

POWER-PACKER®

An Actuant Company

Installation and Service Manual Hydraulic Cab Tilt System

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Part # 3010003741 rev 0B

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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 NOTICE.

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 landing legs.

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


CAUTION

The hydraulic cab tilt system is a cab lifting, not a cab holding device. Before working under a raised cab, always engage the mechanical cab holding device.


CAUTION

Before lowering cab, clear travel path of any obstructions. Disengage mechanical safety lock device to lower cab.


NOTE

The purpose of this manual is to provide basic information about the operation and maintenance of the hydraulic cab tilt system. For more information or to obtain components, please contact the appropriate Truck Service Center nearest you.

4.0 Description

The cab tilt system consists of two hydraulic actuated piston and cylinder assemblies which raise or lower the cab, and either one or two latching cylinder assemblies - depending on cab style - which lock the cab in the down position and release when the cab is raised. These cylinders are connected by flexible high pressure lines to a control head with a built in pump, reservoir and selector valve.

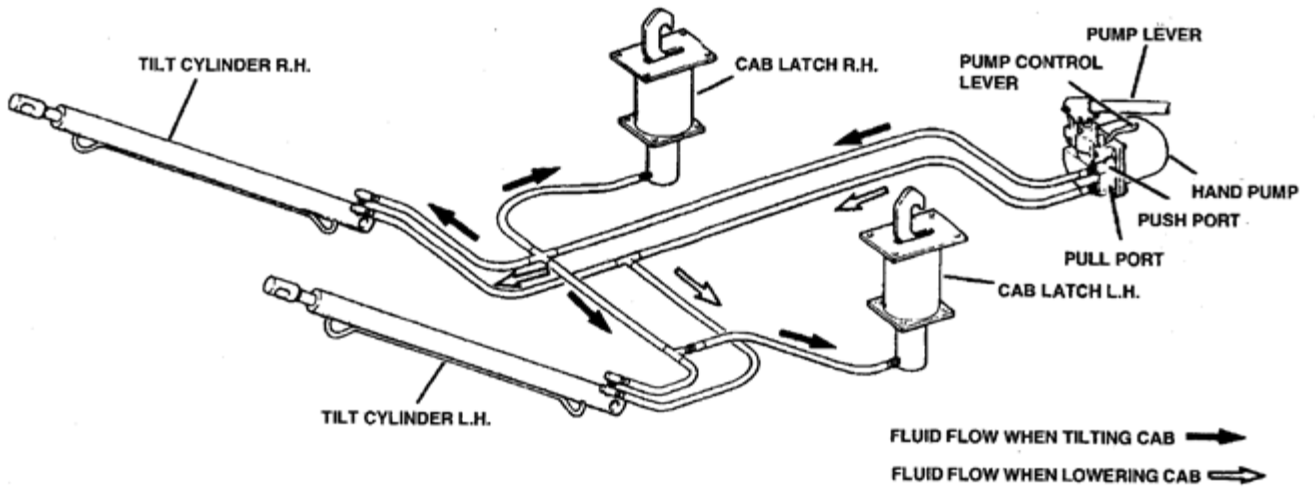
“Velocity Fuses” are incorporated in the cab tilt cylinder ports. They serve to control the cab’s free-fall rate past top-dead-center in either direction, and act as a safety valve to prevent the cab from falling unchecked in the event of a system failure, such as a broken hydraulic line. On all cylinders, “Velocity Fuses” are internal fittings in both the PUSH and PULL ports.

There are (2) options for cab hold down latches. One option consists of a piston and cylinder assembly, and a rotating latch hook. A built-in spring rotates the hook to the open position when the latch is hydraulically energized. The second option consists of a piston and cylinder spring assembly and a latch hook. A built-in cam forces the hook clear of the latch when the piston extends.

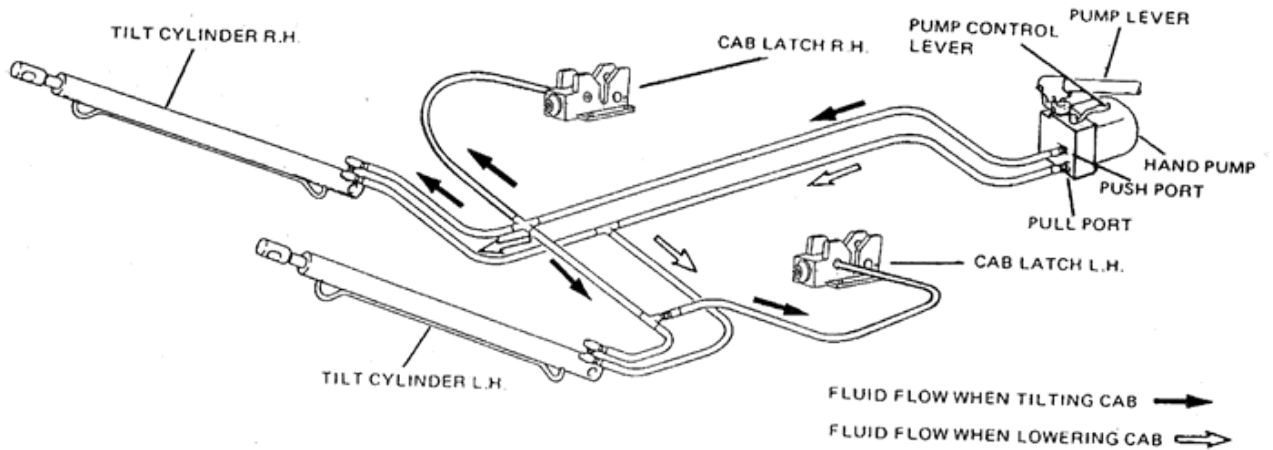
Placing the selector valve in the CAB RAISE position opens the hydraulic system to the PUSH circuit. When the pump is operated, hydraulic pressure builds up in the cab latch cylinder(s) and tilt cylinders. The cab latch releases at a lower pressure than that required to raise the cab. A built-in spring rotates the hook to the open position when the latch is hydraulically energized. The visual “Latch Engaged” indicator protrudes when the latch is opened. As pressure increases, the cab tilt pistons extend, thus raising the cab. When the cab goes over top-dead-center, it free falls at a controlled rate to the full tilt position, automatically relieving hydraulic system pressure.

Placing the selector valve in the CAB LOWER position opens the PULL circuit in the system. When the pump is operated, hydraulic pressure forces the cab back up and over top-dead-center. At this point the cab free falls at a controlled rate until it settles onto the rear mounts. The upper catch bracket lowers into the latch hook rotating it into the latched position. With the hydraulic pressure released, the piston-and-cylinder assembly engages via an internal spring to secure the hook. The visual “Latch Engaged” indicator is flush with the end cap when the latch is engaged.

4.1 Typical Cab Tilt System: Hook Style Latches



4.2 Typical Cab Tilt System: Rotary Style Latches



5.0 Operation

General Information

1. Use hydraulic fluid meeting MIL-H-5606 specification or equivalent. This is a constant viscosity fluid, and is required to ensure consistent operation of the system.
2. Check the level of the hydraulic fluid in the reservoir at regular intervals. Keep the reservoir filled to the top at all times.
3. Periodically inspect the component parts, hydraulic lines and connections for damage or loss of hydraulic fluid.

To Raise The Cab

1. Place selector valve on the control head in the CAB RAISE position. Operate pump to disengage the latch hook(s) and raise the cab.
2. As the cab approaches top dead center (TDC), pump slowly. When cab goes over TDC, stop pumping. The cab will free fall slowly to full tilt.

To Lower The Cab

1. Place selector valve in CAB LOWER position.
2. Begin pumping cab back over TDC. As cab approaches TDC, pump slowly.
3. As the cab goes over TDC, stop pumping. The cab will free-fall smoothly onto the rear mounts, and latch hook(s) will engage. Leave the selector valve in the CAB LOWER position.

5.1 Freeing A Cylinder Lock-Up

The cylinders are equipped with velocity fuses set to a specific flow rate. In the event of a sudden change of flow, exceeding the setting, the velocity fuse will engage and lock up the cylinder. The cylinders can be unlock by actuating the pump in the opposite direction of the fall, then lowering the cab in the normal manner.

If the cylinders have locked-up in the free-fall to full tilt position, and there are no leaks or broken flex lines, place the selector valve in the CAB LOWER position and operate the pump. This will unlock the fuses in the cylinders. After unlocking the fuses, reposition the selector valve to permit free fall to full tilt.

If the cylinders have locked up in the free fall to down position, and there are no leaks or broken lines, unlock by placing the selector valve in the CAB RAISE position and operating the pump. After the fuses unlock, reposition the selector valve to CAB LOWER to permit free fall.

NOTE

Do not use Automatic Transmission or Brake Fluid.

CAUTION

Never fill the reservoir with the cab in the RAISED position.

NOTE

The selector valve should always be in the CAB LOWER position when the tilt system is not in use.

CAUTION

Do not attempt to free a hydraulic lock by tampering with the velocity fuses.

6.0 Preventive Maintenance



CAUTION

Cab must be in the lowered position.



NOTE

Step 4 of "Bleeding and Filling Procedure" must be made before step 5. Do not reverse the sequence of this procedure.



CAUTION

Do not refill the reservoir with the cab in the raised position.



NOTE

Cylinders shipped full of oil.

Bleeding And Filling Procedure

1. Be sure all hydraulic lines are connected and the reservoir is full.
2. Loosen the (4) connections on the tilt cylinders, and the connections on the latch cylinder(s). Do not completely disconnect. Check that all other connections are tight.
3. Fill the pump reservoir to the top with the specified hydraulic fluid (MIL-H-5606 or equivalent). Close and tighten the filler plug.
4. Place the selector valve in the CAB LOWER position. Operate the pump until all air is bled from the DOWN lines, then tighten the connections at the PULL ports on the tilt cylinders.
5. Place the selector valve in the CAB RAISE position. Operate the pump until all air is first bled from the latch cylinder lines, then tighten those connections. Continue pumping until the UP lines are free of air, then tighten the connections on the PUSH ports on the tilt cylinders.
6. After the entire system is bled, and all connections are tight, return selector valve to CAB LOWER position. Check the fluid level in the pump reservoir and refill to the top.

Removing Air From Single Acting Cylinders

1. Since cylinders rods usually are mounted higher than base end, air goes to the top and will not discharge to the reservoir.
2. If number of full pump strokes exceeds (25) before anything starts to happen, then too much air is in the cylinder.
3. Remove cylinders and attach to pump with single hose. With cylinder in rod down/base up position, extend cylinder and then open release valve on pump. By pushing down on cylinder, retract rod into cylinder tube.
4. Replace cylinders on truck and bleed air from lines at cylinder port by actuating hand pump with fittings slightly loose at cylinder base. Actuate pump until solid oil appears at loose fitting.
5. Tighten fittings and refill pump until oil flows out of fill port. Close fill port plug.

6.0 Preventive Maintenance cont.



NOTE

Air, dirt and lack of oil account for 75% of all hydraulic problems.

Removing Air From Double Acting Cylinder

1. With cylinder in retracted position and cab down in lock position, open push port fitting slightly and place valve in up position. Actuate hand pump or air pump until solid oil appears at cylinder ports. Tighten push port fittings at cylinders.
2. Loosen pull port fittings at cylinder and place valve in down position. Actuate pump slowly several times until solid oil appears at loose pull fittings at cylinder.
3. Tighten fittings at cylinder. Refill pump reservoir with cab in down position until oil flows from fill port.
4. Actuate cab and tilt fully to 90° and return to down position. Refill reservoir if necessary after fully tilting to 90°.

Removing Dirt From Hydraulic Tilt System

1. All cylinders have screens at ports. If dirt appears at screen and if it appears clogged, then use a small pick or sharp tool to remove accumulated dirt from screen.
2. All pumps have screens on inlet ports of pump in the reservoir. Remove reservoir if no oil will go through the pump and clean inlet screen. Replace reservoir, refill and bleed hoses.
3. All pumps have mesh screens ("top hat") at pull and push ports of valve. Check screens to ensure that no accumulated dirt has closed off these screens. Use sharp tool or pick to remove accumulated dirt at screen.

7.0 Service

The need for repairs of the pump or cylinders will be evidenced by external leakage at the pump, plunger or the cylinder glands.

Indications of internal problems would be: slow tilting of the cab, cab unable to "hold" in a partially raised position, or inability to raise the cab. For specific conditions, possible causes and correction refer to the table in the Troubleshooting Section.

Service kits for repairing the pump or cylinder and piston assemblies are available through your local Truck Service Center/Dealership.

7.1 Pump Service

For The Aluminum Die Cast Style Pump

Service kits are available through your local Truck Service Center.

Item	Qty	Description
1	1	Pump Body
2	1	Spool
3	1	Cylinder
4	1	Outlet Seat
5	1	Plunger
6	1	Reservoir
7	1	Plug
8	2	Gasket
9	1	Relief Valve
10	1	Gasket
11	1	Inlet Adapter
12	1	Screen
13	1	O-Ring
14	4	Capscrew
15	1	O-Ring
16	1	O-Ring
17	1	Plug
18	1	Spring
19	2	3/16" Ball
20	1	Wiper
21	1	Back-up
22	1	O-Ring
23	1	Beam
24	1	Pin
25	1	Link
26	2	Cotter Pin
27	1	Beam Link Pin
28	1	Pin
29	2	Washer
30	4	Wave Washer
31	1	1/4" Ball
32	1	O-Ring
33	2	O-Ring
34	1	O-Ring
35	1	Wiper
36	1	Orifice Screw
37	1	Screw
38	1	Washer
39	1	Handle
40	1	Setscrew
41	1	Spring
42	1	Plug
43	7	5/32" Ball
44	1	Fill Plug
45	1	Screen
46	1	Capscrew
47	2	Retaining Ring
48	1	Screen
49	1	Back-up

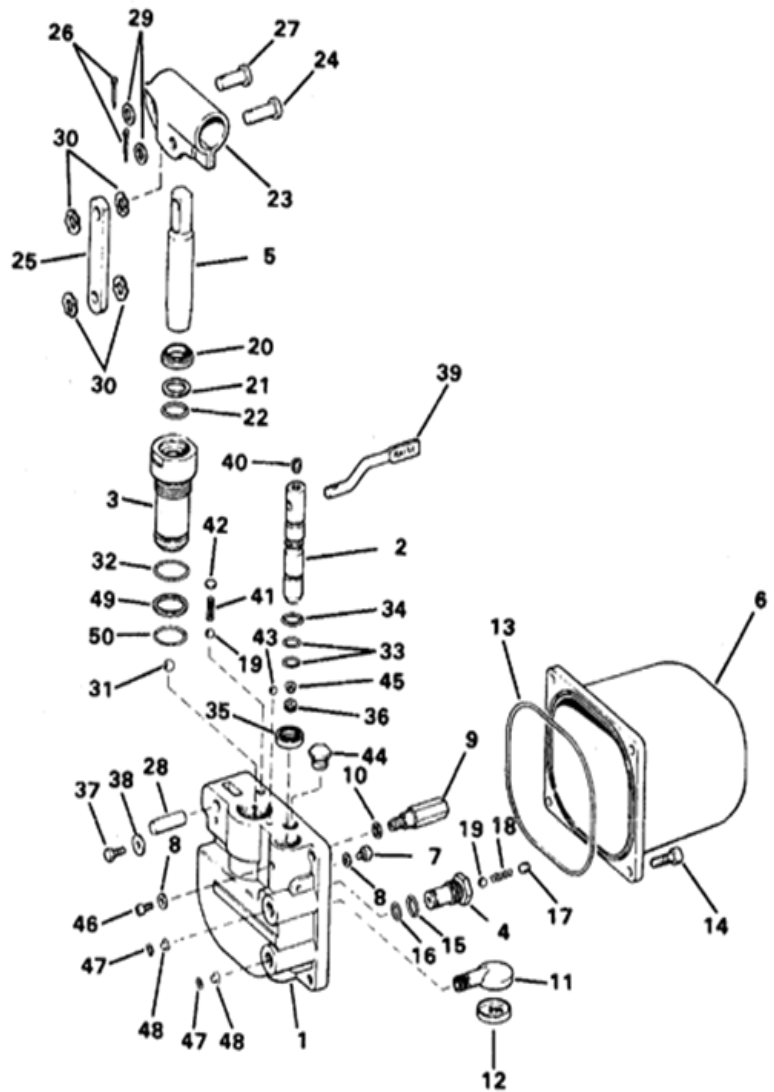


Figure # 1

7.1 Pump Service

For The Aluminum Block Style Pump

Service kits are available through your local Truck Service Center.

Item	Qty	Description
1	1	Pump Body Assembly
2, 3, 4	1	Cylinder Insert Assembly
5	1	Beam - Link Assembly
6	1	Fill Plug
7, 8, 9	1	Reservoir (Small)
7, 8, 10	1	Reservoir (Large)
11	2	Adapter (SAE #4 to .125-27 NPTF)

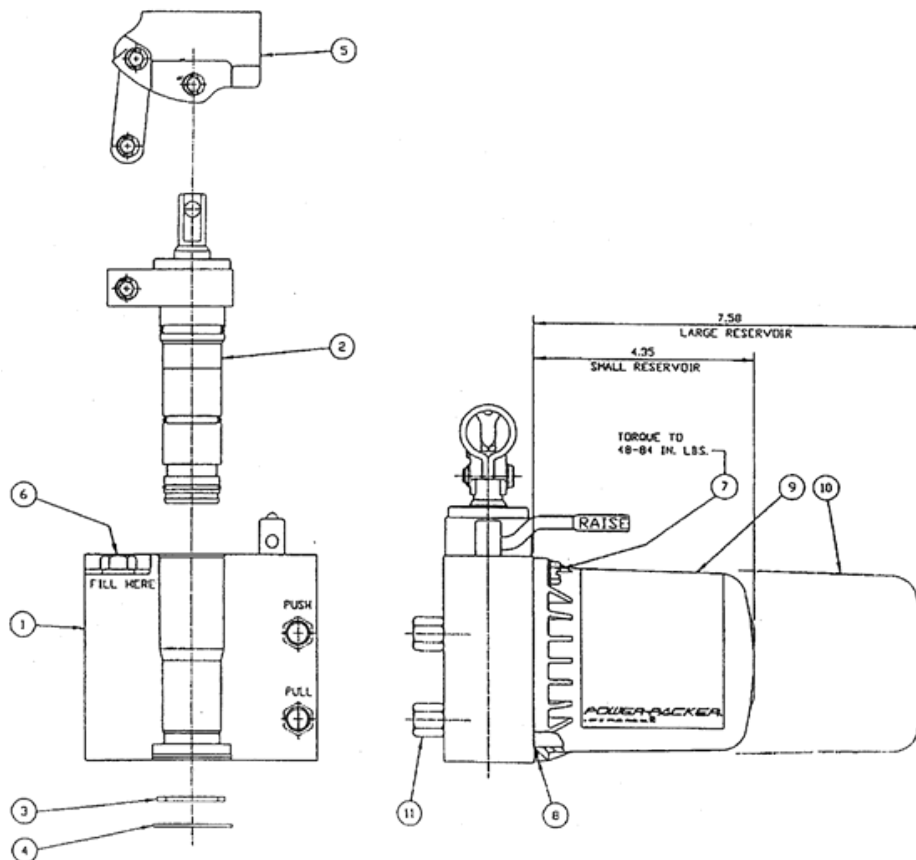


Figure #2

**WARNING**

When working with high pressure hydraulic systems, the pressure must be relieved before any disassembly can occur. Failure to do so can result in product damage and/or severe personal injury.

**WARNING**

When working with high pressure hydraulic systems, the pressure must be relieved before any disassembly can occur. Failure to do so can result in product damage and/or severe personal injury.

6.2 Beam/Link Replacement**For Extruded Aluminum Block Style Pump**

1. With the cab in the lowered operating position, cycle the directional lever several times from raise to lower position to equalize pressure in the pump.
2. Remove retaining ring, washer, clevis pin, and second washer from the swivel bracket.
3. Remove the retaining ring, washer, clevis pin, and second washer attaching this assembly to the pump piston.
4. Remove the beam link assembly from the pump.
5. Place the new beam link assembly on the pump.
6. Install a washer on the clevis pin, insert the clevis pin through the link and swivel, install the second washer and retaining ring.
7. Install a washer on the clevis pin, insert the clevis pin through the beam and piston, install the second washer and retaining ring.

6.3 Pump Cylinder Kit**For Extruded Aluminum Block Style Pump**

1. With the cab in the lowered operating position, cycle the directional lever several times from the raise to lower position in order to equalize pressure in the pump.
2. Slowly loosen and remove the push port hydraulic hose from the pump fitting. Plug the end to avoid losing excess fluid. Label the hose for reassembly. Repeat the process for the pull port hydraulic hose.
3. Unscrew the (2) mounting bolts and remove the pump from the vehicle.
4. With the pump removed from the vehicle, drain the reservoir and place the pump on a clean, flat surface.
5. Remove retaining ring, washer, clevis pin, and second washer from the swivel bracket/link. Save these components for reassembly.
6. Remove the retaining ring, washer, clevis pin and second washer from the beam/piston. Save these components for reassembly.
7. Turn the pump on its side, exposing the bottom. Remove the black insert. (The bottom of the cylinder insert assembly should be clearly visible).
8. Using retaining ring pliers, remove the cylinder insert assembly retaining ring.
9. Grasping the swivel, tap the bottom end of the cylinder insert assembly with a rubber hammer and slowly pull the cylinder insert assembly out of the pump body.
10. Before installing the new cylinder insert assembly, lubricate the o-rings with a petroleum based lubricant (i.e. STP or similar product).
11. Carefully insert the new cylinder insert assembly into the pump body until fully seated. (Tapping with a small rubber hammer may be necessary).

**WARNING**

When working with high pressure hydraulic systems, the pressure must be relieved before any disassembly can occur. Failure to do so can result in product damage and/or severe personal injury.

**NOTE**

Verify the correct installation of retaining ring before proceeding.

**WARNING**

When working with high pressure hydraulic systems, the pressure must be relieved before any disassembly can occur. Failure to do so can result in product damage and/or severe personal injury.

**NOTE**

All other repairs require replacing the complete pump assembly.

6.3 Pump Cylinder Kit Cont.**For Extruded Aluminum Block Style Pump cont.**

12. Turn the pump body on its side exposing the bottom of the cylinder insert assembly. Using the retaining ring pliers, install the new retaining ring into the corresponding groove.
13. Replace the black insert.
14. Place the beam link assembly on top of the new cylinder insert assembly. Install the washer, clevis pin, second washer and retaining ring onto the swivel bracket/link.
15. Install the washer, clevis pin, second washer and retaining ring onto the beam/piston.
16. Install the pump onto the vehicle and reconnect hydraulic hoses.
17. Fill and bleed the hydraulic tilt system.

6.4 Reservoir Replacement Kit

1. With the cab the lowered operating position, cycle the directional lever several times from raise to lower position to equalize pressure in the pump.
2. Slowly loosen and remove the push port hydraulic hose from the pump fitting. Plug the end to avoid losing excess fluid. Label the hose for reassembly. Repeat the process for the pull port hydraulic hose.
3. Unscrew the (2) mounting bolts and remove the pump unit from the vehicle.
4. With the pump removed from the vehicle, drain the reservoir and place the pump on a clean, flat surface.
5. Using a 3/8" socket or wrench, loosen the (4) reservoir mounting bolts (turning counter clockwise).
6. Relocate pump with reservoir down (so as any remaining fluid in the reservoir does not spill out) and remove reservoir mounting bolts. Slowly remove reservoir and reservoir seal from pump body.
7. Clean the reservoir mounting surface on the pump body.
8. While the unit is disassembled, take this time to clean the pump inlet screen.
9. Place the new reservoir o-ring seal into the new reservoir seal groove.
10. Orient the new reservoir to the pump body so that any reservoir labeling will be consistent with old labeling location.
11. Start the (4) hex bolts onto the pump body, (turning clockwise) making sure the o-ring seal remains in the proper groove.
12. Using a 3/8" torque wrench, tighten the (4) reservoir bolts to 3-5 ft. lbs. using an opposite corner "X" pattern for equal torque distribution.
13. Mount the pump back onto the vehicle, reconnect the hydraulic hoses, and fill and bleed the system.

6.5 Cylinder and Piston Assembly

Item	Qty	Description	Status
1	1	Cylinder & Base Assembly	Not serviceable
2	1	Plunger Assembly	Not serviceable
3	1	O-ring	Included in service kit
4	1	Retaining Ring	Included in service kit
5	1	Seal	Included in service kit
6	1	O-ring	Included in service kit
7	1	Back-up	Included in service kit
8	1	Wiper	Included in service kit
9	1	Gland	Included in service kit
10	1	O-ring	Included in service kit
11	1	Piston	Available upon request

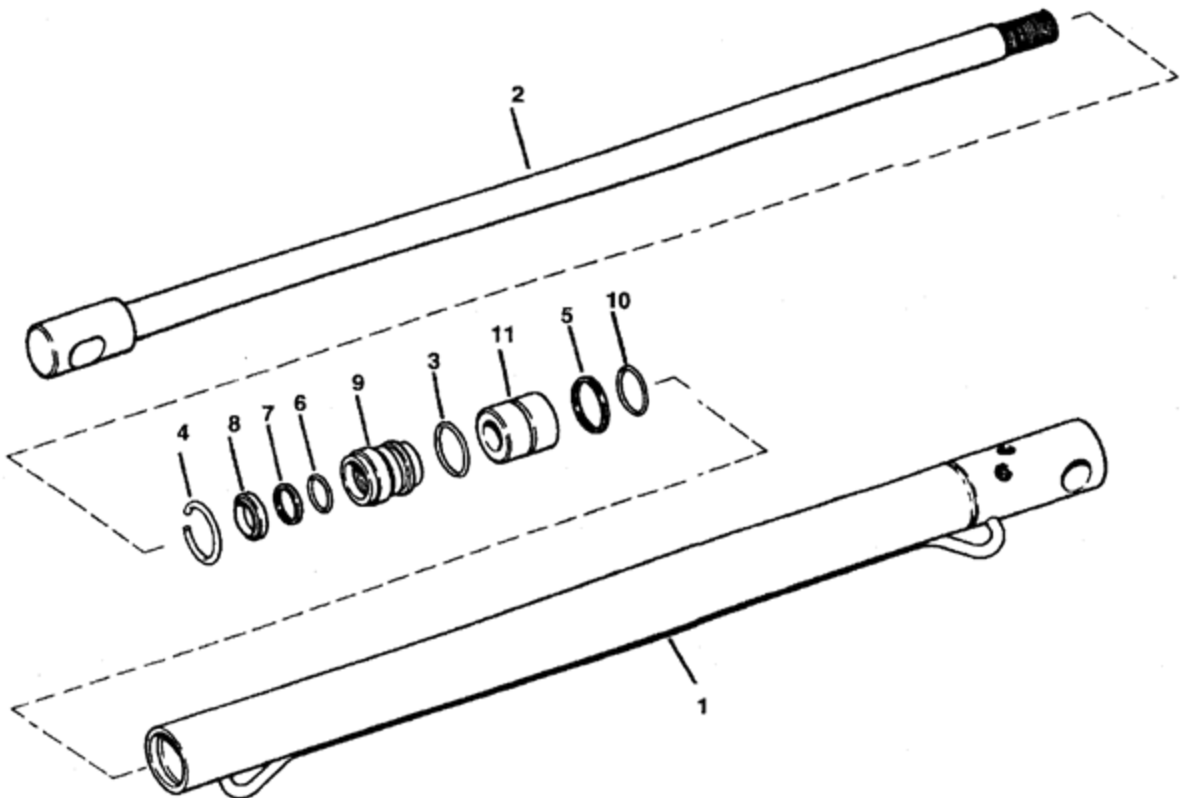


Figure # 3

6.5 Cylinder and Piston Assembly cont.**NOTE**

If cylinder must be removed with cab in raised position, proper cab support must be used before proceeding.

**WARNING**

When working with high pressure hydraulic systems, the pressure must be relieved before any disassembly can occur. Failure to do so can result in product damage and/or severe personal injury.

**NOTE**

If cylinder bore is scored, component replacement is recommended. A scored rod also requires complete cylinder replacement.

**CAUTION**

Retaining ring must be seated in mating groove.

1. **Remove the piston and cylinder assembly from the vehicle.** This can be accomplished with the cab in the raised or lowered position; however, it is recommended that the assembly be removed while the cab is down and locked for three reasons:
 - No undue stress will be placed on the cab.
 - The piston is retracted and not exposed to damage.
 - It is safer.

Release hydraulic pressure and detach hydraulic lines. Disconnect the cylinder and piston assembly first at the clevis end, then the back end, in that order. Clean thoroughly with the piston retracted before disassembly.

2. **Remove piston assembly from cylinder.** (Refer to Figure #3)
 - a. First remove retaining ring (4). Note 1/8" hole in cylinder tube to aid this.
 - b. Gently pull piston assembly from cylinder tube (use caution during disassembly as cylinder may contain oil).
3. **Disassemble piston rod components.**
 - a. Unscrew piston (11) from plunger assembly (2). Remove gland (9).
4. **Inspect parts to be reused.** Clean thoroughly. Inspect the piston rod, gland, piston and the cylinder tubing for undue wear or damage. Replace all components that show damage or wear.

Don't use a bent piston rod or try to straighten it, no matter how small the bend. Required clearances are so close, particularly in relation to the gland and seals, that satisfactory operation cannot be assured once the rod is bent. The only alternative is to replace it.

5. **Reassemble piston rod assembly using kit.** Work under the cleanest possible conditions.
 - a. Replace seal (6), back-up (7) and wiper (8). Lubricate the inside of gland and put back on plunger assembly.
 - b. Apply a very thin coating of hydraulic fluid on the piston rod.
 - c. Screw piston on plunger assembly using LOCTITE pipe sealant on threads. Stake threads on two places 180° apart.
 - d. Install o-ring (3) from kit.
 - e. Install new seal (5) and o-ring (10).
6. **Reinstall piston rod assembly in cylinder.** Make sure the cylinder bore is clean. Pour a small amount of hydraulic fluid in cylinder, then rotate and rock cylinder to spread fluid over entire bore. Put a light coat of hydraulic fluid on the piston seal, gland o-ring, and gland. Slide piston rod assembly into cylinder, using care. Fill cylinder cavity with recommended oil (within 2" of full). After lightly tapping gland into position, reinstall retaining ring (4).

6.5 Cylinder and Piston Assembly cont.



WARNING

When working with high pressure hydraulic systems, the pressure must be relieved before any disassembly can occur. Failure to do so can result in product damage and/or severe personal injury.



WARNING

If work was done with the cab in the raised position, the cab must be lowered before proceeding to the next step. Since the cab tilt system is now full of air, the cab could free fall unchecked. Use a hoist to lower cab.



NOTE

Do not use automatic transmission fluid or brake fluid!



CAUTION

Retaining ring must be seated in mating groove.

7. **Check piston for smooth action in cylinder.** If no binding or irregular action occurs, the cylinder is ready for installation.
8. **Reinstall piston and rod assembly on vehicle.** Connect hydraulic lines to port fittings but do not tighten.
9. **Bleed hydraulic system.** Fill pump reservoir to the top. Use only specified hydraulic fluid (MIL-H-5606B or equivalent).
 - a. Place selector valve in CAB LOWER position. Operate pump until all air is bled from DOWN line. Tighten connection at PULL port on cylinder.
 - b. Place selector valve in CAB RAISE position. Operate pump until all air is bled from UP line. Tighten connection at PUSH port on cylinder.
 - c. Return selector valve to CAB LOWER position.

6.6 Hydraulic Hook Latch Assembly

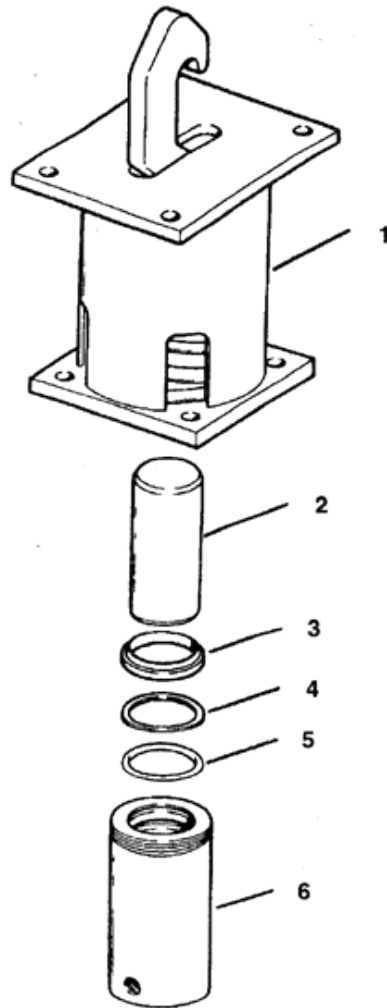


Figure #4

Item	Qty	Description	Status
1	1	Latch Assembly	Included in Latch Hook Kit
2	1	Plunger Assembly	Included in Latch Cylinder Kit
3	1	Wiper	Included in Latch Cylinder Kit
4	1	Back-up	Included in Latch Cylinder Kit
5	1	O-ring	Included in Latch Cylinder Kit
6	1	Cylinder	Included in Latch Cylinder Kit

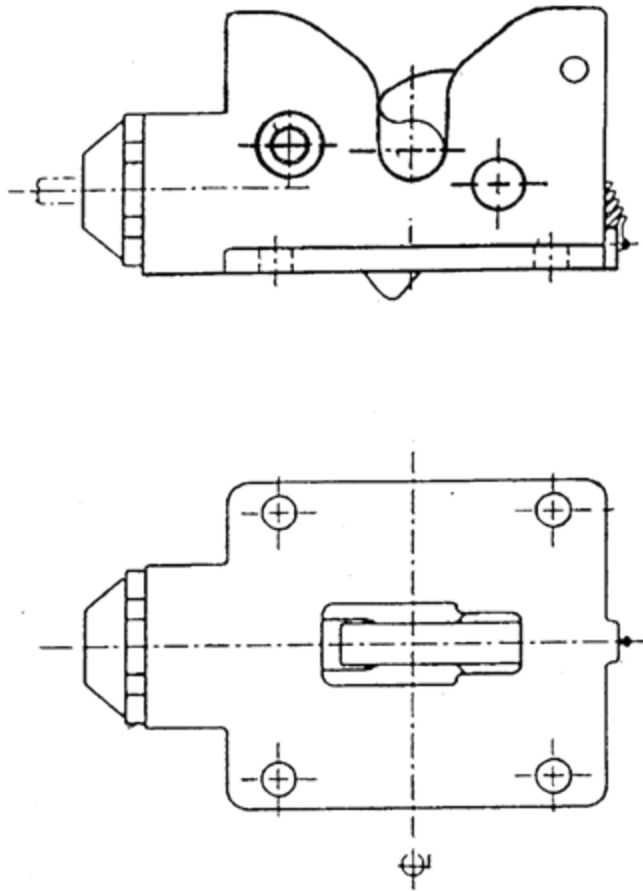
6.6 Hydraulic Hook Latch Assembly cont.

Refer to figure #4.

1. Unscrew latch cylinder (6) from latch assembly.
2. Remove plunger from cylinder.
3. If the end of plunger is mushroomed, replace the entire cylinder section of latch.
4. Thoroughly clean all parts.
5. Install new o-ring (3), back up (4), and wiper (5) from repair kit. Use care to ensure no parts are nicked or cut.
6. Thread cylinder back onto latch weldment (1) with 20-30 ft./lbs. of torque. Place a dab of grease on plunger where it contacts the hook.
7. Bleeding will be accomplished by loosening the hose connection to each latch, and pumping slowly with the pump control valve in the RAISE position. When oil flows steady from the loosened fitting, stop pumping and tighten the fitting.

6.7 Hydraulic Rotary Latch Assembly

The hydraulic rotary latch is not field serviceable. If operational issues occur, replace the entire unit.



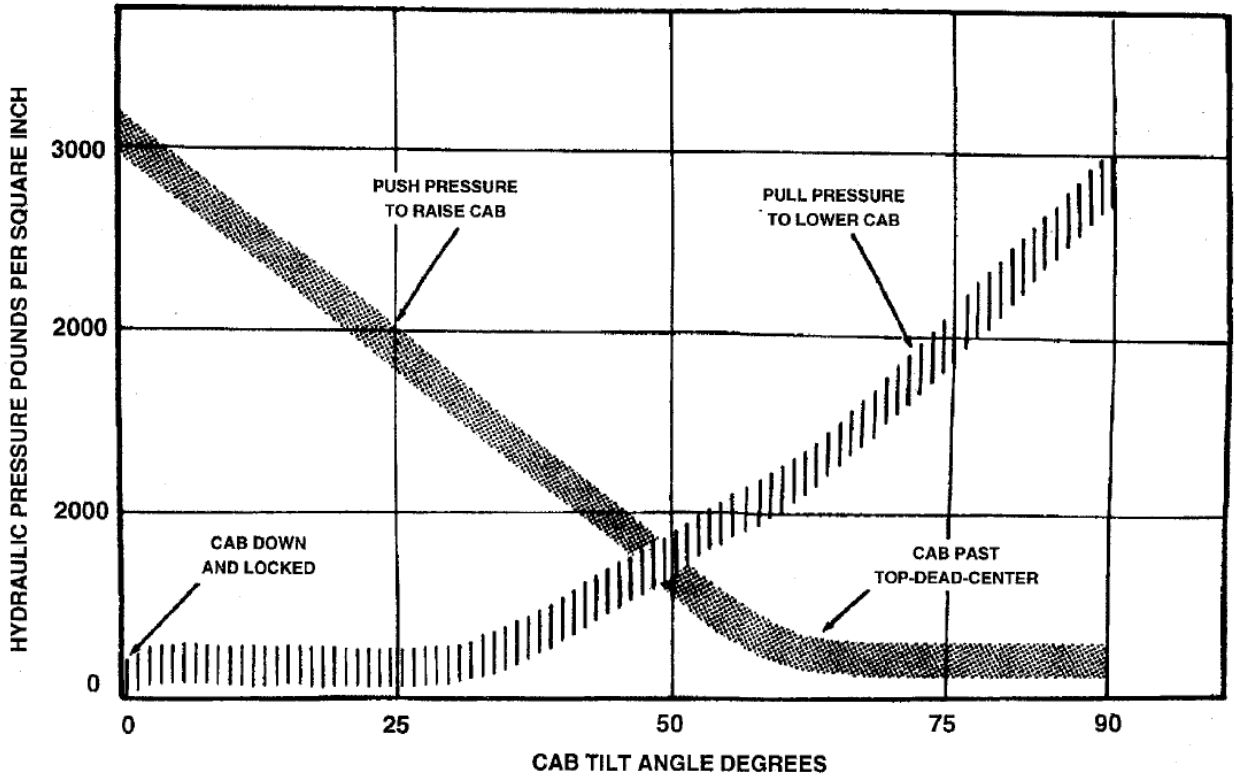
7.0 Troubleshooting

Unsatisfactory operation of the tilt system could be caused by a malfunction of the pump assembly, tilt cylinders, or latch, or by restricted or damaged hydraulic lines. The Troubleshooting table outlines typical conditions, possible causes, and corrections. Check flow through each component, such as fittings. Evaluate before replacing component.

Condition	Possible Cause	Correction
Tilt cylinder will not retract or advance.	1. Damaged or broken line.	1. Replace hydraulic hose.
	2. Pressure builds up in both directions, due to plugged orifice in the pump.	2. Replace pump.
	3. Oil reservoir not filled on pump.	3. Fill pump reservoir.
	4. Worn or faulty seal in cylinder.	4. Replace cylinder and/or replace seals.
	5. Crossed hoses.	5. Replumb and bleed
Pump handle kicks up.	1. Outlet ball leaking.	1. Replace or rebuild pump.
Pump functions only on last portion of stroke.	1. Reservoir low on oil.	1. Fill reservoir.
	2. Inlet ball leaking.	2. Replace pump.
	3. Dirt on inlet screen	3. Clean screen and reservoir.
Pump will not build pressure.	1. Reservoir empty or low.	1. Fill reservoir.
	2. Inlet ball leaking.	2. Replace or rebuild pump.
	3. Bad O-ring on selector valve spool.	3. Replace pump.
	4. Relief valve improperly set or blocked open.	4. Replace pump.
Pump leaks between pump base and reservoir.	1. Bad O-ring on reservoir.	1. Replace or rebuild pump.
Cab latch inoperable.	1. Damaged or broken hydraulic hose.	1. Replace hose.
	2. Binding piston.	2. Replace latch
Cab stops moving when in free fall.	1. Cylinder velocity fuse locked up.	1a. Reverse pump direction with selector lever and pump to unlock. 1b. Check for broken hose.
	2. Plugged orifice in pump.	2. Replace pump.
Cab fails to tilt.	1. Cab latch binding. Fails to unlatch.	1. Replace cab latch cylinder.
	2. Pump does not build pressure.	2. Replace pump.
	3. Check for other causes above.	3. Take appropriate corrective action.
Cylinder velocity fuses locks up consistently.	1. Free fall rate too fast.	1. Replace pump.
Hydraulic fluid forced out of breather.	1. Reservoir overfilled.	1. Drain oil out and properly refill.
Oil leak at hand pump plunger.	1. Damaged seal.	1. Replace or rebuild pump.

8.0 Cab Tilt Angle

The chart below shows the typical relationship of hydraulic system pressure to cab tilt angle.



9.0 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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