



MB-180, MB-210 and MB-210L Motor Brake INSTALLATION MANUAL



DESCRIPTION



Posistop Motor Brakes are multiple surface, spring activated, pneumatic release braking devices that effectively dissipate the heat generated from electric motors requiring frequent starting and stopping,

This Manual covers 3 sizes or models, which are MB-180, MB-210 and MB-210L. For information on other sizes and models not covered in this manual, contact the Force Control Factory or your Force Control Representative

OPERATION

The *Posistop* Motor Brake Cross Section (*Figure 1*) shows the brake in the normally spring loaded braking position.

Compressed air, controlled by external valving, enters the piston housing and moves the piston to disengage the multiple braking disc stack, allowing the drive motor to rotate freely.

When the air pressure is released the piston (spring loaded) returns to the normal braking position.

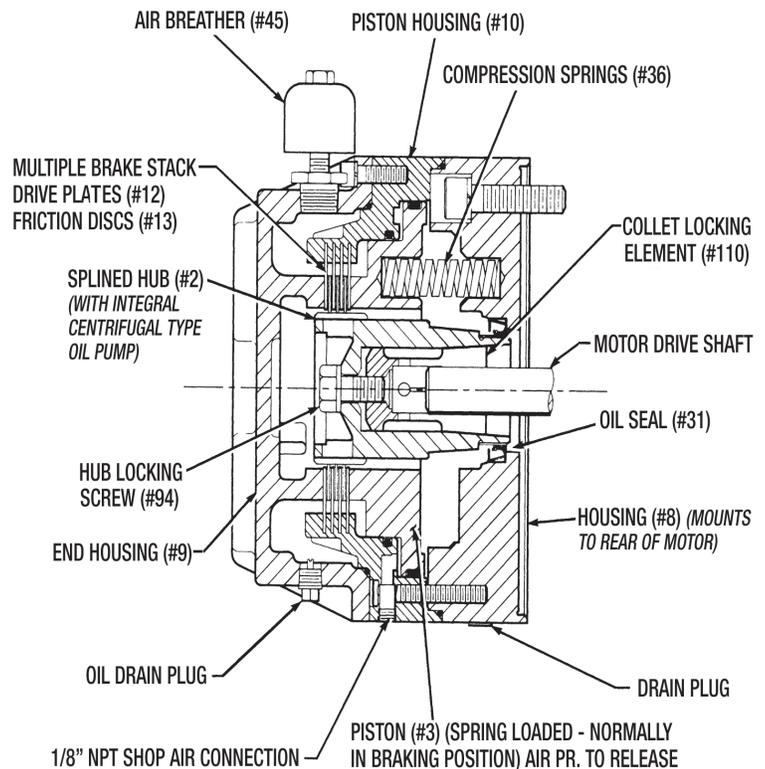


Figure 1 - Unit Description and Operation

INSTALLATION

IMPORTANT SAFETY PRECAUTIONS

The Brake Unit described in this manual must not be installed in any manner except as specified and must not be operated at speeds, torque loads or temperatures other than those specified. Failure to limit operation of the brake to the conditions specified could damage the unit and may cause malfunction or damage to interconnecting equipment.

WARNING - The following precautions must be taken if the installation of the Posistop Motor Brake is to be a retrofit for an existing application. Before attempting installation, open the motor disconnect, shut off the control electrical supply and lock them out to avoid any possibility of personal injury. Be sure any mechanisms holding inclined or vertical loads are locked mechanically with cribbing or other means.

The *Posistop* Motor Brake has been pre-assembled at the factory for ease of shipment. Partial disassembly will

be necessary to assemble the brake to the motor.

A. VERIFYING MOTOR SPECIFICATIONS

The Motor Manufacturer's Specifications must be verified first to ensure the Motor Brake Oil Seal Reliability. The Motor Shaft Run out, Mounting Face Run out and the Motor Shaft to Pilot Diameter Eccentricity need to be checked with a Dial Indicator as shown in *Figure 2*.

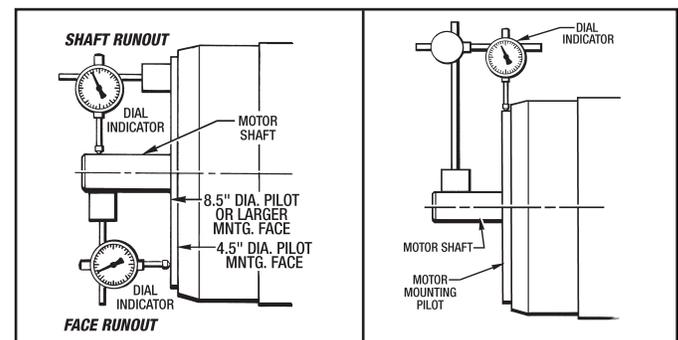


Figure 2 - Verifying Motor Specifications

MAXIMUM ALLOWABLE T.I.R. (Inches)
(As Per NEMA MG 1 Standard)

Pilot Dia. Dimensions	Tolerance on Pilot Dia.		Maximum Allowable Shaft Run out	Maximum Allowable Face Run out	Maximum Allowable Eccentricity
	Plus	Minus			
Less than 12"	.000"	.003"	.002"	.004"	.004"
12" or More	.000"	.005"	.003"	.007"	.007"

CAUTION - T.I.R. in excess of this maximum will result in a potential leak condition.

B. PARTIAL DISASSEMBLY

1. Remove the End Housing (#9) from the Piston Housing Assembly by removing the (8) Screws (#72) and (8) Lockwashers (#128).
2. Pull the Brake Stack off of the lugs on the Piston Housing (#10).

IMPORTANT - Keep the Drive Plates and Friction Discs in the same order as removed.

3. Remove the (6) Screws (#153) and (6) Lockwashers (#128) that bolts the Housing (#8) to the Piston Housing (#10).

CAUTION - Piston Housing (#10) is under spring pressure. Back out Screws (#153) slowly and evenly and be sure housings separate slowly as they are backed out. Gaurd against sudden release of spring pressure.

4. Remove the Springs (#36) from the spring pockets in the Housing (#8).

NOTE - It is not necessary to disassemble the Piston Housing Assembly.

C. HOUSING (#8) TO DRIVE MOTOR

1. First check the motor shaft for any nicks or burrs. Cleanup and de-burr as necessary. Place a piece of masking tape over the motor shaft keyway to protect the Oil Seal (#31) during installation of the Housing (#8).
2. Place the Housing (#8) onto the Motor Pilot Flange with the Drain Plugs (#74) and (#64) located at the bottom.

CAUTION - Do not rest the weight of the Housing (#8) on the motor shaft. The sealing lip of the Oil Seal (#31) could be damaged causing leakage and premature failure of the motor brake.

3. Thread the (4) Soc. Hd. Cap Screws (#152) and Lockwashers (#126) into the tapped holes on the motor flange face (See Figure 3). Torque 3/8"-16 soc. hd. cap screws to **30 lb. ft.** or 1/2"-13 soc. hd. cap screws to **40 lb. ft.**

Check visually to make sure the sealing lip of the

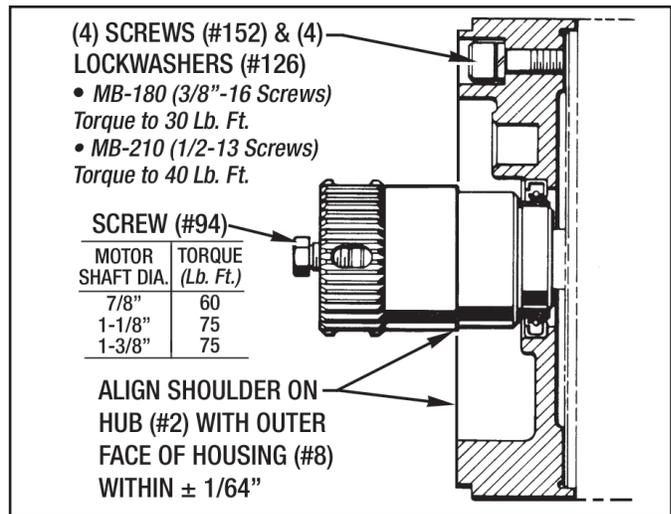


Figure 3 - Hub Alignment

Oil Seal (#31) is undamaged. Remove tape from keyway.

D. HUB ASSEMBLY TO MOTOR SHAFT

CAUTION - Do not use molybdenum disulfide "MOLYKOTE" or any other similar lubricant on the shaft. The collet hub locking element is keyless and depends on friction to transmit torque from the brake to the shaft.

1. The Collet (#110) is installed in Hub (#2) with a Hex Hd. Cap Screw (#94) at the factory. To install the hub onto the motor shaft, remove Hex Hd. Cap Screw (#94) and Washer (#81) and coat the threaded end with Loctite Threadlocker #271 (or equal), and reinstall Screw and Sealwasher (#81), but do not tighten. The collet must be loose in its bore.
2. Apply a light coat of Vaseline or equivalent to the Wear Ring (#32). This will facilitate sliding the hub into the seal.

IMPORTANT - Again use special care not to damage the sealing lip of the oil seal when placing the hub assembly on the motor shaft.

3. Make sure the collet is loose in its bore, if not, back the Hex Hd Cap Screw (#94) out slightly and push it forward to push the collet toward the end of the hub, this will dislodge the collet from the tapered bore.

E. HUB ALIGNMENT

1. Tap the hub lightly to align the proper shoulder of the hub with the housing face. This alignment should be within plus or minus 1/64" (See Figure 3).
2. After the Hub has been properly positioned, tightened the Hex Hd Cap Screw (#94) to specified torque. (See Figure 3).
4. Recheck the alignment - if it is within tolerance, go to the next step.

F. PISTON HOUSING ASSEMBLY TO HOUSING (#8)

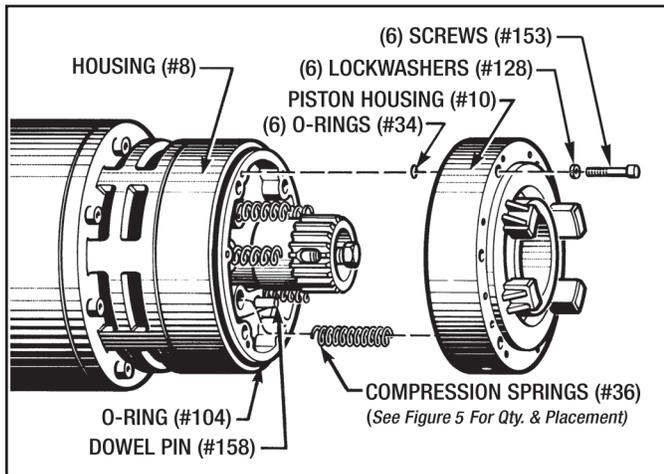


Figure 4 - Mounting Piston Housing Assembly

1. Lubricate the (6) O-Rings (#34) with Vaseline or equivalent and install them into the Piston Assembly (See Figure 4).
2. Lubricate the large O-Ring (#104) with Vaseline or equivalent and install it on the shoulder of the Housing (#8).
3. Place the correct number of Springs (#36) back into the spring pockets in the Housing (#8). (See Figure 5)
4. Carefully guide the Piston Housing Assembly into the mating diameter of the Housing (#8). See Figure 4 for the position of the brake lugs and the 1/4" NPT brake port. Orient the actuation port to the bottom. **Make sure the hole in the Piston (#3) is aligned with the Dowel Pin (#158).**
5. Using (6) Soc. Hd. Cap Screws (#153) and Lockwashers (#128) bolt the Piston Housing Assembly to the Housing (#8).

G. INSTALLATION OF DRIVE PLATES AND FRICTION DISCS

USE THE ASSEMBLY SEQUENCE SHOWN BELOW FOR THE STATIC TORQUE (Lb. Ft.) REQUIRED.

A	20 Lb. Ft.	B	30 Lb. Ft.	C	45 Lb. Ft.	D	60 Lb. Ft.	E	90 Lb. Ft.
(6) DRIVE PLATES (#12)	(4) DRIVE PLATES (#12)								
(2) FRICTION DISCS (#13)	(3) FRICTION DISCS (#13)								
(2) SPRINGS (#36)	(2) SPRINGS (#36)	(3) SPRINGS (#36)	(4) SPRINGS (#36)	(6) SPRINGS (#36)					

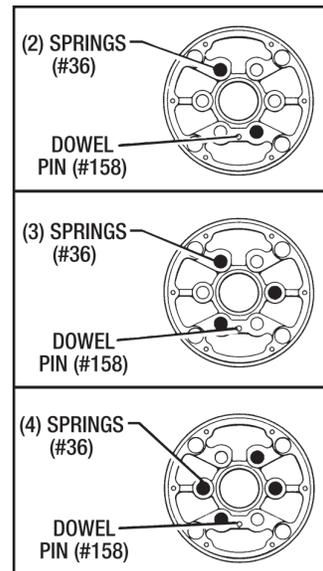


Figure 5 - Spring Placement

slightly to get it started.

The Friction Discs will also start onto the Splined Hub more easily if tilted slightly.

H. INSTALLATION OF SEPARATOR SPRINGS

Vertically mounted motor brakes require the use of Separator Springs. The Separator Springs (#17) are used to prevent residual drag.

Vertically mounted motor brakes have Drive Plates (#18) with rivets, the number of plates with rivets depends on the Torque Configuration. Torque Configuration "A" has (2) Drive Plates (#18) with rivets and (4) Drive Plates (#12) without rivets. Torque Configuration "B", "C", "D" and "E" have (3) Drive Plates (#18) with rivets and (1) Drive Plate (#12) without rivets.

1. Install Separator Springs (#17) on Drive Plates (#18) as shown in Figure 6 on the next page. Simply snap the springs over the large end of the rivet. Install (4) springs per drive plate.

1. Apply 60 PSI air to the 1/8" N.P.T. connection at the bottom of the Piston Housing Assembly so the piston will retract fully.

2. While air pressure is being applied, install Drive Plates (#12) and Friction Discs (#13) as determined by the **Torque Assembly Configurations Chart** and as shown below.

ASSEMBLY TIPS:

One side of the Steel Drive Plates has a slight radius on all edges due to the manufacturing process.

Install the radius side first, tilting the Drive Plate

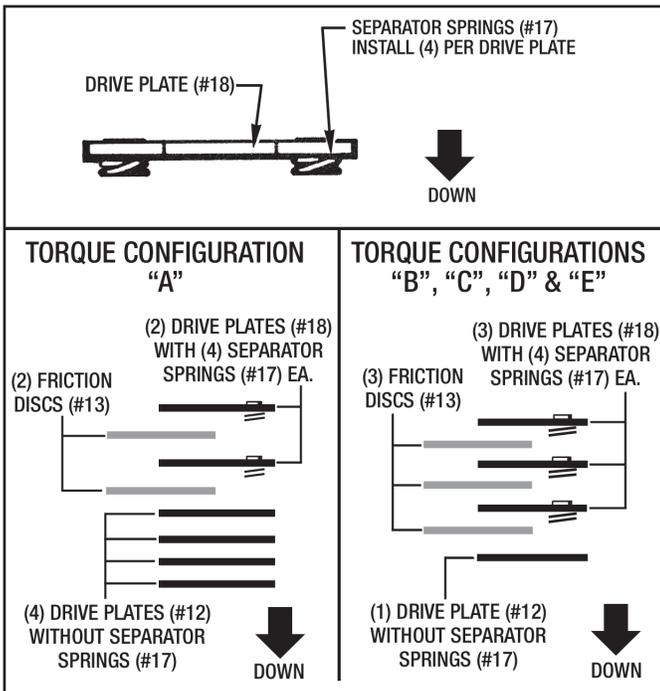


Figure 6 - Installing Separator Springs on Vertical Units

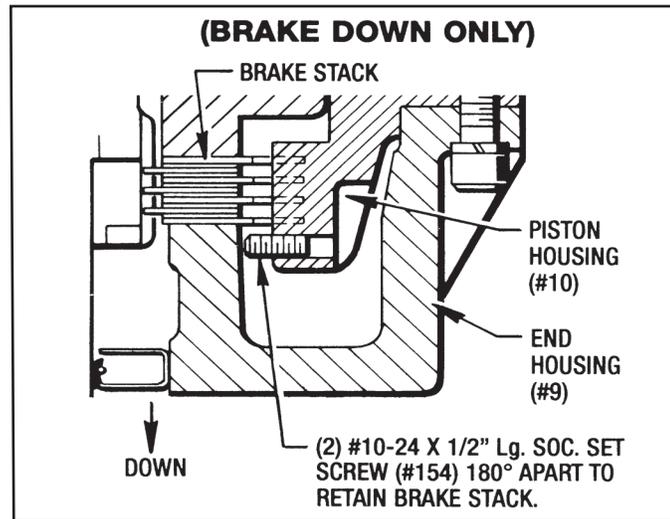


Figure 7 - Brake Stack Retaining Screws (Brake Down)

J. END HOUSING TO BRAKE ASSEMBLY

1. Lubricate O-ring (#30) with a light coating of Vaseline or equivalent and place it on the Piston Assembly. (See Figure 8).
2. Place the End Housing (#9) onto the Piston Housing Assembly.

NOTE

The Breather (#45) is to be located on the top as shown in Figure 1.

Attach the End Housing with (8) Soc. Hd. Cap Screws (#72) and Lockwashers (#128) to a torque reading of **22 lb. ft.**

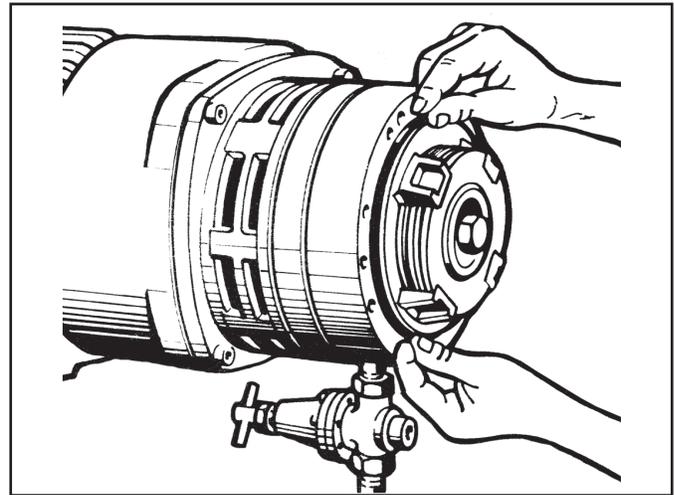


Figure 8 - Installing O-Ring (#30)

IT IS NOW SAFE TO RELEASE THE PISTON AIR PRESSURE.

3. Check the End Housing to see if Sight Gauge (#46), Air Breather (#45), Drain Plug (#74) and Pipe Plug (#73) are installed tightly.
4. Add automatic transmission oil (Mobil Type F ATF) until oil level is in the center of the Sight Gauge (#46). (See Lubrication on Page 6)
5. Install appropriate external pneumatic valving (See Figure 9.)

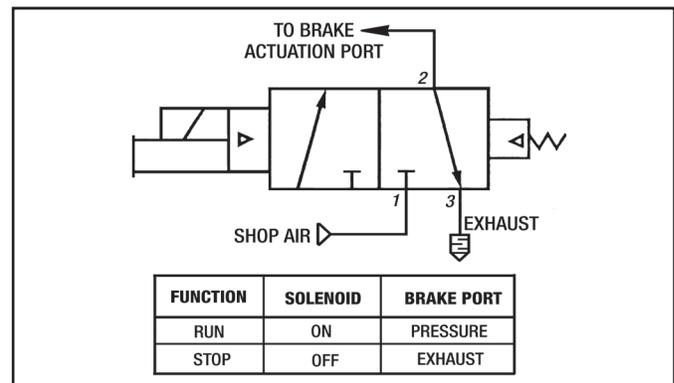


Figure 9 - Control Valve Schematic and Logic

The Solenoid Operated Air Valve used to control the operation of the *Posistop* Brake should be located as close as possible to the brake. Air lines should be no less than 3/8" diameter minimum.

Minimum air pressure to release brake, 20 psi for 2 springs (#36), 28 psi for 3 springs, 35 psi for 4 springs, 51 psi for 6 springs.

YOUR *Posistop* MOTOR BRAKE IS NOW READY TO OPERATE.

K. VERTICAL MOUNTING INSTRUCTIONS

• VERTICAL MOUNTING (Brake Up)

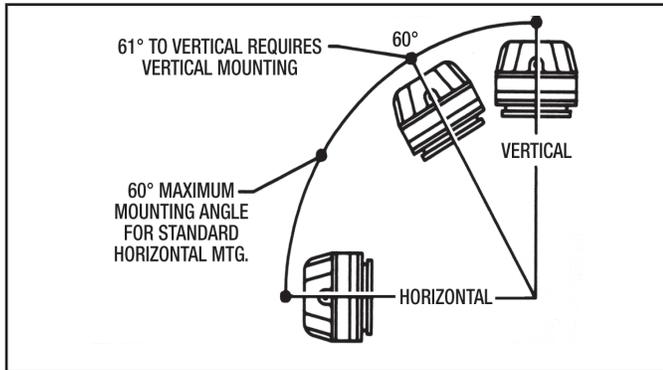


Figure 10 - Mounting Angle (Brake Up)

1. Remove one 1/8" Pipe Plug (#73) from End Housing (#9).
2. Remove Air Breather (#45) and Reducing Bushing (#76) from End Housing (#9).
3. Install Pipe Nipple (#263) in place of Pipe Plug (#73). Thread Bell Reducer (#262) onto nipple. Then install Air Breather (#266).

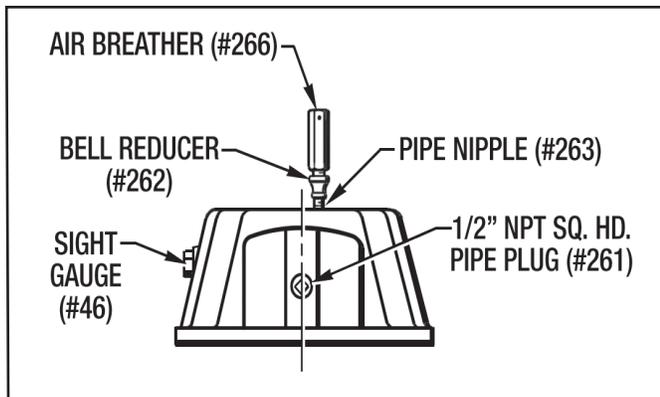


Figure 11 - Air Breather Installation

4. Remove Sight Gauge (#46) from End Housing (#9) and install it into the 1/2" NPT hole where the Air Breather (#45) was located.
5. Plug old sight gauge hole with 1/2" NPT Pipe Plug (#261).

NOTES

Reducer Bushing (#76) is not used for vertical mounting. Parts (#261), (#262), (#263) and (#266) are furnished in a Vertical Mounting Kit.

Use pipe sealant with Teflon (59241) on all pipe threads.

• VERTICAL MOUNTING (Brake Down)

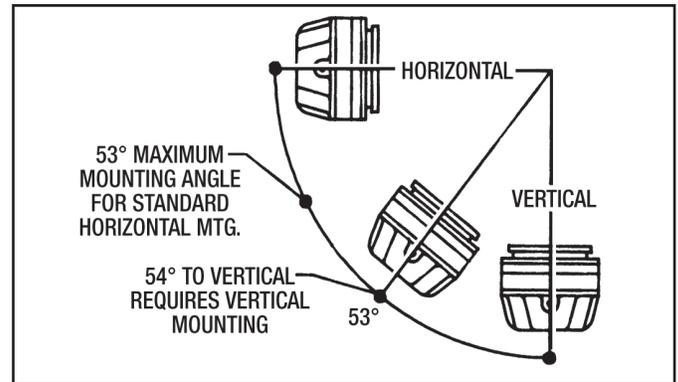


Figure 12 - Mounting Angle (Brake Down)

1. Remove Oil Sight Gauge (#46). Install 90 degree elbow (#264), nipple (#69) and pipe plug (#267).
2. Remove air breather (#45) and reducing bushing (#76). Install pipe plug (#261).
3. Remove pipe plug (#64) from housing (#8). Install 90 degree elbow (#265) and breather (#266).
4. Oil sight gauge (#46), air breather (#45) and reducer bushing (#76) are not used.

Use pipe sealant with Teflon (59241) on all pipe threads.

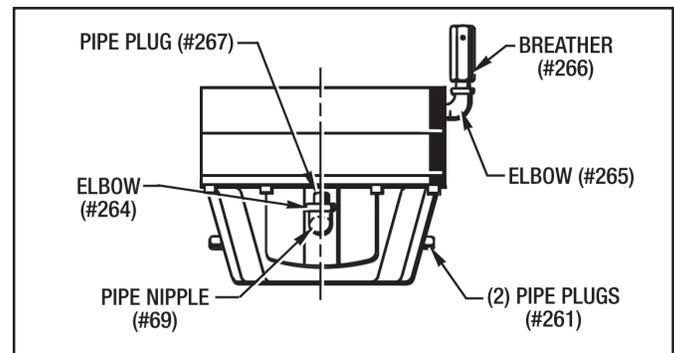


Figure 13 - Air Breather Installation (Brake Down)

LUBRICATION

A. CHECKING THE OIL LEVEL

Check the oil level when the drive is installed and weekly thereafter (until experience dictates otherwise). Always check the oil level with the unit stationary (not running).

NOTE - Oil Gauge (#46) and Pipe Plug (#75) may be reversed so that level is visible from other side

B. CHANGING THE OIL

Every three (3) months remove Drain Plug (#74) and (#64) at the bottom of the End Housing (#9) and Housing (#8). Drain all oil before refilling. More frequent oil change

may be required on high kinetic energy applications or in extremely dirty environments. Check the Oil Sight Gauge (#46) for dirt. Remove and clean if necessary. Replace the drain plugs. Refill unit with clean oil up to the center of the sight gauge. See figure 14 for proper fluid level.

CAUTION - Do not over fill with oil. Excess oil will cause the unit to overheat

C. TYPE OF OIL

Use Automatic Transmission Fluid, Mobil Type F ATF only. **Always use the type of oil called out on the Name Plate.**

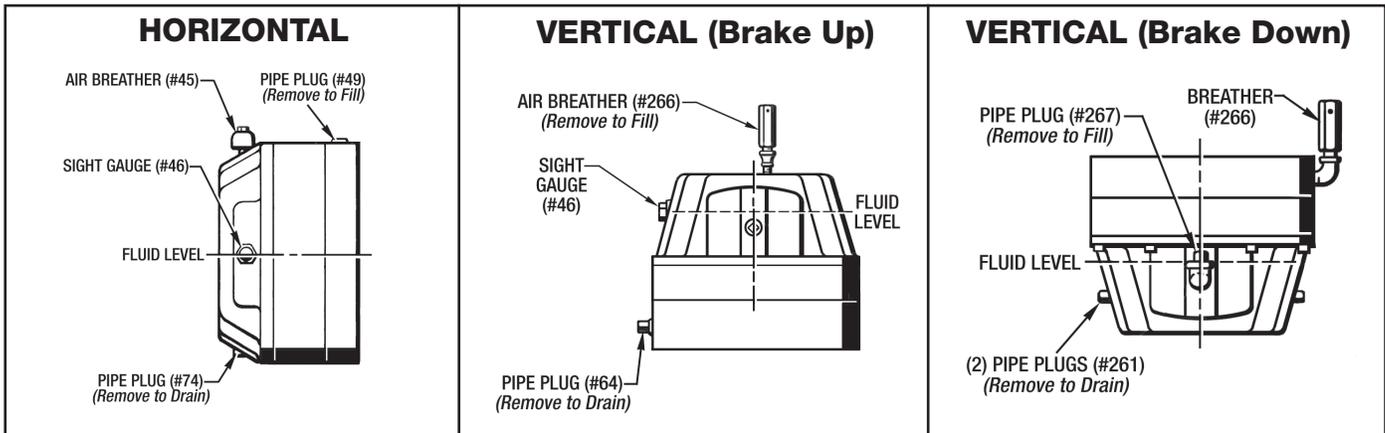


Figure 14 - Lubrication

FACTORY REBUILD SERVICE & COMPLETE SERVICE MANUAL

A. FACTORY REBUILD SERVICE

A Factory Rebuild Service is offered by Force Control. Contact our service or sales department for additional information.

B. COMPLETE SERVICE MANUAL

A complete Service Manual can be downloaded and printed off of our web site. Go to: www.forcecontrol.com

All of our catalogs and manuals on the web site are in PDF format and will require Adobe Acrobat Reader 5.0 or later to open them. This Adobe Acrobat Reader can be downloaded from our web site if you do not have it installed on your computer.



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