MULTIPLE DISC BRAKE

(wet design - pinion)

Service Instructions

NOTE:

This service sheet covers model numbers:

21-100-114
21-100-124

REPAIR KITS

(Refer to Figure 1 for item numbers)

Number	Description	Includes
12-501-416	Repair Kit for 21-100-114	Case Seal (3) O-rings (4 & 7) Back-up Rings (5 & 8) Stator Discs (10) Rotor Discs (11) Return Plate (12) Springs (13) Oil Seal (17)
12-501-447	Repair Kit for 21-100-124	Case Seal (3) O-rings (4 & 7) Back-up Rings (5 & 8) Stator Discs (10) Rotor Discs (11) Return Plate (12) Springs (13) Oil Seal (17)

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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 pressure plate (2) from cover (16) by removing two cap screws (1).

⚠ CAUTION

Pressure plate (2) is under spring tension of approximately 2495 kgf (5500 lb). The two cap screws must be loosened evenly to relieve this force. If a hydraulic press is available, 2722 kgf (6000 lb) maximum, the pressure plate can be held in position while removing cap screws.

2. Remove case seal (3) from cover (16).
3. Remove piston (6) from pressure plate (2).
4. Remove o-rings (4 & 7) and back-up rings (5 & 8) from piston (6).
5. Before removing stator discs (10) and rotor discs (11), record the stacking arrangement for reassembly purposes. Remove stator discs (10), rotor discs (11), return plate (12), and shaft (9) from cover (16).
6. Before removing springs (13), record the spring pattern for reassembly purposes. Remove dowel pins (15), springs (13), and spring retainer (14) from cover (16).
7. Press oil seal (17) from cover (16).

ASSEMBLY

(Refer to Figures 1 and 2)

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. Press new oil seal (17) into cover (16) until it is flush with bearing shoulder. Note direction of oil seal (17).
3. Install shaft (9), dowel pins (15), spring retainer (14), and new springs (13) in cover (16). Be sure to install the springs according to spring pattern recorded during disassembly. Contact ZF Off-Highway Solutions Minnesota Inc. if you have questions regarding the spring pattern.
4. Position new return plate (12) on springs (13). **NOTE: Be careful to avoid contaminating friction surfaces with oil.**
5. Install new rotor discs (11) and new stator discs (10) in the same order as recorded during disassembly.
7. Install new back-up rings (5 & 8) and new o-rings (4 & 7) on piston (6). Note the order of o-rings and back-up rings. Install piston (6) into pressure plate (2). **NOTE: Be careful not to shear o-rings or back-up rings. Be careful not to scratch or mar piston.**
8. Install new case seal (3) on cover (16).
9. Position pressure plate (2) on cover (16) aligning dowel pins (15) with holes in pressure plate (2).
10. Install two cap screws (1) and tighten evenly to draw pressure plate (2) to cover (16). Torque cap screws 74.6 N·m (55 lb·ft). **NOTE: A hydraulic press will simplify installation of pressure plate on cover. Clamp pressure plate in position while tightening cap screws.**

⚠ CAUTION

If hydrostatic bench testing is performed on the brake assembly, release pressure must not exceed 68.9 bar (1000 PSI) unless six additional bolts are used for supplemental clamping.

SPRING CHART

Model Number	Yellow Springs (13) Quantity
21-100-114	16
21-100-124	20

• Items included in Repair Kit

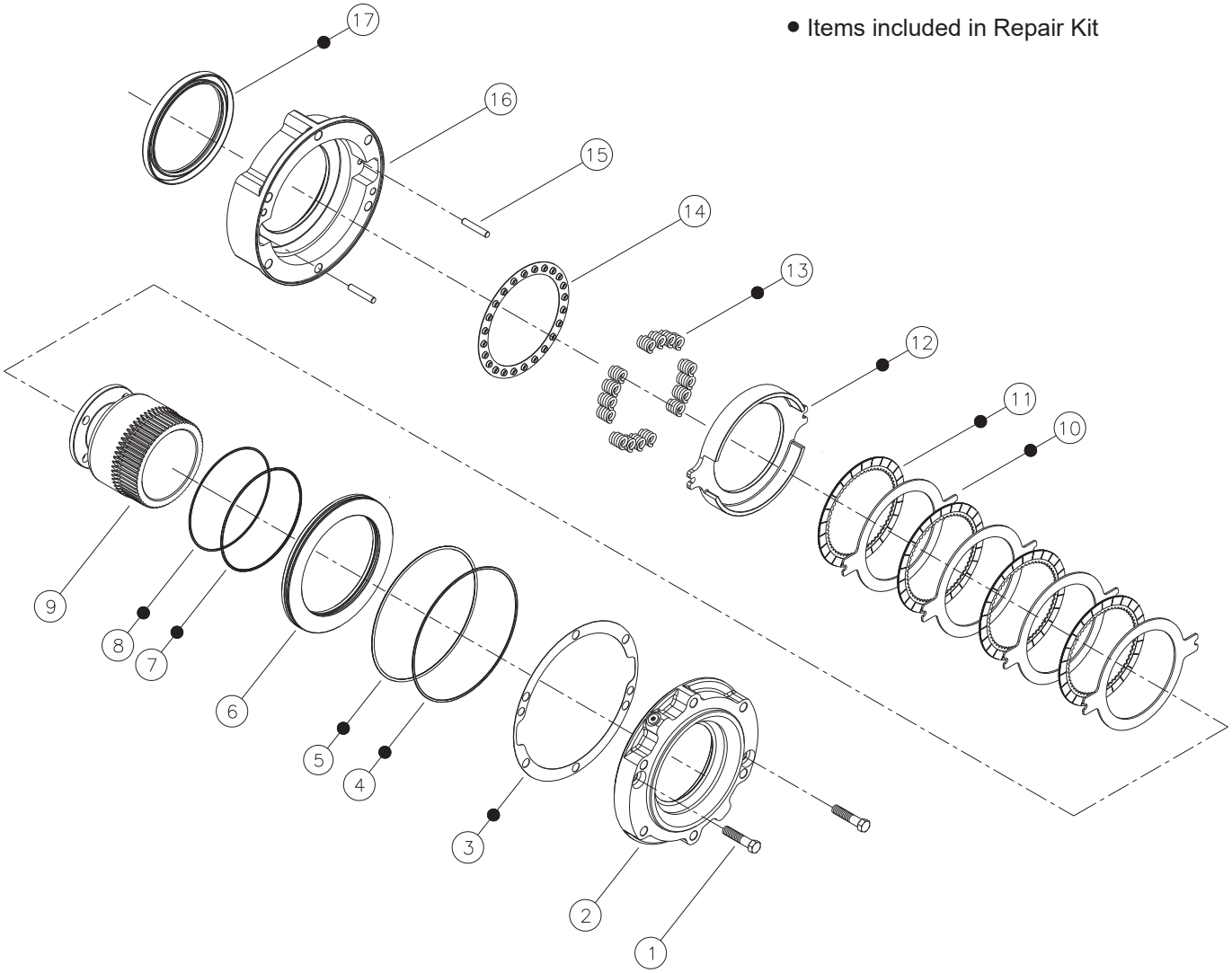
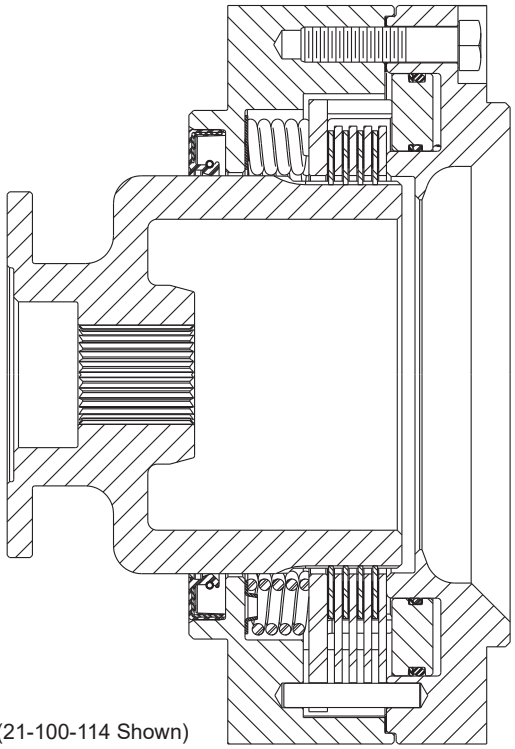


FIGURE 1



(21-100-114 Shown)

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 6.9 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, restrictions in other hydraulic components.
	B. 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.
	C. Springs 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.
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.