MULTIPLE DISC BRAKE

(dry design - SAE B size)

Service Instructions

NOTE:
This service sheet covers model number:
13-100-036

REPAIR KITS

(Refer to page 3 for item numbers)

Number	Description	Includes
12-501-417	Repair Kit	Case Seal (4) O-rings (5 & 8) Back-up Rings (6 & 9) Stator Disc (11) Rotor Disc (12) Return Plate (13) Springs (14)

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

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DISASSEMBLY
(Refer to Figures 1 and 2)

1. Remove shaft (10).
2. Remove pressure plate (3) from cover plate (16) by removing cap screws (1) and washers (2).

⚠ CAUTION

Pressure plate (3) is under spring tension of approximately 454 kgf (1000 lb). The two cap screws must be loosened evenly to relieve this force. If a hydraulic press is available, 544 kgf (1200 lb) maximum, the pressure plate can be held in position while removing the cap screws.

3. Remove case seal (4) from cover plate (16).
4. Remove piston (7) from pressure plate (3).
5. Remove o-ring (5), back-up ring (6), o-ring (8) and back-up ring (9) from piston (7).
6. Remove stator disc (11), rotor disc (12) and return plate (13) from cover (16).
7. Remove dowel pins (15) and springs (14) from cover plate (16). **NOTE: Not all models use the same number of springs or spring pattern. Record this information for assembly purposes.**

ASSEMBLY
(Refer to Figures 1 and 2)

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

1. Insert dowel pins (15) and springs (14) in cover plate (16). **NOTE: 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.**
2. Position return plate (13) on springs (14). **NOTE: Discs (11 & 12) and return plate (13) must remain dry during installation. No oil residue must be allowed to contaminate disc surfaces.**
3. Install rotor disc (12) and stator disc (13).
4. Install o-ring (5), back-up ring (6), o-ring (8) and back-up ring (9) on piston (7). Note order of o-rings and back-up rings. Insert 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.**
5. Install new case seal (4) in cover plate (16).
6. Position pressure plate (3) on cover plate (16) aligning dowel pins (15) with holes in pressure plate.
7. Install cap screws (1) and 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). See Figure 2. **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.**

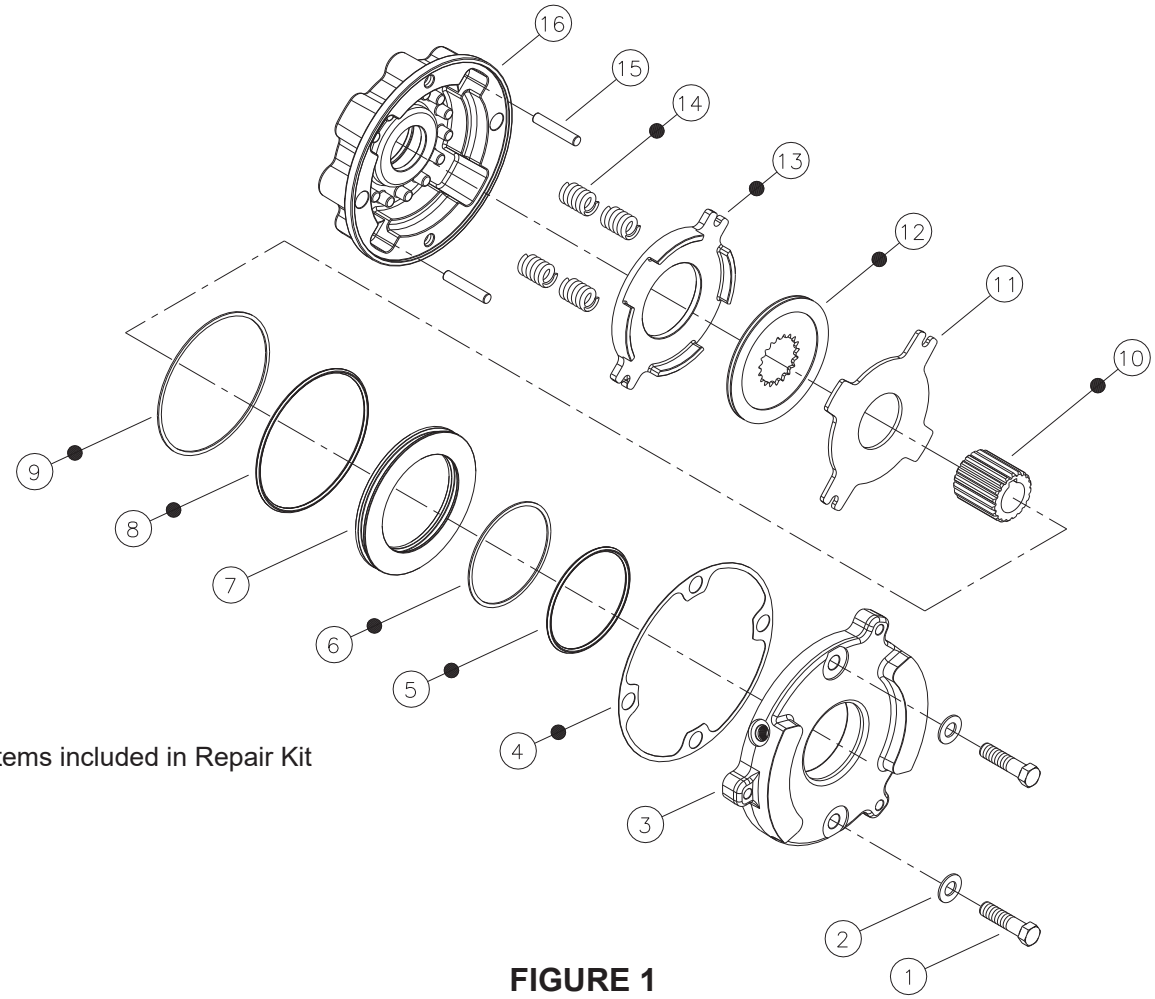
⚠ CAUTION

If hydrostatic bench testing is performed on the brake assembly, release pressure must not exceed 24.1 bar (350 PSI) unless two additional bolts are used for supplemental clamping.

8. Install shaft (10).

SPRING CHART

Model Number	Red Springs (14)	Blue Springs (14)
13-100-036	4	0



● Items included in Repair Kit

FIGURE 1

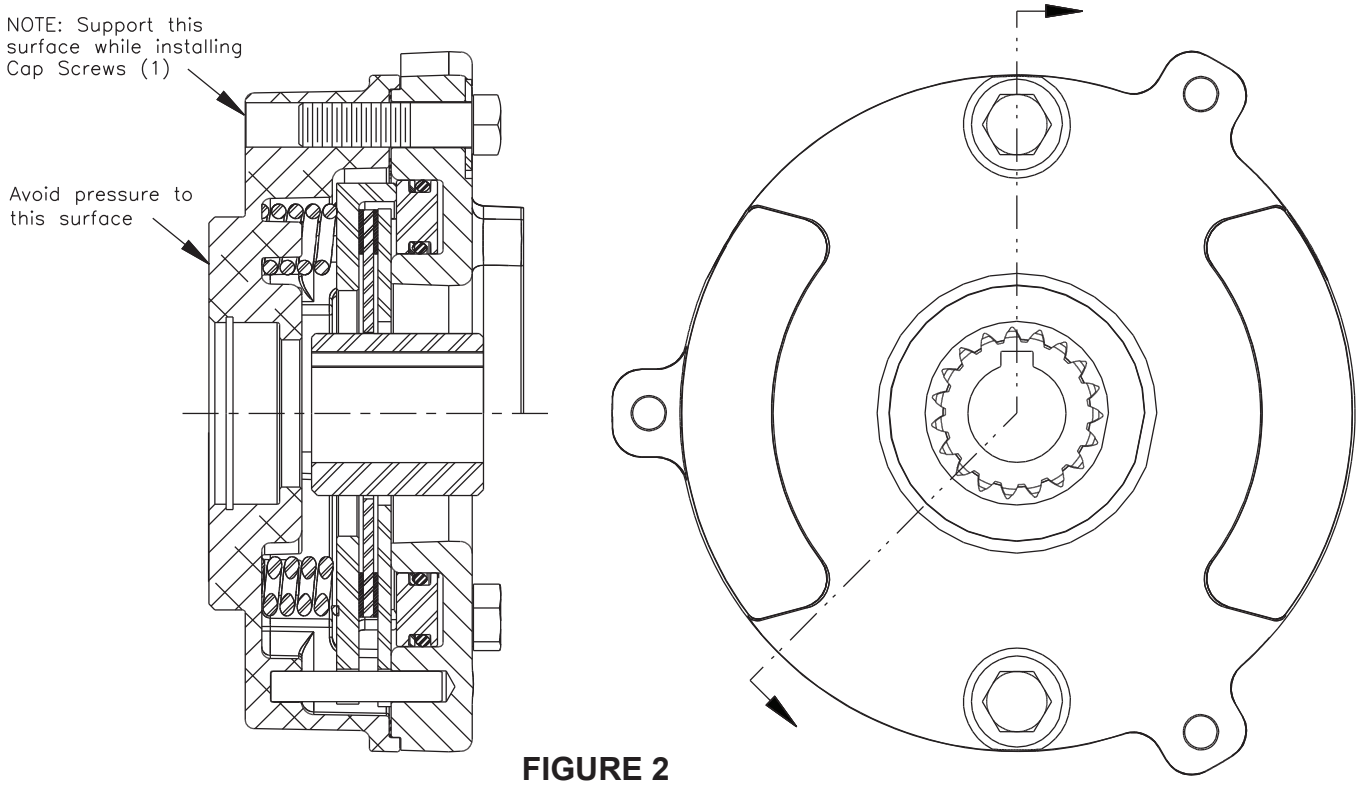


FIGURE 2

BLEEDING

1. Install brake in system and connect pressure lines.
2. Bleed the pressure release section of the brake by pressurizing the side inlet port and allowing air to escape from the 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 a brake designed for dry use	Wet linings generate 67% of the dry torque rating. 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 have broken or have taken a 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.
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.