HYDRAULIC
Caliper Disc Brake

Installation and Service Instructions

TABLE 1

Model Number	Lining Kit Number	Repair Kit Number	Model Number	Lining Kit Number	Repair Kit Number
03-520-069 (BF) replaced by 03-520-281	20-060-003	02-500-055	03-520-096 (HO) replaced by 03-520-283	20-060-120	02-500-252
03-520-072 (HO) replaced by 03-520-282	20-060-003	02-500-252	03-520-281 (BF)	20-060-003	02-500-055
03-520-081 (BF) replaced by 03-520-281	20-060-003	02-500-055	03-520-282 (HO)	20-060-003	02-500-252
03-520-084 (HO) replaced by 03-520-282	20-060-003	02-500-054	03-520-283 (HO)	20-060-120	02-500-252
03-520-091 (HO)	20-060-122	02-500-252	* 03-520-284 (HO)	20-060-003	02-500-252
03-520-094 (HO) replaced by 03-520-283	20-060-120	02-500-252			

BF = Automotive Brake Fluid HO = Mineral Based Hydraulic Oil

* Uses two plugs in place of two bleeder screws

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

READ GENERAL INSTALLATION GUIDELINES SHEET (81-600-001) BEFORE PROCEEDING

⚠ WARNING

ZF Offf-Highway Solutions Minnesota Inc. disc brake linings do not contain asbestos. Brake lining compounds do, however, contain elements that may become airborne during the life of the lining. To prevent any health problems associated with lining dust, we suggest ventilators be installed as needed on enclosed or stationary equipment. A Safety Data Sheet is available upon request.

When installing these 520 Series Disc Brakes, it is of utmost importance that the caliper be centered evenly and squarely over the disc. This will ensure even and equal piston travel and lining to disc contact. It should not be necessary to change the position or setting of the end plug during the life of the lining. When linings have been worn to the point of replacement, replace with lining kit specified in Table 1. This 520 Series Brake is designed to be used with a disc 12.7 mm (0.50 in) thick.

⚠ CAUTION

Minimum recommended disc thickness for models 03-520-069 & 03-520-072 is 9.5 mm (0.375 in). The Minimum recommended disc thickness for models 03-520-081 and 03-520-084 is 11.1 mm (0.438 in). For other disc thicknesses contact ZF Off-Highway Solutions Minnesota Inc.

NOTE

If the master cylinder in the system has a residual check valve, it must be removed so the brake linings will not drag on the disc.

MOUNTING PROCEDURE

1. When planning or designing an installation of this brake on a vehicle, the mounting surface to disc face dimension of 57.9 mm (2.28 in) should be closely held. Use shims as needed to obtain the proper distance. **NOTE: Mounting surface must be parallel with disc.**
2. Using Table 2, determine “A” dimension and locate caliper mounting holes. Bolt caliper assembly securely to vehicle. **SEE TORQUE NOTE.**

TORQUE NOTE

It is recommended to use 1/2-20 plated SAE grade 8 mounting bolts and heat treated flat washers. Torque bolts 122.0-135.6 N·m (90-100 lb·ft).

PLUMBING PROCEDURE

1. After caliper assembly is mounted on vehicle, install hydraulic lines. **NOTE: All Porting is designed for #4 SAE o-ring boss port adapter.**
2. Bleed system making sure all air is eliminated. Apply hydraulic pressure and check for leaks.
3. Torque bleeder screws 12.2-20.0 N·m (9-15 lb·ft).

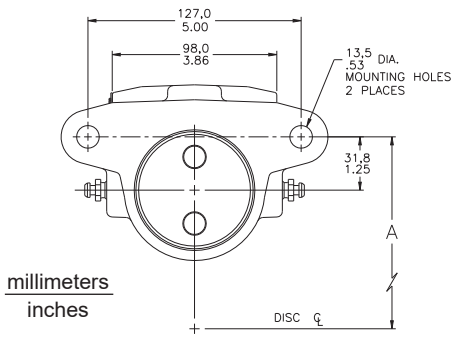


FIGURE 1

DISC CENTERLINE TO MOUNTING HOLE DIMENSION

Disc Diameter	“A” Dimension
254 mm (10 in)	127.0 mm (5.00 in)
304.8 mm (12 in)	152.4 mm (6.00 in)
355.6 mm (14 in)	177.8 mm (7.00 in)
406.4 mm (16 in)	203.2 mm (8.00 in)
457.2 mm (18 in)	228.6 mm (9.00 in)
508.0 mm (20 in)	254.0 mm (10.00 in)
558.8 mm (22 in)	279.4 mm (11.00 in)

TABLE 2

NOTE: For disc diameters greater than 508 mm, add 9.7 mm (20 in, add 0.38 in) to disc radius to obtain “A” dimension.

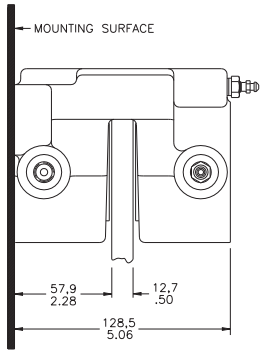


FIGURE 2

MODELS: **03-520-069** **03-520-094** **03-520-282**
03-520-072 **03-520-096** **03-520-283**
03-520-291 **03-520-281** **03-520-284**

CHANGE LINING PROCEDURE

(Refer to Figure 3)

See Table 1 for Lining Kit required for your brake.

NOTE
New linings must be kept free of oil, grease, etc.

1. Remove brake from vehicle by disconnecting necessary fluid lines and removing mounting bolts. Drain fluid from assembly.

⚠ CAUTION
Cap end of fluid line to prevent entry of dirt into the hydraulic system.

2. Place brake in a soft jawed vise and remove end plug (1) from housing (9) using a spanner wrench.
3. Remove piston/lining assembly (10) from housing (9). **NOTE: Be careful not to mar housing bore or piston.**
4. Remove seal (8) from housing (9). **NOTE: Be careful not to scratch housing bore.**
5. Place piston/lining assembly (10) on a flat surface, lining side up. Remove screws (5) and lining (4).

NOTE
Earlier models may require the removal of rivets instead of screws. These models will need to have two #10-24UNC holes tapped into piston (3), approximately 11.1 mm (0.438 in) deep, to accommodate new lining (4) and new screws (5).

6. Install new lining (4) on piston (3) using new screws (5). Torque screws 3.4-8.5 N·m (30-40 lb·in).
7. Lubricate new seal (8) with clean type fluid used in the system and install in housing (9).
8. Clean and lubricate piston (3) portion of piston/lining assembly (10) with clean type fluid used in the system. Install piston/lining assembly (10) into housing (9) bore. **NOTE: Linings must be kept free of oil, grease, etc.**
9. Install end plug (1) into housing (9) and torque 203.4-237.3 N·m (150-175 lb·ft).
10. Repeat steps 2 through 9 on other half of brake.
11. To continue, refer to MOUNTING PROCEDURE and PLUMBING PROCEDURE on page 1

CHANGE REPAIR KIT PROCEDURE DISASSEMBLY

(Refer to Figure 3)

See Table 1 for Repair Kit required for your brake.

1. Remove brake from vehicle by disconnecting necessary fluid lines and removing mounting bolts. Drain fluid from assembly.

⚠ CAUTION
Cap end of fluid line to prevent entry of dirt into the hydraulic system.

2. Place brake in a soft jawed vise and remove end plug (1) from housing (9) using a spanner wrench.
3. Remove piston/lining assembly (10) from housing (9). **NOTE: Be careful not to mar housing bore or piston.**
4. Remove o-ring (2) from end plug (1) and o-ring (6), back-up ring (7) and seal (8) from housing (9). **NOTE: Be careful not to scratch housing bore.**
5. Repeat steps 2 through 5 on other half of brake.

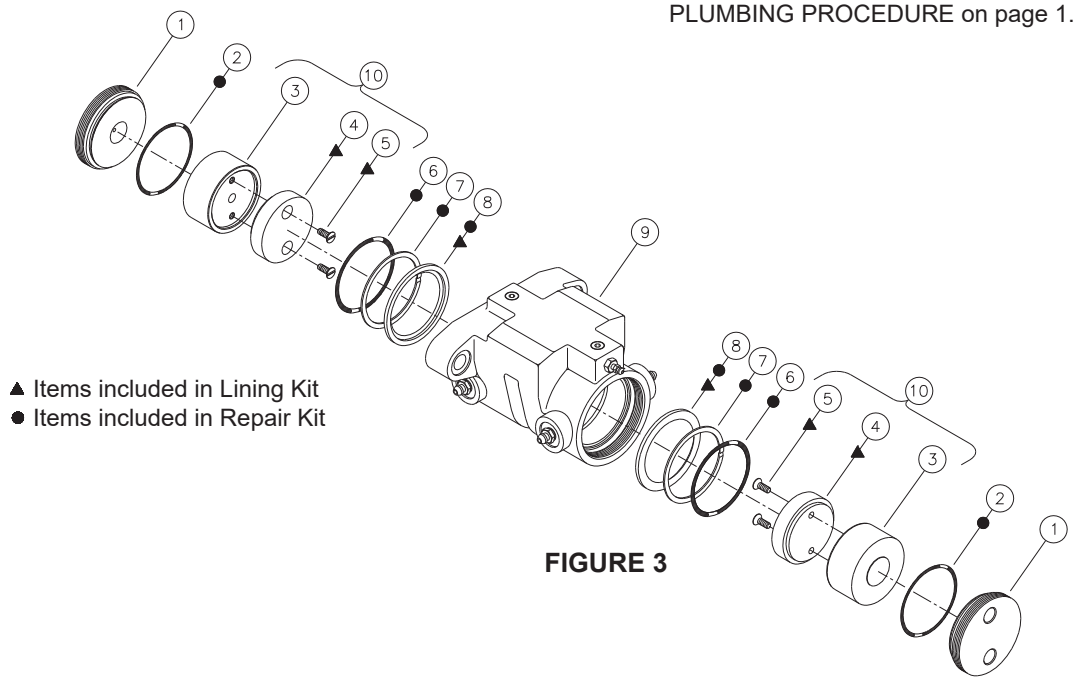
CHANGE REPAIR KIT PROCEDURE ASSEMBLY

(Refer to Figure 3)

LUBRICATE ALL RUBBER COMPONENTS FROM REPAIR KIT WITH CLEAN TYPE FLUID USED IN THE SYSTEM. MAKE SURE THE REPAIR KIT USED IS THE PROPER ONE FOR YOUR SYSTEM.

NOTE
New linings must be kept free of oil, grease, etc.

1. Clean housing bore with clean type fluid used in the system.
2. Install new o-ring (6), new back-up ring (7) and new seal (8) in housing (9). Note order of components.
3. Install piston/lining assembly (10) into housing (9) bore.
4. Install new o-ring (2) on end plug (1). Install end plug (1) into housing (9) and torque 203.4-237.3 N·m(150-175 lb·ft).
5. Repeat steps 2 through 4 on other half of brake.
6. To continue, refer to MOUNTING PROCEDURE and PLUMBING PROCEDURE on page 1.



▲ Items included in Lining Kit
● Items included in Repair Kit

FIGURE 3

MODELS: 03-520-081
03-520-084

CHANGE LINING PROCEDURE

(Refer to Figure 4)

See Table 1 for Lining Kit required for your brake.

NOTE
New linings must be kept free of oil, grease, etc.

1. Remove brake from vehicle by disconnecting necessary fluid lines and removing mounting bolts. Drain fluid from assembly.

⚠ CAUTION
Cap end of fluid line to prevent entry of dirt into the hydraulic system.

2. Place brake in a soft jawed vise and remove end plug (1) from housing (10) using a spanner wrench.
3. Remove piston/lining assembly (11) from housing (10). **NOTE: Be careful not to mar housing bore or piston.**
4. Remove seal (9) from housing (10). **NOTE: Be careful not to scratch housing bore.**
5. Place piston/lining assembly (11) on a flat surface, lining side up. Remove screws (6) and lining (5).

NOTE
Earlier models may require the removal of rivets instead of screws. These models will need to have two #10-24UNC holes tapped into piston (4), approximately 11.1 mm (0.438 in) deep, to accommodate new lining (5) and new screws (6).

6. Install new lining (5) on piston (4) using new screws (6). Torque screws 3.4-4.5 N·m (30-40 lb·in).
7. Lubricate new seal (9) with clean type fluid used in the system and install into housing (10).
8. Clean and lubricate piston (4) portion of piston/lining assembly (11) with clean type fluid used in the system. Install piston/lining assembly (11) into housing (10) bore. **NOTE: Linings must be kept free of oil,grease, etc.**
9. Install end plug (1) into housing (10) and torque 203.4-237.3 N·m (150-175 lb·ft).
10. Repeat steps 2 through 9 on other half of brake.
11. To continue, refer to MOUNTING PROCEDURE and PLUMBING PROCEDURE on page 1.

CHANGE REPAIR KIT PROCEDURE DISASSEMBLY

(Refer to Figure 4)

See Table 1 for Repair Kit required for your brake.

1. Remove brake from vehicle by disconnecting necessary fluid lines and removing mounting bolts. Drain fluid from assembly.

⚠ CAUTION
Cap end of fluid line to prevent entry of dirt into the hydraulic system.

2. Place brake in a soft jawed vise and remove end plug (1) from housing (10) using a spanner wrench.
3. Remove piston/lining assembly (11) from housing (10). **NOTE: Be careful not to mar housing bore or piston.**
4. Remove o-ring (3) and back-up ring (2) from end plug (1) and o-ring (7), back-up ring (8) and seal (9) from housing (10). **NOTE: Be careful not to scratch housing bore.**
5. Repeat steps 2 through 5 on other half of brake.

CHANGE REPAIR KIT PROCEDURE ASSEMBLY

(Refer to Figure 4)

LUBRICATE ALL RUBBER COMPONENTS FROM REPAIR KIT WITH CLEAN TYPE FLUID USED IN THE SYSTEM. MAKE SURE THE REPAIR KIT USED IS THE PROPER ONE FOR YOUR SYSTEM.

NOTE
New linings must be kept free of oil, grease, etc.

1. Clean housing bore with clean type fluid used in the system.
2. Install new o-ring (7), new back-up ring (8) and new seal (9) into housing (10). Note order of components.
3. Install piston/lining assembly (11) into housing (10) bore.
4. Install new back-up ring (2) and new o-ring (3) on end plug (1). Note order of components.
5. Install end plug (1) into housing (10). End plug on mounting surface side must be screwed in until flush with mounting surface. The other end plug must be screwed in until the distance between the linings is approximately 15.9 mm (0.625 in).
6. Repeat steps 2 through 5 on other half of brake.
7. To continue, refer to MOUNTING PROCEDURE and PLUMBING PROCEDURE on page 1.

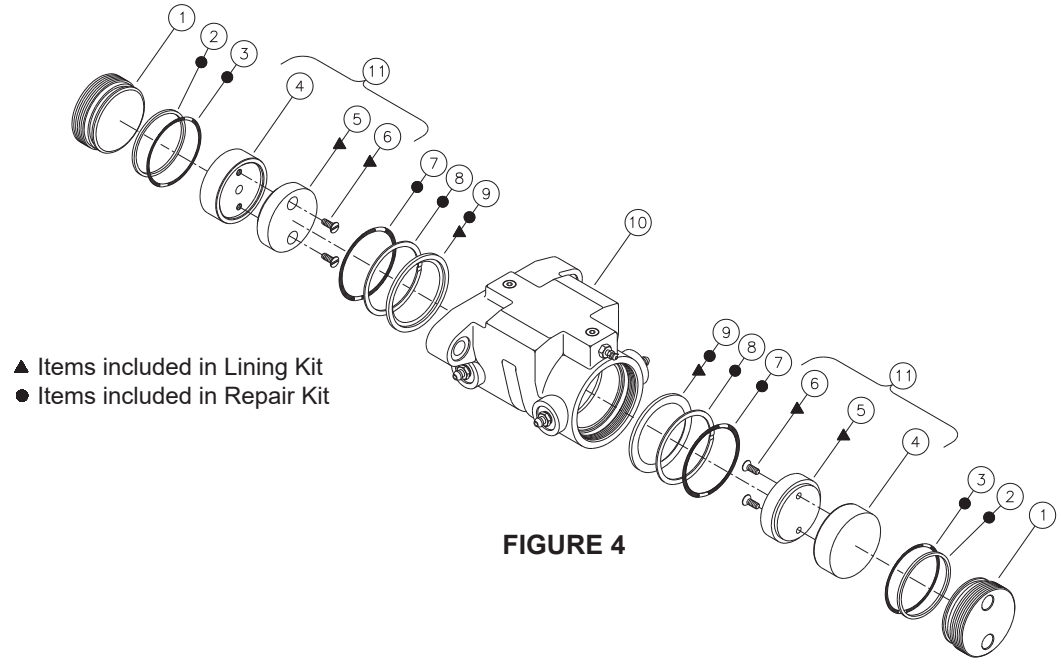


FIGURE 4

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

Form No. 81-520-003 Revised 2017-01-11

www.mico.com