MULTIPLE DISC BRAKE
(dry design)

Service Instructions

NOTE:
This service sheet covers model number: 13-547-488

REPAIR KIT
(Refer to page 3 for item numbers)

Number	Description	Includes
12-501-421	Repair Kit for 13-547-488	Case Seals (3) O-rings (4 & 6) Back-up Rings (5 & 7) Springs (9) Stator Discs (12) Rotor Discs (13) Primary Stator (14)

NOTE: The repair kit includes mounting face gaskets, not shown.

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DISASSEMBLY

(Refer to Figures 1 and 2)

1. Remove four socket head cap screws (1).
2. Tap on spring plate (10) with a soft mallet to separate cover plate (17) from spring plate (10). Remove case seal (3) from cover plate (17). Remove spline shaft (16). If sections will not separate, use a screwdriver to carefully pry the sections apart.
3. Remove four socket head shoulder bolts (15). A suitable holding fixture is useful to hold brake in position.

⚠ CAUTION

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

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

ASSEMBLY

(Refer to Figures 1 and 2)

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

1. Clean all parts thoroughly before assembling.
2. Install new back-up rings (5 & 7) and new o-rings (4 & 6) on piston (8). Back-up rings are on the spring pocket side of piston (8). Be sure o-rings are flat and all twists are removed. **NOTE: Be careful not to scratch or mar piston.**
3. Lubricate piston (8) with clean type fluid used in the system. Carefully press piston into pressure plate (2). Be sure piston (8) is positioned so that the threaded holes in the piston are aligned with the through holes in spring plate (10) when installed.
4. Install new springs (9) in the spring pockets on piston (8). Be sure to install springs according to pattern recorded during disassembly. Contact ZF Off-Highway Solutions Minnesota Inc. if you have questions regarding spring pattern.
5. Affix new case seal (3) to spring plate (10).
6. Place unit on a press. A suitable fixture is useful to hold the brake in position. Depress and install two socket head cap screws (11). Apply two drops of Loctite #242 to threads and torque 47.5-54.2 N·m (35-40 lb·ft).
7. Install new rotor discs (13) and new stator discs (12) in the same sequence as shown in Figure 1. Install new primary stator (14). **NOTE: Be careful to avoid contaminating friction surfaces with oil.**
8. Align the discs and partially screw in four socket head shoulder bolts (15). A suitable holding fixture is useful to hold brake in position. Apply two drops of Loctite #242 to threads of shoulder bolts (15). Inspect for free movement of stack. Pressurize brake release port approximately 20.7 bar (300 PSI) to release discs. Torque shoulder bolts 20.3-24.4 N·m (15-18 lb·ft).
9. Affix new case seal (3) to cover plate (17) and install cover plate (17) on spring plate (10). Apply two drops of Loctite #242 to threads of socket head cap screws (1). Install socket head cap screws (1) and evenly torque 115.3-122.0 N·m (85-90 lb·ft).

SPRING CHART

Model	Red Springs (9)	Blue Springs (9)
13-547-488	6	0

● Items included in Repair Kit

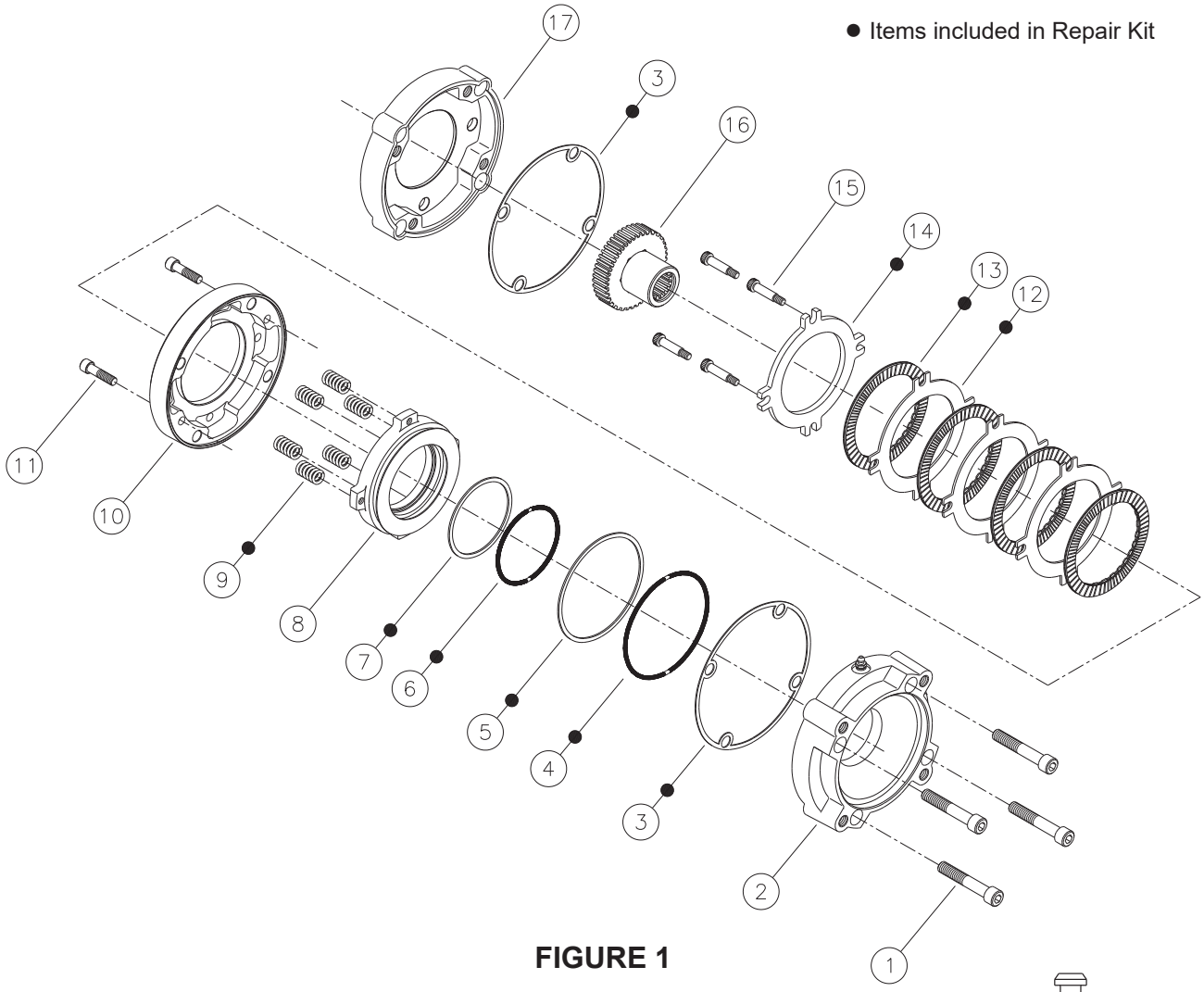

FIGURE 1

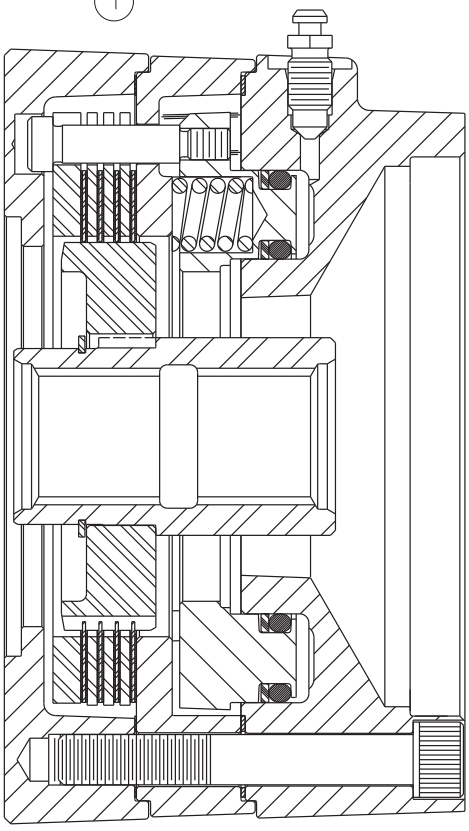

FIGURE 2

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 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.
	D. Springs broken or have taken a permanent set	Broken or set springs can cause reduced torque - a rare occurrence.	Check release pressure (See spring replacement).
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.	Place pressure gauge in 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 bearing.
Brake will not release	A. Stuck valve or clogged	Brakes are designed to come on when system pressure drops below stated release pressure. If pressure cannot get to brake, the brake will not release.	Place pressure gauge in 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.
	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.