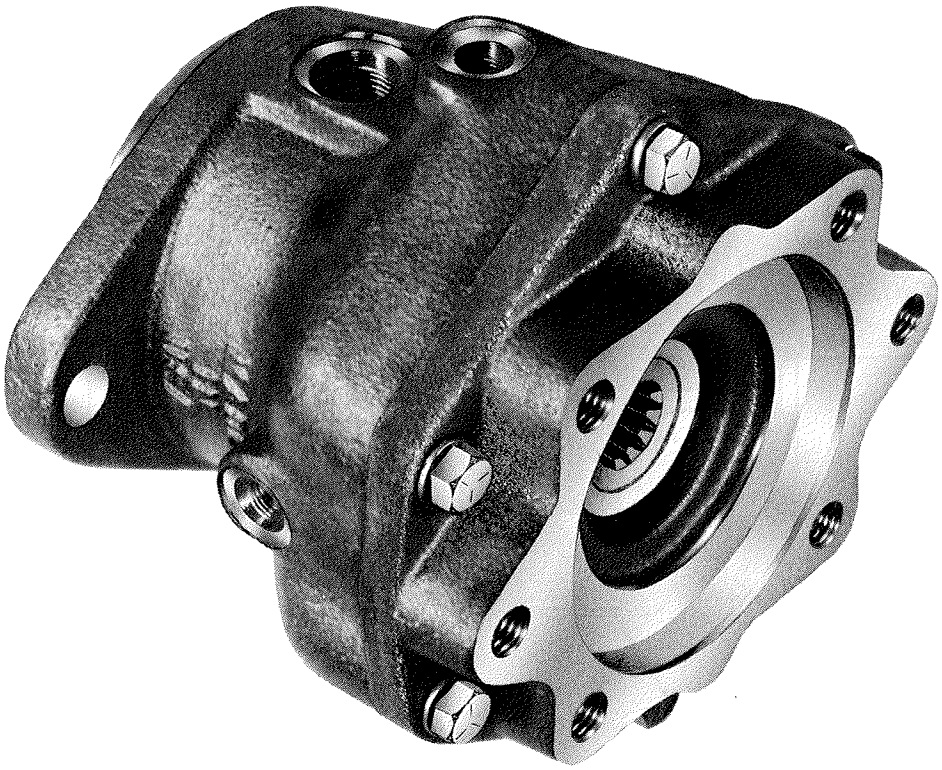
MULTIPLE DISC BRAKE

(liquid cooled - SAE B size)

Service Instructions



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TYPICAL MULTIPLE DISC BRAKE
(Liquid Cooled)

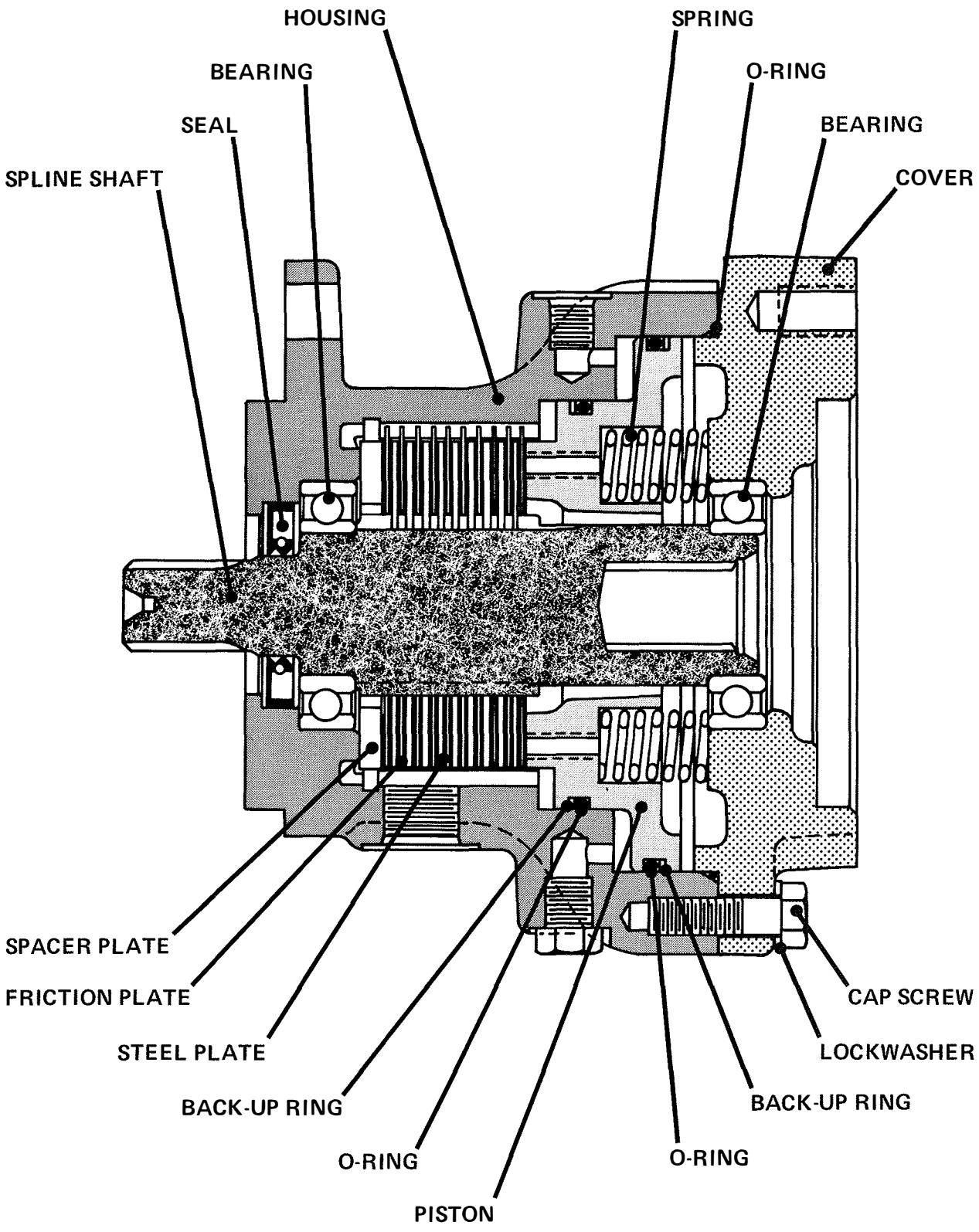

FIGURE 1

DESCRIPTION AND OPERATION OF THE MICO MULTIPLE DISC BRAKE

The Multiple Disc Brake (liquid cooled) is designed specifically for use with heavy duty machinery, off-highway vehicles, construction, materials handling, mining equipment and in a multitude of winching applications. Models are available in standard S.A.E. mounting flange styles. Other special mountings are also available. Contact MICO with your requirements.

This Multiple Disc Brake provides consistent braking torque, positive hold, and long life in rugged environments. An oil bath protects the friction surfaces, dissipates heat efficiently and resists internal corrosion, thus providing high repeatability in performance.

The Brake will also reduce maintenance and downtime, because enviromental contaminants which add to brake lining wear are restricted from entering the brake. Clean oil is a must for optimum lining life.

Braking is provided by a pack of friction discs splined to the housing, and rotating discs splined to the drive shaft. Force is transmitted to the disc pack through a hydraulic piston and a series of preloaded springs. The brake is released by hydraulic pressure applied to the piston to compress the springs. The brake is self-applying since any function which reduces the hydraulic system pressure below the release pressure of the brake will start to initiate a brake application. Zero pressure produces maximum brake torque.

Brake cooling is normally provided by one of the following methods:

SUMP METHOD

Oil is added at the time of installation to a level of 1/4 (2 fl. oz.) to 1/2 (4 fl. oz.) capacity. A breather must be installed on the top cooling port to compensate for expansion, due to heat. This method of cooling is used where the operation of the brake is strictly for parking or emergency use, i.e. either on or off with minimal dragging through the brake. Also the maximum shaft speed should not exceed 1500 RPM in this mode due to fluid viscous shear.

FLOW THRU METHOD

A continuous flow of oil between 1 and 8 GPM from the vehicles hydraulic system is used for cooling. This method is required where the application may involve dragging thru the brake such as in a winch application for positioning a load. Internal cooling pressure should be maintained below 100 PSI. This method is also ideal for higher shaft speed applications.

REPAIR KITS

MODEL NUMBER	LINING KIT	BEARING KIT	O-RING KIT
02-540-080	20-060-043	02-500-072	02-500-073
02-540-082	20-060-045	02-500-079	02-500-078
02-540-084	20-060-045	02-500-079	02-500-078
02-540-086	20-060-043	02-500-072	02-500-076
02-540-088	20-060-043	02-500-072	02-500-073
02-540-090	20-060-043	02-500-072	02-500-073
02-540-092	20-060-043	02-500-072	02-500-073
02-540-094	20-060-043	02-500-072	02-500-073
02-540-096	20-060-045	02-500-079	02-500-093

DISASSEMBLY

1. Remove end cover (item 3) from housing (item 18) by removing cap screws (items 1) and lockwashers (items 2).

   CAUTION: Since cover is under spring tension of approximately 1200 pounds, the six cap screws should be loosened evenly to relieve this force. If a hydraulic press is available (5000 lbs. max.), the cover can be held in position while removing the cap screws and lockwashers.

2. Tap cover with a soft mallet in order to dislodge bearing (item 5) from shaft (item 6) if necessary.
3. Remove o-ring (item 4) from flange of cover (item 3). Press bearing (item 5) out of cover (item 3).

   NOTE: Model 02-540-092 requires pulling bearing (item 5) out of cover (item 3).

4. Remove springs (items 7) from piston (item 10). Remove piston (item 10) from housing (item 18) by inserting two 1/4" - 20 UNC bolts into threaded holes at bottom of spring pockets in piston. Using appropriate puller, remove piston from bore of housing.
5. Remove o-ring (item 9), back-up ring (item 8), o-ring (item 11) and back-up ring (item 12) from piston (item 10).
6. Remove plate stack assembly consisting of plates (items 13), friction plates (items 14) and spacer plate (item 15) from housing (item 18).
7. Remove shaft (item 6) and bearing (item 16) from housing (item 18) by pressing or using a soft mallet on male end of shaft (item 6).
8. Remove bearing (item 16) from end of shaft (item 6) with appropriate bearing puller.
9. Press seal (item 17) from housing (item 18).

   NOTE: Not all models have item 17.

ASSEMBLY

LUBRICATE ALL RUBBER COMPONENTS FROM REPAIR KIT WITH TYPE FLUID USED IN THE SYSTEM.

1. Clean all parts thoroughly before assembly.

   NOTE: Follow step 2 only if item 17 is found in your brake during disassembly.

2. Press new seal (item 17) into housing (item 18) until it shoulders against casting.
3. Install new bearing (item 16) on male end of shaft (item 6) and press until it shoulders on shaft.
4. Carefully press shaft assembly into housing (item 18) until bearing shoulders on bottom of housing.
5. Insert spacer plate (item 15) in housing (item 18).
6. Starting with one of ten new friction plates (items 14) and alternating with nine new steel plates (items 13), install them on shaft (item 6).

   NOTE: Align tabs of friction plates with slots in housing (item 18).

7. Install new o-rings (items 9 and 11) and new back-up rings (items 8 and 12) on piston (item 10). Carefully push piston (item 10) into bore of housing (item 18) until piston bottoms on top of lining stack.
8. Insert springs (item 7) in piston (item 10).
9. Press new bearing (item 5) in end cover (item 3). Install new o-ring (item 4) on flange of cover (item 3).
10. Position cover assembly on top of springs (item 7). Insert cap screws (items 1) and lockwashers (items 2) through cover (item 3) and into housing (item 18). Tighten screws evenly to draw cover (item 3) to housing (item 18) and bearing (item 5) onto shaft (item 6). Torque cap screws (items 1) to 35 ft. lbs.

    NOTE: If available, a hydraulic press will simplify installation of cover on housing. Clamp cover in position while tightening the cap screws.

11. Press on inner ring of bearing (item 5) until it shoulders on shaft (item 6) to eliminate binding on bearings.

* Some models do not contain seal (item 17)

❖ Not all models use 10 springs

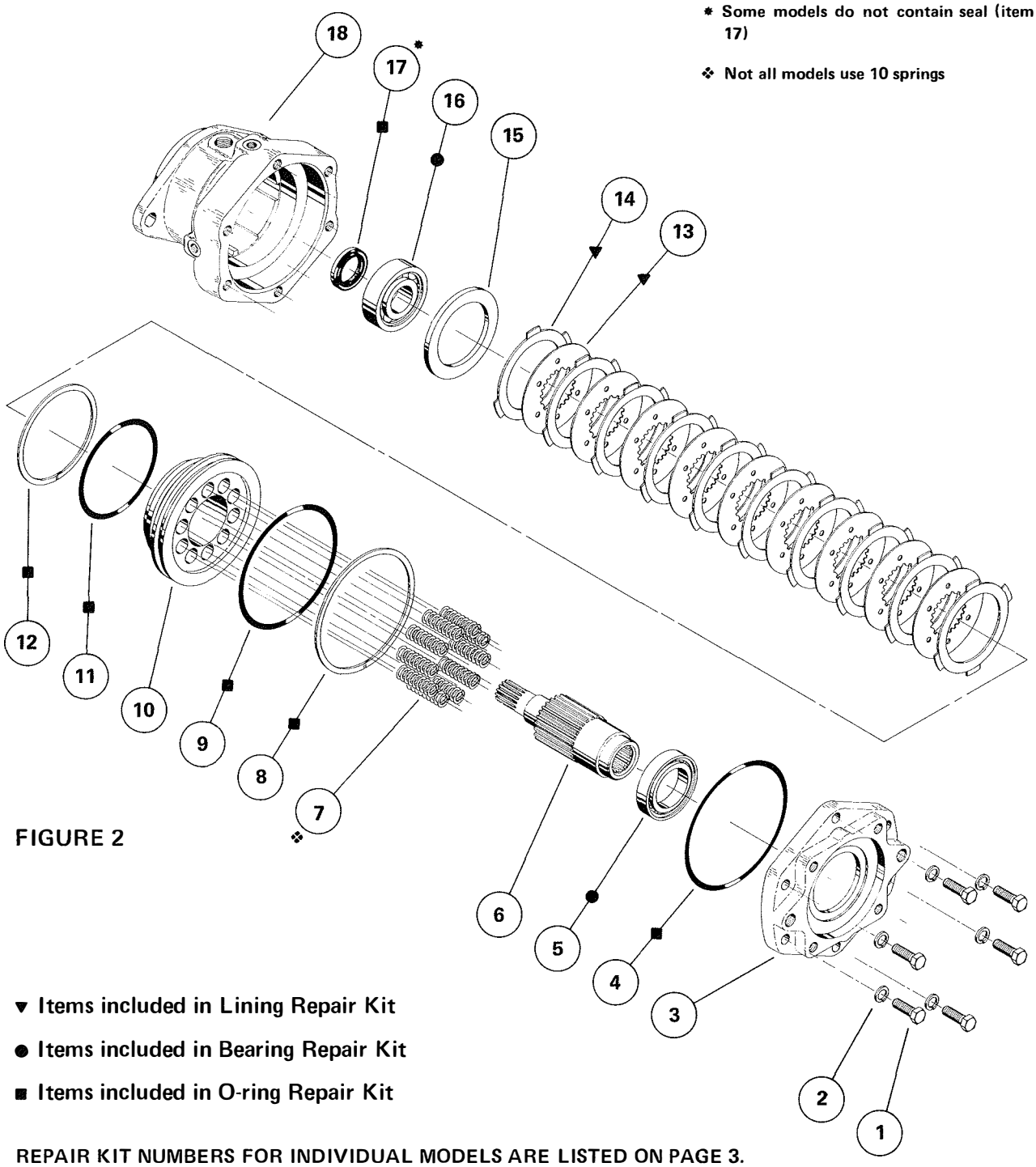

FIGURE 2

▼ Items included in Lining Repair Kit

● Items included in Bearing Repair Kit

■ Items included in O-ring Repair Kit

REPAIR KIT NUMBERS FOR INDIVIDUAL MODELS ARE LISTED ON PAGE 3.

PARTS LIST

ITEM	DESCRIPTION
1	CAP SCREWS (6)
2	LOCKWASHERS (6)
3	COVER
4	■ O-RING
5	● BEARING
6	SPLINE SHAFT
7	SPRINGS
8	■ BACK-UP RING
9	■ O-RING
10	PISTON
11	■ O-RING
12	■ BACK-UP RING
13	▼ STEEL PLATE (9)
14	▼ FRICTION PLATE (10)
15	SPACER PLATE
16	● BEARING
17	■ SEAL
18	HOUSING

▼ ● ■ MOUNTING GASKET (NOT SHOWN) INCLUDED IN ALL KITS

BLEEDING

1. Install brake in system and connect pressure lines as well as coolant lines if flow thru cooling is to be used.
2. Bleed pressure release section of brake by pressurizing side inlet port and allowing air to escape from top port. Pressure should not exceed 100 psi during bleeding.
3. Apply sufficient pressure to release brake and check for proper operation in system.

SERVICE DIAGNOSIS

(Numbers shown refer to Figure 2 on page 5)

BRAKE WON'T RELEASE

1. Insufficient release oil pressure
2. Damaged o-rings (items 9 or 11)
3. Damaged piston (item 10)
4. Damaged bearings (items 5 or 16)
5. Plates (items 13 and 14) warped or welded together due to excessive heat

BRAKE WON'T APPLY

1. Residual oil pressure in release section of brake
2. Damaged springs (items 7)
3. Damaged piston (item 10)
4. Broken bolts (items 1) allowing cover (item 3) to move away from housing (item 18)

BRAKE APPLIES BUT TORQUE LOW

1. Residual oil pressure in release section of brake
2. Springs (items 7) have taken permanent set due to excessive heat
3. Friction plates (items 14) worn out

OIL LEAKS EXTERNALLY FROM BRAKE

1. Damaged rotary oil seal (item 17)
2. Damaged o-ring on cover (item 4)