

## Installation and Service Manual Hydraulic Stabilization Legs

Part # 81-1093 rev 0E

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## 3.0", 3.5", 4.0", 5.0", and 6.0" Bore Hydraulic Stabilization Legs

**(800) 745- 4142**

**info@powerpackerus.com**

**www.powerpackerus.com**

## 1.0 Important Receiving Instructions

Visually inspect all components for shipping damage prior to installation. Shipping damage is not covered by warranty. If shipping damage is found, notify carrier at once. The carrier is responsible for all repair and replacement costs resulting in damage from shipment. For most current manual, see <http://www.powerpackerus.com>

Product descriptions and specifications are subject to change. For specific versions related to your product, contact us.

## 2.0 Safety Issues

Read all Instructions, Warnings and Cautions carefully. Follow all safety precautions to avoid personal injury or property damage during system operation. Power-Packer cannot be responsible for damage or injury resulting from unsafe product use, lack of maintenance or incorrect product and/or system operation. Do not remove warning labels, tags or decals. Contact Power-Packer when in doubt as to the safety precautions and operations.

This manual follows a system of Safety Alert Symbols, Signal Words and Safety Messages to warn the user of specific hazards. Failure to comply with these warnings could result in serious personal injury or death, as well as damage to equipment or other property.

This is a Safety Alert Symbol that appears throughout this manual. It is used to alert you to potential physical injury hazards. Pay close attention to Safety Alert Symbols and obey all safety messages that follow this symbol to avoid possible serious personal injury or death.

Safety Alert Symbols are used in conjunction with certain Signal Words that call attention to safety messages or property damage messages and designate a degree or level of hazard seriousness. The Signal Words used in this manual are WARNING, CAUTION, and NOTE.

WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTE indicates information considered important, but not hazard-related (e.g. messages related to property damage.)



**WARNING**



**CAUTION**



**NOTE**

**NOTE**

Our experience indicates that mixtures of oil and fuel oil cause seals to swell, resulting in subsequent sticking or sluggish action on the stabilizing legs.

**NOTE**

Always grease leg in the fully retracted position.

**DANGER**

Do not place any body parts (feet) below leg shoe while in operation. The operator must be fully aware of people's position in the equipment area.

**3.0 Hydraulic Fluid and Grease Specifications**

Power-Packer recommends using a quality ISO 15 anti-wear hydraulic fluid for most applications. If operating in cold temperatures slower operation will occur. If slower operation in cold weather affects your operations, we recommend using a fluid specially-formulated for cold temperatures. We have found that ISO 15 anti-wear hydraulic fluids work well with Power-Packer systems to -20° F.

If consistently operating at temperatures below -20°F, then we recommend hydraulic fluids conforming to MIL-PRF-5606H or MIL-H-5606A (obsolete). If you have any questions regarding fluid recommendations, please call us.

**Power Packer Hydraulic Lubricant Recommendations****Cold Weather Fluids (ISO 15 HVI)**

<u>Brand</u>	<u>Trade Name</u>	<u>ISO Viscosity Grade</u>
Mobile	DTE 10 Excel 15	15
Kendall	Hyken Glacial Blu	15
Chevron	Rando HDZ 15	15
Phillips 66	Arctic Low Pour	15
Shell	TellusS2 V 15	15
Schaeffer	275SW ISO 15	15

**Extreme Cold Weather Fluids (MIL-H-5606A)**

<u>Brand</u>	<u>Trade Name</u>	<u>ISO Viscosity Grade</u>
Phillips 66	X/C 5606A	15
Mobil	Aero HFA	N/A
Royco	756A	N/A
Shell	AeroShell Fluid 4	N/A
Chevron	5606A	N/A

**Grease**

<u>Brand</u>	<u>Trade Name</u>	<u>NLGI</u>
Mobile	Mobilux EP 0	0
Mobile	Mobilux EP 004	00
Chevron	Delo Grease EP 0	0
Chevron	Delo Grease EP 00	00
Phillips 66	Multiplex Red 0	0
Shell	Gadus S2 V220 0	0
Schaeffer	274 Moly EP Synthetic Plus 0	0
Schaeffer	274 Moly EP Synthetic Plus 00	00

## 4.0 Maintenance/Control Box Operation

### NOTE

Always grease leg in the **fully** retracted position.

### DANGER

Do not place any body parts (feet) below leg shoe while in operation. The operator must be fully aware of people's position in the equipment area.

#### MAINTENANCE

- A. Grease the legs (if applicable) every 6 months with NLGI Grade "00" or "0" grease. Pump grease until grease is observed exiting the lower area close to the shoe.
- B. Seals and lock valves – no maintenance is required. Repair only if malfunction is observed (see trouble shooting).
- C. Fluid
  1. Drain fluid and change oil filter every 12 months. With legs (cylinders) retracted, drain the reservoir fluid using the drain plug on bottom of the reservoir. Change filter, P/N 06-1014. Remove fill plug, add specified fluid until oil level reaches the top of the sight gauge, and reinstall fill plug.
  2. Check fluid level every 2 months as indicated in (1) above by using the sight gauge. Add fluid as needed.
- D. Perform engine maintenance as specified in engine manual.

*To Operate System:*

#### AC OPERATION

- A. Connect power to system per local codes.
- B. Move the lever of the control valve of the leg you wish to raise or lower.

#### DC OPERATION

- A. Turn key switch fully clockwise.
- B. "Flip" paddle switch up to energize the pump. Release switch to stop pump (It is spring centered to "off" position).
- C. Move the lever of the control valve of the leg you wish to raise or lower.

#### GAS ENGINE OPERATION

- A. Check engine oil and gas level.
- B. Start engine.
- C. Move the lever of the control valve of the leg you wish to raise or lower.



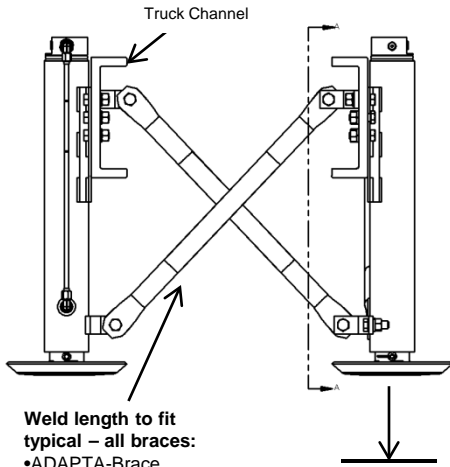
# CAUTION

Do not weld on truck frame.

## 5.0 3.0" Bore Leg Installation

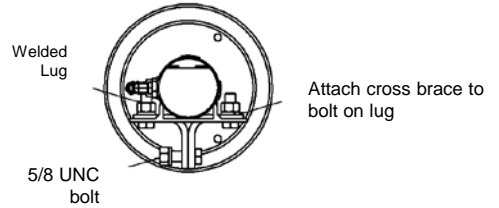
**Product notes:**

1. Mounting bolts (5/8-18UNF×1-3/4 lg), nuts and lock washers supplied in large mounting kit, P/N 101447.
2. Brace kit, P/N 200073, optional includes (1) ADAPTA-brace (2005-01) plus large mounting kit (101447)
3. All bolts must be 5/8" grade 5 min.

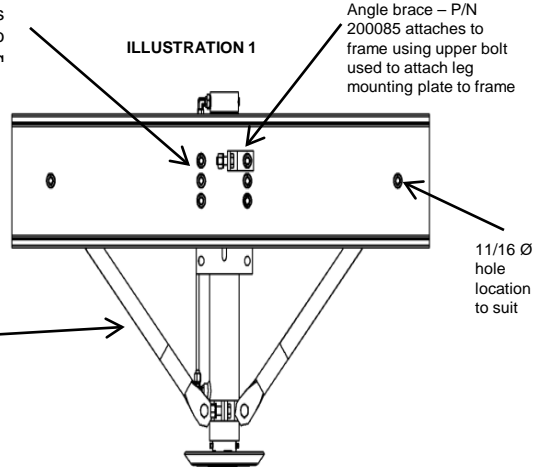


**Weld length to fit typical – all braces:**

- ADAPTA-Brace
- 1-1/2" O.D.x .075 wall (min)
- OR 1-1/2 x 1-1/2" x 1/8 angle stock



(6) 11/16 Ø holes required in frame to mount leg



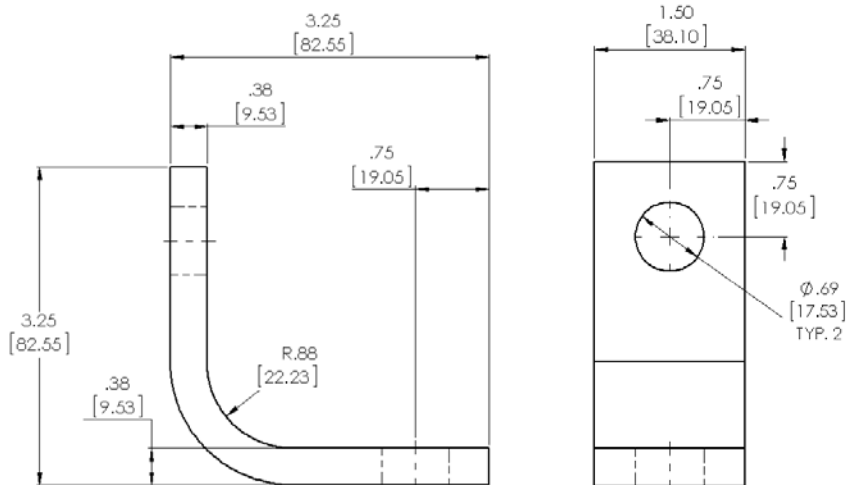
One brace per leg required in front or behind leg as shown. To obtain bracing facing the same direction bolt the supplied lug, P/N 200085 to leg bottom lug. See Illustration 1.

Retracted road clearance 8"-12" (truck empty) to suit application

SECTION AA  
SCALE 1:4

**Brace lug used for:**

1. Cross brace to frame connection
2. Fore and aft leg lug (bolts on leg to allow fore and aft bracing in the same direction).



**Figure 1**

Bracing Lug P/N 200085

## 5.1 3.0" Bore Leg Parts List

## Parts List

Item	Part No.	Description	Qty.	Notes
1		o-ring	1	1,2
2		o-ring	2	1
3		back-up washer	2	1
4		o-ring	2	1
5		back-up washer	2	1
6		lock valve	2	1
7		o-ring	2	1,2
8		back-up washer	1	1
9		retaining nut	1	1
10		o-ring	2	1
11		tee, branch	1	
12		plug	1	
13	17-1003	snap ring	1	2
14		back-up	2	2
15		wear ring	1	2
16		o-ring	1	2
17		seal, piston	1	2
18	*	piston	1	
19	2035-"A"	cylinder barrel	1	3
20	2019-"A"	stop tube	1	3
21		o-ring	1	2
22		back-up washer	1	2
23		rod guide	1	
24		wear ring	1	2
25		snap ring	1	2
26	18-1014	cotter pin	1	
27	2002-"A"	rod guide	1	3
28	2020-"A"	transfer tube	1	3
29		90° elbow	1	
30		seal, rod	1	2
31		wiper	1	2
32	16-1005	washer	2	
33	18-1013	pin	1	
34	200004	shoe assembly	1	

\* Consult factory

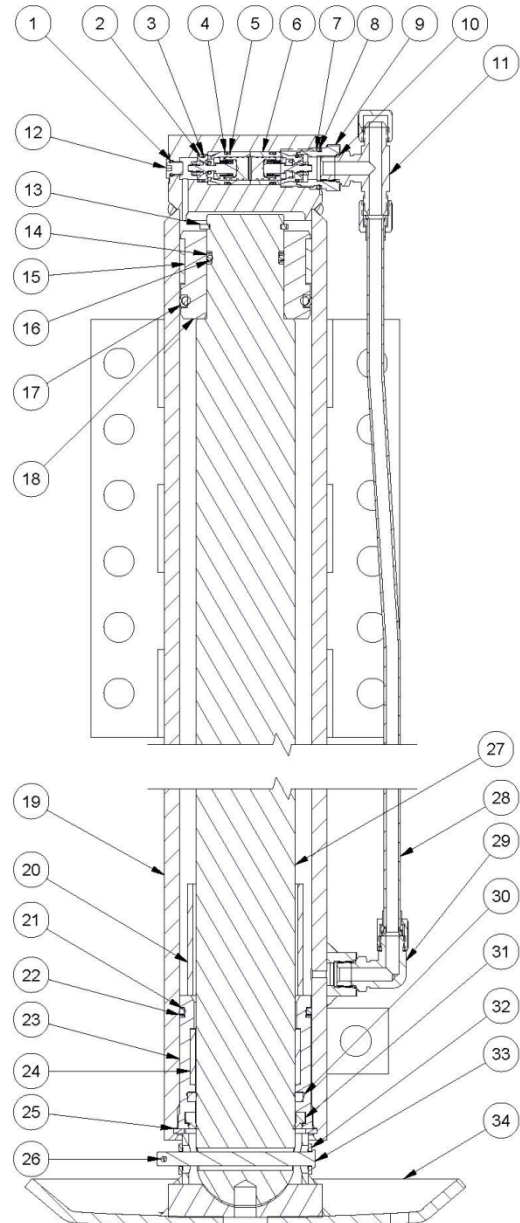


Figure 2

**Product Notes:**

1. These items included in lock valve repair kit P/N 200079.
2. These items included in leg repair kit P/N 200080.
3. -"A" designates item length.


**CAUTION**

Use eye protection.


**CAUTION**

Crack all connections gradually to allow trapped pressure to bleed completely down. Slowly remove hose fitting connections completely.


**WARNING**

Do not stand in front of rod end.

### 5.3 3.0" Bore Leg Repair

#### KIT NO. 200080

(See pg. 6 for detailed leg drawing.)

#### 1. Replacing Leg Seals:

- A. Fully retract leg(s).
- B. Remove leg from mounting on trailer or vehicle.
  1. Loosen hose connections going from ports "A", "B" and "R".
  2. Using a 1/8" allen wrench, slowly turn **plug**, Item 12 to bleed trapped pressure from the cylinder base side (Eye protection is recommended). Remove plug completely when pressure is bled down.
- C. Remove shoe by removing **cotter pin**, Item 26 and **pin**, Item 33.
- D. Loosen the tube nuts on Item 28 approximately two turns to bleed pressure.
- E. Place leg on a table or horizontal surface and remove **snap ring**, Item 25 using a Waldes snap ring pliers No. S-6700 or equivalent.
- F. Hang legs upside down using a hoist, use shoe pin hole to attach chain or cable. Tap on mounting plate with wood block and hammer to force the piston rod assembly to slide within the cylinder barrel. Continue to tap until the **rod guide**, Item 23 and **piston assembly**, Item 18, 27 and 20 can be pulled out of barrel.
- G. Place **rod piston assembly**, Items 18 and 27 and rod guide on clean table.
- H. Remove **rod guide**, Item 23 from the rod by tapping it over the rod end.
- I. Remove **piston retainer snap ring**, Item 13 using Waldes pliers No. S-6600 or equivalent. (Use eye protection.) Tap piston off of rod (use rubber cap mallet).

#### 2. Installation of New Seals and Cylinder Assembly:

- A. Rod Guide – Remove **wiper**, **rod seal**, **wear ring**, **back-up ring** and **o-ring**, Items 31, 30, 24, 22, 21 respectively. Install new seals.
  1. **Wiper**, Item 31 lips facing outward.
  2. **Shaft seal**, Item 30 lips facing inward.
  3. **Wear ring**, Item 24 work in with screwdrivers.
  4. Install **back-up ring**, Item 22 to outside of groove. Radius portion must face inward (touching o-ring).
  5. Install **o-ring**, Item 21 as shown.
  6. Lubricate all seals thoroughly.
- B. Piston Rod Assembly
  1. Remove Items 17, 15, 14 and 16.
  2. Install new **piston seal**, Item 17 (similar to installing a tire on a bicycle wheel).
  3. Install new **wear ring**, Item 15.
  4. Install new **back-up rings** and **o-ring**, Items 14 and 16 on rod. The back-up rings sandwich the o-rings with the curved portion touching the o-ring on both sides.
  5. Lubricate all seals and rod thoroughly, tap piston over rod until bottomed on the rod shoulder. Install new **snap ring**, Item 13 with Waldes pliers No. S-6600. (Use eye protection).


**CAUTION**

Use eye protection.


**CAUTION**

Use eye protection.


**CAUTION**

Crack all connections gradually to allow trapped pressure to bleed completely down. Slowly remove hose fitting connections completely.

### 5.3 3.0" Bore Leg Repair (Continued)

#### KIT NO. 200080

(See pg. 6 for detailed leg drawing.)

#### 2. Installation of New Seals and Cylinder Assembly (Continued):

##### C. Cylinder Assembly

1. With cylinder barrel resting on its head (upside down) lubricate the opening of the cylinder barrel. Drop the piston rod assembly straight and gentle into the barrel. Tap drive in to approximately full retraction.
2. Lubricate the round end of the rod, gently tap the rod guide fully into the barrel. Use a brass/bronze drift to tap around until the rod guide is bottomed out and a new **snap ring**, Item 25 can be installed using Waldes pliers No. S-6600. (Use eye protection).
3. Install new **o-ring**, Item 1 on **plug**, Item 12 and fully insert **plug**, Item 12.
4. Install leg(s) on equipment in reverse manner of "1" A, B and C.
5. After all hose connections are complete, cycle legs up and down (full stroke 2 or 3 times to purge trapped air).

### 6.0 Lock Valve Repair

#### KIT NO. 200079

1. Retract legs fully. (If space permits, it may be done on equipment; if not, remove legs).
2. Slowly crack all fittings on port connections "A", "B" and "R".
3. Slowly loosen **plug**, Item 12 to relieve pressure (use eye protection). Remove **plug**, Item 12.
4. Remove **transfer tube**, Item 28 and loosen **elbow**, Item 29 **swing away**, Item 29 to remove **tube**, Item 28. Loosen **tee fitting**, Item 11 and remove **retainer nut**, Item 10.
5. Using a small drift (1/8") tap through the **plug hole**, Item 12 to push the lock valve cartridges out (two cartridges will come out of large opening where Item 9 was removed).
6. Install new lock valves.
  - A. Lubricate thoroughly with hydraulic oil.
  - B. The inner most lock valve must be inserted with small end first. Use **retainer nut**, Item 9 to drive in.
  - C. The outside lock valve must be inserted with the small end to the outside. Push the nose of the cartridge into the retaining nut and screw the combination into the cylinder. Torque retaining nut to 15 ft.-lb. Install **tee**, Item 11, **tube**, Item 28 and **swing elbow**, Item 29 up and tighten all connections.
  - D. Install new **o-ring**, Item 1 on **plug**, Item 12 and install **plug**, Item 12.



# CAUTION

Do not weld bracing and/or ears directly to well tube. Weld to split collar only. Do not weld split collar to leg. Split collar bolts should be torqued to approximately 20 ft.-lbs.

## 7.0 3.5"/4.0" Bore Leg Installation

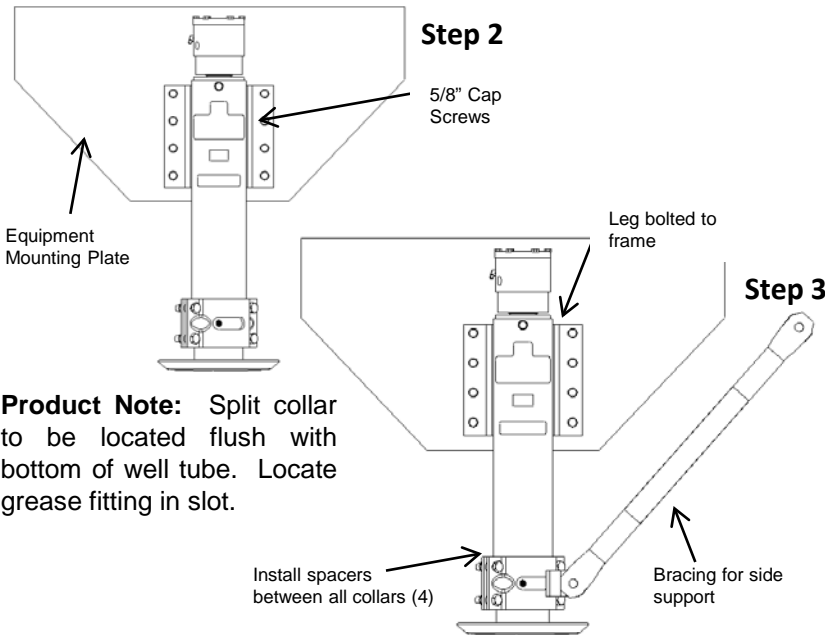
The following instructions and parts lists are furnished as a helpful guide for installation of your stabilizer system. Check shipment to be sure there has been no damage or loss in shipping. Refer to the packing list, packed in the hardware kit. Note location of serial number plate on the control box cover. Always provide serial number and part numbers when ordering parts or requesting technical assistance.

### FRONT MOUNT LEGS

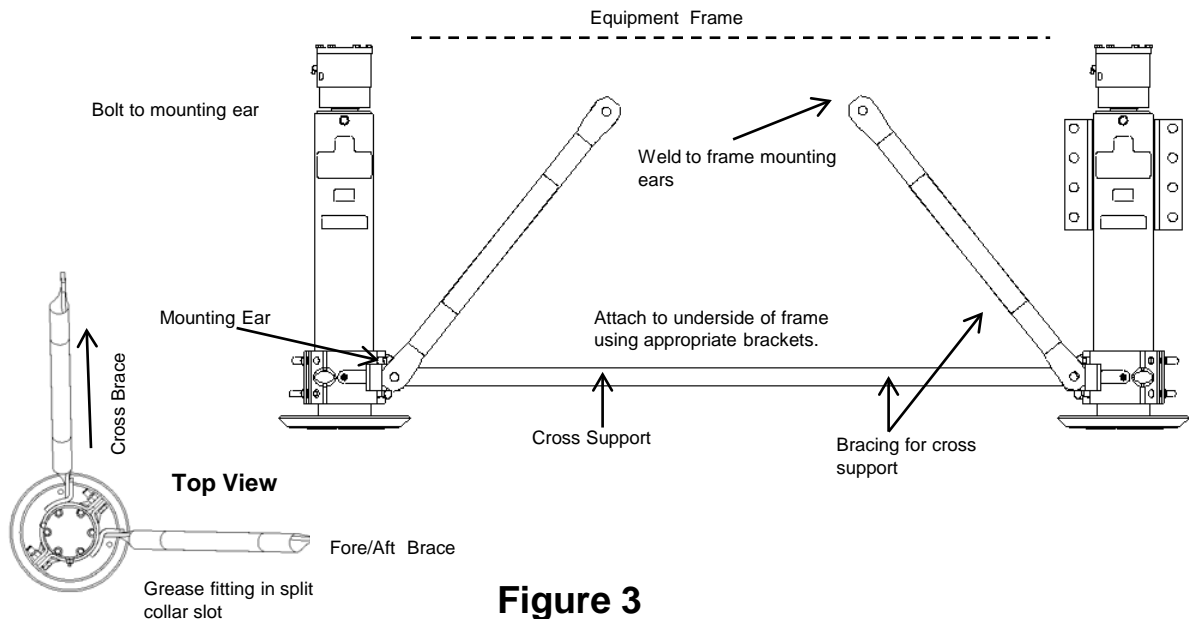
**Step 1** – Remove manually operated stabilizing legs (if applicable).

**Step 2 – Leg Mounting.** Install stabilizer legs to standard leg mounting base. Allow 12" ground clearance with legs fully retracted. Use 5/8-18 UNF grade 5 hex head cap screws and hex nuts. Torque to 150 ft.-lbs.

**Step 3 – Bracing.** Bracing leg as shown, your actual bracing system may be different from that shown. Any bracing system must brace the bottom of the stabilizer leg to structural members of the equipment in two directions 90° apart. Make sure bracing will not interfere with equipment.

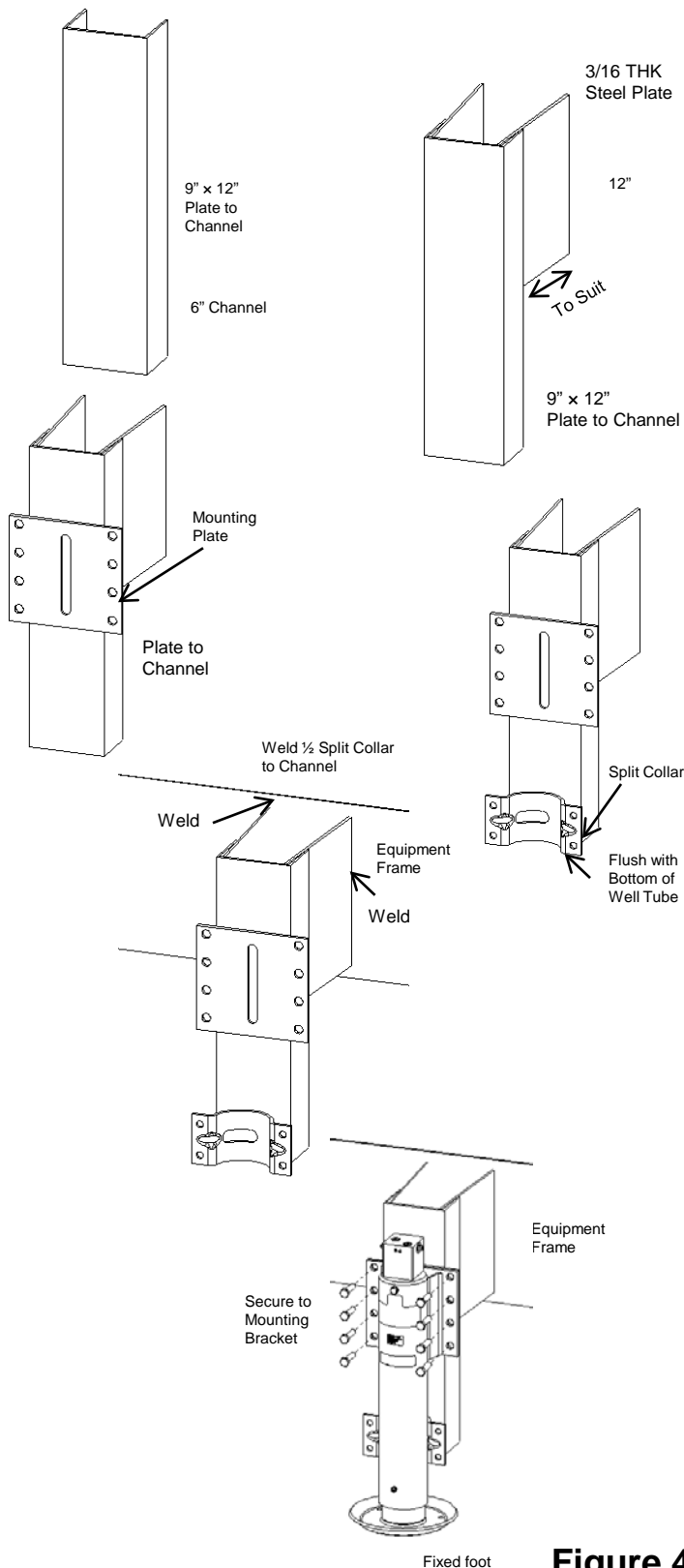


**Product Note:** Split collar to be located flush with bottom of well tube. Locate grease fitting in slot.



**Figure 3**

## 7.0 3.5"/4.0" Bore Leg Installation (Continued)

**REAR MOUNT LEGS**

**Step 4** – Determine the location for stabilizer legs. You should allow 6" of ground clearance (4" absolute minimum). Remember to allow for spring deflection when equipment is loaded. If you have difficulty finding a suitable mounting location, call Power-Packer.

**Step 5 - Leg Mounting.**

1. This is one common way of mounting "rear mount" stabilizer legs. Other methods may be used. When designing a mounting structure, provide enough strength to lift the equipment and proper bracing to take any side loading. In case of questions, please call Power-Packer.
2. Remove wheels, if necessary. Cut a 6" channel to desired length (varies with equipment frame and leg stroke).
3. Weld a 12" long piece of 3/16" steel plate to the inside of the channel. These plates should be wide enough to place the center of the leg between the tires when the leg is mounted to the channel.
4. Weld a loose mounting plate (supplied by Power-Packer) to the channel at the proper height (per installation requirements).
5. Weld a split collar half to the mounting channel where the bottom of the well tube will be located.
6. Weld this fabrication to the trailer frame.
7. Fabricate second leg mounting leg structure in the same manner.
8. Mount legs using 5/8-18 UNF grade 5 bolts. Torque to 150 ft.-lbs.
9. Clamp remaining split collar halves in place with 1/2-20 UNF grade 5 bolts. Torque to 20 ft.-lbs.

**Figure 4**

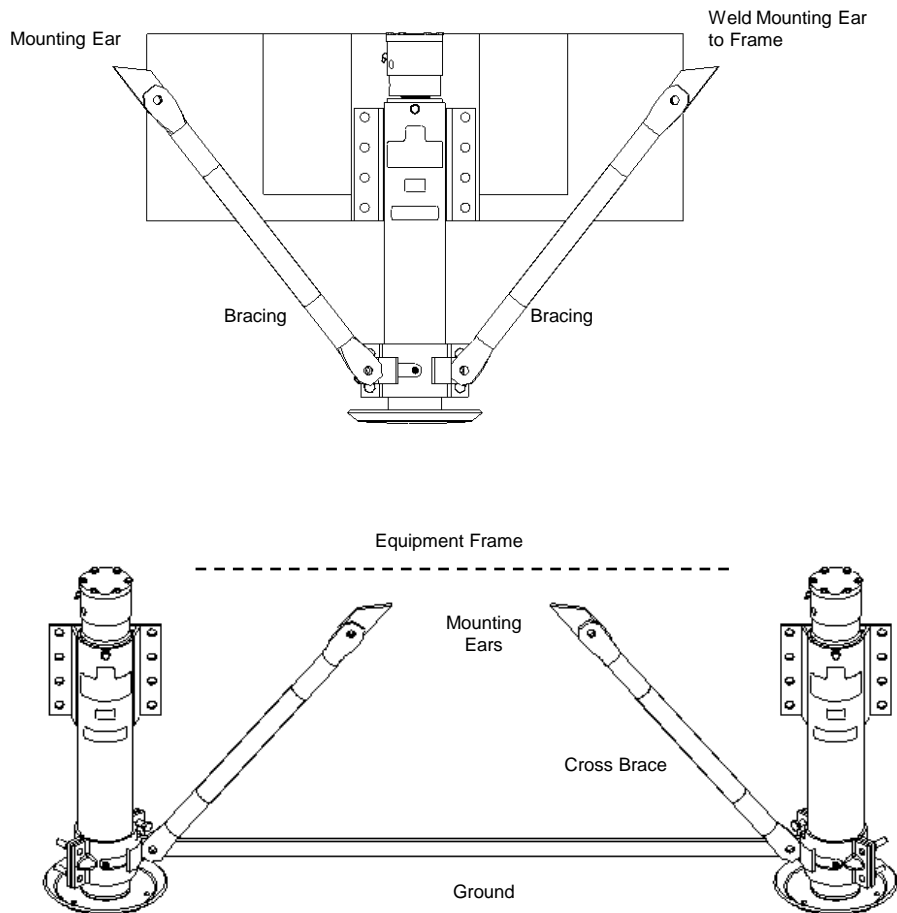
## 7.0 3.5"/4.0" Bore Leg Installation (Continued)

 **NOTE**

Do not use split collar bolt to attach bracing.

**REAR MOUNT LEGS CONTINUED****Step 6 – Bracing.**

1. Other bracing systems may be used to suit this application. The bottom of each leg must be braced to the equipment frame members in two directions 90° apart. These braces should not be welded to the leg. They may be mounted to the split collar, channel and/or the cross brace near the leg.
2. Weld cross brace from the bottom of one channel to the other.
3. Weld a brace from the bottom of each channel to the trailer frame at a 45° angle. This brace should be pointed directly away from the leg.
4. On each side, weld bracing pointing straight forward and/or backward at a 45° angle from each channel on the cross brace to the equipment frame.

**Figure 5**

## 7.1 3.5"/4.0" Bore Leg Parts

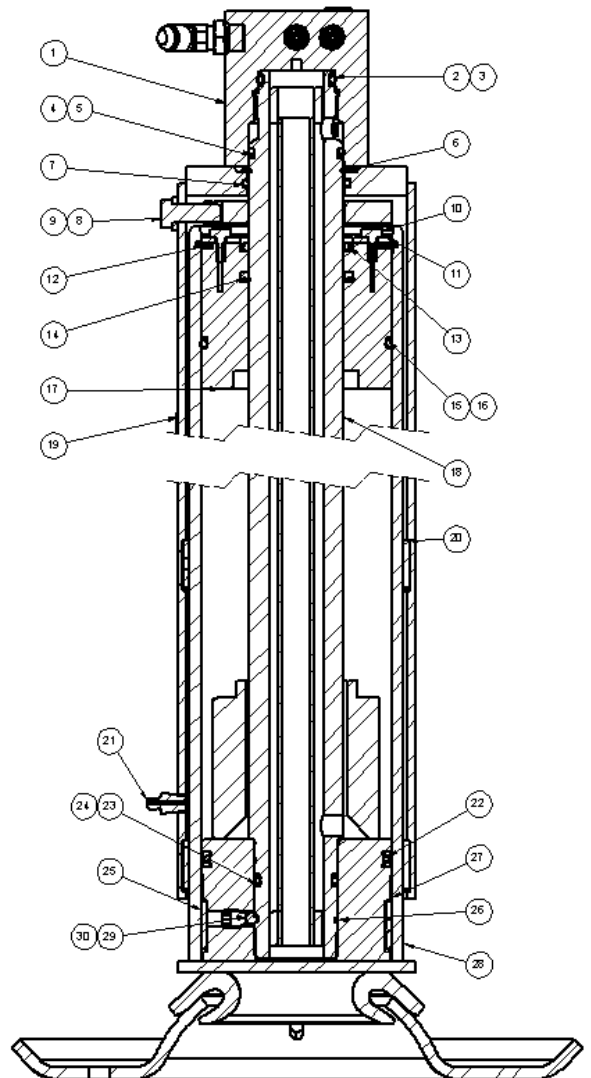
## Parts List

Item	3.5" Bore	4.0" Bore	Description	Qty.	Notes
1	1010001935	1010002577	4:1 lock valve assembly	1	3
2			o-ring	1	1,2
3			back-up washer	2	1,2
4			o-ring	1	1,2
5			back-up washer	1	1,2
6			snap ring, 2" rod	1	2
7			o-ring	1	2
8			hex head cap screw	1	
9			3/8" lock washer	1	
10			hex head cap screw	4	
11			cylinder head retainer	1	
12			retaining ring	1	2
13			oil seal	1	2
14			rod seal	1	2
15			o-ring	1	2
16			back-up washer	1	2
17	*100216	*100276	cylinder head	1	
18	*	*	piston rod	1	
19	*	*	well tube	1	
20			wear ring	2	2
21			grease fitting	1	
22			piston seal	1	2
23			o-ring	1	2
24			back-up washer	2	2
25			wear ring	1	2
26			snap ring, 1.75 rod	1	
27	*	*	piston	1	
28	*	*	cylinder tube	1	
29			nylon ball	1	2
30			set screw	1	2
31	100346	100348	split collar assembly (not shown)	1	

\* Consult Factory before ordering



Figure 6



**Product Notes:**

1. These items are contained in lock valve repair kit P/N 1010001969 and are not available on an individual basis.
2. These items are contained in leg repair kit P/N 101086 (3.5" Bore) or P/N 100422 (4" Bore) and are not available on an individual basis.
3. For legs originally equipped with valve P/N 300520 retrofit kit 1010001968 can be used to update the leg.
4. \*State the model number and part description when ordering.

 **NOTE**

All seals should be coated lightly with grease before installation into leg.

 **CAUTION**

Crack all connections gradually to allow trapped pressure to bleed completely down. Slowly remove hose fitting connections completely.

 **CAUTION**

While lifting piston rod, oil will squirt out of side port at top of rod.

## 7.2 3.5"/4.0" Bore Leg Repair

**KIT NO. 101086 (3.5" Bore)**

**KIT NO. 100422 (4.0" Bore)**

The item numbers listed below are the same as those listed on the leg assembly drawing. See page 12 for detailed leg drawing.

### DISASSEMBLY/ASSEMBLY PROCEDURE

When disassembling and reassembling the leg, care should be taken to keep all parts clean and to prevent parts from being damaged

1. To remove leg from equipment, make sure no weight is being supported by legs. Have legs slightly extended from full retract position to relieve any internal pressure in legs. Disconnect the hoses from the leg. You may wish to mark which hose goes to what port. Remove the leg.
2. Remove the **lock valve**, Item 1 from the leg by screwing counter clockwise. If you need only to repair the lock valve, it may be removed from leg while still on equipment if you have a minimum of 2" clearance above.
3. Remove **o-rings** and back-up washers, Items 2, 3, 4 and 5. Using a snap ring pliers, remove **snap ring**, Item 6. Loosen **hex screw**, Item 8.
4. Lift **well tube**, Item 19 off lower leg assembly. Lift **piston rod**, Item 18 to gain access to top of **cylinder head**, Item 17.
5. Remove four **hex screws**, Item 10. Lift **cylinder head retainer**, Item 11. A wire or rubber band may be used to hold Item 11 to sprocket near the top of piston rod, out of the way.
6. Using a small flat screwdriver, carefully remove **spiral retaining ring**, Item 12. Lift piston rod assembly out of **cylinder tube**, Item 28.
7. Using a large snap ring pliers, remove heavy duty **snap ring**, Item 26 or remove the **set screw**, Item 30. Remove the **piston**, Item 27, **cylinder head**, Item 17, **retaining ring**, Item 12 and **cylinder head retainer**, Item 11.
8. Remove all seals and wear rings. Clean all parts. Inspect all bearing surfaces for scratches, nicks, or other defects; replace if necessary. Replace all wear rings, and lightly lubricate all seals before installing on legs.
9. Carefully reassemble the leg in reverse order as described above. Where applicable, torque **piston**, Item 27 to 40-50 ft.-lbs. Apply two drops Loctite® 277 or equivalent to **set screw**, Item 30 and torque to 50 in./lbs.
10. Return leg to equipment and reconnect all hoses. Apply grease to **grease fittings**, Item 21 and cycle legs fully several times to bleed air from system. Check oil level as described in maintenance section of manual.

## 7.3 3.5"/4.0" Bore Stiff Leg Parts List

 **NOTE**

When ordering parts for a stiff leg model, all parts are common with a non-stiff leg model (see page 12) except for the stated parts.

**Parts List**

Item	Part No.	Description	Qty
1	*	well tube	1
2	*	stiff leg	1
3	18-019	cotterless pin hitch	1
4	99-1002	ferrule	2
5	15-1052	screw	1
6	087-009000	cable	1

\* Consult Factory before ordering

**Product Notes:**

1. \* State the leg part number when ordering.
2. Items 3, 4, 5, and 6 can be purchased in Hitch Pin Kit P/N 101504.

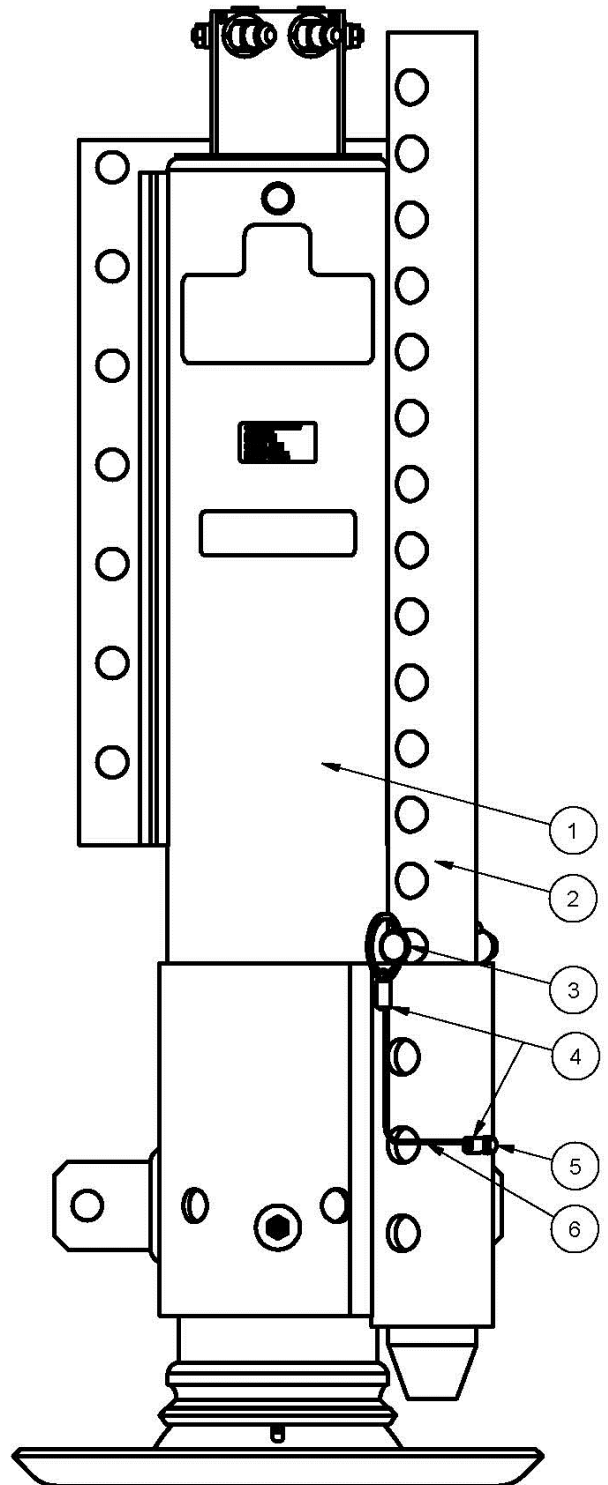
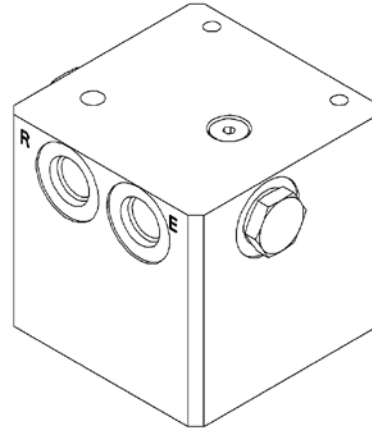
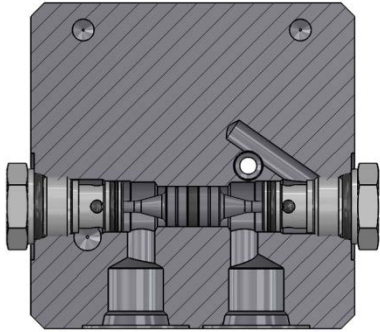
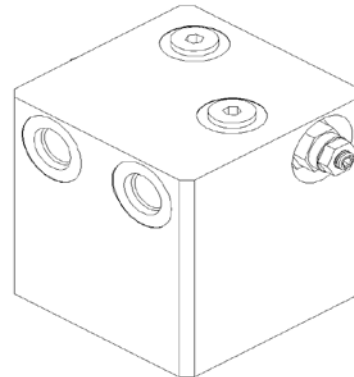
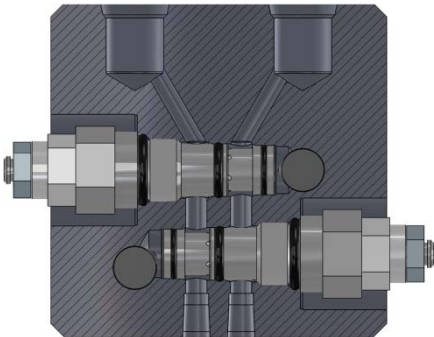


Figure 7

**7.4 3.5"/4.0" Bore Lock Valve****PART NO. 1010001935  
Dual P.O. Check Valve****Product Notes:**

1. Use kit P/N 1010001968 for service.
2. Use kit P/N 1010001969 for retrofit.

**PART NO. 1010002577  
Dual Counterbalance Valve****Product Notes:**

1. Use kit P/N 1010002587 for service.

**Figure 8**

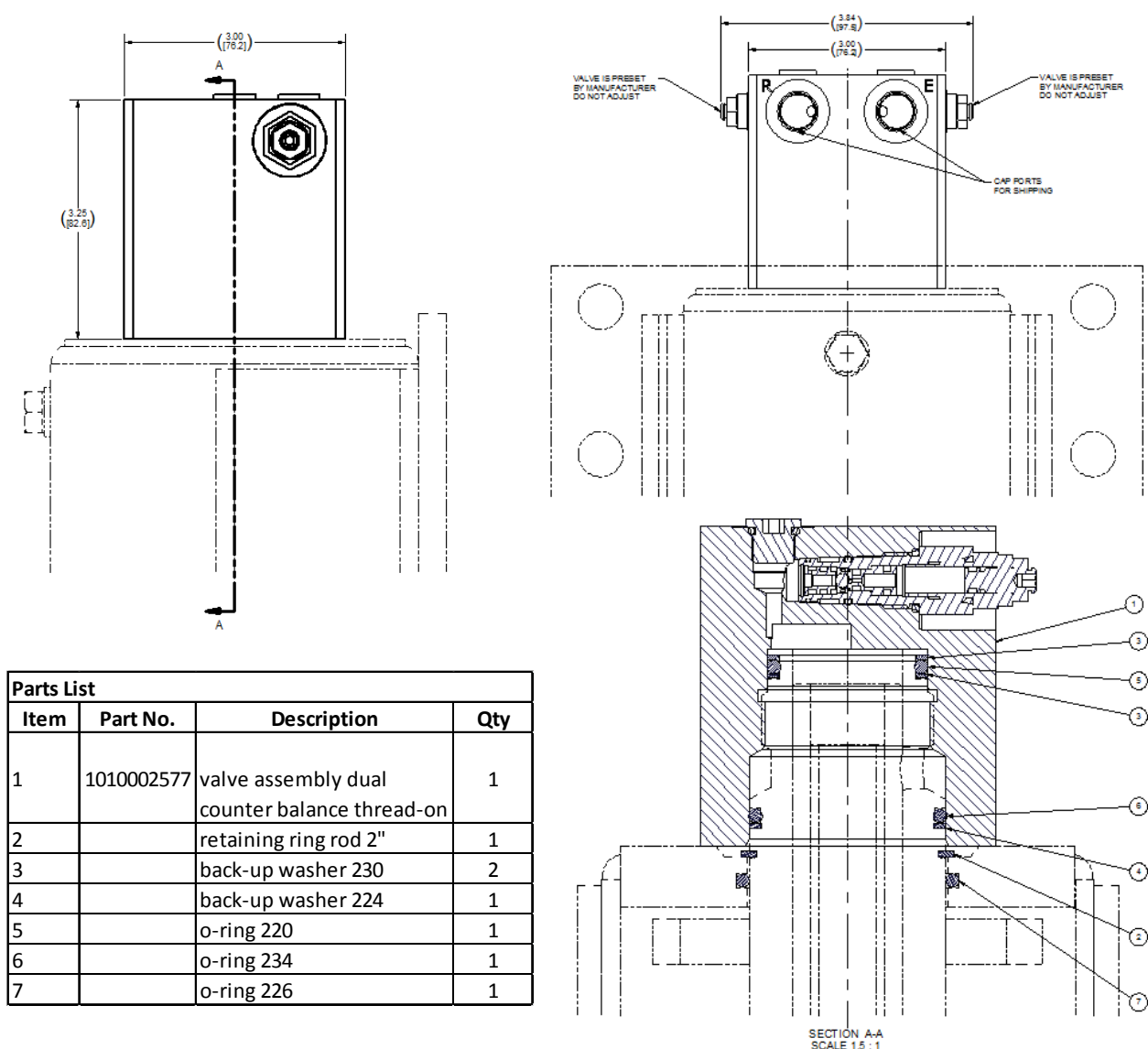
# NOTE

Unless otherwise noted, item numbers refer to Lock Valve Assembly Drawing.

## 7.5 3.5"/4.0" Bore Lock Valve Repair

### KIT NO. 1010002587

1. Remove lock valve as described in leg repair, Step 2.
2. Remove dual counter balance valve cartridge (1).
3. Install new dual counter balance valve assembly. Lubricate seals with clean hydraulic oil.
4. Install new **o-rings** and **back-up washers** on top of piston rod, Items 2-7 on 1010002587.
5. Thread lock valve on piston rod until firmly seated. If the ports need to be relocated – loosen the screw at the top of the well tube and turn lock valve clockwise until ports are at the desired location. Retighten the set screw.



Parts List			
Item	Part No.	Description	Qty
1	1010002577	valve assembly dual counter balance thread-on	1
2		retaining ring rod 2"	1
3		back-up washer 230	2
4		back-up washer 224	1
5		o-ring 220	1
6		o-ring 234	1
7		o-ring 226	1

Figure 9

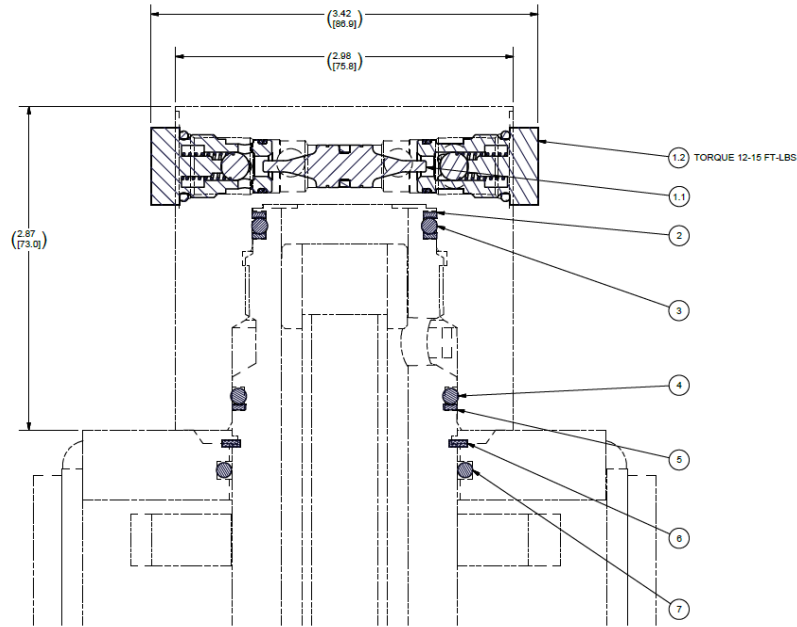
## NOTE

Unless otherwise noted, item numbers refer to Lock Valve Assembly Drawing.

## 7.5 3.5"/4.0" Bore Lock Valve Repair (Continued)

### KIT NO. 1010001969

1. Remove lock valve as described in leg repair, Step 2.
2. Remove check valve cartridges (1.2).
3. Remove pilot piston (1.1).
4. Install new pilot piston. Lubricate with clean hydraulic oil.
5. Install new check valve cartridges. Lubricate seals with clean hydraulic oil. Torque to 12-15 ft.-lbs.
6. Install new **o-rings** and **back-up washers** on top of piston rod, Items 2-7 on 1010001969.
7. Thread lock valve on piston rod until firmly seated. If the ports need to be relocated – loosen the screw at the top of the well tube and turn lock valve clockwise until ports are at the desired location. Retighten the set screw.



SCALE 1.5 : 1

Parts List			
Item	Part No.	Description	Qty
1	1010001967	kit OH leg 3.5-4 check valve cartridge	1
1.1	1010001964	piston assembly dual pilot 06 sealed	1
1.2	1010001963	valve assembly ball check cartridge 06	2
2		back-up washer 230	2
3		o-ring 220	1
4		o-ring 234	1
5		back-up washer 224	1
6		retaining ring rod 2"	1

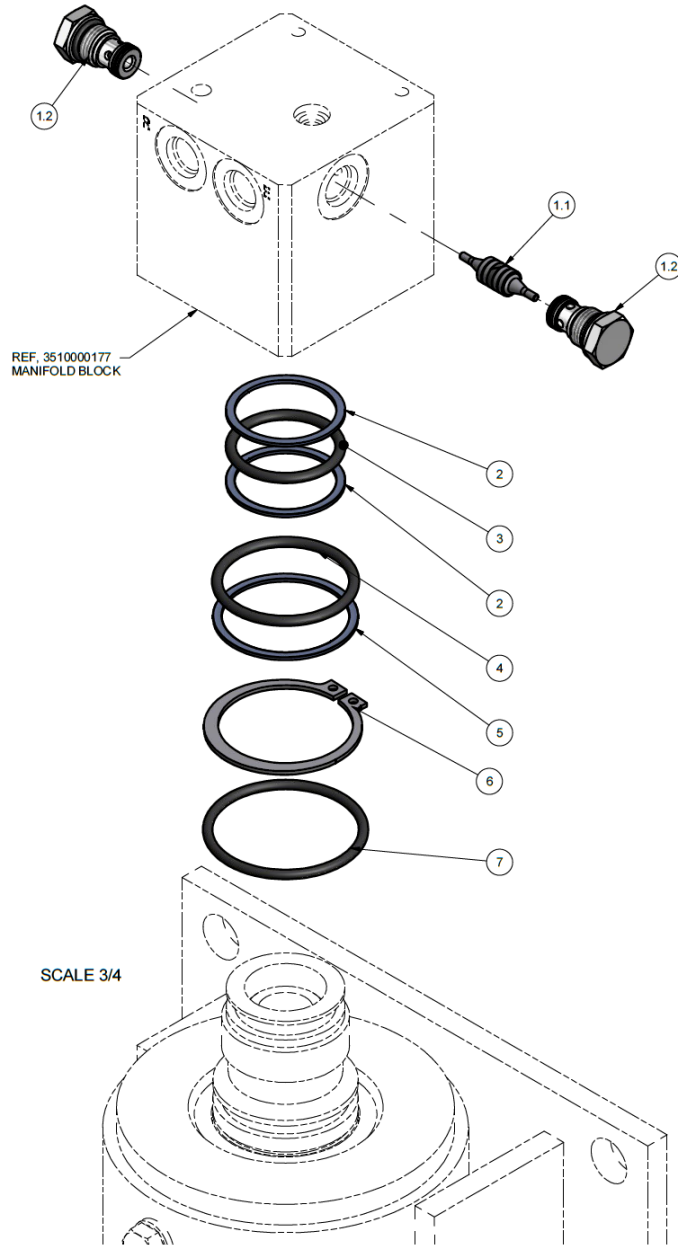
Figure 10a

**NOTE**

Unless otherwise noted, item numbers refer to Lock Valve Assembly Drawing.

*7.5 3.5"/4.0" Bore Lock Valve Repair  
(Continued)*

**KIT NO. 1010001969 (Continued)**



**Figure 10b**

## 8.0 Replacement Shoes

### PART NO. 100411

For the convenience of Power-Packer customers, the replacement foot, or shoe, has been redesigned to facilitate an easier repair and replacement of damaged or worn feet. The new design should make changing feet simpler and less time-consuming. The following steps illustrate the procedure.

1. Replacement Foot part number 100411.
2. Retract leg.
3. Remove damaged foot. Be sure not to cut into end cap of cylinder. There are two notches 180° apart on the end cap on the cylinder tube. Use these notches to start your cut.
4. Place shoe halves under leg.
5. Lower leg to shoe halves, shoe will self center, weld across the top.
6. Retract leg and weld across the bottom.



1. Replacement Foot part number 100411



2. Retract leg.



3. Remove damaged foot. Be sure not to cut into end cap of cylinder



4. Place shoe halves under leg.



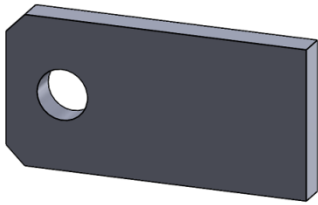
5. Lower leg to shoe halves, shoe will self center, weld across the top.



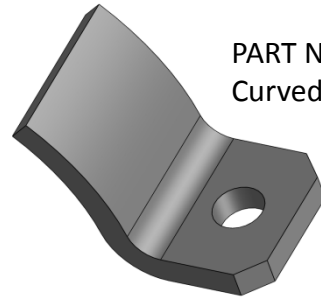
6. Retract leg and weld across the bottom.

**Figure 11**

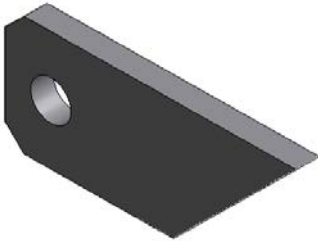
9.0 Mounting Accessories



PART NO. 100357  
Straight ear



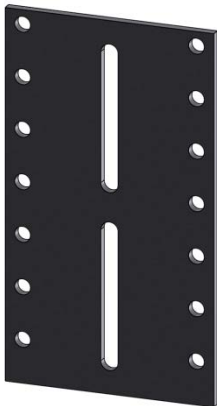
PART NO. 100354  
Curved ear



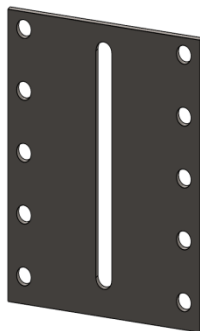
PART NO. 100353  
Angle ear

PART NO. 100346  
Split collar assembly (100 series)

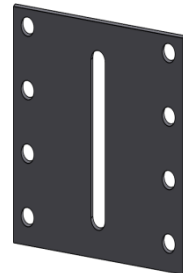
PART NO. 100348  
Split collar assembly (400 series)



PART NO. 100226  
Mounting plate  
9 x 16 x 3/8, 14 holes  
(400 series)



PART NO. 100509  
Mounting plate  
9 x 10-5/8 x 1/4, 10 holes  
(100 series)



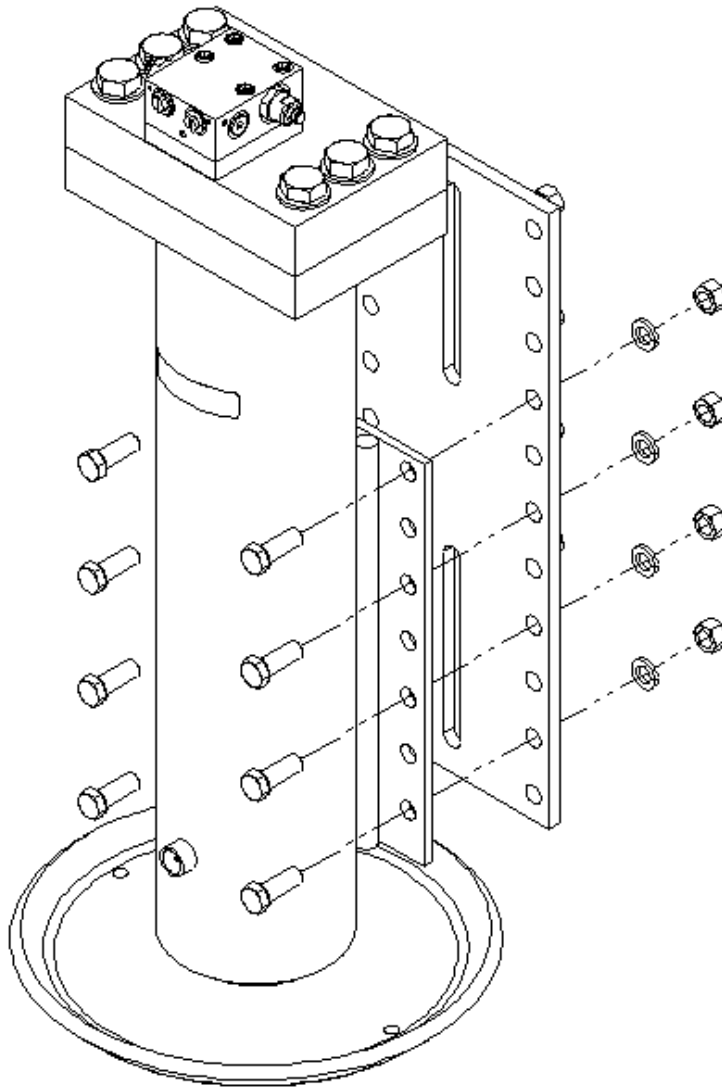
PART NO. 100502  
Mounting plate  
9 x 8-3/8 x 1/4, 8 holes  
(100 series)

**Product Note:** All holes 11/16" dia. on 7-1/2" x 2-1/4" centers

**Figure 12**

**10.0 5.0"/6.0" Bore Leg Installation**

Mount legs to structure using a minimum of ten (10) 5/8-18 UNF inch fasteners (grade 5 or better) on each side of the mounting plate. If two mounting plates are present, use a minimum of four (4) 5/8-18 UNF inch fasteners, (grade 5 or better) on each side of the lower mounting plate. Torque to 150 ft. lbs. (Dry)

**Figure 13**

# NOTE

When ordering parts, indicate date code to ensure proper revision level. Date code is located on label near bottom of leg.

## 10.1 5.0" Bore Leg Parts List

Parts List				
Item	Part No.	Description	Qty.	Notes
1	1010001936	lock valve assembly	1	4
2		H.H.C.S. 5/16-18 UNCx2.50 lrg., gr. 8	4	
3		5/16 SAE flat washer	4	
4		dual lock valve gasket	1	1,2
5		o-ring	2	1,2
6		H.H.C.S. 7/8-14 UNFx3.25 lg., gr. 5	6	
7		7/8 flat washer	6	
8		wiper ring	1	2
9		wear ring	1	2
10		o-ring back-up washer	1	2
11		o-ring	1	2
12	*300476	rod guide	1	
13		shaft seal	1	2
14		piston rod weldment	1	3
15		transfer tube	1	3
16		cylinder tube weldment	1	3
17		well tube weldment	1	3
18		wear ring	2	2
19		stop tube	1	3
20	*300475	piston	1	
21		piston seal	1	2
22		wear ring	1	2
23		o-ring back-up washer	4	2
24		quad ring	2	2
25	1010002943	16" swivel shoe weldment	1	
26	15-1026	H.H.C.S.	1	
27	16-1032	flat washer	1	

### Product Notes:

- These items are contained in lock valve repair kit P/N 1010001972 and are not available on an individual basis.
- These items contained in leg repair kit P/N 300508 and are not available on an individual basis.
- State leg part numbers and part description when ordering these items.
- For legs originally equipped with valve P/N 300519 retrofit kit P/N 1010001971 can be used to update the leg.

\* Consult Factory before ordering

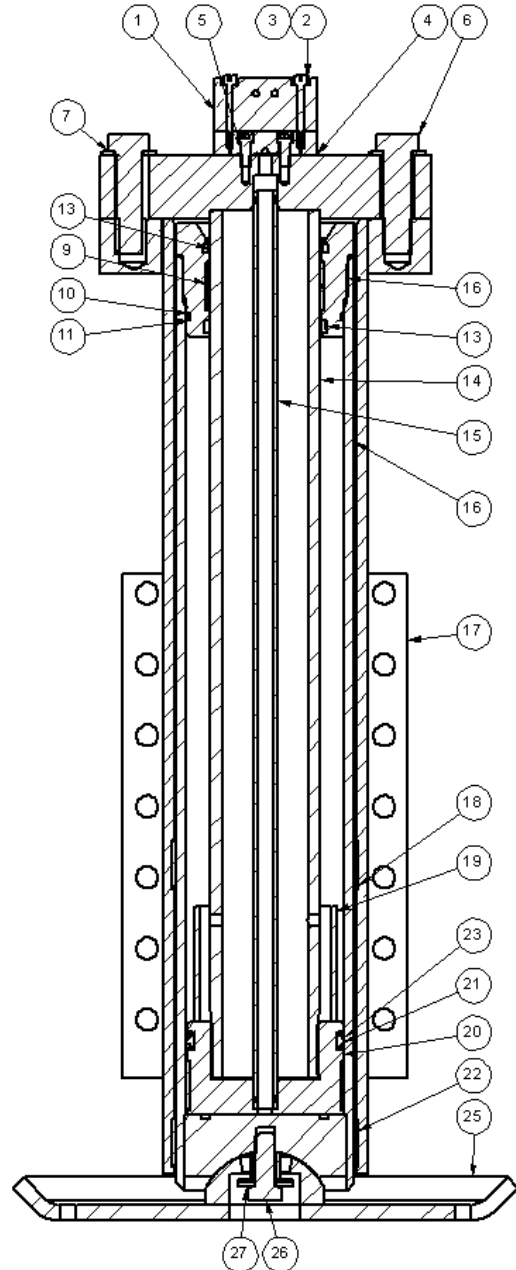


Figure 14

**10.2 5.0" Bore Leg Repair Instructions****KIT NO. 300508** **CAUTION**

Be sure that no load is being supported by leg before servicing.

 **CAUTION**

Crack all connections gradually to allow trapped pressure to bleed completely down. Slowly remove hose fitting connections completely.

This kit contains the necessary soft parts (seals) and associated parts to repair one (1) 5" bore leg.

With pump off, cycle valve to relieve any pressure. Disconnect hydraulic lines from leg. Remove leg from equipment.

Remove the **lock valve**, Item A by removing the four **H.H.C.S.**, Item B. Take the shoe off by removing **H.H.C.S.**, Item C. Remove the six **H.H.C.S.**, Item D and lift the **cylinder tube**, Item E off the **well tube**, Item F. Lift the **piston rod assembly**, Item G away from the **cylinder tube**, Item E, then remove the **rod guide**, Item H from the **cylinder tube**, Item E by unscrewing it. Lift the **piston rod assembly**, Item G out of the **cylinder tube**, Item E. Remove **wear ring**, Item 7 from **piston**, Item 1 and screw piston off using a 7/16 course bolt in the threaded hole.

Clean and inspect all metal parts and replace any damaged parts. **Replace all seals** and lightly coat with grease. Put Loctite® 277 or equivalent on threaded parts. Assemble leg in reverse order. Coat bottom of lock valve and top of cylinder head with anti-seize. Place gasket in between and remount lock valve to leg. Remount leg to equipment.

## 10.3 5.0" Bore Leg Repair Kit

## PART NO. 300508

Parts List		
Item	Description	Qty
1-1	Bag A (well tube)	
1	wear ring	2
2-5	Bag B (piston rod sub assembly)	2
2	quad ring	4
3	back-up ring	1
4	o-ring	1
5	lock valve gasket	1
6-7	Bag C (piston)	
6	piston seal (5 bore)	1
7	wear ring (5 bore)	2
8-12	Bag D (rod guide)	
8	wear ring (3.5 rod)	
9	wiper ring (3.5)	1
10	shaft seal (3.5)	1
11	o-ring	1
12	back-up ring	2

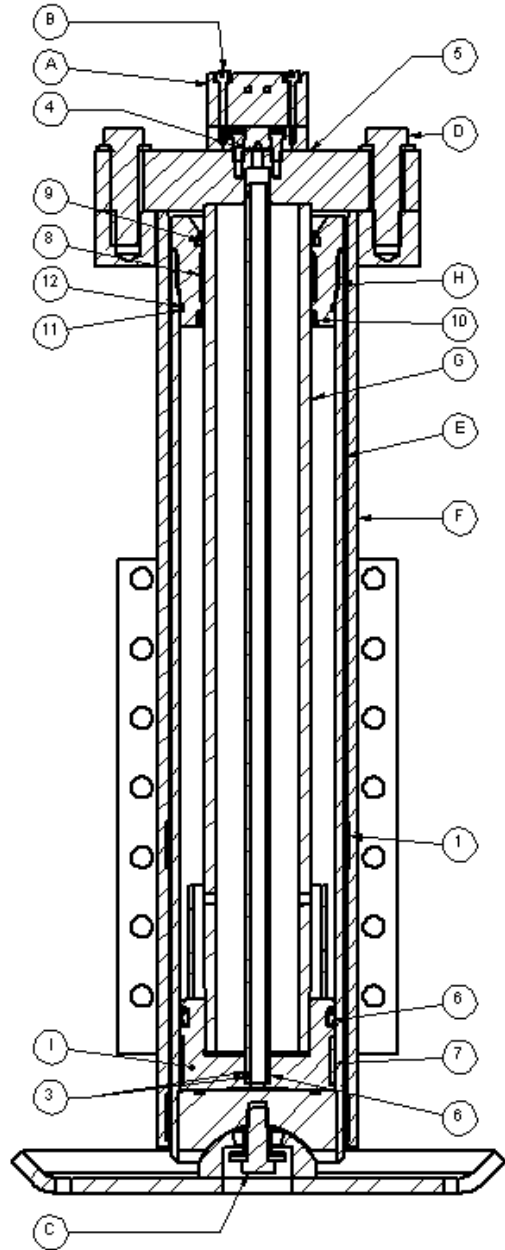


Figure 15

## NOTE

When ordering parts for a stiff leg model, all parts are common with a non stiff leg model except for the stated parts.

### 10.4 5.0" Bore Leg Repair (Continued)

#### Parts List

Item	Part No.	Description	Qty
1	*	rod guide (not	1
2	*	well tube	1
3	300492	pin weldment	2
4	18-1028	snap lock pin	2
5	07-1232	plug, tube	AR

\* State the leg part number when ordering.

\* Consult Factory before ordering

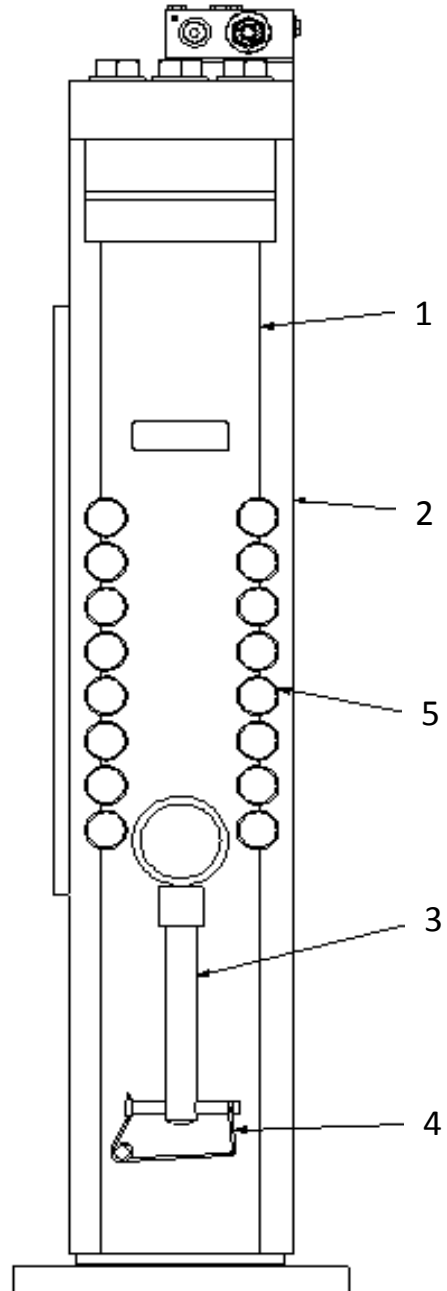


Figure 16

## 11.0 6.0" Bore Leg Parts List

Parts List				
Item	Part No.	Description	Qty	Notes
9		H.H.C.S. 5/16-18 UNC x 2.50 lg., gr.8	4	
10		5/16 SAE flat washer	4	
11		o-ring	2	1,2
12		dual lock valve gasket	1	1,2
13		o-ring	2	2
14		o-ring, back-up washer	4	2
15		o-ring	1	2
16		H.H.C.S. 1/2-13 UNC x 1 lg., gr.9	2	
17		1/2 flat washer	2	
18		1/2 flat washer	2	
19	17-120	6" snap ring	1	
20		o-ring	1	2
21		o-ring back-up washer	2	2
22		wiper ring	1	2
23	*300040	rod guide	1	
24		wear ring	1	2
25		shaft seal	1	2
26		well tube	1	3
27		cylinder tube weldment	1	3
28		piston rod weldment	1	3
29		transfer tube	1	3
32		wear ring	2	2
33		stop tube	1	3
34	*300041	piston	1	
35		piston seal	1	2
36		wear ring	1	2
37		H.H.C.S.	1	
38	1010002943	swivel shoe weldment	1	
39		grease fitting	2	
40		H.H.C.S. 1.00-8 UNC x 2.25 lg., gr.5 (used before March 1, 1992)	2	
41		H.H.C.S. 1.00-14 UNF x 2.50 lg., gr.5 (used after March 1, 1992)	2	
42		flat washer	1	
43	300443	retaining ring	1	
44		H.H.C.S.	6	

\* Consult Factory before ordering

## Product Notes:

1. These items are contained in lock valve repair kit P/N 1010001972 and are not available on an individual basis.
2. These items contained in leg repair kit P/N 300086 are not available on an individual basis.
3. State leg part number and part description when ordering these items. Indicate date code when ordering to ensure proper revision level.

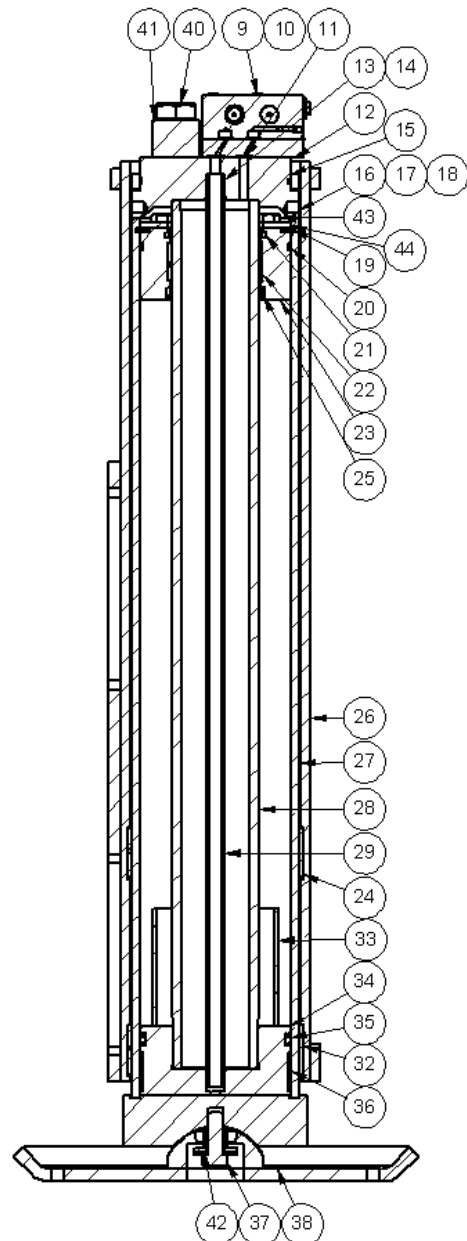


Figure 17

**11.1 6.0" Bore Leg Repair****KIT NO. 300086**

This kit contains the necessary soft parts (seals) and associated parts to repair one (1) 6" bore leg. Some items will not be used in a particular leg, but are included to form a universal kit.

With the pump off, cycle valve to relieve any pressure. Disconnect hydraulic lines from leg. Remove leg from equipment.

Remove lock valve by removing the four bolts, Item A. Remove 2 bolts, Item C and Item D. Remove 3 bolts, Item B from leg and lift well tube off of cylinder tube. Lift piston rod assembly then remove the 6 hex head screws, Item E and the snap ring, Item 8. Lift piston rod assembly out of cylinder tube. Remove wear ring, Item 7 from piston and screw piston off rod using a 7/16" course thread bolt.

Clean and inspect all metal parts and replace any damaged parts. Replace all seals and lightly coat with grease. Assemble leg in reverse order. Coat bottom of lock valve and top of cylinder head with anti-seize. Place gasket in between and remount lock valve to leg. Remount leg to equipment.

**CAUTION**

A small amount of low pressure fluid may be released in this procedure.

**CAUTION**

Be sure that no load is being supported by leg before servicing.

**CAUTION**

Crack all connections gradually to allow trapped pressure to bleed completely down. Slowly remove hose fitting connections completely.

## 11.1 6.0" Bore Leg Repair (Continued)

## PART NO. 300086

Parts List		
Item	Description	Qty
1-1	Bag A (well tube)	
1	wear ring	2
4-8	Bag B (Piston Rod sub assembly)	
4	o-ring	2
5	back-up ring	4
6	o-ring	1
7	wear ring	1
8	snap ring	1
9-11	Bag C (piston and final assembly)	
9	piston seal	1
10	o-ring	2
11	lock valve gasket	1
12-16	Bag D (rod guide)	
12	wear ring	1
13	wiper ring	1
14	shaft seal	1
15	o-ring	1
16	back-up ring	2

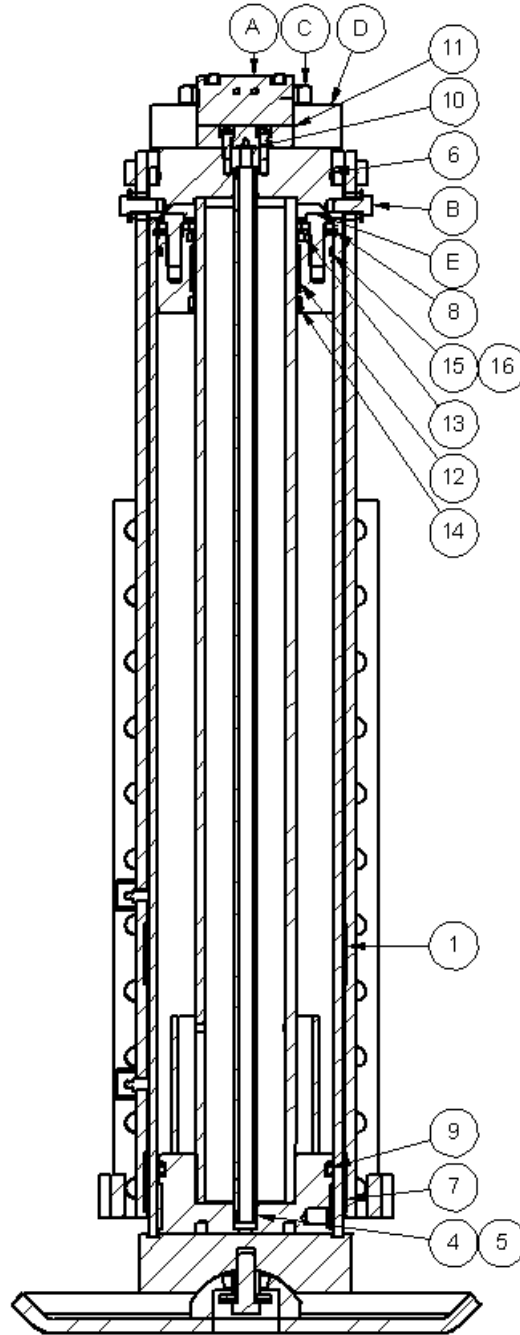


Figure 18

### 11.2 6.0" Bore Stiff Leg Parts List

When ordering parts for a stiff leg model, all parts are common with a non-stiff leg model except for the stated parts.

#### Parts List

Item	Part No.	Description	Qty.
1	*	well tube	1
2	*	stiff legs	1
3	300177	pin weldment	1
4	300183	chain/pin	1
5		H.H.C.S. (not shown)	1
6		lock washer (not shown)	1
7	*	cylinder tube	1

\*State the part number when ordering

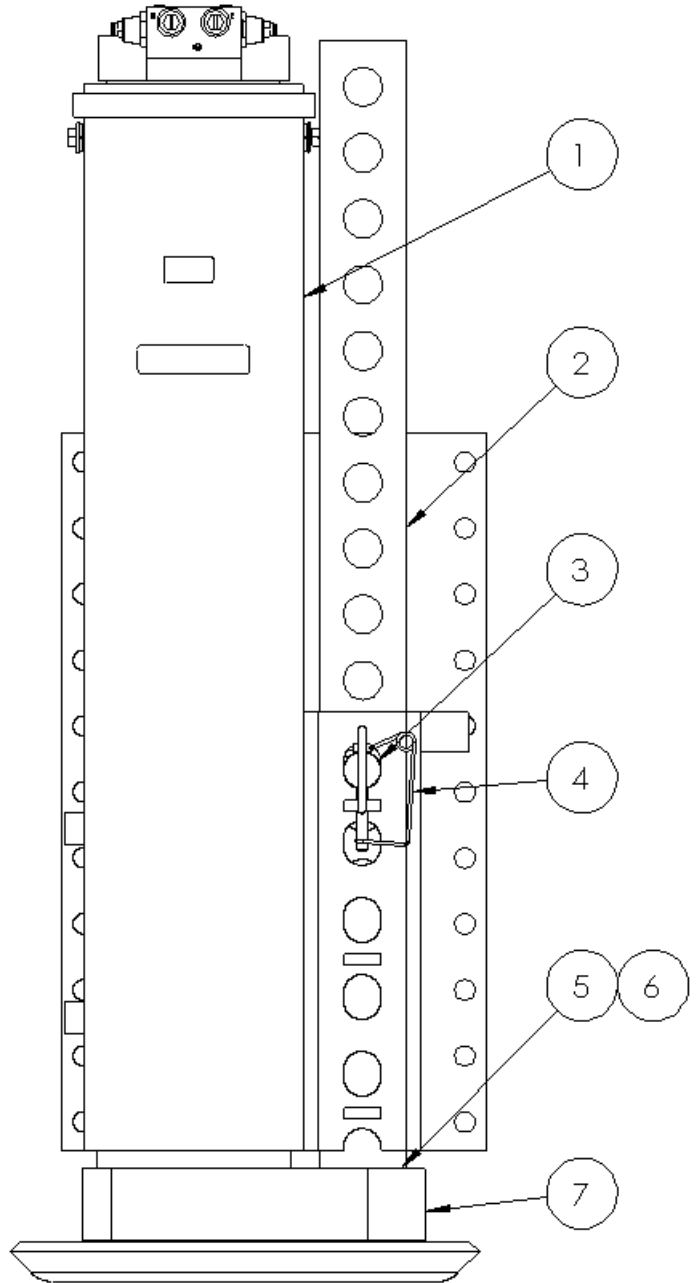


Figure 19

## 11.3 5.0"/6.0" Bore Lock Valve


**CAUTION**

Crack all connections gradually to allow trapped pressure to bleed completely down. Slowly remove hose fitting connections completely.


**CAUTION**

A small amount of low pressure fluid may be released in this procedure.

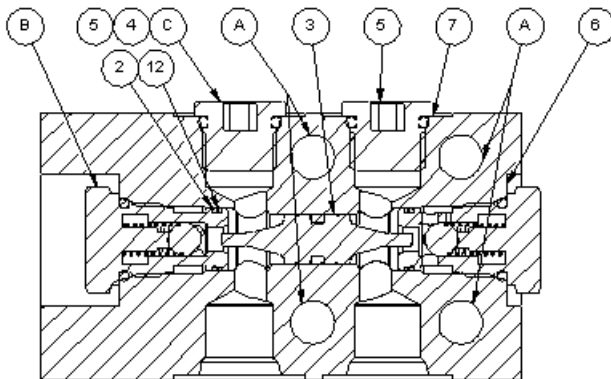
**KIT NO. 1010001972**

This kit contains the necessary soft parts (seals) and associated parts to repair one (1) 5.0/6.0 bore lock valve. Some items will not be used but are included to form a universal kit.

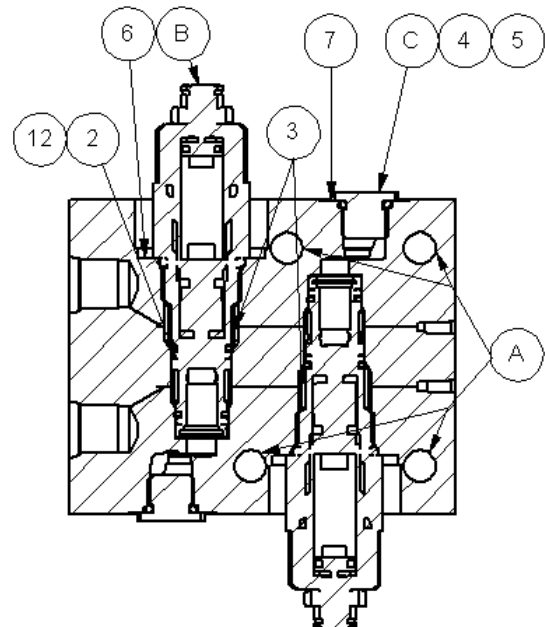
**Lock Valve Repair Procedure**

Be sure that no load is being supported by leg before servicing. With pump off, cycle valve to relieve any pressure. Disconnect hydraulic lines from leg.

1. Remove lock valve by removing the four **bolts**, Item A on the 5.0/6.0 bore leg.
2. Remove check valve cartridges (1.2).
3. Remove pilot piston (1.1).
4. Install new pilot piston. Lubricate with clean hydraulic oil.
5. Install new check valve cartridges. Lubricate seals with clean hydraulic oil. Torque 12-15 ft.-lbs.
6. Coat both bottom of lock valve and top of cylinder head with anti-seize. Remount lock valve to leg making sure to place gasket in between.

**PART NO. 1010001936**  
**Dual P.O. Check Valve**
**Product Notes:**

1. Use kit P/N 1010001971 for retrofit
2. Use kit P/N 1010001972 for service

**PART NO. 1010002816**  
**Dual Counterbalance Valve**
**Product Notes:**

1. Use kit P/N 1010003074 for retrofit

**Figure 20**

## 12.0 AC Installation

### NOTE

Our customers are responsible for wiring this motor in compliance with all applicable electrical codes.

#### **Control Box Mounting**

Determine desired control box location. No part of the control box or handles should extend beyond the sides of the equipment. Hold control box in desired location. Be sure cross members are free of rust and undercoating where control box hanger straps make contact. Tack weld hang straps in place. Replace bolts for hanger straps and lower control box. Finish welding hanger straps to cross members and remount control box. Torque mounting bolts to 20 ft.-lbs.

#### **Plumbing**

Determine lengths of high pressure hose required. Hoses should be minimum 5/16 i.d. min. rated at 2,500 PSI working pressure with #6 27' SAE Flare Female Swivel ends. Hoses to be supplied by the customer

**The motor controls and starter for AC units are not supplied by Power-Packer.**

This pump/motor unit is sized for maximum flow. This means that the unit is sensitive to voltage drop caused by undersized wiring. If the unit stalls under load, check your voltage at the motor while the motor is operating. If substandard voltage is found, check and adjust your wiring.

#### **For 120 or 220 Motors (Single Phase)**

This motor may be wired for either 120 or 220 volts, (21/11 amps respectively), 60 Hz AC single phase. This motor is internally wired in a manner that rotation is not reversible. Consult the motor tag for proper lead connection for the voltage you select.

#### **For 220 or 440 Motor (Three Phase)**

This motor may be wired for either 220 or 440 volts, (5.6/2.8 amps respectively), 60 hz kAC three phase. The motor rotation is dependant on how it is wired, therefore removal of the pump during wiring is a must. The motor must have C.C.W. rotation (looking at shaft) prior to reinstallation of pump. Consult motor tag for proper lead connection for the voltage you select.

If you have any questions, please call Power-Packer at 1-800-745-4142.

#### **Filling**

See page 33.

12.0 AC Installation (Continued)

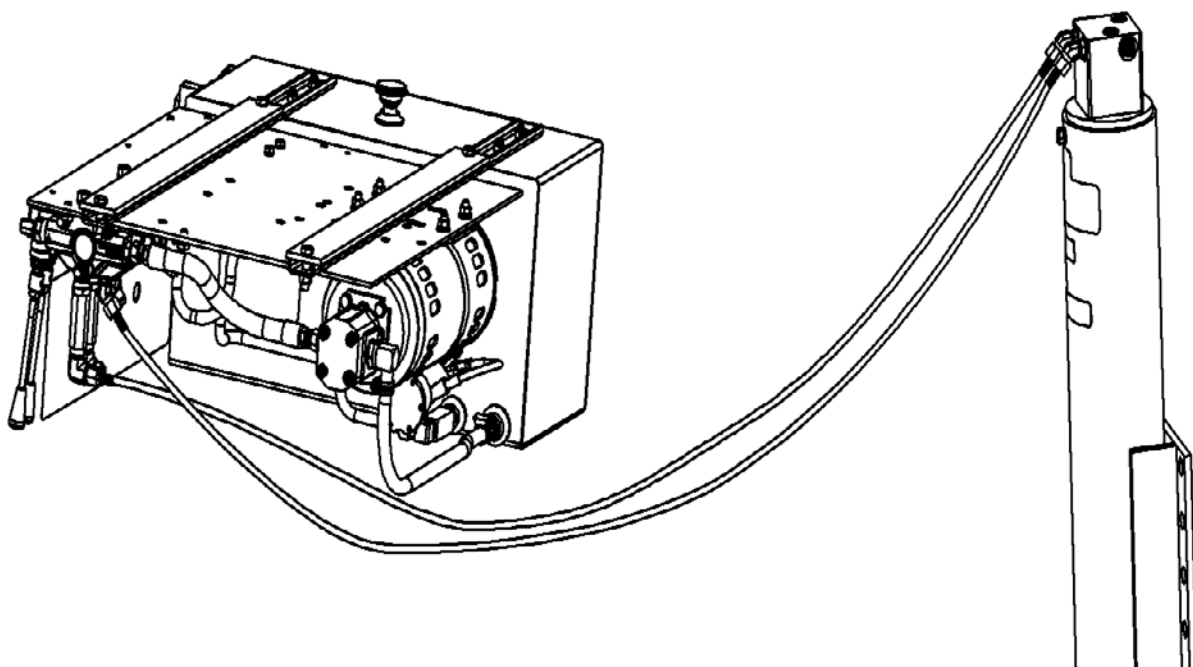


Figure 21

## 13.0 DC Installation

### Control Box Mounting

Determine desired control box location. No part of the control box or handles should extend beyond the sides of the equipment. Hold control box in desired location. Be sure cross members are free of rust and undercoating where control box hanger straps make contact. Tack weld hang straps in place. Replace bolts for hanger straps and lower control box. Finish welding hanger straps to cross members and remount control box. Torque mounting bolts to 20 ft.-lbs.

### Plumbing

Determine lengths of high pressure hose required. Hoses should be minimum 5/16 i.d. min. rated at 2,500 PSI working pressure with #6 37' SAE Flare Female Swivel ends. Hoses to be supplied by the customer

### Filling

1. Remove pipe plug in front of oil tank.
2. Fill with approved oil until oil is at the top of sight gauge.
3. Cycle legs twice to bleed air from system (If legs do not fully extend to full stroke after first fill, add oil until full stroke is able to be reached).
4. With legs fully retracted recheck oil level at sight gauge.
5. Replace plug.
6. Check fittings and hoses for leaks and tighten as required.
7. Secure all hoses in a manner that will not cause chafing.

13.0 DC Installation (Continued)

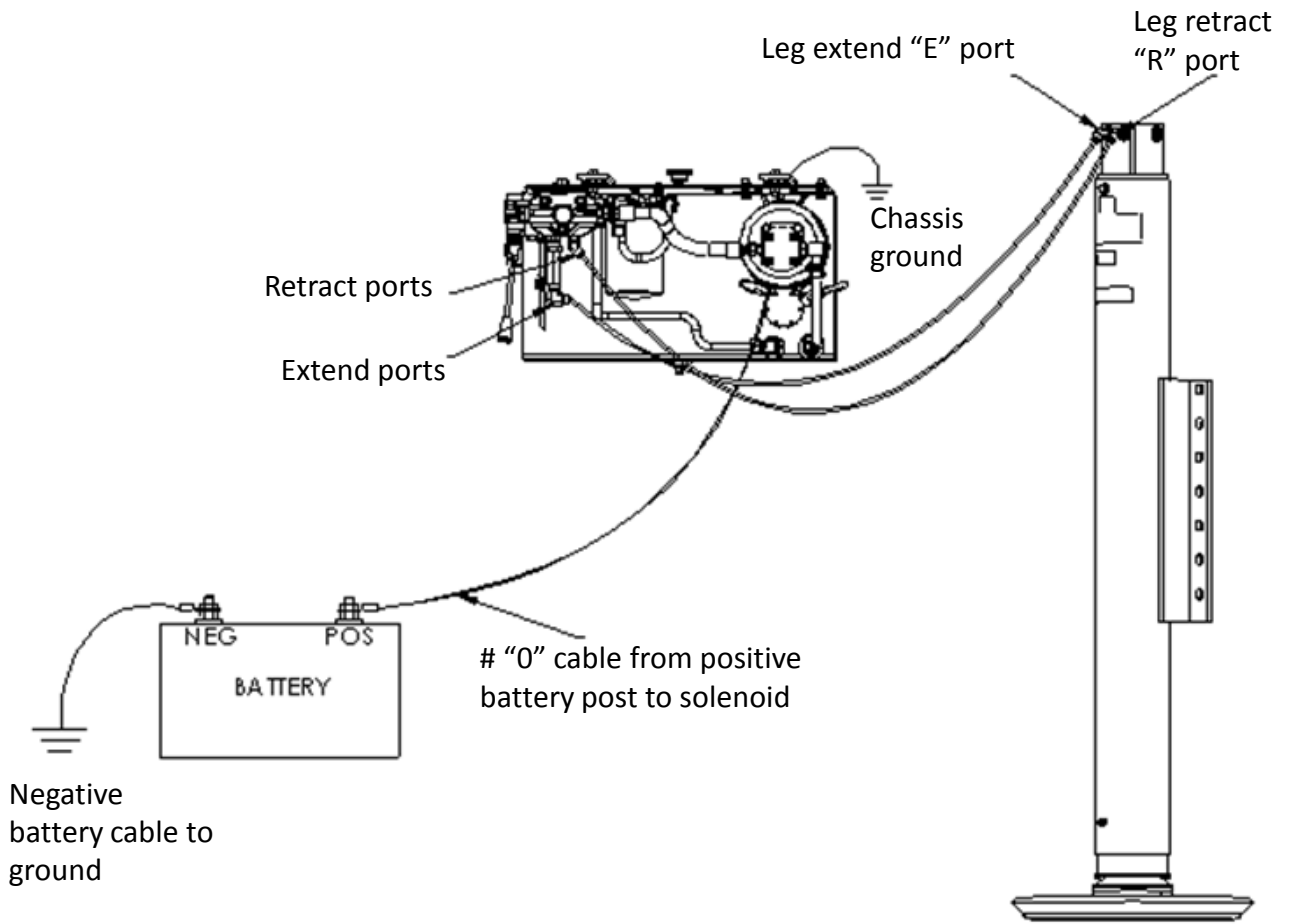


Figure 22

14.0 Stabilizer Control Box for AC and DC Units

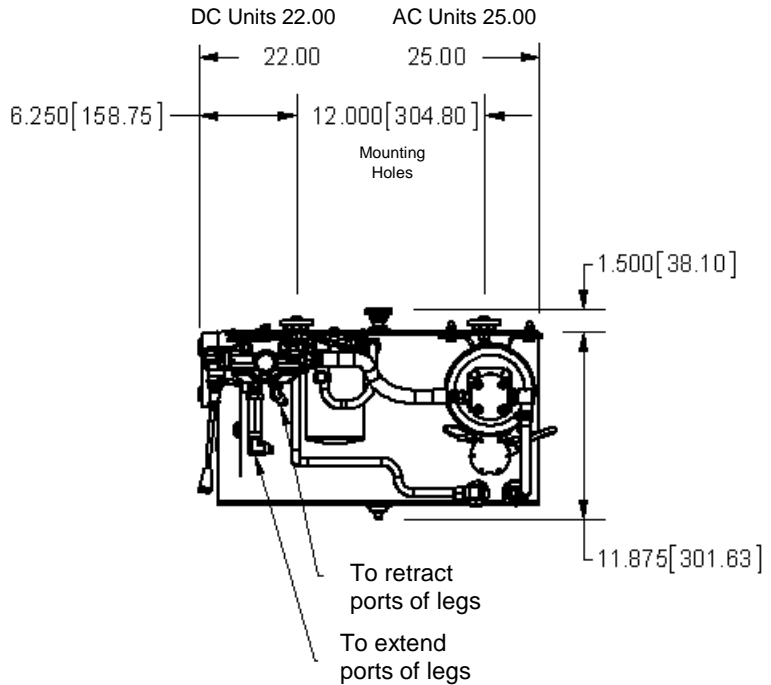
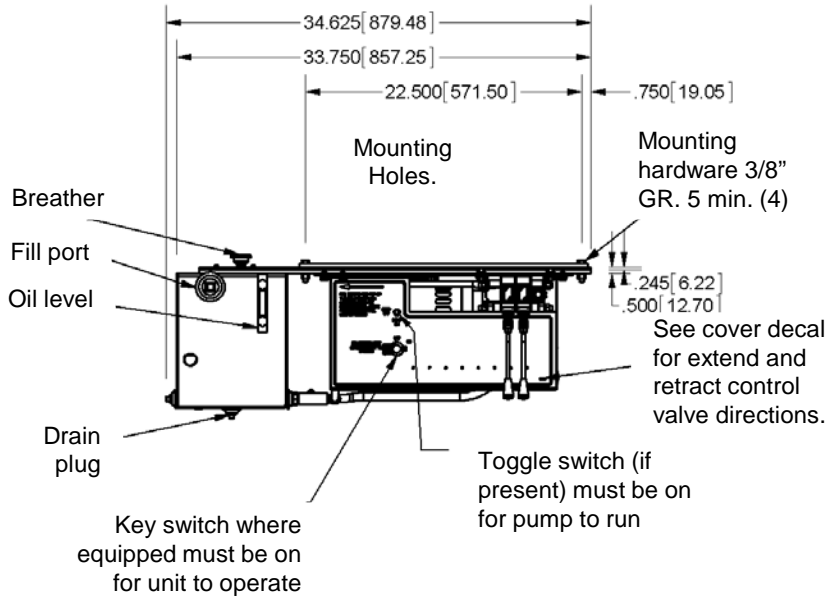


Figure 23

**Product Notes:**

1. All hydraulic connections are number 6 (9/16-18 FHD.) 37" J.I.C. male flare (Hose assembly must have female swivel).
2. Dimensions apply for 1-6 bank valves on stabilizer control boxes.

15.0 Application for Power Beyond Valves

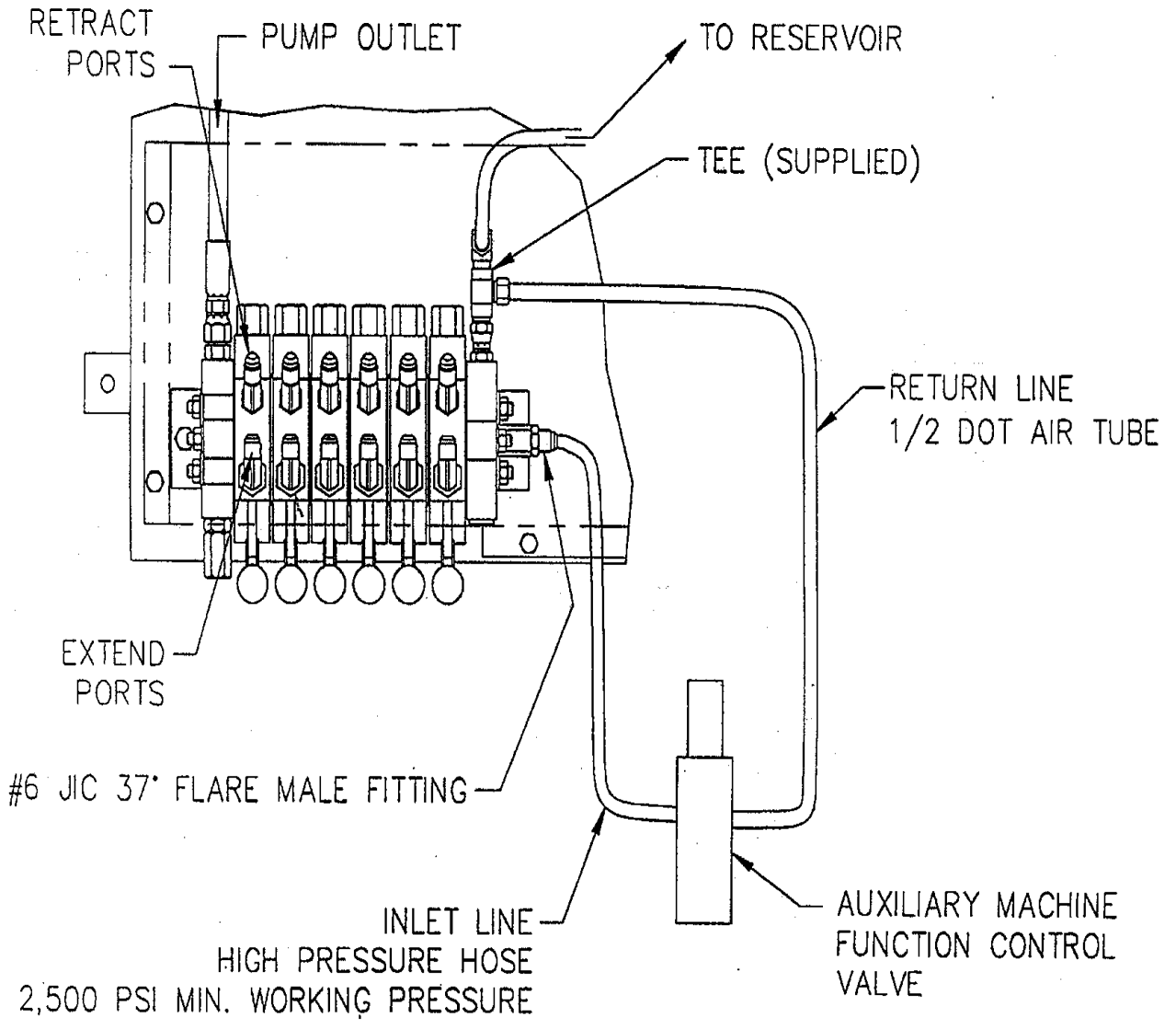


Figure 24

16.0 Application for Last Section Closed Valves

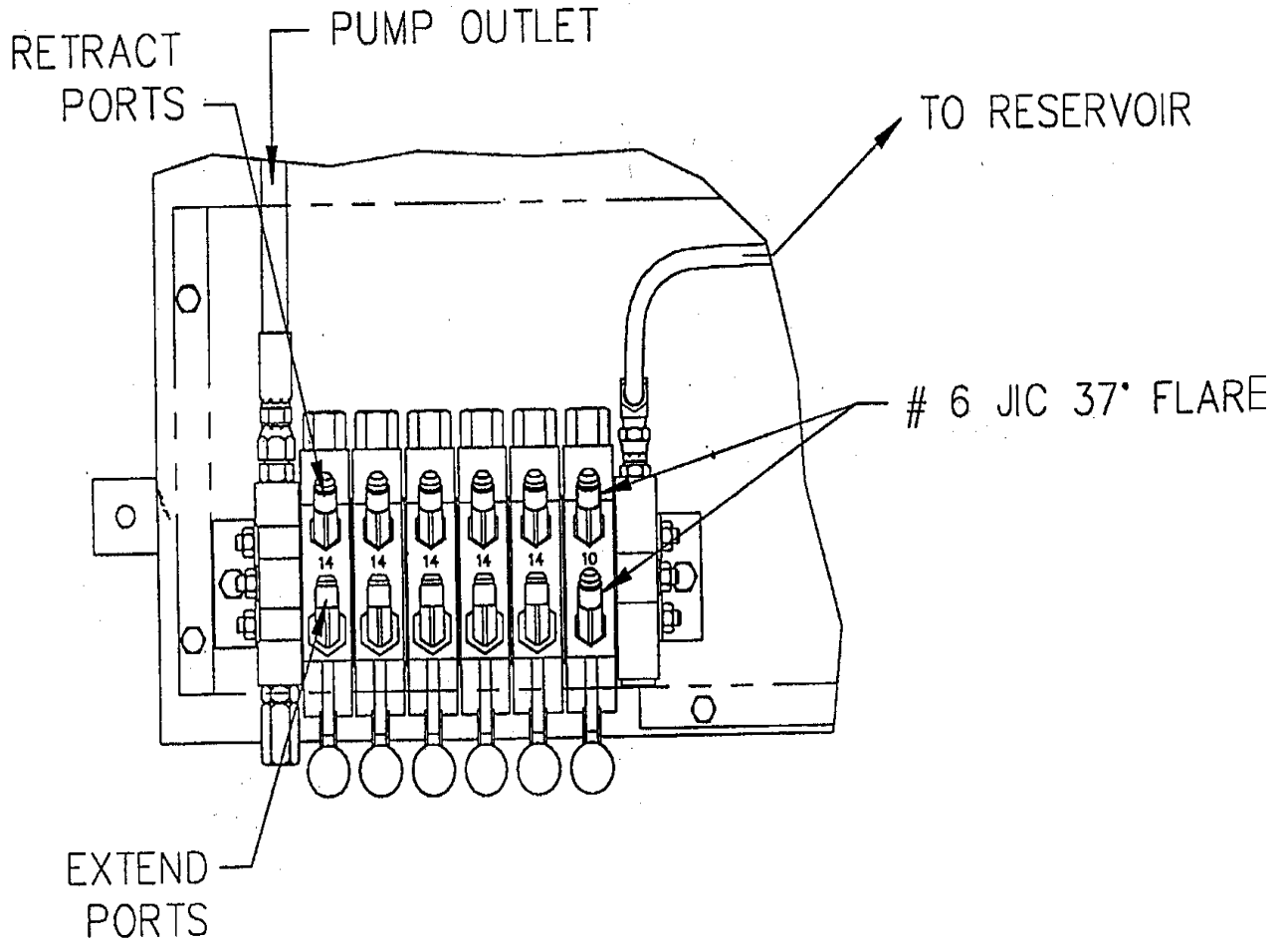


Figure 25

17.0 110 & 220 VAC Control Box

NOTE, MOTOR STARTER AND CONTROLS NOT SUPPLIED BY POWER PACKER

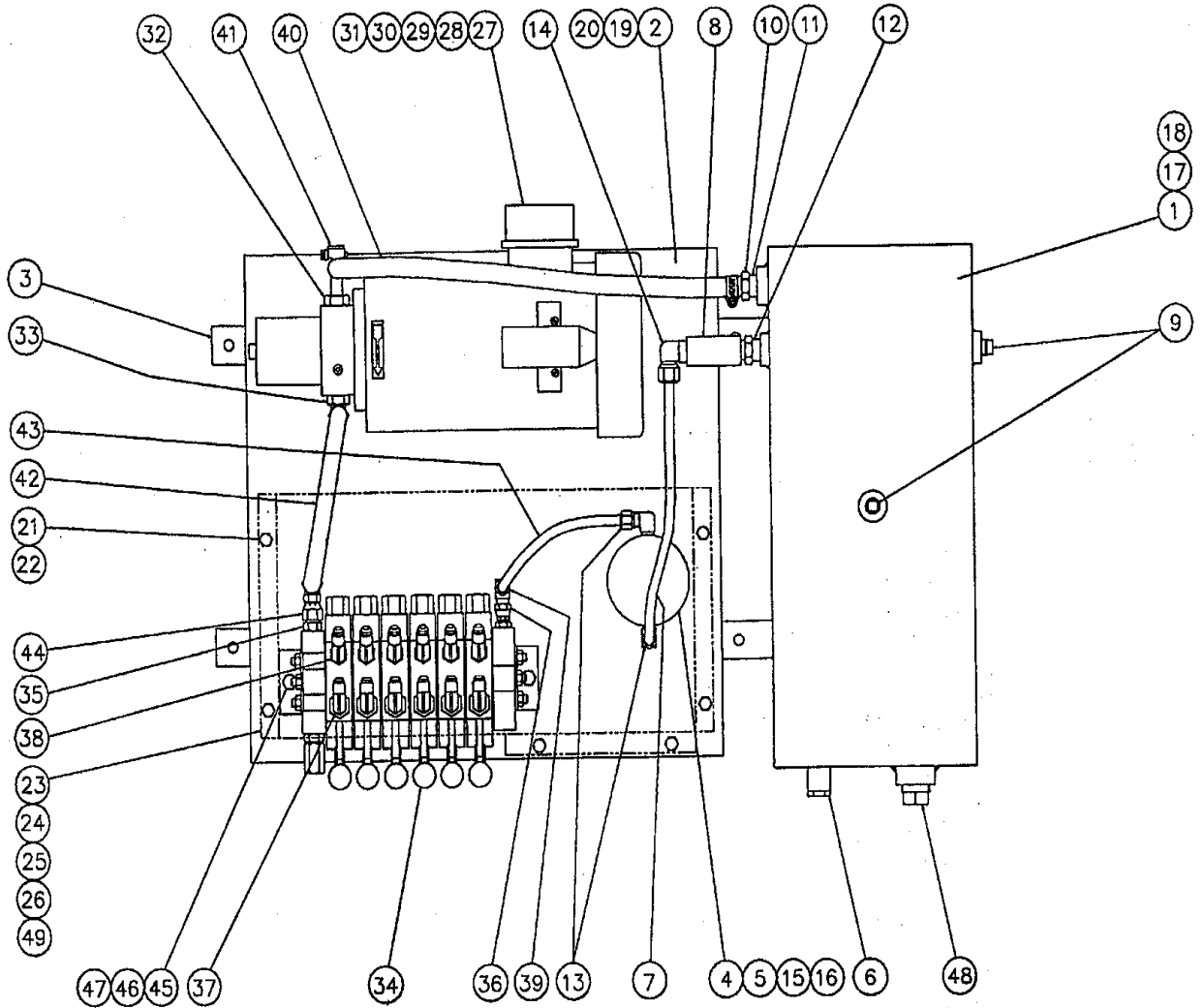


Figure 26

## 17.1 110 &amp; 220 VAC Control Box Parts List

<b>Parts List</b>			
Item	Part No.	Description	Qty
1-20	300208	reservoir plate assembly	1
1	*	reservoir	1
2	*	base plate	1
3	*	base channel	*
4	*	head	1
5	06-1014	element	1
6	*	sight gage	1
7	*	tube, 28.00 long	1
8	*	check valve	1
9	*	plug, magnetic	2
10	*	beaded nipple	1
11	*	reducing bushing	1
12	*	hex nipple	1
13	*	90°elbow	2
14	*	90°elbow	1
15	*	lock washer	2
16	*	H.H.C.S.	2
17	*	vent	1
18	*	lock nuts	4
19	*	machine screw	4
20	*	hex nut	4
21-26	*	cover assembly, AC	1
21	*	H.H.C.S.	4
22	*	lock washer	4
23	*	cover	1
24	*	rubber molding	1
25	*	cover decal	1
26	*	cover decal blanking	1
27-37	*	110 VAC pump/mtr asm. Sing. Ph. Or 220 VAC pump/mtr asm. 3 ph.	
27	*	110 sing. Ph. VAC pump/motor	1

Item	Part No.	Description	Qty
27	*	220 3 ph. VAC pump/motor	1
28	*	H.H.C.S.	4
29	*	lock washer	4
30	*	flat washer	4
31	*	hex nut	4
32	*	90° elbow	1
33	*	90° elbow	1
34-39	*	valve assembly	1
34	*	valve	1
35	*	male connector	1
36	*	adapter	*
37	300309	flow control assembly	*
38	*	45° elbow	*
39	*	valve fitting assembly	1
40	*	hose, 25.00 long	1
41	*	hose clamp	2
42	*	hose assembly, 13.00 long	1
43	*	tube, 9.00 long	1
44	*	90° swivel elbow	1
45	*	H.H.C.S.	2
46	*	lock washer	2
47	*	hex nut	2
48	*	plug, fill	1
49	*	decal, valve operation	1

\*Consult factory when ordering

18.0 12 & 24 VDC Permanent Magnet Motor Control Box

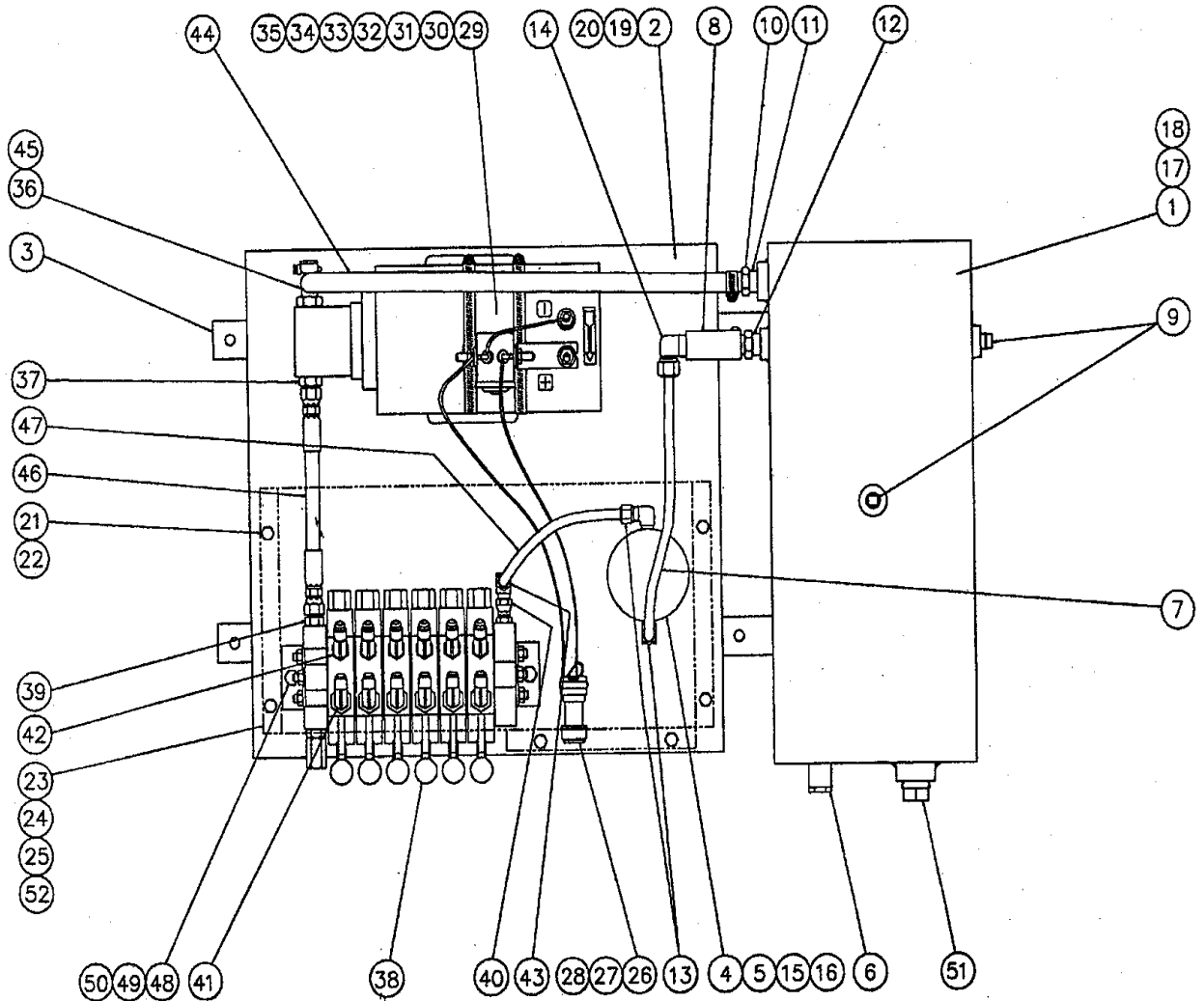


Figure 27

### 18.1 12 & 24 VDC Permanent Magnet Motor Control Box Parts List

Parts List			
Item	Part No.	Description	Qty
1-20	*	reservoir plate assembly	1
1	*	reservoir	1
2	*	base plate	1
3	*	base channel	2
4	*	head	1
5	06-1014	element	1
6	*	sight gage	1
7	*	tube, 28.00 long	1
8	*	check valve	1
9	*	plug, magnetic	2
10	*	beaded nipple	1
11	*	reducing bushing	1
12	*	hex nipple	1
13	*	90°elbow	2
14	*	90°elbow	1
15	*	lock washer	2
16	*	H.H.C.S.	2
17	*	vent	1
18	*	lock nuts	4
19	*	machine screw	4
20	*	hex nut	4
21-28	*	cover assembly, DC	1
21	*	H.H.C.S.	4
22	*	lock washer	4
23	*	cover	1
24	*	rubber molding	1
25	*	cover decal	1
26	*	wire harness	1
27	*	toggle switch	1
28	14-1010	key switch	1
29-39	300189 or 300194	12 VDC P.M. pump/motor asy or 24 VDC P.M. pump/motor asy 1	1

Item	Part No.	Description	Qty
29	*	12 VDC P.M. pump/motor	1
29	*	24 VDC P.M. pump/motor	1
30	*	hose clamp	2
31	14-1033	12 VDC solenoid	1
31	14-1034	24 VDC solenoid	1
32	*	H.H.C.S.	4
33	*	lock washer	4
34	*	flat washer	4
35	*	hex nut	4
36	*	90° elbow	1
37	*	male connector	1
38-43	*	valve assembly	1
38	*	valve	1
39	*	male connector	1
40	*	adapter	*
41	*	flow control assembly	*
42	*	45° elbow	*
43	*	valve fitting assembly	1
44	*	hose, 25.00 long	1
45	*	hose clamp	2
46	*	hose, 9.75 long	1
47	*	tube, 9.00 long	1
48	*	H.H.C.S.	2
49	*	lock washer	2
50	*	hex nut	2
51	*	plug, fill	1
52	*	decal, valve operation	1

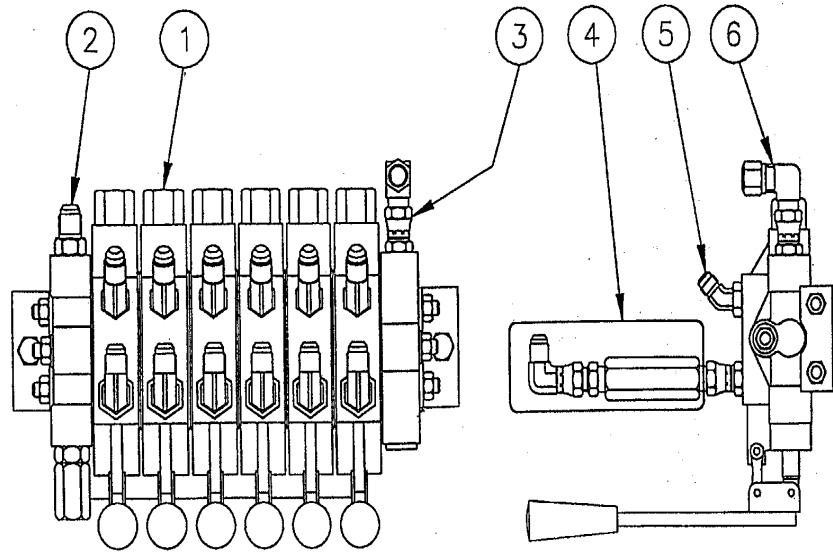
\*Consult factory when ordering.

19.0 Open Center Valve Assembly Parts List

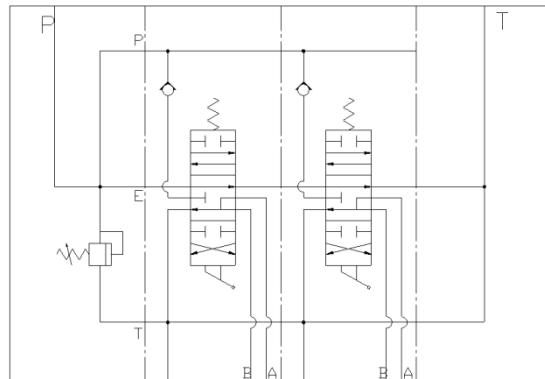
Parts List			
Item	Part No.	Description	Qty
1-6	*	valve assembly	1
1	*	valve	1
2	*	male connector	1
3	*	adapter	*
4	300309	flow control assembly	*
5	*	45° elbow	*
6	*	90° elbow	1
6	*	valve fitting assembly	1

\*Consult factory when ordering.

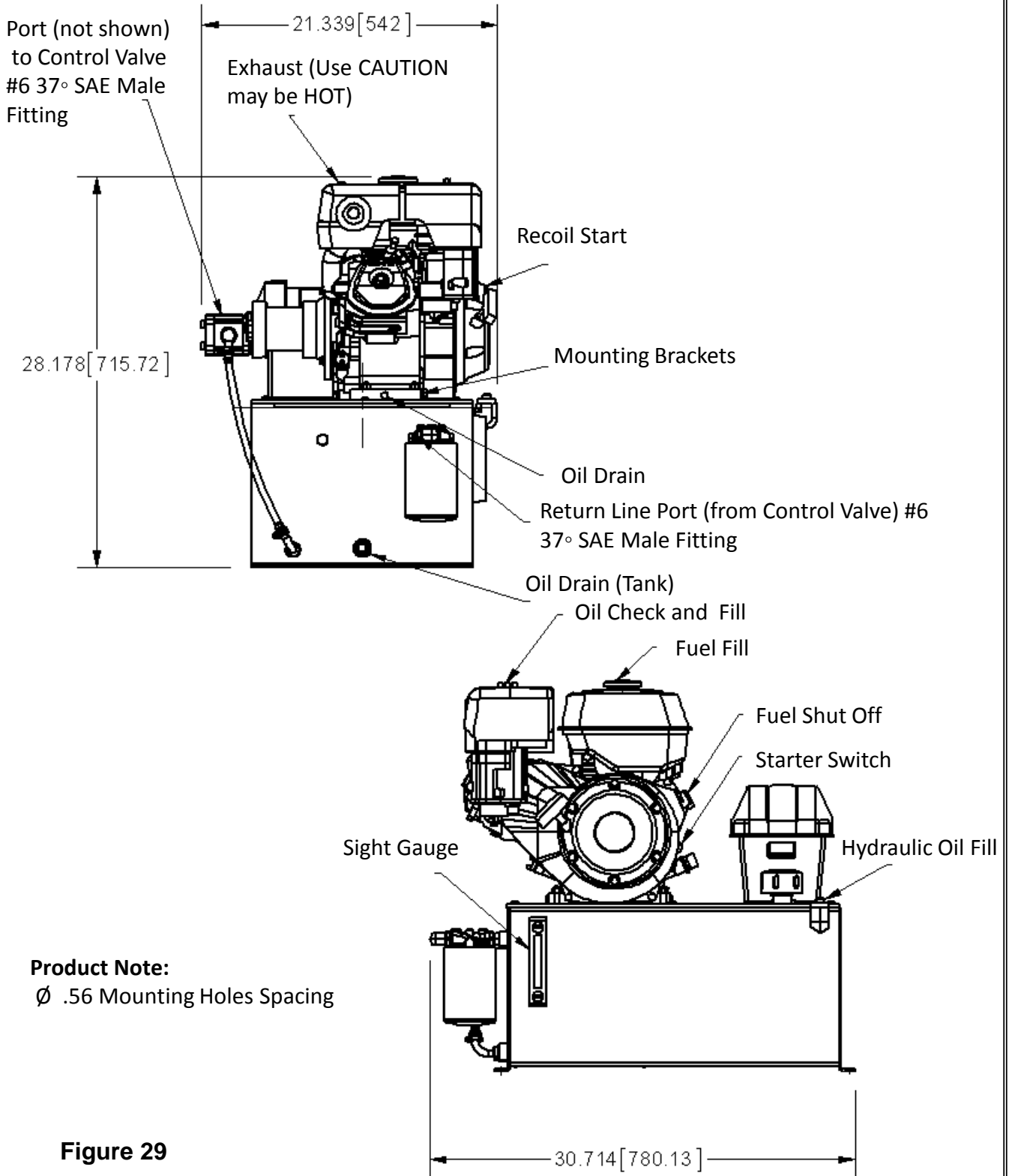
Figure 28



STANDARD PARALLEL CIRCUIT



20.0 8 HP Honda Gas Engine Control Box Drawing



20.1 8 HP Honda Gas Engine Box Parts List

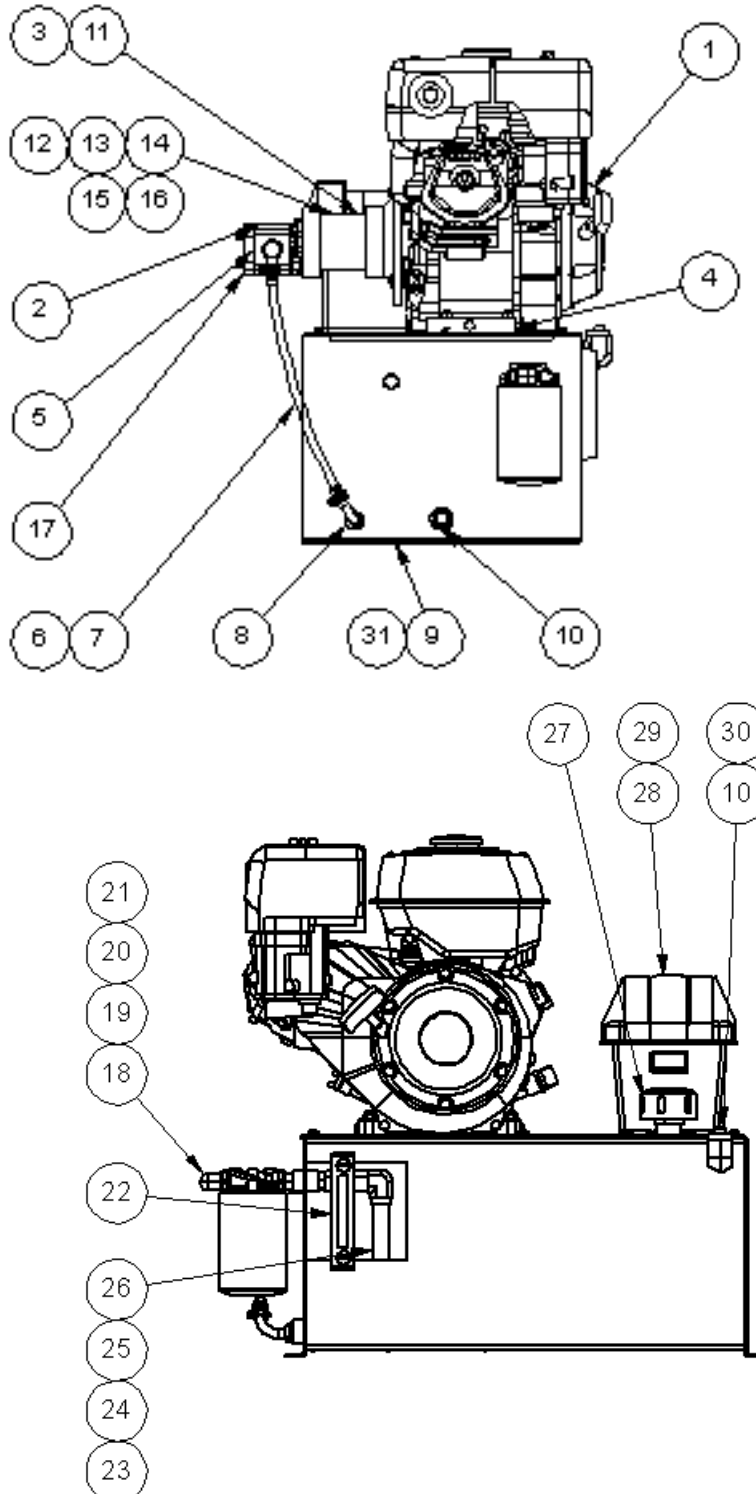


Figure 30

### 20.1 8 HP Honda Gas Engine Box Parts List (Continued)

#### Parts List

Item	Part No.	Description	Qty
1	13-1024	gas engine, 6 H.P.	1
2	*	Str. Thd o-ring connector (not shown)	1
3	*	shaft guard (not shown)	2
4	*	mounting bracket	2
5	*	½" beaded insert x ½" SAE	1
6	*	hose, ½" i.d. x 17.00" lg	1
7	*	hose clamp	2
8	*	½" beaded insert x ½" NPT	1
9	*	hydraulic oil reservoir	1
10	*	¾" NPT pipe plug	2
11	*	pump mount	1
12	*	shaft coupling, 1" bore (not shown)	1
13	*	shaft coupling, 1/2" bore (not shown)	1
14	*	spider (not shown)	1
15	*	1/4" sq. key x 1" lg. (not shown)	1
16	*	1/8" sq. key x 1" lg. (not shown)	1
17	3510000450	pump	1
18	*	90° male elbow	1
19	*	oil filter head	1
20	06-1014	oil filter element	1
21	*	pipe nipple, ½" NPT	1
22	*	sight gage	1
23	*	pipe nipple, ½" x 3/8" NPT	1
24	*	check valve	1
25		90° 3/8" male x ½" female	1
26	*	standpipe	1
27	*	¾" NPT breather	1
28	14-1027	battery	1
29	14-1028	battery case	1
30	*	street elbow, ¾" NPT	1

\* Consult factory  
before ordering

## 20.2 8 HP Honda Gas Engine Installation

### Plumbing

Determine length of high pressure hose required. Hoses should be minimum 5/16 i.d. high pressure (rated at 4,000 psi or above) with #6 37° SAE flare female swivel ends. Hoses to be supplied by the customer.

### Engine

Make certain engine is ready to run according to engine manual (i.e. gas and oil). Do not run until hydraulic reservoir is filled, see filling.

### Filling

1. Remove pipe plug in front of oil tank.
2. Fill reservoir to top of sight glass.
3. Cycle legs twice to bleed air from system.
4. With legs fully retracted, refill reservoir to top of sight glass.
5. Replace plug.
6. Check fitting and hoses for leaks and tighten as required.
7. Secure all hoses in manner that will not cause chafing.
8. Your system is now ready to use.

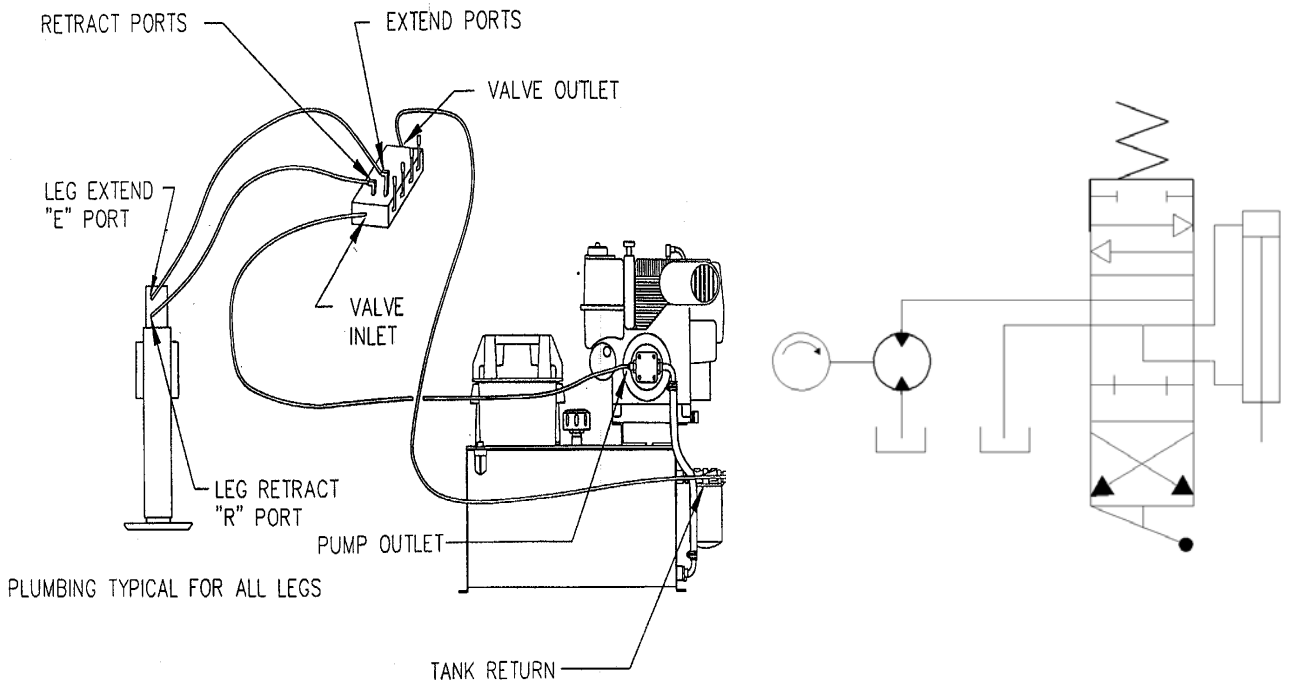


Figure 31

## 21.0 Troubleshooting

PROBLEM	CAUSE	SOLUTION
<b>For DC Units:</b> 1. Pump won't turn on.	Key switch not turned on. Low or dead battery. Loose or dirty electrical connections. Defective solenoid. Defective pump. Defective toggleswitch. Defective keyswitch.	Turn key switch on. Charge or replace battery. Repair. Replace solenoid. Replace. Replace P/N 14-1018. Replace P/N 14-1010.
<b>For AC Units:</b> 1. Pump won't turn on.	Power not connected to local system. Pump wired incorrectly. Loose or dirty electrical connections. Defective pump.	Connect power per codes. Correct wiring per local codes. Repair. Replace.
<b>For Gas Engine Units:</b> 1. Engine won't start.  2. Engine starts, but legs move slowly or not at all.	Battery discharged. Battery wires loose or corroded.  If the problem is not with the battery or wires, consult engine manual.  Control valve not fully activated. Low fluid level. Lock valve sticking. Legs (cylinders) loaded over capacity. Faulty or stuck relief valve at control valve. Leaky piston seal in leg (cylinder).	Change battery. Check and tighten or clean as necessary.  Fully "shift" control valves. Check and refill as required. Rebuild lock valves. Reduce load. Adjust relief valve clockwise, increases pressure. Rebuild leg.*
<b>For Gas, AC &amp; DC Units:</b> 1. Pump turns on, but legs move slowly or not at all.	Control valve not fully activated. Low fluid level. Lock valve sticking. Legs (cylinders) loaded over capacity. Faulty or stuck relief valve at control valve. Leaky piston seal in leg (cylinder).	Fully *shift* control valve. Check and refill as required. Rebuild lock valves. Reduce load. Adjust relief valve clockwise, increases pressure. Rebuild leg.*

**CAUTION**

Use eye protection and equipment supports.

## 21.0 Troubleshooting (Continued)

PROBLEM	CAUSE	SOLUTION
<p><b>For Gas, AC &amp; DC Units Continued:</b></p> <p>3. Control valve will not center.</p> <p>4. Legs leak down.</p> <p>5. Legs leak down from retracted position.</p> <p>6. External oil leak.</p> <p>7. Erratic motion of legs.</p> <p>8. Leg(s) will not retract.</p> <p>9. Control valve leaks externally.</p>	<p>Valve spool is dirty and/or corroded or return springs broken.</p> <p>Extend legs so that they support the trailer 3 - 6" above jack stand. Remove both lines at each leg. Wipe any oil from around ports. Leave sit until oil is noticed leaking from one port or the other. If the extend port leaks, the check valve is defective. If the retract port leaks, the leg seals are defective. Worn or damaged piston seal. Leaking lock valve cartridge.</p> <p>If the legs do not leak as described in "4" above, lock valves leak. If the legs leaked as described in "4."</p> <p>Leaking rod seal or rod guide o-ring seal.</p> <p>Pump sucking air.</p> <p>Faulty lock valve.</p> <p>Defective/clogged flow control.</p> <p>Leak seals at one or all joints.</p>	<p>Try lubricating spool or replace valve.</p> <p>Rebuild as needed.</p> <p>Rebuild legs.* Rebuild lock valve.</p> <p>Rebuild lock valves.</p> <p>Rebuild legs.*</p> <p>Rebuild legs.*</p> <p>Tighten pump suction fittings. Low oil level. Replace pump (bad shaft seal).</p> <p>To retract legs, loosen the small plug at the lock valve, 1 to 1-1/2 turns counter-clockwise. This will allow bleeding oil out of the cylinder. Once the pressure is relieved, remove the plug and retract the cylinder manually with a pry bar. Catch oil from the open port in a bucket. Repair lock valves. Replace/clean flow control.</p> <p>Consult factory.</p>

\*See leg repair section.

## *22.0 Warranty*

Power-Packer warrants to the Purchaser that the product shall be free from defects in material and workmanship at the time of manufacture and appearing within 12 months from the Product's date of sale by Power-Packer.

Power-Packer makes no other warranties or representations, express or implied, by operation of law or otherwise, including but not limited to any express or implied warranty as to merchantability or fitness for a particular purpose.

This warranty shall not extend to claims that result, in Power-Packer's judgment, from misuse, negligence, neglect, accident, alteration, use contrary to instructions (including, but not limited, to moving a vehicle without retracting legs), installation contrary to instructions or recommended installation practice, use of unauthorized components or parts, or unauthorized repair or service.

In addition, Power-Packer shall not be liable on any claims under this warranty with respect to which purchaser shall not have given notice to Power-Packer within 30 days of purchaser receiving notice of the facts giving rise to such claim.

***POWER-PACKER®***

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