MULTIPLE DISC BRAKE

(dry design - SAE B size)

Service Instructions

NOTE:

This service sheet covers model number:

13-100-009

REPAIR KITS

(Refer to Figure 1 for item numbers)

Number	Description	Includes
12-501-411	Repair Kit for 13-100-009	Case Seal (4) O-rings (5 & 8) Back-up Rings (6 & 9) Stator Disc (11) Rotor Disc (12) Return Plate (13) Springs (14) Oil Seal (17) Bearing (18) Retaining Ring (19) Retaining Ring (20)

NOTE: The repair kit includes a mounting face gasket and an o-ring. Some motors and gearboxes allow for the use of the o-ring to seal the mounting faces on either side of the brake. Do not use the o-ring and face gasket together to seal a mounting face.

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NOTE

This literature services various models in this brake series. The components shown in Figures 1 and 2 may appear different than what is found in your brake.

DISASSEMBLY

(Refer to Figures 1 and 2)

1. Remove pressure plate (3) from cover (16) by removing cap screws (1) and washers (2).

⚠ CAUTION

Pressure plate is under spring tension of approximately 907 kgf (2000 lb). The two cap screws must be loosened evenly to relieve this force. If a hydraulic press is available, 1361 kgf (3000 lb) maximum, the pressure plate can be held in position while removing the cap screws. Cover plate (16) must be supported as indicated in Figure 1.

2. Remove case seal (4) from cover (16).
3. Remove piston (7) from pressure plate (3).
4. Remove o-ring (5), back-up ring (6), o-ring (8) and back-up ring (9) from piston (7).
5. Remove stator disc (11), rotor disc (12) and return plate (13) from cover (16).
6. Before removing springs (14), note the spring pattern and spring color for reassembly purposes. Remove dowel pins (15) and springs (14) from cover plate (16).
7. Remove retaining ring (19) from cover plate (16).
8. Remove shaft (10) by pressing or using a soft mallet on male end of shaft (10). **NOTE: Cover plate (16) must be supported as indicated in Figure 1.**
9. Remove retaining ring (20) from cover plate (16) and press out oil seal (17) and bearing (18) if required. **NOTE: Cover plate (16) must be supported as indicated in Figure 1.**

ASSEMBLY

(Refer to Figures 1 and 2)

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

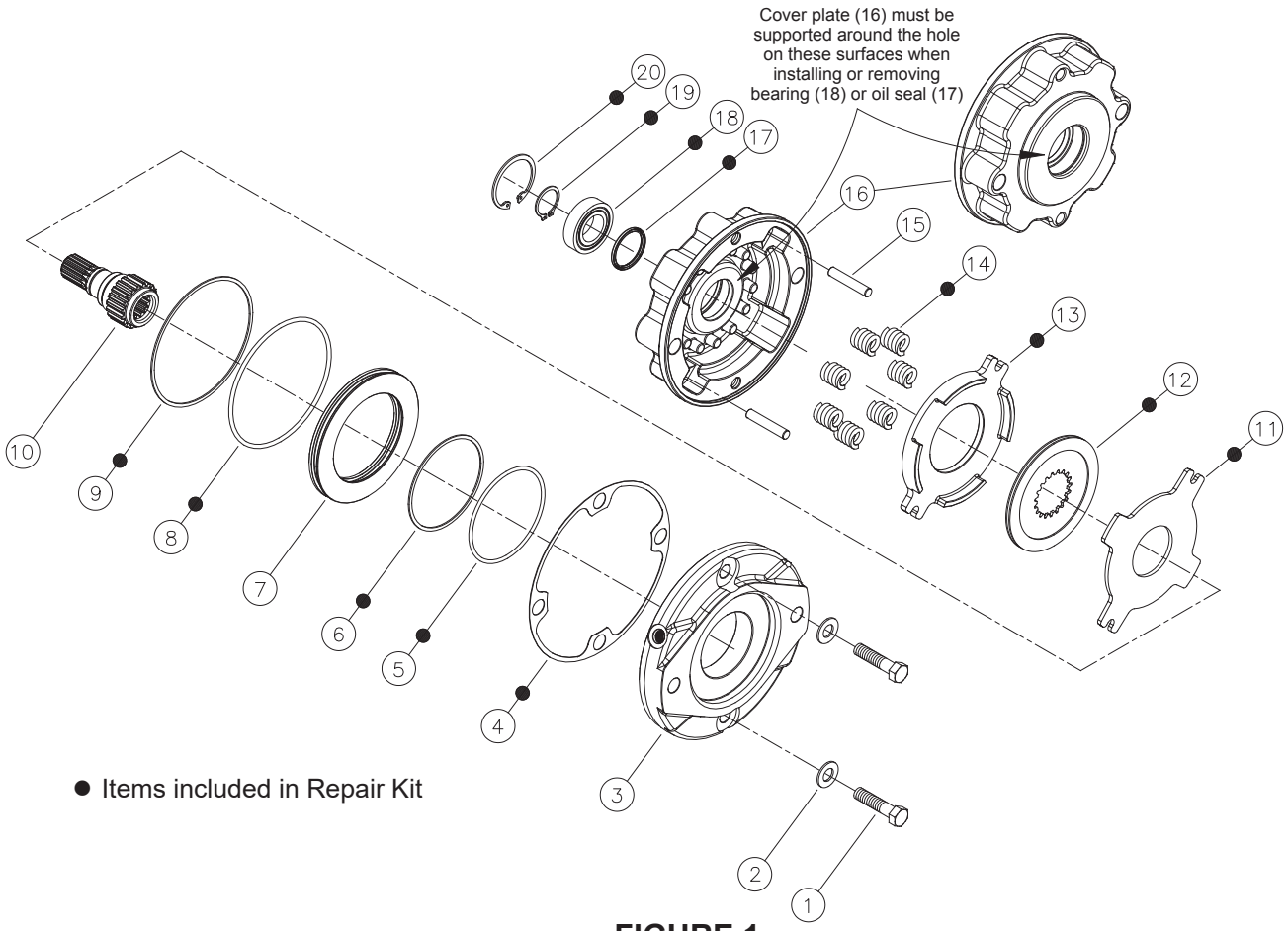
1. Use an alkaline wash to clean parts before assembly.
2. Press new oil seal (17) into cover plate (16) until it is flush with bearing shoulder. Note direction of oil seal (17).
3. Press new bearing (18) into position until it bottoms out on borestep. **NOTE: Cover plate (16) must be supported as indicated in Figure 1.**
4. Install new retaining ring (20) in cover plate (16).
5. Press shaft (10) into bearing (18) until it bottoms on shoulder. **NOTE: Bearing (18) inner race and cover plate (16) must be supported as indicated in Figure 1 during this operation.**
6. Install new retaining ring (19) on shaft (10).
7. Install dowel pins (15) and new springs (14) in cover plate (16). Be sure to use the same number of springs and spring pattern as recorded during disassembly. Contact ZF Off-Highway Solutions Minnesota Inc. if you have questions regarding the spring pattern.
8. Position new return plate (13) on springs (14). **NOTE: Return plate (13), rotor disc (12), and stator disc (11) must remain dry during installation. No oil residue must be allowed to contaminate friction surfaces.**
9. Install new rotor disc (12) and new stator disc (13).
10. Install new o-rings (5 & 8) and new back-up rings (6 & 9), on piston (7). Note the order of o-rings and back-up rings. Install piston (7) into pressure plate (3). **NOTE: Be careful not to shear o-rings or back-up rings. Be careful not to scratch or mar piston.**
11. Install new case seal (4) in cover plate (16).
12. Position pressure plate (3) on cover plate (16) aligning dowel pins (15) with holes in pressure plate (3).
13. Install two cap screws (1) and two washers (2) and tighten evenly to draw pressure plate (3) to cover plate (16). Torque cap screws 65.1-67.8 N·m (48-50 lb·ft). **NOTE: A hydraulic press will simplify installation of pressure plate on cover. Clamp pressure plate in position while tightening the cap screws. Cover plate (16) must be supported as indicated in Figure 1.**

⚠ CAUTION

If hydrostatic bench testing is performed on the brake assembly, release pressure must not exceed 134.5 bar (500 PSI).

SPRING CHART

Model Number	Red Springs (14)	Blue Springs (14)
13-100-009	5	2



● Items included in Repair Kit

FIGURE 1

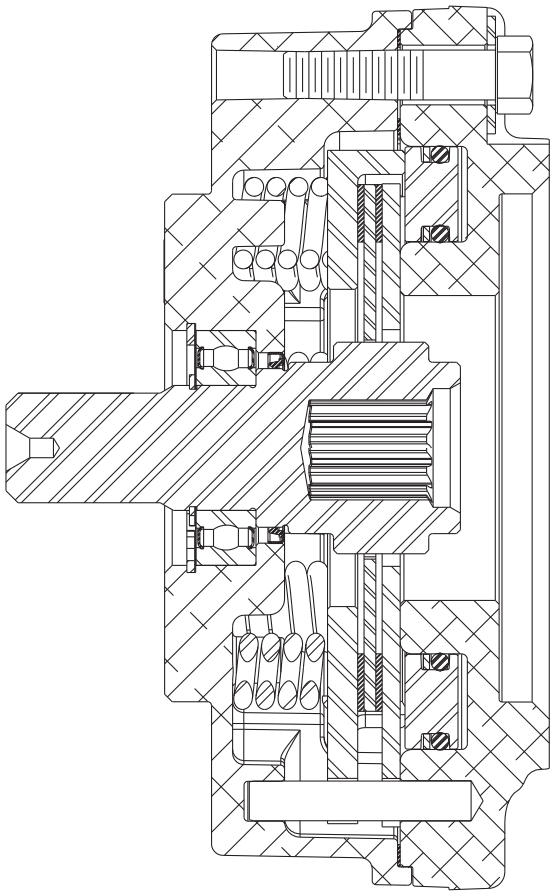


FIGURE 2

BLEEDING

1. Install brake in system and connect pressure lines.
2. Bleed pressure release section of brake by pressurizing side inlet port and allowing air to escape from top port. Pressure should not exceed 6.89 bar (100 PSI) during bleeding.
3. Apply sufficient pressure to release brake and check for proper operation in system.

SERVICE DIAGNOSIS

PROBLEM	CAUSE	EXPLANATION	ACTION
Brake slips	A. Excessive pressure in hydraulic system	If there is back pressure in the actuation line of the brake, holding torque will be reduced.	Check filters, hose size, restrictions in other hydraulic components.
	B. Oil in brake designed for dry use	Dry linings generate 50% more torque than linings saturated with oil. If the brake has oil in it, check the type of oil. 1. Gearbox oil 2. Hydraulic oil	Replace oil seal in brake. Check motor seal. Check piston seals. **NOTE: Internal components will need to be inspected, cleaned, and replace as required.**
	C. Disc plates worn	The thickness of the disc stack sets the torque level. A thin stack reduces torque.	Check disc thickness and contact ZF Off-Highway Solutions Minnesota Inc.
	D. Springs broken or have taken permanent set	Broken or set springs can cause reduced torque, a rare occurrence.	Check release pressure and contact ZF Off-Highway Solutions Minnesota Inc. (May need servicing with a new kit).
Brake drags or runs hot	A. Low actuation pressure	The brake should be pressurized to a minimum of 1.38 bar (20 PSI) over the full release pressure under normal operating conditions. Lower pressures will cause the brake to drag thus generating heat.	Attach pressure gauge to bleed port and check pressure with system on.
	B. Bearing failure	If the bearing should fail, a large amount of drag can be generated.	Replace the bearing. Refer to kit on page 1.
Brake will not release	A. Stuck or clogged valve	Brakes are designed to come on when system pressure drops below stated release pressure. If pressure cannot get to the brake, the brake will not release.	Attach pressure gauge to bleed port. Check for adequate pressure. Replace defective line or component.
	B. Bad o-rings	If release piston will not hold pressure, the brake will not release.	Replace o-rings. Refer to kit on page 1.
	C. Discs frozen	These brakes are designed for only limited dynamic braking. A severe emergency stop or prolonged reduced release pressure operation may result in this type of damage.	Replace disc stack. Refer to kit on page 1.