

220V Hydraulic Pump

M5776-00



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

Operating and Maintenance Instructions

TABLE OF CONTENTS

Introduction 4

Safety Guidelines 5

Receiving & Installation 10

Operation Instructions..... 11

Parts List & Diagrams..... 19

Preventative Maintenance..... 38

Troubleshooting Guide 42

Warranty 46

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. See "Technical Information" section on page 11 for further information.
- 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.
- Dress Properly. Do not wear loose clothing or jewelry. Wear a protective hair covering to contain long hair. It is recommended that the operator wear safety glasses with side shields or a full face shield eye protection. Gloves and water repellant, nonskid footwear are also recommended. Keep hands and gloves away from moving parts.
- Use Safety Equipment. Everyone in the work area should wear safety goggles or glasses with side shields complying with current safety standards. Wear hearing protection during extended use, respirator for a confined space and a dust mask for dusty operations. Hard hats, face shields, safety shoes, respirators, etc. should be used when specified or necessary. Keep a fire extinguisher nearby.
- Keep Bystanders Away. Bystanders should be kept at a safe distance from the work area to avoid distracting the operator and contacting the blade.
- 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. For all repairs, insist on only identical replacement parts.
- Guard Against Electric Shock. For more information refer to the “Technical Information” section on page 11.
- Keep Hands Away from All Moving Parts.
- Do Not Overreach. Maintain Control. Keep proper footing and balance at all times.
- Stay Alert. Watch what you are doing, and use common sense. DO NOT use a tool when you are tired, distracted or under the influence of drugs, alcohol or any medication causing decreased control.
- Unplug Tool. Unplug tool when it is not in use, before changing accessories or performing recommended maintenance.
- Maintain Tool Carefully. Keep tools sharp and clean for best and safest performance. Follow instructions for lubrication, maintenance and changing accessories. For more information see “Maintenance” section. Periodically inspect the tool cord and extension cords for damage. Have damaged parts repaired or replaced by an Elliott service facility.
- Store Idle Tools. When not in use, store your tool in a dry, heated, secured place. For more information see “Maintenance” section.
- 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.

SAFETY DEFINITIONS

Safety symbols are used to identify any action or lack of action that can cause personal injury. Your reading and understanding of these safety symbols is very important.

DANGER

Danger is used only when your action or lack of action will cause serious human injury or death.

WARNING

Warning is used to describe any action or lack of action where a serious injury can occur.

DANGEROUS VOLTAGE

Dangerous Voltage is used to describe any action or lack of action that could cause serious personal injury or death from high voltage electricity.

CAUTION

Caution 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 help prevent personal injury,

HYDRAULIC HOSE

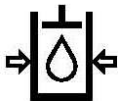


- Before operating the pump, all hose connections must be tightened with the proper tools. Do not overtighten. Connections should only be tightened securely and leak-free. Overtightening can cause premature thread failure or high pressure fittings to split at pressures lower than their rated capacities.
- Always shut off the electric motor before breaking any connections in the system.
- Should a hydraulic hose ever rupture, burst, or need to be disconnected, immediately shut off the pump. Never attempt to grasp a leaking pressurized hose 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, extreme heat or cold, or heavy impact. Do not let the hose kink, twist, curl or bend so tightly that oil flow within the hose is blocked or reduced. Periodically inspect the hose for wear, because any of these conditions can damage the hose.
- Do not use the hose to move attached equipment. Stress can damage the hose, causing 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 can 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 can result in personal injury.
- Before replenishing the oil level, retract the system to prevent overfilling the pump reservoir. An overfill can cause personal injury due to excess reservoir pressure created when the cylinders are retracted.

CYLINDER

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

POWER SUPPLY (Electric)



- Never use an ungrounded power supply with this unit.
- The pump must be compatible with existing line voltage.
- Disconnect the pump from the power supply when performing maintenance or repair on the unit.
- If the unit's power supply is damaged or the inner wiring is exposed in any way, replace immediately.
- 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 the jet motor (single, or three phase) is a complicated and, if not done correctly, dangerous procedure. Consult the pump manufacturer's Technical Services Department for specific information before attempting any rewiring. Rewiring voids CSA approval.
- All voltages must be wired for CW rotation when viewed from the lead end (top) of the motor.
- Check the total amperage draw for the electrical circuit you will be using. (For example: 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.

- To rewire a motor from one voltage to another or when a flow control valve is changed between manual and solenoid, consult the electrical schematic in the pump's parts list.
- **Circuit Breakers:** If motor stops due to an overload or power outage, **Universal Motor:** Move motor switch to OFF and control valve to neutral. Let motor cool or wait until power is restored. Reset circuit breaker switch in power panel. (The pump motor doesn't have a circuit breaker.) **Single-phase Motor:** Thermal overload switch will break circuit to the motor. Move motor switch to OFF and control valve to neutral. Allow motor to cool before switching on again, or wait until power is restored. **Three-phase Motor:** A magnetic starter switch breaks circuit to the motor. Move the motor switch to OFF and control valve to neutral. Remove the cover on motor control box. Let the motor cool or wait until power is restored. One of three reset buttons must be pushed in to reset motor. Replace cover.

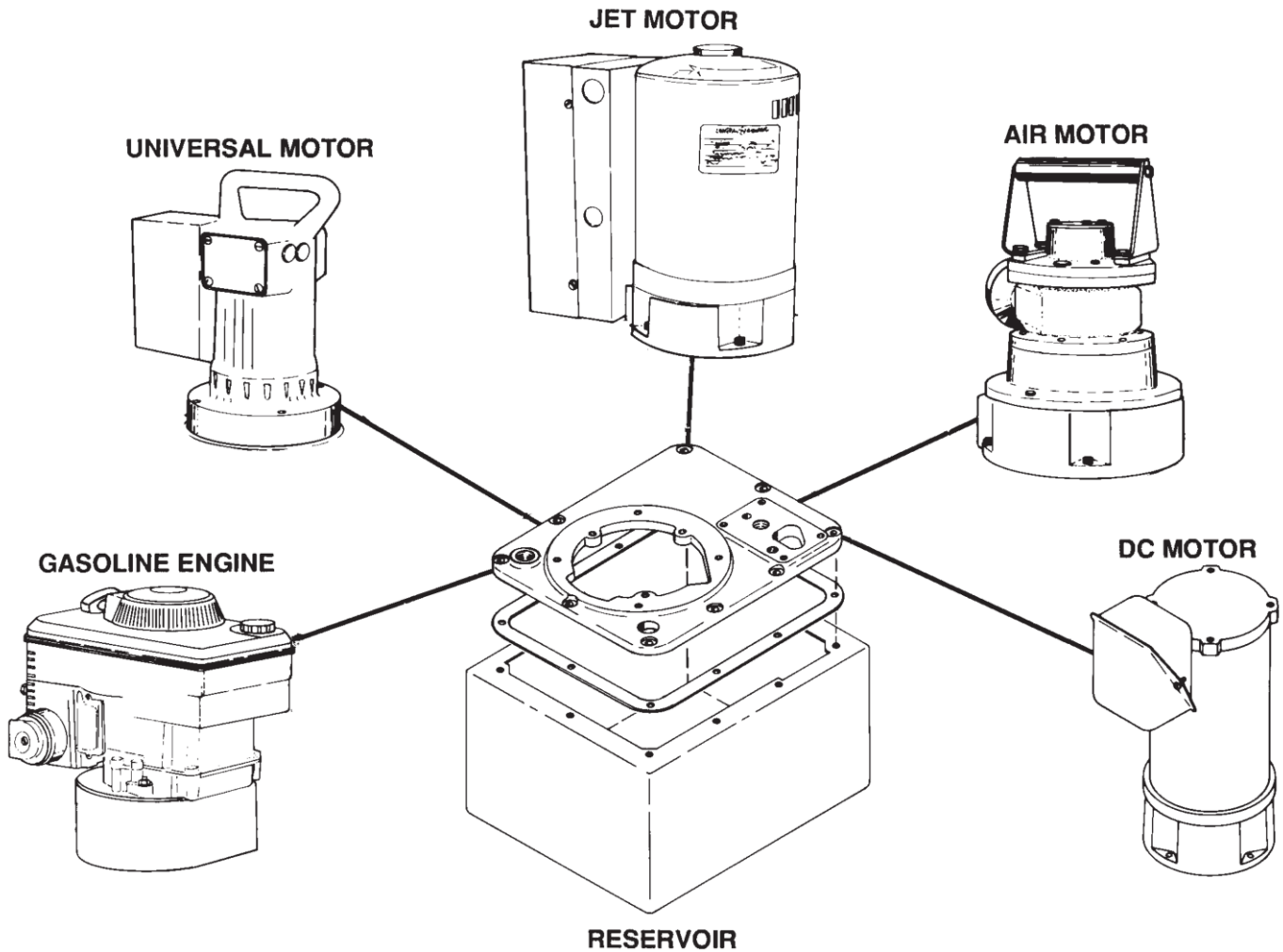
Power Supply (Gasoline Engine)

- Read the instruction manual for the gasoline engine before using.
- Do not allow fuel to splash on the engine when refueling.
- Do not add fuel when the engine is running or very hot.

Power Supply (Air Driven Motor)

- Disconnect air supply when pump is not in use or when breaking any connection in the hydraulic system.
- A shut-off valve or quick disconnect should be installed in the air line to the pump unit. Close the shut-off valve before connecting the air line to the pump.

RECEIVING & INSTALLATION



NOTE

- Carefully inspect the pump upon arrival. The carrier, not the manufacturer, is responsible for any damage resulting from shipment.
- Read and carefully follow these instructions. Most problems with new equipment are caused by improper operation or installation.
- The hydraulic power unit can be ordered with “building block” flexibility. The customer can choose from a variety of motors, controls, reservoirs, and other options. Because of the many options available, these instructions will include directions for options that your particular pump may not have.
- Do not change motors without consulting the pump manufacturer’s Technical Services Department.

HYDRAULIC PUMP SET-UP PROCEDURE

1. Motor Hook-up and Operation

A. 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.

B. Jet Motor, Single-phase

The single-phase jet motor is wired for 115 or 230 volts, 50/60 cycles according to the customer's request.

C. Jet Motor, Three-phase

The three-phase jet motor is wired for 230 or 460 volts, 50/60 cycles according to the customer's request.

D. Gasoline-Powered

Consult the instruction manual for the gasoline engine.

E. 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.

2. Electric Line Connections (for electric motor units only)



DANGER

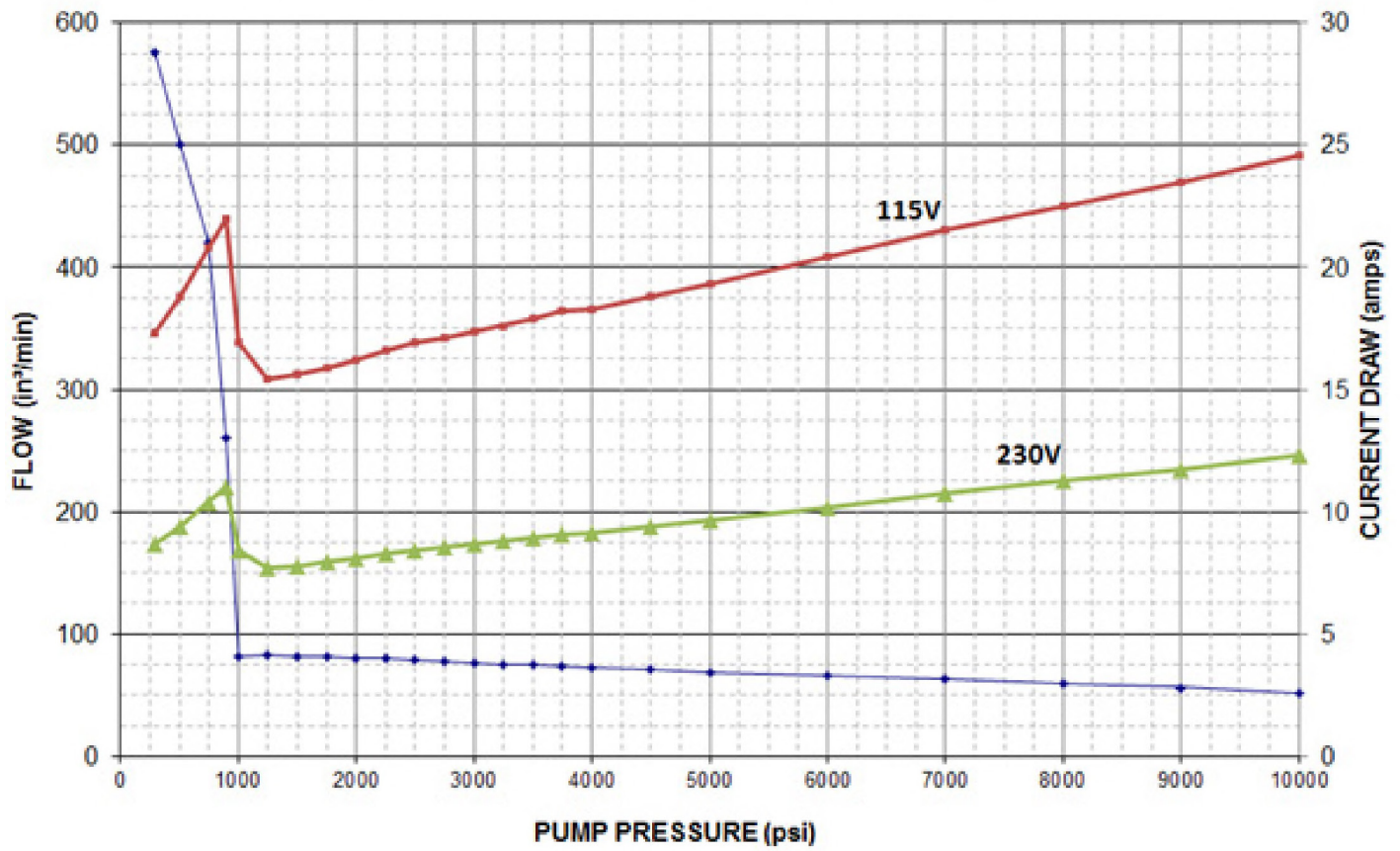
Your pump comes equipped with a standard plug and cord and is appropriate for the specified voltage of this pump (as identified on the product and package labeling). Before each use of the pump, the user must consult with the figure below in order to determine the applicable current draw for each specific application and then must ensure that the infrastructure of the facility in which the pump is to be used is suitable for safe operation of this pump based upon the following guidelines:

- A. Line circuit protection and disconnect are to be provided by the customer.
- B. Line circuit protection is to be at least 115% of the full load current at the peak pressure attained when the pump is in use (see figure below). Per the specific application.
- C. Refer to the pump nameplate for additional information about the pump's power rating.
- D. Refer to the SAFETY PRECAUTIONS at the beginning of this manual before operation and before making any modifications.

MODIFICATIONS TO THE CORD AND/OR PLUG SHOULD ONLY BE DONE BY A QUALIFIED ELECTRICIAN. IT IS THEIR RESPONSIBILITY TO ADHERE TO ALL LOCAL, STATE AND FEDERAL CODES.

Alternative cord sets are available based upon your specific application requirements (see figure below). Contact your local service center or distributor or www.PowerTeam.com for details.

FLOW vs PRESSURE PE55 PERFORMANCE



OPERATING INSTRUCTIONS

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.

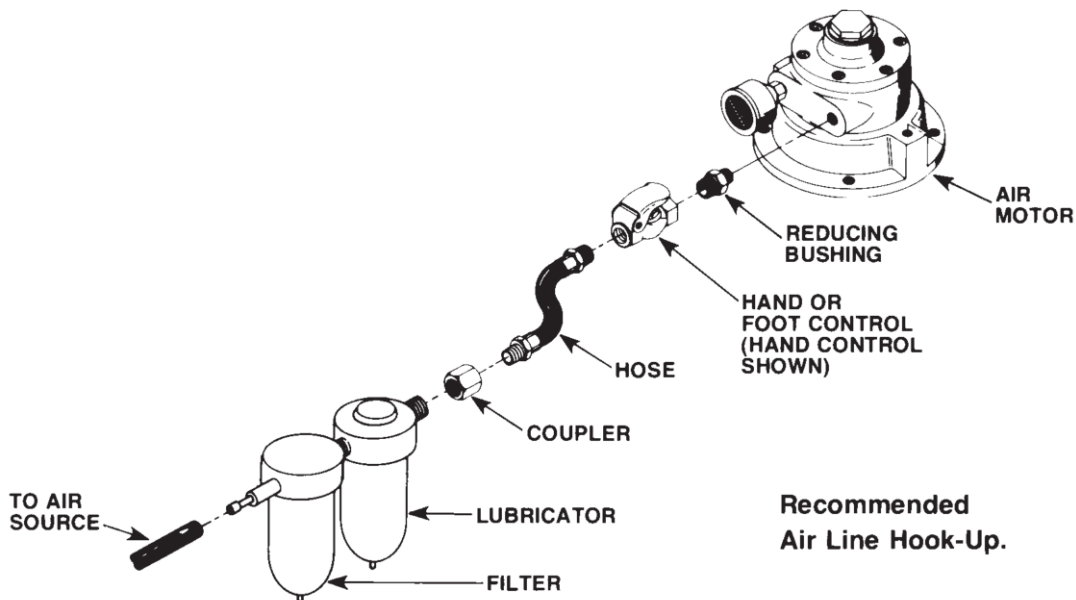


FIGURE 1

SET-UP AND OPERATION

1. 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.

- A. 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.
- B. Retract all cylinders to the return position.
- C. 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.
- D. Cycle the pump (with cylinders attached) several times. Retract the cylinders, and check the oil level in the pump reservoir again.

OPERATING INSTRUCTIONS

2. Hydraulic Connections

- A. Clean all the areas around the oil ports of the pump and cylinder.
- B. Inspect all threads and fittings for signs of wear or damage, and replace as needed.
- C. Clean all hose ends, couplers or union ends.
- D. 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.

3. Valve Options

A. 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.

B. "Posi-Check" Valves

"Posi-Check" is a valve feature that holds the load while shifting from "advance" to "hold" positions.

4. Hydraulic Gauge (Optional)

A. 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.

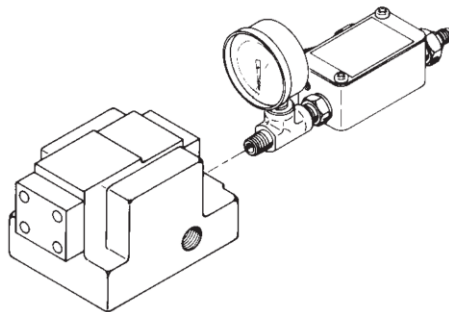


FIGURE 2

OPERATING INSTRUCTIONS

B. "Posi-Check" Valves

If a "Posi-Check" valve is used, a hydraulic gauge shows zero pressure when the valve is switched to the neutral (hold) position. Cylinder pressure, however, is held without loss.

- (1) Installation of the hydraulic gauge (refer to Figure 3):
 - (a) Remove the pipe plug from the valve's gauge port.
 - (b) Install a 45° elbow fitting.
 - (c) Install the gauge into the 45° elbow fitting.

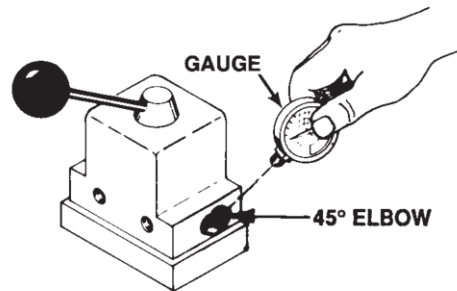


FIGURE 3

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.

OPERATING INSTRUCTIONS

5. Adjusting The Hydraulic Gauge

A. 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.

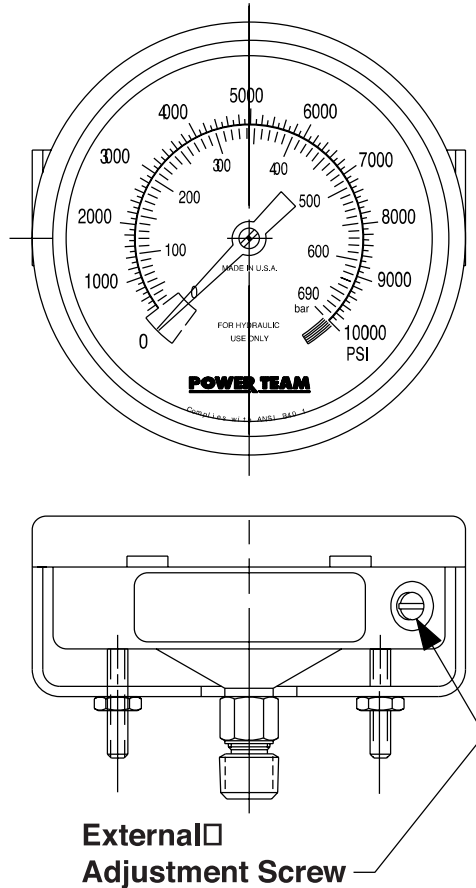


FIGURE 4

6. Reservoir Vent Air Filter (Optional)

- A. Remove the filler cap, and insert either the 45° fitting or the straight fitting. Fasten O-ring end of fitting into pump.
- B. 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.
- C. If the straight fitting is used, thread the air filter on and hand tighten.

7. Priming The Pump

- A. When operating the pump for the first time:
- B. Valve and hose connections must be tight, and the reservoir must be filled to the proper oil level. Start the motor.
- C. 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.

OPERATING INSTRUCTIONS

- D. 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" in PRE-VENTIVE MAINTENANCE section.
- E. 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.

8. Adjusting The Pressure Regulating Controls

A. 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.

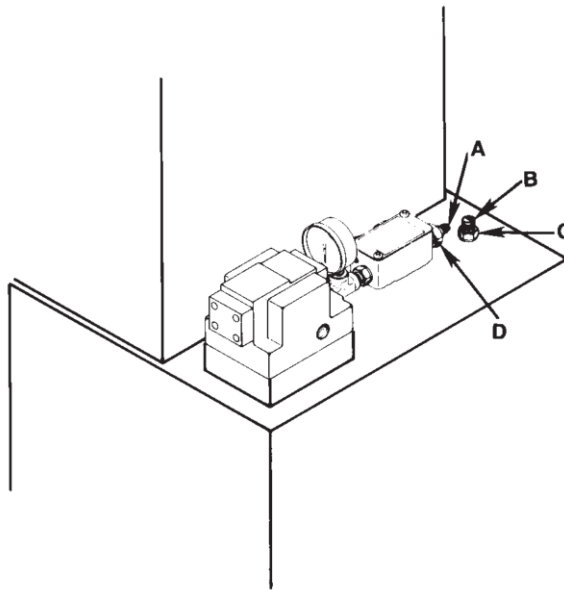


FIGURE 5

9. 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.

OPERATING INSTRUCTIONS

- A. 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.
- B. The pump must be completely connected. Set the motor control toggle switch on “Run” and push the “Start” button.
- C. 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.**

10. Adjusting The Pressure Switch

- A. 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.
- B. 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.
- C. Adjust the pressure regulating valve to the desired pressure setting by using the procedure previously outlined.
- D. 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.
- E. 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.

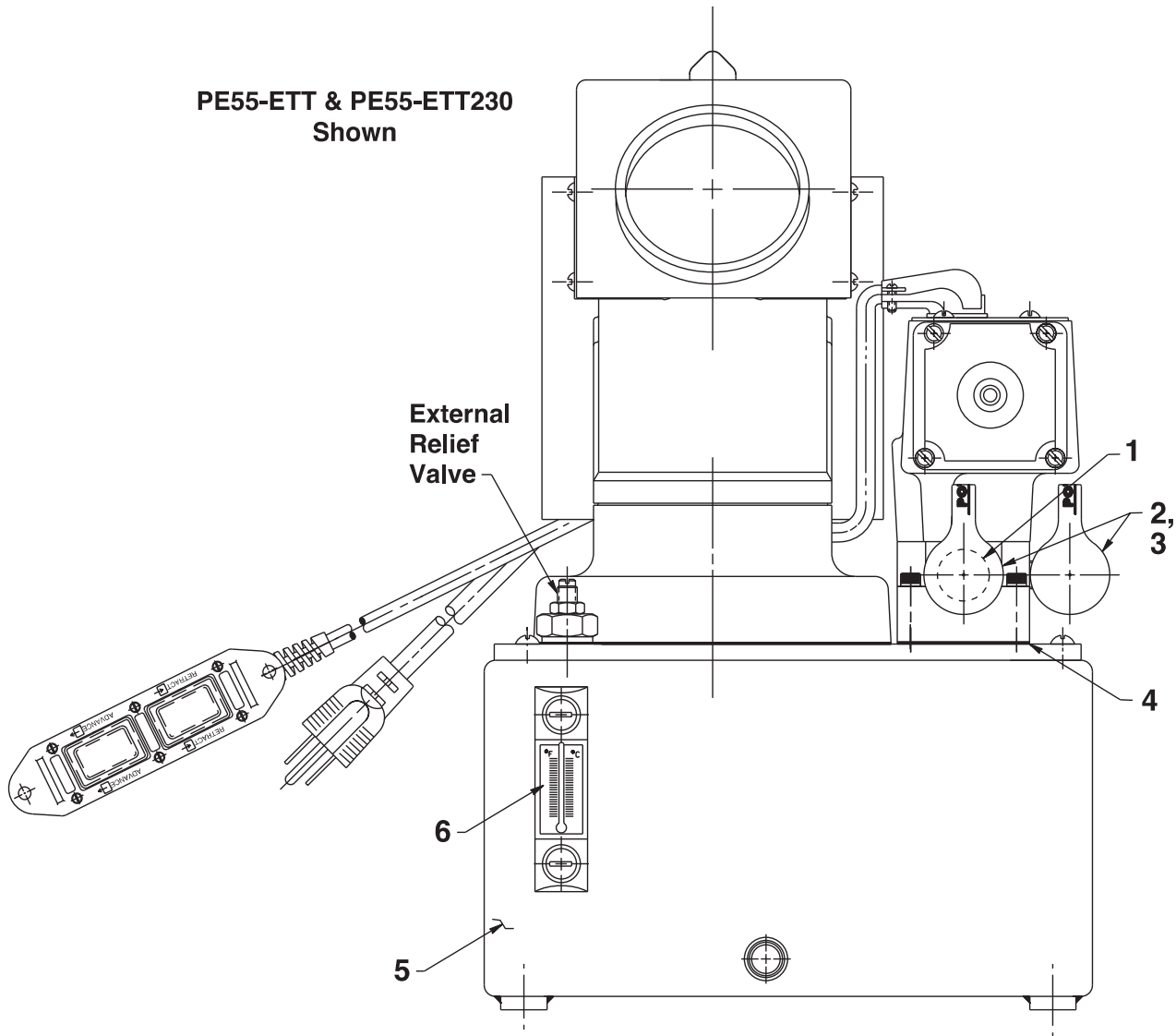
NOTE

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.

PARTS LIST & DIAGRAMS

MODEL C ELECTRIC HYDRAULIC PUMP SIDE VIEW

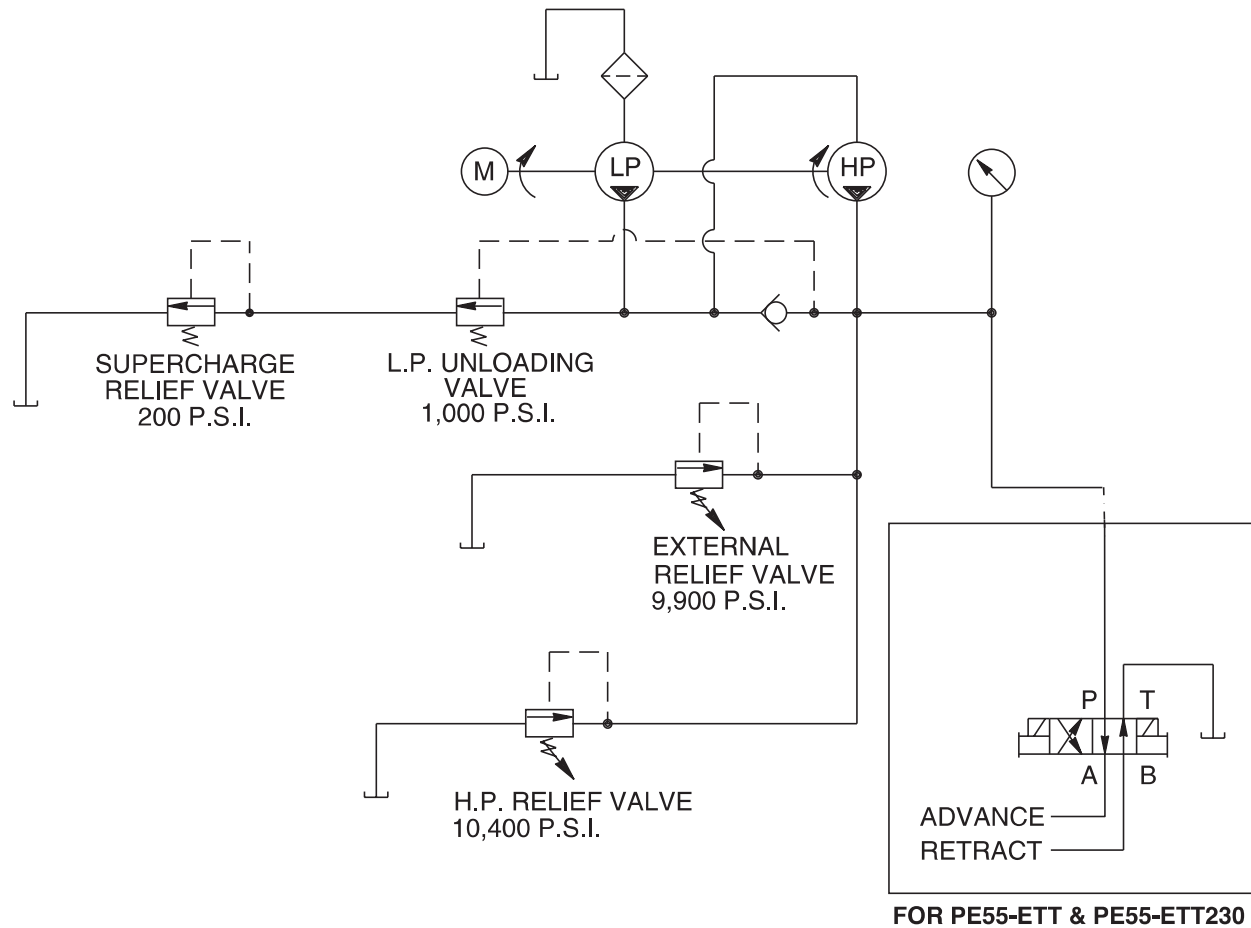
PE55-ETT & PE55-ETT230
Shown



Item No.	Part No.	No. Req'd	Description
1	9689	1	Reducer Connector
2	25600-1	2	Cylinder Half Coupler
3	9800	2	Dust Cap
4	200395	1	Gasket
5	66694BK2	1	Reservoir (2 gallon)
6	351940	1	Gauge, Oil Level W/Thermometer

PARTS LIST & DIAGRAMS

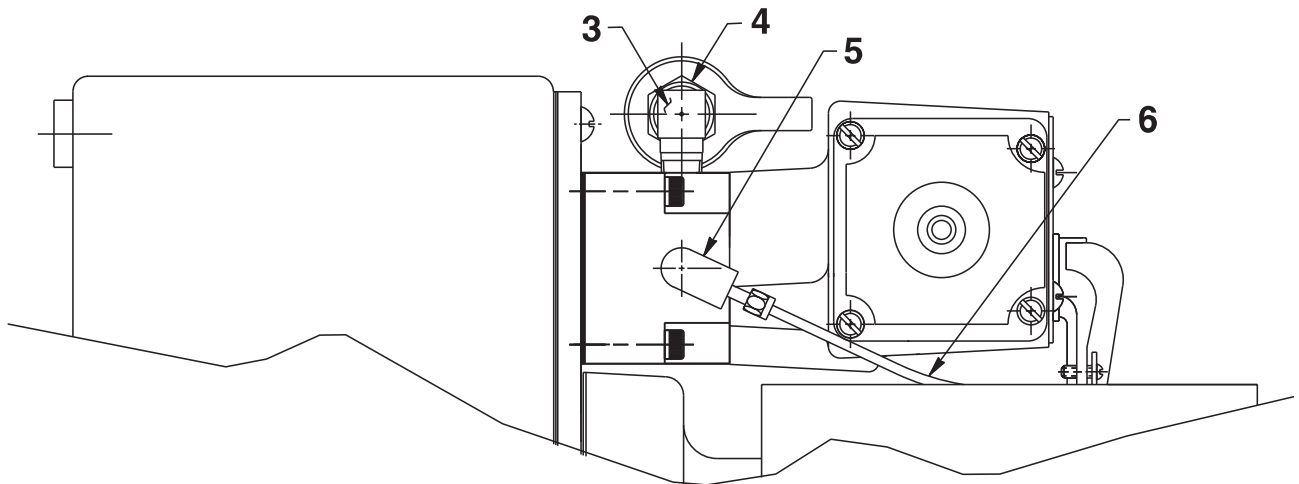
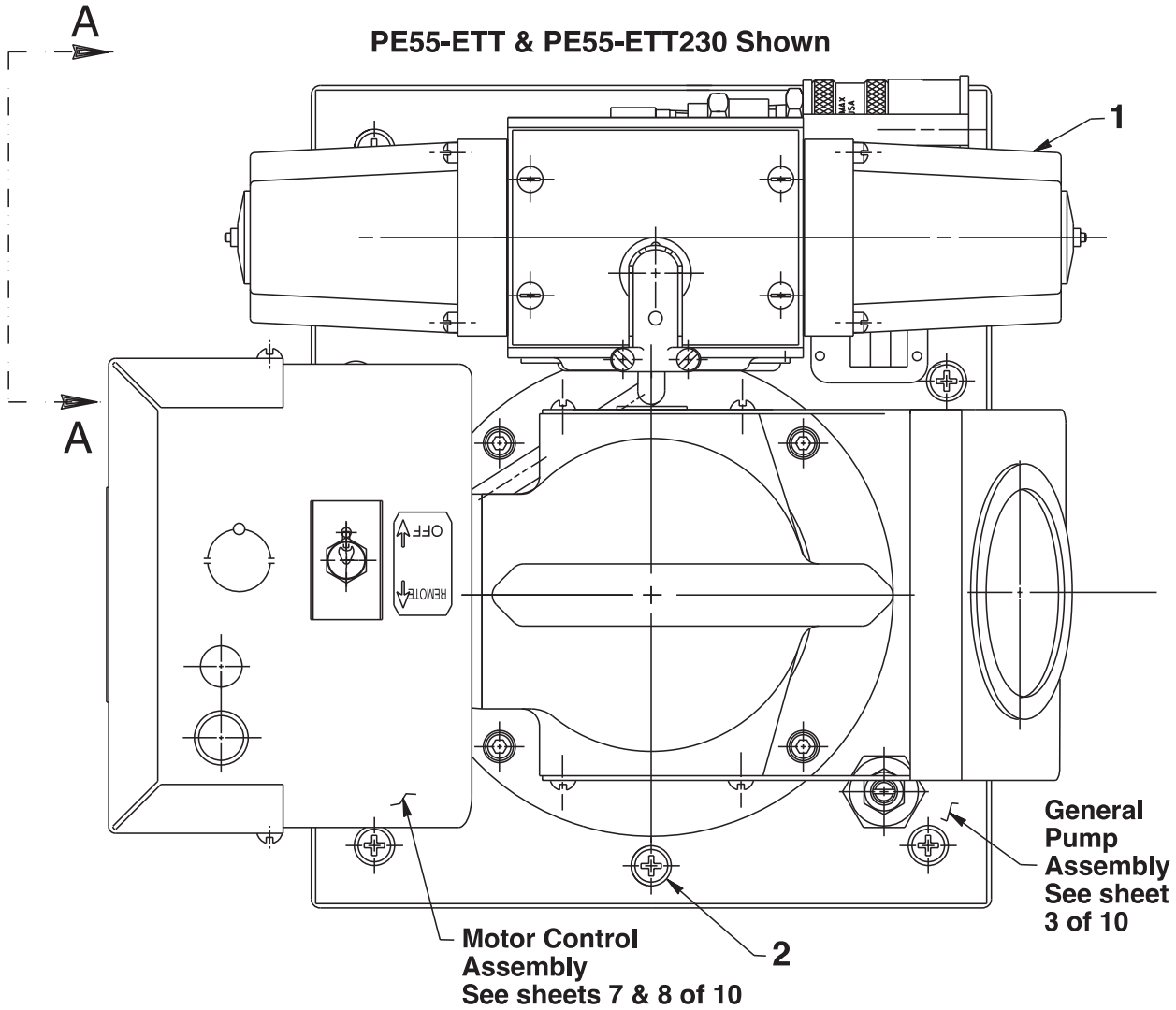
HYDRAULIC SCHEMATIC



PARTS LIST & DIAGRAMS

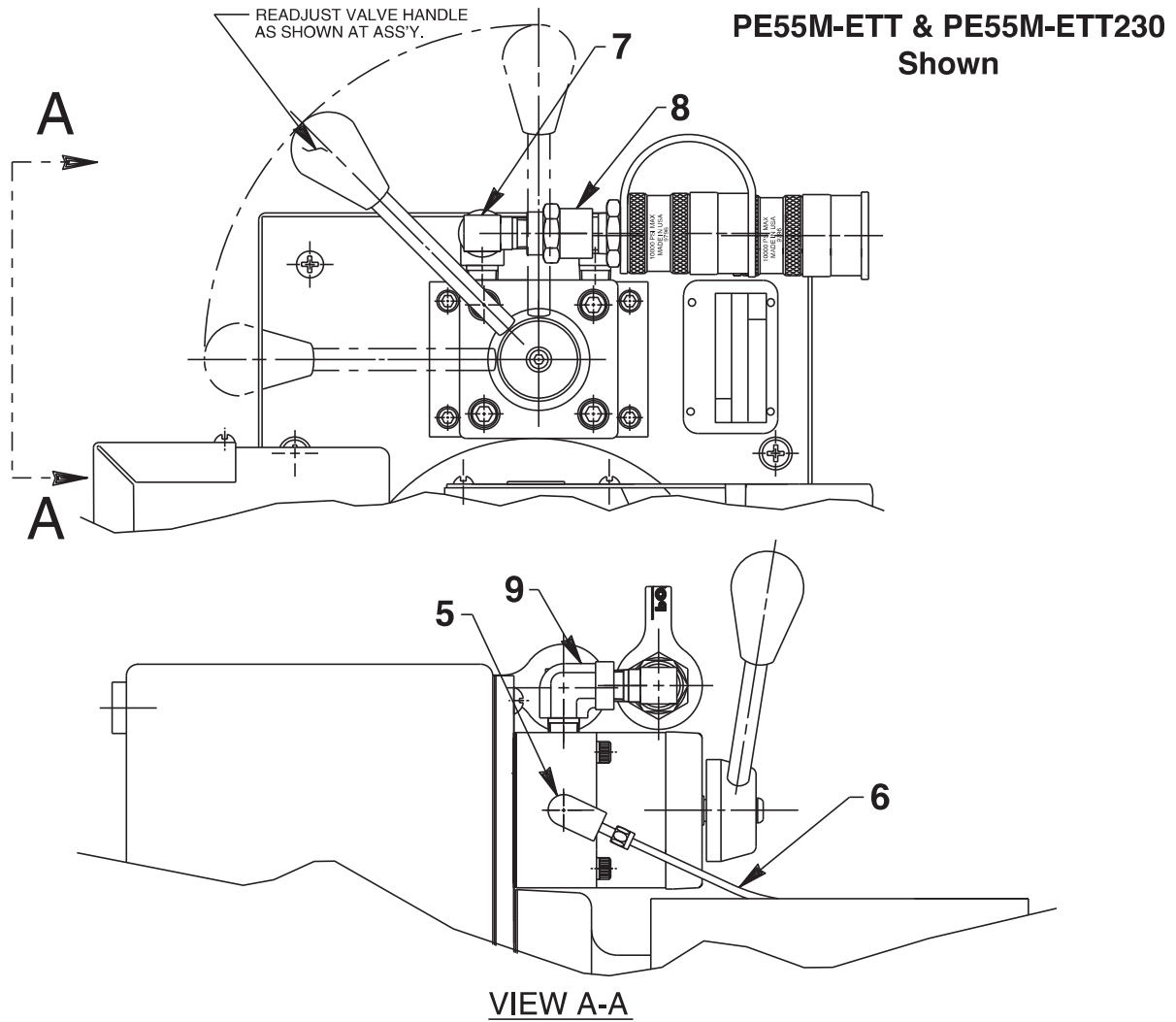
TOP VIEW & VIEW A-A

PE55-ETT & PE55-ETT230 Shown



VIEW A-A

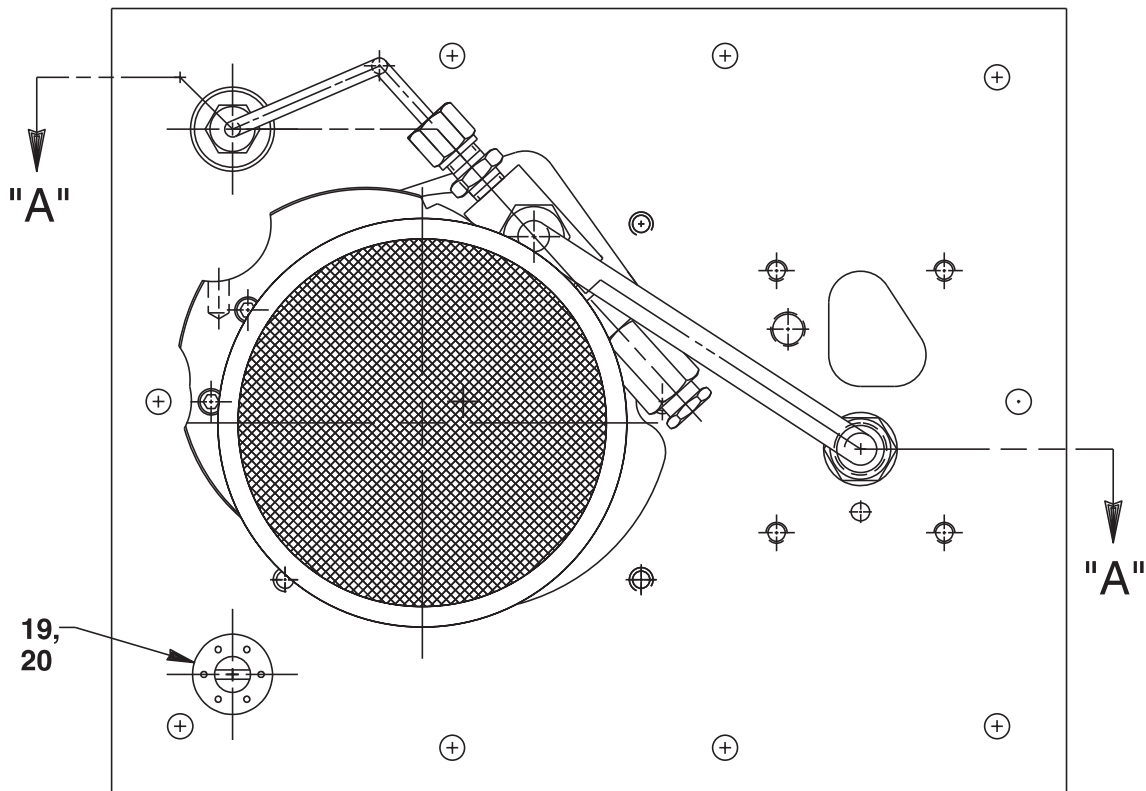
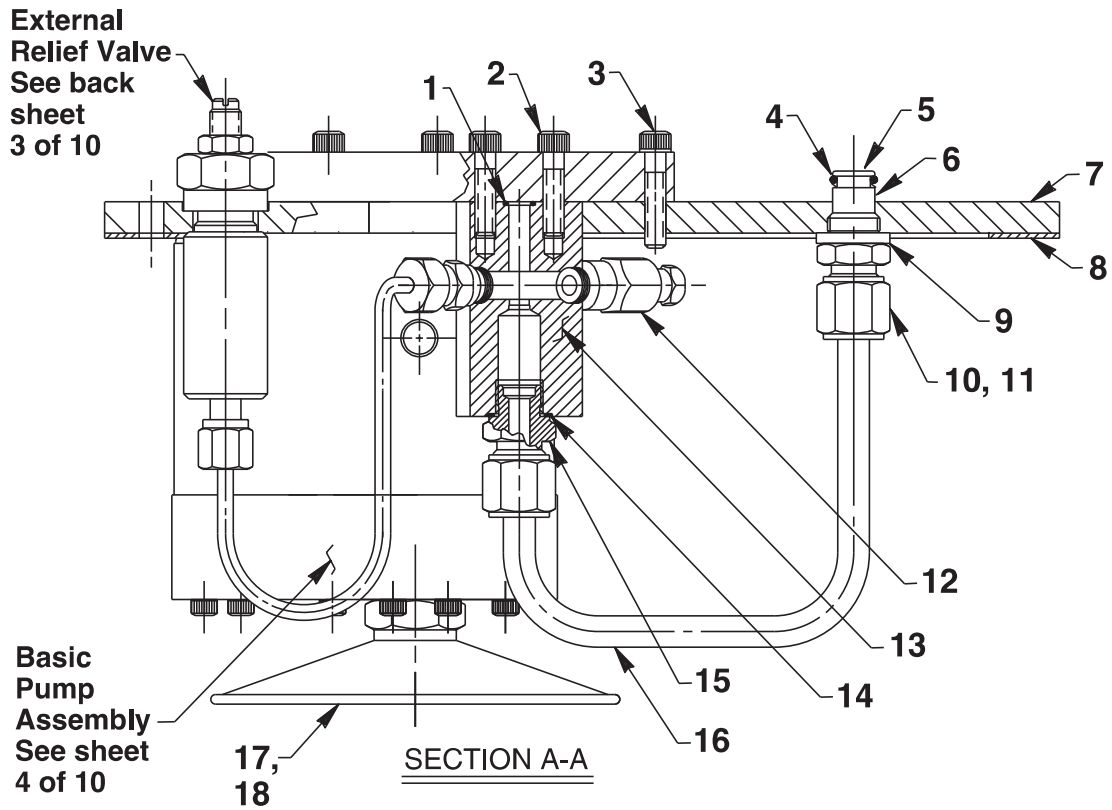
PART NUMBERS & DIAGRAMS



Item No.	Part No.	No. Req'd	Description
1	9592	1	4-way Solenoid Valve (For PE55-ETT; See Form No. 108066)
	9552	1	4-way Solenoid Valve (For PE55-ETT230; See Form No. 108066)
	9500	1	4-way Manual Valve (For PE55M-ETT & PE55M-ETT230; See Form No. 100623)
2	10177	10	Rnd. Hd. Screw (1/4-20 x 3/4)
3	250381	1	90° Elbow Fitting (For PE55-ETT & PE55-ETT230)
4	13831	1	Straight Fitting (For PE55-ETT & PE55-ETT230)
5	253159	1	90° Elbow Fitting
6	501049	1	Oil Line Tube
7	16254	2	90° Elbow Fitting (For PE55M-ETT & PE55M-ETT230)
8	10682	2	Straight Fitting (For PE55M-ETT & PE55M-ETT230)
9	10621	1	90° Elbow Fitting (For PE55M-ETT & PE55M-ETT230)

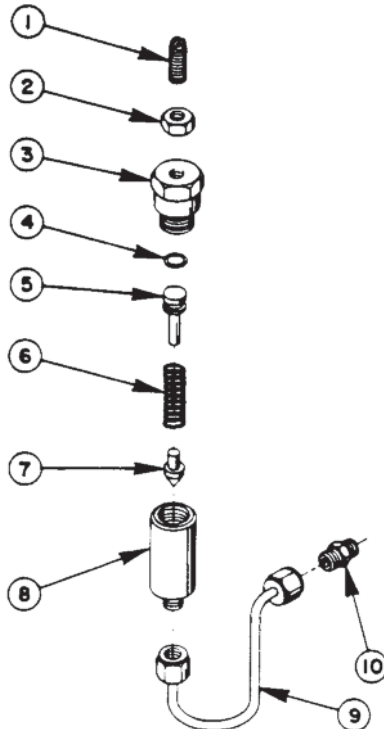
PART NUMBERS & DIAGRAMS

GENERAL PUMP ASSEMBLY



PARTS LIST & DIAGRAMS

Item No.	Part No.	No. Req'd	Description
1	10266	1	O-ring (3/8 X 1/4 X 1/16)
2	10015	2	Soc. Hd. Cap Screw (1/4-28 UNF X 1" Lg.; Torque to 130/180 in. lbs.)
3	10016	3	Soc. Hd. Cap Screw (1/4-20 UNC X 1" Lg.)
4	10268	1	O-ring (1/2 X 3/8 X 1/16)
5	20787	1	Valve Connector
6	11863	1	Teflon Backup Washer
7	66467BK2	1	Cover Plate
8	40164	1	Gasket
9	21484	1	Spacer
10	10430	2	Tube Sleeve
11	10431	2	Tube Nut
12	21278	1	Relief Valve (Set at 10,100/10,700 PSI)
13	20776	1	Valve Body
14	10261	1	Copper Washer (3/4 X 19/32 X 1/32)
15	20770	1	Connector (Torque to 40/45 ft. lbs.)
16	260004	1	Oil Line
17	21344	1	Filter Ass'y (Includes Item 18)
18	10300	1	O-ring (5/8 X 15/32 X 5/62)
19	20937	1	Vent Cap
20	200415	1	O-ring (13/16 X 5/8 X 3/32)

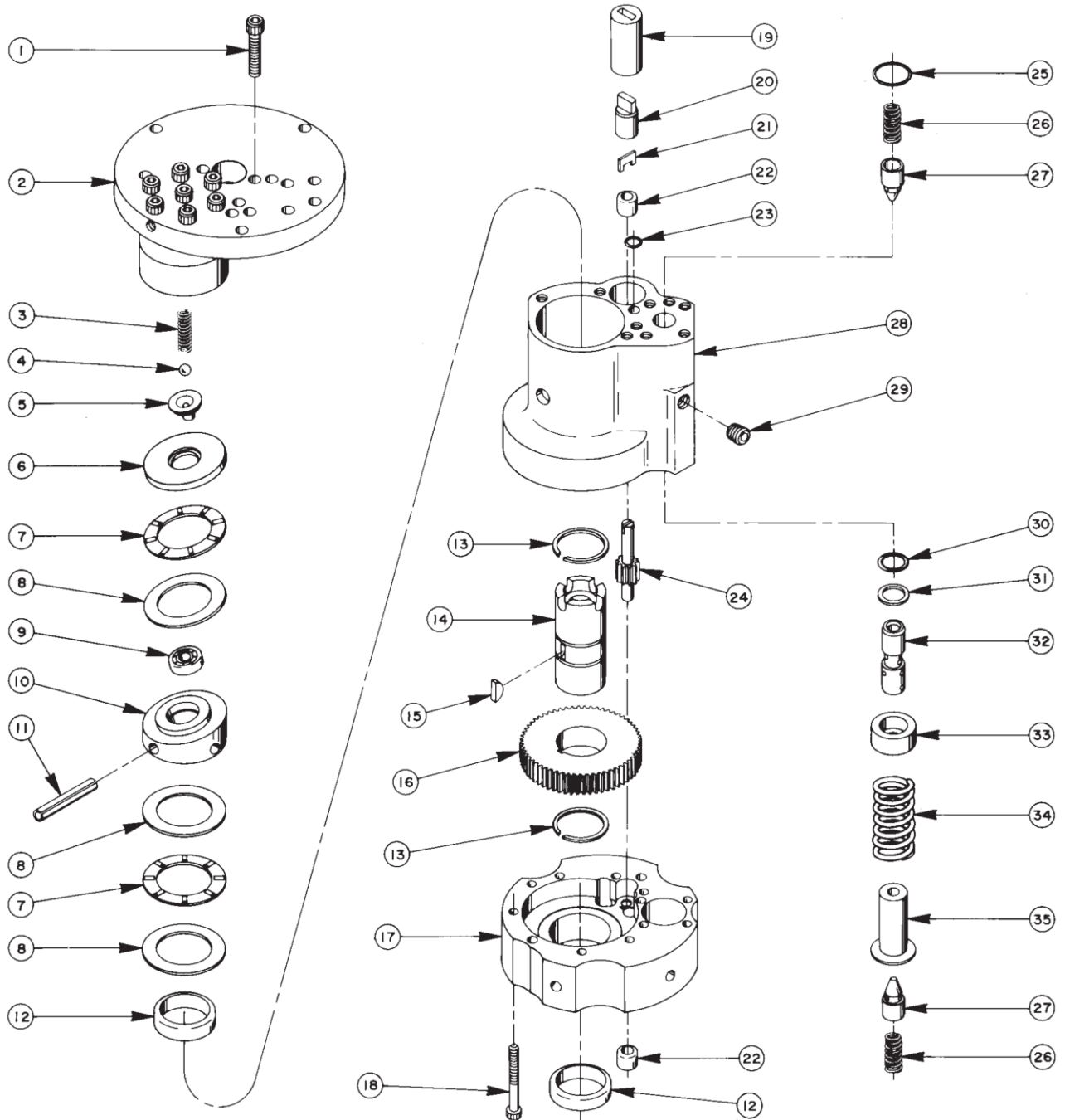


#22360 PRESSURE REGULATOR ASSEMBLY

Item No.	Part No.	No. Req'd	Description
1	22362	1	Adjusting Screw
2	10386	1	Hex Jam Nut
3	21305	1	Valve Cap
4	10268	1	O-ring (1/2 X 3/8 X 1/16)
5	21306	1	Spring Guide
6	10495	1	Compression Spring (1/2 O.D. X 1-5/8 Lg.)
7	21046	1	Valve Stem
8	22361	1	Body
9	29267	1	Oil Line Ass'y (With nuts)
10	14844	1	Connector Fitting

PARTS LIST & DIAGRAMS

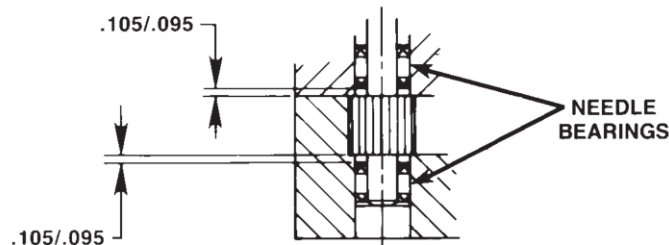
BASIC PUMP ASSEMBLY



PARTS LIST & DIAGRAMS

Item No.	Part No.	No. Req'd	Description
1	10020	9	Soc. Hd. Cap Screw (1/4-20 UNC X 1-1/4 Lg.; Torque to 170-180 in. lbs.)
2	33113	1	High Pressure Pump Ass'y (See sheet 5 of 10)
3	10361	1	Compression spring (1/4 O.D. X 1" Lg.)
4	10375	1	Steel Ball (1/4" dia.)
5	23547	1	Bearing Top Plate
6	23548	1	Top Plate
7	11228	2	Thrust Bearing
8	11813	3	Bearing Race
9	11814	1	Ball Bearing
10	23549	1	Angle Plate
11	11955	1	Roll Pin (1/4" dia. X 1-3/4 Lg.)
12	11064	2	Needle Bearing
13	11261	2	Retaining Ring
14	23556	1	Shaft
15	11821	1	Woodruff Key
16	23574	1	Gear
17	40072	1	Pump End Plate
18	10001	13	Soc. Hd. Cap Screw (#10-32 UNF X 1-3/4" Lg.; Torque to 50 in. lbs.)
19	21091	1	Coupling
20	21092	1	Adapter
21	21093	1	Key
22	11198	2	Needle Thrust Bearing (See Note below)
23	10266	1	O-ring (3/8 X 1/4 X 1/16)
24	20774	1	Drive Gear
25	10303	1	O-ring (7/8 X 3/4 X 1/16)
26	10425	2	Compression Spring (3/8 O.D. X 3/4 Lg.)
27	20771	2	Poppet
28	40071	1	Pump Body
29	10427	1	Pipe Plug (1/8" NPTF)
30	10271	1	O-ring (11/16 X 1/2 X 3/32)
31	12389	1	Teflon Backup Washer (11/16 X 1/2 X 1/16)
32	20849	1	Spool
33	23255	1	Spring Guide
34	10426	1	Compression Spring (1" O.D. X 1-13/16 Lg.)
35	23256	1	Spring Guide

NEEDLE BEARING INSTALLATION SPECIFICATIONS

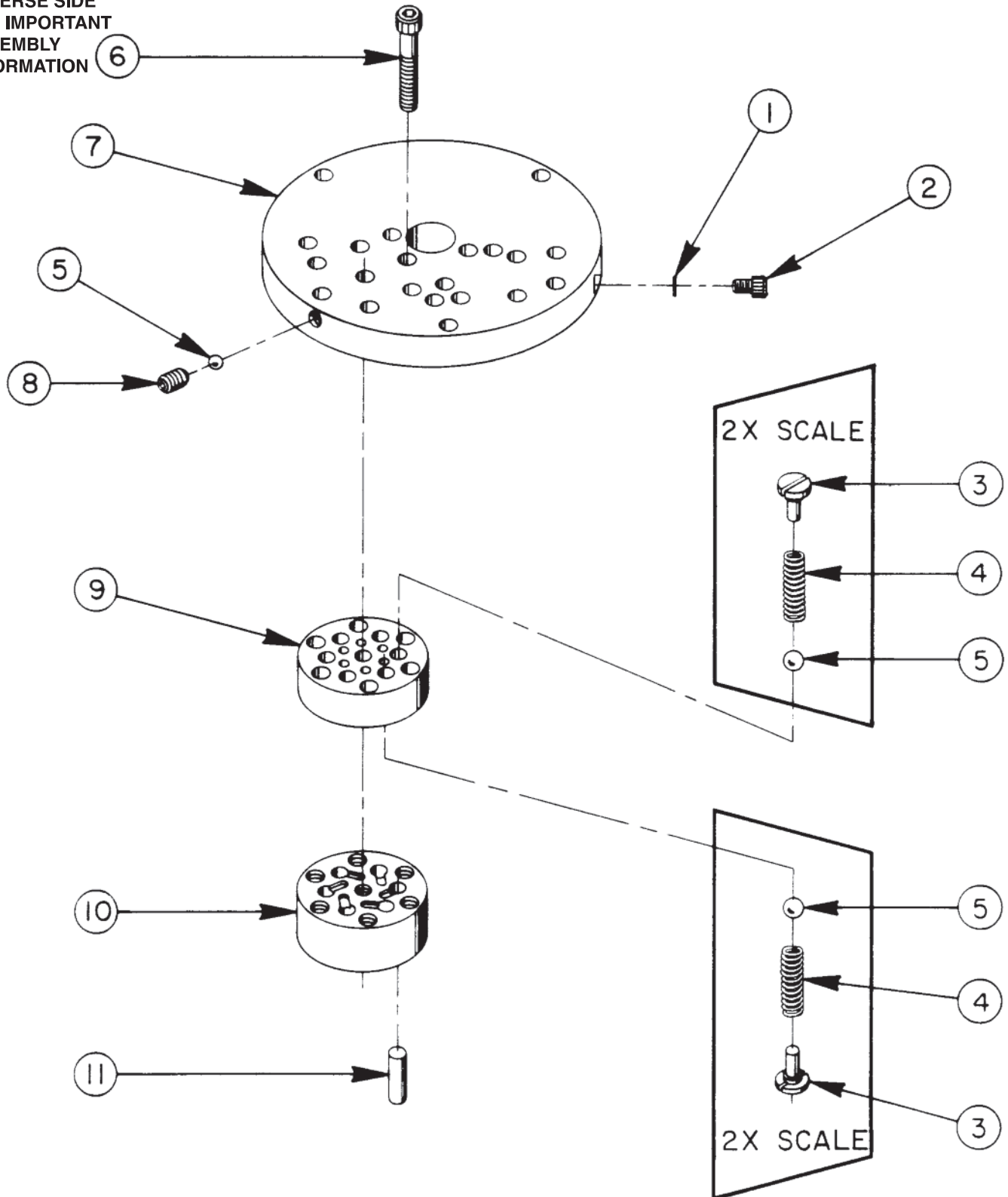


When replacing the needle bearings on the drive gear of the basic pumps, the dimensions shown must be as specified.

PARTS LIST & DIAGRAMS

HIGH PRESSURE PUMP ASSEMBLY

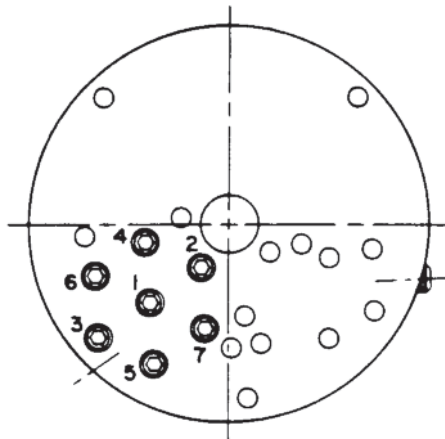
SEE DIAGRAM ON
REVERSE SIDE
FOR IMPORTANT
ASSEMBLY
INFORMATION



PARTS LIST & DIAGRAMS

Item No.	Part No.	No. Req'd	Description
1	10442	1	Copper Washer (3/8 X 1/4 X 1/32)
2	10002	1	Soc. Hd. Cap Screw (1/4-20 UNC X 3/8" Lg.; Torque to 140/160 in. lbs.)
3	24549	6	Valve Guide
4	10445	6	Compression Spring (5/32" O.D. X 3/4" Lg.)
5	12223	7	Steel Ball
6	10023	7	Soc. Hd. Cap Screw (1/4-20 UNF X 1-1/2" Lg.; Torque to 170/180 in. lbs.; See note below)
7	50411	1	Top Plate
8	10519	1	Soc. Set Screw (1/4-20 UNC X 3/8 Lg.; Torque to 65/70 in. lbs.)
9	40630	1	Valve Head
10	41062	1	Pump Barrel
11	21628	3	Piston

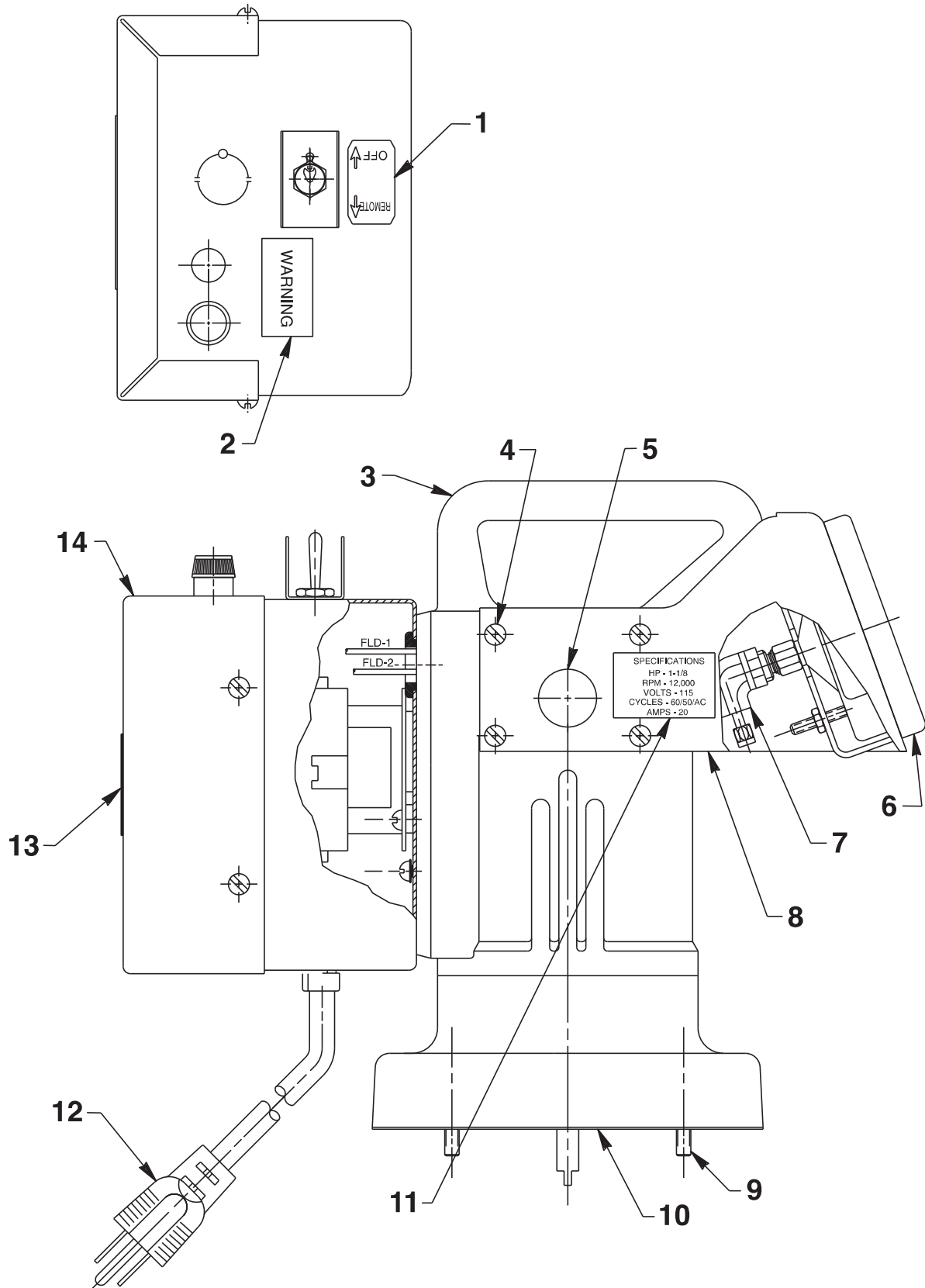
BOLT TIGHTENING SEQUENCE



NOTE: Assemble in sequence shown. Lubricate under head and on threads. Torque to 180 in. lbs.

PARTS LIST & DIAGRAMS

MOTOR & CONTROL BOX ASSEMBLY

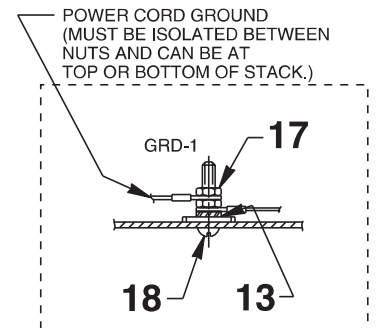
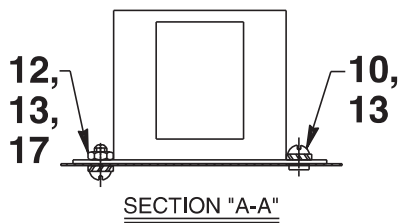
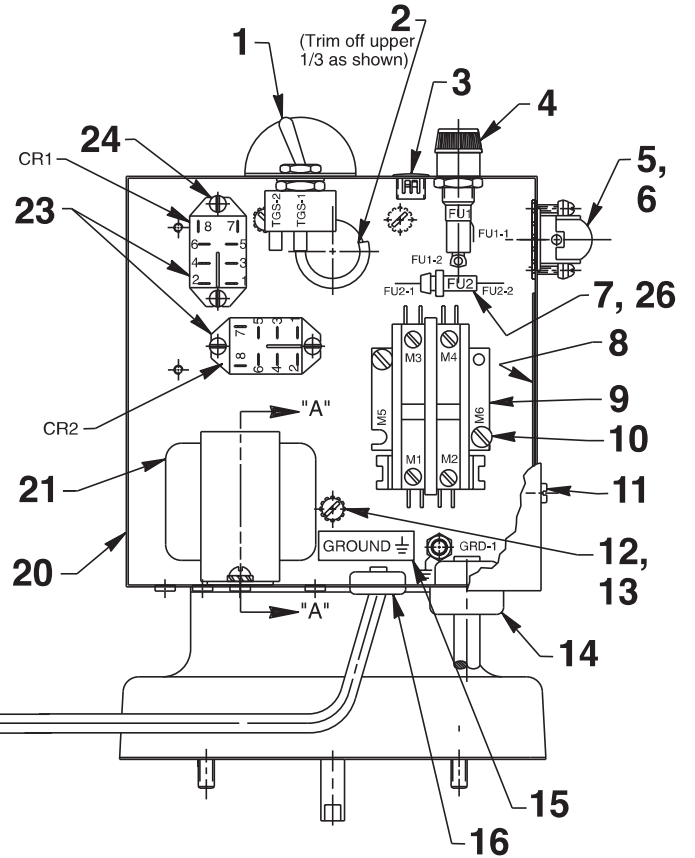
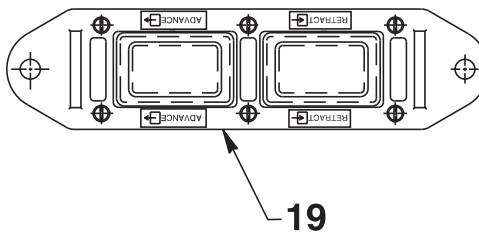
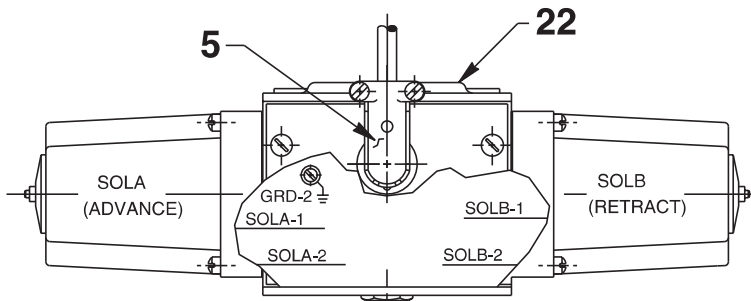
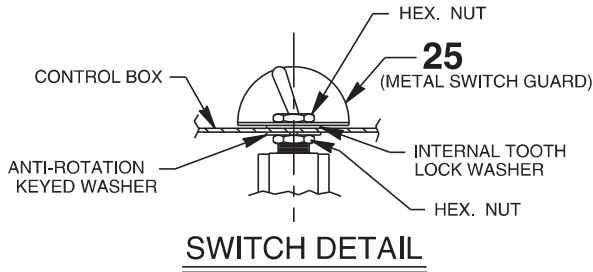


PARTS LIST & DIAGRAMS

Item No.	Part No.	No. Req'd	Description
1	360069	1	OFF-REMOTE Decal
2	252305	1	Warning Decal (For PE55-ETT & PE55M-ETT)
	252306	1	Warning Decal (For PE55-ETT230 & PE55M-ETT230)
3	53338	1	Basic Motor Assembly (115 V.; For PE55-ETT & PE55M-ETT; See sheet 9 of 10)
	53337	1	Basic Motor Assembly (230 V.; For PE55-ETT230 & PE55M-ETT230; See sheet 9 of 10)
4	11539	8	Rnd. Hd. Screw (10-24 x 1/4)
5	19502	2	Hole Plug
6	252426	1	Gauge (10,000 PSI; 4" dia.)
7	253160	1	90° Elbow Fitting
8	59375WH2	1	Gauge Bracket
9	10022	4	Soc. Hd. Screw (1/4-20 x 1-1/2)
10	30650	1	Motor Base Gasket
11	215164	1	Specifications Decal (115V; For PE55-ETT & PE55M-ETT)
	215163	1	Specifications Decal (230V; For PE55-ETT230 & PE55M-ETT230)
12	307440	1	Cord (8' lg.; For PE55-ETT & PE55M-ETT)
	308752	8'	Cable (For PE55-ETT230 & PE55M-ETT230)
13	200188	1	Warning/Important Decal
14	43126WH2	1	Control Box Cover

PARTS LIST & DIAGRAMS

MOTOR CONTROL BOX ASSEMBLY FOR PE55-ETT & PE55-ETT230



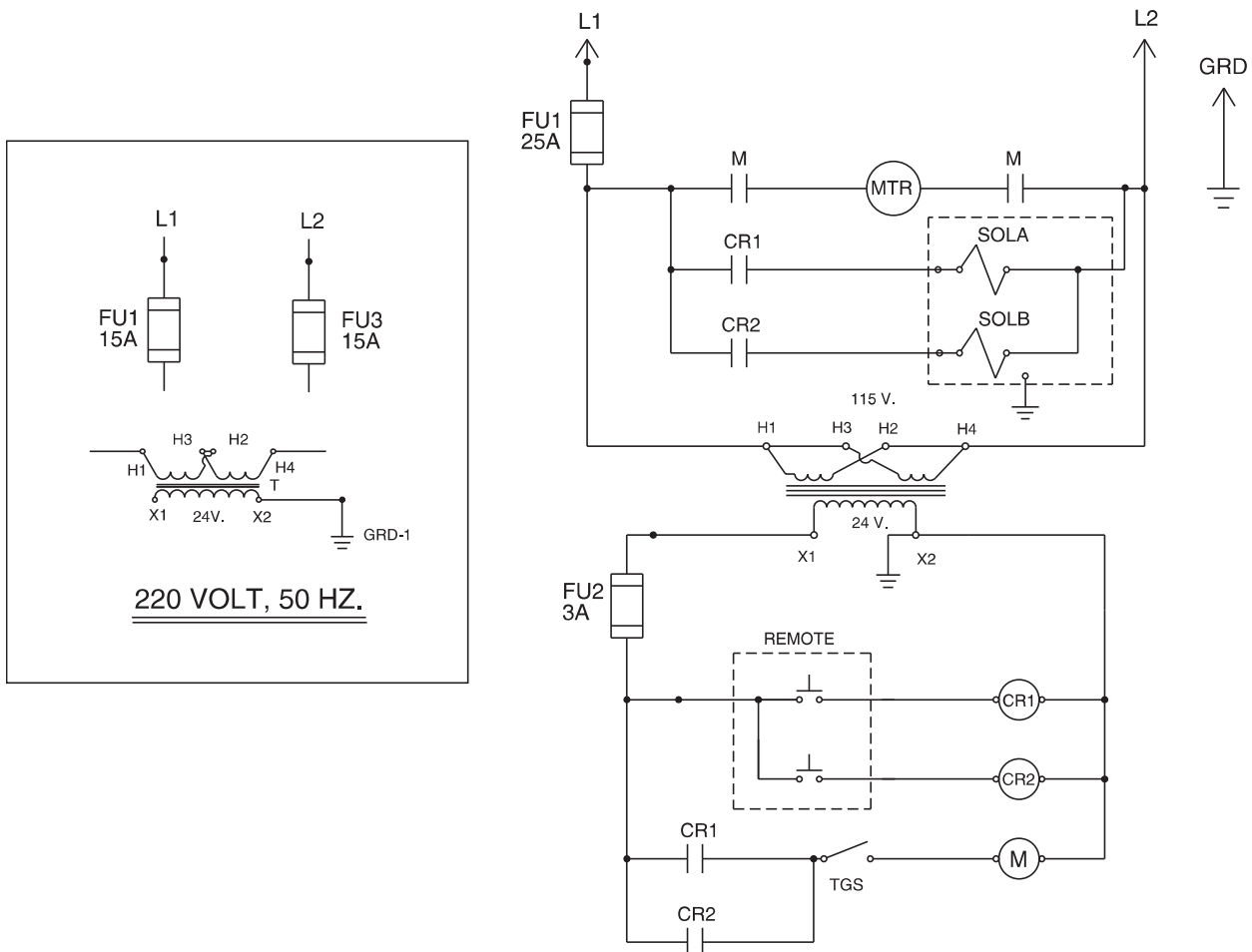
NOTE: SERRATED LOCK WASHER MUST BE ADJACENT TO METAL BOX. MORE WASHERS CAN BE USED IF DESIRED.

PARTS LIST & DIAGRAMS

Item No.	Part No.	No. Req'd	Description
1	12301	1	Toggle Switch
2	15497	1	Rubber Grommet
3	17782	1	Snap Plug (For PE55-ETT)
	18292	1	Fuse Holder (For PE55-ETT230)
	252288	1	Fuse (15 AMP 250V; For PE55-ETT230)
4	18292	1	Fuse Holder
	252289	1	Fuse (25 AMP 125V; For PE55-ETT)
	252288	1	Fuse (15 AMP 250V; For PE55-ETT230)
5	11144	2	90° Elbow Fitting
6	15565	2'	Cable (16/4 SO)
7	206962	1	Fuse (3 AMP 250V)
8	250150	1	Warning Decal
9	420718-4	1	Contactors
10	11539	3	Rnd. Hd. Screw (10-24 x 1/4)
11	14812	4	Pan Hd. Screw (8-18 x 3/8)
12	10164	4	Rnd. Hd. Screw (10-24 x 3/8)

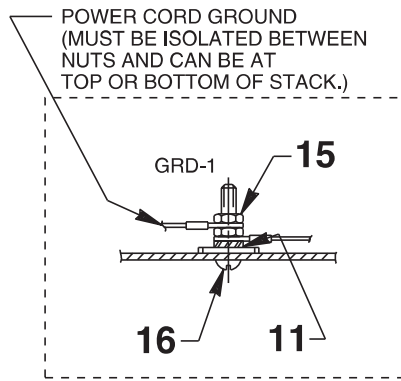
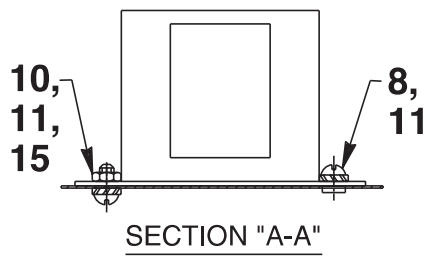
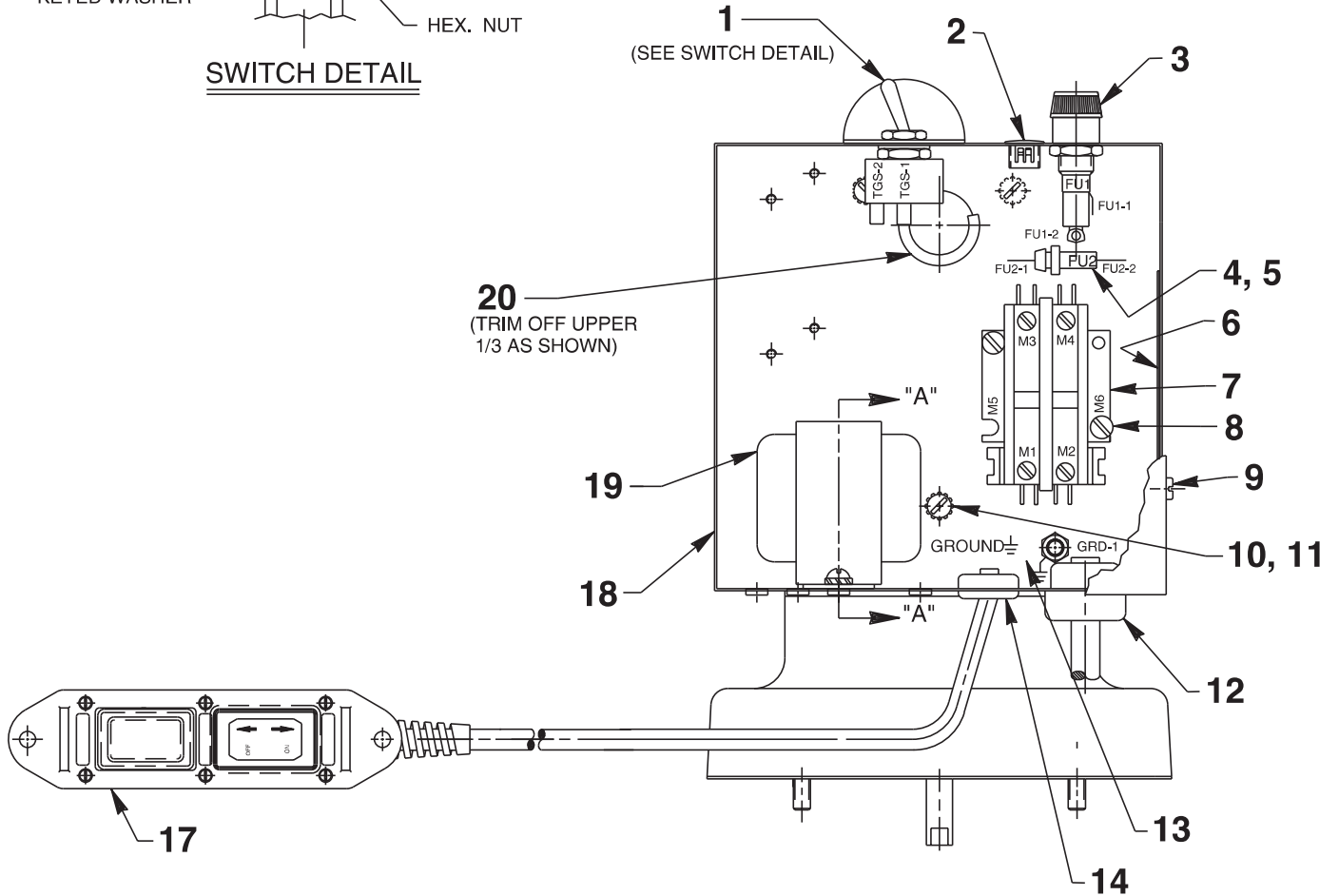
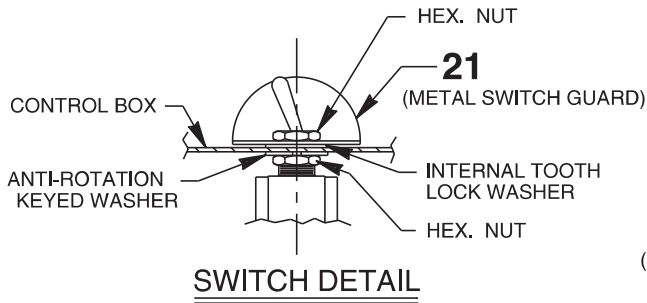
Item No.	Part No.	No. Req'd	Description
13	11108	6	Washer (Ext. Tooth .40 x .20)
14	210112	1	Strain Relief Bushing
15	205189	1	Ground Decal
16	15993	1	Strain Relief Bushing
17	10197	3	Hex Nut (10-24)
18	11856	1	Rnd. Hd. Screw (10-24 x 1")
19	351979-10	1	Hand Control Assembly (See sheet 9 of 9)
20	65264WH2	1	Electrical Control Box
21	11852	1	Transformer
22	9592	1	Solenoid Valve (4-way 115V; For PE55-ETT; See Form No. 108066)
	9552	1	Solenoid Valve (4-way 230V; For PE55-ETT230; See Form No. 108066)
23	251046	2	General Purpose Relay
24	17563	4	Pan Hd. Screw (6-32 x 1/4)
25	352061	1	Switch Guard
26	16887	1	Fuse Holder

ELECTRICAL SCHEMATIC



PARTS LIST & DIAGRAMS

MOTOR CONTROL BOX ASSEMBLY FOR PE55M-ETT & PE55M-ETT230

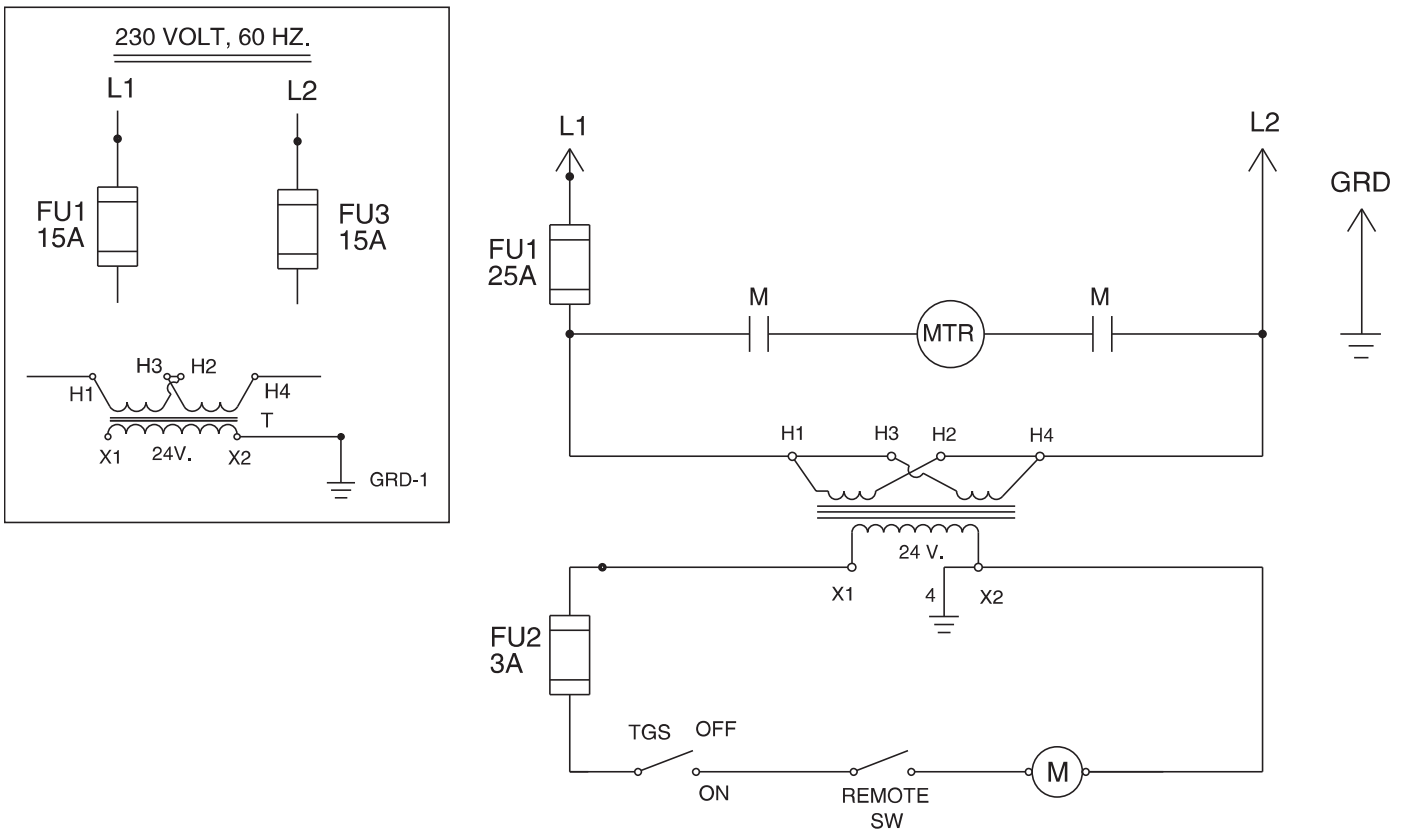


NOTE: SERRATED LOCK WASHER MUST BE ADJACENT TO METAL BOX. MORE WASHERS CAN BE USED IF DESIRED.

PARTS LIST & DIAGRAMS

Item No.	Part No.	No. Req'd	Description	Item No.	Part No.	No. Req'd	Description
1	12301	1	Toggle Switch	10	10164	4	Rnd. Hd. Screw (10-24 x 3/8)
2	17782	1	Snap Plug (For PE55M-ETT)	11	11108	6	Washer (Ext. Tooth .40 x .20)
	18292	1	Fuse Holder (For PE55M-ETT230)	12	210112	1	Strain Relief Bushing
	252288	1	Fuse (15 AMP 250V; For PE55M-ETT230)	13	205189	1	Ground Decal
3	18292	1	Fuse Holder	14	15993	1	Strain Relief Bushing
	252289	1	Fuse (25 AMP 125V; For PE55M-ETT)	15	10197	3	Hex Nut (10-24)
	252288	1	Fuse (15 AMP 250V; For PE55M-ETT230)	16	11856	1	Rnd. Hd. Screw (10-24 x 1")
4	206962	1	Fuse (3 AMP 250V)	17	25017	1	Hand Control Assembly (See Form No. 101644)
5	16887	1	Fuse Holder	18	65264WH2	1	Electrical Control Box
6	250150	1	Warning Decal	19	11852	1	Transformer
7	420718-4	1	Contactors	20	15497	1	Rubber Grommet
8	11539	3	Rnd. Hd. Screw (10-24 x 1/4)	21	352061	1	Switch Guard
9	14812	4	Pan Hd. Screw (8-18 x 3/8)				

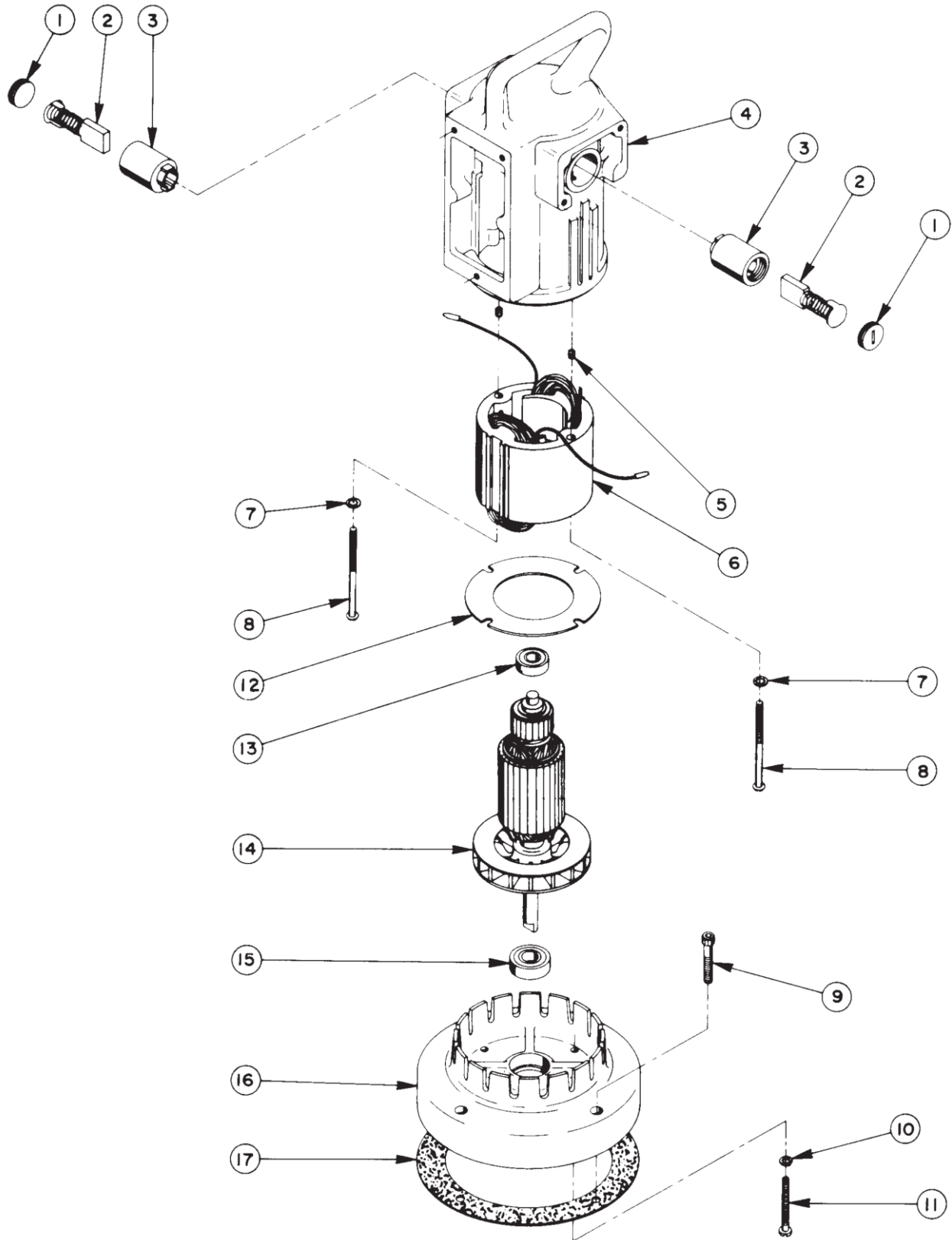
ELECTRICAL SCHEMATIC



PARTS LIST & DIAGRAMS

UNIVERSAL MOTOR ASSEMBLY

12,000 RPM -- 115 or 230 Volt, 50/60 Hz.

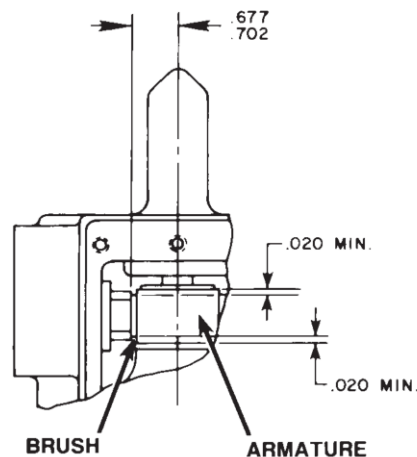


PARTS LIST & DIAGRAMS

Item No.	Part No.	No. Req'd	Description
1	10806	2	Brush Holder Cap
2	10804	2	Brush Assembly
3	10805	2	Brush Holder
4	50160	1	Motor Shell
5	10133	2	Set Screw
6	10802	1	Field (115 Volt; For PE55-ETT & PE55M-ETT)
	*58841F	1	Field (230 Volt; For PE55-ETT230 & PE55M-ETT230)
7	12356	2	Lockwasher
8	10170	2	Rd. Hd. Machine Screw (10-24 UNC x 3-1/4 Lg.)
9	10022	4	Soc. Hd. Cap Screw (1/4-20 UNC x 1-1/2 Lg.)
10	10241	4	Lockwasher
11	10169	4	Pan Hd. Machine Screw (10-24 UNC x 2" Lg.; Torque to 20/25 in. lbs.)
12	20786	1	Baffle Plate
13	10438	1	Ball Bearing
14	10800	1	Armature (115 Volt; For PE55-ETT & PE55M-ETT)
	*58841A	1	Armature (230 Volt; For PE55-ETT230 & PE55M-ETT230)
15	10439	1	Ball Bearing
16	40059	1	Motor Base
17	30650	1	Gasket

***NOTE:** If replacing the field or armature on 230 V. motors, order Kit No. 252311.

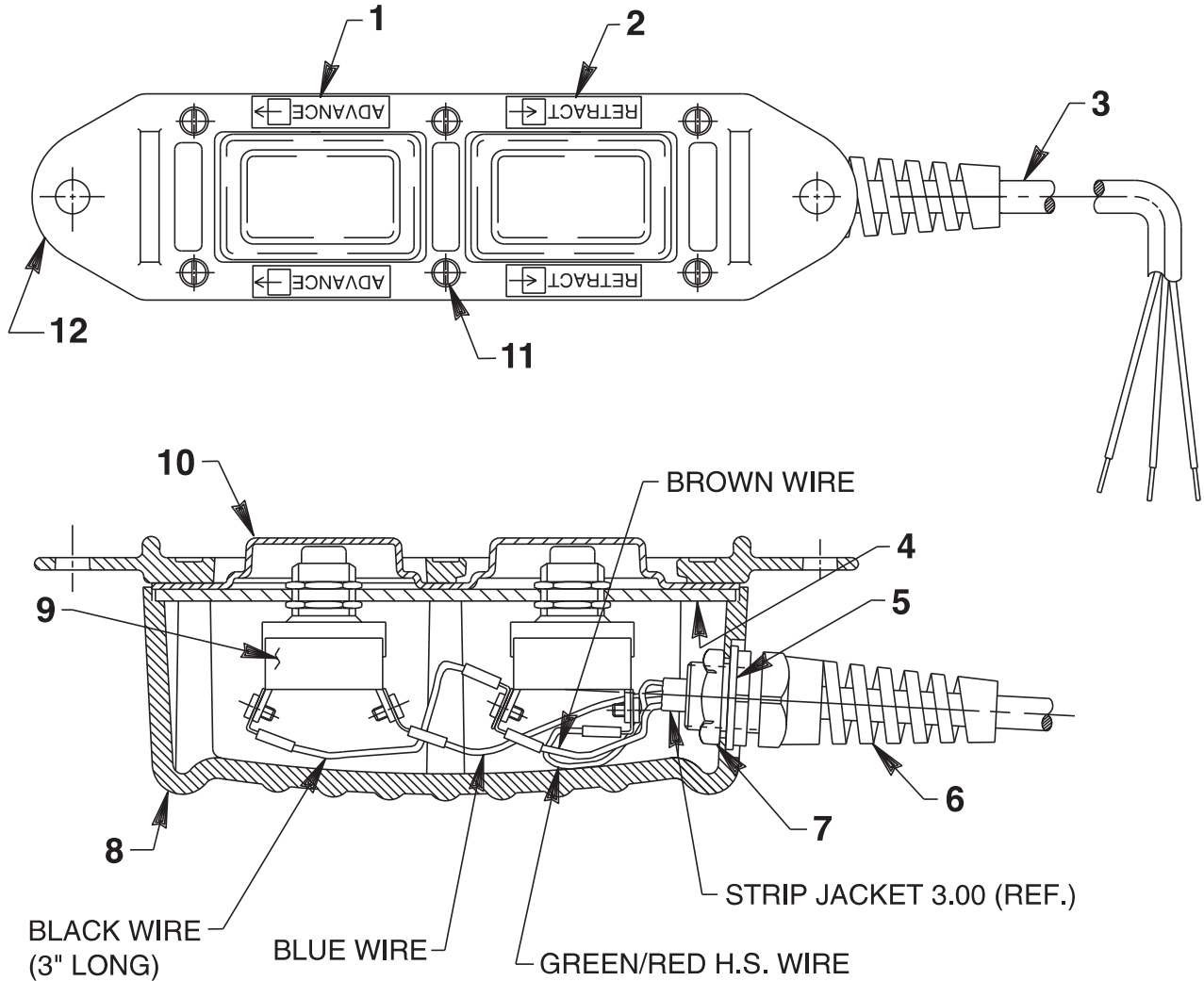
BRUSH HOLDER & ARMATURE INSTALLATION SPECIFICATIONS



PARTS LIST & DIAGRAMS

#351979-10

REMOTE CONTROL HAND SWITCH ASSEMBLY



Item No.	Part No.	No. Req'd	Description
1	29663	2	Advance Label Decal
2	29664	2	Retract Label Decal
3	12293	11'	Cable (16/3 SJTO)
4	421880	1	Switch Mounting Plate
5	253607	1	Rubber Gasket
6	251818	1	Strain Relief Bushing
7	251802	1	Locknut
8	420050-4	1	Switch Housing
9	253197	2	Push Button Switch
10	420050-2	1	Gasket
11	250248	6	Pan Hd. Screw (4-24 x 3/4)
12	251044	1	Plastic Cover

PREVENTATIVE MAINTENANCE



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.**

1. 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:

- A. The hydraulic cylinder(s) must be positioned on their side(s) with the couplers located upward.
- B. 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.

2. Hydraulic Fluid Level

- A. 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.
- B. 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. Lubrication (Air Driven Motor Only)

- A. 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.

4. Maintenance Cleaning

- A. Keep the pump's outer surface as free from dirt as possible.
- B. Seal all unused couplers with thread protectors.
- C. Keep all hose connections free of dirt and grime.

PREVENTATIVE MAINTENANCE

- D. The breather-hole in the filler cap must be clean and unobstructed at all times.
- E. Equipment connected to the pump must be kept clean.
- F. Use only an approved, high-grade hydraulic oil in this pump. Change as recommended (every 300 hours).

5. Draining And Flushing The Reservoir

IMPORTANT

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

- A. 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.

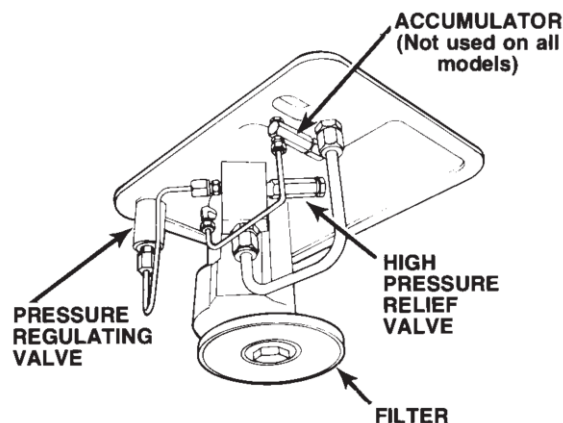


FIGURE 6

- B. Clean the inside of the reservoir and fill with a suitable flushing oil. Rinse the filter clean.
- C. 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.

- D. Run the pump for several minutes. Then disconnect the motor and pump assembly, and drain and clean the inside of the reservoir.

PREVENTATIVE MAINTENANCE

- E. 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.

6. Adding Oil To The Reservoir

- A. Cylinder(s) must be fully retracted and the power supply disconnected when adding oil to the reservoir.
- B. Clean the entire area around the filler plug before removing the filler plug.
- C. Use a clean funnel with filter when adding oil.
- D. Use an approved, high-grade hydraulic oil (215 SSU @ 100° F) only.

7. 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.

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

8. Checking Brushes On Universal Motors

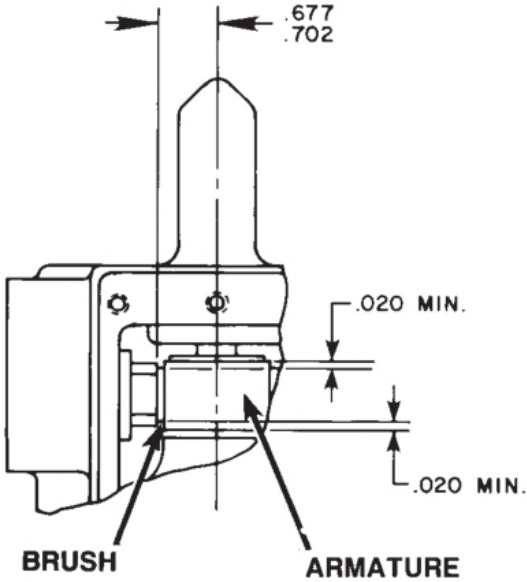
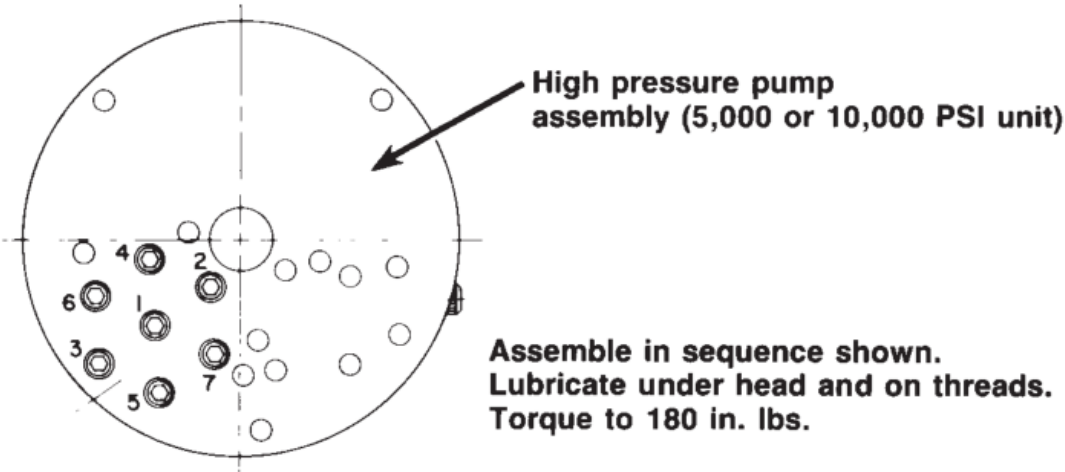
To help prevent premature failure of the armature, check the brushes periodically.

- A. Remove the metal brush cover plates.
- B. Remove the brush holder caps and brush assemblies
- C. The brush assemblies must be replaced if they are 1/8" long or less. See Figure 7.
- D. Install brush assemblies, brush holder caps, and metal brush cover plates.



FIGURE 7

REASSEMBLY SPECIFICATIONS



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

TROUBLESHOOTING GUIDE



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
Electric motor does not run	1. Pump not turned ON.	1. Flip toggle switch to “Run” 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. Broken lead wire or defective power cord plug.	4. Replace defective parts.
	5. Defective switches.	5. Check switches.
	6. Defective motor.	6. Repair or replace motor.
	7. Defective starter relay.	7. Replace defective parts.
	8. Defective remote switch.	8. Repair or replace remote switch.
	9. Worn brushes	9. Replace brushes
	10. Circuit breaker tripped because total amperage draw too high for existing circuit.	10. Add an additional circuit or use alternate circuit.
	11. Overheated motor (single-phase motor only). Magnetic starter disengaged (three-phase motor only). Thermal protector open.	11. Wait for motor to cool before restarting. Reset thermal protector (Single-phase motor will reset automatically.)
	12. Faulty thermal protector (single-phase motor). Faulty magnetic starter (three-phase motor).	12. Replace



WARNING

To help prevent personal injury, disconnect power supply before removing cover. Any electrical work should be performed by a qualified electrician.

TROUBLESHOOTING GUIDE

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 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. Be 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.

TROUBLESHOOTING GUIDE

- | | |
|----------------------------|---|
| 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. |
|----------------------------|---|

PROBLEM	CAUSE	SOLUTION
Pump builds pressure but cannot maintain pressure.	<ol style="list-style-type: none"> 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 Troubleshooting Guide. 3. Leaking pressure switch seal. 	<ol style="list-style-type: none"> 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. 3. Repair or replace seal.
Pump will not build full pressure.	<ol style="list-style-type: none"> 1. Faulty pressure gauge. 2. Check for external leakage. 3. Check the external pressure regulator. Check the relief valve setting. 4. Look for internal leakage in double-acting cylinders. 5. Check for leaks in the flow control valve. 	<ol style="list-style-type: none"> 1. Calibrate gauge. 2. Seal 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. If functioning normally, it should start to leak off at relief valve pressure. 4. Remove the cylinder from the pump. If the pump builds full pressure, the cylinder is defective. 5. Clean and reseal or replace parts.

TROUBLESHOOTING GUIDE

PROBLEM	CAUSE	SOLUTION
Pump will not build full pressure. (Continued)	6. Inspect the pump for internal leakage. Check high pressure pump inlet or outlet ball checks.	6. Same procedure as above, but look for leaks around the entire inner mechanism. If there are no visible leaks, the high pressure pump sub-assembly may be leaking. Remove all parts. Check the valve head assembly body for any damage to the sea area. Clean and reseal if necessary. Inspect for damage and replace if necessary, then reassemble.
	7. Sheared key(s).	7. Replace
	8. Inadequate air pressure (air motor only).	8. Increase air pressure.
	9. Shifting spool seat and/or shifting spool poppet (located under high pressure pump assembly) worn.	9. Clean and reseal or replace.
	10. Shifting spool O-ring (located within shifting spool bore) worn or broken.	10. With an O-ring pick, remove O-ring and backup washer through low pressure pump assembly end. Replace.
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	1. Check the cylinder 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. Defective valve.	2. Check valve operation and inspect parts. Replace if necessary.
	3. Inadequate air pressure (air motor model only).	3. Increase air pressure.
Pump delivers excess oil pressure.	1. Faulty pressure gauge.	1. Calibrate gauge.
	2. Relief valve not properly set.	2. Adjust the relief valve.
Gasoline engine		1. Refer to instruction manual included with gasoline engine.

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.

THE WARRANTIES PROVIDED IN THE OBLIGATIONS AND LIABILITIES OF SELLER HEREUNDER, AND THE RIGHTS AND REMEDIES OF BUYER HEREUNDER ARE EXCLUSIVE AND IN SUBSTITUTION FOR, AND BUYER HEREBY WAIVES ALL OTHER WARRANTIES, GUARANTEES, OBLIGATIONS, CLAIMS FOR LIABILITIES, RIGHTS AND REMEDIES, EXPRESS OR IMPLIED, ARISING BY LAW OR OTHERWISE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTY FOR MERCHANTABILITY AND FITNESS FOR PURPOSE.

Seller's total liability is limited to the lower of the cost of repair or replacement.

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