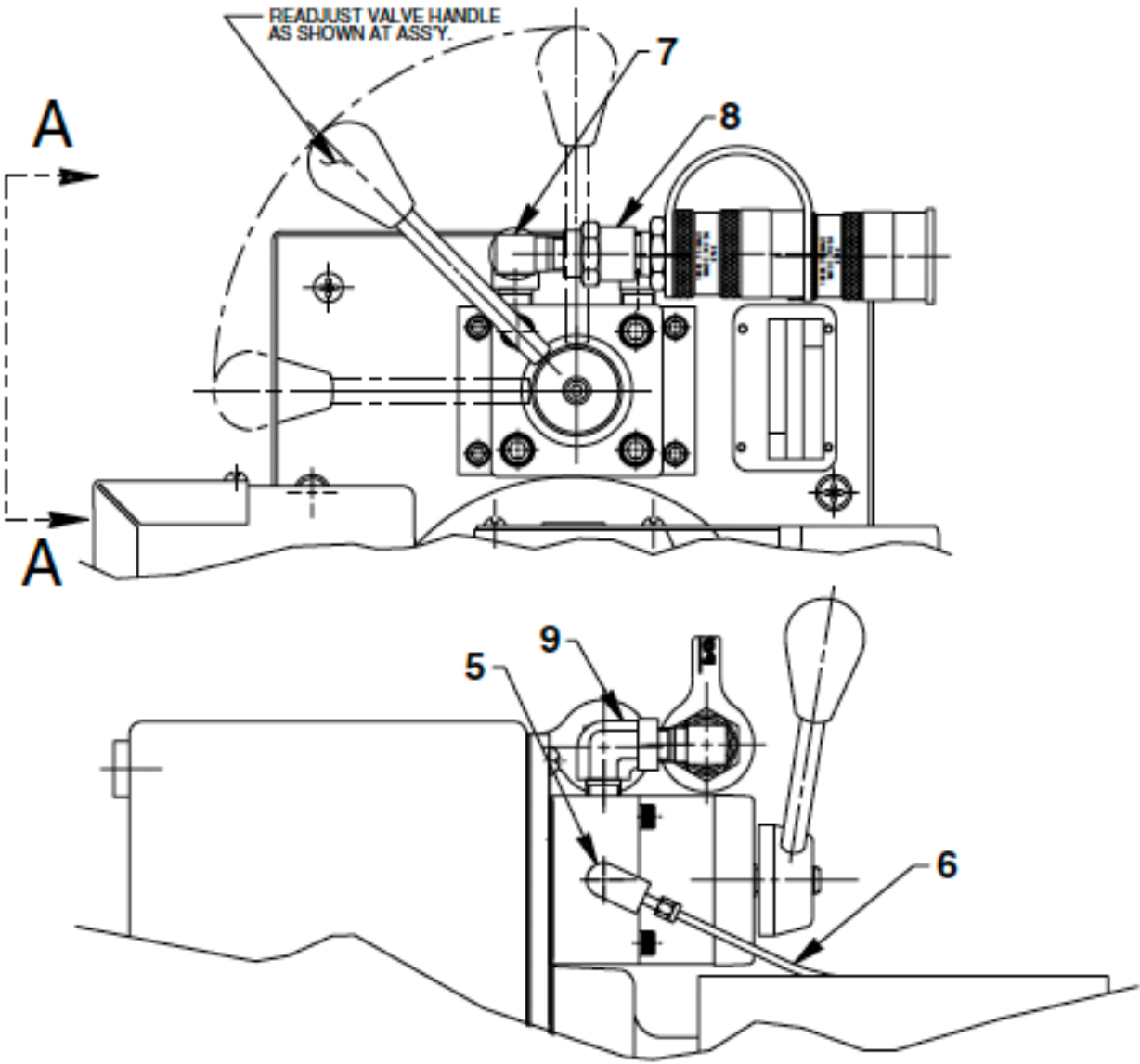
Item Number	No. Required	Description
1	1	Reducer Connector
2	2	Cylinder Half Coupler
3	2	Dust Cap
4	1	Gasket
5	1	Reservoir (2 gal)

# PARTS & DIAGRAMS

Top View



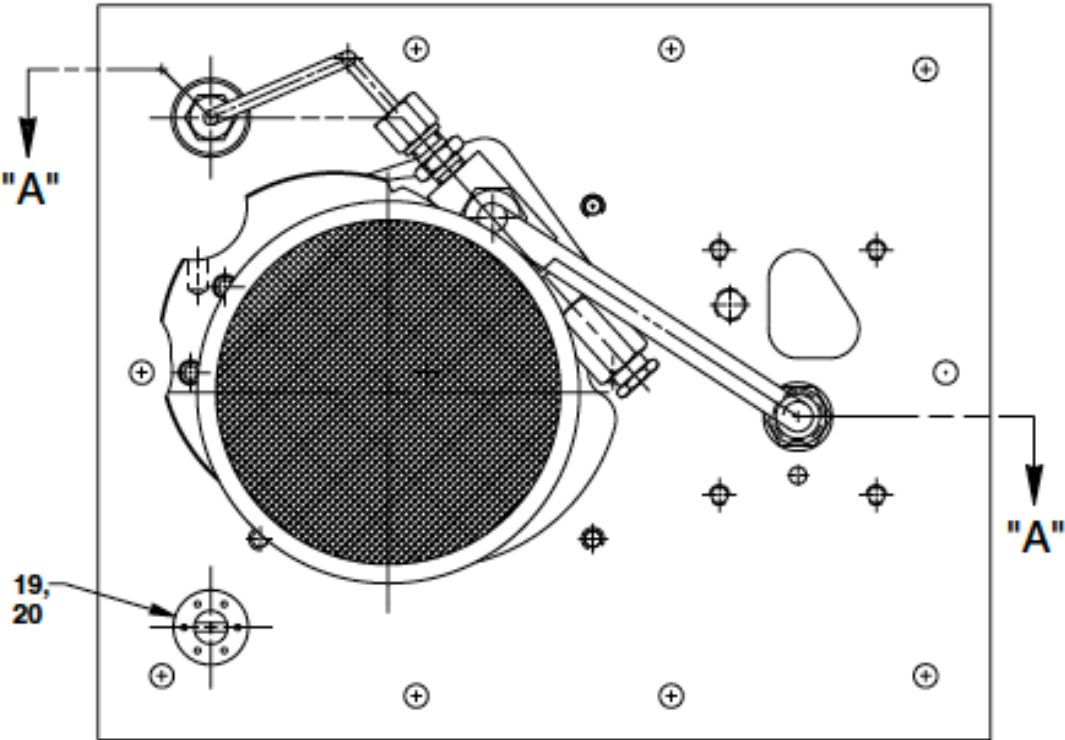
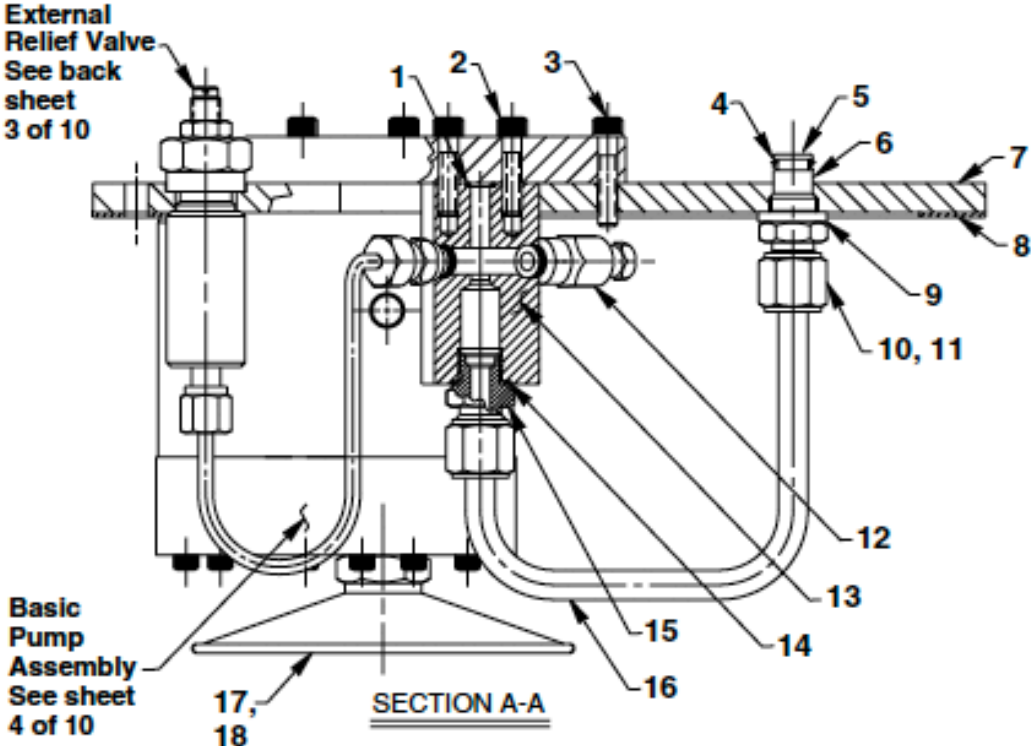
# PARTS & DIAGRAMS



Item Number	No. Required	Description
1	1	4-Way Solenoid Valve
2	10	Rnd. Hd. Screw
3	1	90° Elbow Fitting
4	1	Straight Fitting
5	1	90° Elbow Fitting
6	1	Oil Line Tube
7	2	90° Elbow Fitting
8	2	Straight Fitting
9	1	90° Elbow Fitting

# PARTS & DIAGRAMS

## General Pump Assembly



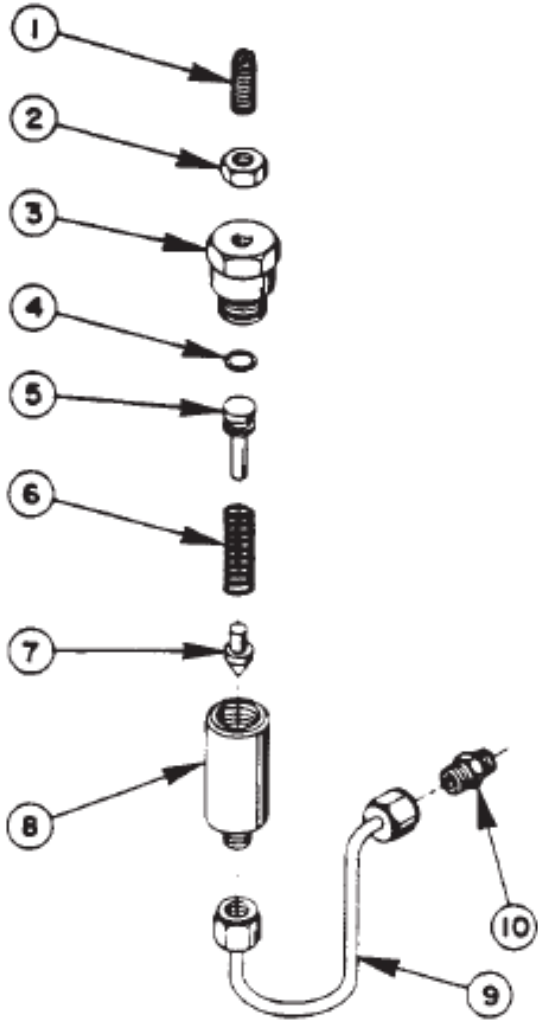
# PARTS & DIAGRAMS

## General Pump Assembly

Item Number	No. Required	Description
1	1	O-ring: 3/8 x 1/4 x 1/16
2	2	Soc. H. Cap Screw: 1/4-28 UNF x 1" Lg, Torque to 130/180 in lbs
3	3	Soc. Hd. Cap Screw: 1/4-20 UNC x 1" Lg
4	1	O-ring: 1/2 x 3/8 x 1/16
5	1	Valve Connector
6	1	Teflon Backup Washer
7	1	Cover Plate
8	1	Gasket
9	1	Spacer
10	2	Tube Sleeve
11	2	Tube Nut
12	1	Relief Valve: Set at 10,100/10,700 PSI
13	1	Valve Body
14	1	Copper Washer: 3/4 x 19/32 x 1/32
15	1	Connector: Torque to 40/45 ft. lbs.
16	1	Oil Line
17	1	Filter Assembly
18	1	O-ring: 5/8 x 15/32 x 5/62
19	1	Vent Cap
20	1	O-ring: 13/16 x 5/8 x 3/32

# PARTS & DIAGRAMS

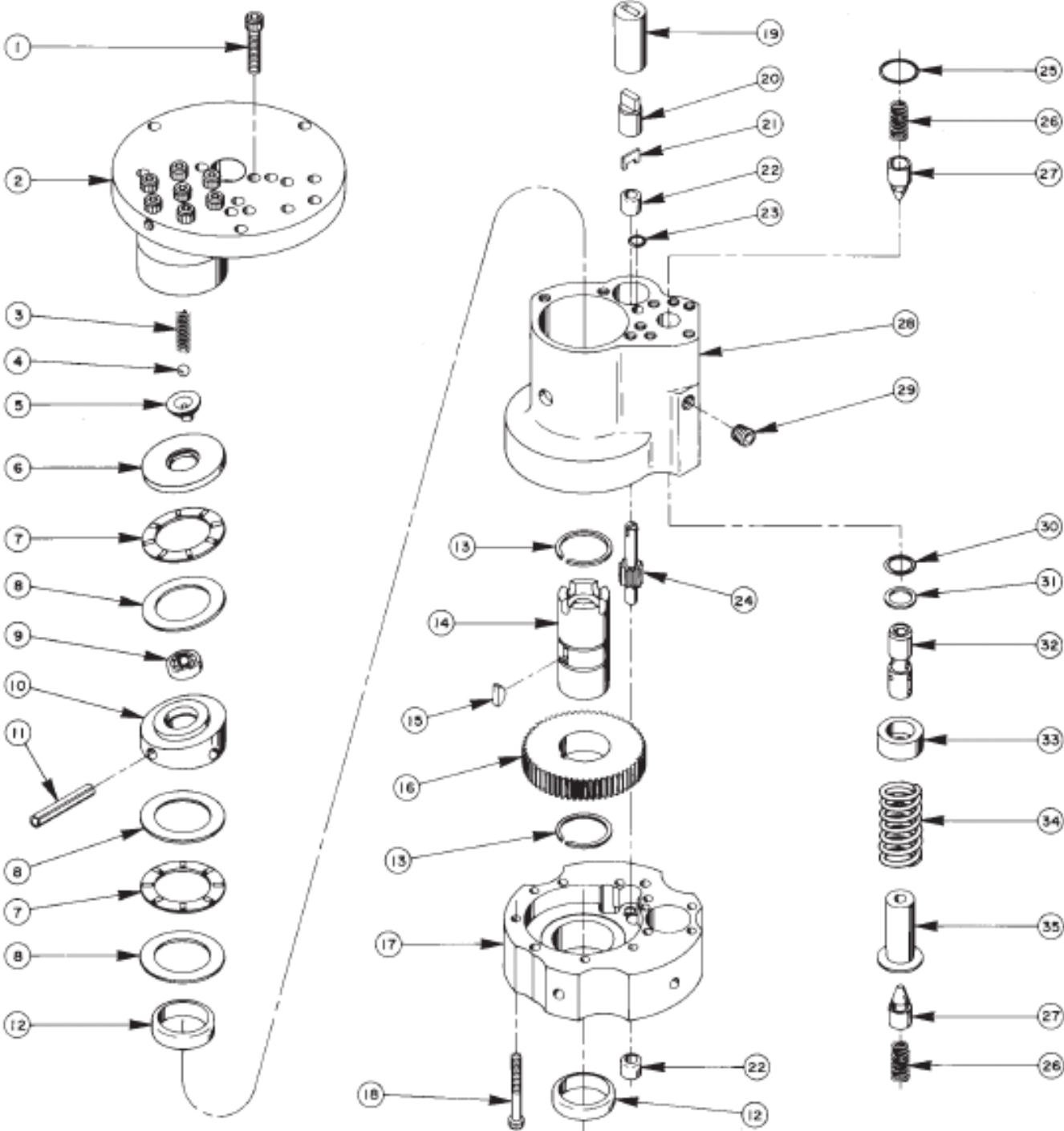
## General Pump Assembly



Item Number	No. Required	Description
1	1	Adjusting Screw
2	1	Hex Jam Nut
3	1	Valve Cap
4	1	O-ring: 1/2 x 3/8 x 1/16
5	1	Spring Guide
6	1	Compression Spring: 1/2 OD x 1-5/8 Lg
7	1	Valve Stem
8	1	Body
9	1	Oil Line Assembly with nuts
10	1	Connector Fitting

# PARTS & DIAGRAMS

## Basic Pump Assembly



# PARTS & DIAGRAMS

## Basic Pump Assembly

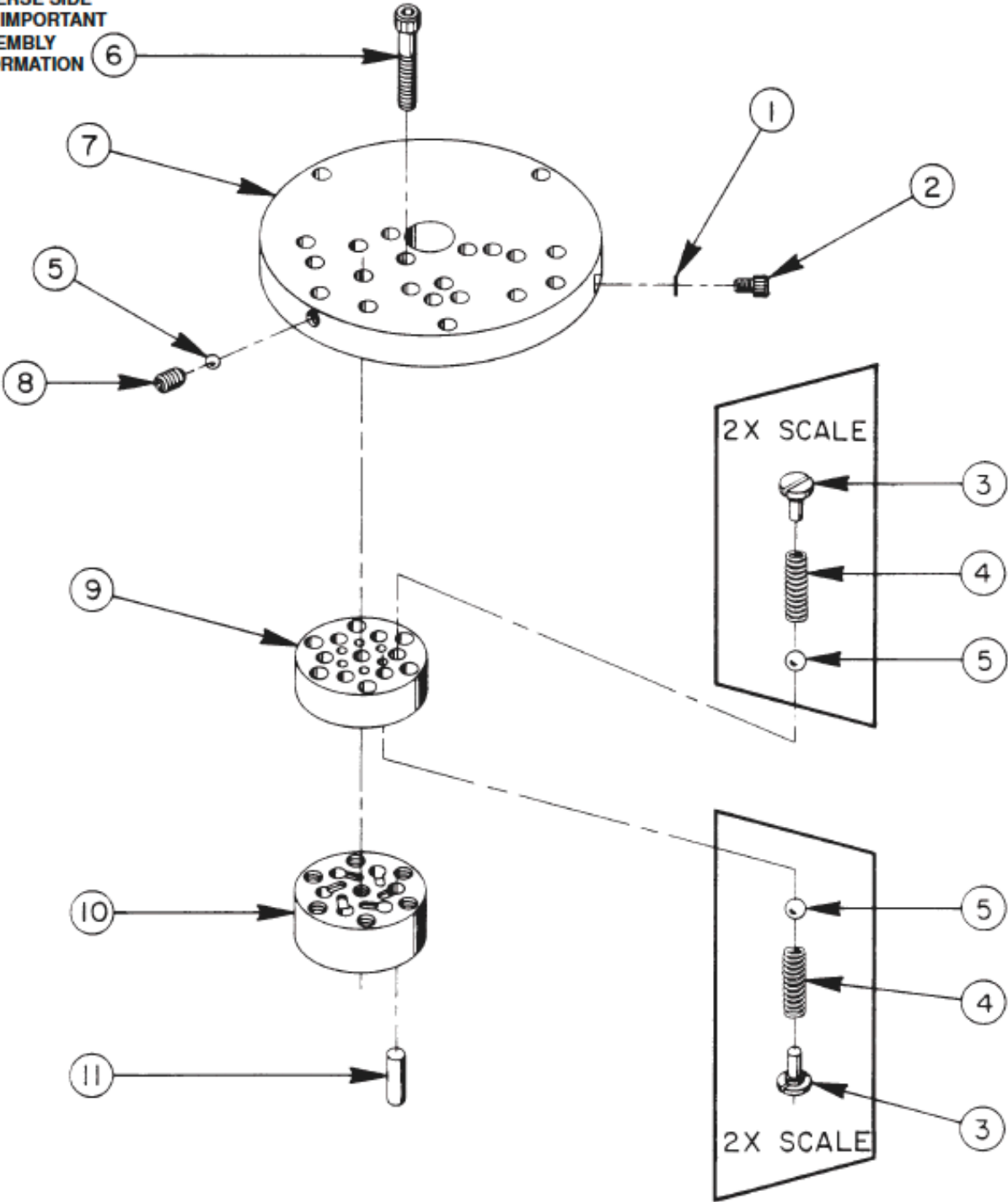
Item Number	No. Required	Description
1	9	Soc. Hd. Cap Screw: 1/4-20 UNC x 1-1/4 Lg, Torque to 170-180 in. lbs
2	1	High Pressure Pump Assembly
3	1	Compression Spring: 1/4 OD x 1" Lg
4	1	Steel Ball: 1/4" dia
5	1	Bearing Top Plate
6	1	Top Plate
7	2	Thrust Bearing
8	3	Bearing Race
9	1	Ball Bearing
10	1	Angle Plate
11	1	Roll Pin: 1/4" dia x 1-3/4" Lg
12	2	Needle Bearing
13	2	Retaining Ring
14	1	Shaft
15	1	Woodruff Key
16	1	Gear
17	1	Pump End Plate
18	13	Soc. Hd. Cap Screw: #10-32 UNF x 1-3/4" Lg, Torque to 50 in. lbs.
19	1	Coupling
20	1	Adapter
21	1	Key
22	2	Needle Thrust Bearing
23	1	O-ring: 3/8 x 1/4 x 1/16
24	1	Drive Gear
25	1	O-ring: 7/8 x 3/4 x 1/16
26	2	Compression Spring: 3/8 OD x 3/4 Lg
27	2	Poppet
28	1	Pump Body
29	1	Pipe Plug: 1/8" NPTF
30	1	O-ring: 11/16 x 1/2 x 3/32
31	1	Teflon Backup Washer: 11/16 x 1/2 x 1/16
32	1	Spool
33	1	Spring Guide
34	1	Compression Spring: 1" OD x 1-13/16 Lg
35	1	Spring Guide



# PARTS & DIAGRAMS

## High Pressure Pump Assembly

SEE DIAGRAM ON  
REVERSE SIDE  
FOR IMPORTANT  
ASSEMBLY  
INFORMATION



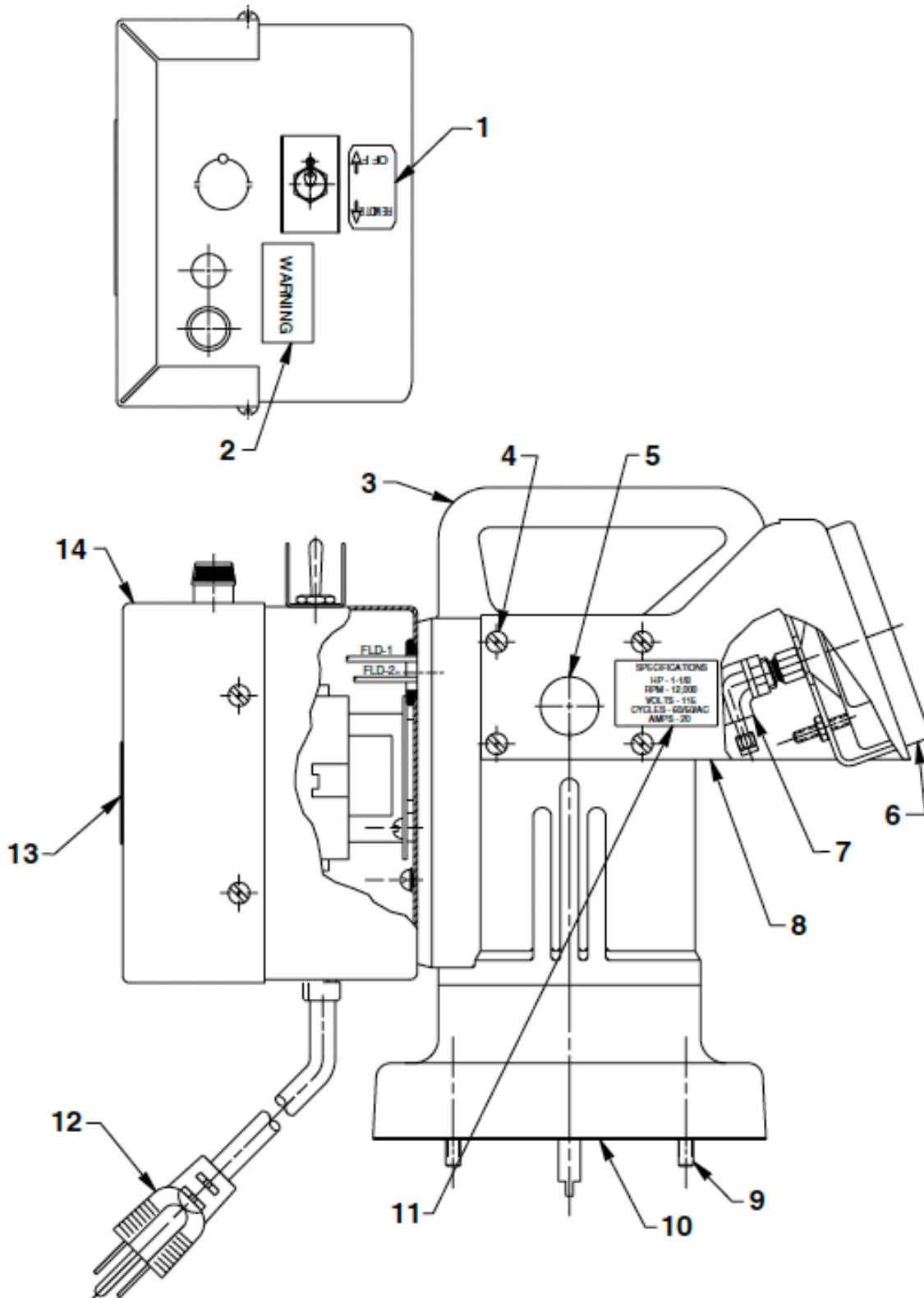
# PARTS & DIAGRAMS

## High Pressure Pump Assembly

Item Number	No. Required	Description
1	1	Copper Washer: 3/8 x 1/4 x 1/32
2	1	Soc. Hd. Cap Screw: 1/4-20 UNC x 3/8" Lg, Torque to 140/160 in. lbs.
3	6	Valve Guide
4	6	Compression Spring: 5/32" OD x 3/4" Lg
5	7	Steel Ball
6	7	Soc. Hd. Cap Screw: 1/4-20 UNF x 1-1/2" Lg, Torque to 170/180 in. lbs.
7	1	Top Plate
8	1	Soc. Set Screw: 1/4-20 UNC x 3/8 Lg. Torque to 65/70 in. lbs.
9	1	Valve Head
10	1	Pump Barrel
11	3	Piston

# PARTS & DIAGRAMS

## Motor & Control Box Assembly



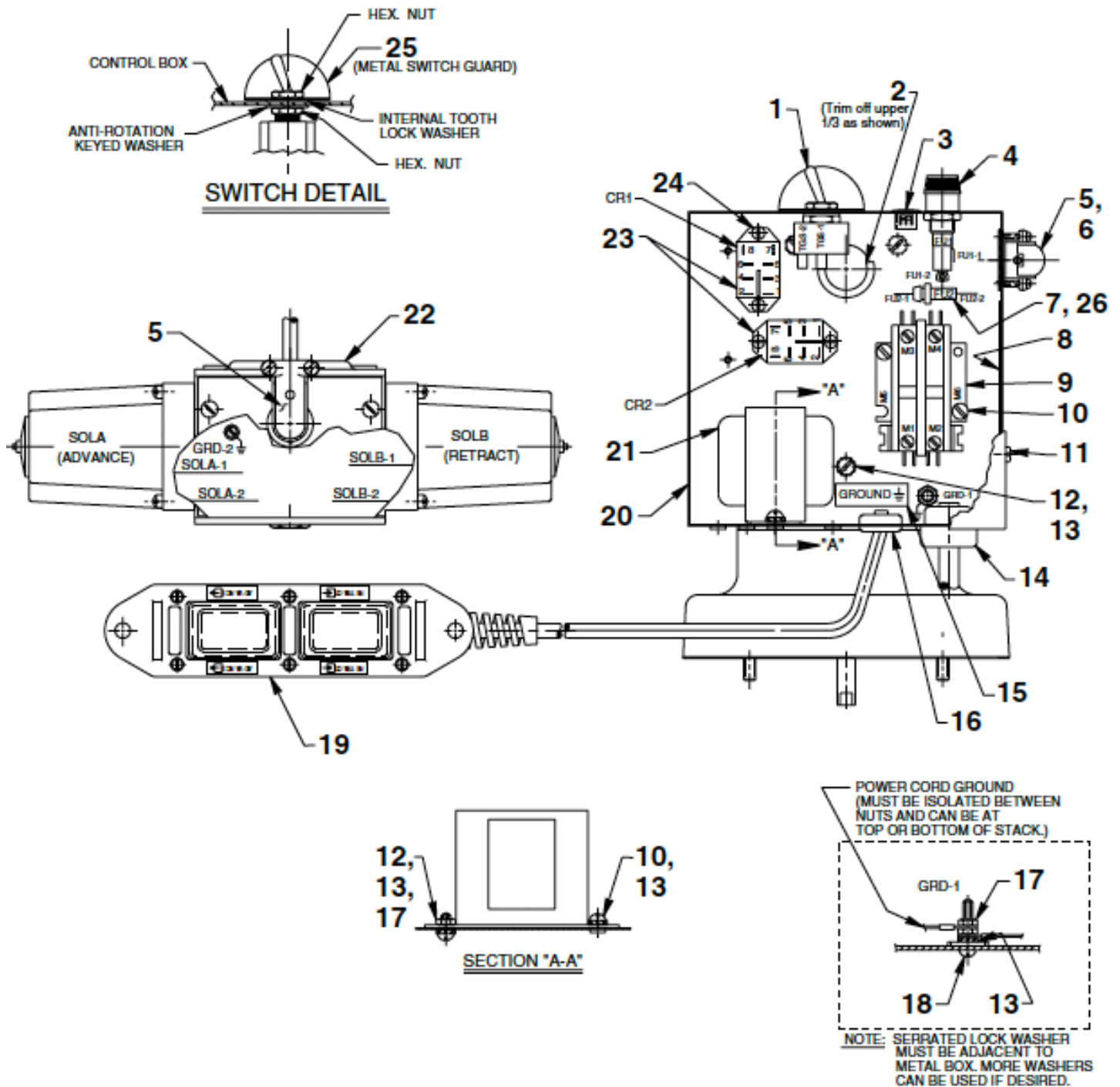
# PARTS & DIAGRAMS

## Motor & Control Box Assembly

Item Number	No. Required	Description
1	1	Off-Remote Decal
2	1	Warning Decal
3	1	Basic Motor Assembly
4	8	Rnd. Hd. Screw: 10-24 x 1/4
5	2	Hole Plug
6	1	Gauge: 10,000 PSI, 4" dia
7	1	Soc. Hd. Screw: 1/4-20 x 1-1/2
8	1	Motor Base Gasket
9	4	Specifications Decal
10	1	Motor Base Gasket
11	1	Specifcations Decal
12	1	Cord: 8' long
13	1	Warning/Improtant Decal
14	1	Contorl Box Cover

# PARTS & DIAGRAMS

## Motor Control Box Assembly



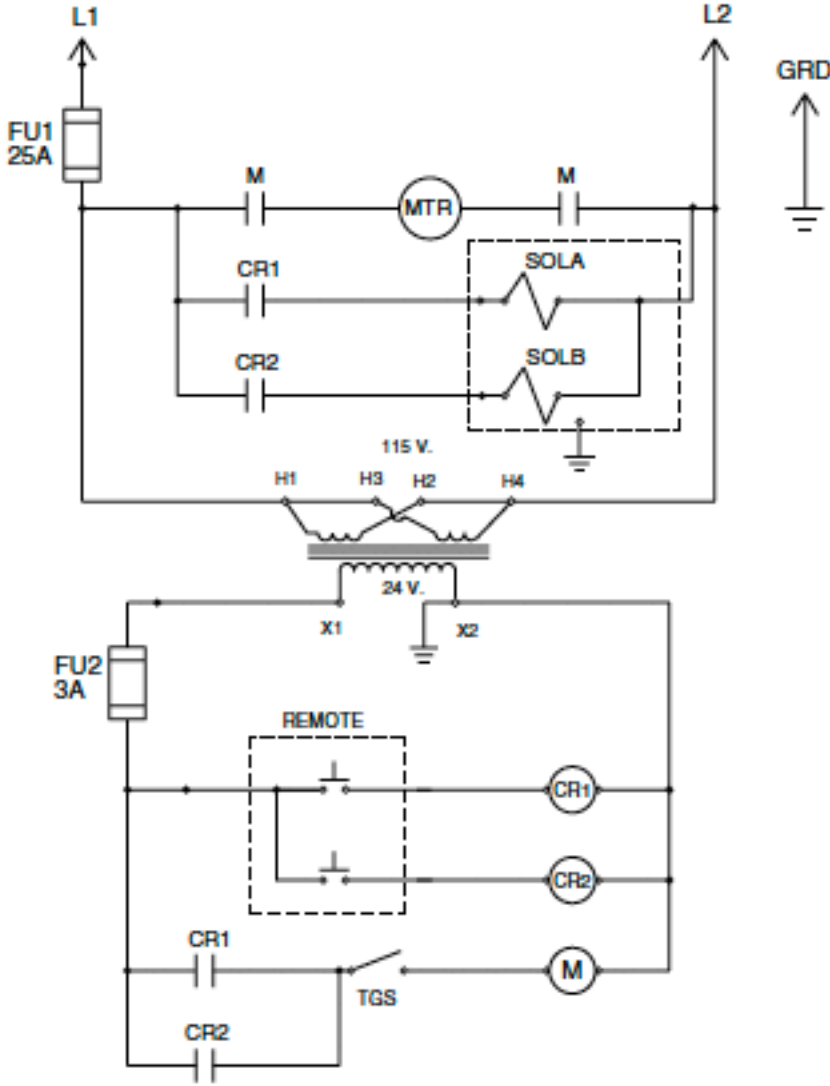
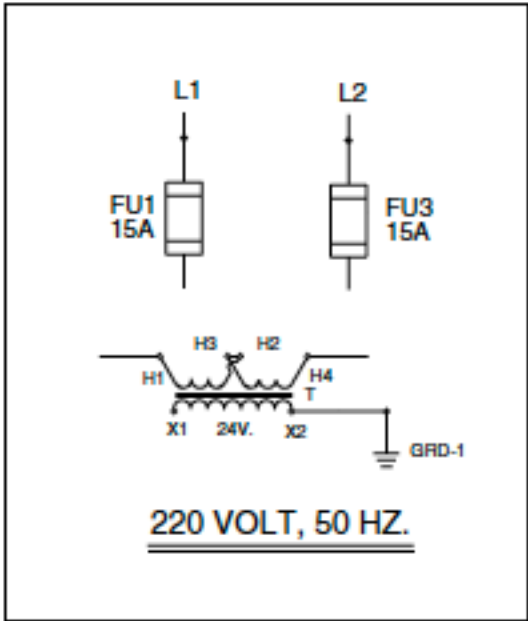
# PARTS & DIAGRAMS

## Motor Control Box Assembly

Item Number	No. Required	Description
1	1	Toggle Switch
2	1	Rubber Grommet
3	1	Snap Plug/Fuse Holder/Fuse
4	1	Fuse Holer/Fuse
5	2	90° Elbow Fitting
6	1	2' Cable
7	1	Fuse: 3 AMP 250V
8	1	Warning Decal
9	1	Contractor
10	3	Rnd. Hd. Screw: 10-24 x 1/4
11	4	Pan Hd. Screw: 8-18 x 3/8
12	4	Rnd. Hd. Screw: 10-24 x 3/8
13	6	Washer
14	1	Strain Relief Bushing
15	1	Ground Decal
16	1	Straing Relief Bushing
17	3	Hex Nut: 10-24
18	1	Rnd. Hd. Screw: 10-24 x 1"
19	1	Hand Control Assembly
20	1	Electrical Control Box
21	1	Transformer
22	1	Solenoid Valve
23	2	General Purpose Relay
24	4	Pan Hd. Screw: 6-32 x 1/4
25	1	Switch Guard
26	1	Fuse Holder

# PARTS & DIAGRAMS

## Electrical Schematic



# PARTS & DIAGRAMS

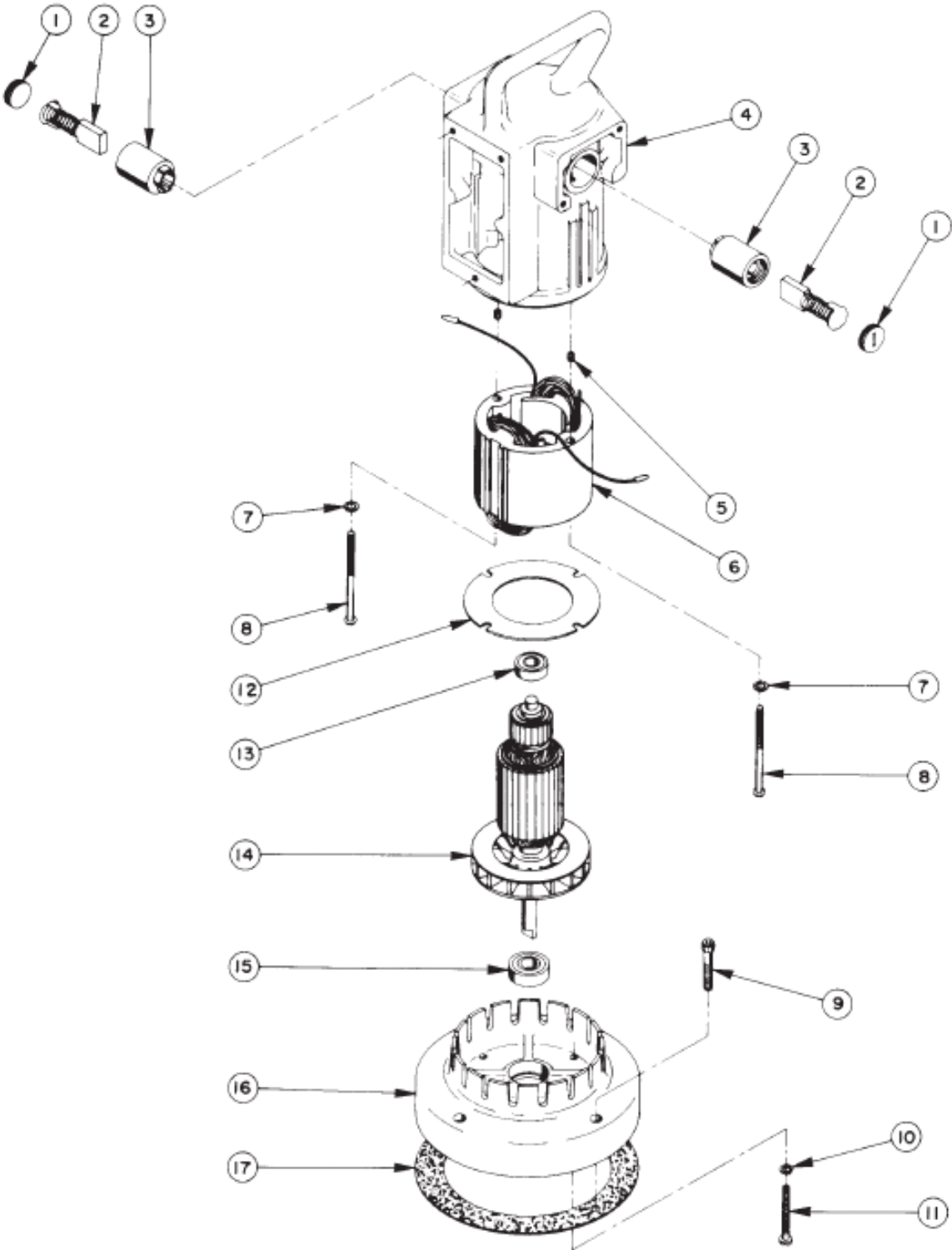
## Motor Control Box Assembly

Item Number	No. Required	Description
1	1	Toggle Switch
2	1	Rubber Grommet
3	1	Snap Plug/Fuse Holder/Fuse
4	1	Fuse Holer/Fuse
5	2	90° Elbow Fitting
6	1	2' Cable
7	1	Fuse: 3 AMP 250V
8	1	Warning Decal
9	1	Contractor
10	3	Rnd. Hd. Screw: 10-24 x 1/4
11	4	Pan Hd. Screw: 8-18 x 3/8
12	4	Rnd. Hd. Screw: 10-24 x 3/8
13	6	Washer
14	1	Strain Relief Bushing
15	1	Ground Decal
16	1	Straing Relief Bushing
17	3	Hex Nut: 10-24
18	1	Rnd. Hd. Screw: 10-24 x 1"
19	1	Hand Control Assembly
20	1	Electrical Control Box
21	1	Transformer
22	1	Solenoid Valve
23	2	General Purpose Relay
24	4	Pan Hd. Screw: 6-32 x 1/4
25	1	Switch Guard
26	1	Fuse Holder



# PARTS & DIAGRAMS

## Universal Motor Assembly



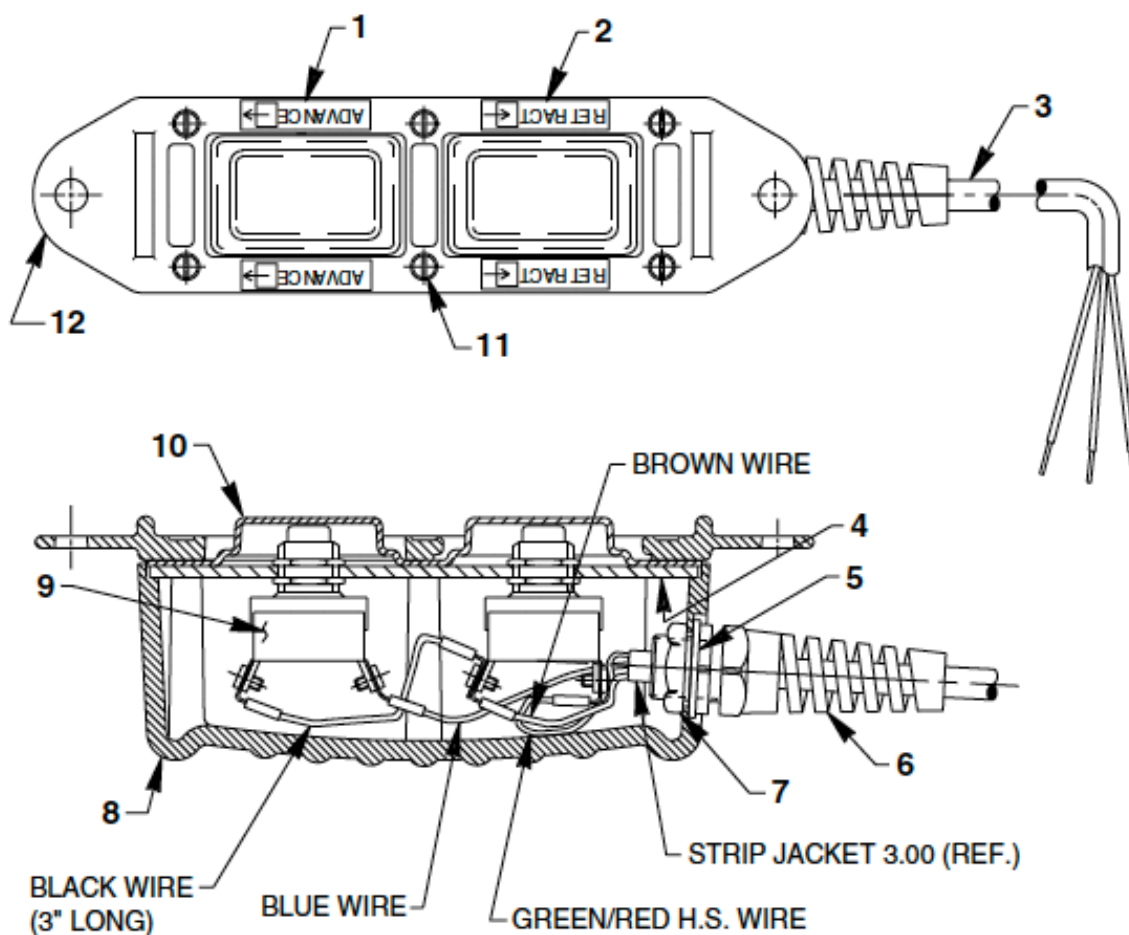
# PARTS & DIAGRAMS

## Universal Motor Assembly

Item Number	No. Required	Description
1	2	Brush Holder Cap
2	2	Brush Assembly
3	2	Brush Holder
4	1	Motor Shell
5	2	Set Screw
6	1	Field
7	2	Lockwasher
8	2	Rd. Hd. Machine Screw: 10-24 UNC x 3-1/4 Lg
9	4	Soc. Hd. Cap Screw: 1/4-20 UNC x 1-1/2 Lg
10	4	Lockwasher
11	4	Pan Hd. Machine Screw: 10-24 UNC x 2" Lg, Torque to 20/25 in. lbs.
12	1	Baffle Plate
13	1	Ball Bearing
14	1	Armature
15	1	Ball Bearing
16	1	Motor Base
17	1	Gasket

# PARTS & DIAGRAMS

## Remote Control Hand Switch Assembly



Item Number	No. Required	Description
1	2	Advance Label Decal
2	2	Retract Label Decal
3	1	11' Cable
4	1	Switch Mouting Plate
5	1	Rubber Gasket
6	1	Strain Relief Bushing
7	1	Locknut
8	1	Switch Housing
9	2	Push Button Switch
10	1	Gasket
11	6	Pan Hd. Screw: 4-24 x 3/4
12	1	Plastic Cover

# WARRANTY

Should any part, of Seller's own manufacture, prove to have been defective in material or workmanship when shipped (as determined by Seller), Seller warrants that it will, at its sole option, repair or replace said part f.o.b., point of manufacture, provided that Buyer notifies, in writing, of such defect within twelve (12) months from date of shipment from the manufacturing plant.

On request of Seller, the part claimed to be defective will be returned, transportation, insurance, taxes and duties prepaid, to the factory where made, for inspection. Any item, which has been purchased by Seller, is warranted only to the extent of the original manufacturer's warranty to Seller. Seller shall not be liable for any damages or delays caused by defective material or workmanship.

No allowance will be made for repairs or alterations made by others without Seller's written consent or approval. If repairs or alterations are attempted without Seller's consent, Seller's warranty is void.

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