

MULTIPLE DISC BRAKE

(gearbox design - SAE A size)



Service Instructions

NOTE:

This service sheet covers
model number:

21-100-112

REPAIR KITS

(Refer to page 3 for item numbers)

Number	Description	Includes
12-501-408	Repair Kit	Case Seal (4) O-rings (5 & 8) Back-up Rings (6 & 9) Stator Disc (10) Rotor Disc (11) Return Plate (12) Springs (13)

NOTE: The repair kit includes mounting face gaskets and an o-ring. 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 gaskets together to seal a mounting face.

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DISASSEMBLY

(Refer to Figures 1 and 2)

1. Remove pressure plate (3) from cover (16) by removing cap screws (1) and washers (2).

⚠ CAUTION

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

2. Remove case seal (4) from cover (16).
3. Remove piston (7) from pressure plate (3).
4. Remove o-ring (5), back-up ring (6), o-ring (8) and back-up ring (9) from piston (7).
5. Remove stack assembly, consisting of stator disc (10), rotor disc (11) and return plate (12) from cover (16).
6. Remove dowel pins (15), springs (13) and spring retainer (14) 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. Insert dowel pins (15), spring retainer (14) and springs (13) in cover (16).
3. Position return plate (12) on springs (13).
NOTE: Discs (10 & 11) and return plate (12) must remain dry during installation. No oil residue must be allowed to contaminate disc surfaces.
4. Install rotor disc (11) and stator disc (10).
5. Install o-ring (5), back-up ring (6), o-ring (8) and back-up ring (9) on piston (7). Note order of o-rings and back-up rings.
6. Insert piston (7) into pressure plate (3). **NOTE: Be careful not to shear o-rings or back-up rings. Be careful not to scratch or mar piston.**
7. Install new case seal (4) on cover (16).
8. Position pressure plate (3) on cover (16) aligning dowel pins (15) with holes in pressure plate.
9. Install cap screws (1) and washers (2) and tighten evenly to draw pressure plate (3) 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 the washer head cap screws.**

⚠ CAUTION

If hydrostatic bench testing is performed on the brake assembly, release pressure must not exceed 137.9 bar (2000 PSI) unless two additional bolts are used for supplemental clamping.

SPRING CHART

Model Number	Red Springs (13)	Blue Springs (13)
21-100-112	14	0

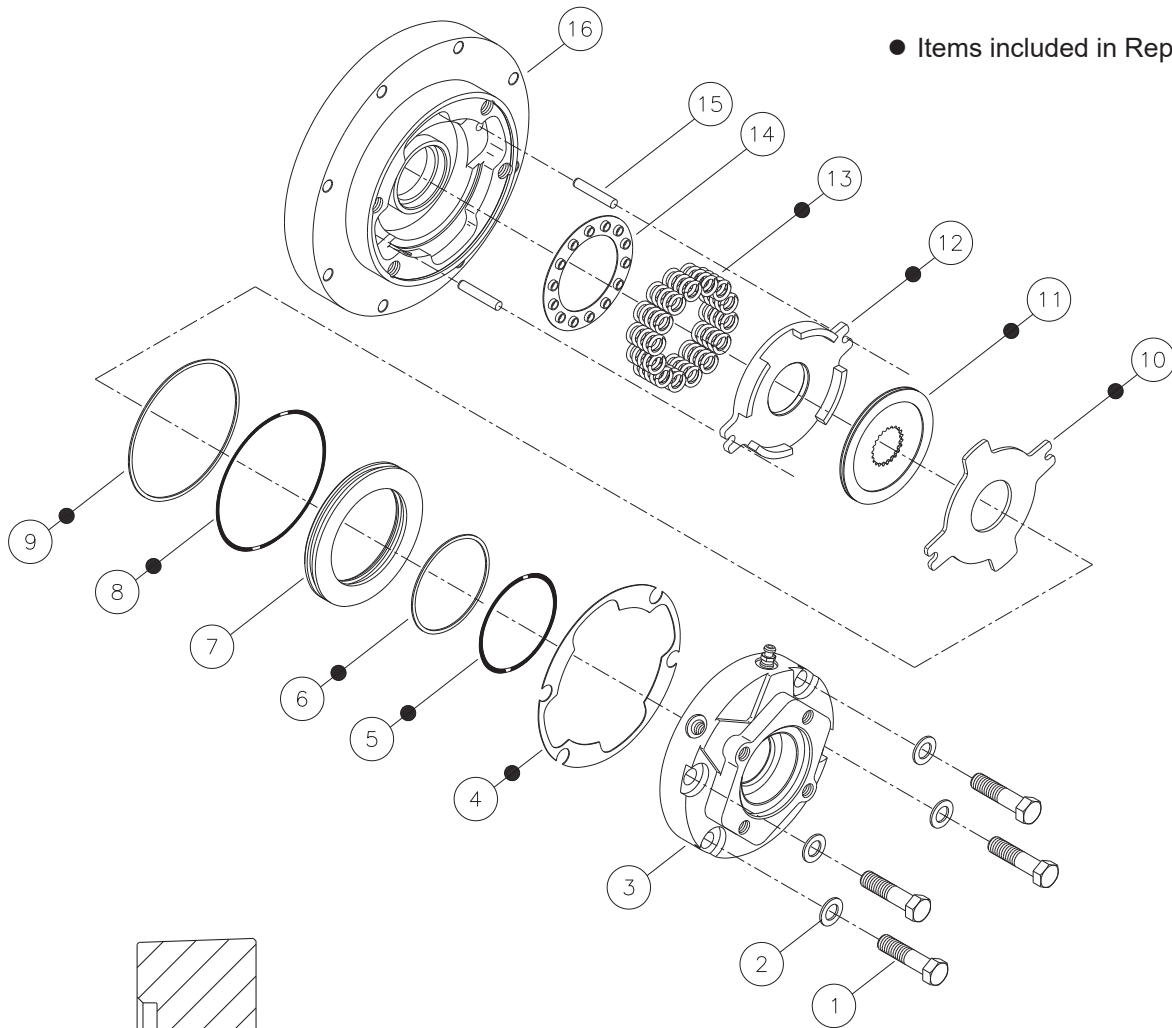


FIGURE 1

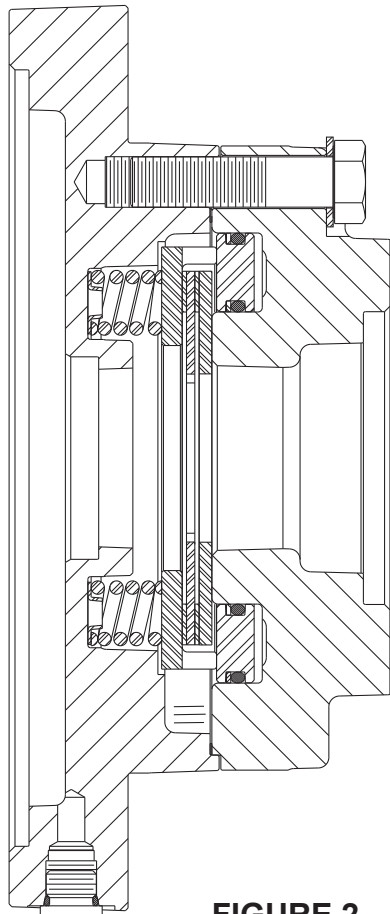


FIGURE 2

BLEEDING

1. Install brake in system and connect pressure lines.
2. Bleed the pressure release section of the brake by pressurizing the side inlet port and allowing air to escape from the 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 a brake 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. <ol style="list-style-type: none"> 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 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 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.