917 and 917-5 POWERIG Hydraulic Unit
(Obsolete) Instruction manual
for reference only
An important notice
Please read this manual before servicing or using Tool. Comply with WARNINGS to prevent serious personal injury. Observe CAUTIONS, Notes and bold face type to avoid damage to equipment. The SAFETY GLOSSARY helps in understanding our safety language.

If you require more information, contact our local representative, or the nearest office listed on the back cover. Since our only concern is keeping you as a valued customer, please let us know your requirements -- this includes equipment, literature and safety information. For a quick response, call any time during business hours.

WARNING
When operating Huck installation equipment, always wear approved eye protection.

SAFETY GLOSSARY

Bold Italic type is for stronger emphasis and requires particular attention. Wherever used, underlining is for additional emphasis.

WARNINGS require complete understanding to avoid severe personal injury.

CAUTIONS indicate conditions that will damage equipment/structure.

Notes are reminders of required procedures.

Bold type within a sentence is for emphasis concerning a particular procedure.

This manual applies to Huck Model 917 POWERIG® Hydraulic Units (ser. no. 0101 and above), and 917-5 (ser. no. 0120 and above).
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Please note:
917CSA550 and 915-5-550 wiring diagram
is on P. 42 (3rd. tool on P. 32). 8-20-92
Description

Specifications
Table 1.

<table>
<thead>
<tr>
<th>Description</th>
<th>917</th>
<th>917-5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Width:</strong></td>
<td>25.0 (635 mm)</td>
<td>31.0 inches (787 mm)</td>
</tr>
<tr>
<td><strong>Length:</strong></td>
<td>44.0 (1118 mm)</td>
<td>44.0 (1118 mm)</td>
</tr>
<tr>
<td><strong>Height:</strong></td>
<td>30.0 (762 mm)</td>
<td>30.0 (762 mm)</td>
</tr>
<tr>
<td><strong>Weight:</strong> Operational</td>
<td>585 lbs. (265 kg)</td>
<td>601 lbs. (272 kg)</td>
</tr>
<tr>
<td></td>
<td>708 lbs. (321 kg)</td>
<td>724 lbs. (328 kg)</td>
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</table>

**System:** Single open center circuit with 8,400 psi max. 2 gal/min each circuit

**Pump:** Axial 6 piston SPLIT FLOW Rivett Constant Displacement, Hydraulic Piston Pump direct mounted to motor.

**Oil Control:** four way solenoid operated Directional Valve, pressure relief valve, and idler valve on each circuit.

**Reservoir Capacity:** 22 gallons (center of sight gauge)

**Cooler:** Fan and radiator air/oil heat exchanger

**Remote Control:** 24 volt control circuit

**Power Source:** 10 HP Reuland electric motor 220 or 440 volts, 60 hertz, 3 phase (1)

**Hydraulic Fluid:** Fire resistant hydraulic fluid (SUS 230°F 100°F and SUS 400°F 210°F)

**Output Pressure:**
5800 psi (40000 kPa) PULL
2800 psi (19300 kPa) RETURN

(1) Components shipped with unit allow change over to 220 volts, 60 hertz, 3 phase operation. Other options available include:

917CSA220 220V, 60 Hz, 3 ph-10 hp
917CSA440 440V, 60 Hz, 3 ph-10 hp
917CSA550 550V, 60 Hz, 3 ph-10 hp

917-2 500V, 50 Hz, 3 ph-10 hp
917-3 400V, 50 Hz, 3 ph-10 hp
917-5 220 or 440V, 60 Hz, 3 ph-10 hp

Model numbers for combinations of POWERIG Hydraulic Unit/Hose Kits are:

917-26 POWERIG Hydraulic Unit and Hose Kit - 26 ft.
917-52 POWERIG Hydraulic Unit and Hose Kit - 52 ft.

See Tables 11 and 12 for optional model parts list and hose kits.
General

The Models 917 and 917-5 POWERIG® Hydraulic Units are electrically operated hydraulic power sources designed to operate Huck Installation Equipment. Model 917 is designed to operate two pieces of equipment simultaneously and independent of each other. The units are semi-portable and can be moved with a fork-lift truck.

Model 917-5 operates three tools simultaneously and independently of each other. The Model 917-5 is the basic Model 917 with an additional combination valve; including related electrical and hydraulic components. An enclosure containing the electric-hydraulic control assembly is mounted to the reservoir.

Figures 1, 2, 3, 4 and 5 show features of Model 917 and 917-5 POWERIG Hydraulic Units and identify main components. Hydraulic pressure is developed by axial piston pump driven by 10-hp electric pump motor. Hydraulic pressure from pump is directed to PULL and RETURN ports by combination valves controlled from installation equipment by relays and solenoids.

Hydraulic fluid is stored in the 22 gallon reservoir which serves as a base for motor, pump, etc. Filler-strainer is provided for adding hydraulic fluid. A 70 micron strainer in reservoir suction line assures clean, filtered hydraulic fluid for hydraulic system.

Before returning to reservoir, circulating hydraulic fluid passes through cooler where temperature of fluid is lowered to proper operating level. Fan attached to rear shaft extension of electric motor aids in dissipating heat from the cooler.

Note

Factory delivered Models 917 and 917-5 POWERIG Hydraulic Units are fused and wired for 440 volt, 60 hertz, 3 phase (1) alternating current outputs. The units are shipped WITHOUT hydraulic fluid.

(1) See Optional POWERIG Hydraulic Unit Models for units operating on other electrical power sources.

Electrical Control Panel

Electrical control panel contains two compartments (1) Disconnect and (2) Control and transformers.

Disconnect compartment contains three-pole main disconnect switch, three main line fuses and terminals for power cable connection.

Control compartment contains 460/230-110 volt transformer, 110-24 volt transformer for control circuit, motor contactor with three overload relays (heaters), multi-contact relay(s) for control circuit, START and STOP buttons, 24 volt and 110 volt circuit breakers, base(s) (socket(s)) for plugging in the tool control cord(s) and power cable entrance connector.
Figure 1,
Model 917 and 917-5 -- Front View (hood removed)

Figure 2,
Model 917 -- Left Side View (hood removed)
Serial No. 0797 and Below
Figure 3, Model 917 -- Left Side View (hood removed) Serial No. 0798 and Above
Figure 4,
Model 917-5 -- View of Electric-Hydraulic Control Assembly

Figure 5,
Model 917-5 -- Top View (hood removed)
Serial No. -- 0126 and Above
Four-conductor power cable, including ground conductor, is used to connect POWERIG Hydraulic Unit to electrical power source. Cable is NOT shipped with unit. User must furnish power cable in accordance with his particular requirements. Only a qualified electrician should install power cable and make the few adjustments necessary to suit voltage to be used: 440 volts, 60Hz, 3 phase. See Optional POWERIG Hydraulic Unit Models operating on other electrical power sources.

Combination Valve

Each combination valve contains a four-way solenoid operated directional valve, pressure relief valve and idler valve. Four-way valve, which is controlled by tool trigger through a relay and solenoid, directs hydraulic fluid under pressure to PULL or RETURN hoses connected to installation tool, or other equipment. Pressure relief is designed to protect POWERIG Hydraulic Unit and installation tools from excessive pressure during pull cycle. It is factory preset to 5400 psi (37250 kPa). Idler valve is designed to protect unit and installation tools from excessive pressure during return cycle. Idler valve is preset at factory to provide 2800 psi (19300 kPa) return pressure and approximately 200 psi (1400 kPa) idling pressure. Various systems require different output pressures. See Checking and Adjusting Output Pressures before using POWERIG Hydraulic Unit.

POWERIG® Hydraulic Unit Kits

Models 917 and 917-5 may be ordered separately or in kits with hydraulic hoses, control cord, mobile unit, etc. See POWERIG Hydraulic Unit Kits, Table 11, for options available.

Hydraulic Fluid

Hydraulic fluid is not shipped with POWERIG Hydraulic Unit and is not available from Huck. Fire-resistant hydraulic fluids must be used to comply with Occupational Safety and Health Administration (OSHA) regulation 1926.302 paragraph (d) "the fluid used in hydraulic powered tools shall be fire-resistant fluids approved under Schedule 30 of the U.S. Bureau of Mines, Dept. of Interior, and shall retain its operating characteristics at the most extreme temperatures to which it will be exposed." Fluid with viscosity in the range of 230 SUS at 100° F and 46 SUS at 210° F is recommended for ambient temperatures between 0° and 130°. (Seals compatible with phosphate ester fluids are furnished in the combination valve and pump of Models 917 and 917-5 POWERIG Hydraulic Units.)
Principles of Operation

Refer to Figures 6 or 8, Electrical Schematic and Figures 7 or 9, Hydraulic Diagram. With the disconnect switch ON, input power is supplied to open motor contactors and to transformer (T-1) which develops 110 volts ac across its secondary. When the START button is depressed momentarily, the circuit is completed through the motor contactor, closing the contacts and starting the motor. The START button is now bypassed by a closed motor contactor and the motor continues to run when the START button is released, unless the STOP button is depressed or the overload relays in the motor contactor open due to overheating or overloading.

After the START button is depressed, 24 volts AC is developed across the secondary of transformer (T-2) for the tool control circuits. When the tool trigger is depressed, relay ICR energizes closing its contacts in the operating solenoid circuit. This action energizes the solenoid, changing the position of the directional valve spool so that high-pressure hydraulic fluid is directed out the FULL pressure port and hose to the tool. When the tool trigger is released, the solenoid de-energizes and the valve spool returns to its original position, directing the hydraulic fluid out the RETURN pressure port and hose to the tool. Each tool has a control circuit which allows it to operate simultaneously and independently of the other.
Figure 6, Model 917 Electrical Schematic

Figure 7, Model 917 Hydraulic Diagram
Figure 8,
Model 917-5 Electrical Schematic

Figure 9,
Model 917-5 Hydraulic Diagram
Preparation for Use

Good Service Practices

The introduction of foreign material into hydraulic system will result in poor performance and repair down-time. To avoid this, observe the following good service practices:

1. Clean area around reservoir filler cap before removing it.

2. Use clean funnel with filter.

3. Clean hose fittings and coat with SLIC-TITE Teflon thread compound (Huck P/N 503237) before attaching couplers. Do not use Teflon tape or red lead compound.

4. Do not let hose fittings and couplers lay or drag around on a dirty floor or the ground.

Note

Three very important facts must be known before preparing Models 917 and 917-5 POWERIG Hydraulic Unit for first-time use:

1. Electric current to be used:
   a. 440 volts, 60 hertz, 3 phase; or
   b. 220 volts, 60 hertz, 3 phase; or
   c. Other: See Optional POWERIG Hydraulic Unit Models

2. Working pressure for TOOL # 1:
   a. 5400 psi (37250 kPa)
      2800 psi (19300 kPa)
   b. 7000 psi PULL (48250 kPa)
      2800 psi RETURN (19300 kPa)
   c. 8000 psi PULL (55150 kPa)
      2800 psi RETURN (19300 kPa)

3. Working pressures for TOOL # 2:
   a. 5400 psi PULL (37250 kPa)
      2800 psi RETURN (19300 kPa)
   b. 7000 psi PULL (48250 kPa)
      2800 psi RETURN (19300 kPa)
   c. 8000 psi PULL (55150 kPa)
      2800 psi RETURN (19300 kPa)

4. Working pressures for TOOL #3 (917-5)
   a. 5400 psi PULL (37250 kPa)
      2800 psi RETURN (19300 kPa)
   b. 7000 psi PULL (37250 kPa)
      2800 psi RETURN (19300 kPa)
   c. 8000 psi PULL (55150 kPa)
      2800 psi RETURN (19300 kPa)

* SLIC-TITE is a trademark of Lake Chemical Co.
* Teflon is a trademark of E.I. du Pont de Nemours & Co.
See PULL and RETURN pressures listed in applicable Installation Tool Instruction manual.

First Time Start-up

1. Check that drain plug and hydraulic fluid heater port plugs are tight.

2. Fill reservoir with hydraulic fluid, approximately 22 gallons, until fluid level is in middle of fluid level gauge.

3. Remove plastic shipping plugs from the PULL and RETURN pressure ports for both TOOL #1 and TOOL #2 (Model 917) and also TOOL #3 (917-5).

4. Connect the PULL pressure hose between PULL and RETURN ports for TOOL #1. (Models 917 & 917-5) See Connecting Installation Tool(s) to POWERIG Hydraulic Unit.

5. Connect the PULL pressure hose between PULL and RETURN ports for TOOL #2. (Models 917 & 917-5).

Caution

If different working pressures are to be used for Tool #1 and Tool #2, and if different hoses are to be used for each, be sure that the proper hoses are used at each place.

6. Remove POWERIG® Hydraulic Unit hood.

7. Remove pipe plug in service tee in suction line. Use 5/8 inch hex key (Huck P/N 504249).

8. Turn fan by hand and add fluid until pump is filled level with top of service tee. Reassemble pipe plug.

Note

Always prime pump after filling reservoir.

Note

Only a qualified electrician should install the power cable, according to local electrical codes, and service the electrical control and disconnect panel.

Models 917 and 917-5 POWERIG Hydraulic Units are shipped from factory with internal wiring connected for 440 volt operation. If 220 volt operation is required, refer to 220 Volt, Three Phase Operation instructions.
440 Volt, Three Phase Operation

1. Turn disconnect switch to OFF and open covers of electrical control panel. See Figure 21.

2. Bring 440 volt, three phase input power cable (4 conductors) into disconnect compartment through hole in front of panel and secure with connector furnished.

3. Remove line shield.

4. Connect power cable leads to terminals L1, L2 and L3. Replace line shield.

5. Connect ground wire (green) to ground terminal provided.

6. Close covers of electrical control panel.

7. Connect power cable to input power source.

8. Turn disconnect switch to ON and push START button.

9. Check that motor rotation is in the same direction as arrow on motor cover. To reverse rotation, disconnect power cable from power source, turn disconnect switch to OFF and open covers. Change position of any two wires connected to terminals L1, L2 or L3. Close covers, connect power cable to power source, turn disconnect switch to ON and push START button.

10. Let POWERIG operate for approximately five minutes to remove air from hydraulic fluid circuit. Check for leaks.

11. Push STOP button.

12. Check hydraulic fluid level and add hydraulic fluid if necessary.

13. Reinstall hood.

14. Check output pressures. See CHECKING AND ADJUSTING OUTPUT PRESSURES.

220 Volt, Three Phase Operation

(First time start-up or change from 440 volt operation)

1. Disconnect power cable from power source.

2. Remove hood.

3. Turn disconnect switch to OFF and open covers of electrical control panel. See Figure 21.

4. Bring 220 volt, three phase input power cable (4 conductors) into disconnect compartment through hole in front of panel and secure with connector furnished.

5. Remove line shield.
6. Connect power cable leads to terminals L1, L2 and L3. Replace line shield.

7. Connect ground wire (green) to ground terminal.

8. Change transformer (21-17) hook-ups as shown in Wiring Diagram, Figure 6 or 8 and on transformer plate.

9. Remove three heaters (21-19) (Westinghouse H43) Contactor (ref. no.18. See Figure 21.

10. Install three heaters (21-19) (Westinghouse H52) furnished.

11. Change motor leads as shown on plate on side of motor.

12. Close covers of electrical control panel.

13. Turn CAUTION plate over to show that internal wiring has been changed for 220 volt operation.

14. Connect power cable to input power source.

15. Turn disconnect switch to ON and push START button.

16. Check that motor rotation is in the same direction as arrow on motor cover. To reverse rotation, disconnect power cable from power source, turn disconnect switch to OFF and open covers. Change position of any two wires connected to terminals L1, L2 or L3. Close covers, connect power cable to power source, turn disconnect switch to ON and push START button.

17. Let hydraulic unit operate for approximately five minutes to remove air from hydraulic fluid circuit. Check for leaks.

18. Push STOP button.

19. Check hydraulic fluid level and add hydraulic fluid if necessary.

20. Reinstall hood.

21. Check output pressures. See CHECKING AND ADJUSTING OUTPUT PRESSURES.
Figure 10,
Typical Hose and Control Cord Hook-up
(See Table 12 for available Hose and Control Cord Kits)
Regular Use

Before each POWERIG® Hydraulic Unit operation:

1. Check hydraulic fluid level in reservoir and add hydraulic fluid as required.
2. Be sure hood is in place. Never operate unit without hood.
3. Inspect hoses for cuts and damage and replace as required.
4. Check for leaks and correct.
5. Connect power cable to power source compatible with internal wiring of POWERIG Hydraulic Unit.

Connecting Installation Tools to POWERIG Hydraulic Unit

Figure 10 shows a typical hose and control cord hook-up. Hose and Cord Kits for connecting Installation Tools to the unit are shown in Table 12. Be sure that hose from port P of tool is connected to PULL pressure port on POWERIG Hydraulic Unit, and hose from port R of tool is connected to RETURN pressure port of unit.

Note

Coat threaded fittings of hoses with SLIC-TITE (a non-hardening Teflon thread compound), or equivalent. Available from Huck in stick form as P/N 503237. Do not use Teflon tape or red lead compound.

Note

PULL and RETURN ports of Models 917 and 917-5 not being used must be plugged with 3/8-18 NPTF steel pipe plugs, Huck P/N 502375.

Operating Instructions

Before starting POWERIG Hydraulic Unit operation, be sure unit has been prepared for service as shown in Preparation for Use and hoses and control cords are connected as shown in Connecting Installation Tools to POWERIG Hydraulic Unit.

1. Connect power cable to proper power source.
2. Turn DISCONNECT SWITCH to ON.
3. To start unit push START button and then release.
4. Push STOP button to stop unit.
5. Depress tool trigger to cycle tool. (When tool trigger is held down, tool piston will retract. When trigger is released, tool piston will return.)
6. Always be alert for (a) leaks at hose connections, (b) damage to hoses, (c) hydraulic fluid level.
Maintenance

The electrical control and disconnect panel should be serviced only by a qualified electrician.

Preventive Maintenance

An effective preventive maintenance program includes scheduled inspections to detect and correct minor troubles:

1. Inspect hydraulic and electrical fittings to be sure they are secure.

2. Inspect hoses frequently for signs of damage. At regular intervals switch hoses or end-for-end them to equalize wear and fatigue. Replace hoses at regular intervals or if damage is detected.

3. Inspect during operation to detect any abnormal heating vibration or leakage.

4. Inspect hydraulic fluid periodically and replace if contamination is detected. Clean sump filter if fluid is dirty and being replaced.

5. Keep hood in place.

6. Keep all exterior surfaces clean.

7. Do not operate POWERIG Hydraulic Unit if line voltage is lower than 5 percent below normal.

Combination Valve Overhaul

Combination valve(s) used on Model 917 (serial nos. 0798 and above) and Model 917-5 (serial no. 0126 and above) are identical.

Combination valves should be returned to the nearest repair facility shown on the inside of the back cover of this manual if a major overhaul is necessary.

Minor overhaul -- cleaning and replacing seals, perishable parts and high wear components -- Huck recommends only minor overhaul by the customer. If a major overhaul is required, return the combination valve to:
Huck Manufacturing Company  
85 Grand Street  
Kingston, New York 12401-0250

Extra combination valve(s) should be available to use on POWERIG Hydraulic Unit while original valve is being overhauled or returned to factory for major overhaul.

Smear LUBRIFICATE 130AA or hydraulic fluid on O-rings and other components when reassembling combination valve. Follow Figures 12 or 13 for proper position of all components.

Note

After overhauling combination valve(s), PULL and RETURN pressures must be checked. See Checking and Adjusting POWERIG Hydraulic Unit Output Pressures.

Checking and Adjusting POWERIG Hydraulic Unit Output Pressures

Output pressures should be checked and adjusted as required when preparing the unit for operation, after overhauling the pump or combination valve and when troubleshooting. Pressure Checking Gauge Model T-10280 is available for this purpose.

If necessary, prime and bleed unit. See Preparation for Use.

Checking Pressures with T-10280 Pressure Gauge

The pressures for each tool of the Model 917 and 917-5 must be checked separately. The pair(s) of unused PULL pressure and RETURN pressure ports must be connected together with one hydraulic hose -- PULL connected to RETURN of same valve.

1. Connect Coupler Nipple - male (2) of T-10280 Pressure Gauge to PULL pressure Coupler Body - female of hydraulic unit. See Figure 1.
2. Connect Coupler Body - female (3) of T-10280 to RETURN pressure Coupler Nipple - male of hydraulic unit.
3. Move Control Knob (1) on T-10280 to OPEN position.
4. Connect POWERIG Hydraulic Unit to power source and turn unit ON.

Caution

Maximum PULL pressure is 8400 psi when checked at tool end of hose and 9400 when checked at POWERIG Hydraulic Unit.

5. Refer to Table 2, PULL and RETURN pressures for Huck Installation Equipment.
Figure 11,
Model T-10280 Pressure Gauge

Table 2 - Pull and Return Pressures for Huck Installation Equipment

<table>
<thead>
<tr>
<th>Output Pressures (psi)</th>
<th>For Huck Installation Equipment Model Nos.</th>
</tr>
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<tbody>
<tr>
<td>3000 PULL</td>
<td>609-1, 611-1, 612-1</td>
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<tr>
<td>3000 RETURN</td>
<td></td>
</tr>
<tr>
<td>5400 PULL</td>
<td>516, (1) 520, (1) 524, (1) 532, (1) 536, (1)</td>
</tr>
<tr>
<td>2800 RETURN</td>
<td>206, 207, 208, 504, 505, 506, 507, 542</td>
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<tr>
<td></td>
<td>543, 544, 557, 568, (1) 574, (1) 585, 2384, 2394, 4801, 5304, 5901</td>
</tr>
<tr>
<td>7000 PULL</td>
<td>6042, 6062, 6062-16, 7042, 7062, 8042</td>
</tr>
<tr>
<td>2800 RETURN</td>
<td></td>
</tr>
<tr>
<td>8000 PULL</td>
<td>4802, 216-10, 216-12, 6304, 6304-16, 7142, 7304, 8142, 8304, 8304-24, 9304, 9304-28, 12142</td>
</tr>
<tr>
<td>2800 RETURN</td>
<td></td>
</tr>
<tr>
<td>8400 PULL</td>
<td>4803, 2702</td>
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<tr>
<td>2800 RETURN</td>
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</table>
There are two methods, using T-10280 Gauge, for checking output pressures.

Pressure Checking Method # 1:

1. Install an Auxiliary Electric Switch and Control Cord Assembly, P/N 113056, in control cord socket of tool ports being checked. Hydraulic fluid will be directed out PULL pressure when switch is depressed.

Caution

Following check must be completed quickly as hydraulic unit components cannot withstand sustained high pressure.

2. Move control knob to PULL position. Depress auxiliary switch and read PULL pressure on gauge – release auxiliary switch. Hydraulic fluid is directed out RETURN pressure port.

3. Move control knob to OPEN position.

4. Slowly move control knob to RET position and read RETURN pressure on gauge.

5. Turn control knob to OPEN position

6. Turn unit to OFF and disconnect electrical power source from unit.

7. Remove Model T-10280 Gauge.

8. Connect installation tool to hoses and control cord as shown in Figure 10.

Pressure Checking Method # 2:

1. Move control knob to PULL position.

Caution

Following check must be completed quickly as hydraulic components cannot withstand sustained high pressure.

2. Install dummy plug in control cord socket for tool ports being checked. This energizes valve and directs PULL pressure fluid -- read PULL pressure on gauge and pull out dummy plug. See Figure 11.

3. Move control knob to OPEN position.

4. Slowly move control knob to RET position and read RETURN pressure on gauge.

5. Turn control knob to OPEN position.
6. Turn unit OFF and disconnect power source from unit.

7. Remove Model T-10280 Gauge.

8. Connect installation tool to hoses and control cord as shown in Figure 10.

Adjusting Combination Valve Output Pressures

The POWERIG Hydraulic Unit should be prepared for operation, see Preparation for Use. Pressure checking Gauge T-10280 should be used to check pressures before and after adjusting PULL and RETURN pressures -- see Checking Pressures with T-10280 Pressure Gauge.

Adjusting Old Style Combination Valve, P/N 110049 --
Model 917 (S/N 0797 and below), Model 917-5 (S/N 0125 and below)

Model 917 and 917-5 Combination Valve

Adjustment for Tools #1 and 2:

PULL pressure adjustment:

See relief valve at Section B-B of Figure 12. To adjust PULL pressure to different pressure, use 5/16 hex key and engage relief valve adjusting screw.

a. Screw in (clockwise) to increase pressure.
   b. Screw out (counter-clockwise) to decrease pressure.

RETURN pressure adjustment:

See idler valve at Section A-A of Figure 12.

a. Unscrew nut and remove spring.
   b. Add shim(s) to increase pressure.
   c. Remove shim(s) to decrease pressure.
   d. Install nut with spring.
Model 917-5 Combination Valve Adjustment
for Tool 3:

PULL pressure adjustment:

See relief valve at Section B-B of Figure 13. To adjust PULL pressure to different pressure, push 5/16 hex key through small hole in bottom of enclosure cover and engage relief valve adjusting screw.

a. Screw in (clockwise) to increase pressure.
b. Screw out (counter clockwise) to decrease pressure.

RETURN pressure adjustment:

1. See Figure 4 -- enclosure for tool 3 must be removed. See Figure 24. Disconnect pump to valve hose (32) at swivel connection (42). Disconnect return line (31) at swivel fitting (44).

Caution

Support enclosure cover -- wiring must be disconnected from components attached to cover before cover will be completely free.

2. Unscrew six cover screws and support cover while disconnecting wires.

3. With hex key unscrew four cap screws holding combination valve to inside of cover. Pull cover away from valve.

See idler valve at Section A-A of Figure 12.

a. Unscrew nut and remove spring.
b. Add shim(s) to increase pressure.
c. Remove shim(s) to decrease pressure.
d. Install nut with spring.

4. Reassemble in reverse order of disassembly.

Adjusting New Style Combination Valve - page 26
Figure 12, Combination Valve and Solenoid Assembly, P/N 110049, for Models 917 (0797 and below) and 917-5 (0175 and below)
### Table 3
**Parts List for Service Parts Kit, 110908, used on Combination Valve, P/N 110049**

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part No.</th>
<th>Req.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
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<td>504550</td>
<td>3</td>
<td>O-ring - AS 568-011, 90D VITON</td>
</tr>
<tr>
<td>2</td>
<td>504551</td>
<td>1</td>
<td>O-ring - AS 568-012, 90D VITON</td>
</tr>
<tr>
<td>3</td>
<td>504552</td>
<td>2</td>
<td>O-ring - AS 568-013, 90D VITON</td>
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<td>4</td>
<td>504553</td>
<td>2</td>
<td>O-ring - AS 568-014, 90D VITON</td>
</tr>
<tr>
<td>5</td>
<td>504710</td>
<td>2</td>
<td>O-ring - AS 568-096, 90D VITON</td>
</tr>
<tr>
<td>6</td>
<td>504711</td>
<td>1</td>
<td>O-ring - AS 568-908, 90D VITON</td>
</tr>
<tr>
<td>7</td>
<td>504712</td>
<td>2</td>
<td>O-ring - AS 568-912, 90D VITON</td>
</tr>
<tr>
<td>8</td>
<td>504349</td>
<td>1</td>
<td>QUAD Ring - Q4006, 70D VITON</td>
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<tr>
<td>9</td>
<td>110910</td>
<td>1</td>
<td>Cone-Relief Valve</td>
</tr>
<tr>
<td>10</td>
<td>110906</td>
<td>1</td>
<td>Plug-Directional Valve</td>
</tr>
<tr>
<td>11</td>
<td>109354</td>
<td>3</td>
<td>Shim-Directional Valve</td>
</tr>
<tr>
<td>12</td>
<td>109355</td>
<td>3</td>
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<td>107861</td>
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<td>Spring-Unloading Valve</td>
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<td>14</td>
<td>107860</td>
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<td>Spring - Relief Valve</td>
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<td>15</td>
<td>107862</td>
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<td>107859</td>
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<tr>
<td>-</td>
<td>109798</td>
<td>1</td>
<td>Pin (Solenoid)</td>
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### Table 4
**Parts List for Service Parts Kit, P/N 115569, used on Combination Valves, P/N 113960 (AC), and P/N 114687 (DC)**

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<thead>
<tr>
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<th>Part No.</th>
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<th>Description</th>
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<td>109354</td>
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<td>O-ring</td>
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<td>5</td>
<td>500811</td>
<td>2</td>
<td>O-ring</td>
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<tr>
<td>6</td>
<td>110910</td>
<td>1</td>
<td>Cone</td>
</tr>
<tr>
<td>7</td>
<td>107860</td>
<td>1</td>
<td>Spring</td>
</tr>
<tr>
<td>8</td>
<td>110905</td>
<td>3</td>
<td>Shim</td>
</tr>
<tr>
<td>9</td>
<td>500777</td>
<td>1</td>
<td>O-ring</td>
</tr>
<tr>
<td>10</td>
<td>504475</td>
<td>2</td>
<td>O-ring</td>
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<tr>
<td>11</td>
<td>504414</td>
<td>1</td>
<td>O-ring</td>
</tr>
<tr>
<td>12</td>
<td>107859</td>
<td>1</td>
<td>Spring</td>
</tr>
<tr>
<td>13</td>
<td>115704</td>
<td>1</td>
<td>Retaining Ring</td>
</tr>
<tr>
<td>14</td>
<td>505409</td>
<td>1</td>
<td>Spring</td>
</tr>
</tbody>
</table>

### Notes

#### Specifications for Tables

1. Applicable Service Parts Kits should be kept on hand. Kits include O-rings, Back-up Rings and other perishable items.

2. Shims in Service Parts Kit, P/N 115569, are used for adjusting RETURN pressure on units: S/N 0797 and below (917), S/N 0125 and below (917-5).

3. All part numbers shown are available from Huck for replacement in a kit, as shown in parts list.

4. Parts in the 500000 series generally can be purchased locally.
Figure 13,
Combination Valve and Solenoid Assembly, P/N 113960,
for Models 917 (0798 and above)
and 917-5 (0126 and above)

Figure 13a,
Section B-B
Relief Valve -- Screw Adjustment
Adjusting New Style Combination Valve, P/N 113960 -- Model 917
(S/N 0798 and up), Model 917-5 (S/N 0126 and up)

The first production POWERIG Hydraulic Units with the new combination valve have shims for adjusting valve RETURN pressure. Units now being produced have a socket head hex screw for adjusting RETURN pressure. Both first production units and present production units have a socket head hex screw for adjusting PULL pressure.

**PULL pressure adjustment:**

See relief valve at Section B-B of Figure 13a. To adjust PULL pressure to different pressure, use 5/16 hex key and engage relief valve adjusting screw.

- a. Screw in (clockwise) to increase pressure.
- b. Screw out (counter-clockwise) to decrease pressure.

**RETURN pressure adjustment with shim:**

See idler valve at Section A-A of Figure 13b.

- a. Unscrew nut and remove spring.
- b. Add shim(s) to increase pressure.
- c. Remove shim(s) to decrease pressure.
- d. Install nut with spring.

**RETURN pressure adjustment hex screw:**

See idler valve at Section A-A of Figure 13c. To adjust RETURN pressure to different pressure, use 5/16 hex key and engage relief valve adjusting screw.

- a. Screw in (clockwise) to increase pressure.
- b. Screw out (counter-clockwise to decrease pressure.
Hydraulic Pumps

Pumps used on all Models 917 and 917-5 are identical except for the covers. (The 917 pump cover has two outlets while the 917-5 pump cover has three outlets.)

Pumps should be returned to the address on page 17 if a major overhaul is necessary. These pumps will be returned to the manufacturer for overhaul and test, and will be returned with a new warranty.

Minor overhaul -- cleaning and replacing perishable and high wear components -- may be done if replacement parts are available as shown in Figure 14 and Table 5.

An extra pump(s) should be available to use on POWERIG Hydraulic Unit while the original pump is being overhauled or returned to the factory for major overhaul.

Figure 14,
Exploded View of Split Flow
Hydraulic Pumps P/N 110217 and P/N 114200 (917-5)
Table 5
Parts List for Split Flow Hydraulic Pumps, P/N 110217 (917),
and P/N 114200 (917-5)

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part Number 917</th>
<th>Part Number 917-5</th>
<th>No. Req.</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>110931</td>
<td>110931</td>
<td>1</td>
<td>Shaft Seal (14 O.D.xI.D.x5/16 C.S. VITON)</td>
</tr>
<tr>
<td>2</td>
<td>109404</td>
<td>109404</td>
<td>6</td>
<td>Piston Assembly</td>
</tr>
<tr>
<td>3</td>
<td>109405</td>
<td>109405</td>
<td>6</td>
<td>Spring - Piston Return</td>
</tr>
<tr>
<td>4</td>
<td>504649</td>
<td>504649</td>
<td>1</td>
<td>O-ring AS 568-243, 90D VITON</td>
</tr>
<tr>
<td>-</td>
<td>110509</td>
<td>------</td>
<td>1</td>
<td>Cover Assembly (incl.ref.5,6,7,8&amp;9)</td>
</tr>
<tr>
<td>-</td>
<td>------</td>
<td>114195</td>
<td>1</td>
<td>Cover Assembly (incl.ref.5,6,7,8&amp;9)</td>
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<tr>
<td>5</td>
<td>504617</td>
<td>504617</td>
<td>6</td>
<td>O-ring, AS568-211, 90D VITON</td>
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<td>109406</td>
<td>109406</td>
<td>6</td>
<td>Seat-Check Valve</td>
</tr>
<tr>
<td>7</td>
<td>109413</td>
<td>109413</td>
<td>6</td>
<td>Ball-Check Valve</td>
</tr>
<tr>
<td>8</td>
<td>109407</td>
<td>109407</td>
<td>6</td>
<td>Spring-Check Valve</td>
</tr>
<tr>
<td>9</td>
<td>109615</td>
<td>------</td>
<td>1</td>
<td>Cover &amp; Pins Assembly</td>
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<td>9</td>
<td>------</td>
<td>114199</td>
<td>1</td>
<td>Cover &amp; Pins Assembly</td>
</tr>
<tr>
<td>10</td>
<td>500090</td>
<td>500090</td>
<td>6</td>
<td>Screw-Socket Hd. Cap (3/8-16x1&quot;)</td>
</tr>
<tr>
<td>11</td>
<td>500095</td>
<td>500095</td>
<td>6</td>
<td>Screw-Socket Hd. Cap (3/8-16x2&quot;)</td>
</tr>
<tr>
<td>12</td>
<td>------</td>
<td>------</td>
<td>2</td>
<td>Woodruff Key - SAE#91 (1/4x3/4)</td>
</tr>
</tbody>
</table>

To remove pump for overhaul:

Refer to Figures 1 and 2.

1. Disconnect solenoid wires in electrical panel or remove solenoids from combination valves.

2. Disconnect pressure hose(s) from combination valve(s).

3. Disconnect return line hose.

4. Remove six (6) socket head cap screws holding bracket and combination valves. Lift bracket and valves and set aside.

5. Loosen pipe union in suction line (see Figure 2).

6. Remove two (2) socket head cap screws holding pump to motor.

7. Support weight of pump and pull straight out from motor.

8. Pump to motor coupling, P/N 110572, comes out with the pump. Remove coupling only if necessary. Screws holding coupling to pump shaft were treated with LOCTITE Retaining Compound.

Refer to Figure 14

9. Remove six (6) socket head cap screws (ref. no. 11) to remove cover to replace O-rings, seats, balls or springs (ref. no. 8). (If this is the only service being performed, steps 5, 6, 7, 8 and 9 may be eliminated).

10. Remove six (6) socket head cap screws (ref. no. 10) to remove barrel to replace O-ring, piston assemblies or springs (ref. no. 3). (If this is the only service being performed, steps 5, 6, 7, 8 and 9 may be eliminated).
11. A worn shaft seal can be removed using a pointed rod.

12. Smear O-rings with LUBRIPLATE®130AA or hydraulic fluid when reassembling.

13. Tighten socket head cap screws (ref. nos. 10 and 11) to 30-35 ft. lbs. torque.

14. If pump to motor coupling was removed, reassemble with coupling positioned 5/16 - 3/8 from pump flange.

![Figure 15, Pump and Coupling](image)

15. Reassemble pump to motor and tighten two socket head set screws to 90 ft. lbs. torque if plated and 120 ft. lbs. if unplated.

16. Reassemble solenoids, pressure hoses, return hose and suction line. Use SLICTITE thread compound on pipe threads of fittings and hoses.

NOTE

Pumps must be primed after overhaul. See "First Time Start-up." Check output pressures. See "Checking and Adjusting Output Pressures".

Table 6,

Pump Seal Kit, P/N 110933

Kit contains seals for replacements or for converting pumps to operate with fire resistant hydraulic fluids.

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part Number</th>
<th>Reg. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>110931</td>
<td>1</td>
<td>Shaft Seal(1½ O.D.x7/8x5/16 C.S.-VITON)</td>
</tr>
<tr>
<td>4</td>
<td>504649</td>
<td>1</td>
<td>O-ring--AS568-243, 90D VITON</td>
</tr>
<tr>
<td>5</td>
<td>504617</td>
<td>6</td>
<td>O-ring--AS568-211, 90D VITON</td>
</tr>
</tbody>
</table>

Note: Seal kit also used on pumps 106535 (906) and 107396 (914).

* LUBRIPLATE is a trademark of Fiske Brothers Refining Co.
Troubleshooting

Always check out the simplest possible cause of a malfunction first. Review PREPARATION FOR USE and FIRST TIME START-UP. Check fuses, circuit breakers, control cord and connections, and hydraulic hose couplers. Where possible substitute known good parts for suspected bad parts. Use following Troubleshooting Chart as an aid in locating trouble and correcting it. Also, refer to Electrical and Hydraulic Schematics and Wiring Diagrams to trace defective circuits.

1. With POWERIG® Hydraulic Unit motor running, tool fails to operate when trigger is depressed.
   a. Loose or faulty connections in control cord.
   b. Loose or faulty hydraulic hose couplings.
   c. Defective tool trigger assembly.
   d. Open 24-volt circuit breaker.
   e. Defective relay or solenoid coil.
   f. Hydraulic fluid viscosity too heavy to pick up prime. Replace fluid.
   g. Clogged strainer in reservoir.
   h. Defective hydraulic pump. Replace pump.
   i. Defective directional valve assembly. Replace assembly.
   j. Installation tool not operating properly. Troubleshoot tool. (See applicable Tool Instruction Manual).

2. Tool does not return on release of trigger.
   a. Defective relay or solenoid coil.
   b. Defective directional valve. Clean and replace spring.
   c. Installation tool not operating properly. Troubleshoot tool. (See applicable Tool Instruction Manual).

3. Pump cavitating (noisy throughout entire installation cycle).
   a. Low hydraulic fluid level in reservoir.
   b. Clogged strainer in reservoir.
   c. Hydraulic fluid viscosity too heavy to pick up prime. Replace fluid.

4. Tool operation slow but entire cycle does occur.
   a. Pump cavitating. See 3.
   b. Hydraulic fluid viscosity too thin. Do not operate if over 150° F.
   d. Worn pump seals, seats, etc. Replace seals, etc. or replace complete pump if necessary.
   e. Worn directional valve or relief valves. Use Gauge T-10280 to check output pressure. Replace valve if necessary.

5. Solenoid coil heats up.
   a. Low voltage - check and correct.
   b. Push rod between solenoid plunger and valve spool too long. Shorten push rod -- retain full stroke.
   c. Wrong solenoid coil. Replace coil (50 hertz or 60 hertz).
Models 917 and 917-5, Electric Control Panel Assembly (see Figure 21)

Figure 17
Model 917-5 Wiring Diagram for 3rd. Tool Hydraulic-Electric Control Assembly
<table>
<thead>
<tr>
<th>Ref.</th>
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<th>917-5</th>
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</thead>
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<td>Pump-Hydraulic</td>
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<td>100047</td>
<td>100047</td>
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<td>Filler &amp; Filter Assem.</td>
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<td>3</td>
<td>107754</td>
<td>107754</td>
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<td>Oil Cooler</td>
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<td>4</td>
<td>101999</td>
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<td>Fan</td>
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<td>107768</td>
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<tr>
<td>6</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>Elec. Control Panel Assem.</td>
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<td>(incl. 7, 8, 9, 10, 11, 12, 17, 18, 20, 21, 22, 23 &amp; 24)</td>
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<td>Start Button--Furnas Elec.</td>
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<td>Base--Control Cord Conn.</td>
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<td>Swivel Adapter--Anchor</td>
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<td>Westinghouse 1F0909</td>
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<td>Heater-440V. Westinghouse H43</td>
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<td>Line Fuse-35 amp--Bussmann FR3 35</td>
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<td>Transformer - 115/24 V.--Basker Elec. Co. BE-8982-16D-45</td>
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<tr>
<td>22</td>
<td>102473</td>
<td>102473</td>
<td>1</td>
<td>Relay--Potter &amp; Brumfield</td>
</tr>
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<tr>
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<td>Filter-Sump--MichFluid</td>
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<tr>
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<td>Solenoid--115V-60Hz</td>
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<tr>
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<td>Enclosure-Drilled</td>
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</tr>
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<td>35</td>
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<td>Socket-Amphenol 146-104</td>
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<tr>
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<td>Base -- Control Conn.</td>
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<tr>
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<tr>
<td>43</td>
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Table 8,

General Parts List for POWERIG Hydraulic Unit serial nos. 0798 (917) and 0126 (917-5), and above.

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<th>Description</th>
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<td>100047</td>
<td>100047</td>
<td>1</td>
<td>Filler &amp; Filter Assem.</td>
</tr>
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<td>3</td>
<td>107754</td>
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<td>Oil Cooler</td>
</tr>
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<td>101999</td>
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<td>Fan</td>
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<td>107768</td>
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<td>Motor</td>
</tr>
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<td>-----</td>
<td>-----</td>
<td>1</td>
<td>Elec. Control Panel Assem. (incl. 7, 8, 9, 10, 11, 12, 17, 18, 20, 21, 22, 23 &amp; 24)</td>
</tr>
<tr>
<td>7</td>
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<td>Handle-Disconnect Switch</td>
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<tr>
<td>8</td>
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<td>Stop Button--Furnas Elec. BJO-2-J</td>
</tr>
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<td>9</td>
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<td>Start Button--Furnas Elec. BJO-3-K</td>
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<td>11</td>
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<td>Breaker--115 and 24 V.--E.T.A. 3 amp</td>
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<td>Connector--Power Cable--T&amp;B 2545</td>
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<td>Gauge-Fluid Level--Gits BW20-4054</td>
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<td>Hood</td>
</tr>
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<td>503938</td>
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<td>Line Fuse-35 amp--Bussmann FSR 35</td>
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<td>Reg.</td>
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<td>------</td>
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</tr>
<tr>
<td>22</td>
<td>102473</td>
<td>102473</td>
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<td>Relay--Potter * Brumfield KAP11AY</td>
</tr>
<tr>
<td>23</td>
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<td>103576</td>
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<td>Spring-Hold Down--P &amp; B 9KAL</td>
</tr>
<tr>
<td>24</td>
<td>102472</td>
<td>102472</td>
<td>2</td>
<td>Socket--Amphenol 146-104</td>
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<tr>
<td>26</td>
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<td>Hose-Pump to Comb. Valve</td>
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<tr>
<td>27</td>
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<td>Combination Valve (incl. next three items)</td>
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<tr>
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<td>29</td>
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<td>30</td>
<td>115832</td>
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<td>Tube-Solenoid</td>
</tr>
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<td>31</td>
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<td>114115</td>
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<td>Return Line Assembly</td>
</tr>
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<td>110572</td>
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<td>Coupling--Pump to motor (not shown)</td>
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<td>33</td>
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</tr>
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<td>36</td>
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<td>Spring-Hold Down--P &amp; B 9KAL</td>
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<td>Swivel-Adapter--Anchor 6FH-6UFS</td>
</tr>
</tbody>
</table>

Notes:

1. All part numbers are available from Huck Mfg. Co. Standard part nos., 500000 series, can generally be purchased locally.

2. Service Parts Kit, P/N 110908, should be kept on hand. Kit includes O-rings, Back-up Rings and other perishable items.
Figure 18,
Model 917 -- Top View (hood removed)
See Fig. 14 for Exploded View of Pump

Figure 19,
Model 917-5 -- Top View (hood removed)
See Fig. 14 for Exploded View of Pump
Figure 20,
Model 917 and 917-5 -- Front View (hood removed)

Figure 21,
Models 917 and 917-5 -- Electrical Control Panel
Figure 22,
Model 917 -- Left Side View (hood removed)
Old Style Combination Valve, P/N 110049

Figure 23,
Model 917 -- Left Side View (hood removed)
New Style Combination Valve, P/N 113960
Figure 24,
Model 917-5 -- Top View (hood removed)
New Style Combination Valve, P/N 113960
Table 9 - Optional POWERIG Hydraulic Unit Models

Model 917 and 917-5 POWERIG Hydraulic Units designed to operate on other than 220/440 volts, 60 hertz, 3 phase electrical power are available as follows:

917-2: 500 volts, 50 hertz, 3 phase
917-3: 400 volts, 50 hertz, 3 phase
917-5: 400 volts, 60 hertz, 3 phase
917CSA220: 220 volts, 60 hertz, 3 phase
917CSA440: 440 volts, 60 hertz, 3 phase
917CSA550: 550 volts, 60 hertz, 3 phase

The Parts List for optional models is the same as for the basic models except as shown in following Table

Table 10 - Parts List, Optional Models

<table>
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<tr>
<th>Ref. No.</th>
<th>Description</th>
<th>Req'd.</th>
<th>917-2</th>
<th>917-3</th>
<th>917CSA220</th>
<th>917CSA440</th>
<th>917CSA550</th>
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<td>5</td>
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<td>110348</td>
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<td>110368</td>
<td>109746</td>
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<td>110916</td>
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<td>108048</td>
<td>104929</td>
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<td>104249</td>
<td>115832</td>
<td>115832</td>
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</tr>
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</table>

Table 11 - POWERIG Hydraulic Unit Kits

Kits include:

1. 917 POWERIG Hydraulic Unit.

2. Hose and Cord Kit 110839 for 26 ft. Hoses (-26), or Hose and Cord Kit 110841 for 52 ft. hoses (-52).
Table 12 - Hose and Control Cord Kits

<table>
<thead>
<tr>
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<th>Description</th>
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<tbody>
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<td>110839</td>
<td>(1)</td>
<td>Hose and Control Cord Kit - 26 ft. long</td>
</tr>
<tr>
<td>110848</td>
<td>1</td>
<td>Hose and Control Cord Assembly</td>
</tr>
<tr>
<td>--------</td>
<td>1</td>
<td>Hose and Control Cord Tube</td>
</tr>
<tr>
<td>110525</td>
<td>1</td>
<td>Control Cord</td>
</tr>
<tr>
<td>110440</td>
<td>1</td>
<td>Hydraulic Quick Disconnects</td>
</tr>
<tr>
<td>110841</td>
<td>(1)</td>
<td>Hose and Control Cord Kit - 52 ft. long</td>
</tr>
<tr>
<td>110848</td>
<td>2</td>
<td>Hose and Control Cord Assembly</td>
</tr>
<tr>
<td>110440</td>
<td>1</td>
<td>Hydraulic Quick Disconnects (male and female)</td>
</tr>
<tr>
<td>503697</td>
<td>2</td>
<td>Adapter Union</td>
</tr>
</tbody>
</table>

(1) The quantity and length of Hose Kits depends upon the POWERIG being used and the user's requirements. Hose Kits may be coupled together using Quick Disconnects 110440 or Adapter Unions 503697 (must be ordered separately).

(2) The hoses in these kits are rated by the manufacturer for 10,000 psi maximum working pressure. Two hoses and a tube for the control cord are bonded together.

(3) The hoses in these kits are compatible with phosphate ester hydraulic fluids.

Accessories

Pressure Checking Gauge T-10280

Optional Pressure Checking Gauge T-10280 is shown in Figure.
It is used to check output hydraulic pressures. Huck recommends that gauge T-10280 be available to maintenance personnel.

Hydraulic Quick-Disconnects--110440

These quick disconnects provide a positive, easy connection for tool hoses to POWERIG Hydraulic Unit hoses. Part no. 110440 is a set consisting of one female member and one male member.

Control Cord Connections

Replacement connectors are available in a set as P/N 110835.

Kit Number 110230

Model 908 POWERIG Hydraulic Units, serial number 0176 and below may be converted directly to Model 917. Kit no. 110230 includes components and instructions for converting.

Kit Number 110200

Model 908 POWERIG Hydraulic Units, serial no. 0177 and above, and earlier serial numbers which have been retrofitted using Kit No. 110214, may be converted to Model 917. Kit No. 110200 includes components and instructions for converting.
Combination Valve and Adapter Plate for Models 917, 917-5 and 950 POWERiG® Hydraulic Unit.

Models 917 and 917-5 Combination Valve, P/N 110049, is no longer available and is replaced by Combination Valve and Adapter Kit, P/N 115570. Refer to 42-442 specifications for instructions to attach kit to hydraulic unit.

Model 950 Combination Valve, P/N 107759, is also no longer available, and is replaced by Combination Valve and Adapter Kit, P/N 115571. Refer to 42-443 specifications for instructions to attach kit to hydraulic unit.

Each combination valve contains a four-way solenoid operated directional valve, a pressure relief valve and an idler valve. The four-way valve, which is controlled by the tool trigger through a relay and solenoid, directs hydraulic fluid under pressure to the PULL or RETURN hoses connected to the Installation Tool or other equipment. The pressure relief valve is designed to protect the POWERiG® Hydraulic Unit and Installation Tools from excessive pressure during the return cycle. The idler valve is preset at the factory to provide 2800-3000 return pressure and approximately 200 psi idling pressure.

The high and low pressures should be checked as your tool model may require a different input/output pressure. Use Pressure Checking Gauge Set-up No. T-10280 — if valve adjustments are required see applicable POWERiG® Hydraulic Unit Instruction Manual and/or Instructions for T-10280 Pressure Gauge.

Combination Valve Kit

The new Combination Valve Kit includes:
1. Pull Pressure — pump to valve
2. Return pressure Adjuster — idler valve
3. Adapter plate
4. Solenoid
5. Pull pressure port (not shown)
6. Return pressure port
7. Pull pressure adjusting screw
8. Return flow to tank
9. Directional valve and relief valve
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<th>Qty. Req.</th>
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</tr>
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<td>503714</td>
<td>3</td>
<td>Flat Hd. Screw — 5/16-18 x ¾ (not shown)</td>
</tr>
<tr>
<td>3</td>
<td>500194</td>
<td>4</td>
<td>Lockwasher — for 5/16 screw (not shown)</td>
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<tr>
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<td>501236</td>
<td>4</td>
<td>Soc. Hd. Screw (nylon insert) 5/16-18 x ½ (not shown)</td>
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<tr>
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<td>120362</td>
<td>1</td>
<td>Combination Valve — D.C.</td>
</tr>
<tr>
<td>6</td>
<td>504058</td>
<td>1</td>
<td>Elbow, ¾ NPT — I-E 849LL-FS-08x06</td>
</tr>
<tr>
<td>7</td>
<td>503697</td>
<td>2</td>
<td>Adapter — Anchor GFH-6UFS (not shown)</td>
</tr>
<tr>
<td>8</td>
<td>504057</td>
<td>3</td>
<td>Nipple, M to M — Fiodar PF10L-6x2</td>
</tr>
<tr>
<td>9</td>
<td>503681</td>
<td>1</td>
<td>Elbow — Fiodar PF21-6</td>
</tr>
<tr>
<td>10</td>
<td>503680</td>
<td>1</td>
<td>Street Elbow, ¾ NPTF — Fiodar PF201-6</td>
</tr>
<tr>
<td>11</td>
<td>505207</td>
<td>1</td>
<td>Reducing Bushing, ¾ to ¾ — Fiodar PF110-12-6</td>
</tr>
</tbody>
</table>

[Image of a combination valve kit]
Instructions for Attaching New Combination Valve

A. Removing old valve:

1. Disconnect power supply
2. Remove hood
3. Remove pressure hose(s) from combination valve. Cut return hose(s) next to valve fitting. Remove fitting. Remove hose clamp and cut hose remnant from fitting.
4. Loosen two screws holding solenoid wires in electrical clamp on back of electrical box.
5. Disconnect wires from block inside electrical box. Pull wires out of electrical box.
6. Disconnect hoses from hydraulic unit. Unscrew swivel connectors from combination valve.
7. Unscrew four socket head cap screws holding valve to bracket. Use hex ¼ hex key.

B. To Install New Valve:

1. Attach valve mounted to adapter plate to bracket/bulkhead of hydraulic unit with washers and four socket head screws. Use ¼ hex key.
2. Pull plastic sleeve off wires of old combination valve solenoid. Cut both wires approximately 5 inches from solenoid.
3. Using connectors provided, connect control panel wires. Slide plastic sleeve over spliced wires and connect wires to block inside electrical box. See wiring diagram in applicable instruction manual.
4. Coat hose fitting threads with a non-hardening TEFLO\textsuperscript{*} thread compound such as Slic-tite. (Slic-tite is manufactured by Markal Co., and is available from Huck in stick form as P/N 503237). Do not use TEFLO\textsuperscript{*} tape on hose fitting threads; pipe threads may cause tape to shred resulting in tool and hydraulic unit valves to malfunction. Attach pressure and return hoses to new valve(s).

*TEFLO\textsuperscript{*} is a trademark of E.I. duPont de Nemours & Co.

Note:
Prime and bleed hydraulic unit per applicable instruction manual.
Checking and Adjusting Output Pressures

POWERIG® Hydraulic Unit output pressures should be checked and adjusted when new valve is installed, preparing hydraulic unit for operation, overhauling the pump or the combination valve, and when troubleshooting.

There are two adjustments to be made if the output pressures require changing to match the installation tool pressures listed in Table 1. Refer to applicable Instruction Manual when adjusting valve output pressures.

Pressure Checking Gauge Set-up No. T-10280 is available for checking hydraulic pressures. Use the following procedures:

1. Connect Coupler Nipple-male (10) of T-10280 to PULL pressure coupler body-female of hydraulic unit.
2. Connect Coupler Body-female (11) of T-10280 to RETURN pressure coupler nipple-male of hydraulic unit.
3. Move Control Knob (1) on T-10280 to OPEN position.
4. Start POWERIG Hydraulic Unit engine.

Checking Output Pressures on Model 917, 917-5 & 950

Note:
When checking pressures, the output pressures for Tool #1 and Tool #2 and/or #3 where applicable, must be checked separately. Connect unused PULL pressure port to the unused RETURN pressure port with a tool. Use a tool or short length of hose with couplers.

1. Install plug in control cord socket for tool ports being checked. Hydraulic fluid will be directed out the PULL pressure port when trigger is depressed.

CAUTION!
Complete this check as quickly as possible because hydraulic unit components are designed for high pressures only momentarily.

3. With hydraulic unit still running, slowly move control knob to RET position on gauge.
4. Return control knob to OPEN Position.
5. Stop POWERIG Hydraulic Unit.
6. Remove T-10280 Gauge.
7. Connect installation tool to hoses and control cord.
Model T-10260 Pressure Checking Gauge
### Parts List for Model T-10280 Pressure Checking Gauge

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part Number</th>
<th>No. Req.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>T-10280</td>
<td>1</td>
<td>Pressure Checking Gauge</td>
</tr>
<tr>
<td>1</td>
<td>113877</td>
<td>1</td>
<td>Knob-Control</td>
</tr>
<tr>
<td>2</td>
<td>113878</td>
<td>1</td>
<td>Lever-Control</td>
</tr>
<tr>
<td>3</td>
<td>113874</td>
<td>1</td>
<td>Body-Pressure Gauge</td>
</tr>
<tr>
<td>4</td>
<td>113876</td>
<td>1</td>
<td>Gauge-Pressure</td>
</tr>
<tr>
<td>5</td>
<td>113875</td>
<td>1</td>
<td>Spindle-Flow Control</td>
</tr>
<tr>
<td>6</td>
<td>501007</td>
<td>1</td>
<td>Ring-Retaining — Truarc 5100-100</td>
</tr>
<tr>
<td>7</td>
<td>501108</td>
<td>2</td>
<td>Back-up Ring — S-11248-117</td>
</tr>
<tr>
<td>8</td>
<td>504036</td>
<td>2</td>
<td>O-ring — AS 568-117</td>
</tr>
<tr>
<td>9</td>
<td>502131</td>
<td>3</td>
<td>Pin-Spring — .094 Dia. x 3/8 long</td>
</tr>
<tr>
<td>-</td>
<td>110440</td>
<td>1</td>
<td>Hydraulic Coupling Assembly — (incl. ref 10 &amp; 11)</td>
</tr>
<tr>
<td>10</td>
<td>— — —</td>
<td>1</td>
<td>Nipple (Male) — See Fig. 1</td>
</tr>
<tr>
<td>11</td>
<td>— — —</td>
<td>1</td>
<td>Body (Female) — See Fig. 1. (incl. 11a &amp; 11b)</td>
</tr>
<tr>
<td>11a</td>
<td>504438</td>
<td>1</td>
<td>O-ring — AS 568-111 (not shown)</td>
</tr>
<tr>
<td>11b</td>
<td>501102</td>
<td>1</td>
<td>Back-up Ring — S-11248-111 (not shown)</td>
</tr>
<tr>
<td>12</td>
<td>110842</td>
<td>1</td>
<td>Hose-Hydraulic — 3/16 I.D. x 3/8 x 3/8 X 24 in.</td>
</tr>
<tr>
<td>13</td>
<td>503683</td>
<td>1</td>
<td>Nipple Pipe — Flodar #PF10-6</td>
</tr>
</tbody>
</table>
## Table 1 — Pull and Return Pressures for Huck Installation Equipment

<table>
<thead>
<tr>
<th>Output Pressures (psi)</th>
<th>For Huck Installation Equipment Model Nos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000 PULL 3000 RETURN</td>
<td>609-1, 611-1, 612-1</td>
</tr>
<tr>
<td>5400 PULL 2800 RETURN</td>
<td>516, (1) 520, (1) 524, (1) 532, (1) 536, (1) 205, 207, 208, 504, 505, 506, 507, 542 543, 544, 557, 568, (1) 574, (1) 585, 2384 2394, 4801, 5304, 5901.</td>
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<tr>
<td>7000 PULL 2800 RETURN</td>
<td>6042, 6062, 6062-16, 7042, 7062, 8042</td>
</tr>
<tr>
<td>8000 PULL 2800 RETURN</td>
<td>4802, 216-10, 216-12, 6304, 6304-16, 7142, 7304, 8142, 8304, 8304-24, 9304, 9304-28, 12142</td>
</tr>
<tr>
<td>8400 PULL 2800 RETURN</td>
<td>4803, 2702</td>
</tr>
<tr>
<td>8400 PULL 6000 RETURN</td>
<td>HPT25, HPT35, HPT57</td>
</tr>
</tbody>
</table>

(1) Spring piston return

### Notes:

1. All part numbers are available from Huck. Standard part numbers, 500000 series, can generally be purchased locally.

2. Material for O-ring, 504036, is Nitrile or Buna N, 90 durometer. Material for O-ring, 504438, is VITON (Parker Seal Co. compound V747-75, or equivalent), 75 durometer.

3. Back-up Rings are W.S. Shamban & Co. series S-11248, single turn TEFLEX (MS-28774), or equivalent.
Maintenance and Repair of Combination Valves

Service Parts Kit, P/N 120073, is available from Huck for replacing seals, perishable parts and high wear components — Huck recommends only minor overhaul by the customer. If a major overhaul is required, return the combination valve to:

Huck Manufacturing Co.
85 Grand Street
Kingston, N.Y. 12401-0250

An extra combination valve(s) should be available to use on the POWERIG® Hydraulic Unit while the original valve is being overhauled, or returned to the factory for overhaul.

Smear LUBRIPLATE 130AA or hydraulic fluid on O-rings and other components when reassembling the combination valve. Follow Figure 2 and 3 for proper position of all components.

After overhauling the combination valve(s) the PULL and RETURN pressures must be checked. See Checking Output Pressures.

Parts List for Service Parts Kit, P/N 120073
Used on Combination Valves P/N 119740 (AC) and P/N 120362 (DC).

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part No.</th>
<th>No. Req.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>120074</td>
<td>1</td>
<td>Spring Retainer</td>
</tr>
<tr>
<td>2</td>
<td>120075</td>
<td>1</td>
<td>Unloading Plug</td>
</tr>
<tr>
<td>3</td>
<td>107862</td>
<td>1</td>
<td>Spring</td>
</tr>
<tr>
<td>4</td>
<td>504410</td>
<td>2</td>
<td>O-ring</td>
</tr>
<tr>
<td>5</td>
<td>504711</td>
<td>2</td>
<td>O-ring</td>
</tr>
<tr>
<td>6</td>
<td>110910</td>
<td>1</td>
<td>Cone</td>
</tr>
<tr>
<td>7</td>
<td>107860</td>
<td>1</td>
<td>Spring</td>
</tr>
<tr>
<td>8</td>
<td>110905</td>
<td>3</td>
<td>Shim</td>
</tr>
<tr>
<td>9</td>
<td>504407</td>
<td>1</td>
<td>O-ring</td>
</tr>
<tr>
<td>10</td>
<td>504475</td>
<td>2</td>
<td>O-ring</td>
</tr>
<tr>
<td>11</td>
<td>504414</td>
<td>1</td>
<td>O-ring</td>
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<tr>
<td>12</td>
<td>107859</td>
<td>1</td>
<td>Spring</td>
</tr>
<tr>
<td>13</td>
<td>115704</td>
<td>1</td>
<td>Retaining Ring</td>
</tr>
<tr>
<td>14</td>
<td>505409</td>
<td>1</td>
<td>Spring</td>
</tr>
</tbody>
</table>
Sectional Views A-A and B-B
Warranties

Warranty
THE NINETY DAY WARRANTY HEREBIN EXpressed SHAll BE THE EXCLUSIVE WARRANTY ON ITEMS MANUFACTURED BY SELLER AND SHALL BE IN THE PLACE AND STEAD OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTYS OF MERCHANTABILTY AND FITNESS FOR A PARTICULAR PURPOSE.

Seller shall not be liable for any loss or damage resulting from delays or non-fulfillment of orders owing to strikes, fires, accidents, transportation or for any reason or reasons beyond the control of seller or its suppliers.

All warranty claims must be submitted to the seller in writing, within 90 days from date of shipment, and no returns will be accepted without written permission.

Other provisions hereof notwithstanding, seller shall not be liable for any loss of business, profits or any incidental or consequential damages incurred by Buyer or any third person in connection with the items or use thereof, however caused.

Tool Warranty
Seller expressly disclaims any warranty express or implied, as to the condition, design, operation, merchantability or fitness for use of any tool, or part(s) thereof not manufactured by seller. The only warranties made with respect to such tool or part(s) thereof are those made by the manufacturer thereof and seller agrees to cooperate with buyer in enforcing such warranties when such action is necessary. Seller agrees to repair or replace F.O.B. seller's plant, any tool or part(s) thereof manufactured by it and proved to seller to be defective due to faulty workmanship or material.

Warranty on "Other Items"
With regard to items other than FASTENERS and TOOLS ("OTHER ITEMS"), seller expressly disclaims any warranty, express or implied, as to the condition, design, operation, merchantability or fitness for use of any "OTHER ITEMS", or part(s) thereof not manufactured by seller. The only warranties made with respect to such "OTHER ITEMS" or part(s) thereof are those made by the manufacturer thereof and seller agrees to cooperate with buyer in enforcing such warranties when such action is necessary.

Seller agrees to repair or replace F.O.B. seller's plant, any "OTHER ITEMS" or part(s) thereof manufactured by it and proved to seller to be defective due to faulty workmanship or material.

Huck Installation Equipment

Huck International Inc. reserves the right to make changes in specifications and design and to discontinue models without notice.

Huck Installation Equipment should be serviced by trained servicemen only.

Always give the Serial No. of the equipment when corresponding or ordering service parts.

Complete repair facilities are maintained by Huck International Inc. Please contact one of the offices listed below.

Eastern
85 Grand Street, Kingston, New York 12401 (914) 331-7300, Telephone 914-331-7300, FAX 914-334-7333

Western
900 Watsoncenter Road, Carson, California 90746 Telephone 310-830-6200, FAX 310-830-1436

Canada
326 Humber College Boulevard, Rexdale, Ontario M9W 5P4, Canada. Telephone 416-675-3400, FAX 416-675-3917

Outside USA and Canada
Contact your nearest Huck International Office. See Back Cover.

In addition to the above repair facilities, there are Authorized Tool Service Centers (ATSC) located throughout the United States. These service centers offer repair services, spare parts, Service Parts Kits, Service Tool Kits and Nose Assemblies. Please contact your Huck representative or the nearest Huck Office listed on the back cover for the ATSC in your area.
Huck Acceptance is World-wide

Huck International Inc. maintains company offices throughout the United States and Canada with subsidiary offices in many foreign countries. Sales engineers and systems specialists located in your area can help in solving your fastener problems.

Huck International Inc. world-wide locations:

Americas

Huck International, Inc.
Installation Systems Division
P.O. Box 2270
85 Grand Street
Kingston, NY 12401
800-431-3091
914-331-7300
FAX: 914-334-7333

Huck International, Inc.
World Headquarters
6 Thomas Street
P.O. Box 19590
Irvine, CA 92718
714-855-9000
FAX: 714-855-8537

Huck International, Inc.
Aerospace Fastener Division
PO Box 5268
900 Watonwcenter Rd.
Carson, CA 90749
800-421-1459
310-830-8200
FAX: 310-830-1436

Huck International, Inc.
Aerospace Fastener Division
Lakewood Operation
3969 Paramount Blvd.
Lakewood, CA 90712
800-344-6566
310-421-3711
FAX: 310-425-3242

Huck International Ltd.
6150 Kennedy Road, Unit 10
Mississauga, Ontario L5T214
Canada
905-564-1825
FAX: 905-564-1963

Huck International, Inc.
Avenida Parque Lira, 79-402
Tacubaya Mexico, D.F.
C.P. 11850
FAX: 525-515-1776
TELEX: 1173530 LUKSME

Far East

Huck Australia, Pty. Ltd.
Private Bag 6
Rowville, Victoria
Australia 3178
03-764-5500
Toll Free: 008-335-030
FAX: 03-764-5510

Huck Limited
Yodogwa-Gobankan 11F
No. 2-1, 3 Chome Toyosaki
Kita-Ku, Osaka 531 Japan
06-372-1193
FAX: 06-372-9346
TELEX: 63632

Huck International Singapore PTE, Ltd
7500A Beach Road
#10-323 The Plaza
Singapore 0719
65-298-2791
FAX: 65-298-2792

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Huck International Ltd.
Unit C, Stafford Park 7
Telford, Shropshire
England TF3 3BQ
0952-290011
FAX: 0952-290459

Huck International GmbH
Postfach 12 60
37520 Osterode Am Harz
Germany
05522-505-300
FAX: 05522-505-300

Huck S.A.
Clos D’Asseville
BP4
95450 Us Par Vigny
France
34-66-07-00
FAX: 34-66-07-00

A Throckmorton
Company