

HYDRAULIC Caliper Disc Brake



Installation and Service Instructions

TABLE 1

Model Number	Lining Kit Number	Repair Kit Number	* Mounting Surface to Disc Face Dim. (Figure 2)	* Disc Thickness (Figure 2)	Model Number	Lining Kit Number	Repair Kit Number	* Mounting Surface to Disc Face Dim. (Figure 2)	* Disc Thickness (Figure 2)
02-520-184 (HO)	20-060-013	02-500-132	50.0 mm (1.97 in)	12.7 mm (0.50 in)	02-520-260 (HO)	20-060-013	02-500-132	50.0 mm (1.97 in)	12.7 mm (0.50 in)
** 02-520-193 (BF)	20-060-013	02-500-131	50.0 mm (1.97 in)		02-520-261 (BF)	20-060-013	02-500-131	50.0 mm (1.97 in)	12.7 mm (0.50 in)
** 02-520-194 (BF)	20-060-013	02-500-132	50.0 mm (1.97 in)		** 02-520-262 (HO)	20-060-013	02-500-132		
02-520-233 (BF)	20-060-008	02-500-131	60.2 mm (2.37 in)	12.7 mm (0.50 in)	** 02-520-263 (BF)	20-060-013	02-500-131		
02-520-238 (HO)	20-060-008	02-500-132	60.2 mm (2.37 in)	12.7 mm (0.50 in)	02-520-264 (HO)	20-060-013	02-500-132	50.0 mm (1.97 in)	25.4 mm (1.00 in)
** 02-520-240 (HO)	20-060-008	02-500-048	60.2 mm (2.37 in)		02-520-265 (BF)	20-060-013	02-500-131	50.0 mm (1.97 in)	25.4 mm (1.00 in)
02-520-248 (HO)	20-060-076	02-500-132	60.2 mm (2.37 in)	12.7 mm (0.50 in)	02-520-268 (HO)	20-060-013	02-500-234	50.0 mm (1.97 in)	12.7 mm (0.50 in)
02-520-250 (HO)	20-060-013	02-500-132	50.0 mm (1.97 in)	12.7 mm (0.50 in)	02-520-274 (HO)	20-060-013	02-500-132	50.0 mm (1.97 in)	25.4 mm (1.00 in)
02-520-251 (BF)	20-060-013	02-500-131	50.0 mm (1.97 in)	12.7 mm (0.50 in)	02-520-276 (HO)	20-060-130	02-500-132	50.0 mm (1.97 in)	25.4 mm (1.00 in)
** 02-520-252 (HO)	20-060-013	02-500-132			03-520-179 (BF)	20-060-013	02-500-131	50.0 mm (1.97 in)	12.7 mm (1.00 in)
** 02-520-253 (BF)	20-060-013	02-500-131			03-520-181 (BF)	20-060-013	02-500-131	50.0 mm (1.97 in)	25.4 mm (1.00 in)
02-520-255 (BF)	20-060-013	02-500-131	50.0 mm (1.97 in)	25.4 mm (1.00 in)	03-520-279 (BF)	20-060-013	02-500-131	50.0 mm (1.97 in)	12.7 mm (1.00 in)

BF = Brake Fluid HO = Mineral Base Hydraulic Oil ** Brake Half
NOTE: If your product number is not listed, contact ZF Off-Highway Solutions Minnesota Inc. for information.

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

⚠ WARNING

ZF Off-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 this Disc Brake, 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.

⚠ CAUTION

The minimum allowable disc thickness for this brake is 12.7 mm (0.50 in). For use with a thinner disc, disassemble caliper and reduce spacer thickness accordingly. Spacer thickness = disc thickness + 3.2 mm (0.125 in). A loss of fluid may occur at the time of complete lining wear if the above procedure is not followed.

Uneven lining wear may occur if the caliper is not mounted squarely over the disc, or if the lining assemblies are not parallel to the disc surface. Reduced o-ring seal life may also be evident. When the linings have worn to the point of replacement, replace with Lining Kit specified in Table 1.

MOUNTING PROCEDURE

(Refer to Figures 1 and 2)

1. When planning or designing an installation of this brake on a machine, the mounting surface to disc face dimension, as shown in Table 1, should be closely held. Use shims as needed to obtain the proper distance.
2. Using Table 2, determine "A" dimension and locate caliper mounting holes. Bolt caliper assembly securely to machine. **SEE TORQUE NOTE.**

TORQUE NOTE

It is recommended to use using 5/8-18UNC SAE grade 8 plated bolts and heat treated flat washers.
Torque: 257.6-271.2 N·m (190-200 lb·ft).

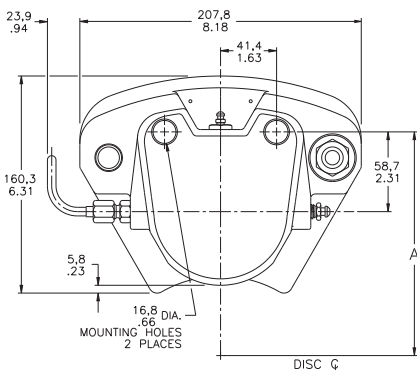


FIGURE 1

DISC CENTERLINE TO MOUNTING HOLE DIMENSION

Disc Diameter	"A" Dimension
304.8 mm (12 in)	168.2 mm (6.62 in)
355.6 mm (14 in)	193.6 mm (7.62 in)
406.4 mm (16 in)	219.0 mm (8.62 in)
457.2 mm (18 in)	244.4 mm (9.62 in)
508.0 mm (20 in)	269.8 mm (10.62 in)

TABLE 2

NOTE: For disc diameters between 508 to 914 mm, add 15 mm (20 to 36 in, add 0.62 in) to disc radius to obtain "A" dimension.

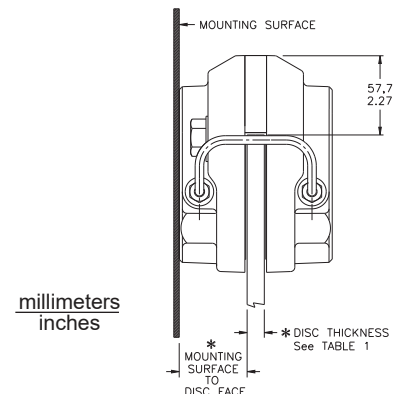


FIGURE 2

PLUMBING PROCEDURE

1. After caliper assembly is mounted on machine, install hydraulic lines. **NOTE: All porting is designed for #4 SAE o-ring boss port adapter.**
2. Bleed the system making sure all air is eliminated. Apply hydraulic pressure and check for leaks.

NOTE

This literature services various models in this brake series. The components shown in Figure 3 and 4 may appear different than what is found in your brake.

CHANGE LINING PROCEDURE

(Refer to Figures 3 and 4)

1. Remove brake from machine by disconnecting necessary fluid lines and removing mounting bolts. Drain fluid from brake assembly.
2. For some models it may not be necessary to separate housing halves, however, if you must separate housing (3) halves, remove cap screws (1), washers (2), tubing assembly (11), and spacer (8). Do not remove connectors (12). Use a bench vice. **NOTE: Earlier models use nuts (13) and two additional washers (2). See Figure 4.**
3. Remove lining assemblies (7) from housings (3).
4. Gently press piston (6) back into housing (3) bore. Piston must bottom on housing to assure lining to disc clearance. Install new lining assembly (7) into housing pocket. Repeat the process for remaining housing half.
5. Position spacer(s) (8) between housing (3) halves. Install cap screws (1) and washers (2). **NOTE: Earlier models use nuts (13) and two additional washers (2) to be installed and tightened after cap screws (1) are torqued. See Figure 4.** Determine size of cap screws (1), lubricate the threads of cap screws (1), and evenly torque cap screws, not nuts (13), as follows: 5/8-18UNF 257.6-278.0 N·m (190-205 lb·ft). 3/4-16UNF 413.6-454.3 N·m (285-315 lb·ft).
6. Connect tubing assembly (11) and torque 12.2-20.3 N·m (9-15 lb·ft).
7. Install brake on machine with bleeder screws (9) facing up. Shim as required to center the caliper over disc. **SEE TORQUE NOTE ON PAGE 1.**
8. Connect necessary fluid lines.
9. Bleed the system making sure all air is eliminated.
10. Make several static brake applications. Check for leaks and bleed once more.
11. Check linings to be sure there is no drag. If lining to disc drag occurs, refer to step 4 above to correct.

NOTE

When installing new linings, examine the disc for excessive wear. As a guide, the following limits are suggested for re-finishing the disc.

- Surface finish 1-1.5 micron (40-60 micro inch).
- Surfaces to be parallel within 0.051 mm (0.002 in).
- Do not reduce thickness by more than 0.762 mm (0.030 in) when refinishing.

DISASSEMBLY PROCEDURE

(Refer to Figures 3 and 4)

1. Remove brake from machine by disconnecting necessary fluid lines and removing mounting bolts. Drain fluid from brake assembly.
2. Separate housing (3) halves by removing cap screws (1), washers (2), tubing assembly (11), and spacer (8). Do not remove connectors (12). Use a bench vice. **NOTE: Earlier models use nuts (13) and two additional washers (2). See Figure 4.**

3. Remove lining assembly (7) from housing (3).
4. Remove piston (6) from one housing (3) half by pulling piston from bore. If piston fails to move, place housing half face down on bench. Protect piston face by placing cloth between piston and bench. Support housing half on bench in such a way that piston can be eased out of its bore. This is accomplished by carefully introducing low pressure air 0.7-1.0 bar (10-15 PSI) through fluid inlet fittings.

CAUTION

Do not use high pressure as it is dangerous and unnecessary. Use just enough air pressure to ease the piston out of the bore. Do not blow piston out of the bore. If the piston is seized or cocked or does not come out readily, release the air pressure and use a soft (brass) hammer to rap sharply on and around the end of the piston. Reapply air pressure to remove the piston.

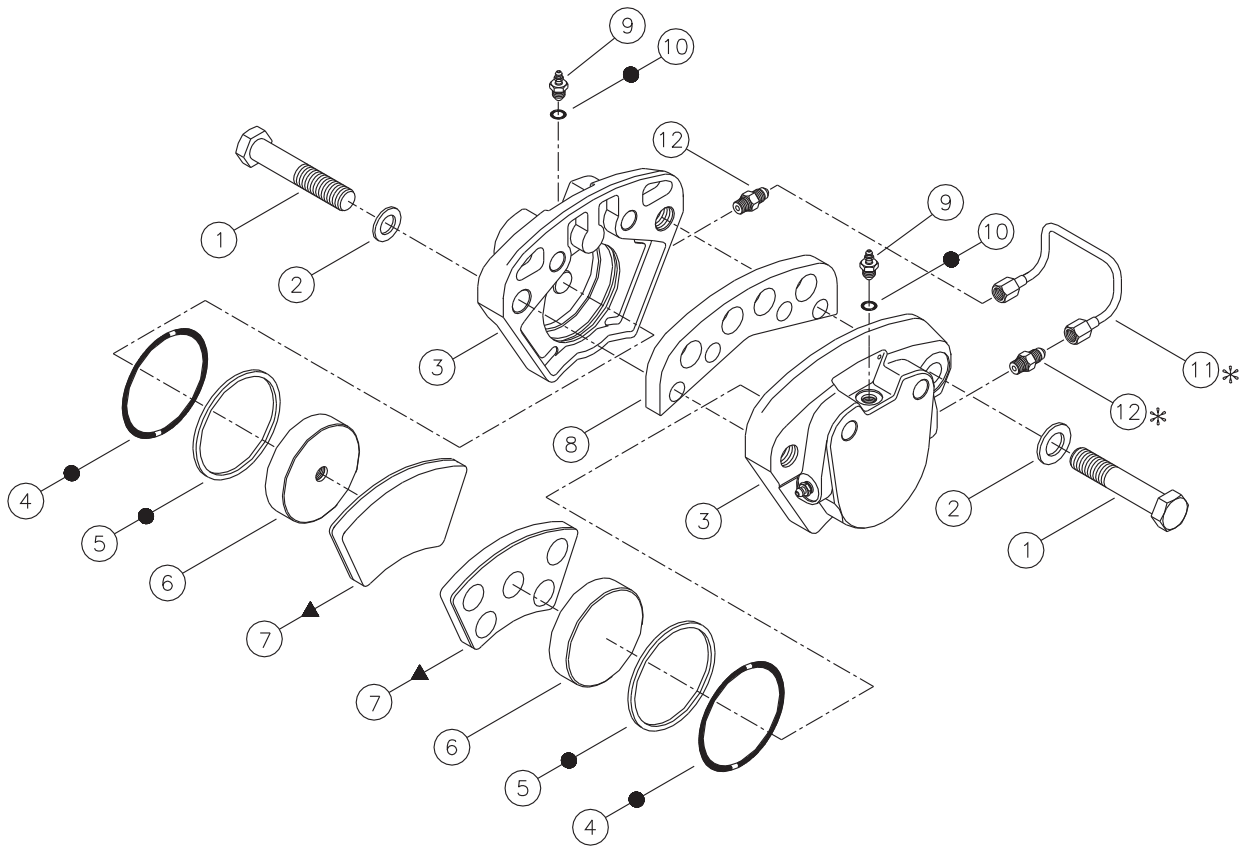
5. Remove o-ring (4) and back-up ring (5) from housing (3) half. **NOTE: Be careful not to scratch or mar housing bore.**
6. Remove bleeder screws (9) from housings (3). Remove o-rings (10) from bleeder screws (9).
7. Repeat steps 3 through 5 for second housing (3) half.

ASSEMBLY PROCEDURE

(Refer to Figures 3 and 4)

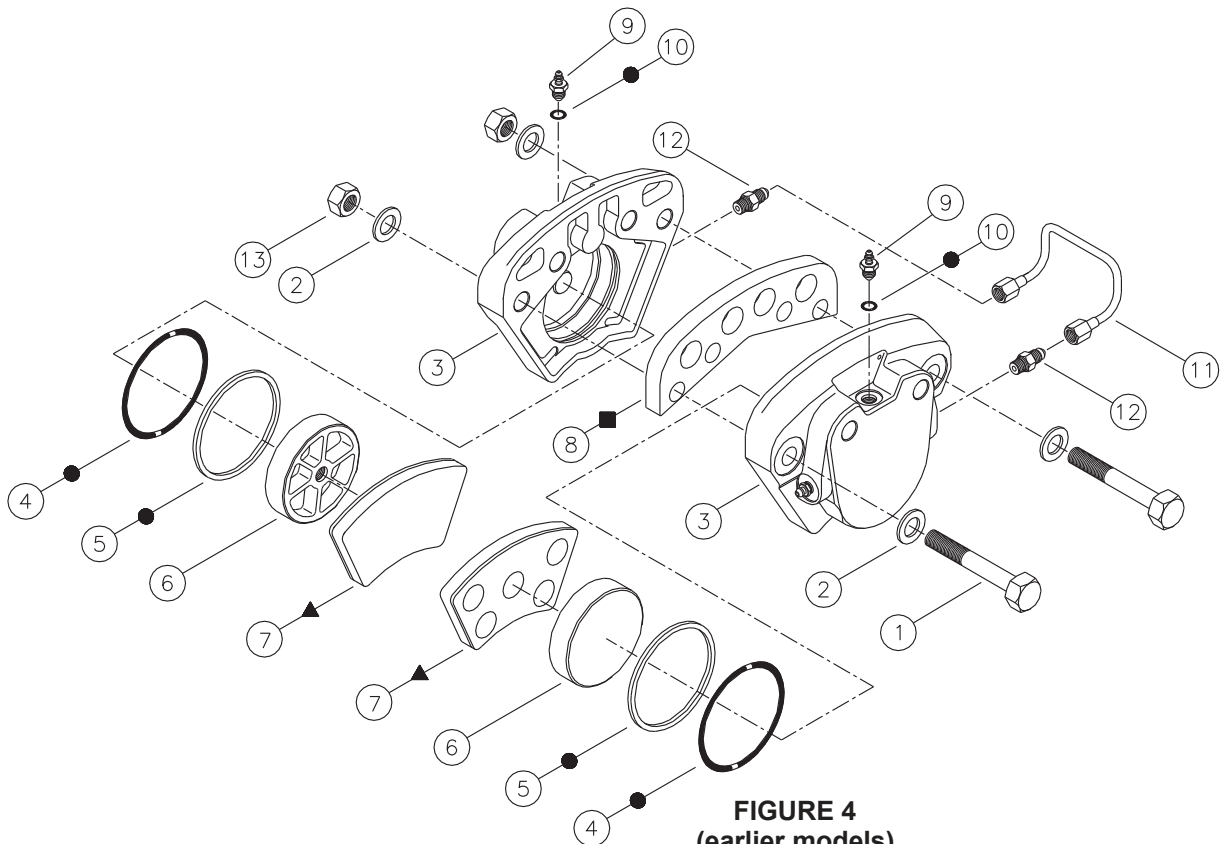
LUBRICATE ALL RUBBER COMPONENTS FROM REPAIR KIT WITH CLEAN TYPE FLUID USED IN THE SYSTEM

1. Clean housing bore with clean type fluid used in system
2. Install new o-ring (10) on bleeder screw (9). Install bleeder screw in housing (3) half and torque 12.2-20.3 N·m (9-15 lb·ft).
3. Install new o-ring (4) and new back-up ring (5) in groove of housing (3). Note the order of components. **NOTE: Care must be taken so as not to scratch or mar housing bore.**
4. Gently press piston (6) into housing (3) bore. Piston must bottom on housing to assure lining to disc clearance. Install lining assembly (7) into housing pocket. Note the order of components.
5. Repeat steps 1 through 4 for the second housing (3) half.
6. Position spacer(s) (8) between housing (3) halves. Install cap screws (1) and washers (2). **NOTE: Earlier models use nuts (13) and two additional washers (2) to be installed and tightened after cap screws (1) are torqued. See Figure 4.** Determine size of cap screws (1), lubricate the threads of cap screws (1), and evenly torque cap screws, not nuts (13), as follows: 5/8-18UNF 257.6-278.0 N·m (190-205 lb·ft) 3/4-16UNF 413.6-454.3 N·m (285-315 lb·ft).
7. Connect tubing assembly (11).
8. Install brake on machine with bleeder screws (9) up. Shim as required to center caliper over disc. **SEE TORQUE NOTE ON PAGE 1.**
9. Connect necessary fluid lines.
10. Bleed the system making sure all air is eliminated.
11. Make several static brake applications. Check for leaks and bleed once more.
12. Check linings to be sure there is no drag. If lining to disc drag occurs, refer to step 4 above to correct.



**FIGURE 3
(later models)**

- Items included in Repair Kit
- ▲ Items included in Lining Kit
- * Not used in all models
- Models 02-520-255 and 03-520-181 have two spacers. Models 02-520-264 and 02-520-265 use one thick spacer.



**FIGURE 4
(earlier models)**

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