MULTIPLE DISC CLUTCH
(SAE C size)

Service Instructions

NOTE:
This service sheet covers model: 13-565-034

REPAIR KITS
(Refer to page 3 for item numbers)

Number	Description	Includes
12-501-453	Repair Kit	Case Seals (8 & 26) Back-up Rings (22 & 24) O-rings (2, 23, & 25) Bearings (6 & 28) Oil Seal (9) Washers (10) Thrust Bearings (11) Rotors (13) Stators (14 & 15) Springs (20) Loctite
12-501-490	O-ring and Back-up Ring Kit	Case Seals (8 & 26) Back-up Rings (22 & 24) O-rings (2, 23, & 25) Oil Seal (9) Loctite

NOTE: All repair kits include mounting face gaskets and o-rings. 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 gasket together to seal a mounting face.

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

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DISASSEMBLY

(Refer to Figures 1 and 2)

1. Remove two cap screws (1) and o-rings (2). A suitable holding fixture is useful to hold clutch in position.
2. Remove retaining ring (3) from shaft (12).
3. Carefully separate cover plate assembly (4) from spring plate (19) and shaft (12). It may be necessary to use a screwdriver and carefully pry the sections apart.
4. Remove two washers (10) and thrust bearing (11) from cover plate (7) or shaft (12).
5. If bearing (6) is not being replaced, disregard this step. Remove retaining ring (5) from cover plate (7) and press bearing (6) out of cover plate.
6. Press oil seal (9) from cover plate (7).
7. Remove shaft (12) from rotors (13) and stators (14 & 15).
8. Remove rotors (13), stators (14), thick stator (15), washer (10), and thrust bearing (11).
9. Remove case seal (8) and washer (17) from spring plate (19).
10. Remove retaining ring (29) from shaft assembly (16).
11. Carefully remove shaft assembly (16) from pressure plate (27) by tapping on female spline end of shaft assembly with a soft mallet.
12. Remove four socket head cap screws (18). Separate spring plate (19) and pressure plate (27).
13. Remove springs (20), piston (21), and case seal (26) from pressure plate (27).
14. Remove o-rings (23 & 25) and back-up rings (22 & 24) from piston (21). **NOTE: Be careful not to scratch or damage piston (21).**
15. If bearing (28) is not being replaced, disregard this step. Remove retaining ring (30) from pressure plate (27) and press bearing (28) from pressure plate (27).

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. Press new oil seal (9) into cover plate (7) until it is flush with bearing shoulder. Note direction of oil seal (9).
3. If necessary, press new bearing (6) into cover plate (7) until it bottoms on borestep. Install retaining ring (5) in cover plate (7).
4. If necessary, Press new bearing (28) in pressure plate (27) until it bottoms on borestep. Install retaining ring (30) in pressure plate (27).
5. Press shaft assembly (16) into bearing (28) to the depth where retaining ring (29) can be installed on shaft assembly (16). Install retaining ring (29) on shaft assembly (16). **NOTE: Bearing inner race must be supported during this operation.**
6. Carefully install o-rings (23 & 25) and back-up rings (22 & 24) on piston (21). **NOTE: Be careful not to scratch or damage piston.**
7. Properly position piston (21) in pressure plate (27) bore so spring plate (19) and pressure plate (27) bolt holes are aligned.
8. Install springs (20) in the spring pockets on piston (21).
9. Affix case seal (26) to pressure plate (27). Note, case seal (26) is a black rubber compound.
10. Place unit on a press. A suitable fixture is useful to hold the clutch in position. Depress and install four socket head cap screws (18). Apply two drops of Loctite #242 to threads and torque 24.4-31.2 N·m (18-23 lb·ft).
11. Install washer (17) on dowel pins of spring plate (19).
12. Install washer (10), thrust bearing (11), thick stator (15), stators (14), and rotors (13) over shaft (16). Align stators (14 & 15) so they will properly fit into shaft (12).
13. Affix case seal (8) to spring plate (19).
14. Install shaft (12) over rotors (13), stators (14) and thick stator (15) until fully engaged with shaft assembly (16).
15. Install two washers (10) and thrust bearing (11) on shaft (12).
16. Install cover plate assembly (4) over shaft (12) and on spring plate (19). Install two flat head screws (1) and o-rings (2). Apply two drops of Loctite #242 to threads and torque 33.9-40.7 N·m (25-30 lb·ft).
17. Install retaining ring (3) on shaft (12). be sure retaining ring is fully seated in groove.

See page 1 for items included in kits.

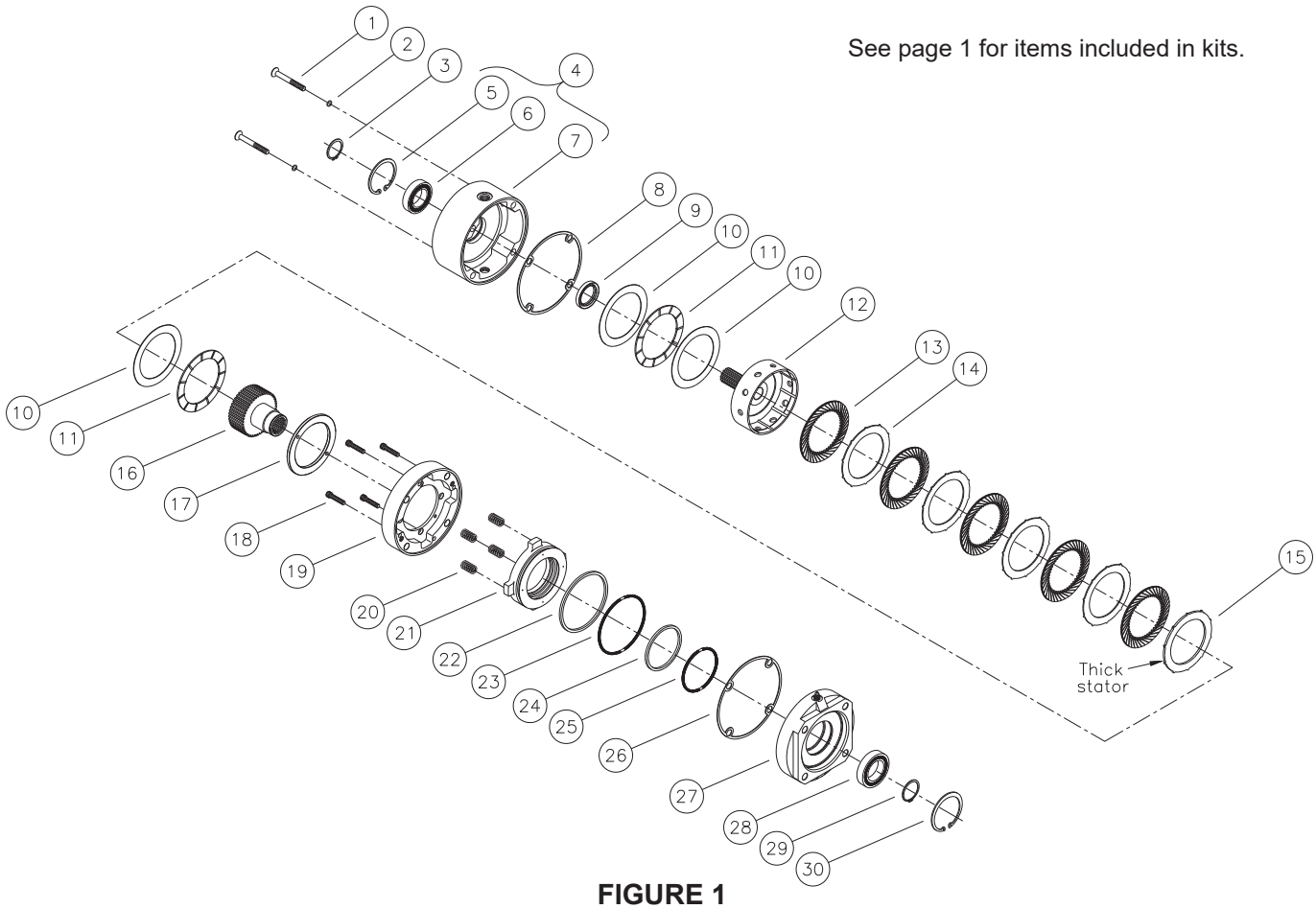

FIGURE 1

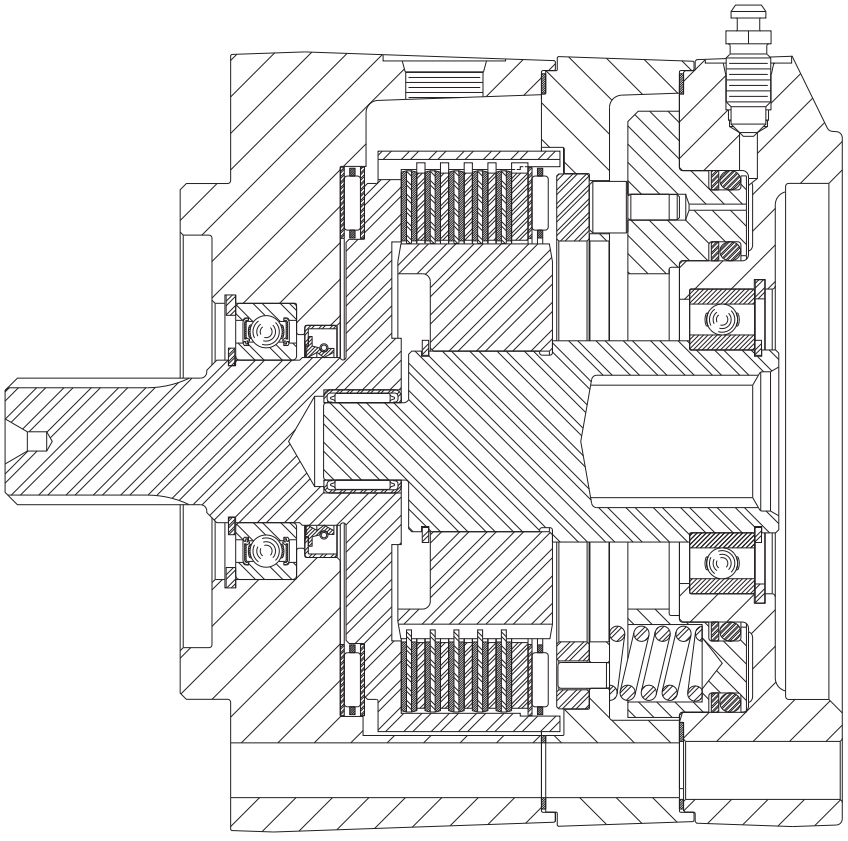

FIGURE 2

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	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 have broken or have taken a permanent set	Broken or set springs can cause reduced torque, a rare occurrence.	Check release pressure and contact 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 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 kits on page 1.
	C. Oil in 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 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 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.