INSTRUCTION MANUAL

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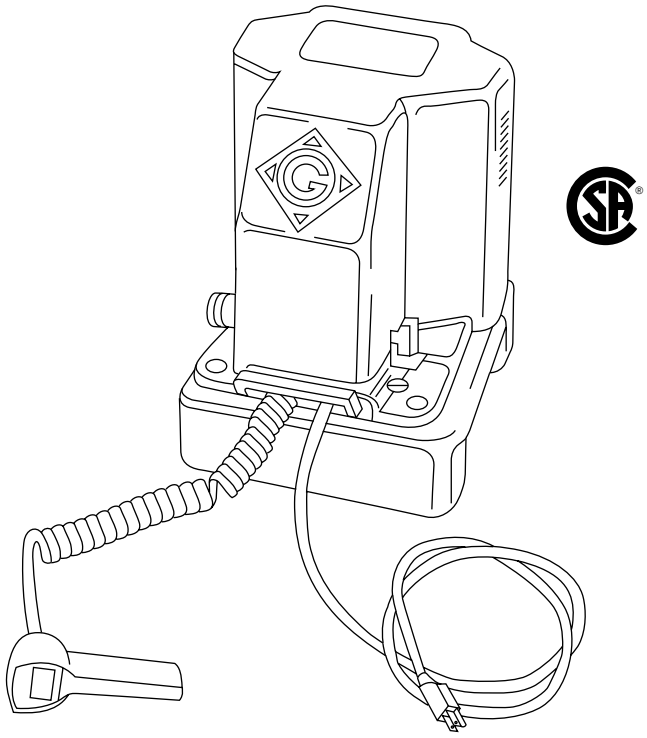
A Textron Company



980
Hydraulic Power Pump

Serial Code WW

Read and **understand** all of the instructions and safety information in this manual before operating or servicing this tool.

Table of Contents

Description

Greenlee 980 Hydraulic Power Pump is an electrically powered two-stage pump that develops a maximum of 690 bar (10,000 psi). This pump is intended to provide hydraulic power for an accessory with a single-acting ram such as a Greenlee conduit bender or cable cutter.

This pump has a factory-set internal pressure relief valve.

⚠CAUTION

Fill unit with hydraulic oil before operating pump.

Failure to fill unit with oil will result in damage to the pump.

Safety

Safety is essential in the use and maintenance of Greenlee tools and equipment. This instruction manual and any decals on the tool provide information for avoiding hazards and unsafe practices related to the use of this tool. Observe all of the safety information provided.

Purpose

This instruction manual is intended to familiarize all personnel with the safe operation and maintenance procedures for the Greenlee 980 (Serial Code WW).

Keep this manual available to all personnel.

Replacement manuals are available upon request at no charge.

KEEP THIS MANUAL

IMPORTANT SAFETY INFORMATION

SAFETY ALERT SYMBOL

This symbol is used to call your attention to hazards or unsafe practices which could result in an injury or property damage. The signal word, defined below, indicates the severity of the hazard. The message after the signal word provides information for preventing or avoiding the hazard.

⚠DANGER

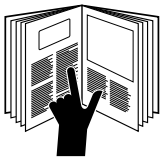
Immediate hazards which, if not avoided, WILL result in severe injury or death.

⚠WARNING

Hazards which, if not avoided, COULD result in severe injury or death.

⚠CAUTION

Hazards or unsafe practices which, if not avoided, MAY result in injury or property damage.



⚠DANGER

Read and understand all of the instructions and safety information in this manual before operating or servicing this tool.

Failure to observe this warning will result in severe injury or death.

⚠DANGER

Do not connect the pump to any system or system component other than those supplied by Greenlee. Other manufacturers' components may not withstand the maximum pressure and may fail. Nearby personnel can be injured by flying components and hydraulic oil.

Failure to observe this warning will result in severe injury or death.

⚠DANGER

Do not alter the internal high-pressure relief valve setting. Altering this setting will change the maximum pressure the pump can develop, which can cause a component failure. Nearby personnel can be injured by flying components and hydraulic oil.

Failure to observe this warning will result in severe injury or death.

IMPORTANT SAFETY INFORMATION

⚠DANGER

Do not use this pump in a hazardous environment. Hazards include flammable liquids, gases, or other materials. Using this pump in a hazardous environment can result in a fire or explosion.

Failure to observe these warnings will result in severe injury or death.

⚠WARNING

Electric shock hazard:

- Do not expose power tools to rain.
- Do not immerse the pendant switch in water or other liquid.

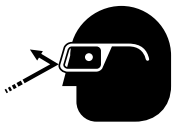
Failure to observe these warnings can result in severe injury or death.

⚠WARNING

Skin injection hazard:

High pressure oil easily punctures skin causing serious injury, gangrene, or death. If injured, seek medical help immediately to remove oil.

- Do not use fingers or hands to check for leaks.
- Depressurize hydraulic system before servicing or disconnecting the hose.



⚠WARNING

Wear eye protection when using this tool.

Failure to wear eye protection can result in serious eye injury from flying debris or hydraulic oil.

⚠WARNING

Inspect pump, hoses, couplers, and fittings for wear or damage. Replace worn, damaged or missing components with Greenlee replacement parts. Worn or damaged components can fail, resulting in injury.

Failure to observe this warning can result in severe injury or death.

⚠CAUTION

Fill unit with hydraulic oil before operating pump.

Failure to fill unit with oil will result in damage to the pump.

⚠CAUTION

- The pump is heavy and requires two persons to lift. Improper lifting can result in injury.
- Do not use hose or cord to pull, lift, or carry the equipment. Misuse will damage the hose or cord.

Failure to observe these precautions can result in injury or property damage.

IMPORTANT

Make sure all hose fittings are properly seated before starting the pump. Incomplete connections may not allow the accessory's ram to retract after the hydraulic operation is finished.

Note: Keep all decals clean and legible, and replace when necessary.

Specifications

Motor

Voltage	120 VAC
Frequency	60 Hz
Current	18.4 amps
Power	2100 watts
Revolutions per minute	3600

Pump Output

Power	1119 watts (1-1/2 hp)
Hydraulic pressure (maximum)	690 bar (10,000 psi)

Hydraulic Fluid Capacity*

Full	7.6 liters (8 quarts)
Usable	5.7 liters (6 quarts)

Hydraulic Fluid Specifications (Mobil DTE® 13M)

Viscosity	30 cSt at 40 °C (150 SSU at 100 °F)
	6 cSt at 100 °C (46 SSU at 210 °F)
Viscosity Index	145
Pour Point	-40 °C (-40 °F)

Typical Performance

Pressure	Volume
0	5 liters/min (300 in^3/min)
6.9 bar (100 psi)	3.9 liters/min (225 in^3/min)
345 bar (5000 psi)	0.91 liters/min (57 in^3/min)
552 bar (8000 psi)	0.88 liters/min (54 in^3/min)

Dimensions

Length	305 mm (12")
Width	305 mm (12")
Height	445 mm (17.5")
Weight/Mass	32 kg (71 lbs)

Setup

Hydraulic Connection

1. Clean all couplers, threaded fittings, ports and the area around all ports.
2. Remove any dust plugs from couplers.
3. Hand-tighten all couplings firmly (until all threads are fully engaged). Do not use tools.

Electrical Connection

⚠WARNING

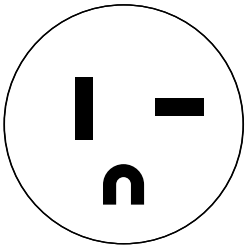
Electric shock hazard:

- Do not modify the plug provided with the tool.
- Connect this tool to a grounded receptacle on a 20-amp GFCI-protected circuit.

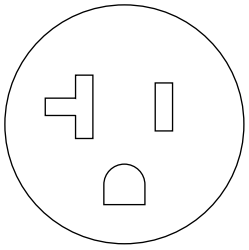
Failure to observe these warnings can result in severe injury or death.

This tool must be grounded. In the event of a malfunction or breakdown, an electrical ground provides a path of least resistance for the electric current. This path of least resistance is intended to reduce the risk of electric shock.

This tool's electric cord has a grounding conductor and a grounding plug as shown. Do not modify the plug. Connect the plug to a corresponding 20-amp GFCI-protected receptacle that is properly installed and grounded in accordance with all national and local codes and ordinances. Do not use an adapter.



Plug



Receptacle

Extension Cord Specifications:

Diameter ..... 2.5 mm^2 (12 AWG)

Length ..... 30 Meters (100 Feet)

Use only three-wire extension cords. Use of an inadequate extension cord will cause the motor to stall.

Operation

⚠WARNING

Skin injection hazard:

High pressure oil easily punctures skin causing serious injury, gangrene or death. If injured, seek medical help immediately to remove oil.

- Do not use fingers or hands to check for leaks.
- Depressurize hydraulic system before servicing or disconnecting the hose.

IMPORTANT

Procedure for depressurizing the hydraulic system:

1. Disconnect the pump from the power source.
2. Rotate the release lever to AUTO RELEASE and allow the ram to retract fully.
3. Disconnect the hose slowly to release any trapped pressure.

Note: To prevent leakage, this pump was shipped with an unvented plug installed in the reservoir fill hole. This plug must be replaced with the attached vented plug (6) before use. Failure to replace the unvented plug will cause poor performance.

Note: Starting the motor without a tool attached to the pump will cause the pump to immediately build an internal pressure of 690 bar (10,000 psi).
If this happens, shut off the pump and turn the release valve to AUTO RELEASE to release the hydraulic pressure.

1. Move release valve lever to the AUTO RELEASE position.
2. Check reservoir oil level. The oil level should be within 25 mm (1 inch) of the top of the reservoir. If oil level is too low, see Adding Oil in the Maintenance section for instructions.
3. Place release valve lever in desired position:
   a. AUTO RELEASE – ram will stop and then retract when the hand switch or foot switch is released.
   b. MANUAL RELEASE – ram will stop but will not retract when the hand switch or foot switch is released.
4. Press the hand switch or foot switch to advance the hydraulic ram. When finished, release the hand switch or foot switch.

   Note: If release valve lever is in the MANUAL RELEASE position, the ram will not retract. To retract ram, rotate the release valve lever to the AUTO RELEASE position.

Maintenance

IMPORTANT

Procedure for depressurizing the hydraulic system:

1. Disconnect the pump from the power source.
2. Rotate the release lever to AUTO RELEASE and allow the ram to retract fully.
3. Disconnect the hose slowly to release any trapped pressure.

Every time the pump is used

- Check the oil reservoir level. The oil level should be approximately 25 mm (1 inch) from the top of the reservoir. If the oil level is low, see Adding Oil.
- Examine the condition of the hose, connectors, and O-rings for deterioration, wear, or other damage. Replace any missing or damaged components.
- Check the condition of all electrical cords, plugs, and connectors.
- Listen for unusual noises and observe the operation of the pump for changes in performance. Either situation may indicate that maintenance or repairs are necessary.

Periodically

- Examine the hydraulic oil for changes in color or viscosity, and the presence of dirt or other contamination.
- Occasionally check oil temperature after pump is operated. The recommended operating temperature is 38° to 50 °C (100° to 125°F).

Cleaning

- Periodically clean the exterior of the pump and motor. Use a vacuum cleaner to clean the ventilation openings.
- Clean the area around the reservoir vent, and be sure the vent breather hole is open.
- Keep all hose connections clean and use protective caps or plugs when couplers are not in use.

Oil Condition

Visual inspection of the oil may be used as a guide to determine the need to replace the oil. A change in appearance, such as darkening or thickening, will indicate a need for replacement. The continued use of oil after it should be replaced will cause accelerated wear of system components and will void the warranty.

Adding Oil

⚠CAUTION

Do not use brake fluid. Brake fluid will ruin the seals.

1. Place control lever in AUTO RELEASE position.
2. Unplug the electrical cord from the power source.
3. Thoroughly clean the area around the fill hole.
4. Remove the vented reservoir plug.
5. Use Greenlee hydraulic fluid or an equivalent high-grade light hydraulic oil. See Specifications section of this manual to determine the correct type of hydraulic oil.
6. Pour the oil through a clean funnel with filter screen.
7. Add oil until oil level is 25 mm (1 inch) from the top of the reservoir cover.

Maintenance (cont'd)

Purging (Bleeding) Air

⚠CAUTION

When purging air from the system:

- Do not advance the ram more than 3/4 of its stroke. Overextending the ram will allow hydraulic fluid to leak out, and the ram may damage the O-rings when it retracts.
- Do not restrict the ram travel to run the pump up to full pressure (commonly called *dead heading* the pump).

Failure to observe these precautions can result in injury or property damage.

Erratic performance may indicate air in the hydraulic fluid.

1. Remove the ram from the accessory (conduit bender frame, cable cutter, etc.).
2. If possible, position the pump so that it is located higher than the ram. This will allow air to travel up the hydraulic hose to the pump reservoir.
3. Place the ram in a vertical position with the hose coupler upward.
4. Rotate the control lever counterclockwise (to MANUAL RELEASE).
5. Start the pump and, using the ram scale as a reference, advance the ram 3/4 of its stroke. Stop the pump. Do not overextend the ram!
6. Rotate the control lever clockwise (to AUTO RELEASE). The ram will retract, forcing any air out through the hose, into the pump reservoir, and through the vented plug.
7. Check the oil lever of the reservoir. Add oil if necessary.

Draining and Flushing the System

Note: Thoroughly clean the pump exterior before removing the reservoir.

1. Remove the reservoir cover screws.
2. Remove the pump system from the reservoir.
   Note: Be careful not to damage the cover gasket, inlet strainer or relief valve when removing the pump.
3. Clean the interior of the reservoir and fill with clean kerosene. Do not use solvents. Rinse the inlet strainer.
4. Place the pump system into the reservoir and replace the four cover screws.
5. Connect a hose to the pump as usual. Insert the other end of the hose into the pump reservoir at fill hole.
6. Run the pump for several minutes. While the pump is running, rotate the control lever between MANUAL RELEASE and AUTO RELEASE several times. Start and stop the pump several times to cycle the pilot-operated valve.
7. Remove the hose and remove the pump assembly from the reservoir. Drain and clean the reservoir interior. Allow the reservoir to dry. Drain the hose.
8. Reassemble the pump system.
9. Refill reservoir as instructed under the Adding Oil instructions in this section.

Motor Maintenance

Disconnect the pump from the power source before servicing or cleaning the motor. The exposed motor bearings and shaft should be cleaned periodically.

Lubrication

Lubricate the motor according the motor manufacturer's instructions, which are on the nameplate or the terminal box cover.

Troubleshooting—Hydraulic Pump

Repair work must be done by qualified personnel familiar with this equipment.

If possible, use a hand pump to apply back pressure when checking for leaks.

How to use this table: If your hydraulic pump does not operate properly, find the description of the problem under the “Problem” column. Read the Probable Cause and the Possible Remedy. Begin with solution listed first, and proceed through all of the solutions until the problem is solved. Where repairs are necessary, see the appropriate schematic and item listed in the “Possible Remedy” column.

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Motor will not start.	No power to motor.	Plug electric cord in to a properly rated power source. Unplug cord and inspect the contacts. Clean contacts if necessary.
		Replace low voltage control. The voltage should be 120 VAC (+/– 10%).
		Replace the electric cord.
		Replace switch cord or ON/OFF switch.
	Motor is damaged or worn out.	Replace motor.
Motor will not start under load.	Voltage supplied to motor is too low.	Unplug cord and check power source with a voltmeter. The voltage should be 120 VAC (+/– 10%).
	Current rating of extension cord is too low.	See the extension cord specifications under Electrical Connection in the Setup section of this manual.
	Pilot-operated valve will not open, will not open fully, or opens too slowly.	See “Troubleshooting—Pilot-Operated Valve” at the end of this Troubleshooting section.

Troubleshooting—Hydraulic Pump (cont'd)

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Motor starts, but stops when it encounters a load.	Voltage supplied to motor is too low.	Unplug cord and check power source with a voltmeter. The voltage should be 120 VAC (+/– 10%).
	Current rating of extension cord is too low.	See the extension cord specifications under Electrical Connection in the Setup section of this manual.
	Motor is overheated.	Let motor cool. Do not run motor continuously in a hot environment.
	Misalignment of the motor shaft and low pressure pump drive shaft.	Replace reservoir cover plate (22).
	The counterweight needs adjustment.	See Motor Face Seal, Figure A1, for the correct setting of the counterweight.
	Motor is damaged or worn out.	Replace motor.
Ram will not advance. Ram advances slowly. Ram will not advance completely.	Low-pressure system has a partial or complete failure.	See Hydraulic Schematic (1, 3, 7) and refer to Figure A4 in the Repairs section of this manual.
	Unvented plug has not been replaced.	Remove the unvented plug and install the vented plug.
	Oil level is too low.	Add oil per instructions in the Maintenance section of this manual.
	Wrong oil viscosity.	Replace oil with the type recommended in the Specifications section of this manual.
	Oil is dirty.	Replace oil with the type recommended in the Specifications section of this manual.
	Oil is cold.	Preheat oil. Without an accessory connected to the coupler, run the pump to build pressure, then release. Repeat until oil is warm.

Troubleshooting—Hydraulic Pump (cont'd)

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Ram will not advance. Ram advances slowly. Ram will not advance completely. (cont'd)	The intake strainer is dirty or clogged.	Remove the strainer and clean with kerosene.
	Motor rotates in the wrong direction.	Correct the motor wiring. See the Motor Control, Schematic Diagram in the Motor Control Unit section of this manual.
	Low-pressure relief valve is dirty or is set incorrectly.	To clean and adjust this valve, see Low-Pressure Relief Setting, Figure A4 in the Repairs section of this manual.
	Broken internal part.	Inspect and/or replace drive pin (78), motor shaft key (34), rollpin (39), or drive shaft (77).
	Worn or damaged internal part.	Inspect and/or replace the gerotor (80); eccentric shaft (38), or bearings (37 and/or 41).
	Pilot-operated valve will not close.	See "Troubleshooting—Pilot-Operated Valve" at the end of this troubleshooting section.
	Internal hydraulic fluid leak.	Inspect and replace as necessary: O-ring Plug (79) & Pump Block Cover (50).
Ram advances erratically and retracts erratically.	Air in the hydraulic fluid.	Refer to Purging (Bleeding) Air in the Maintenance section of this manual.

Troubleshooting—Hydraulic Pump (cont'd)

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Pump will not build enough pressure to complete the job. Ram advances slowly.	High-pressure system is faulty.	See Hydraulic Schematic (5) and refer to Figure A5-1 in the Repairs section of this manual.
	System has an external hydraulic leak.	Visually inspect hoses, connectors and fittings for leaking hydraulic fluid. Replace faulty components.
	Pilot-operated valve will not close.	See "Troubleshooting—Pilot-Operated Valve" at the end of this Troubleshooting section.
	Low-pressure system is at fault.	Find "Low-pressure system partial or complete failure" under Probable Causes in this Troubleshooting section.
	At high-pressure inlet, the check ball has too much travel.	See Check Ball Travel at High Pressure Inlet, Figure A5-1. If the seats are leaking, see Ball Seat Refinishing, Figure B2 in the Repairs section of this manual.
	The high-pressure piston is stuck.	Disassemble, clean, and inspect the high-pressure bushing (75) and high-pressure piston (76). Replace parts as necessary.
	Internal hydraulic fluid leak.	Inspect and replace as necessary: O-ring Plug (68) Cavity Insert (74) High-Pressure Bushing (75) High-Pressure Relief Valve (72)
	High-pressure relief valve failure.	Readjust, re-seat or replace valve (72).

Troubleshooting—Hydraulic Pump (cont'd)

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Ram will not hold pressure.	System has an external leak.	Visually inspect hoses, connectors and fittings for leaking hydraulic fluid. Replace faulty components.
	Manual control valve needs adjustment or repair.	See Hydraulic Schematic (8) and refer to Figures A2 and A3 in the Repairs section of this manual.
	The manual control valve is not in correct position.	Rotate the manual control valve to AUTO RELEASE position.
	The manual control valve needs to be adjusted.	See Manual Release/Automatic Release Valve Handle Setting, Figure A3 in the Repairs section of this manual.
	Check ball does not seat properly.	See Manual Release/Automatic Release Valve Handle Setting, Figure A2, and Ball Seat Refinishing, Figure B4 in the Repairs section of this manual.

Troubleshooting—Hydraulic Pump (cont'd)

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Ram will not retract.	The manual control valve is not in correct position.	Rotate the manual control valve to AUTO RELEASE position.
	The manual control valve needs to be adjusted.	Adjust the handle. See Manual Release/Automatic Release Valve Handle Setting, Figure A3 in the Repairs section of this manual.
	Quick-couplers are not fully threaded together.	Disconnect the hydraulic hoses and clean the couplings. Reconnect the hydraulic hoses. Hand-tighten couplings firmly until all threads are engaged. Do not use a wrench.
	Manual control valve set incorrectly.	See Hydraulic Schematic (8) and refer to Figures A2 and A3 in the Repairs section of this manual.
	The pilot-operated valve will not open, will not open fully, or opens too slowly.	See "Troubleshooting—Pilot-Operated Valve" at the end of this Troubleshooting section.
	Hydraulic cylinder of the accessory has failed.	Troubleshoot the accessory that is connected to the pump.

Troubleshooting—Pilot-Operated Valve

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Pilot-operated valve will not open. Pilot-operated valve will not open fully. Pilot-operated valve opens too slowly.	The pilot piston does not return freely.	See Hydraulic Schematic (7) and refer to Low-Pressure Relief Setting, Figure A4 in the Repairs section of this manual.
	Oil is cold.	Preheat oil. Without an accessory connected to the coupler, run the pump to build pressure, then release. Repeat until oil is warm.
	Wrong oil viscosity.	Replace oil with the type recommended in the Specifications section of this manual.
	Oil is dirty.	Replace oil with the type recommended in the Specifications section of this manual.
	Oil is cold.	Preheat oil. Without an accessory connected to the coupler, run the pump to build pressure, then release. Repeat until oil is warm.
	Pilot piston components may be worn or damaged.	Clean and inspect items 42-49. Replace parts as necessary.
	Low-pressure bypass check valve is set incorrectly.	See Hydraulic Schematic (4).
		If set too low: The pump cannot shift to the high-pressure stage. See Pressure Adjustment for the Low-Pressure Bypass Check, Figure A5 in the Repairs section of this manual.
		If set too high: The pump cannot restart under pressure. See Pressure Adjustment for the Low-Pressure Bypass Check, Figure A5 in the Repairs section of this manual.
	The ball seat of the low-pressure bypass check valve is damaged.	See Ball Seat Refinishing, Figure B2 in the Repairs section of this manual.

Troubleshooting—Pilot-Operated Valve (cont'd)

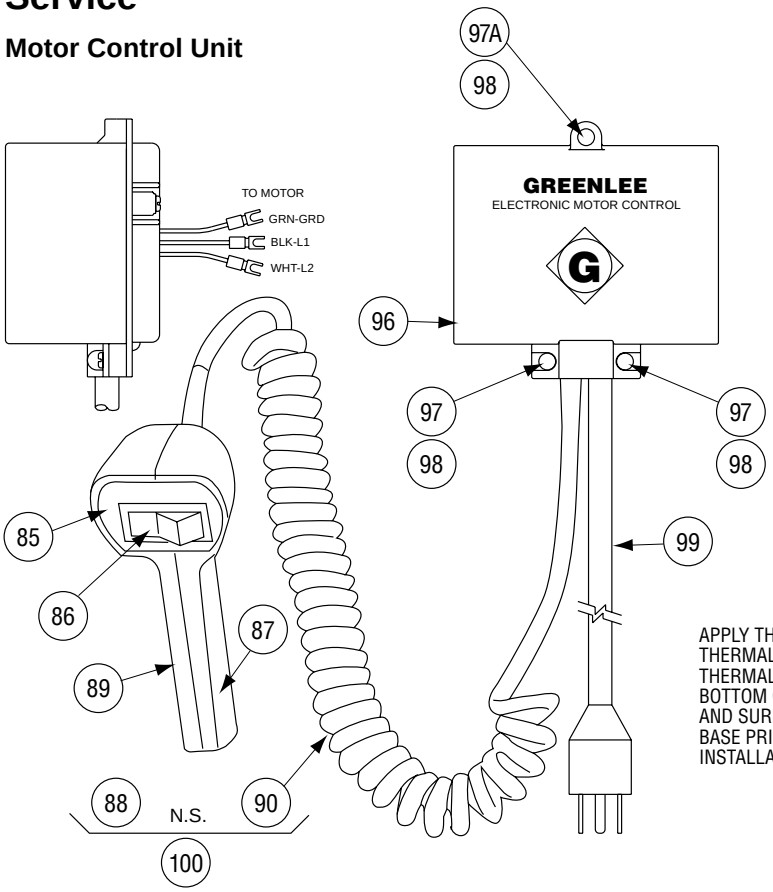
PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Pilot-operated valve will not close.	A particle of dirt or some other foreign object is holding the low-pressure bypass check valve open.	Disassemble, clean and inspect spring (70) and 9/32" ball (71). Replace parts as necessary.
	Low-pressure bypass check valve is faulty.	See Hydraulic Schematic (4).
		If set too low: The pump cannot shift to the high-pressure stage. See Pressure Adjustment for the Low-Pressure Bypass Check, Figure A5 in the Repairs section of this manual.
		If set too high: The pump cannot restart under pressure. See Pressure Adjustment for the Low-Pressure Bypass Check, Figure A5 in the Repairs section of this manual.
	The ball seat of the low-pressure bypass check valve is damaged.	See Ball Seat Refinishing, Figure B2, B3 and B4 in the Repairs section of this manual.
	Low-pressure bypass check ball seat is oversized.	Replace the pump block (84).

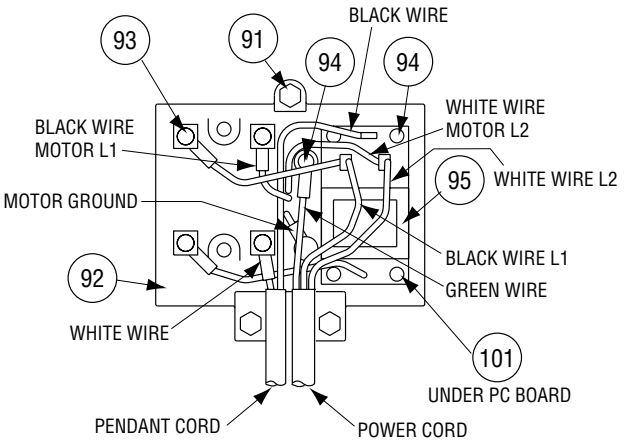
Troubleshooting—Pilot-Operated Valve (cont'd)

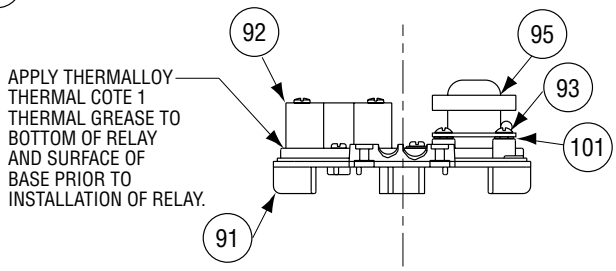
PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
Pilot-operated valve will not close. (cont'd)	A particle of dirt or some other foreign object is holding the low-pressure relief valve open.	Disassemble, clean and inspect the valve piston (48), spring (47), ball (46), spring (45) and stem (44). Replace parts as necessary.
	Low-pressure relief valve is set too low.	See Low-Pressure Relief Setting, Figure A4 in the Repairs section of this manual.
	Low-pressure bypass check ball seat is damaged.	See Ball Seat Refinishing in the Repairs section of this manual. Figures B2, B3, and B4.
	Low-pressure bypass check seat is oversized.	Replace the pump block (84).
	The pilot piston does not advance freely.	See Hydraulic Schematic (7).
		See Low-Pressure Relief Setting, Figure A4 in the Repairs section of this manual. Clean and inspect items 42-49. Replace parts as necessary.
	Valve seat is damaged.	See Hydraulic Schematic (3, 7).

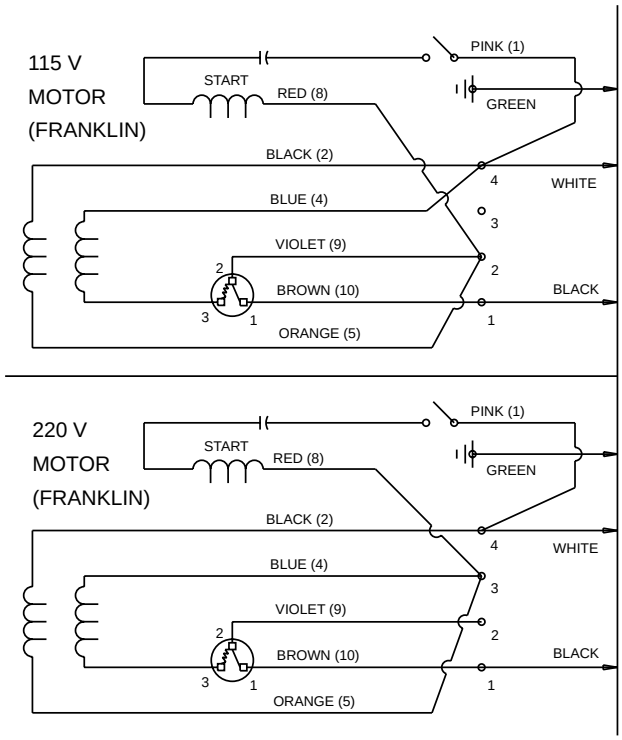
Service

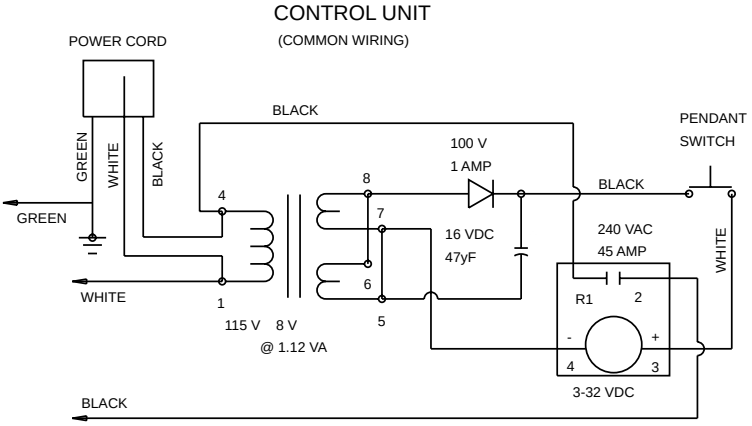
Motor Control Unit







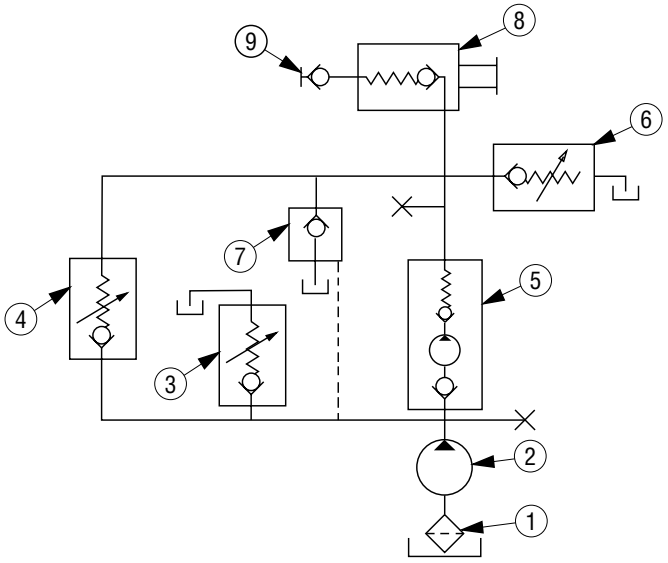




MOTOR WIRE CHART	
FRANKLIN ELEC.	**GENERAL ELEC.**
BROWN (10)	PURPLE (P1)
VIOLET (9)	BROWN (P2)
PINK (1)	BLACK (T5)
ORANGE (5)	ORANGE (T3)
BLACK (2)	YELLOW (T4)
RED (8)	RED (J10)
BLUE (4)	WHITE (T2)

Service (cont'd)

Hydraulic Schematic



(1) Intake strainer, #50 mesh brass screen

(2) Low-pressure pump — 5.52 liters/min. (335 in^3/min) at 3600 rpm (100%)

(3) Low-pressure relief valve — 19 bar (275 psi) located in pilot-operated valve (7) Piston

(4) Low-pressure bypass check valve

(5) High-pressure pump 980 — 1.04 liters/min. (63.5 in^3/min) at 3450 rpm (100%)

(6) High-pressure relief valve — 717/690 bar (10,400/10,000 psi)

(7) Pilot-operated directional control valve — 3 way, 2 position

(8) Manually operated check valve

(9) Female coupler half

Sealing Instructions for Assembly

Motor

If the motor has been disassembled, seal with a 3 mm (1/8") bead of a silicone-based gasket/flange sealant, such as Loctite® 587 Ultra Blue®, as follows:

(A) To the mounting surface around the threads (four locations)

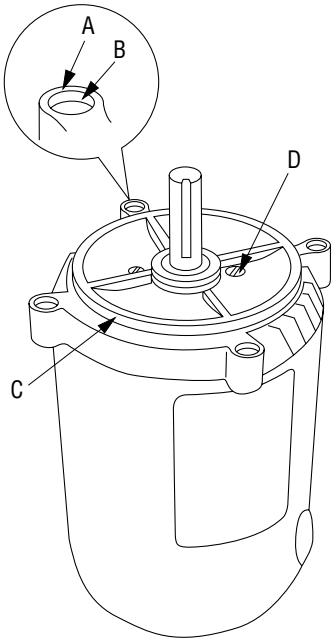
(B) To the chamfer (four locations)

(C) Around the innermost machined circumference of the mounting surface

Apply a 1.5 mm (1/16") bead of an RTV-type silicone-based sealant, such as Dow Corning 732™ Multipurpose Sealant, as follows:

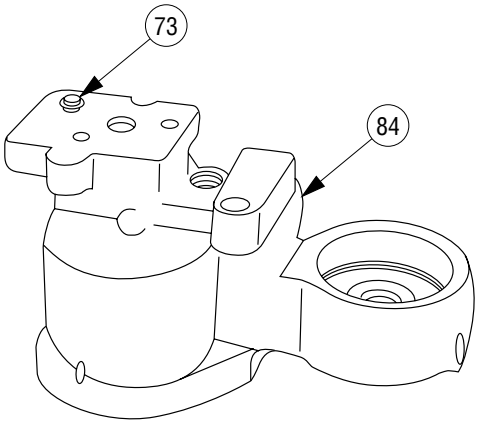
(D) Around the motor bearing screws (two locations)

Assemble immediately.



Driv-Lok Pin

Seal the Driv-Lok pin (73) to the pump block (84) with a 1.5 mm (1/16") bead of an RTV-type silicone-based sealant, such as Dow Corning 732™ Multipurpose Sealant or equivalent.



Repairs

The following section and figures describe pertinent details for refinishing ball seats and component re-assembly and adjustments.

Motor Face Seal

When reassembling the motor, refer to Figure A1 for the face seal seating dimension. Also, refer to this figure for setting the vertical position of counterweight (32).

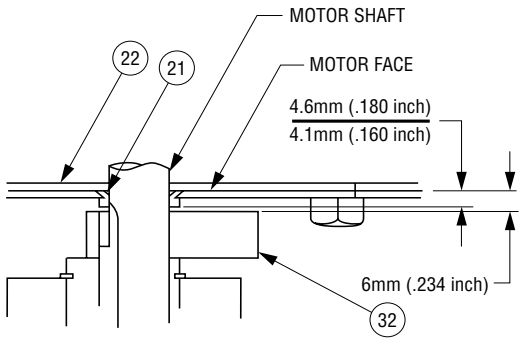


Figure A1 (8)

Manual Release/Automatic Release Valve Handle Setting

Refer to Figures A2 and A3. Thread in the shaft (62) until it just touches the check ball (55) (in its spring-loaded closed position). Slide collar (104) on the shaft. Position the handle (61) at the location “Position 1” (Figure A3), with the other surface of the handle flush with the end of the shaft. Lock in place. Rotate the handle to “Position 2” (Figure A3). Slide the collar toward the valve body until it contacts the 15.9 mm (5/8") diameter portion of the control shaft. Rotate the lock collar clockwise until it touches the stop pin, and lock in place.

When locking control handle and lock collar in place, torque set screws tight to 2.8–3.4 N·m (25–30 inch-pounds).

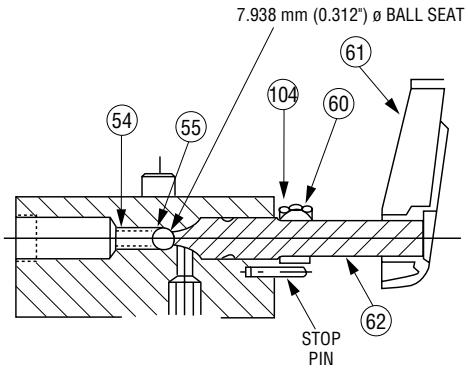


Figure A2 (8)

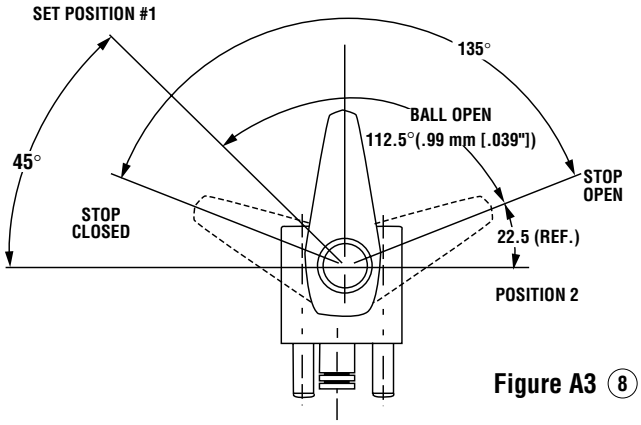


Figure A3 (8)

Repairs (cont'd)

Low Pressure Relief Setting

Refer to Figure A4. Lightly bottom the stem (44) on the ball (46). Then, back out the stem 3-1/2 turns. Tighten nut (43). The resulting pressure setting should be approximately 19 bar (280 psi).

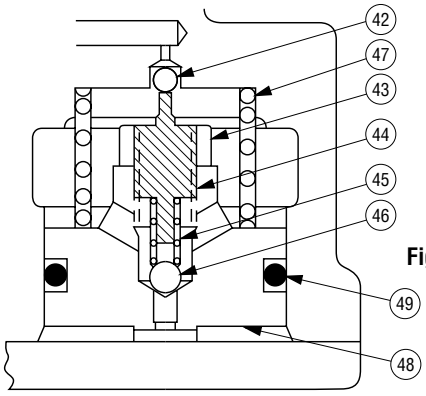


Figure A4 (3) (7)

Low-Pressure Bypass Check Pressure Adjustment

When properly set to the dimension shown in Figure A5, the high pressure stage operation of the pump will be delayed approximately one (1) second after the motor starts. This delay is created by the closing time of the pilot-operated valve.

Note: This dimension must be increased if ball seat depth is increased by more than 0.4 mm (1/64 inch).

Increasing the bypass pressure (CW rotation of adjusting screw—increase of set dimension) will shorten delay. If delay becomes too short, the motor will not restart when high pressure is held in the line. The motor should restart with a maximum required off time of 1/2 to 1 second.

Decreasing the bypass pressure (CCW rotation of adjusting screw) will increase delay. The pilot-operated valve will not close if pressure is set too low.

Changes in oil temperature (viscosity) will affect the amount of delay. The pumping delay will increase with rising oil temperature (thinner oil).

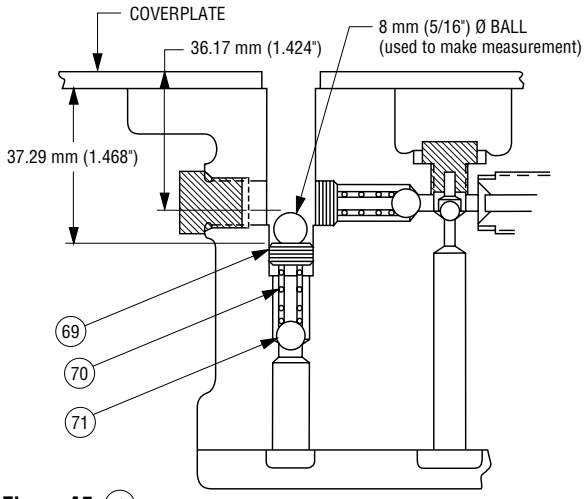


Figure A5 (4)

Repairs (cont'd)

High-Pressure Inlet Check Ball Travel

The amount of allowable ball travel is critical to the optimum high pressure output (flow rate). Refer to Figure A5-1. Carefully and accurately measure (depth "mike") the "A" dimension (top of pump block to seated ball) and "B" dimension (top of pump block to head of plug—at center). Carefully and accurately set the "C" dimension (overall length of assembled plug and pin) of a new plug and pin equal to "A" minus "B" minus .305 ± .050 mm (.012 ± .002 inches).

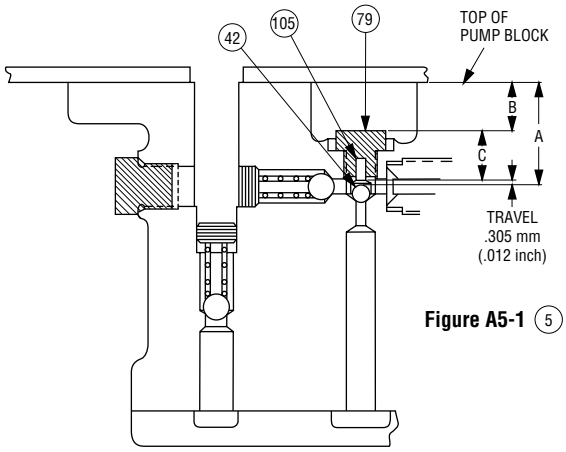


Figure A5-1 (5)

Low Pressure Pump Drive Pin

Assemble with cone point end in half-round keyway.

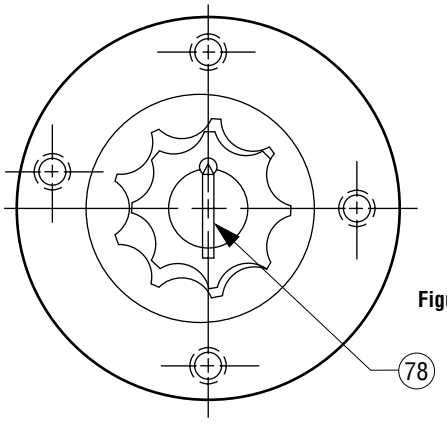


Figure A6

Ball Seat Refinishing

Refer to Figures B2, B3, and B4 for the proper drill size to refinish the conical seat and finish ream size. These operations must be performed with the pump or valve block properly held and using a drill press. Only a very small amount of material should be removed.

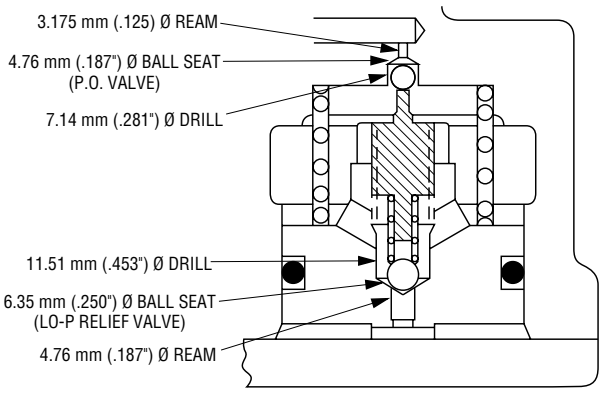


Figure B2 (3) (7)

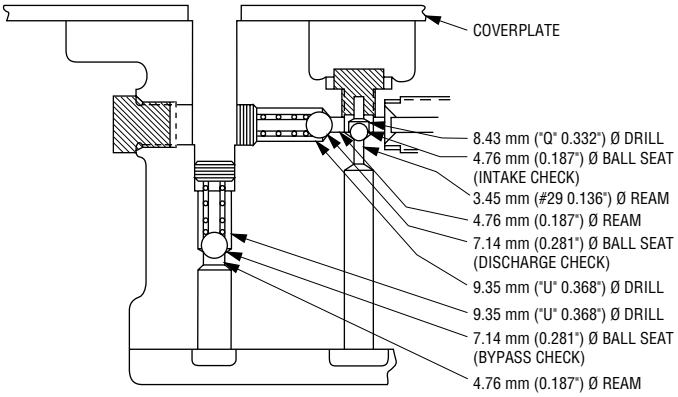


Figure B3 (4) (5)

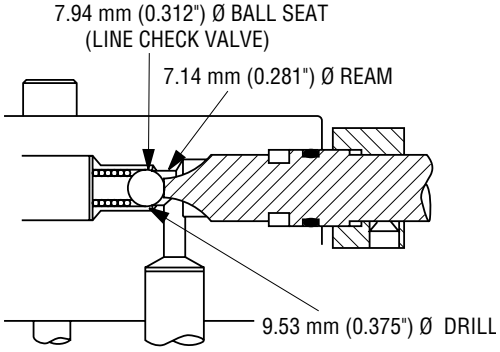
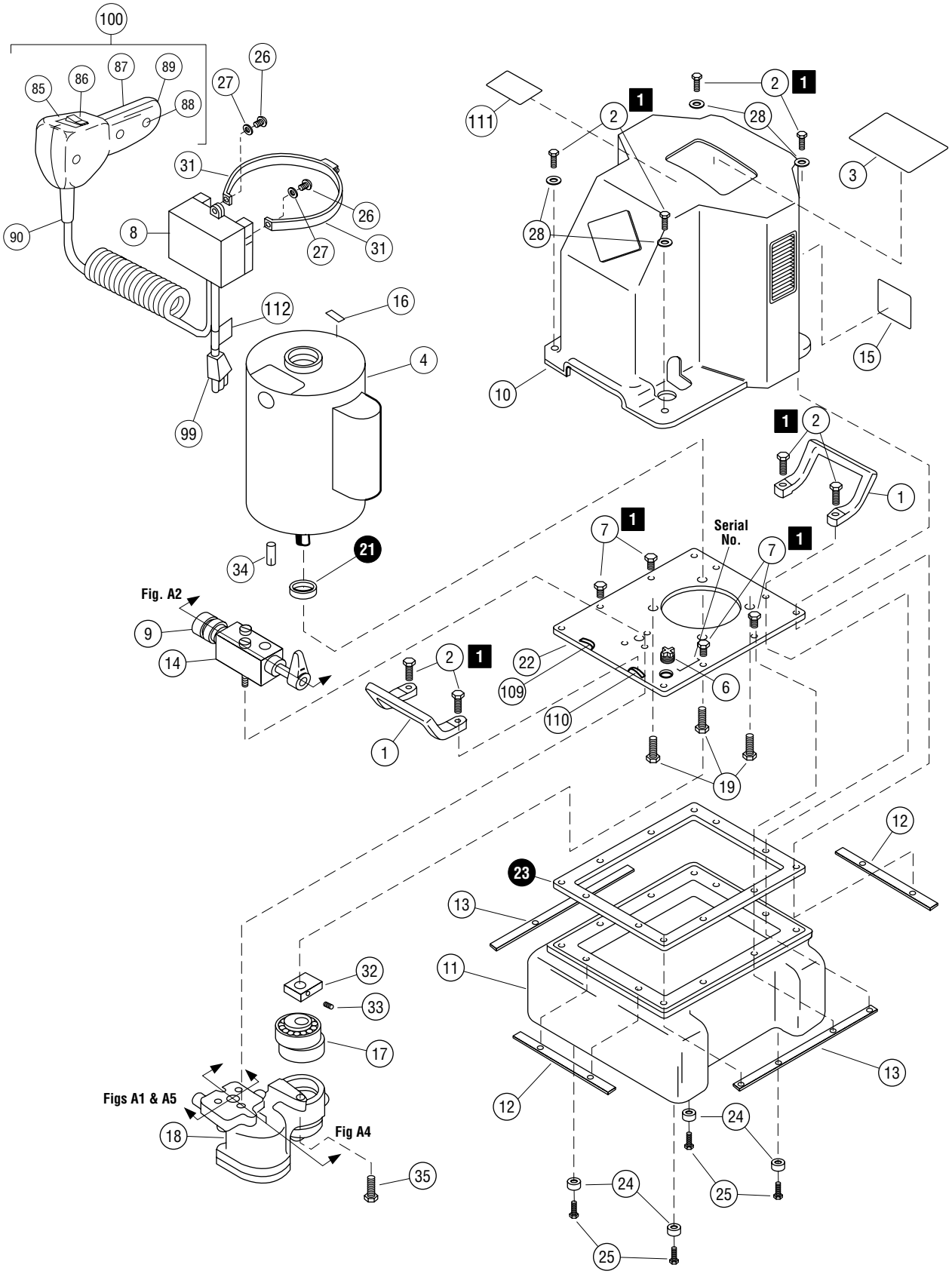
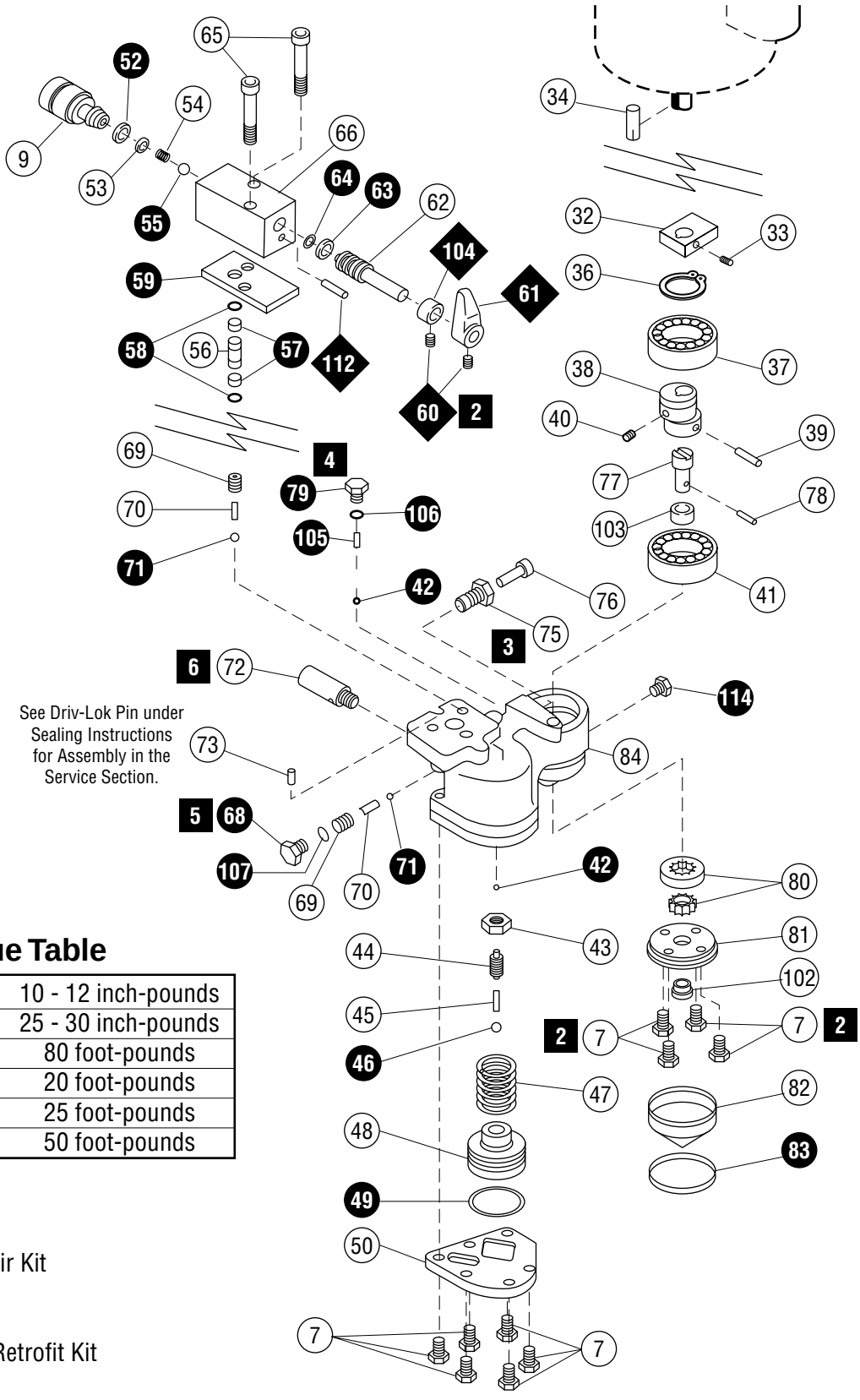


Figure B4 (8)

Exploded View



Exploded View—Pump Block



Torque Table

1	1.13 - 1.35 N•m	10 - 12 inch-pounds
2	2.8 - 3.4 N•m	25 - 30 inch-pounds
3	110 N•m	80 foot-pounds
4	27 N•m	20 foot-pounds
5	34 N•m	25 foot-pounds
6	68 N•m	50 foot-pounds

● 503 4369.6
Hydraulic Repair Kit

◆ 503 5464.7
Release Knob Retrofit Kit

Parts List

KEY	PART NO.	DESCRIPTION	QTY.
1	503 3518.9	Carrying Handle	2
2	905 3709.2	1/4"-20 x 1-1/4" Hex Head Screw	8
3	503 3962.1	Decal	1
4	918 6314.7	Motor, 115 VAC, 1-1/2 HP GE Motor 5KC48NG848X FE Motor 1103007483	1

SERVICE PARTS:		GE	FE
Capacitor	Greenlee No.	918 5349.4 ①	918 6548.4 ②
	Manufacturer No.	8753704AX16 ①	275463-103 ②
Cover, Cap	Greenlee No.	918 5353.2	918 6549.2
	Manufacturer No.	111B276AA1	290312-101

6	503 2661.9	Fill-Vent Plug	1
7	905 0520.4	1/4"-20 x 3/4" Hex Head Screw	14
8	503 3503.0	Motor Control Unit (Consists of 91-101 & 111-113)	1
9	905 0807.6	Coupling	1
10	503 3488.3	Shroud	1
11	503 3555.3	Reservoir	1
12	503 3535.9	Short Retaining Strap	2
13	503 3536.7	Long Retaining Strap	2
14	503 3537.5	Release Valve Unit (Consists of 52-66, 104, 108)	1
15	503 3722.0	I.D. Decal	1
16	501 5832.5	Arrow Decal	1
17		Eccentric Unit (see Exploded View—Pump Block for breakdown)	1
18		Pump Block Unit (see Exploded View—Pump Block for breakdown)	1
19	905 0530.1	Hex Hd. Cap Screw #3/8-16 x 1.00	3
*21	905 3682.7	Seal	1
22	503 3517.0	Cover Plate	1
*23	503 2627.9	Cover Plate Gasket	1
24	905 3829.3	Rubber Foot	4
25	905 1185.9	Screw, 1/4"-20 x 1/2"	4
26	905 1460.2	Self-Tapping Screw #10 x 3/8"	2

Parts List (cont'd)

KEY	PART NO.	DESCRIPTION	QTY.
27	905 3468.9	#10 Flat Washer	2
28	905 2339.3	1/4" Flat Washer	4
31	503 9896.2	Mounting Strap	1
32	503 3527.8	Counterweight	1
33	905 1269.3	Set Screw, 1/4"-20 x 1/4"	1
34	501 4557.6	Motor Shaft Key, 3/16" x 1-3/8"	1
35	905 0533.6	Hex Hd. Cap Screw 3/8"-16 x 1.50	1
36	905 3707.6	Retaining Ring	1
37	905 3758.0	Ball Bearing #1206	1
38	503 3526.0	Eccentric Shaft	1
39	905 0699.5	Rollpin, 3/16" x 1"	1
40	905 0791.6	Set Screw, #10-32 x 1/4"	1
41	905 3704.1	Ball Bearing, #3206	1
*42	905 0678.2	Ball, 3/16"	2
43	905 0016.4	Jam Nut, 1/2"-20	1
44	503 3520.0	Stem	1
45	502 2534.5	Spring	1
*46	905 0679.0	Ball, 1/4"	1
47	905 3701.7	Spring	1
48	503 3519.7	Auto Valve Piston	1
*49	905 0340.6	O-Ring, 1-5/8" x 2" x 3/16"	1
50	503 3521.9	Pump Block Cover	1
*52	905 3503.0	Retaining Ring	1
53	905 3468.9	Plain Flat Type "A" Washer	1
54	905 3510.3	Compression Spring	1
*55	905 0680.4	Ball, 5/16"	1
56	503 2622.8	Coupling	1
*57	905 1290.1	Back-up Ring, 3/8" x 1/2" x 1/16"	2
*58	905 0168.3	O-Ring, 3/8" x 1/2" x 1/16"	2
*59	503 2626.0	Gasket	1
+60	905 1269.3	Set Screw, 1/4"-20 x .38	2
+61	503 4796.9	Release Valve Knob	1
62	503 3541.3	Control Shaft	1
*63	905 3827.7	Back-up Ring, 1/2" x 5/8"	1

Parts List (cont'd)

KEY	PART NO.	DESCRIPTION	QTY.
*64	905 0912.9	O-Ring, 1/2" x 5/8" x 1/16"	1
65	905 3496.4	Cap Screw, 5/16"-18 x 2.50	2
66	503 2623.6	Release Valve Body	1
*68	905 3698.3	O-Ring Plug (includes 107)	1
69	905 3712.2	Jam Screw, 7/16"	2
70	905 3702.5	Spring	2
*71	905 0436.4	Ball, 9/32"	2
72	500 6067.8	High Pressure Relief Valve	1
73	905 3706.8	Type "D" Driv-Lok Pin, 1/4" x 1/2"	1
75	503 3530.8	High Pressure Bushing	1
76	503 3528.6	High Pressure Piston	1
77	503 3525.1	Drive Shaft	1
78	503 2934.0	Drive Pin	1
*79	905 3699.1	O-Ring Plug (includes 106)	2
80	905 3517.0	Gerotor	1
81	503 4197.9	Lower Gerotor Plate Unit (includes Key 102)	1
82	503 3524.3	Filter	1
*83	905 3766.1	O-Ring, 2-3/8" x 2-5/8" x 1/8"	1
84	503 3533.2	Pump Block	1
85	503 2370.9	Faceplate Decal	1
86	918 6265.5	Switch	1
87	503 1902.7	Handle, Right Half	1
88	905 3441.7	Self-Tapping Screw, #6-20 x 5/8"	3
89	503 1901.9	Handle, Left Half	1
90	503 2362.8	Cord	1
91	503 3491.3	Motor Control Base	1
92	918 6292.2	Relay	1
93	905 3840.4	Self-Tapping Screw, #6-32 x 5/16"	6
94	905 3695.9	Pan Head Type C Screw, #6-32 x 1/4"	2
95	503 3733.5	Transformer Unit	1
96	503 3492.1	Motor Control Cover	1
97	905 3580.7	Pan Head Mach. Screw, #6-32 x 5/8"	2
97A	905 0430.5	Pan Head Mach. Screw, #6-32 x 3/8"	1

Parts List (cont'd)

KEY	PART NO.	DESCRIPTION	QTY.
98	905 0632.4	Hex Nut, #6–32	3
99	918 6487.9	96" Long Cord	1
100	503 2363.6	Pendant Switch Unit (Consists of 85-90)	1
101	905 3831.5	Nylon Spacer, .150 ID x 5/16" OD x .050	4
102	905 3839.0	Bearing, Bronze	1
103	905 3320.8	Bearing, Bronze, 1/2" x 5/8" x 1/2"	1
+104	503.4886.8	Shaft Stop Collar	1
*105	905 3816.1	Pin, 1/8" x 1/4" Driv-Lok	1
106	905 3878.1	O-Ring	2
107	905 3880.3	O-Ring	1
+108	905 0078.4	Roll Pin, .187 Dia. x 3/4" Long	1
109	905 4171.5	Clamp, 5/16"	1
110	905 4172.3	Clamp, 7/16"	1
111	500 2581.3	Decal, caution	1
112	502 2510.3	Decal, caution	1

* Parts included in Hydraulic Repair Kit No. 503 4369.6

+Parts included in Release Knob Retrofit Kit 503 5464.7

①	440 µfd.	Grainger	#1A569	1B/16Ø x 3-3/8	↓	PSA4R 10400N
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