

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
01-530-126 (HO) 01-530-128 (HO) 01-530-131 (BF)	02-530-126 (HO) 02-530-128 (HO) 02-530-131 (BF)	03-530-126 (HO) n/a 03-530-131 (BF)	20-060-021 20-060-021 20-060-021	02-500-032 02-500-032 02-500-033	02-500-059 02-500-059 02-500-177
01-530-400 (HO) 01-530-401 (BF)	02-530-400 (HO) 02-530-401 (BF)	03-530-400 (HO) 03-530-401 (HO)	20-060-021 20-060-021	02-500-034 02-500-040	02-500-174 02-500-179
01-530-600 (HO) 01-530-601 (BF) n/a n/a n/a n/a	02-530-600 (HO) 02-530-601 (BF) n/a 02-530-604 (HO) 02-530-624 (HO) 02-530-626 (HO)	03-530-600 (HO) 03-530-601 (BF) 03-530-603 (BF) 03-530-604 (HO) n/a n/a	20-060-021 20-060-021 20-060-054 20-060-054 20-060-021 20-060-021	02-500-034 02-500-040 02-500-040 02-500-034 02-500-034 02-500-219	02-500-152 02-500-178 02-500-178 02-500-152 02-500-152 02-500-220

HO = Mineral Base Hydraulic Oil BF = Automotive Brake Fluid

* Belleville springs are pre-greased. DO NOT remove grease from springs. See GREASE NOTE on page 4, Figure 8 and page 5, Figure 10.

NOTE: If your product number is not listed, please 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 12.7 mm (0.50 in).

⚠ CAUTION

Minimum recommended disc thickness for this brake is 11.1 mm (0.438 in). For other disc thicknesses, contact ZF Off-Highway Solutions Minnesota Inc.

MOUNTING PROCEDURE

1. Figures 2 and 3 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

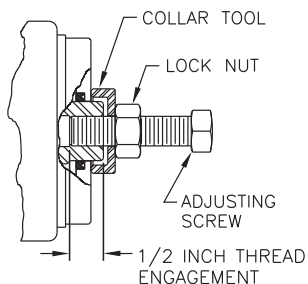


FIGURE 1

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 4 and 5 on page 2, determine "A" dimension and locate mounting bracket assembly holes.

NOTE

The mounting procedures differ for the 530-100 series brakes and the 530-400, 530-600 series brakes. Mounting the 530-100 series brakes will require using the collar tool provided with the brake when purchased. It is also provided in lining kits, seal kits, and repair kits. See Figure 1. This tool is used to retract the piston until sufficient clearance is obtained between the linings, which allows the brake to slide over the disc.

3. See appropriate mounting information for your brake.

530-100 SERIES BRAKES

Assemble lock nut, adjusting screw, and collar tool as shown in Figure 1 and thread into piston approximately 12.7 mm (0.50 in). Tighten lock nut until piston is retracted. Push lining assembly into brake housing.

530-400 and 530-600 SERIES BRAKES

Install lock nut and adjusting screw into piston. Push lining assembly into 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.

NOTE
 Dimensions shown in Figures 2 and 3 are typical for all models. Mounting surface to disc face dimension is typical of rectangular and triangular brackets. Mounting bolts not included.

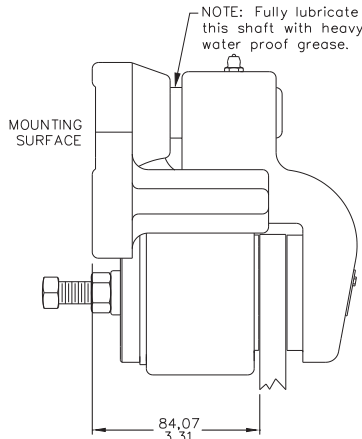


FIGURE 2

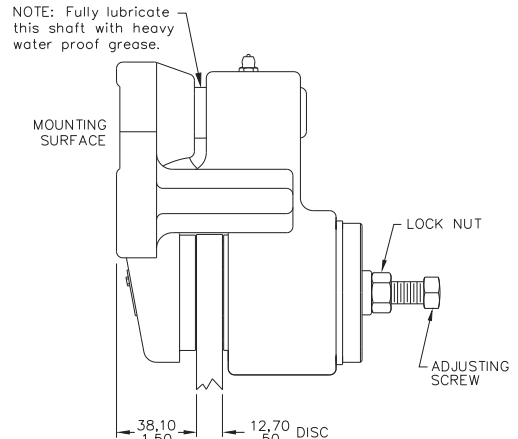


FIGURE 3

millimeters
inches

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

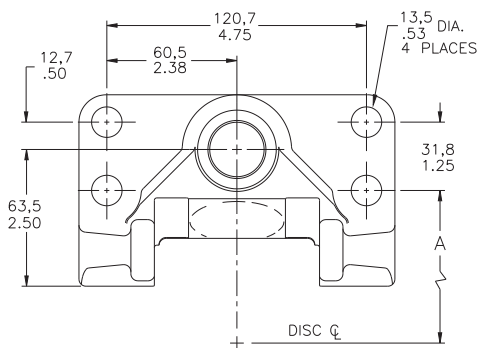


FIGURE 4
(rectangular mount)

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.

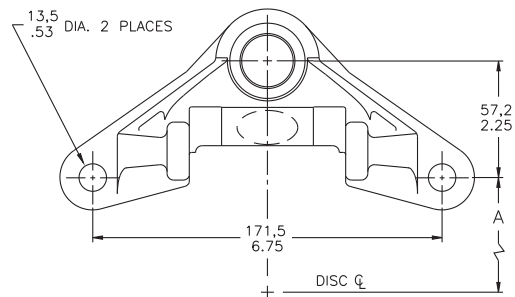


FIGURE 5
(triangular mount)

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.

millimeters
inches

PLUMBING PROCEDURE

1. After the brake is mounted on machine, install the 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).

CHANGE LINING KIT PROCEDURE

(Refer to Figure 6)

See **TABLE 1** for kit required for your brake.

NOTE

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

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

CAUTION

Cap the 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 and bushings. Using a thin blade tool, pry lining from housing and remove through the disc clearance slot.
6. Force lining assembly from housing by advancing adjusting screw. Remove lining assembly through the disc clearance slot.
7. Lubricate new lining assembly seal with clean type fluid used in the system and install the new lining assembly into the housing through disc clearance slot. Back off adjusting screw to allow room for new lining assembly.
8. Insert new bushings into the new lining. Install new lining into housing through disc clearance slot. Line up the holes with the housing and fasten with new screws. Torque screws 2.8-4.0 N·m (25-35 lb·in).
9. Reinstall brake on machine as described in MOUNTING PROCEDURE Section (steps 3 and 4), and PLUMBING PROCEDURE Section.
10. Adjust brake as described in BRAKE ADJUSTMENT PROCEDURE Section.

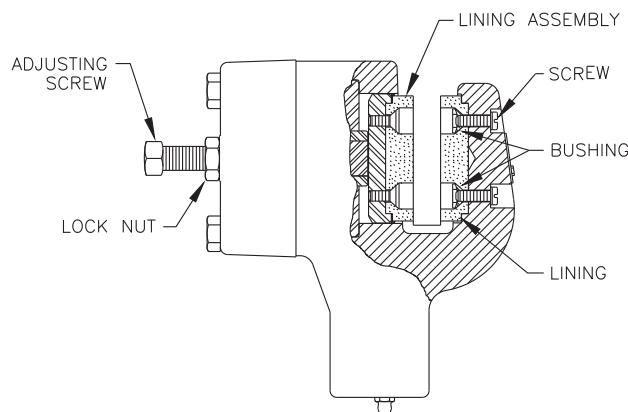


FIGURE 6

BRAKE ADJUSTMENT PROCEDURE

(Refer to Figure 7)

CAUTION

The collar tool on the 530-100 series brakes will have to be reversed before proceeding. See Figure 7.

1. Apply rated hydraulic pressure.
2. Loosen lock nut and adjusting screw.
3. Place a 0.31 mm (0.012 in) thick shim between the 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 the shim and release hydraulic pressure.

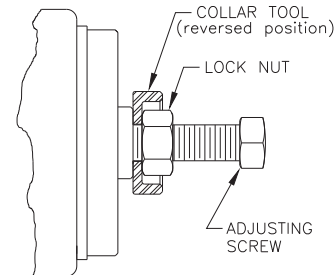


FIGURE 7

530-100 SERIES BRAKES

CHANGE SEAL KIT or REPAIR KIT PROCEDURE

(Refer to Figure 8 on page 4)

See **TABLE 1** for kit required for your brake. If repair kit is being installed see Change Lining Kit Procedure.

NOTE

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 kit used is the correct one for the system fluid used.

1. Loosen lock nut (6) and back-off adjusting screw (5).
2. Disconnect fluid line from the brake.

CAUTION

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

3. Remove the 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. Drain fluid from brake.
4. Place the brake in a soft jawed vise with end plug (1) in a vertical position. **NOTE: Clamping should be done on the sides of the brake on machined surfaces.**
5. Remove end plug (1) and spacer (2) using a spanner wrench. Using a thin blade tool, remove seal (3) from end plug (1).
6. Remove Belleville springs (4). Note stacking sequence of the Belleville springs.
7. Remove piston (7) from housing (19) bore. Remove o-ring (9) and back-up ring (8) from piston. Push rod (10) should also come out with piston (7).

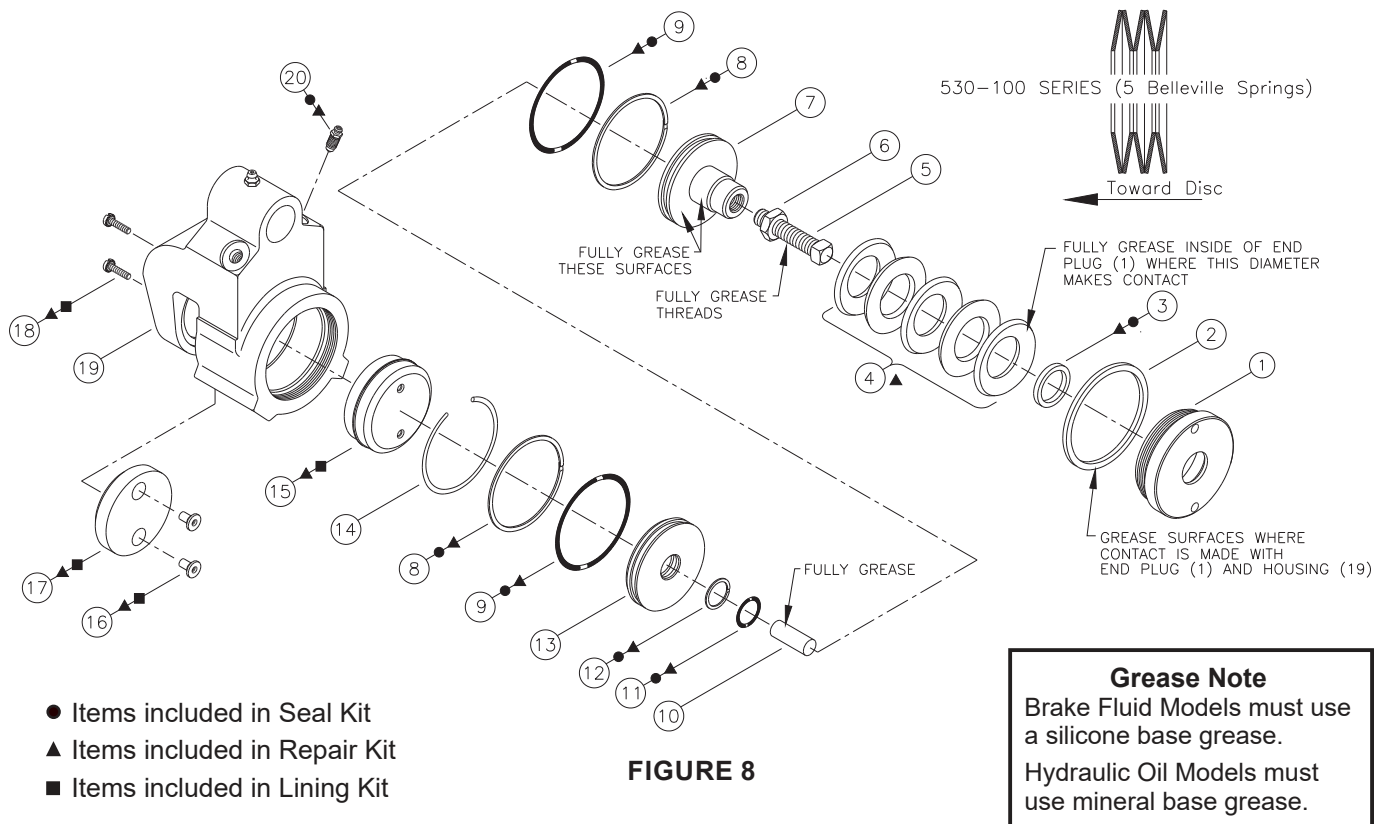
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8. Remove piston (13) from housing (19) bore. Remove o-rings (11 & 9) and back-up rings (12 & 8) from piston.
9. Remove bleeder screw (20).
10. Lubricate all rubber components from the seal kit or repair kit with clean type fluid used in the system.
11. Clean all parts and housing bore thoroughly with clean type fluid used in the system and keep free of all contaminants, dirt, and debris. **NOTE: Use a heavy, water proof grease to lubricate surfaces as shown in Figure 8. See Grease Note.**
12. Install new bleeder screw (20) and finger tighten.
13. Install new o-rings (9 & 11) and new back-up rings (12 & 8) on piston (13). Note the order of components. **NOTE: When installing back-up rings it is essential that surfaces of diagonal splice match with each other after back-up ring is installed in groove.**
14. Install piston (13) into housing (19) bore. Note direction of piston. **NOTE: When installing piston, be careful not to pinch o-ring on inlet ports.**
15. Install new back-up ring (8) and new o-ring (9) on piston (7). Note the order of components. Make sure push rod (10) is in the bore of piston (7). Install piston (7) into housing (19) bore.

16. Fully lubricate threads of adjusting screw (5) and lock nut (6) and install into piston (7).
17. Install Belleville springs (4) over the end of piston (7). Follow the stacking sequence shown in Figure 8. **NOTE: If seal kit is being installed use the existing Belleville springs after completely lubricating them with a light coat of heavy, water proof grease. See Grease Note. If repair kit is being installed use new Belleville springs, already greased. Note that the Belleville spring nearest the end plug must contact the end plug on its outside diameter.**
18. Install new seal (3) in end plug (1).
19. Install spacer (2) and end plug (1). Torque end plug (1) to approximately 20.3 N·m (15 lb-ft).
20. To continue assembly refer to MOUNTING PROCEDURE Section (steps 3 and 4), PLUMBING PROCEDURE Section, and BRAKE ADJUSTMENT PROCEDURE Section.

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

530-100 SERIES BRAKES



530-400 and 530-600 SERIES BRAKES

CHANGE SEAL KIT or REPAIR KIT PROCEDURE

(Refer to Figure 10)

See **TABLE 1** for kit required for your brake. If repair kit is being installed see Change Lining Kit Procedure.

NOTE

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 kit used is the proper one for the system fluid used.

1. Loosen lock nut (7) and back-off adjusting screw (6).
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 machine. Remove brake and mounting bracket assembly from machine and remove mounting bracket assembly from brake. Drain fluid from 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. 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.

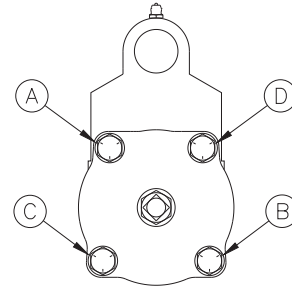


FIGURE 9

6. Remove cap screws (1), lock washers (2), and cover (3). Using a thin blade tool, remove seal (4) from cover (3).
7. Remove belleville springs (5). Note stacking sequence of the belleville springs.
8. Remove piston (10) from housing (18) bore. Remove o-ring (9) and back-up ring (8) from piston. Push rod (11) should also come out with piston (10).
9. Remove piston (14) from housing (18) bore. Remove o-rings (12 & 9) and back-up rings (13 & 8) from piston.

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530-400 and 530-600 SERIES BRAKES

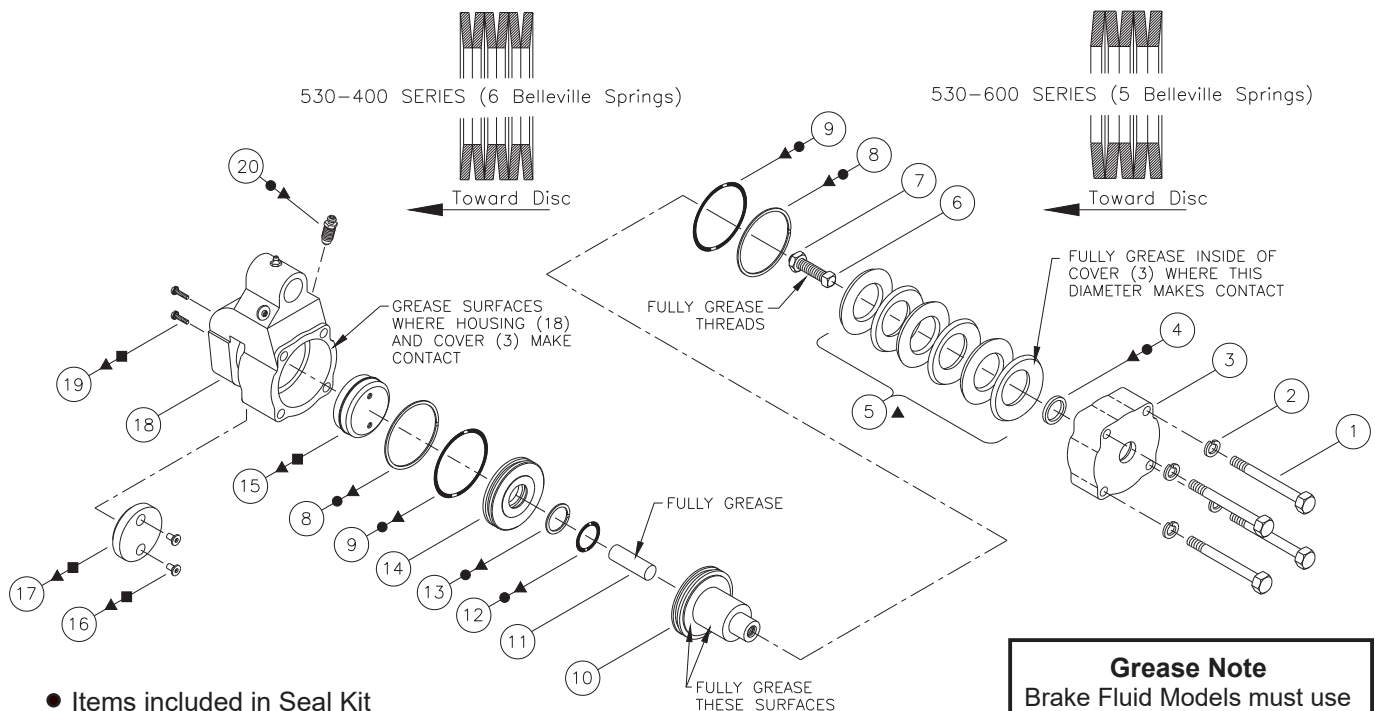


FIGURE 10

Grease Note

Brake Fluid Models must use a silicone base grease.
Hydraulic Oil Models must use mineral base grease.

10. Remove bleeder screw (20).
11. Lubricate all rubber components from the seal kit with clean type fluid used in the system.
12. Clean all parts and housing bore thoroughly with clean type fluid used in the system and keep free of all contaminants, dirt, and debris. **NOTE: Use a heavy, waterproof grease to lubricate surfaces as shown in Figure 10 on page 5. See Grease Note.**
13. Install new bleeder screw (20) and finger tighten.
14. Install new o-rings (9 & 12) and new back-up rings (8 & 13) on piston (14). Note the 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.**
15. Install piston (14) into housing (18) bore. Note direction of piston. **NOTE: When inserting piston, be careful not to pinch the o-ring on inlet ports.**
16. Install new back-up ring (8) and new o-ring (9) on piston (10). Note the order of components. Install push rod (11) in the bore of piston (10). Install piston (10) into housing (18) bore.
17. Fully lubricate threads of adjusting screw (6) and lock nut (7) and install into piston (10).

18. Install belleville springs (5) over the end of piston (10). Follow the stacking sequence shown in Figure 10 on page 5. **NOTE: If seal kit is being installed use the existing belleville springs after completely lubricating with a light coat of heavy, waterproof grease. See Grease Note, Figure 10 on page 5. If repair kit is being installed use new belleville springs, already greased. Note that the belleville spring nearest the cover must contact the cover on its outside diameter.**
19. Install new seal (4) in cover (3).
20. Install cover (3), lock washers (2), and cap screws (1). Torque cap screws to 29.8-36.6 N·m (22-27 lb·ft).

⚠ CAUTION

Tighten cap screws evenly and in order A, B, C, D.
See Figure 9 on page 5.

21. To continue assembly refer to MOUNTING PROCEDURE Section (steps 3 and 4), PLUMBING PROCEDURE Section, and BRAKE ADJUSTMENT PROCEDURE Section.

⚠ CAUTION

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

NOTES

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