BendPak Technical Service Bulletin
Hydraulic Cylinder Troubleshooting

BendPak TSB 86 – 022022

The purpose of this Technical Service Bulletin is to provide general troubleshooting guidance for Hydraulic Cylinder Fluid leaks on BendPak equipment. Hydraulic Leaks may have a variety causes, but can usually be narrowed to a few common problems. This document is intended to be used as a general guide and does not call out any specific BendPak product.

Hydraulic Cylinder Leaks - Troubleshooting

⚠ **WARNING** Hydraulic Fluid under pressure is dangerous. Wear OSHA-approved (publication 3151) Personal Protective Equipment: leather gloves, steel-toed work boots, back belts, hearing protection, and ANSI-approved eye protection (safety glasses, face shield, or goggles). Keep rags and oil absorbent nearby to remove Hydraulic Fluid.

Locate the Leak

Begin by accurately locating the source of the leak. If you have already determined the source of the leak then move to the **Typical Leak Sources** listed below.

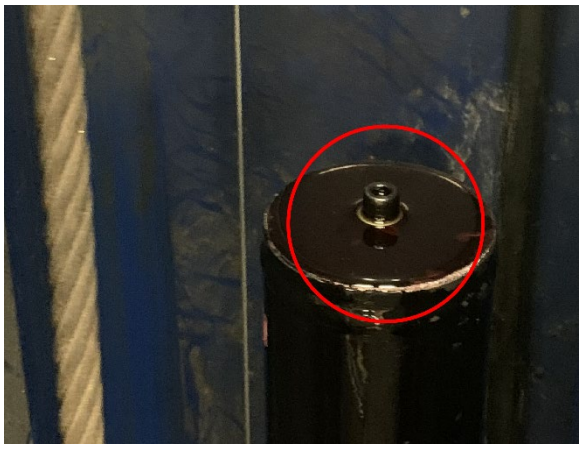
To Locate the Source of the Leak:

1. Remove power. Clean the outer Hydraulic Cylinder, Hoses and Fittings thoroughly with a damp cloth and a weak solution of water and dish soap, then use clean rags to dry thoroughly.
2. Return power to the equipment and apply pressure to the Hydraulic System.
3. Pass clean cardboard or paper over the suspected leaking area. The paper will show oil traces in the leak area. Inspect to localize further, if required.
4. Once the Leak is located, return the equipment to a safe off condition, remove power and lock out to prevent accidental operation while working on the equipment.

Typical Leak Sources

Bleed Screw

The Bleed Screw is intended to allow the removal of air from the Hydraulic System. Oil leaking from the Bleed Screw is usually easily corrected.



Corrective Action: Simply tighten the screw. Some Bleed Screws include an O-ring, others use a Bonded Seal with Washer. If you tighten the Bleed Screw and Hydraulic Fluid is still escaping, then investigate further to see if the Screw or Gasket is damaged or contaminants are preventing it from sealing. When replacing the Bleed Screw and O-Ring, use a drop or two of the system Hydraulic Fluid on the O-Ring or Gasket to ensure it does not tear when compressed between the Screw and the Cylinder.

Breather Screw

It is not unusual to see some Hydraulic Fluid at the Breather Screw. A small amount of Hydraulic Fluid will migrate past the Piston Seals and may appear at the Breather Screw along with some shipping oil. This is normal in the operation of single acting Hydraulic Cylinders. The Breather Screw allows air to pass into and out of the non-pressurized side of a Hydraulic Cylinder.

Excessive amounts of Hydraulic Fluid appearing at the Breather Screw would indicate that the internal Piston Seals have failed. Additional indications would be a severe reduction of the Hydraulic Cylinder movement and lifting ability.

Corrective action: Replace/rebuild the Cylinder.

Leaks at NPT Fittings or Plugs on the Hydraulic Cylinder

National Pipe Thread (NPT) Fittings and Plugs are common on Hydraulic Cylinder Ports. Common problem areas include:

1. Cross-threaded fitting. Indicated by a slow to moderate leak at the Fitting where it mates to the Cylinder Port. Examine the Fitting as it enters the Cylinder. If the Fitting looks like it is not in line (co-linear) with the Cylinder Port, it could have been cross-threaded.

   Corrective action: Remove the fitting and examine the threads. If the Fitting or Cylinder threads are damaged, the Cylinder will likely need to be rebuilt and the fitting replaced. Metal shavings from cross threading may have migrated into the Cylinder which will eventually damage the Seals and or the Pump.

2. Fitting not tightened. Indicated by a slow to heavy leak at the Cylinder/Fitting connection.

   Corrective Action: Tighten the Fitting to correct. NPT threads are tapered and are not typically assigned a torque value. Always start threading the fitting by hand, after the fitting is finger tight, use a wrench to tighten 2 to 3 turns further. See item 3 below.

3. Insufficient or no thread sealant. Indicated by a slow to moderate leak at the Fitting. All NPT fittings require a thread sealant.

   Corrective Action: Remove the Fitting, clean the both the Fitting and the Lift Cylinder Port with a clean rag or paper towel. ***Leave no debris that may enter the Hydraulic System***. Leaving the first thread clean, apply thread sealant to the rest of Fittings' threads. BendPak recommends a liquid PTFE thread sealant. Always start threading the fitting by hand, after the fitting is finger tight, use a wrench to tighten 2 to 3 turns further. Starting the Fitting by hand helps to ensure that you are not cross-threading the Fitting. Wait the manufacturer's recommended 24-hours before applying pressure to the system.

Leaks at or in the Hydraulic Hose or its Fittings

There are several failure modes for Hydraulic Hoses.

1. A split or cracked Hydraulic Hose, reinforcing wire may be visible. May or may not be indicated by a leak in proportion to the size of the opening in the Hose. Possible causes are heat, abrasion or contamination.

   Corrective Action: If the Hose is too close to heat or a source of abrasion, then re-route or remove the source of the damage. The Hose assembly should be replaced, if damaged.

2. The Hose Fitting is loose or actually separated from the Hose indicating a crimp failure. This failure is indicated by a slow to severe leak, and or visible damage to the exterior of the Hose. Refer to the figure to the right.

   Corrective Action: Verify the Hose is not being bent at an excessively tight radius. An excessively tight Hose bend can cause the Hose Crimp to fail. Reroute and replace the Hose assembly.

3. The Hose Fitting is bent out of round or threads are damaged. Indicated by an inability to thread onto the mating Fitting.

   Corrective Action: Inspect to verify the condition and replace and reroute the Hose assembly.

4. Serious particulate contamination and or Hydraulic Fluid incompatibility can cause a Hose to delaminate from the inside out. This is an usual condition, usually indicated by a split in the Hose.

   Corrective Action: Replace the Hose. Drain and flush the system with clean Hydraulic Fluid, then replace with the correct fluid. There will usually be debris in the system and likely Hydraulic Cylinder and Power Unit Seal damage. If the suspect fluid could damage the Hose, it also likely damaged other Seals and internal system components. The Cylinder and Power Unit should be disassembled and the Seals inspected and replaced. The figure below details internal Hose Damage from an incompatible fluid.

Leaks at the Cylinder

Several failure modes for the Hydraulic Cylinder itself are listed below.

1. Damaged Rod or Rod Bearings are the most common cause of internal Seal failures. Symptoms of damaged Rods and or Bearings are wear or galling on one side or area of the Rod. Refer to the photo on the right.

   Corrective Action: Rebuild or replace the cylinder.

2. Seal failure. Contaminated Hydraulic Fluid (abrasive particles suspended in the Hydraulic Fluid) can cause premature Seal failure. Water can also contaminate Hydraulic Fluid affecting the lubricity of the Fluid leading to Seal failure.

   Corrective Action: Rebuild or replace the Hydraulic Cylinder. Flush the Hydraulic system and refill with clean Hydraulic Fluid.

3. Some Fluids react negatively with the Seal materials or contaminants causing expansion or shrinkage, resulting in leaks around the Seals.

   Corrective Action: Use only the recommended fluid specified in the operation manual. If the Hydraulic Cylinder Seals were damaged by an incompatible fluid, it is likely that the internal motor Seals and even the Hydraulic Hoses may have been damaged as well. The Power unit should be disassembled and rebuilt. Inspect the Hoses carefully and replace, if damaged. Flush the Hydraulic system and refill with clean fluid.

If you have questions about your Ranger BendPak Lift Cylinder, go to **Bendpak.com/support**, email **support@bendpak.com**, or call **(805) 252-2363** ext. 196.