

BOOSTED MASTER CYLINDER (Master Cylinder Section) Service Instructions

MASTER CYLINDER SECTION - Mineral Base Hydraulic Oil

POWER ASSIST SECTION - Mineral Base Hydraulic Oil

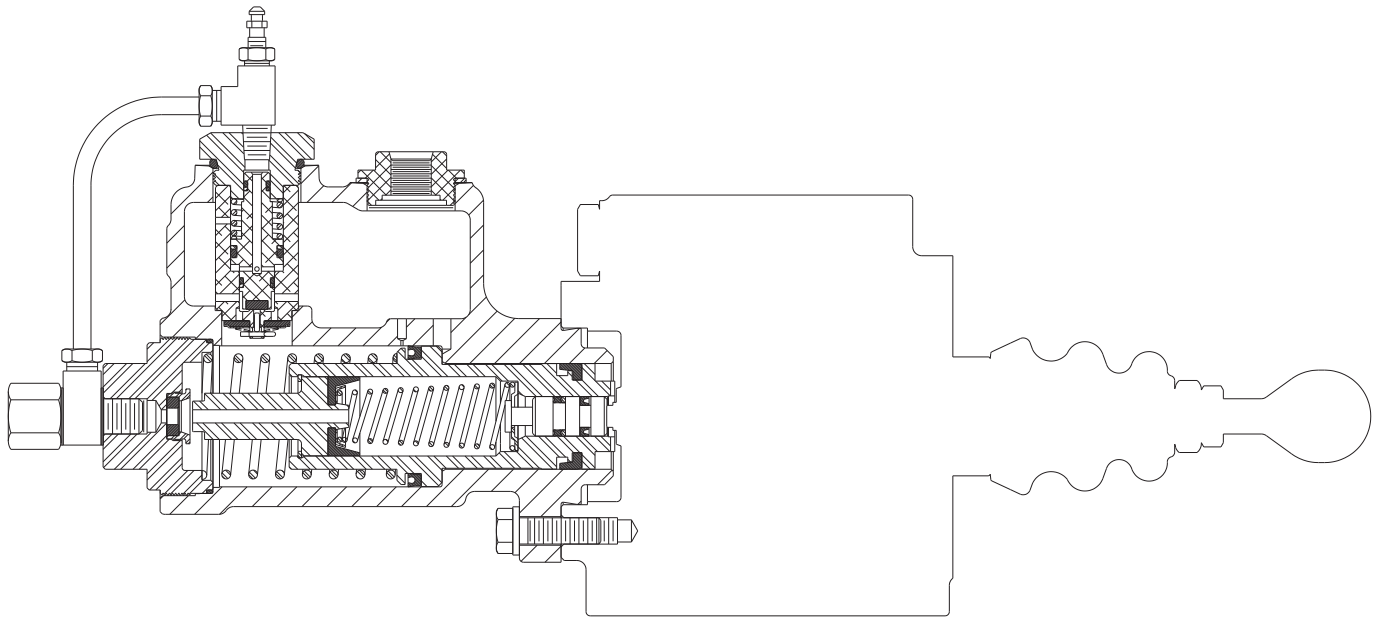


FIGURE 1

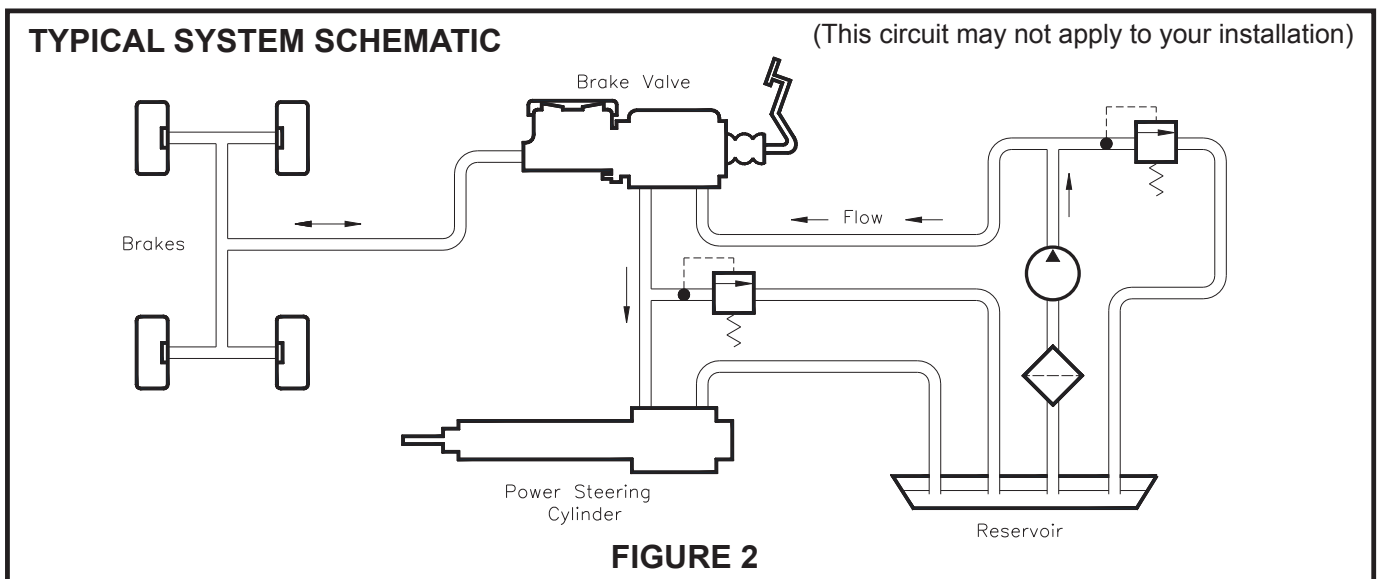


FIGURE 2

REMOVING MASTER CYLINDER FROM THE MACHINE AND SEPARATING SECTIONS

(Refer to Figures 1 and 3)

1. Remove the master cylinder assembly from the machine by disconnecting the necessary fluid lines, disconnecting the push rod, and removing the mounting bolts. Drain the fluid from the assembly.
2. Separate the master cylinder section from the power assist section by removing three cap screws and three lock washers.

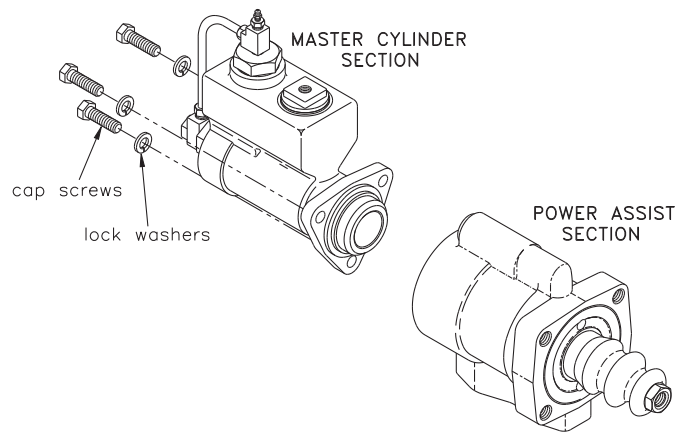


FIGURE 3

CONNECTING SECTIONS AND MOUNTING MASTER CYLINDER ON THE MACHINE

(Refer to Figures 1 and 3)

1. Attach the master cylinder section to the power assist section with three cap screws and three lock washers. Torque cap screws 29.8-36.6 N·m (22-27 lb·ft).
2. Install the master cylinder assembly on the machine. Connect the push rod. Connect the fluid lines. Fill the reservoir and bleed the system of air. Tighten fittings if leaks occur. Make several applications to be sure the master cylinder is working properly. **NOTE: All fittings must be inspected for leaks and tightened if leaks occur.**

DISASSEMBLY

(Refer to Figures 1 and 4)

1. Drain fluid from the unit before disassembling.
2. Remove upper tube nut on tubing assembly (24) from fitting (23).
3. Remove line bolt (1), gaskets (2 & 4), and fitting block (3). Tubing assembly (24) need not be removed from fitting block (3).
4. Remove end plug (5) using a large box end wrench.

⚠ CAUTION

End plug (5) is under tension of spring (9).

5. Remove retainer (7) and seal (6) from end plug (5).
6. Remove o-ring (8) and spring (9) from housing (20).
7. Remove piston assembly (30) from housing (20) by pushing on piston assembly with a wooden dowel from the small diameter side of housing (20).
8. Remove cups (17 & 19) from piston (18).
9. Depress piston (11) and remove retaining ring (10). Hold firmly, spring (14) will force piston (11) out of piston (18) bore. Remove cup (12) from piston (18).
10. Remove retainer (13) and spring (14).
11. Remove piston assembly (16) from piston (18) by pushing on piston assembly (16) with a wooden dowel from the small diameter end of piston (18).
12. Remove relief valve assembly (29) from housing (20). Using a box end wrench remove end cap (25). Remove o-ring (26) from end cap (25). **NOTE: End cap (25) is under tension of spring (27).**
13. Remove spring (27).
14. Remove filler cap (22) and gasket (21) from housing (20).

ASSEMBLY

(Refer to Figures 1 and 4)

Use only mineral base hydraulic oil in master cylinder section.

LUBRICATE ALL RUBBER COMPONENTS FROM REPAIR KIT WITH CLEAN TYPE FLUID USED IN THE SYSTEM.

1. Clean all parts thoroughly before assembling.
2. Install new slotted retainer (15) on new piston assembly (16) and gently insert into piston (18). Note the direction of retainer (15).
3. Install retainer (13) on the end of spring (14). Install spring (14), large end first into piston (18).
4. Install new cup (12) on piston (11).
5. Insert piston (11) into piston (18) with cup (12) against retainer (13). Depress piston (11) and install new retaining ring (10).
6. Install new cup (17) and new cup (19) on piston (18). Note direction of cups (17 & 19).
7. Install piston assembly (30) into housing (20). Note direction of piston assembly (30).
8. Install spring (9) over piston assembly (30).
9. Install new o-ring (8) in housing (20).
10. Install new seal (6) and new retainer (7) in end plug (5).
11. Install end plug (5) into housing (20). Using a large box end wrench torque end plug (5) 67.8-108.5 N·m (50-80 lb·ft).
12. Insert new piston and body assembly (28) into housing (20).
13. Install new spring (27).
14. Install new o-ring (26) on end cap (25).
15. Install end cap (25) into housing (20) and torque 101.7-108.5 N·m (75-80 lb·ft).
16. Assemble new gaskets (2 & 4), fitting block (3), and line bolt (1) into end plug (5). Torque line bolt (1) 46.1-54.2 N·m (34-40 lb·ft). **NOTE: Hold fitting block (3) in a fixed position as shown in Figure 4 while tightening line bolt (1).**

- Items included in Repair Kit

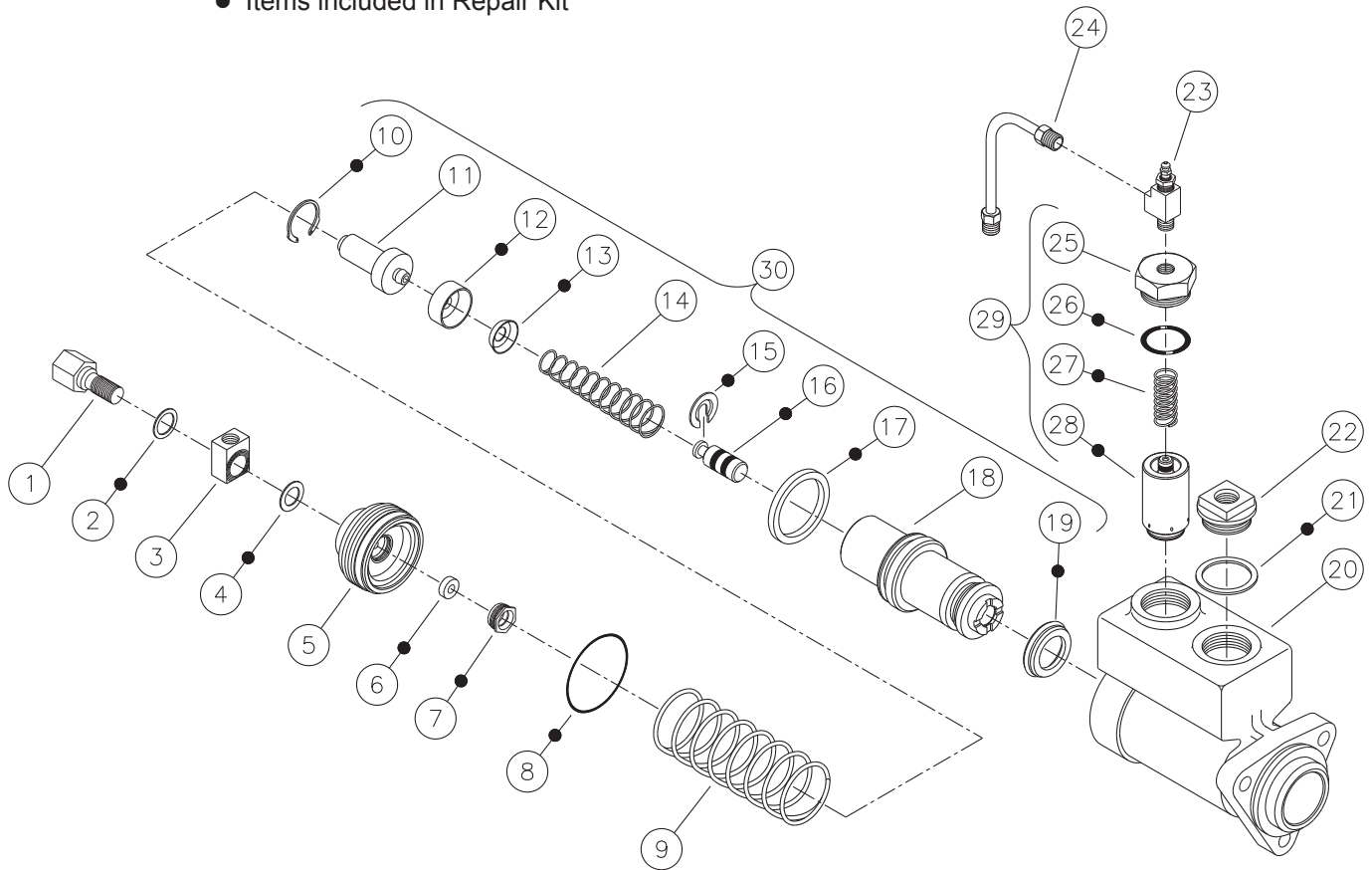


FIGURE 4

17. Install upper tube nut on tubing assembly (24) into fitting (23). Torque upper and lower tube nuts 12.2-20.3 N·m (9-15 lb·ft).
18. Install new gasket (21) and filler plug (22) on housing (20).
19. To continue assembly refer to CONNECTING SECTIONS AND MOUNTING MASTER CYLINDER ON THE MACHINE on page 2.

BLEEDING PROCEDURES

NOTE

Use only proper fluid specified by machine manufacture. Never reuse fluid that has been drained from the system. Be sure that you maintain a high level of fluid in the reservoir during and after the entire bleeding process.

PRESSURE BLEEDING INSTRUCTIONS

1. Master cylinder must be mounted to the power assist section.
2. Fill the reservoir with proper fluid.
3. Be certain all fittings are tight to avoid leaking.
4. DO NOT DEPRESS THE PEDAL.
5. Connect pressure bleeder to the reservoir adapter. Recommended bleeding pressure is 2.07 bar (30 PSI) maximum. **NOTE: Make sure to use correct pressure bleeder for type fluid used in the system.**
6. Open the bleeder screw closest to the master cylinder outlet. Most of the air contained in the system will escape by this route. Close bleeder screw.
7. Continue to the next bleeder screw and so on. At each point when air bubbles disappear close bleeder screw.
8. Remove the pressure bleeder.
9. Open the bleeder screw at the master cylinder. Actuate the cylinder to remove any residual air. Tighten the bleeder screw before allowing the pedal to return.
10. Depress the pedal several times. If pedal is spongy, check for system leaks and repeat bleeding process.

BENCH BLEEDING INSTRUCTIONS

(Refer to Figure 5)

1. This process can be done in a bench vise or on the machine with master cylinder mounted to power assist section.
2. Remove master cylinder filler cap.
3. Connect a length of tubing to an outlet port and immerse the other end below the fluid level in the master cylinder reservoir. Keep reservoir fluid within 12.7 mm (0.50 in) of inside reservoir top.
4. Actuate master cylinder piston with a smooth object large enough to hold the small internal piston from coming out. Slowly stroke and release master cylinder piston 34.9-38.1 mm (1.38-1.50 in). Repeat until air bubbles in reservoir have ceased.
5. Remove the tubing. This should be done quickly so the loss of fluid will be minimized.
6. If cylinder was bench bled in a vise, it must now be attached securely to the power assist section and mounted on the machine. Complete all plumbing connections before continuing to step 7.
7. Bleed remaining air from system by depressing brake pedal and opening the bleeder fitting closest to master cylinder. Close bleeder fitting before the brake pedal is released. Continue to next bleeder port. In all cases the bleeder fittings must be closed before the brake pedal is released or air will be pulled in through the bleeder and ingest unwanted air in the system.
8. Fill the reservoir to within 12.7 mm (0.50 in) of top. Install the filler cap and torque 33.9-47.5 N·m (25-35 lb-ft).
9. Be sure all fittings are tight to avoid any leaking.
10. Depress the pedal several times. If the brake pedal feels spongy, check for system leaks and repeat the bleeding process.

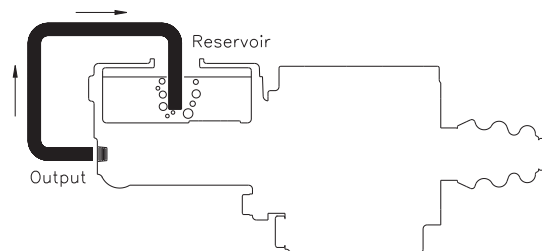


FIGURE 5