

# **Motor Shaft Seal Replacement Belt Drive Motors**

**REPAIR MANUAL**

**Issue Date: January 2022**

# Introduction

This instruction describes the correct procedure to replace a failed hydraulic motor seal and over hung load adapter seal.

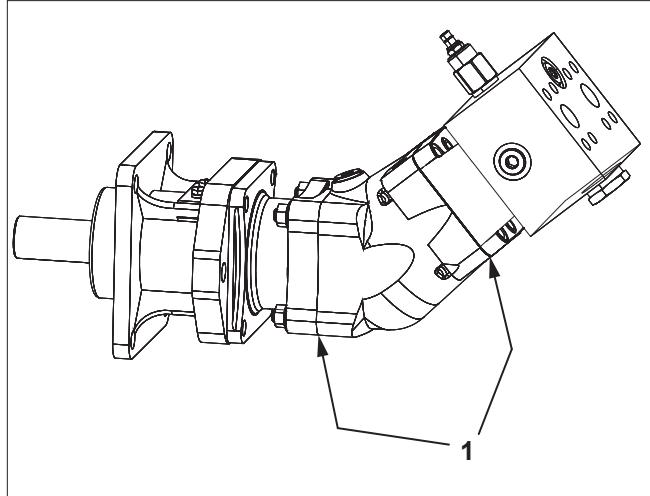
**Do not separate motor housing at location (1).**

## NOTICE

**Prevent equipment damage.**

**Do not separate motor housing at locations (1). Reassembly is nearly impossible without extensive training and special tools.**

**Separating motor housing at locations (1) will void the warranty.**



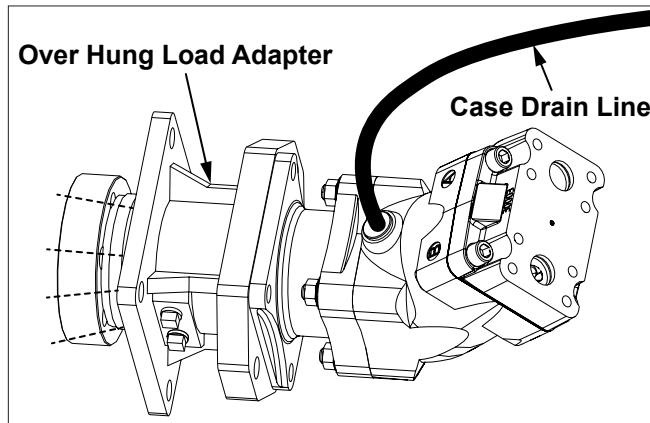
# Identify Repairs Needed

Before starting any repairs, you must identify how your machine is equipped to determine what repairs are needed.

### Machines Without Vented Adapter Or Zero Leak Relief Valve

If case drain line is not properly connected, is blocked or restricted, motor shaft seal and over hung load adapter seal will fail (this is an intentional safety feature to keep the motor from breaking open). If this happens, oil will typically leak out around over hung load adapter shaft into the belt chamber.

Go to Remove Motor And Over Hung Load Adapter on page 5 to begin repair procedure.

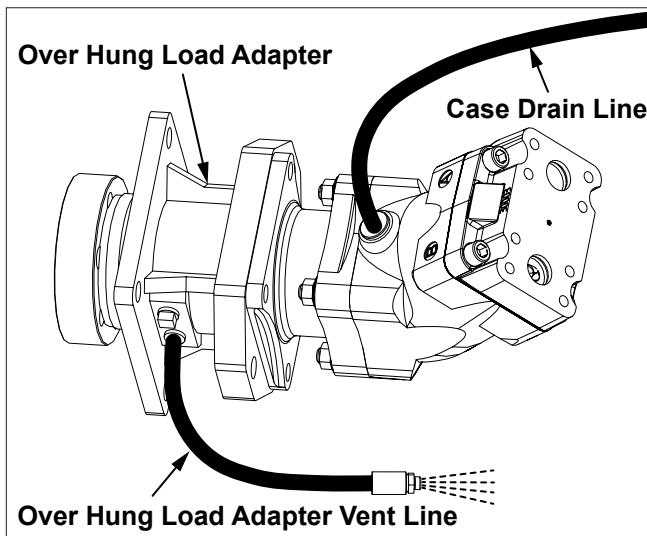


Contact your dealer for information about installing an over hung load adapter vent or zero leak relief valve to help prevent seal failure.

### Machines With Vented Over Hung Load Adapter

If case drain line is not properly connected, is blocked or restricted, motor shaft seal will fail. If this happens, oil will leak out through over hung load adapter vent line.

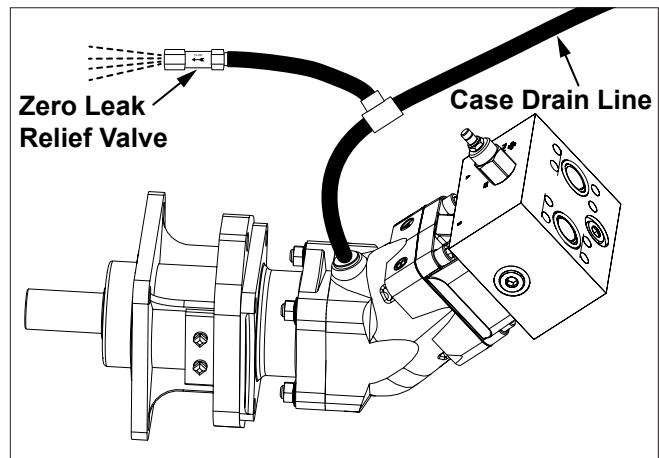
Go to Remove Motor on page 7 to begin repair procedure. Note that over hung load adapter does not need to be removed to replace the motor shaft seal.



### Machines With Zero Leak Relief Valve

If case drain line is not properly connected, is blocked or restricted, oil will leak out through the zero leak relief valve to prevent motor shaft seal failure.

The zero link relief valve will self reset after the over pressure in the case drain line is rectified. If the problem persists, replace case drain line if damage, obstructed or pinched.



# Prevent Seal Failure

To prevent hydraulic motor damage, the motor shaft seal is designed to fail if case pressure exceeds 100 psi (689 kPa).

If motor shaft seal has failed, case drain line is blocked or restricted. Verify case drain line is free flow to sump or reservoir. Correct any problems before replacing shaft seal.

## NOTICE

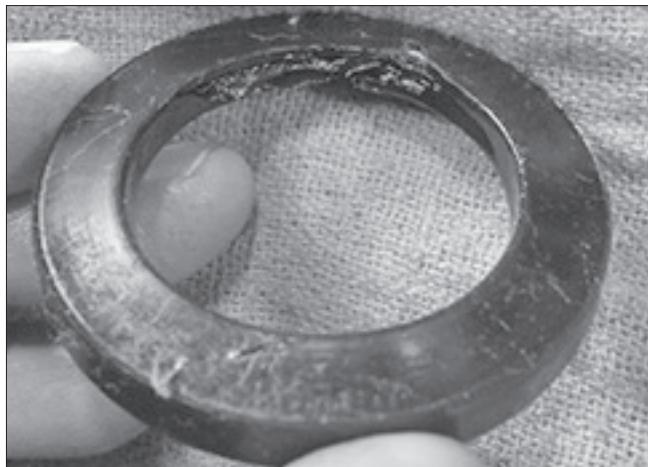
**Prevent equipment damage.**

**Over-pressurizing motor case may result in seal failure and is not covered by warranty.**

**Seal can fail immediately if hydraulic flow is applied to motor without a properly connected case drain line.**



*Over-Pressurized Damaged Washer*



*Over-Pressurized Failed Seal*

# Remove Motor And Over Hung Load Adapter

1. If equipment is attached to power unit, lower equipment to ground, set parking brake, stop engine and remove key.

## **⚠ WARNING**

**Moving parts can crush and cut.**

**Keep clear of moving components.**

**Follow lockout procedure before servicing.**

2. Relieve hydraulic pressure. See power unit manual for procedure.
3. Remove or open cover to access drive belt.
4. Remove hardware and lock plate (1).
5. Loosen turnbuckles (2) to relieve tension on belt.

## **NOTICE**

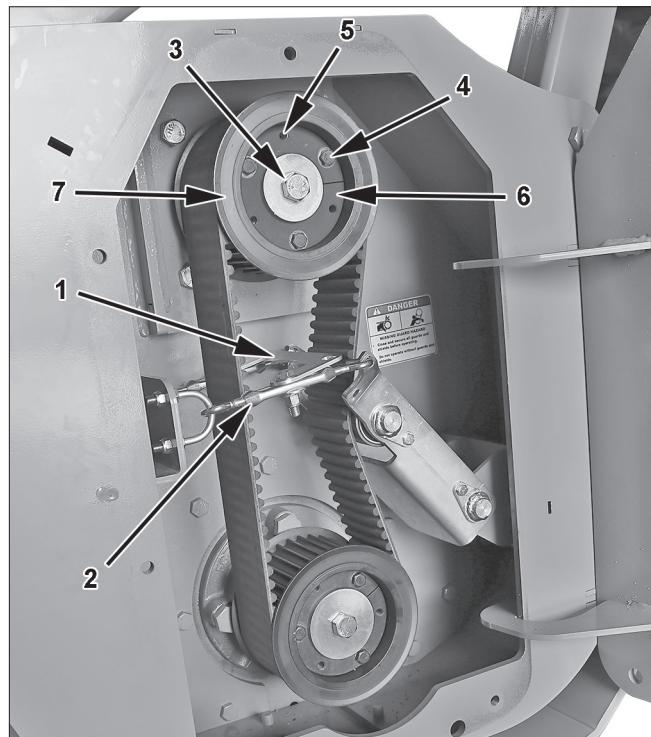
**Prevent equipment damage.**

**Carefully identify hydraulic hoses for proper re-assembly.**

**Seal will fail immediately if hydraulic hoses are improperly connected.**

6. Remove shaft pulley bolt (3) and washer.
7. Remove three hub bolts (4). Place hub bolts into threaded holes (5) in hub (6).
8. Evenly tighten bolts to push pulley (7) off of hub (6).
9. Remove hub, pulley and belt. If hub is stuck to shaft, a puller may be required to remove hub from shaft.
10. Remove covers or panels necessary to access motor.

11. Identify hydraulic hoses for reassembly. Disconnect hydraulic hoses from motor.



12. Mark over hung load adapter and mounting plate for proper orientation during reassembly.
13. Remove four 5/8 inch bolts connecting over hung load adapter to mounting plate.

## NOTICE

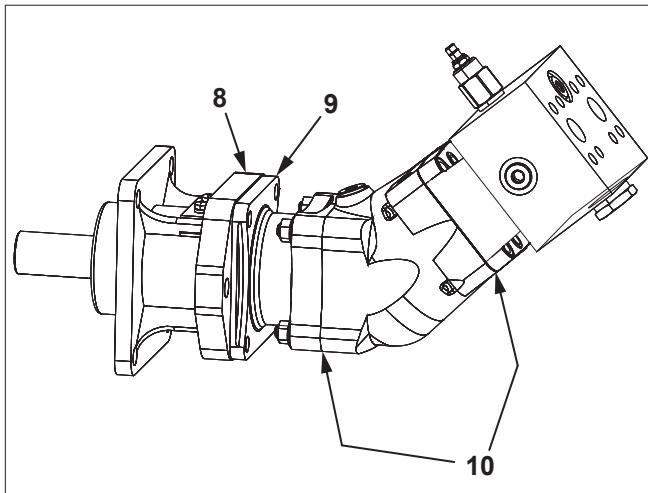
**Prevent equipment damage.**

**Do not separate motor housing at locations (10). Reassembly is nearly impossible without extensive training and special tools.**

**Separating motor housing at locations (10) will void the warranty.**

**⚠ Do not disassemble motor housing at locations (10)!**

14. Mark over hung load adapter (8) and motor (9) for proper orientation during reassembly.
15. Remove four bolts and separate over hung load adapter (8) from motor (9). Silicon sealant has been applied to mating surfaces, it may be necessary to strike housing with a rubber mallet to separate parts (8) and (9).



16. Go to Replace Seals on page 8.

# Remove Motor

1. If equipment is attached to power unit, lower equipment to ground, set parking brake, stop engine and remove key.

## **⚠ WARNING**

**Moving parts can crush and cut.**

**Keep clear of moving components.**

**Follow lockout procedure before servicing.**

2. Relieve hydraulic pressure. See power unit manual for procedure.

## **NOTICE**

**Prevent equipment damage.**

**Carefully identify hydraulic hoses for proper re-assembly.**

**Seal will fail immediately if hydraulic hoses are improperly connected.**

3. Remove covers or panels necessary to access motor.
4. Identify hydraulic hoses for reassembly. Disconnect hydraulic hoses from motor.
5. Mark over hung load adapter (1) and motor (2) for proper orientation during reassembly.

## **NOTICE**

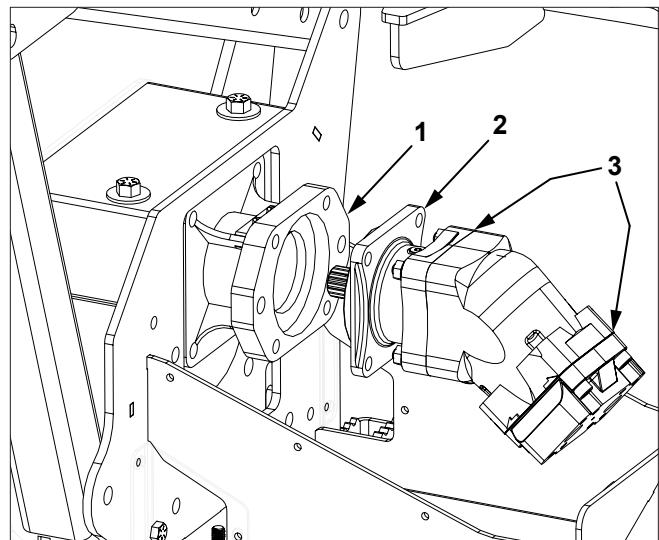
**Prevent equipment damage.**

**Do not separate motor housing at locations (3). Reassembly is nearly impossible without extensive training and special tools.**

**Separating motor housing at locations (3) will void the warranty.**

**⚠ Do not disassemble motor housing at locations (3)!**

6. Remove four bolts connecting over hung load adapter (1) to motor (2).
7. Remove motor (2).



8. Go to Replace Seals on page 8.

# Replace Seals

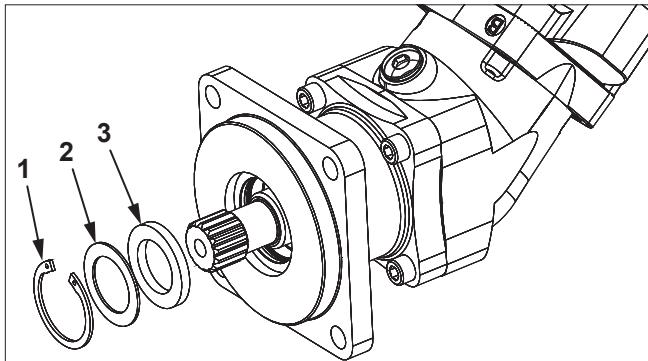
## NOTICE

**Prevent equipment damage.**

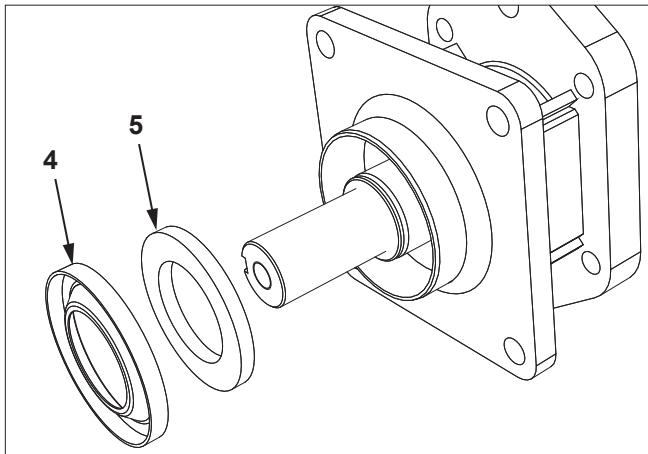
**Do not disassemble motor any further than instructed.**

1. Remove snap ring (1) and washer (2) from motor. Save for reuse.
2. Remove motor seal (3). If seal is difficult to remove, drill a small hole through the seal and insert a wood screw into hole. Pull screw and seal out with a vise grip or pliers.

**Note:** It is important not to plunge too deep with the drill or internal damage might happen inside the motor. Also make sure no metal shavings go inside the motor.



3. **If Over Hung Load Adapter Was Removed:** Remove seal protector (4) and seal (5) from over hung load adapter.



4. Clean and inspect all parts.
5. Inspect washer (2). Washer must be flat. If washer is concave, discard washer and install new washer.

*Normal Flat Washer*



*Damaged Concave Washer*

6. Discard parts (3), (4) and (5).

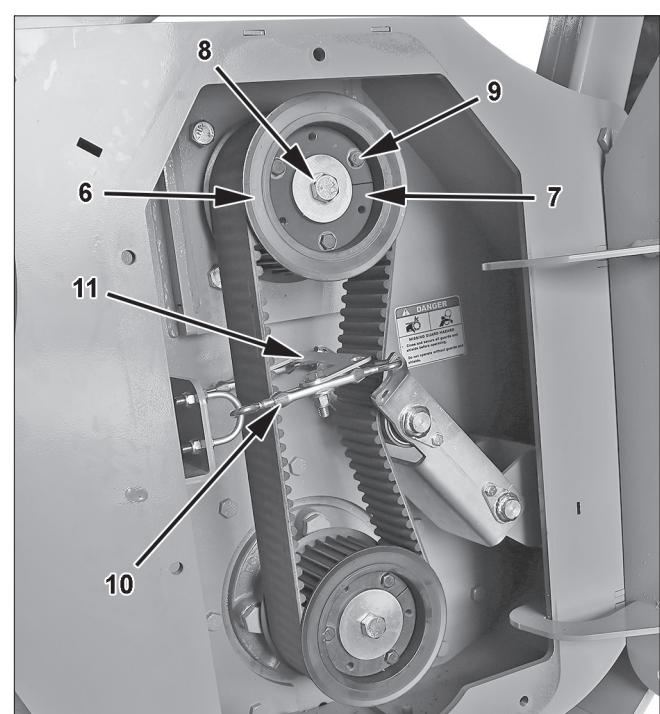
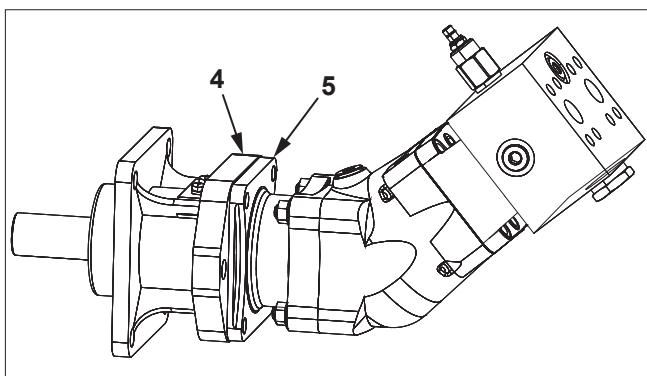
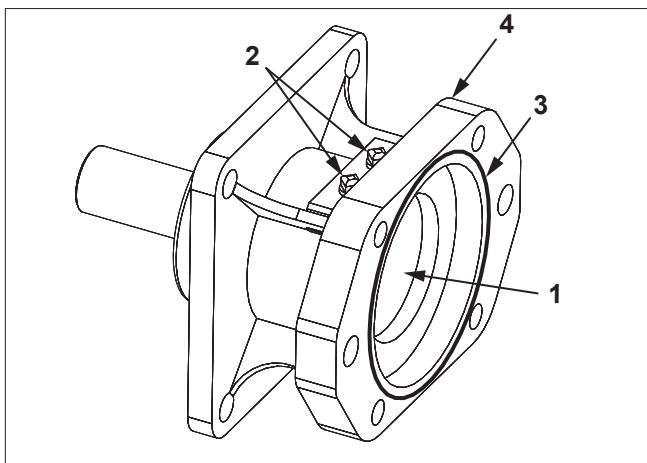
Ask your Product Guru for the replacement parts.

**Note:** Seal protector (4) is not part of the seal kit and is not necessary for this application. Seal protector (4) is designed to protect the seal when seal would be exposed to harsh conditions, such as under the deck on a rotary mower. In this application, the seal in a closed compartment and not exposed to harsh conditions.

7. **If Over Hung Load Adapter Was Removed:** Using the proper seal driver, install new seal (5) in over hung load adapter.  
See note above regarding seal protector (4).
8. Using the proper seal driver, install new seal (3). Install washer (2) and snap ring (1) in motor.

# Install Motor And Over Hung Load Adapter

1. Add 0.08 qt (0.08 L) of gear oil to the over hung load adapter through motor shaft opening at (1). Any type of gear oil will work. Gear oil can be added after assembly through one of the fill plugs (2).
2. Apply a bead of silicon sealant (3) as shown to mounting flange on over hung load adapter (4).
3. Assemble over hung load adapter (4) and motor (5). Fill plugs should face upward when motor and over hung load adapter assembly is installed on mulcher. Install four bolts. Tighten bolts evenly.
4. Position motor assembly on mulcher mounting plate and install four 5/8 inch bolts connecting over hung load adapter to mounting plate. Tighten bolts evenly.
5. Install pulley (6) and belt on motor shaft.
6. Install taper lock hub (7) on shaft. Position hub to be flush with end of shaft.
7. Install washer and shaft bolt (8). Tighten bolt.
8. Align pulley holes with non threaded holes in hub (7) and install bolts (9).

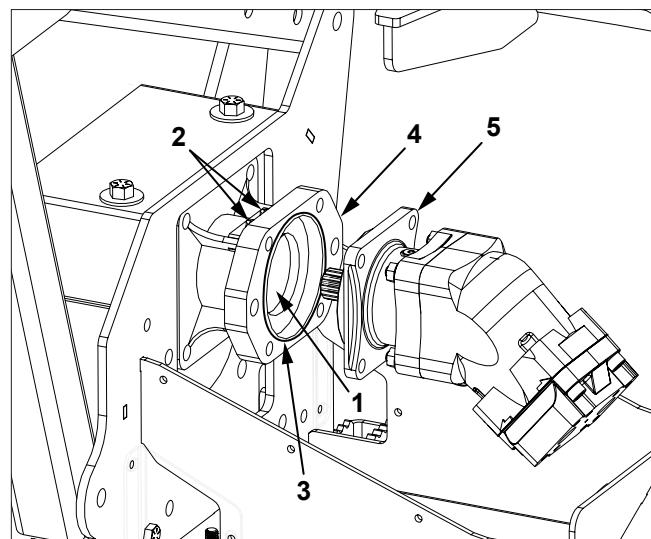


9. Place a straight edge on drive pulley and rotor pulley. Pulleys must be aligned or belt will wear quickly. Adjust pulley alignment as necessary.
10. Tighten bolts (9) to pull pulley onto hub. Verify that hub is still flush with end of shaft.
11. Tighten turn buckles (10) equally to tension belt. Belt deflection should be 0.5 in. (13 mm) at 4.25 lbs of force. If turnbuckles are not tightened equally, tensioner will force belt to run against the edge of the pulley, causing premature belt wear. The belt will run towards the side of the loose turnbuckle. If the belt is running against one side of the pulley, tighten that side turnbuckle.

## Install Motor

12. Install lock plate (11) and mounting hardware to prevent turnbuckles from loosening.
13. Go to Connect Hoses on page 11.

1. Drain oil from over hung load adapter.
2. Add 0.08 qt (0.08 L) of gear oil to the over hung load adapter through motor shaft opening (1). Any type of gear oil will work. Gear oil can be added after assembly through one of the fill plugs (2).
3. Apply a bead of silicon sealant (3) as shown to mounting flange on over hung load adapter (4).
4. Install motor (5) on over hung load adapter (4). Install four bolts. Tighten bolts evenly.



5. Go to Connect Hoses on page 11.

# Connect Hoses

## NOTICE

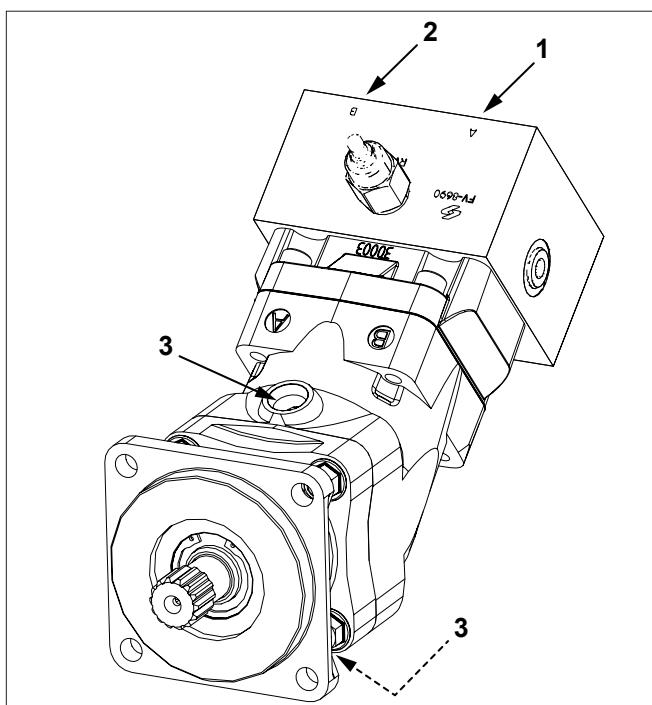
**Prevent equipment damage.**

**Motor shaft seal will fail immediately if hydraulic hoses are improperly connected.**

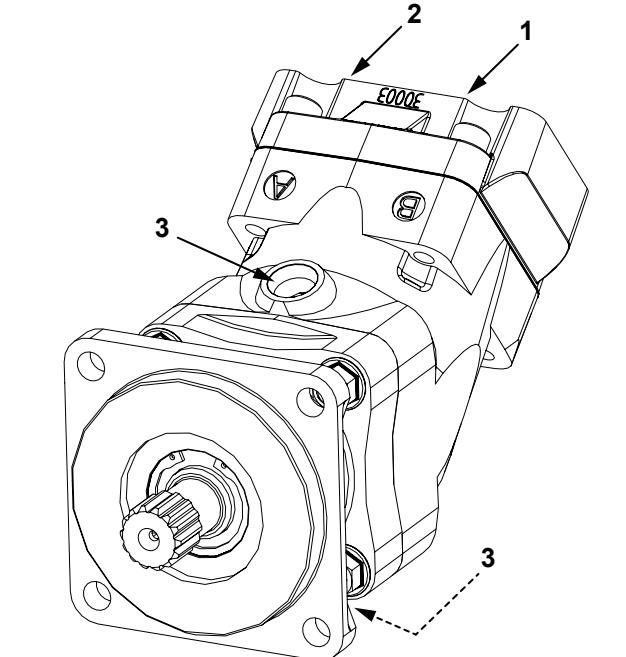
**Case drain hose must be connected to port (3) on motor housing.**

**Improper connection of hoses is not covered by warranty.**

- 1. Motor With Anti-Cavitation Block On Motor:**  
Connect pressure hose to port (1) and return hose to port (2). Connect case drain hose to one of the case drain ports (3). The unused port (3) must be plugged.



**Motor With Remote Anti-Cavitation Block:**  
Connect pressure hose to port (1) and return hose to port (2). Connect case drain hose to one of the case drain ports (3). The unused port (3) must be plugged.



## WARNING

**Pressurized fluids can penetrate the skin.**

**Use body and face protection while searching for leaks. A tiny, almost invisible leak can penetrate the skin, thereby requiring immediate medical attention. Use wood or cardboard to detect hydraulic leaks, never use your hands.**

2. Check hydraulic pressure on case drain line. Maximum pressure on case drain line is 100 psi (689 kPa). Exceeding maximum pressure may result in motor seal and over hung load adapter seal failure.
3. Install covers and panels that were removed or opened for access.
4. Check operation and verify there are no leaks.

