

Service Call:

Planetary Slip Brake Rotation

Tools Required:

- S or Open-End Wrench Set
- Dynamometer or Load Cell
- Hydraulic Pressure Gauge
- Side Pull Sheave (Z653)
- 3/8" Allen Head Socket
- Torque Wrench
- Suitable anchor for side pulling that can withstand a minimum side pull of 2500 lbs.

Model(s):

- C3000
- C4000

Tech Tip Safety Rules



Danger

Failure to obey the instructions and safety rules in the appropriate Operator's Manual and Service Manual for your machine will result in death or serious injury. Many of the hazards identified in the operator's manual are also safety hazards when maintenance and repair procedures are performed.

Do Not Perform Maintenance Unless:

- You are trained and qualified to perform maintenance on this machine.
- You read, understand and obey:
 - manufacturer's instructions and safety rules
 - employer's safety rules and worksite regulations
 - applicable governmental regulations
- You have the appropriate tools, lifting equipment and a suitable workshop.

The information contained in this tech tip is a supplement to the service manual. Consult the appropriate service manual of your machine for safety rules and hazards.

Introduction

The planetary rotation slip brake will slip when it reaches the maximum side load. The rotation brake will hold in position when not being used.

All unit hydraulic pressures must be set before continuing the planetary rotation slip brake test. Refer to the Quick Reference section in the unit specific maintenance manual for proper hydraulic pressure adjustments.

There are two parts to the rotation system on a Digger Derrick to protect the unit from overload and damage of the boom or rotation system:

1. The brake will hold the boom in position when the rotation system is not being used, such as during road travel. The slip brake protects the boom when winching, digging, or setting screw anchors when a side load is generated.
2. The rotation port relief valves limit the maximum side force that the rotation system will generate when rotating the boom.

Verify that a planetary slip brake rotation system is installed on the unit before proceeding.

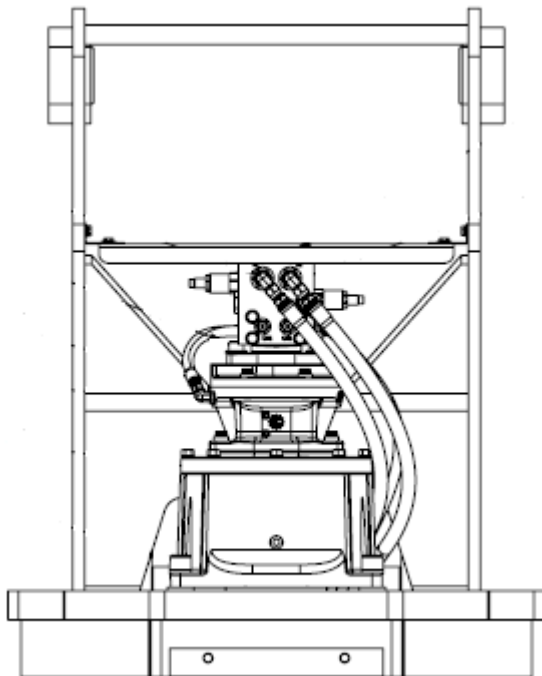
The picture below shows an example of this system.



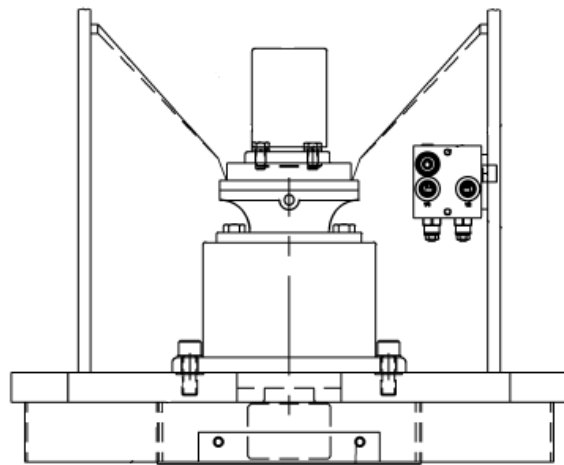
The drawing on the left shows the current Slip Brake Rotation Assembly. All the plumbing is connected to the manifold which is flanged mounted to the hydraulic motor.

The drawing on the right shows an older Slip Brake Rotation Assembly where the manifold was independent and mounted on the right side of the turntable near the Planetary Gear box assembly.

Both Slip Brake Rotation Assemblies operate the same.

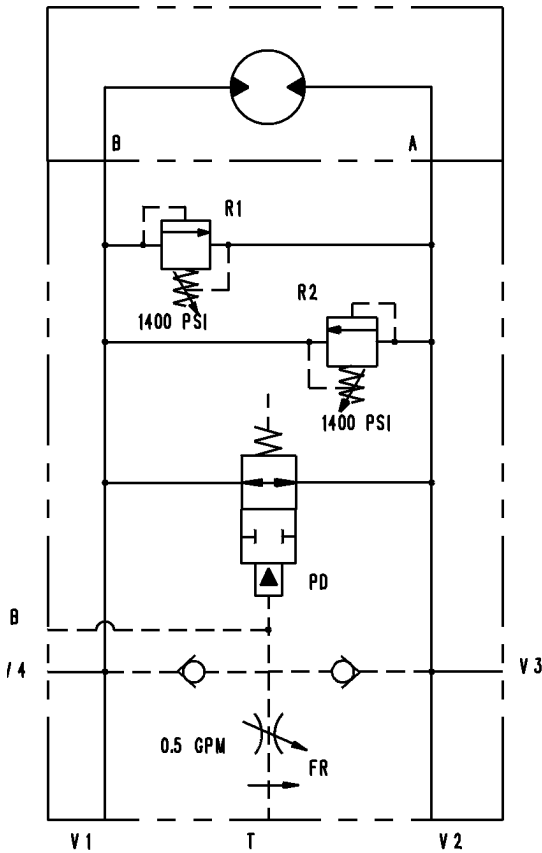


New Units

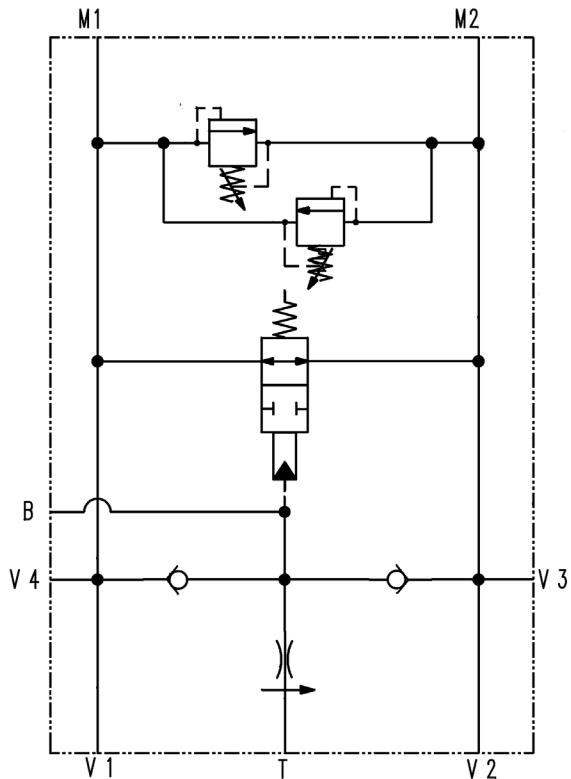


Older Units

The hydraulic schematics for both types of assemblies are also shown below.



New Units



Older Units

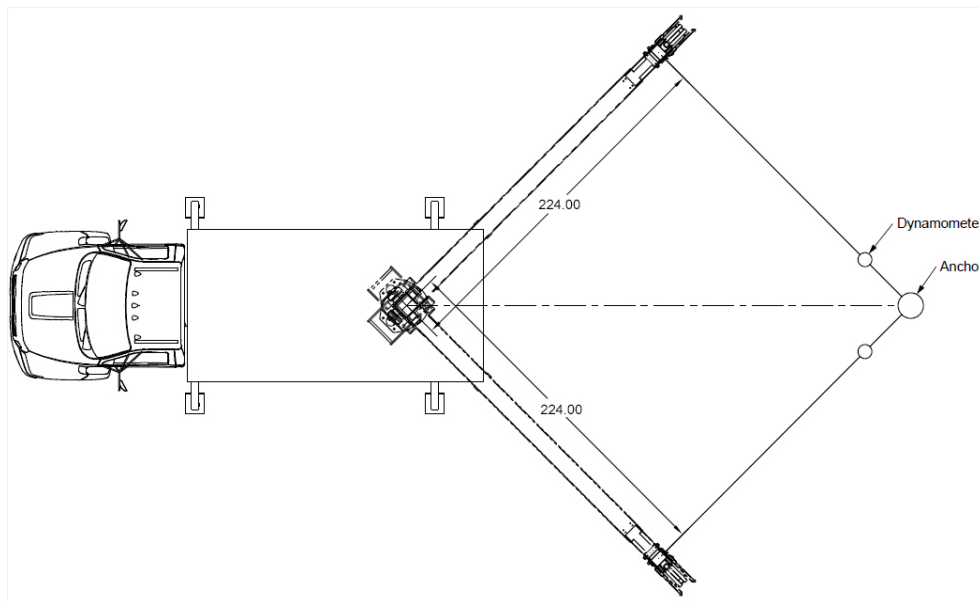
Step 1

Bring the unit up to operating temperature. Then operate the rotation for several revolutions in each direction to purge all hydraulic lines.

Locate a suitable anchor capable of holding 2300 lbs. in an area with no overhead obstructions. The area on each side of the anchor must be clear to be able to position the boom on both sides and apply a side load.

Step 2

Position and set up the truck near the anchor so the load line can be positioned to pull with the side pull attachment at 224 inches from the centerline of rotation.



Test Set up

The boom lift cylinders must be lowered all the way down so the HOP system is not operational.

String the load line through the testing sheave (Z-653) to the load cell and the anchor.



The anchor must be capable of holding up to 2,300 lbs. of force



The side pull sheave Z653 is only used for testing. Side pulling is not permitted during operation, only for testing purposes.

Step 3

Using the rotation control, rotate the unit away from the anchor keeping the load line tight. Check the side pull results at an idle. Once it has been verified that the unit will stop, perform this test with the engine at full RPM.

If the pull test exceeds the maximum pulling capacity STOP the test immediately! Lower the adjustment on the relief valve for that side and retest.

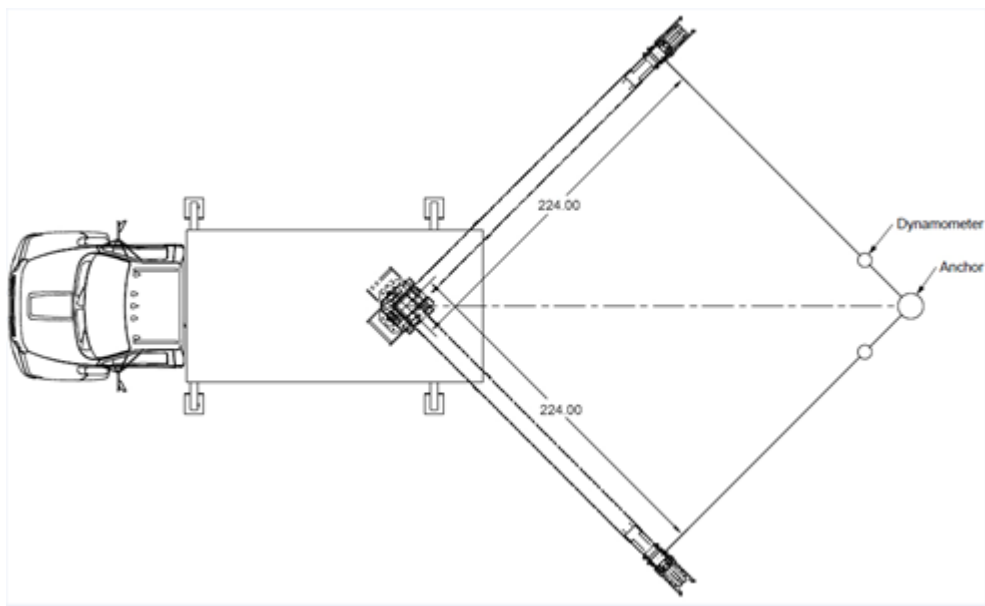
The rotation relief valves are on the brake manifold. They should bypass between 1,400 and 1,600 lbs. of force on the side pull.



Do NOT exceed 2,300 lbs. of force on the load cell

Step 4

To perform a planetary rotation slip test, the unit will be set-up the same way as the relief valves adjustment, however the winch controls will be used instead of the rotation controls. Set the boom up in a configuration that will cause the slip brake to slip when the boom is at 90 degrees. The boom will need to be positioned so that it can go past a 90 degree angle.



Document the load cell values where the rotation brake slipped. The value should be between 1,900 and 2,200 lbs.

Step 5

To adjust the slip brake value, the rotation motor must be removed. Make sure the tension is removed from the load line. If the tension is not released, it could rotate the motor.



Using a tool similar to the one shown below, turn the brake adjustment in (CW) to increase the tension and out (CCW) to decrease the tension.



Note: This homemade tool is constructed of a 1/2" cap, a flat bar, and 2 pins.

Step 6

Reinstall hydraulic motor and torque bolts to 55 ft.-lbs. When done adjusting remove bolts and torque to 55 ft.-lbs. with red Loctite.



Step 7

Remove all tools used, dynamometer and side pull sheave from load line and operate to verify smooth and correct operation.

Note: Kit #Z1500 is available to cover the rotation system preventing the winch rope from catching on valves and damaging them.

