Wheel Mount
MULTIPLE DISC BRAKE
with pressure override
(wet design)

Service Instructions

NOTE:
This service sheet covers model number:

13-587-086

REPAIR KITS
(Refer to page 3 for item numbers)

Number	Description	Includes
12-501-444	Repair Kit for 13-587-086	Case Seal (7) Back-up Rings (9 & 12) O-rings (8, 11 & 13) Stator Discs (15) Rotor Discs (16) Return Plate (17) Springs (18) Bearings (4 & 24) Oil Seal (25)

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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 woodruff key (21), retaining ring (1), and washer (3) from shaft (20).
2. Position brake assembly so pressure plate (6) is facing up. A suitable holding fixture is useful to keep the brake in position. Remove two cap screws (5) and pressure plate (6).

⚠ CAUTION

Pressure plate (6) is under spring tension of approximately 907 kgf (2000 lb). The two cap screws (5) should be loosened evenly to relieve this force. If a hydraulic press is available, 1361 kgf (3000 lb) minimum, the pressure plate can be held in position while removing the cap screws.

3. Remove piston (10) from pressure plate (6).
4. Remove o-rings (8 & 11) and back-up rings (9 & 12) from piston (10). **NOTE: Be careful not to scratch or mar piston (10).**
5. Remove piston (14) and o-ring (13) from pressure plate (6). **NOTE: Be careful not to scratch or mar piston (14).**
6. Remove case seal (7) from cover plate (23).
7. Remove stack assembly, consisting of stator discs (15), rotor discs (16), and return plate (17) from cover plate (23).
8. Before removing springs (18) record the spring pattern for reassembly purposes. Remove shaft (20), dowel pins (22), springs (18), and spring retainer (19) from cover plate (23).
9. Remove oil seal (25) and bearing (24) from cover plate (23).
10. Remove retaining ring (2) from pressure plate (6) and press bearing (4) out of pressure plate (6).

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. Carefully press new bearing (24) into cover plate (23) until the bearing contacts the shoulder inside of cover plate (23).
3. Install new oil seal (25) in cover plate (23). Note the direction of oil seal (25).
4. Install shaft (20) through bearing (24) in cover plate (23).
5. Install dowel pins (22), spring retainer (19), and new springs (18) in cover plate (23). Be sure to install new springs (18) according to the spring pattern recorded during disassembly. Contact ZF Off-Highway Solutions Minnesota Inc. if you have questions regarding spring pattern.
6. Install new return plate (17), new rotor discs (16), and new stator discs (15) over dowel pins (22) and spline of shaft (20).
7. Press new bearing (4) into pressure plate (6). Install retaining ring (2).
8. Install new o-rings (8 & 11) and new back-up rings (9 & 12) on piston (10). Note order of o-rings and back-up rings. **NOTE: Be careful not to scratch or mar piston (10).**
9. Carefully insert piston (10) into pressure plate (6). Note direction of piston (10). Be careful not to shear o-rings or back-up rings.
10. Carefully insert new o-ring (13) and piston (14) into pressure plate (6). **NOTE: Be careful not to scratch or mar piston (14).**
11. Install new case seal (7) on cover plate (23).
12. Position pressure plate (6) on cover plate (23) aligning dowel pins (22) with holes in pressure plate. Install cap screws (5) and tighten evenly to draw pressure plate (6) to cover plate (23). Torque cap screws (5) 47.5-54.2 N·m (35-40 lb·ft).

NOTE

If available, a hydraulic press can be used to clamp pressure plate (6) to cover plate (23) while installing and tightening cap screws (5). Be sure to support shaft (20) during this process.

13. Position shaft (20) so shaft shoulder contacts bearing (4). Install washer (3) and retaining ring (1).
14. Install woodruff key (21) on shaft (20).

⚠ CAUTION

If hydraulic bench testing is performed on the brake assembly, release pressure should not exceed 69.0 bar (1000 PSI) unless four additional bolts, SAE grade 5 or better, are used for supplemental clamping.

See page 1 for items included in kit.

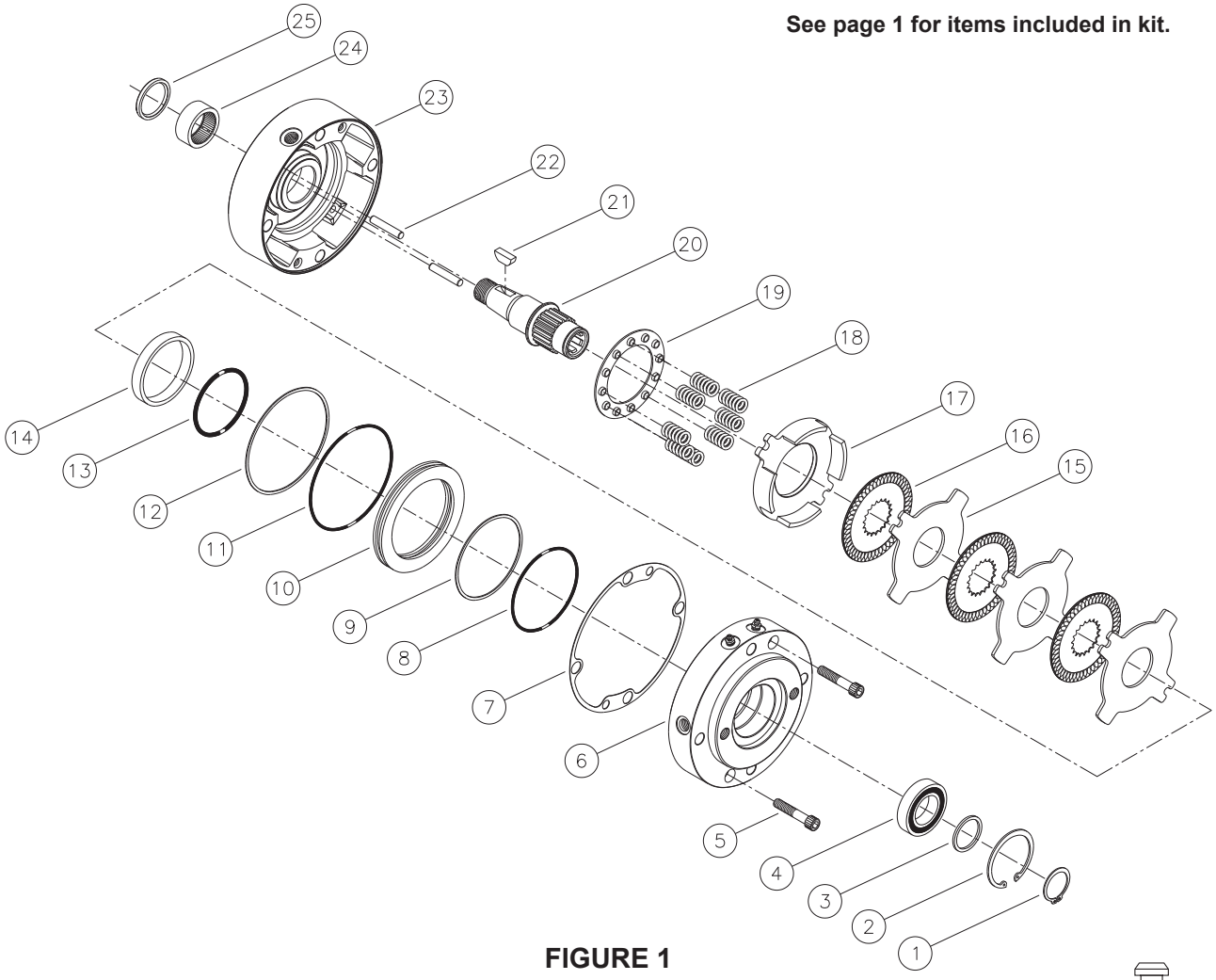

FIGURE 1

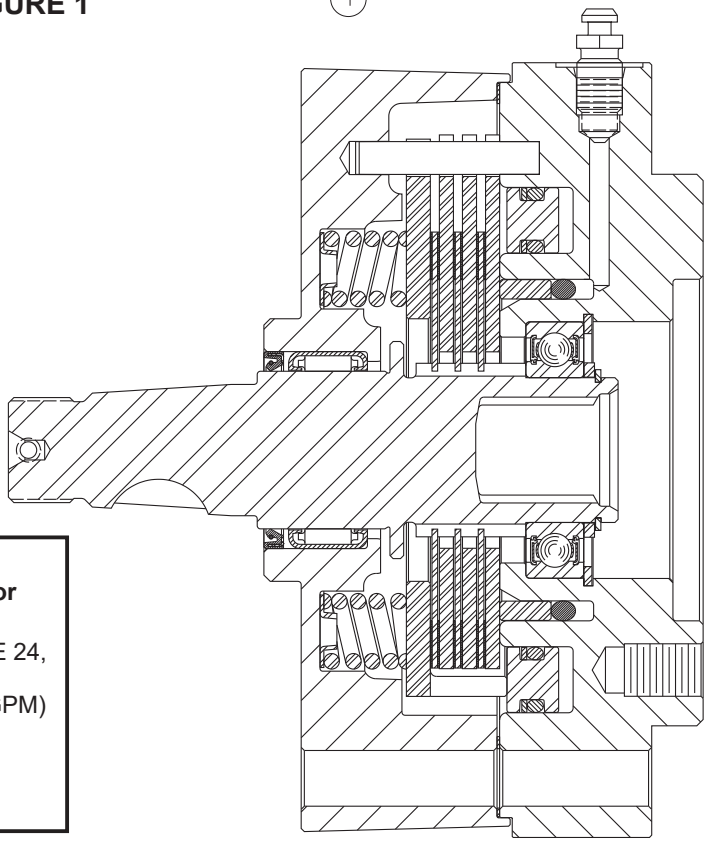

FIGURE 2

Notes for Oil Cooled ("Z" option) Brakes

NOTE

Brakes are shipped dry. Customer is responsible for adding proper type and volume of cooling oil.

Oil Type: Mineral base hydraulic oil such as Mobil DTE 24, Citgo A/W 32 or equivalent.
Flow Through Capacity: 3.8 - 26.5 L/Min. (1.0 - 7.0 GPM)
Maximum Case Pressure: 1.03 bar (15 PSI)
Sump Oil Volume: Horizontal - 118.3 mL (4 fl oz)
Vertical - Contact ZF Off-Highway Solutions Minnesota Inc.

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 6.9 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, and restrictions in other hydraulic components.
	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 are 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 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.