Modular
MULTIPLE DISC BRAKE
(SAE A Mount Gearbox)

Service Instructions

NOTE:

This service sheet covers model numbers:

13-538-368
13-538-380

REPAIR KITS
(Refer to page 3 for item numbers)

Number	Description	Includes
12-501-354	Lining Kit	Case Seals (3) Rotor Discs (12) Stator Discs (13) Primary Stator (14) Loctite
12-501-355	Spring Kit	Case Seals (3) Springs (9) Loctite
12-501-353	O-ring and Back-up Ring Kit	Case Seals (3) O-rings (4 & 6) Back-up Rings (5 & 7) Loctite

ZF Off-Highway Solutions Minnesota Inc.
1911 Lee Boulevard / North Mankato, MN U.S.A. 56003
Tel: +1 507 625 6426 **Fax:** +1 507 625 3212

Form No. 81-538-003 Revised 2016-11-08

DISASSEMBLY

(Refer to Figures 1, 2, and 3)

1. Remove two socket head screws (1) from pressure plate (2). A suitable holding fixture is useful to keep the brake in position.
2. Remove pressure plate (2) and spring plate (10) assembly from cover (16).
3. Remove four socket head shoulder bolts (15). A suitable holding fixture is useful to hold the brake in position.

⚠ CAUTION

Do not remove shoulder bolts without pressurization of the brake, approximately 20.7 bar (300 PSI), or damage may result.

4. Remove primary stator (14), rotor discs (12), and stator discs (13).
5. Release pressure to the brake before removing four socket head cap screws (11).
6. Remove case gasket (3) from spring plate (10).
7. Before removing springs (9), note the pattern and color for reassembly purposes.
8. Remove piston (8) by carefully applying hydraulic pressure through brake release port on pressure plate (2).
9. Remove o-rings (4 & 6) and back-up rings (5 & 7) from piston (8). **NOTE: Be careful not to scratch or mar piston (8).**
10. Remove case gasket (3) from pressure plate (2).

ASSEMBLY

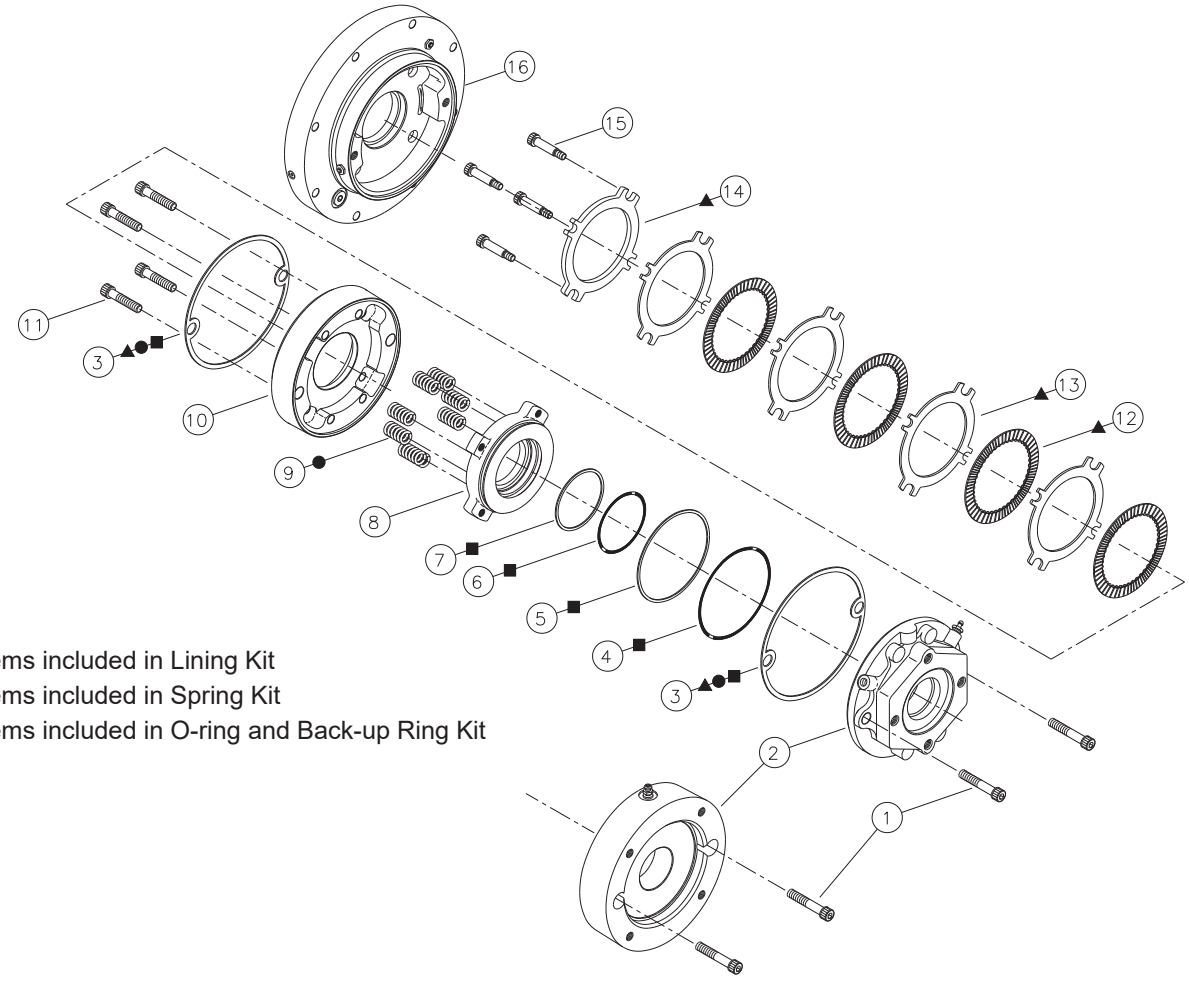
(Refer to Figures 1, 2, and 3)

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. Install back-up rings (5 & 7) on piston (8) toward spring pockets.
3. Install o-rings (4 & 6) on piston (8). Be sure o-rings are flat and all twists removed. **NOTE: Be careful not to scratch or mar piston.**
4. Lubricate piston (8) with clean type fluid used in the system. Carefully press piston into pressure plate (2). Be sure piston is oriented so threaded holes in piston are aligned with through holes in spring plate (10) when installed.
5. Install springs (9) according to pattern and color noted during disassembly. Different colored springs must be alternated. Contact ZF Off-Highway Solutions Minnesota Inc. if you have questions regarding the spring pattern.
6. Affix case gaskets (3) to pressure plate (2) and spring plate (10).
7. Place pressure plate (2) assembly on a press. Using fixture, depress spring plate (10) and install four socket head assembly bolts (11). **NOTE: Apply two drops of Loctite #242 to threads.** Torque bolts 47.5-54.2 N·m (35-40 lb·ft). A suitable holding fixture is useful to hold the brake in position.
8. Install rotor discs (12) and stator discs (13). Begin with a rotor disc (12) and alternate with stator discs (13). The last stator disc is assembled next to primary stator (14).
9. Install primary disc (14).
10. Align pressure plate (2) and spring plate (10) assembly with cover (16). Install two socket head cap screws (1) and torque 108.5-122.0 N·m (80-90 lb·ft).

⚠ CAUTION

If hydrostatic bench testing is performed on the brake assembly, release pressure should not exceed 69.0 bar (1000 PSI) unless two additional bolts are used for supplemental clamping.



▲ Items included in Lining Kit
● Items included in Spring Kit
■ Items included in O-ring and Back-up Ring Kit

FIGURE 1

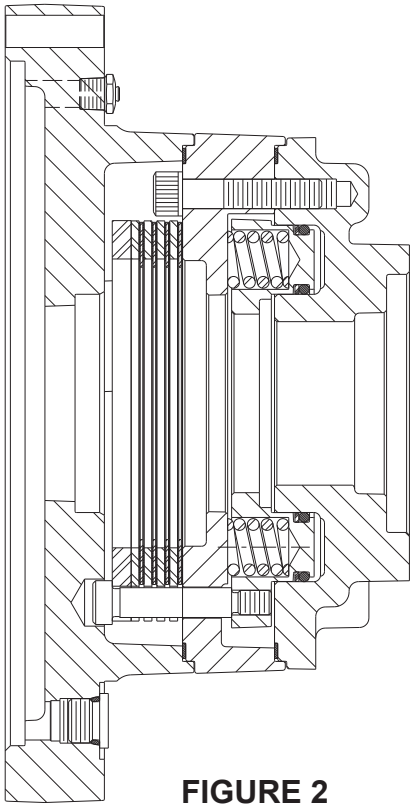


FIGURE 2
(model number 13-538-368)

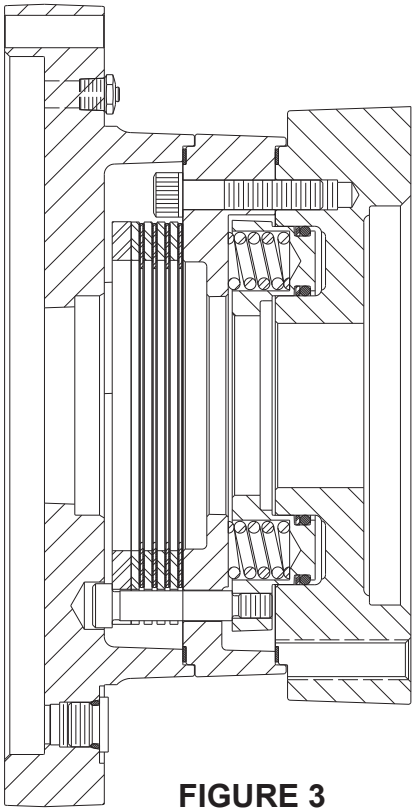


FIGURE 3
(model number 13-538-380)

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 6.9 bar (100 PSI) during bleeding.
3. Apply sufficient pressure to release the brake and check for proper operation in the 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 if 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 hydraulic or gearbox. 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 replaced as required.**
	C. Disc plates worn	The thickness of the disc stack sets the torque level. A thin stack reduces torque.	Check disc thicknesses and contact ZF Off-Highway Solutions Minnesota Inc..
	D. Springs 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 new spring kit).
Brake drags or runs hot	A. Low actuation pressure	The brake should be pressurized to 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 in bleed port and check pressure with system on.
	B. Bearing failure in gearbox	If a bearing should fail, a large amount of drag can be generated.	Replace the bearing.
	C. Oil in the brake	Excess fill of oil in sump condition through wet brakes can cause the unit to run hot. Also excessive RPM in sump condition.	Drain oil and refill as specified for brake. Switch to flow through cooling.
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 can not get to brake, the brake will not release.	Attach pressure gauge to the bleed port. Check for adequate pressure. Replace defective line or component.
	B. Bad o-rings	If release piston will not hold pressure, brake will not release.	Replace o-rings. Refer to kits 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 kits on page 1.