

Disc Brake Service

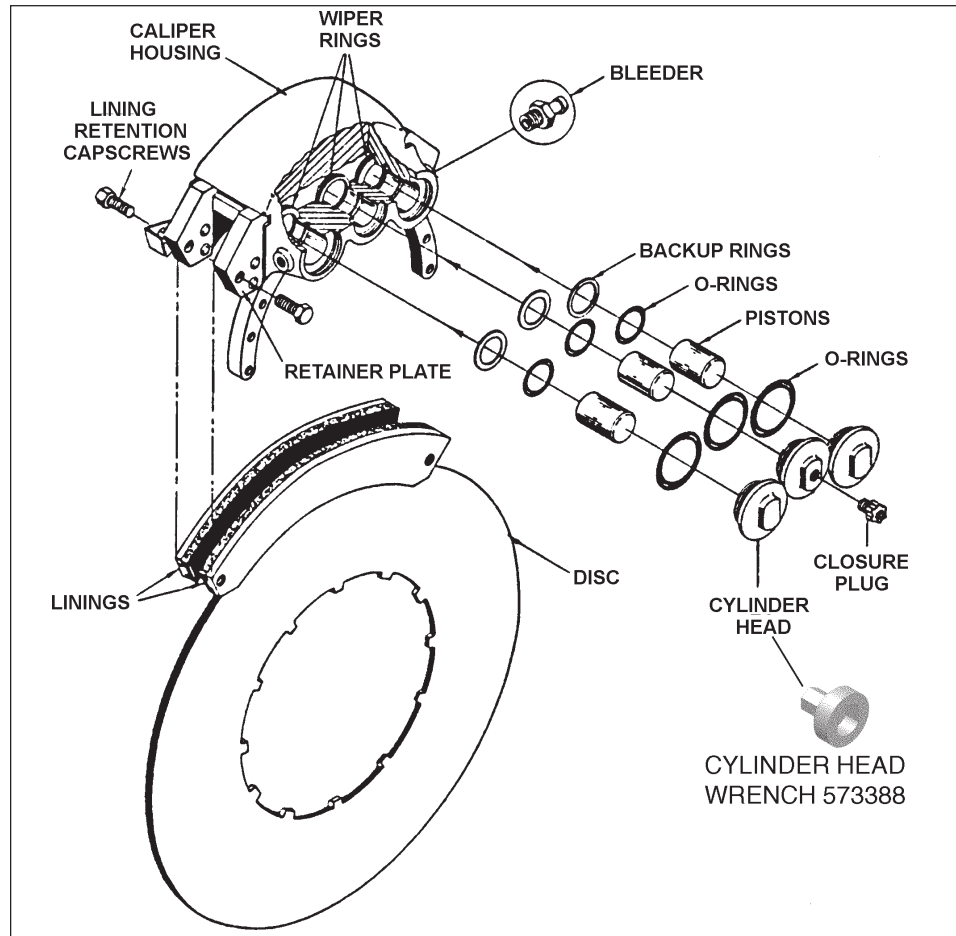


Figure 1 - Brake Caliper

General

Wagner heavylift machines use a hydraulically applied service disc brake. It uses a fixed caliper with a floating disc, with pistons on one side of the disc. The maximum rated pressure is 3,000psi (207 bar). A mineral oil based fluid, ATF, is used as brake fluid. See Form 80-257 for a list of recommended and factory fill fluids.



WARNING

DO NOT USE AUTOMOTIVE BRAKE FLUID AS IT WILL CAUSE SEAL DETERIORATION, LOSS OF BRAKING EFFICEINCY, AND/OR BRAKE FAILURE.

Maintenance

The entire brake system should be inspected at regularly scheduled intervals. Every 50 hours, or weekly, is recommended.

See Figure 1 and check for the following:

1. Inspect the linings for wear. Linings must be replaced when worn to a minimum of 3/16" (5mm) from the back plate.
2. Inspect the entire brake system for signs of fluid leakage. Areas to check are around pistons, fluid connectors and bleeders. If the pistons are leaking, the caliper must be removed and repaired or replaced.
3. Inspect brake lines for signs of damage. Make sure that no lines are bent, kinked or rubbing. Brake guards must be in place.

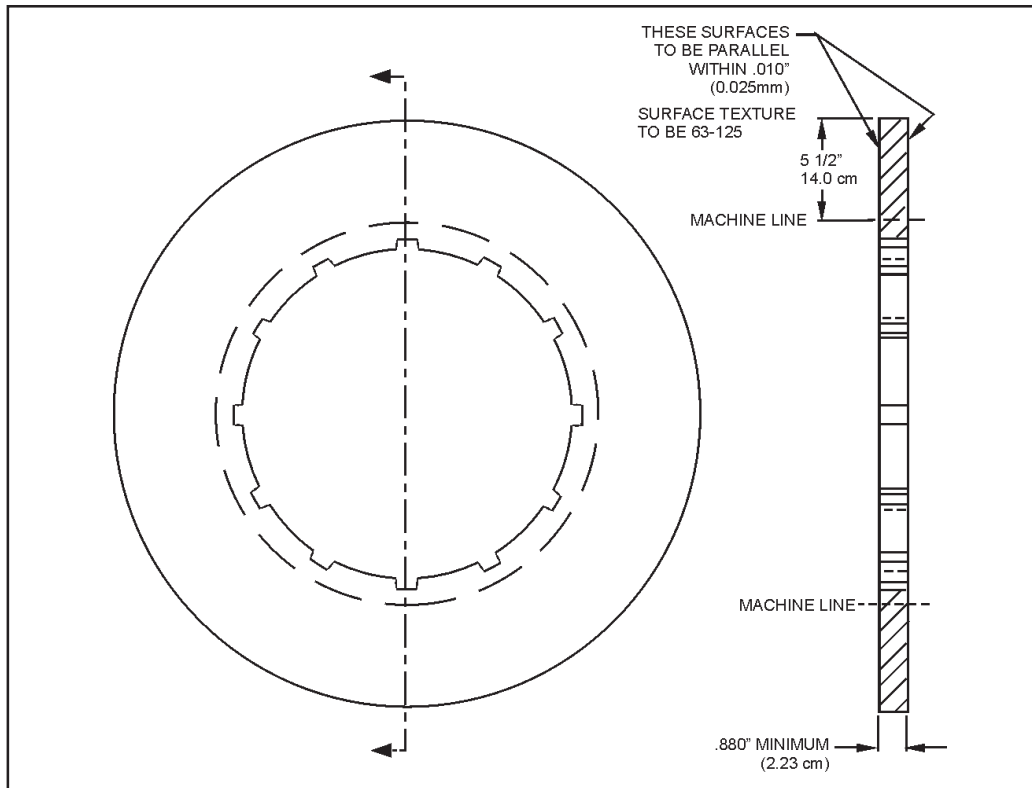


Figure 2 - Brake Disc

4. Inspect the disc for wear limits. See Figure 2, on page 2. Also, inspect the disc for deep scratches, cracks, heat checking and warping. The disc may be resurfaced as long as it remains within the published wear limits.



WARNING

DO NOT USE BRAKE DISCS THAT DO NOT MEET MINIMUM WEAR LIMITS. OVERHEATING, CRACKING OR WARPING MAY OCCUR. BRAKING EFFICIENCY MAY BE GREATLY DEMINISHED. SAFETY WILL BE COMPRIMISED.

Caliper Removal, Disassembly and Inspection

Before the calipers can be removed, the brake guards must be removed. For ease of handling, removal of the brake caliper is best accomplished with the linings removed. Bend the locking tabs up and remove the bolts securing the lining retention plates. Remove the retention plates and the linings.

Disconnect the brake lines and plug them to keep dirt

from entering the system. Remove the caliper retaining bolts and remove the caliper.

Removal of the brake disc requires partial disassembly of the axle. See the Axle Service Manual for instructions.

Prior to assembly, the caliper should be drained of fluid, openings plugged, and the outside of the caliper cleaned. Cylinder heads can be removed using P/N 573388 cylinder head wrench.

Disassemble and inspect the caliper in the following order:

- A. Lining Retention Plates
- B. Bolts and Bleeders
- C. Cylinder Heads and O-Rings
- D. Pistons, Piston O-Rings, Backup Rings and Wiper Rings

Note: If the Piston Rings are removed through the cylinder head openings, take care not to damage the cylinder head threads.

Always replace O-Rings, Backup Rings and Wiper Rings when disassembling the caliper.

Clean the inside of the caliper with mineral oil.

Inspect the cylinder walls and piston surfaces for nicks, scratches or rust. If necessary, polish with a fine emery cloth. Inspect seal grooves for damage.

Measure the diameter of the piston bores with an inside micrometer. If the inside diameter exceeds 2.754 inches, the caliper must be replaced.

Measure the diameter of the pistons. If a piston diameter is less than 2.745 inches, it must be replaced.

Caliper Assembly and Installation

Lubricate all cylinder walls, threads, seals and pistons with silicone grease (Dow Corning DC4). If silicone grease is not available, lubricate with approved brake fluid (see Form 80-257).

Install new piston O-Rings, backup rings and wiper rings. The backup ring is located on the lining side of the groove.

Install the pistons, using care not to pinch the seals. The pistons should be installed from the lining side of the housing and pushed in until in line with the wiper ring.

Install new O-Rings on the cylinder heads using care not to damage them on the threads. Screw the cylinder heads onto the housing and tighten to 75 ft-lbs (55 Nm).

Install Bleeders. Do not overtighten.

The linings may be installed at this time, or they may be installed after the caliper is installed on the machine. Install the linings and secure them with the lining retention plates, capscrews and locking tabs. Tighten the capscrews to 35 ft-lbs (45 Nm) and bend the locking tabs up to secure the capscrews.

Install the caliper on the machine. Apply loctite 272 and tighten the mounting capscrews and washers to 500 ft-lbs (675 Nm). Be sure the threads are clean before installation. Reinstall the brake guards.

Install the brake lines and bleed the system as follows:

1. Fill the brake system with clean approved mineral oil.



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2. Open each bleeder and apply low hydraulic pressure until all air is evacuated from the system.
3. Retighten the bleeders.
4. Fill reservoir as necessary with approved fluid. See Form 80-257.

To test the brakes, apply full pressure several times. After releasing pressure check that the linings are free and that there is no sign of leakage.

Burnishing the Linings



WARNING

DO NOT OPERATE THE MACHINE WITH NEW LININGS BEFORE BURNISHING. OPERATING THE MACHINE WITH UNBURNISHED LININGS GREATLY INCREASES STOPPING DISTANCE.

To burnish new brake linings or brake discs complete the following steps after installation:

1. Make a stop from 10 mph and record the deceleration rate and/or the stopping distance.
2. Apply the brake pressure and drag the brakes until the disc temperature is 400-450°F (200-230°C). Do not overheat.
3. Allow the disc to cool to 200°F (90°C).
4. Repeat the 10mph stop test recording the deceleration rate and/or stopping distance test until the results are constant.

Temperature can be determined by using heat sensitive temperature sticks. To use the stick stroke the heated disc surface with the stick. A liquid smear will appear at the specified temperature rating.