MULTIPLE DISC BRAKE MODULE
(SAE A size)

Service Instructions

NOTE:

This service sheet covers model numbers:

21-100-012
21-100-022
21-100-024
21-100-030
21-100-034
21-100-044

REPAIR KITS

(Refer to Page 3 for item numbers)

Number	Description	Includes
12-501-134	O-ring and Back-up Ring Kit	Case Gasket (13) O-rings (10 & 12) Back-up Rings (9 & 11) Loctite
12-501-136	Lining Kit	Case Gaskets (13) Primary Disc (2) Stator Discs (4) Rotor Discs (3) Loctite
12-501-138	Spring Kit for 21-100-012	Case Gaskets (13) Springs - Blue (7) Springs - Red (7) Loctite
12-501-265	Spring Kit for 21-100-022 21-100-034 21-100-044	Case Gaskets (13) Springs - Blue (7) Loctite
12-501-266	Spring Kit for 21-100-024 21-100-030	Case Gaskets (13) Springs - Blue (7) Springs - Red (7) Loctite

NOTE: All repair kits include mounting face gaskets.

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DISASSEMBLY
(Refer to Figures 1 and 2)

1. Separate pressure plate (14) from spring plate (6) and remove case seal (13).
2. Remove four socket head shoulder bolts (1). A suitable holding fixture is useful to hold brake in position.
3. Remove primary disc (2), rotor discs (3), stator discs (4) and thrust washer (5).
4. Before removing springs (7), record the spring pattern and color for reassembly purposes. Remove springs (7) from spring plate (6).
5. Remove piston (8) by carefully applying hydraulic pressure through brake port on pressure plate (14).
6. Remove o-rings (10 & 12) and back-up rings (9 & 11) from piston (8). **NOTE: Be careful not to scratch or mar piston (8).**

DISASSEMBLY
(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 the parts before assembling. Refer to page 1 for items included in kits.
2. Place piston (8) on a press with spring pockets facing upward. Install springs (7) in the spring pockets of piston (8) according to the spring pattern and color recorded during disassembly. Contact ZF Off-Highway Solutions Minnesota Inc. if you have questions regarding the spring pattern.
3. Place spring plate (6) over springs (7) and piston (8) with through holes in spring plate (6) aligned with the threaded holes in piston (8). Carefully apply pressure and depress spring plate (6). **NOTE: Be careful not to scratch or damage piston.**
4. Place thrust washer (5), rotor discs (3), stator discs (4) and primary stator (2) on spring plate (6). Note stacking arrangement in Figure 1a for 21-100-030.
5. Apply two drops of Loctite 242 or equivalent to the threads of shoulder bolts (1). Install four shoulder bolts (1) and evenly torque 20.3-24.4 N·m (15-18 lb·ft). Release press pressure.
6. Install back-up rings (9 & 11) on spring side of piston (8). **NOTE: Be careful not to scratch or damage piston.**
7. Install o-rings (10 & 12) on piston (8). Be sure o-rings are flat and all twists are removed. **NOTE: Be careful not to scratch or mar piston (8).**
8. Lubricate piston (8) with clean type fluid in the system. Carefully press piston (8) into pressure plate (14).

SPRING CHART

Model Number	Red Springs (7)	Blue Springs (7)
21-100-012	4	2
21-100-022	0	6
21-100-024	2	4
21-100-030	2	4
21-100-034	0	6
21-100-044	0	4

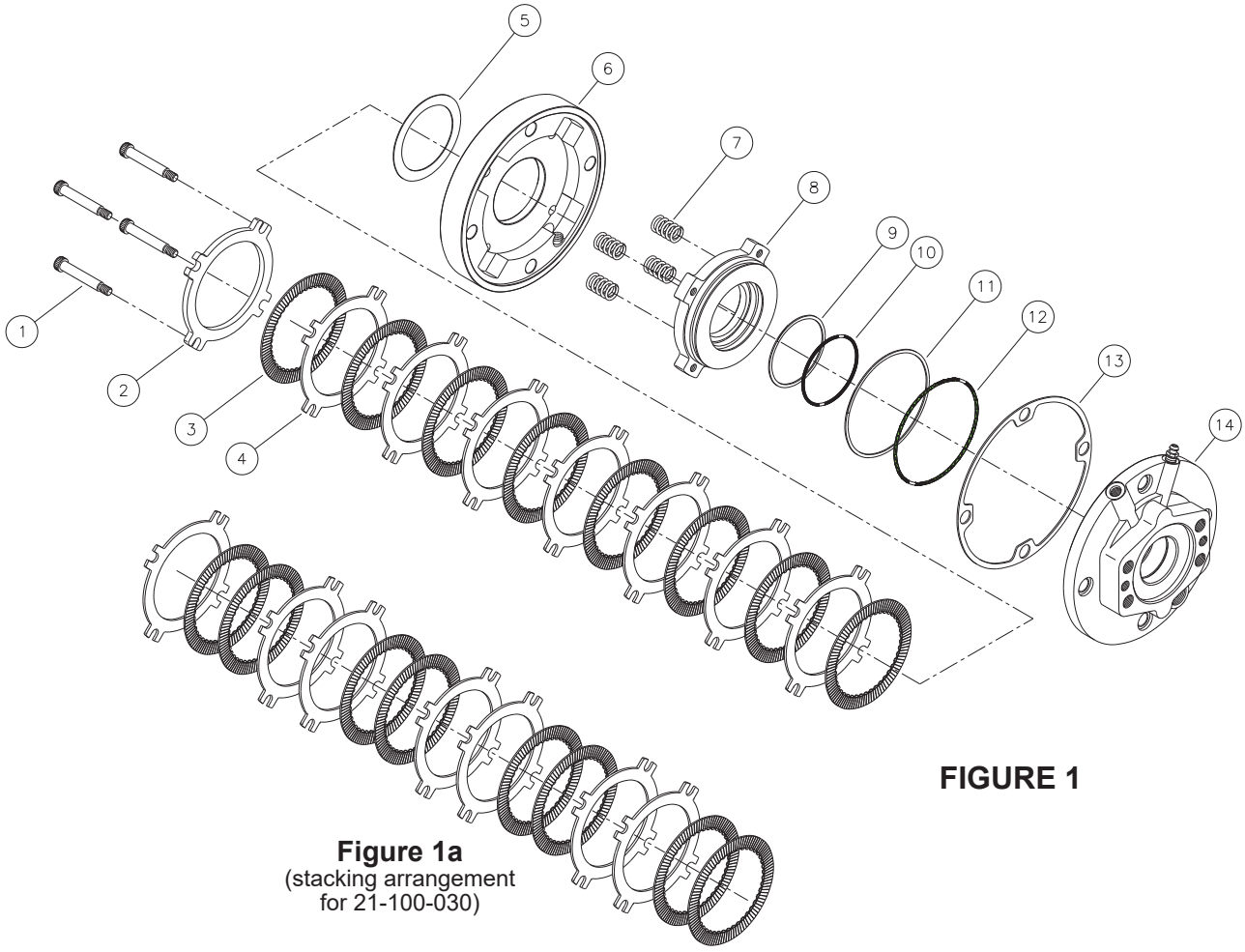

FIGURE 1

Figure 1a
(stacking arrangement
for 21-100-030)

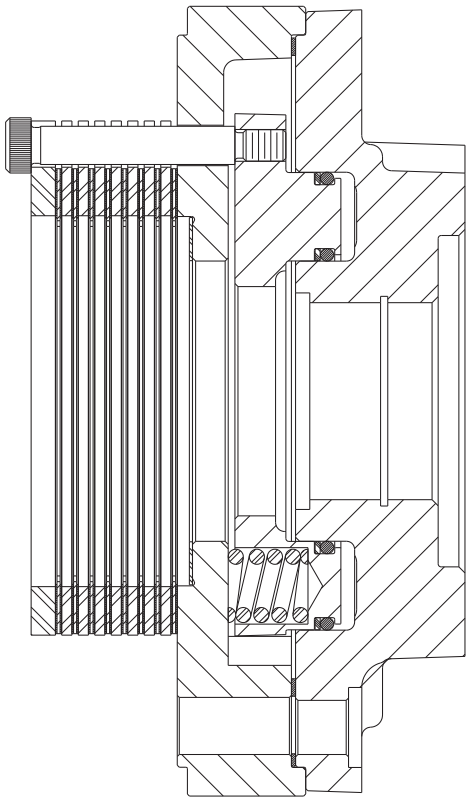

FIGURE 2
(21-100-044 Shown)

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 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.