

# MASTER CYLINDER (Air Actuated)



## Service Instructions

TABLE 1

Model Number	Repair Kit Number	Air Chamber Replacement Kit Number	Model Number	Repair Kit Number	Air Chamber Replacement Kit Number
* 02-460-501 (BF)	02-001-120	02-001-304	02-460-517 (BF)	02-001-122	02-001-305
* 02-460-502 (HO)	02-001-123	02-001-304	02-460-518 (HO)	02-001-255	02-001-306
02-460-503 (BF)	02-001-122	02-001-304	02-460-519 (BF)	02-001-269	02-001-306
02-460-504 (HO)	02-001-123	02-001-306	02-460-520 (HO)	02-001-255	02-001-306
* 02-460-505 (BF)	02-001-120	02-001-305	* 02-460-521 (BF)	02-001-120	02-001-304
* 02-460-506 (HO)	02-001-123	02-001-305	02-460-523 (BF)	02-001-122	02-001-310
* 02-460-507 (BF)	02-001-120	02-001-306	02-460-524 (HO)	02-001-255	02-001-304
* 02-460-509 (BF)	02-001-120	none	02-460-527 (BF)	02-001-122	02-001-306
02-460-511 (BF)	02-001-122	none	02-461-502 (HO)	02-001-123	02-001-304
02-460-512 (HO)	02-001-255	none	02-461-505 (BF)	02-001-120	02-001-305
02-460-513 (BF)	02-001-122	none	02-461-506 (HO)	02-001-123	02-001-305
02-460-514 (HO)	02-001-255	02-001-306	02-461-521 (BF)	02-001-255	02-001-304
02-460-515 (BF)	02-001-122	02-001-305	03-460-353 (BF)	02-001-122	none
02-460-516 (HO)	02-001-255	02-001-304	** 20-100-709 (HO)	02-001-123	n/a

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

(BF) = Brake Fluid (HO) = Mineral Base Hydraulic Oil

\* Includes residual check valve

\*\* Master cylinder only

### REMOVING ACTUATOR FROM MACHINE AND SEPARATING SECTIONS

(Refer to Figure 1)

1. Remove the Air/Hydraulic Actuator from machine by disconnecting the necessary air and fluid lines and removing mounting bolts. Drain fluid from assembly.
2. Separate air chamber section and mounting bracket from master cylinder section by removing two nuts and two lock washers.

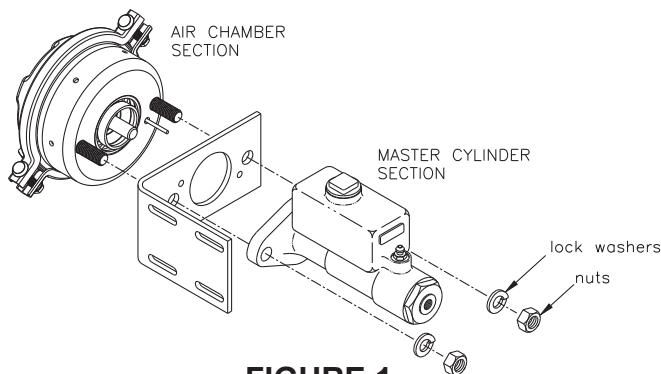


FIGURE 1

### CONNECTING SECTIONS AND MOUNTING BRAKE ACTUATOR ON MACHINE

(Refer to Figures 1 and 2)

1. Assemble new boot (17) and guide (18). **Note: Not all repair kits include a new boot.**
2. Completely lubricate inside diameter of guide (18) with moly impregnated grease.
3. Slide guide (18) and boot (17) on air chamber push rod until end of push rod is exposed.
4. Lubricate push rod with moly impregnated grease.
5. Attach boot (17) to the master cylinder while assembling air chamber, bracket, and master cylinder. Install lock washers and nuts and torque 97.6-105.8 N·m (72-78 lb-ft).
6. Install unit on the machine. Connect air and fluid lines. Bleed the fluid system of air. Tighten fittings if leaks occur. Make several applications to be sure that the actuator is working properly. **NOTE: All fittings must be inspected for leaks and tightened if leaks occur.**

This publication is not subject to any update service. Information contained in this publication was in effect at the time the publication was approved for printing and is subject to change without notice or liability. ZF Off-Highway Solutions Minnesota Inc. reserves the right to revise the information presented or to discontinue the production of parts described at any time.



ZF Off-Highway Solutions Minnesota Inc.

1911 Lee Boulevard / North Mankato, MN U.S.A. 56003

Tel: +1 507 625 6426 Fax: +1 507 625 3212

## NOTE

This literature services various models in this air actuated master cylinder series. The components shown in Figures 1, 2, and 3 may appear different than what is found in your actuator.

## DISASSEMBLY

(Refer to Figure 2)

1. Drain fluid from unit before disassembly.
2. Remove guide (18) and boot (17).
3. Remove end plug (1) from housing (14). Remove o-ring (2) from end plug (1).

## CAUTION

End plug (1) is under spring tension.

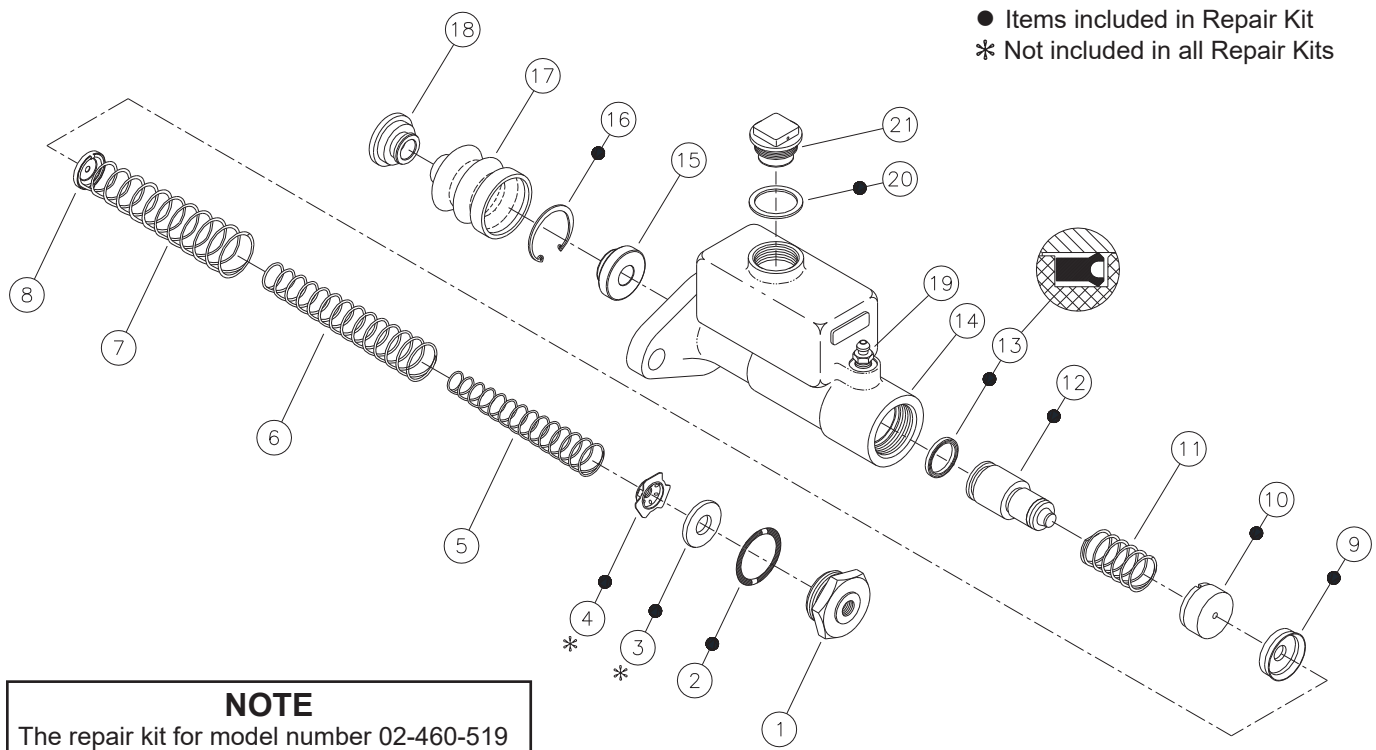
4. Remove seat (3), check valve (4), and springs (5, 6, & 7) from housing. **NOTE: Not all models use seat (3), check valve (4) or springs (5 & 6).**
5. Remove cup (9) and piston assembly (10) from housing. Note direction of cup and piston assembly.
6. Remove retaining ring (16) and bearing (15) from housing.
7. Use a wooden dowel to push spring (11)/piston assembly (12) out end plug (1) end of housing.
8. Gently twist spring (11) from piston assembly (12).
9. Remove cup (13) from piston assembly (12). Note direction of cup.
10. Remove filler plug (21) and gasket (20) from housing.
11. If servicing model number 02-460-519, remove bleeder screw (19).

## ASSEMBLY

(Refer to Figure 2 and Table 1)

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

1. Clean all parts thoroughly before assembling.
2. Gently twist spring (11) onto new piston assembly (12). **NOTE: Repair kit 02-001-269 for model number 02-460-519 includes a new spring (11).**
3. Install new cup (13) on new piston assembly (12). Note the direction of cup (13).
4. Install new piston assembly (12)/spring (11) in housing. Note direction of assembly. **NOTE: Be careful not to scratch housing bore.**
5. Install bearing (15) and new retaining ring (16) in housing.
6. Install new piston assembly (10) and new cup (9) in housing. Note direction of piston assembly and cup.
7. Install new retainer (8)/spring (7) and springs (6 & 5) in housing. **NOTE: Repair kit 02-001-269 for model number 02-460-519 includes new retainer (8) and new springs (5, 6, & 7). Install new retainer (8) on spring (7) before installing in housing.**
8. Install new check valve (4) and new seat (3) in housing. **NOTE: Not all models use seat (3) or check valve (4).**
9. Install new o-ring (2) on end plug (1) and install end plug in housing. Torque 61.0-81.4 N·m (45-60 lb·ft).
10. Install new gasket (20) and filler plug (21) on housing.
11. If servicing model number 02-460-519, install new bleeder screw (19).



## NOTE

The repair kit for model number 02-460-519 also includes items 5, 6, 7, 8, 11, 17, and 19.

FIGURE 2