BOOSTED MASTER CYLINDER
(Master Cylinder Section)

Service Instructions

MASTER CYLINDER SECTION - **Automotive Brake Fluid**

POWER ASSIST SECTION - **Mineral Base Hydraulic Oil**

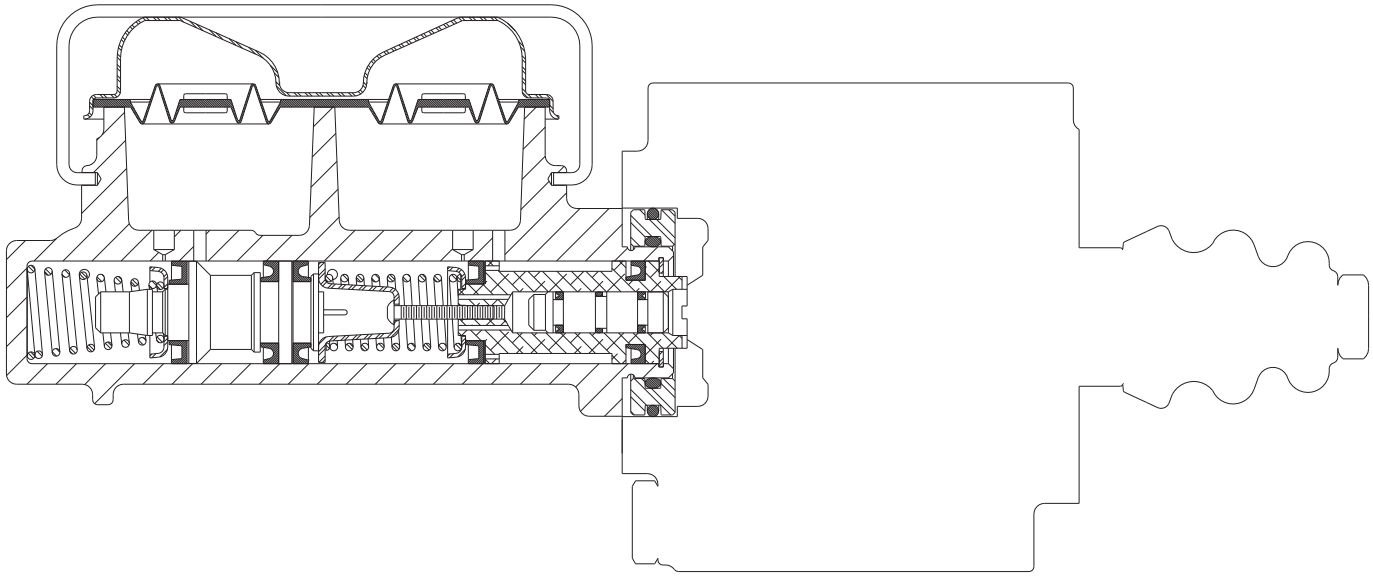

FIGURE 1

This instruction sheet services the Master Cylinder Section for this model number:
02-460-256

NOTE: If your product number is not listed, contact ZF Off-Highway Solutions Minnesota Inc. for information.

TYPICAL SYSTEM SCHEMATIC

(This circuit may not apply to your installation)

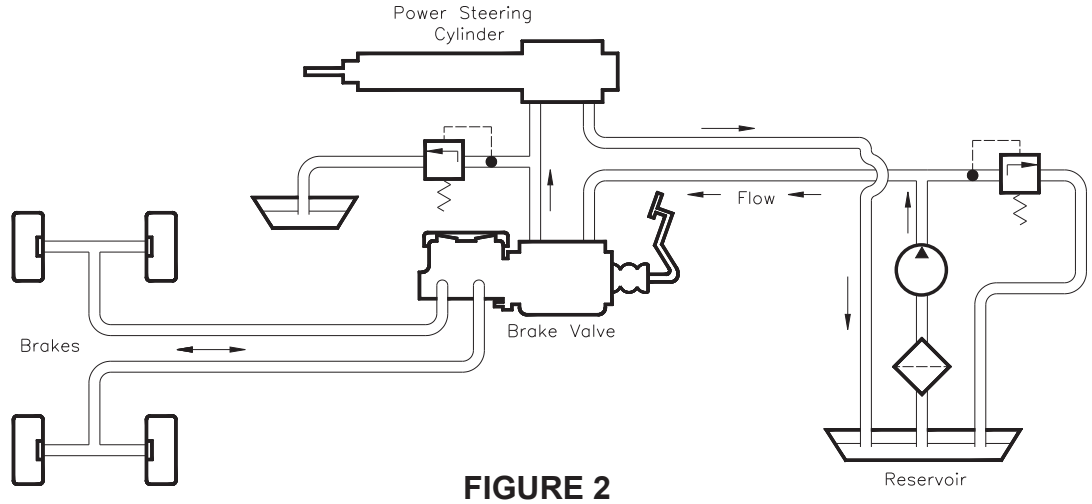

FIGURE 2

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 fluid from the assembly.
2. Separate the master cylinder section from the power assist section by removing three cap screws and three lock washers.

CONNECTING SECTIONS AND MOUNTING MASTER CYLINDER ON THE MACHINE

(Refer to Figures 1 and 3)

1. Install the spacer between the two sections.
2. Attach the master cylinder section to the power assist section with three cap screws and three lock washers. Torque cap screws 29.83-36.61 N·m (22-27 lb·ft).
3. Install the master cylinder assembly on the machine. Connect the push rod. Connect the fluid lines. 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.**

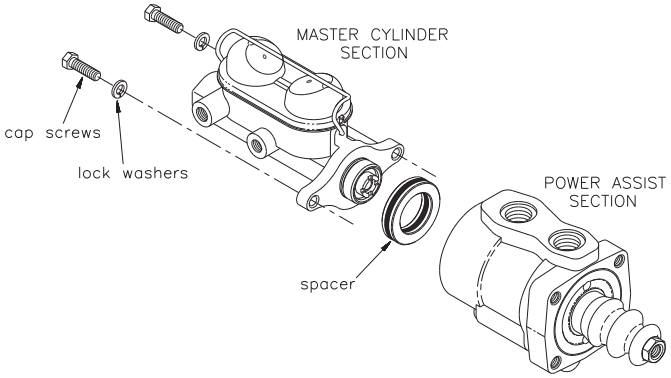

FIGURE 3

⚠ CAUTION

The primary port is designed to be connected to disc brakes. The secondary port is designed to be connected to drum brakes. If the Secondary Port is to be connected to disc brakes, residual check valve items (12, 13, & 14) must be removed.

DISASSEMBLY

(Refer to Figures 1 and 4)

1. Remove spacer assembly (4) from housing (8).
2. Remove cylinder from vehicle. Drain fluid from cylinder.
3. Remove retaining ring (5) from housing (8).
4. Remove piston assemblies (6 & 7) from housing (8). **NOTE: Be careful not to scratch or mar housing bore.**
5. Remove hook (11), cover (10), and diaphragm (9) from housing (8).
6. Use a no. 6 self tapping screw and washer to remove insert (12). See Figure 4a. Remove valve (13) and spring (14).
7. Remove screw (16) from housing (8). Remove o-ring (15) from screw (16). **NOTE: Not all models use screw (16) or o-ring (15).**

ASSEMBLY

(Refer to Figures 1 and 4)

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

1. Clean all parts thoroughly before assembling.
2. Install new piston assemblies (6 & 7) and new retaining ring (5) in housing (8). Note the order and direction of piston assemblies (6 & 7). **NOTE: Be careful not to scratch or mar piston assemblies or housing bore.**
3. Install new spring (14), new valve (13), and new insert (12) in housing (8). Use a wood or brass dowel to tap new insert (8) into housing until it bottoms out in port.
4. Install diaphragm (9), cover (10), and hook (11) on housing (8).
5. Install new o-ring (15) on screw (16). Install screw (16) in housing and tighten. **NOTE: Not all models use screw (16) or o-ring (15).**
6. Install new o-rings (1 & 2) on spacer (3). Install spacer assembly (4) on housing.

● Items included in Repair Kit 02-400-080
✻ Not used in all models

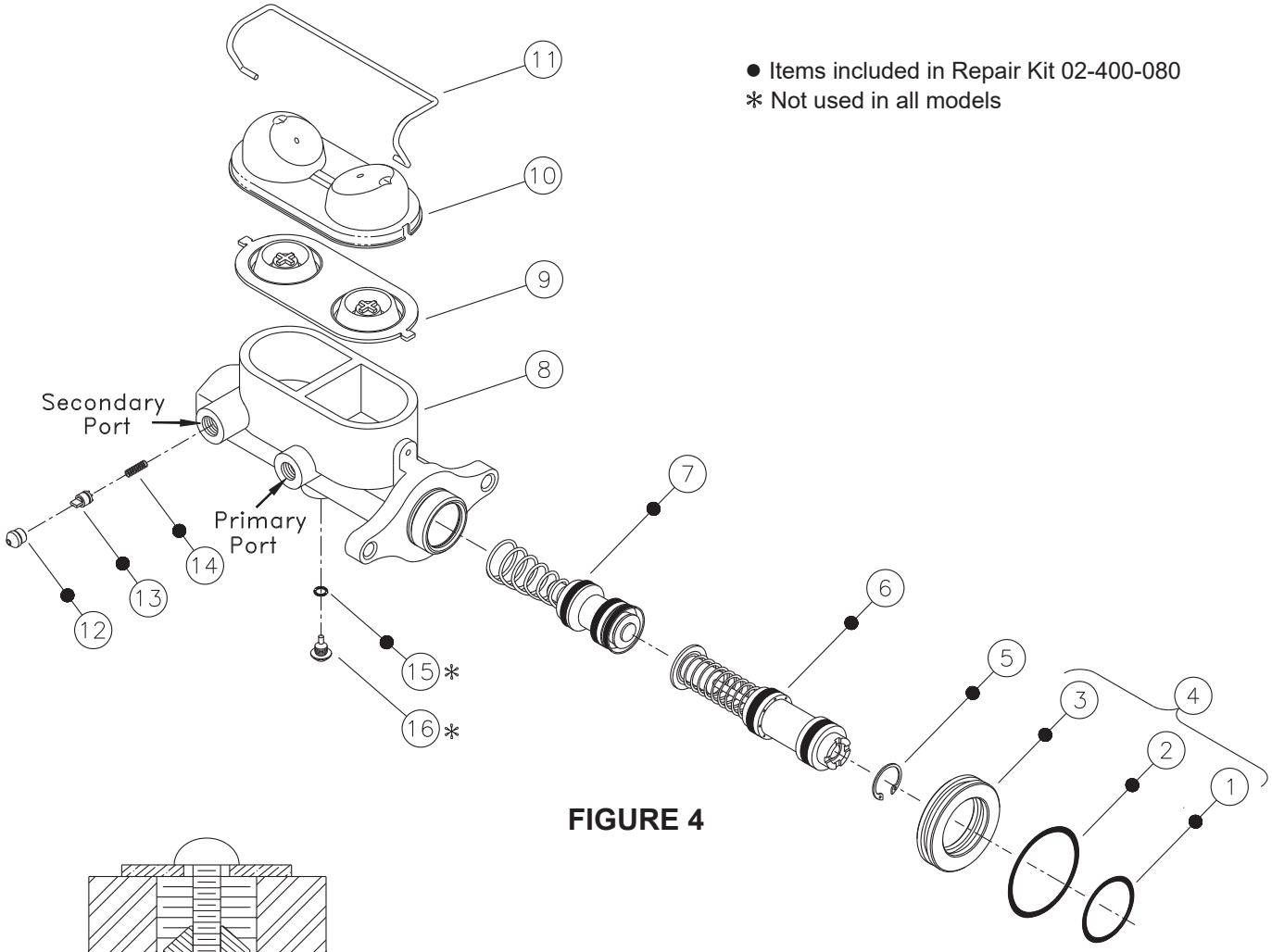

FIGURE 4

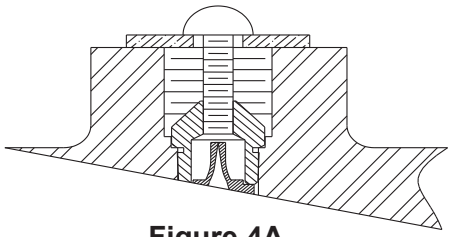

Figure 4A

BLEEDING PROCEDURES

NOTE

Use only proper fluid specified by the 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 power assist section.
2. Fill the reservoir with proper fluid.
3. Be certain all fittings are tight to avoid leaking.
4. DO NOT DEPRESS PEDAL.
5. Connect a pressure bleeder into the reservoir adapter. Recommended bleeding pressure is 2.07 bar (30 PSI) maximum. **NOTE: Make sure to use correct pressure bleeder for the type fluid used in the system.**
6. Open 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 the 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 permitting pedal to return.
10. Actuate the pedal several times. If the 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 the master cylinder mounted to the power assist section.
2. Remove the master cylinder reservoir cover.
3. Connect a length of tubing to each of the outlet ports and immerse the other ends below the fluid level in each of the master cylinder reservoirs. Keep the reservoir fluid within 12.7 mm (0.50 in) of inside reservoir top.
4. Actuate the master cylinder piston with a smooth object large enough hold the small internal piston from coming out. Slowly stroke and release the master cylinder piston 34.9-38.1 mm (1.38-1.50 in). Repeat until air bubbles in the reservoir have ceased.
5. Remove tubing. This should be done quickly so the loss of fluid will be minimized.
6. If the 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 the brake pedal and opening the bleeder fitting closest to master cylinder. Close the bleeder fitting before the brake pedal is released. Continue to the 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 each reservoir to within 12.7 mm (0.50 in) of top and install reservoir cover.
9. Be certain all fittings are tight to avoid any leaking.
10. Actuate the pedal several times. If the brake pedal feels spongy, check for system leaks and repeat bleeding process.

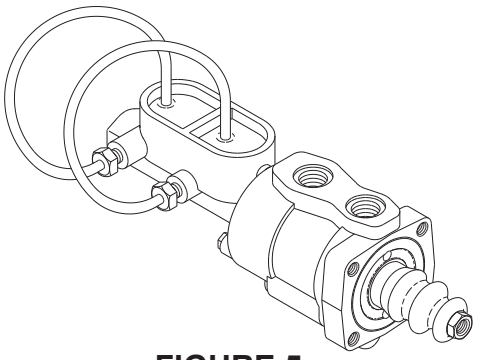

FIGURE 5

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