SPRING APPLY
Caliper Disc Brake

Installation and Service Instructions

TABLE 1

Caliper Model Number	Caliper with Rectangular Bracket Model Number	Caliper with Triangular Bracket Model Number	Lining Kit Number	Seal Kit Number	*Repair Kit Number
01-530-306 (HO)	02-530-306 (HO)	03-530-306 (HO)	20-060-113	02-500-058	02-500-223
01-530-307 (BF)	02-530-307 (BF)	03-530-307 (BF)	20-060-113	02-500-040	02-500-225
n/a	02-530-308 (HO)	n/a	20-060-113	02-500-058	02-500-229
n/a	02-530-310 (HO	n/a	20-060-113	02-500-058	02-500-223
n/a	02-530-312 (HO)	n/a	20-060-113	02-500-058	02-500-223
01-530-314 (HO)	02-530-314 (HO)	n/a	20-060-116	02-500-058	12-501-407
01-530-628 (HO)	02-530-628 (HO)	03-530-628 (HO)	20-060-113	02-500-058	02-500-224
01-530-629 (BF)	02-530-629 (BF)	03-530-629 (BF)	20-060-113	02-500-040	02-500-226
n/a	02-530-630 (HO)	n/a	20-060-113	02-500-230	02-500-228
n/a	02-530-632 (HO)	03-530-632 (HO)	20-060-121	02-500-058	02-500-244

HO = Mineral Base Hydraulic Oil BF = Brake Fluid

*** Belleville springs are pre-greased. DO NOT remove grease from springs. See Grease Note on page 3, Figure 7.**

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 these Spring Brakes, it is of utmost importance that the caliper be centered evenly and squarely over the disc. This will ensure even lining to disc contact. When linings have been worn to a point of replacement, replace with the lining kit specified in TABLE 1. This series of 530 Spring Brakes is designed for use with a disc thickness of 7.9-12.7 mm (0.31-0.50 in).

MOUNTING PROCEDURE

1. Figures 1 and 2 on page 2 illustrate the two methods of mounting this series of brakes. See mounting bracket shaft grease note. The mounting surface to disc face dimension should be closely held as this provides for the required caliper movement. Use shims as needed to obtain the proper distance.
2. Using TABLE 2 and Figures 3 and 4 on page 2, determine “A” dimension and locate mounting bracket assembly holes.
3. Loosen lock nut and slightly back off adjusting screw. Push lining assembly back into the brake housing.
4. Mount brake and bracket assembly on disc and bolt securely to the machine using SAE grade 8 or better mounting bolts with lock washers.

PLUMBING PROCEDURE

1. After brake is mounted on machine, install bleeder screw (provided with brake) and hydraulic line. **NOTE: All porting is designed for #4 SAE o-ring boss port adapters.**
2. Bleed system making sure all air is eliminated. Apply rated pressure and check for leaks.
3. Torque bleeder screw 12.2-20.3 N·m (9-15 lb·ft).

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NOTE

Dimensions shown in Figures 1 and 2 are typical for all models. Mounting surface to disc face dimension is typical of rectangular and triangular brackets. Mounting bolts not included.

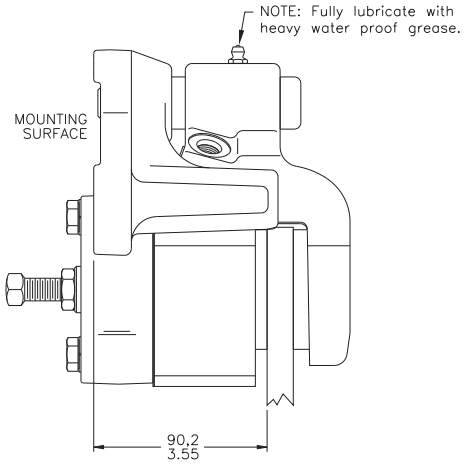
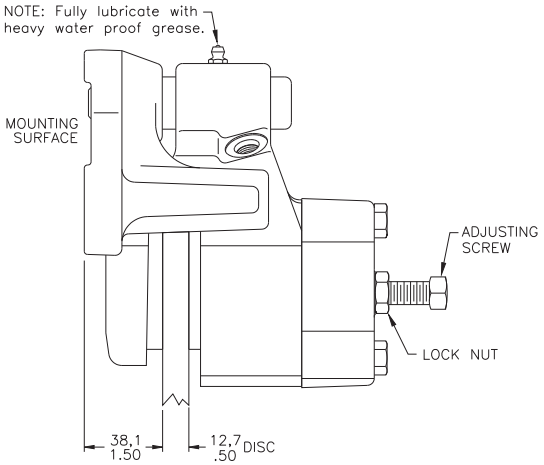


FIGURE 1



millimeters
inches

FIGURE 2

DISC CENTERLINE TO MOUNTING HOLE DIMENSION

Disc Diameter	Rectangular Mount "A" Dimension	Triangular Mount "A" Dimension
228.6 mm (9 in)	155.6 mm (6.125 in)	117.5 mm (4.625 in)
254.0 mm (10 in)	168.3 mm (6.625 in)	130.2 mm (5.125 in)
304.8 mm (12 in)	193.7 mm (7.625 in)	155.6 mm (6.125 in)
355.6 mm (14 in)	219.1 mm (8.625 in)	181.0 mm (7.125 in)
406.4 mm (16 in)	247.6 mm (9.75 in)	206.4 mm (8.125 in)
457.2 mm (18 in)	273.0 mm (10.75 in)	231.8 mm (9.125 in)
508.0 mm (20 in)	298.4 mm (11.75 in)	257.2 mm (10.125 in)
558.8 mm (22 in)	323.8 mm (12.75 in)	282.6 mm (11.125 in)
609.6 mm (24 in)	349.2 mm (13.75 in)	308.0 mm (12.125 in)

TABLE 2

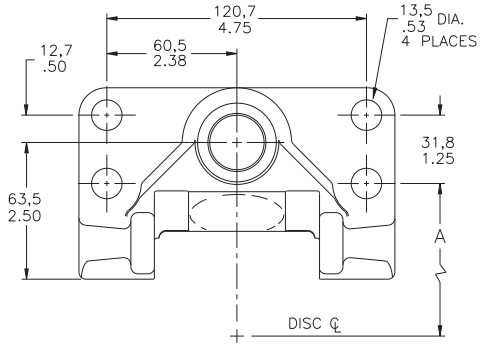
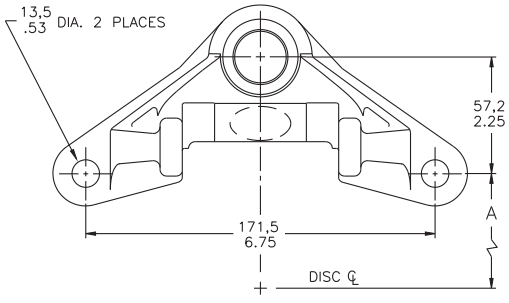


FIGURE 3
(rectangular mount)

NOTE: For disc diameters greater than 609.6 mm add 44.4 mm (24 inch add 1.75 in) to disc radius to obtain "A" dimension.



millimeters
inches

FIGURE 4
(triangular mount)

NOTE: For disc diameters greater than 609.6 mm add 3.2 mm (24 inch add 0.125 in) to disc radius to obtain "A" dimension.

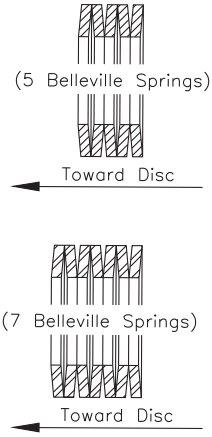


FIGURE 5

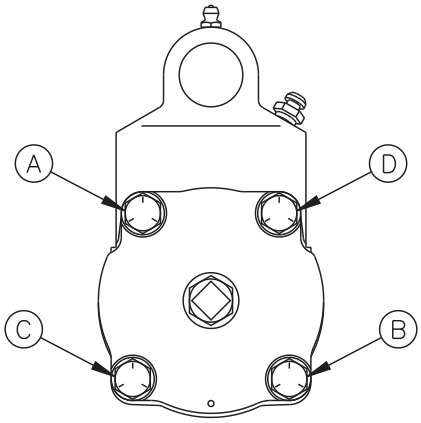


FIGURE 6

- ● Items included in Seal Kit
- ▲ Items included in Repair Kit
- ■ Items included in Lining Kit
- ∗ Not used in all models

Grease Note

Brake Fluid Models must use a silicone base grease.

Hydraulic Oil Models must use mineral base grease.

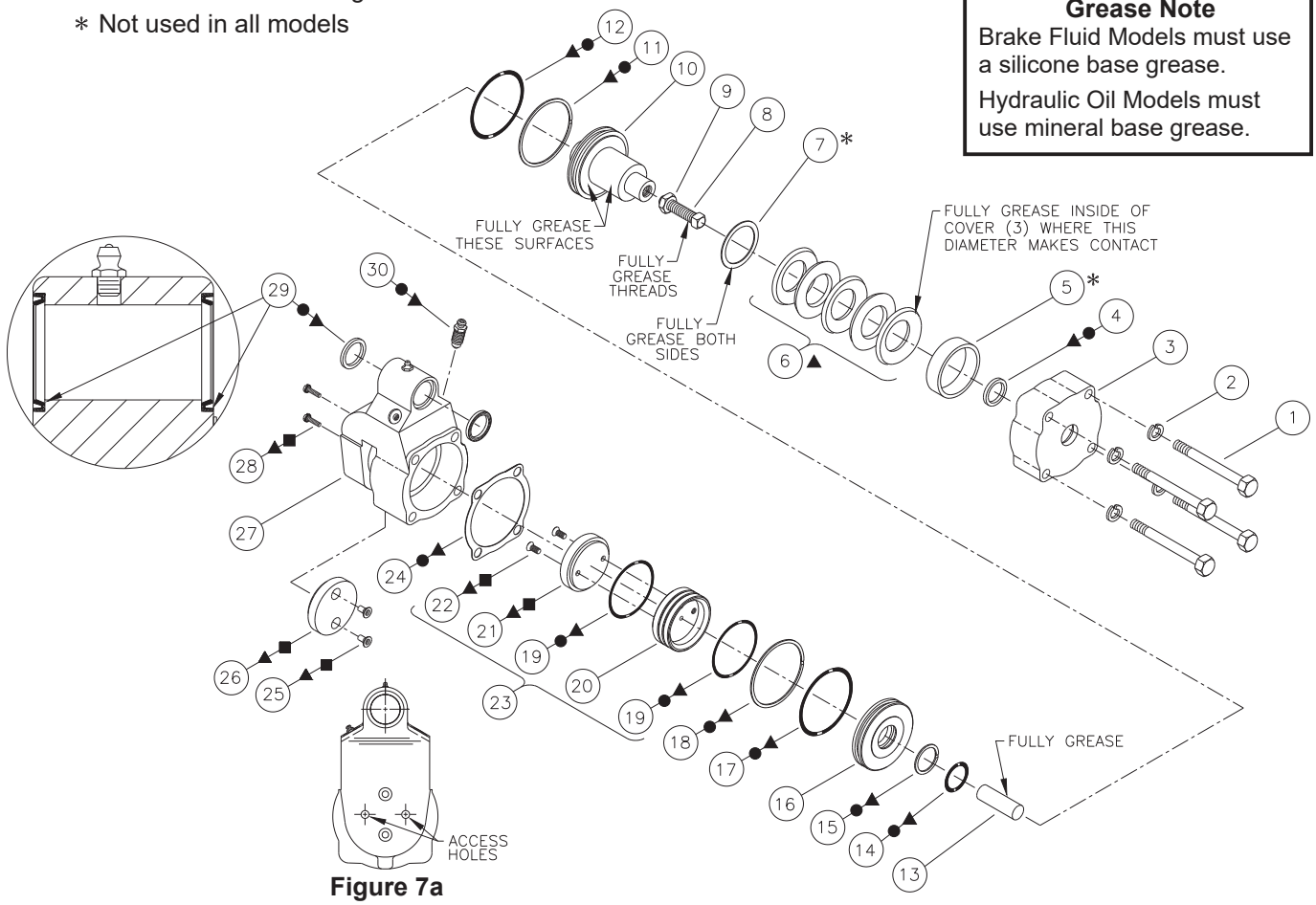


Figure 7a

FIGURE 7

CHANGE REPAIR KIT PROCEDURE

(Refer to Figure 7 on page 3)

NOTE

This literature services various models in this brake series. The components shown in Figure 7 may appear different than what is found in your brake.

When removing seals and back-up rings be careful not to scratch or mar pistons. When installing new seals in the brake, make sure the repair kit being used is the proper one for the system fluid.

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

1. Loosen lock nut (9) and back off adjusting screw (8).
2. Disconnect fluid line from the brake.

⚠ CAUTION

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

3. Remove bolts used to fasten the mounting bracket assembly to the machine. Remove brake and mounting bracket assembly from machine and remove mounting bracket assembly from the brake.
4. Place the brake in a soft jawed vise with cover (3) in a vertical position. **NOTE: Clamping should be done on the sides of the brake on the machined surfaces.**
5. Remove bleeder screw (30).
6. Using a sharp bladed tool, carefully remove two seals (29) from housing (27).
7. To remove cover (3), loosen four cap screws (1).

⚠ CAUTION

Loosen cap screws evenly and in order A, B, C, D until spring preload is released. See Figure 6 on page 3.

8. Remove cap screws (1), lock washers (2), cover (3), and gasket (24). Using a thin blade tool, remove seal (4) from cover (3).
9. Remove spacer (5), belleville springs (6), and washer (7). Note the stacking sequence of belleville springs. **NOTE: Not all models use spacer (5), or washer (7). Some models use two washers (7).**
10. Remove piston (10) from housing (27) bore. Remove o-ring (12) and back-up ring (11) from piston (10). Push rod (13) should also come out with piston (10).
11. Remove piston (16) from housing (27) bore. Remove o-rings (14 & 17) and back-up rings (15 & 18) from piston (16).
12. Remove lining assembly (23) from housing (27) bore. Holding assembly on a flat surface, separate lining (21) and piston (20) by removing flat head screws (22). Remove o-rings (19) from piston (20).
13. Loosen vise jaws and rotate brake so the disc clearance slot is facing upward. Remove pan head screws (28), lining (26), and bushings (25) from housing (27).
14. Lubricate rubber components from repair kit with clean type fluid used in the system. DO NOT LUBRICATE SEALS (29).
15. Wash all parts and housing bore thoroughly with clean type fluid used in the system and keep free of all contaminants, dirt, and debris. Linings must be kept free of oil, grease, etc. **NOTE: Use a heavy, waterproof grease to lubricate surfaces as shown in Figure 7 on page 3. See Grease Note.**
16. Install new lining (26) in housing (27) using new bushings (25) and new pan head screws (28). Torque screws (28) 2.5-3.2 N·m (22-28 lb·in).
17. Rotate brake to original position in vise.
18. Install new lining (21) on piston (20) using new flat head screws (22). Torque screws (22) 2.7-3.4 N·m (24-30 lb·in). Install new o-rings (19) on piston (20) and insert lining assembly (23) into housing (27) bore.
19. Carefully install two new seals (29) in housing (27). Note direction of seals (29). Cup side of seals (29) face outward. DO NOT LUBRICATE SEALS (29).
20. Install new bleeder screw (30) and finger tighten.
21. Install new o-rings (14 & 17) and new back-up rings (15 & 18) on piston (16). Note order of components. **NOTE: When installing back-up rings it is essential that the surfaces of diagonal splice match with each other after o-ring is installed in groove.**
22. Install piston (16) into housing (27) bore. Note direction of piston (16). **NOTE: When inserting piston, be sure not to pinch the o-ring on inlet ports.**
23. Install new back-up ring (11) and new o-ring (12) on piston (10). Note order of components. Install push rod (13) in the bore of piston (10). Install piston (10) into housing (27) bore.
24. Fully lubricate threads of adjusting screw (8) and lock nut (9) and install into piston (10).
25. Install washer (7), spacer (5), and new belleville springs (6) over the end of piston (10). Follow the stacking sequence shown in Figure 5. Not all models use spacer (5), or washer (7). Some models use two washers (7). **NOTE: The belleville spring nearest the cover must contact the cover on its outside diameter.**
26. Install new seal (4) in cover (3).
27. Install new gasket (24), cover (3), lock washers (2), and cap screws (1). Torque cap screws 29.8-36.6 N·m (22-27 lb·ft).

⚠ CAUTION

Tighten cap screws evenly and in order A, B, C, D. See Figure 6 on page 3.

28. Loosen lock nut (9) and slightly back off adjusting screw (8). Push lining assembly back into the brake housing (27). Mount brake and bracket assembly on the disc and bolt securely to the machine using SAE grade 8 or better mounting bolts with lock washers.
29. Reattach the hydraulic line. Bleed system making sure all air is eliminated. Apply rated pressure and check for leaks. Torque bleeder screw (30) 12.2-20.3 N·m (9-15 lb·ft).
30. Refer to BRAKE ADJUSTMENT PROCEDURE on page 6.

⚠ CAUTION

Do not move the machine until a firm brake pedal is obtained.

CHANGE SEAL KIT PROCEDURE

(Refer to Figure 7 on page 3)

NOTE

This literature services various models in this brake series. The components shown in Figure 7 may appear different than what is found in your brake.

When removing seals and back-up rings be careful not to scratch or mar pistons. When installing new seals in the brake, make sure the seal kit being used is the proper one for the system fluid.

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

1. Loosen lock nut (9) and back off adjusting screw (8).
2. Disconnect fluid line from the brake.

⚠ CAUTION

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

3. Remove bolts used to fasten the mounting bracket assembly to the machine. Remove brake and mounting bracket assembly from machine and remove mounting bracket assembly from the brake.
4. Place the brake in a soft jawed vise with cover (3) in a vertical position. **NOTE: Clamping should be done on the sides of the brake on the machined surfaces.**
5. Remove bleeder screw (30).
6. Using a sharp bladed tool, carefully remove two seals (29) from housing (27).
7. To remove cover (3), loosen four cap screws (1).

⚠ CAUTION

Loosen cap screws evenly and in order A, B, C, D until spring preload is released. See Figure 6 on page 3.

8. Remove cap screws (1), lock washers (2), cover (3), and gasket (24). Using a thin blade tool, remove seal (4) from cover (3).
9. Remove spacer (5), belleville springs (6), and washer (7). Note the stacking sequence of belleville springs. **NOTE: Not all models use spacer (5), or washer (7). Some models use two washers (7).**
10. Remove piston (10) from housing (27) bore. Remove o-ring (12) and back-up ring (11) from piston (10). Push rod (13) should also come out with piston (10).
11. Remove piston (16) from housing (27) bore. Remove o-rings (14 & 17) and back-up rings (15 & 18) from piston (16).
12. Remove lining assembly (23) from housing (27) bore. Remove o-rings (19) from lining assembly (23).

⚠ CAUTION

Linings must be kept free of oil, grease, etc.

13. Lubricate rubber components from seal kit with clean type fluid used in the system. DO NOT LUBRICATE SEALS (29).
14. Wash all parts and housing bore thoroughly with clean type fluid used in the system and keep free of all contaminants, dirt, and debris. Linings must be kept free of oil, grease, etc. **NOTE: Use a heavy, waterproof grease to lubricate surfaces as shown in Figure 7 on page 3. See Grease Note.**
15. Carefully install two new seals (29) in housing (27). Note direction of seals (29). Cup side of seals (29) face outward. DO NOT LUBRICATE SEALS (29).
16 Install new o-rings (19) on piston (20) and insert lining assembly (23) into housing (27) bore.
17. Install new bleeder screw (30) and finger tighten.
18. Install new o-rings (14 & 17) and new back-up rings (15 & 18) on piston (16). Note order of components. **NOTE: When installing back-up rings it is essential that the surfaces of diagonal splice match with each other after o-ring is installed in groove.**
19. Install piston (16) into housing (27) bore. Note direction of piston (16). **NOTE: When inserting piston, be sure not to pinch the o-ring on inlet ports.**
20. Install new back-up ring (11) and new o-ring (12) on piston (10). Note order of components. Install push rod (13) in the bore of piston (10). Install piston (10) into housing (27) bore.
21. Fully lubricate threads of adjusting screw (8) and lock nut (9) and install into piston (10).
22. Install washer (7), spacer (5), and new belleville springs (6) over the end of piston (10). Follow the stacking sequence shown in Figure 5. Not all models use spacer (5), or washer (7). Some models use two washers (7). **NOTE: Completely lubricate belleville springs (6) with a light coat of heavy duty, waterproof grease (see Grease Note, Figure 7). The belleville spring nearest the cover must contact the cover on its outside diameter.**
23. Install new seal (4) in cover (3).
24. Install new gasket (24), cover (3), lock washers (2), and cap screws (1). Torque cap screws 29.8-36.6 N·m (22-27 lb·ft).

⚠ CAUTION

Tighten cap screws evenly and in order A, B, C, D. See Figure 6 on page 3.

25. Loosen lock nut (9) and slightly back off adjusting screw (8). Push lining assembly back into the brake housing (27). Mount brake and bracket assembly on the disc and bolt securely to the machine using SAE grade 8 or better mounting bolts with lock washers.
26. Reattach the hydraulic line. Bleed system making sure all air is eliminated. Apply rated pressure and check for leaks. Torque bleeder screw (30) 12.2-20.3 N·m (9-15 lb·ft).
27. Refer to BRAKE ADJUSTMENT PROCEDURE on page 6.

⚠ CAUTION

Do not move the machine until a firm brake pedal is obtained.

CHANGE LINING KIT PROCEDURE

(Refer to Figure 7 on page 3)

NOTE

This literature services various models in this brake series. The components shown in Figure 7 may appear different than what is found in your brake.

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

1. Loosen lock nut (9) and back off adjusting screw (8).
2. Disconnect fluid line from the brake.

⚠ CAUTION

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

3. Remove bolts used to fasten the mounting bracket assembly to the machine. Remove brake and mounting bracket assembly from machine and remove mounting bracket assembly from the brake.
4. Place the brake in a soft jawed vise with disc clearance slot facing up. **NOTE: Clamping should be done on the sides of the brake on the machined surfaces.**
5. Remove pan head screws (28) and bushings (25). Using a thin blad tool, pry lining (26) from housing (27) and remove through disc clearance slot.
6. Rotate lining assembly (23) until screws (22) are aligned with access holes in housing (27), see Figure 7a on page 3. Remove flat head screws (22). Pry lining (21) from piston (20) and remove through disc clearance slot.
7. Install new lining (21) on piston (20) through disc clearance slot. Install new flat head screws (22) and torque 2.7-3.4 N·m (24-30 lb·in).
8. Insert new bushings (25) into new lining (26). Install new lining into housing through disc clearance slot. Line up the holes with the housing and fasten with new screws (28). Torque screws (28) 2.5-3.2 N·m (22-28 lb·in).
9. Loosen lock nut (9) and slightly back off adjusting screw (8). Push lining assembly back into the brake housing (23). Mount brake and bracket assembly on the disc and bolt securely to the machine using SAE grade 8 or better mounting bolts with lock washers.
10. Reattach the hydraulic line. Bleed system making sure all air is eliminated. Apply rated pressure and check for leaks. Torque bleeder screw (30) 12.2-20.3 N·m (9-15 lb·ft).
11. Refer to BRAKE ADJUSTMENT PROCEDURE.

⚠ CAUTION

Do not move the machine until a firm brake pedal is obtained.

BRAKE ADJUSTMENT PROCEDURE

(Refer to Figure 2 on page 2)

1. Apply rated hydraulic pressure.
2. Loosen lock nut and adjusting screw.
3. Place a 0.30 mm (0.012 in) thick shim between disc and one of the linings.
4. Tighten adjusting screw until it is just possible to remove the shim.
5. Torque lock nut 29.8-36.6 N·m (22-27 lb·ft) while holding adjusting screw with a wrench. Remove shim and release hydraulic pressure.