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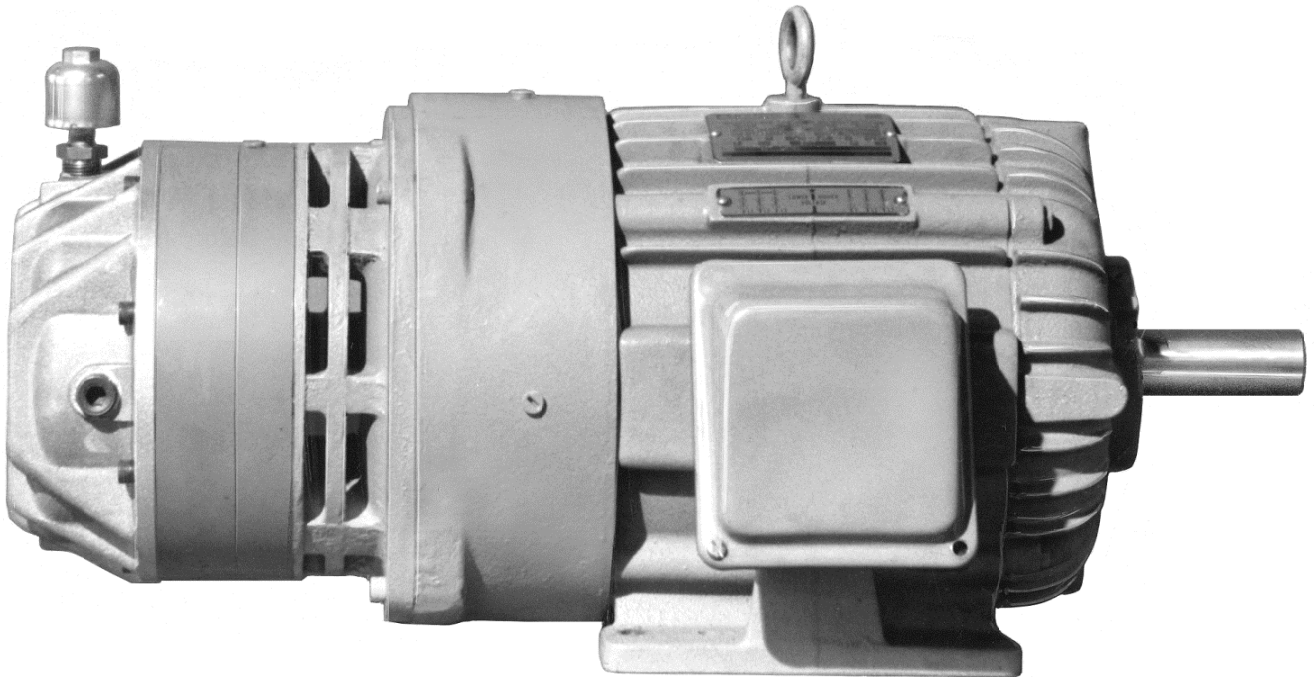
SERVICE MANUAL AND REPAIR PARTS

FOR

Posistop[®] Motor Brakes

Models:

MB-180 and MB-210/210L



**WARNING - Read this manual before any
installation, maintenance or operation.**



FORCE CONTROL INDUSTRIES, INC.

MANUFACTURERS OF MECHANICAL AND
ELECTRICAL POWER TRANSMISSION EQUIPMENT

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SPECIAL 24 MONTH WARRANTY

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Table of Contents

Section 1 - DESCRIPTION & OPERATION

1-1 The Oil Shear Principle	1
1-2 Description.....	1
1-3 Features	1
1-4 Operation.....	2

Section 2 - SPECIFICATIONS

2-1 Dimensions.....	3
2-2 Torque Specifications	4

Section 3 - INSTALLATION

Important Safety Precautions	5
3-1 Housing to Drive Motor	5
3-2 Hub Assembly to Motor Shaft	5
3-3 Hub Alignment.....	6
3-4 Piston Housing Assembly (Pre-Assembled)	6
3-5 Piston Housing Assembly to Housing (#8).....	6
3-6 Installation of Drive Plates and Friction Discs.....	7
3-7 Installation of Separator Springs (Vertical Mounting Only)	7
3-8 End Housing to Brake Assembly.....	7
3-9 Vertical Mounting Instructions	8

Section 4 - LUBRICATION

4-1 Checking the Oil Level	10
4-2 Changing the Oil.....	10
4-3 Type of Oil	10

Section 5 - OPERATIONAL CHECKS

5-1 Operational Checks.....	11
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Section 6 - TROUBLESHOOTING

Troubleshooting Chart	12
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Section 7 - REPAIR

7-1 General Information.....	13
7-2 Cleaning and Inspection.....	13
7-3 Repair or Replacement	13
7-4 Reassembly.....	13

Section 8 - ORDERING REPAIR PARTS

8-1 General Information.....	14
8-2 Name Plate Information	14
8-3 Ordering Repair Parts	14
8-4 Factory Re-Build Service	14
8-5 <i>Posistop</i> Model Numbers	15
Repair Parts List	16
<i>Posistop</i> Exploded View Drawing.....	17
Typical Pneumatic Schematic.....	18

Section 1

DESCRIPTION & OPERATION

1-1 THE OIL SHEAR PRINCIPLE

Conventional clutches and brakes depend on the friction between solid surfaces operating in air to transmit torque. Friction does the job, but produces a great amount of **HEAT and WEAR**, causing an increase in replacement parts, breakdown and maintenance time.

OIL SHEAR TECHNOLOGY was pioneered by Force Control in 1959 and resulted in one of the most energy efficient brake/clutch/variable speed drive systems available today.

In 1970 Force Control introduced an integral oil pump, which requires no additional parts. This oil pump forces a positive oil feed from the center of the brake disc stack to "Float" the friction surfaces in a continuously circulating bath of oil.

The oil molecules tend to cling to each other and also to the friction surfaces. As moving and stationary surfaces are brought together, a thin but positive film of oil is maintained between them and is controlled by the clamping pressure and grooves designed into the braking surfaces.

TORQUE is transmitted from one surface to the other through the viscous shear of the oil film. The braking surfaces are protected by this oil film, which reduces wear and effectively transmits heat away from the braking surfaces.

...thus brake wear is greatly reduced along with all routine maintenance common to conventional dry motorbrakes.

A PERIODIC OIL CHANGE IS ALL THAT IS REQUIRED FOR NORMAL MAINTENANCE.

1-2 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.

FORCE CONTROL provides 6 Models of *Posistop* Motor Brakes to meet your individual requirements for deceleration torque, thermal dissipation and static torque.

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

1-3 FEATURES

(See Figure 1-1)

- **NEMA-C STANDARD FLANGE MOUNTING** to any suitable double shaft drive motor
- **"COLLET" LOCKING ELEMENT** for a positive self-locking, keyless hub mounting with high torque transmitting capabilities.

"COLLET" ADVANTAGES:

- 1. CONVENIENT EASY MOUNTING** - No press fits or costly machining necessary. Allows use of commercial tolerance motor shafts.
 - 2. EASY RELEASING AT DISASSEMBLY**
 - 3. TOTALLY SELF CENTERING**
 - 4. FULL SHAFT STRENGTH** - Since no metal is removed, stress concentrations are avoided permitting shafts to retain their full strength.
- **INTERNAL CENTRIFUGAL TYPE OIL PUMP** - Maintains positive oil film between braking surfaces without external pumping devices.
 - **MULTIPLE BRAKING DISC STACK** - At the heart of your *Posistop* Motor Brake is a multiple braking disc stack consisting of drive plates, keyed to the piston housing and friction discs, splined to the drive hub.

AS A RESULT, THE TORQUE is distributed along the hub rather than on a single braking surface reducing the heat and wear on each brake disc.

1-4 OPERATION

The *Posistop* Motor Brake Cross Section (Figure 1.1) 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 brake stack, allowing the drive motor to rotate freely.

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

MOTOR BRAKE CROSS SECTION

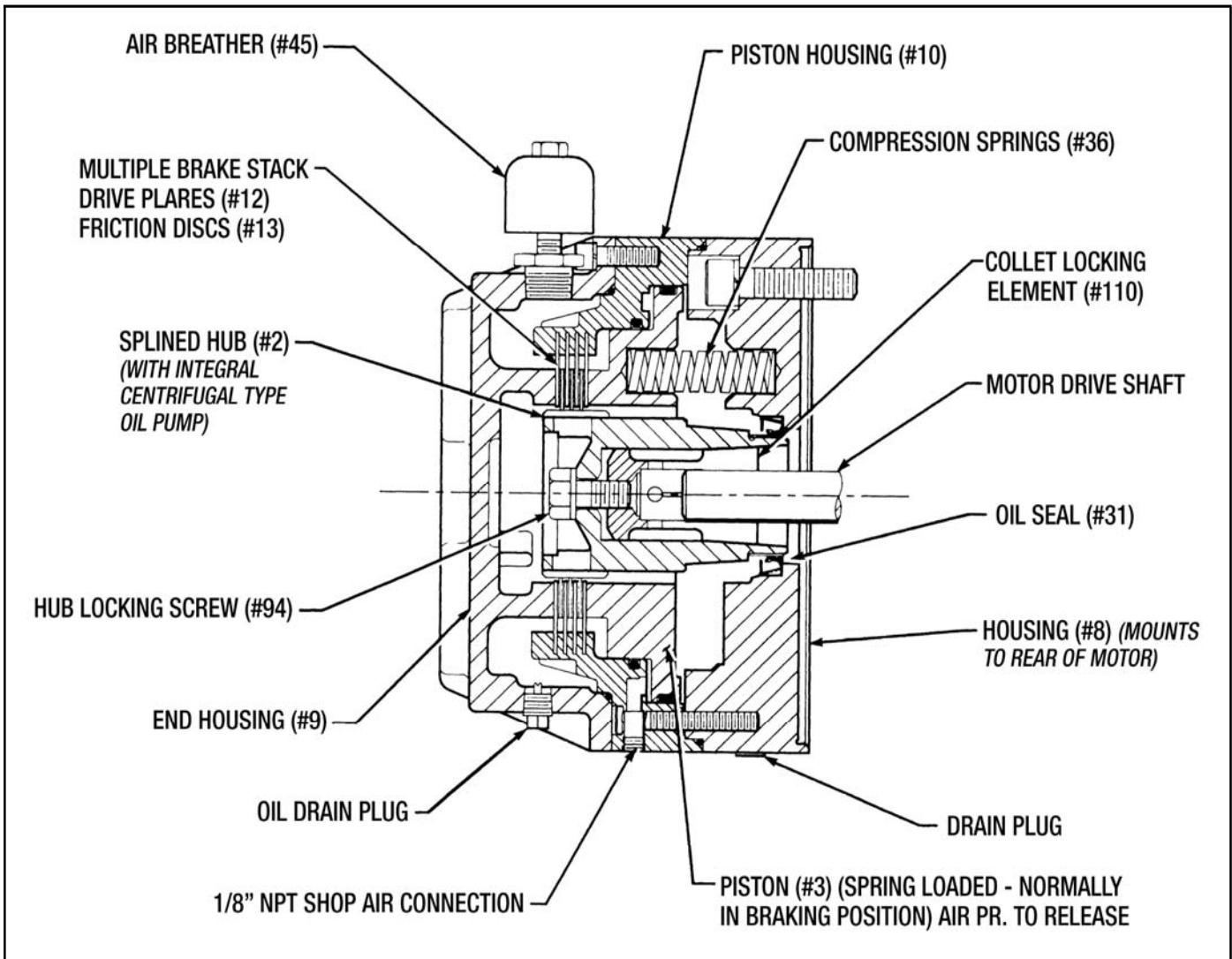


Figure 1.1 - Motor Brake Cross Section

Section 2 SPECIFICATIONS

2-1 DIMENSIONS

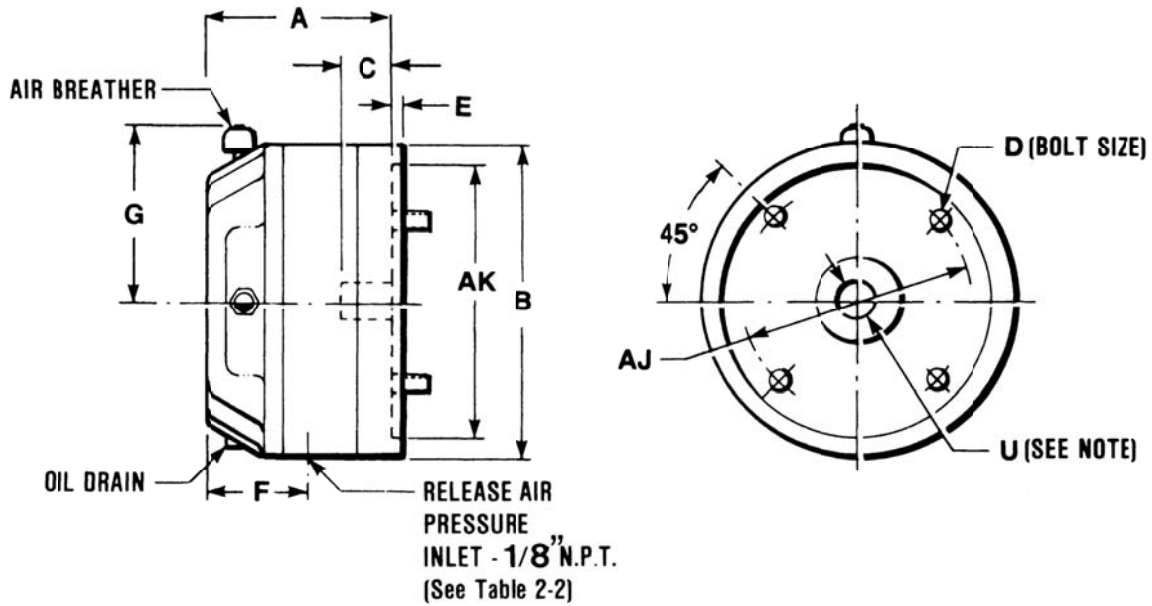


Figure 2.1 - Dimensions

MODEL No.	DIMENSIONS (Inches)											OIL CAP. (Qts.)	WEIGHT (Lbs.)
	A	B	C		D	E	F	G	U	AJ	AK		
			MIN.	MAX.									
MB-180	6-1/8	8-13/16	1-3/4	2-3/4	3/8-16	1/4	3-3/8	5-3/4	7/8	5-7/8	4-1/2	1	40
									1-1/8				
MB-210	6-1/8	8-13/16	1-3/4	2-3/4	1/2-13	3/16	3-3/8	5-3/4	7/8	7-1/4	8-1/2	1	45
									1-3/8				
MB-210L	6-7/8	8-13/16	2-1/2	3-1/2	1/2-13	3/16	3-3/8	5-3/4	7/8	7-1/4	8-1/2	1	45
									1-1/8				
									1-3/8				

Table 2.1 - Dimensions

NOTE: Consult the Force Control Factory or your Force Control Representative for Non-Standard Bore Sizes not listed and for Thru-Shaft Configurations.

2-2 OPERATING SPECIFICATIONS

TORQUE CAPACITY

Given below are 5 different Assembly Configurations (A, B, C, D and E) for the Drive Plates (#12), Friction Discs (#13) and Springs (#36). Different Assembly

Configurations are used to obtain different Torque Capacity Requirements.

Refer to Table 2.2 below for your Torque Requirements and other related specifications.

See Installation of Drive Plates and Friction Discs in Section 3 on Page 8 for Assembly Procedure.

MOTOR BRAKE TORQUE ASSEMBLY CONFIGURATIONS






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

Figure 2.2 - Motor Brake Torque Assembly Configurations

- Denotes quantity of Compression Springs (#36) used for this specific torque requirement. See Section 3-6 Piston Housing Assembly to Housing on page 7 for spring placement.

MOTOR BRAKE OPERATING TORQUE SPECIFICATIONS

MODEL	NOMINAL STATIC TORQUE (Lb. Ft.)	NOMINAL DYNAMIC TORQUE (Lb. Ft.)	TORQUE ASSEMBLY CONFIG. (See Above)	PRESSURE TO RELEASE (PSIG)	CYCLIC WK ² (PSIG)	THERMAL RATING (HP/Sec/Min)	PISTON VOLUME (Cu. In.)
MB-180	20	17	A	20	.034	25	3
	30	26	B	20			
	45	39	C	28			
	60	52	D	35			
	90	78	E	51			
MB-210 MB-210L	20	17	A	20	.034	25	3
	30	26	B	20			
	45	39	C	28			
	60	52	D	35			
	90	78	E	51			

Figure 2.2 - Operating Torque Specifications

Contact Force Control Factory or your Force Control Representative for additional information on different torque ratings and assembly configurations not listed in this manual.

Maximum Speed - 1800 RPM

Section 3

INSTALLATION

IMPORTANT SAFETY PRECAUTIONS

THE BRAKE UNITS DESCRIBED IN THIS MANUAL MUST NOT BE INSTALLED IN ANY MANNER EXCEPT AS SPECIFIED HEREIN, AND MUST NOT BE OPERATED AT SPEEDS, TORQUE LOADS OR TEMPERATURES OTHER THAN THOSE SPECIFIED IN THIS MANUAL. FAILURE TO LIMIT OPERATION OF THE BRAKES TO THE CONDITIONS SPECIFIED COULD DAMAGE THE UNITS, MAY CAUSE MALFUNCTION OR DAMAGE TO INTERCONNECTING EQUIPMENT AND VOID THE WARRANTY.

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 any installation, open the motor disconnect, shut off the control electrical supply and shut off the air supply then lock them out to avoid the possibility of personal injury.

NOTE - The *Posistop* Motor Brake has been partially assembled at the factory for ease of shipment. Partial disassembly will be necessary to assemble the brake to the motor.

The installation text covers the complete assembly. In the event the brake must be completely disassembled and reassembled.

The sections of the Installation procedures that do not apply to Initial installation of the motor brake are noted as being pre-assembled.

During Installation see *Figure 8-1* for a visual reference of parts.

3-1 HOUSING TO MOTOR DRIVE

1. First check the motor shaft for any nicks or burrs. Clean-up 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 Plug (#64) located at the bottom (See *Figure 8.1*).

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.

REQUIRED TORQUE:

MB-180 (4) 3/8-16 soc. hd. cap screws 30 Lb. Ft.
MB-210 (4) 1/2-13 Soc. Hd. Cap Screws 40 Lb. Ft.

Check visually to make sure the sealing lip of the Oil Seal (#31) is undamaged. Remove tape from the keyway.

3-2 HUB ASSEMBLY TO MOTOR SHAFT

CAUTION

DO NOT USE MOLYBDENUM DISULPHIDE "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 Hex Hd. Cap Screw (#94) at the factory. To install the hub onto the shaft, remove Hex Hd. Cap Screw (#94) and Washer (#81) and coat the threaded end with LOC-TITE THREADLOCKER #271 (or equal), and reinstall the Screw (#94) and Seal Washer (#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 Sleeve (#32). This will facilitate sliding the hub into the seal.
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.

3-3 HUB ALIGNMENT

1. Tape a steel straightedge to the outer face of the housing as shown in *Figure 3.1* on the next page.
2. Tap the hub lightly to align the proper shoulder of the hub with the housing face (straightedge). This alignment should be within plus or minus 1/64" (See *Figure 3.2* on the next page).
3. After the hub has been properly positioned retain it from turning and tighten Hex Hd. Cap Screw (#94) (See *Figure 3.2*) for proper torque reading.

RE-CHECK THE ALIGNMENT - If It Is within tolerance, remove straightedge.

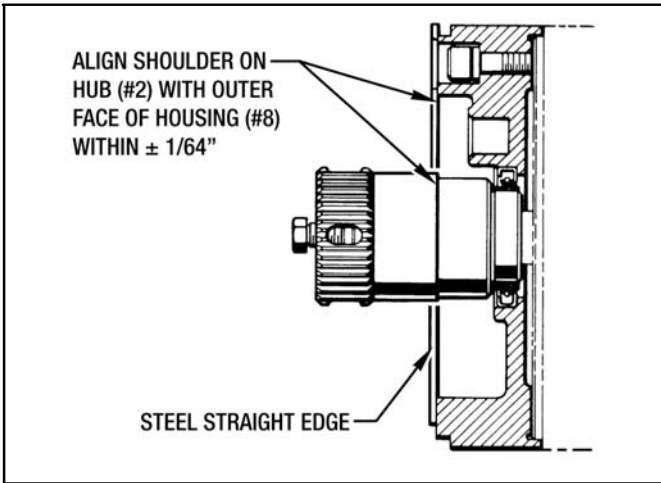


Figure 3.1 - Hub (#2) Alignment

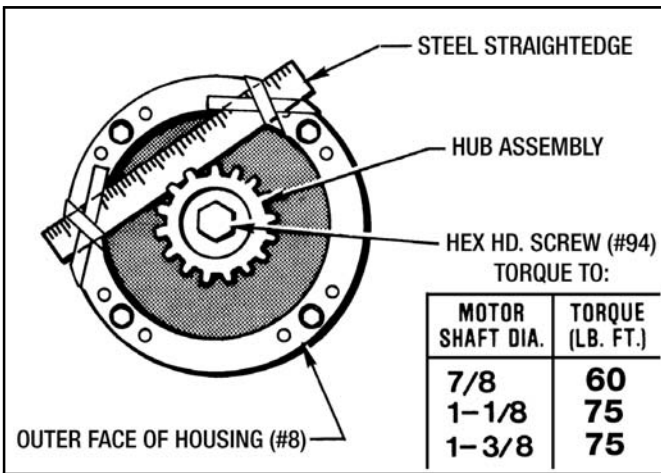


Figure 3.2 - Collet Bolt Torque

3-4 PISTON HOUSING ASSEMBLY (Pre-Assembled)

NOTE - This part of the brake is pre-assembled and does not need to be taken apart. At initial installation skip to 35 PISTON HOUSING ASSEMBLY TO HOUSING below.

1. Lubricate the O-Ring (#39) and the Liner (#42) with Vaseline or equivalent and place them into the I.D. groove of the Piston Housing (#10).
2. Lubricate the (2) O-Rings (#40) and the Liner (#43) with Vaseline or equivalent and place them in the O.D. groove on piston #3.
3. Place the Piston (#3) into the Piston Housing (#10).

3-5 PISTON HOUSING ASSY. TO HOUSING

(See Figures 3.3 and 3.4)

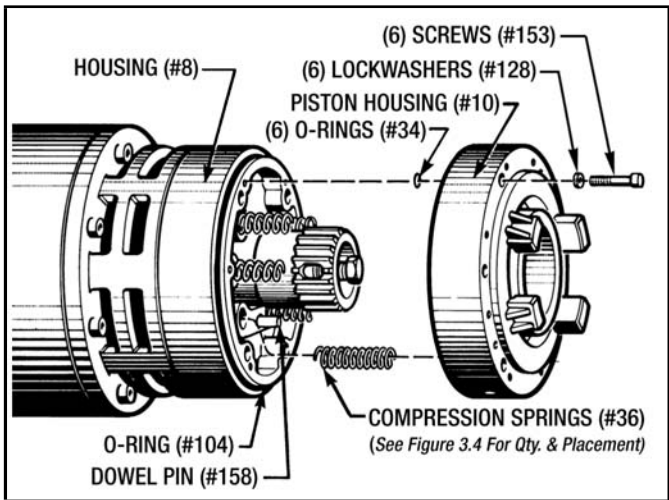


Figure 3.3 - Mounting Piston Housing Assembly

1. Lubricate the O-ring (#104) with Vaseline or equivalent and place it on Housing (#8).
2. Place correct number of Springs (#36) into spring pockets in the housing. Install Dowel Pin (#158) into Housing (#8) See Figure 3.4 below for quantity used and arrangement).

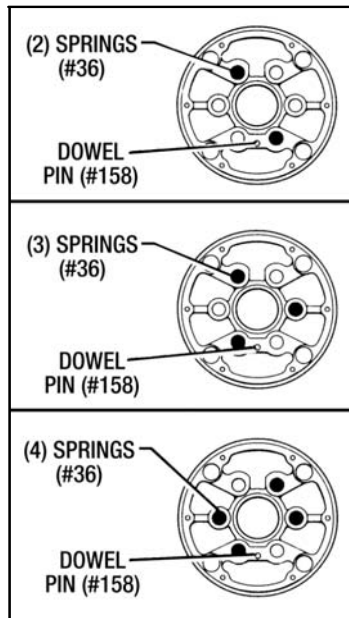


Figure 3.4 - Spring Location

3. Lubricate the (6) O-Rings (#34) with Vaseline or equivalent and install them into the counter bored recesses in the Piston Housing (#10.)

4. Carefully place the Piston Housing Ass'y. guiding the Springs (#36) into the mating pockets in the Piston (#3), onto the mating flange of the Housing (#8).

Also make sure that the 1/8" N.P.T. shop air connection in the piston housing is located at the bottom.

5. Secure the piston housing assembly with the (6) Soc. Hd. Cap Screws (#153) and Lockwashers (#128). Torque down evenly to 22 Lb. Ft.

WARNING

The Piston Housing Assembly is now under spring pressure and care must be taken at disassembly to remove the (6) Soc. Hd. Cap Screws (#153) evenly until the spring pressure is relieved.

3-6 INSTALLATION OF DRIVE PLATES AND FRICTION DISCS

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

MOTOR BRAKE TORQUE ASSEMBLY CONFIGURATIONS

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)	(4) DRIVE PLATES (#12)	(4) DRIVE PLATES (#12)	(4) DRIVE PLATES (#12)
(2) FRICTION DISCS (#13)	(3) FRICTION DISCS (#13)	(3) FRICTION DISCS (#13)	(3) FRICTION DISCS (#13)	(3) FRICTION DISCS (#13)
* (2) SPRINGS	* (2) SPRINGS	* (3) SPRINGS	* (4) SPRINGS	* (6) SPRINGS

Figure 3.5 - Motor Brake Torque Assembly Configurations

1. Apply 60 P.S.I. of shop air to the 1/8" N.P.T. shop air 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 Figure 3.5 above.

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 slightly to get it started.

The friction discs will also start onto the splined hub more easily if tilted slightly.

3-7 INSTALLATION OF SEPARATOR SPRINGS

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

1. Vertically mounted motor brakes have drive plates with rivets, the number of plates with rivets depend-

ing on the torque configuration. Torque configuration "A" has two drive plates with rivets and Torque Configurations "B", "C", "D" and "E" have three drive plates with rivets.

2. Install Separator Springs (#17) on Drive Plates (#18) (See Figure 3-8). Simply snap the springs over the large end of the rivets in Drive Plates (#18.) Install four springs per drive plate.
3. Do not install separator springs on the first Drive Plate (#12) (See Figure 8.1). When installing the drive plates, place Drive Plate (#12) in the brake first.

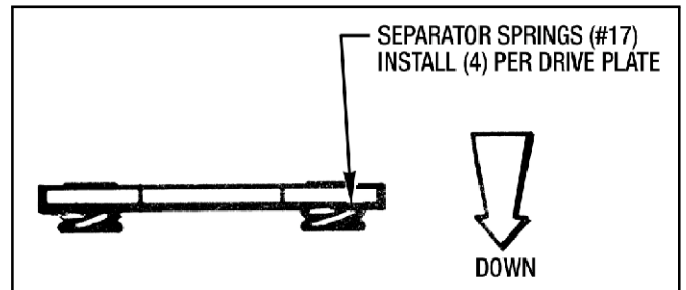


Figure 3.6 - Installing Separator Springs

NOTE - On Vertical Brake Down Units there are (2) #1024 X 1/2" Lg. Socket Set Screws (#154) installed in the Piston Housing to retain the Brake Stack during Disassembly and Reassembly procedure. (See Figure 3-7 on next page.)

3-8 END HOUSING TO BRAKE ASS'Y.

1. Lubricate O-Ring (#30) with a light coating of Vaseline or equivalent and place it on the Piston Assembly Shoulder (See Figure 3.8 on next page).
2. Place the End Housing (#9) onto the Piston Housing Assembly.

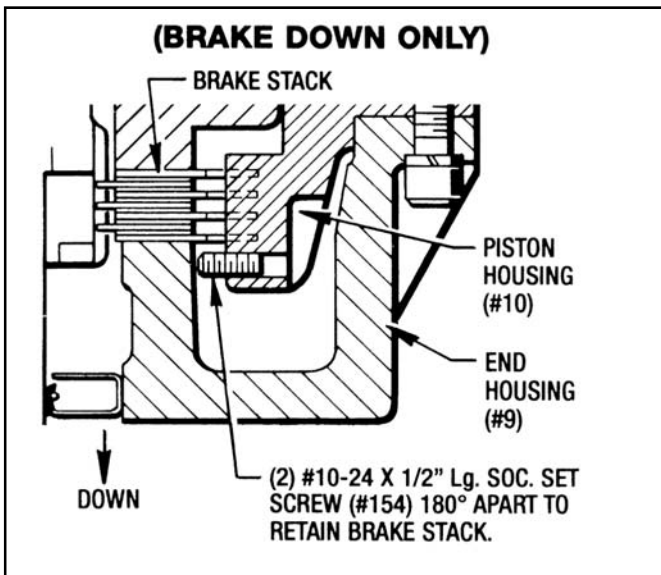


Figure 3.7 - Brake Stack Down

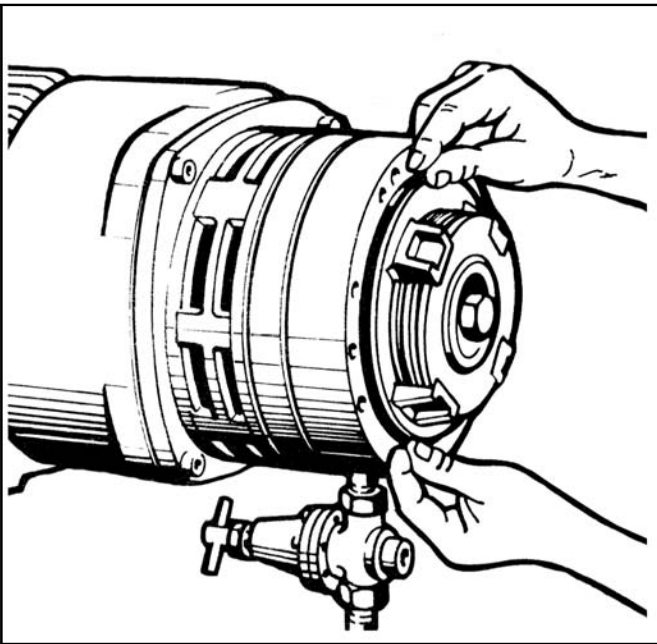


Figure 3.8 - Installing O-Ring (#30)

NOTE - Install Breather (#45) and Reducer Bushing (#76) on top of End Housing (#9) (See Figure 8.1).

3. Attach the End Housing with (8) Soc. Hd. Cap Screws (#72) and Lockwashers (#128) to a torque reading of 15 Lb. Ft.

IT IS NOW SAFE TO RELEASE THE PISTON AIR PRESSURE.

4. Check the end housing to see if Sight Gauge (#46), Air Breather (#45), Drain Plug (#74), Pipe Plug (#75) and End Plug (#73) are installed tightly.

NOTE - For Vertical Mounting of your motor brake see Section 3-9

5. Add Automatic Transmission Oil (Mobil ATF 210) until oil level is in center of the Sight Gauge (#46).
6. Install appropriate external pneumatic valving (See page 16 for typical pneumatic schematic).

Your Posistop Motor Brake is now ready to operate.

3-9 VERTICAL MOUNTING INSTRUCTIONS

A. VERTICAL MOUNTING BRAKE UP

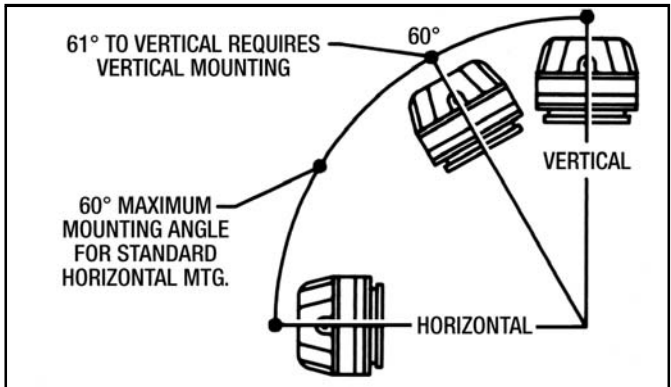


Figure 3.9 - Horizontal/Vertical Mounting Angles

1. See Page 8, Section 3-7 for installation of Separator Springs (#17) on Drive Plates (#12).
2. Remove 1/8" Pipe Plug (#73) from End Housing (#9). (See Figure 8.1).
3. Remove Air Breather (#45) and Reducing Bushing (#76) from End Housing (#9). (See Figure 8.1)
4. Install Air Breather (#266) into End Housing (#9) along with bell reducer and nipple, furnished with vertical kit (See Figure 3.10).

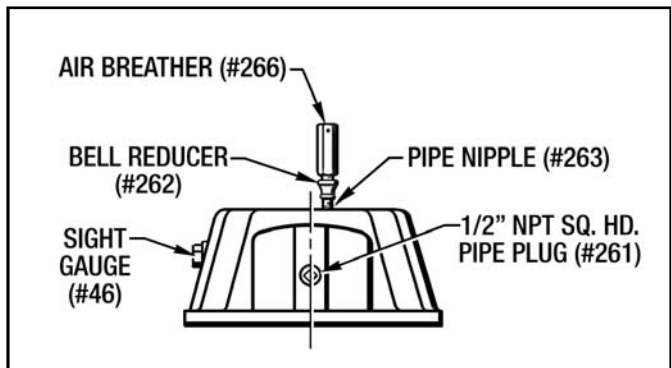


Figure 3.10 - Vertical Up Mounting Kit

NOTE - The Reducer Bushing (#76) is not used for Vertical Mounting.

5. Remove Sight Gauge (#46) from End Housing (#9) (See Figure 8.1) and install it into the 1/2" N.P.T. hole where the Air Breather (#45) was located (See Figure 3.10)

6. Plug old sight gauge hole with a 1/2" N.P.T. Sq. Hd. Pipe Plug (#261) (See Figure 3.10). This plug is furnished with the Vertical Mounting Kit.

NOTE - USE PIPE SEALANT WITH TEFLON ON ALL PIPE THREADS.

B. VERTICAL MOUNTING BRAKE DOWN

1. See Page 8, Section 3-7 for Installation of Separator

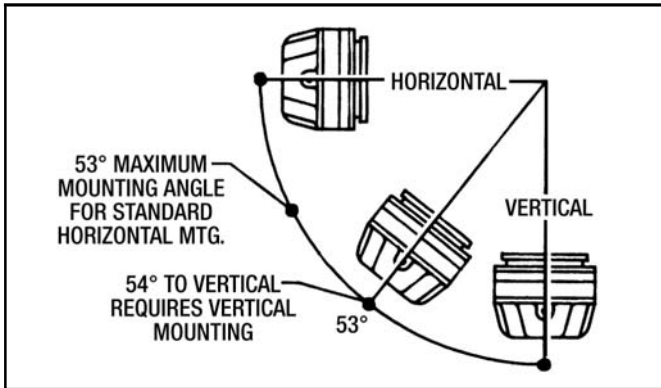


Figure 3.11 - Horizontal/Vertical Mounting Angles

Springs (#17) on Drive Plates (#12).

2. Remove Oil Sight Gauge (#46) (See Figure 8.1). Install 90 Degree Elbow (#264), Nipple (#69) and Pipe Plug (#267) (See Figure #3.12).
3. Remove Air Breather (#45) and Reducing Bushing (#76) (See Figure 8.1). Install Pipe Plug (#261) (See Figure 3.11).
4. Remove Pipe Plug (#64) from Housing (#8) (See Figure 8.1). Install 90 Degree Elbow (#265) and Breather (#266) (See Figure 3.12).

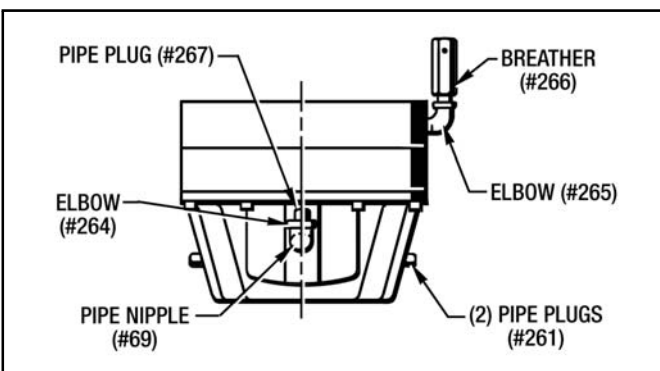


Figure 3.12 - Vertical Down Mounting Kit

5. Oil Sight Gauge (#46), Air Breather (#45) and Reducer Bushing (#76) are not used.

NOTE - USE PIPE PLUG SEALANT WITH TEFLON ON ALL PIPE THREADS.

SECTION 4 LUBRICATION

4-1 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.

With units mounted vertically brake down, the oil level is to be just below the top of Elbow (#264.)

4-2 CHANGING THE OIL

Every twelve (12) months remove Drain Plug (#74) and (#64) at 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. Approximate capacities are listed on page 3.

CAUTION

Do not overfill with oil. Excess oil will cause the unit to overheat.

4-3 TYPE OF OIL

Use Automatic Transmission Fluid, Mobil ATF-210 (type F) or Mobil Multi-Purpose ATF.

Section 5

OPERATIONAL CHECKS

WARNING

Make Operational Checks ONLY when the drive motor and motor brake are NOT IN OPERATION. Open motor disconnect and LOCK IT OUT to avoid personal injury.

1. If automatic controls are used, make provisions for Manual Operation.
2. Remove Air Breather (#45) and Reducer Bushing (#76) from End Housing (#9). Do not remove while motor is operating.
3. Apply 60 P.S.I. air pressure to the brake and observe the action of the piston through the air breather port. If the piston action is irregular, or if it tends to stick or bind, internal damage may be indicated.
4. Listen and look for air bubbles in the oil, which would indicate piston leakage.
5. If the piston moves slowly and leaks are evident, the piston seals may be damaged.
6. Exhaust the air pressure and observe that the piston returns quickly and smoothly back to normal braking position.
7. Re-install the Reducer Bushing (#76) and the Air Breather (#45) back into the End Housing (#9).

Section TROUBLESHOOTING

TROUBLE	POSSIBLE CAUSE	CORRECTION
A. Brake fails to engage properly.	Piston sticking or binding Weak or broken spring. Air pressure not exhausting or slow in exhausting. Worn friction surfaces.	Disassemble to extent necessary and inspect for damaged parts. Replace as needed. Check air regulator valve and replace if necessary. Check parts for wear and replace if necessary.
B. Brake engages too quickly.	Low oil level.	Check oil level and correct.
C. Noise and vibration.	Improper or loose mounting of the drive motor.	Check mounting and correct. If partial disassembly is required, refer to Installation Section 3
D. Brake fails to engage properly.	Low air pressure. Piston sticking or binding. Air regulator valve not functioning properly.	Increase pressure (See Table 2.2) Disassemble to extent necessary and inspect for damaged parts. Check valve operation and replace if necessary.
E. Unit overheats (Temperature over 225° F)	Brake not engaging or disengaging properly, causing excessive slippage. Improper oil level	Refer to Troubles A and D. Check oil level and add or drain as necessary.
F. Oil leakage.	Oil seal lip damaged. O-Ring seals.	Check for oil leaking around shaft. Replace Oil Seal if necessary. Tighten all external bolts.
G. Oil leaking at breather.	Damaged seal around piston. Oil level too high.	Disassemble and replace. Drain excess oil.
H. Brake does not repeat.	Air pressure changed. * Oil temperature changed.	Check and adjust air pressure. Check temperature.

* For installations requiring precise starting and stopping, operating temperatures are important. Operating temperatures between 116° F and 165° F are recommended.

Section REPAIR

7-1 GENERAL INFORMATION

Unless the brake is to be completely overhauled, it should be disassembled only to the extent necessary to gain access to the worn or damaged parts.

Follow the sequence and procedures set forth in Section 3, INSTALLATION for both disassembly and reassembly of the Motor Brake, noting the following for hub removal.

When hub removal is required, remove Hex Hd. Cap Screw (#94). It may be necessary to apply heat to Hex Hd. Cap Screw (#94) to release the bond of the sealant. Install a $\frac{1}{2}$ "-13 x $\frac{3}{4}$ " long socket set screw into the Collet (#110). Install a 5/8-11 x 2" long Hex Hd. Cap Screw into the Hub (#2). Turn the 5/8" Hex Hd. Cap Screw to push the hub off of the collet.

7-2 CLEANING AND INSPECTION

Clean metal parts in a suitable solvent and dry with low pressure compressed air. Clean drive plates and friction discs one at a time, keeping parts in the same order as they were when removed. After cleaning, inspect parts for cracks, distortion, scoring, nicks, burrs or any other damage that would affect the operation of the brake. Pay particular attention to the following:

1. Check the Friction Discs (#13) wear surfaces for scoring, galling or evidence of uneven wear.
2. Check the brake Drive Plates (#12) for scoring or galling. Make sure they are flat. If a perceptible ridge is worn in the drive plate where it mates with the friction disc, it should be replaced.
3. Carefully check the piston and bore surfaces for nicks, scratches, scoring or other damage, which would affect operation or cause leakage.
4. Pay particular attention to the Wear Sleeve (#32) and Oil Seal (#31), checking for any nicks, scratches or any damage that would cause leakage.

WARNING

Petroleum based cleaning solvents are extremely flammable. Open flames or smoking by any personnel in the vicinity of these solvents is extremely hazardous and MUST NOT BE PERMITTED.

7-3 REPAIR OR REPLACEMENT

A fine stone or crocus cloth may be used to remove minor surface defects from parts, if the operation or sealing action of the part is not affected. The use of coarser abrasives or other machining methods should not be attempted. Otherwise, damaged parts should be replaced. Replacement is recommended for the following parts when needed.

1. Replace all O-rings, Piston Liners and Oil Seals removed during disassembly.
2. Replace brake discs and plates as a complete set.

7-4 REASSEMBLY

Note the following general reassembly instructions as applicable:

1. Lubricate O-rings, liners and the lip of the oil seal with a light coating of Vaseline or equivalent immediately before assembly and installation of mating parts.
2. External O-ring liners will be easier to install if heated in an oven to approx. 200°F max.
3. The installation of press-fitted parts can also be made easier by heating the outside part in an oven.

CAUTION

USE SUITABLE GLOVES WHEN HANDLING HEATED PARTS.

4. Immediately before assembly, thoroughly clean screw threads with Loctite Safety Solvent. At assembly apply Loctite 242 (or equivalent) to all screw threads. Use this adhesive sparingly and wipe off any excess.

Section

ORDERING REPAIR PARTS

8-1 GENERAL INFORMATION

This section lists, describes and illustrates all available repair parts for the Force Control *Posistop* Motor Brake.

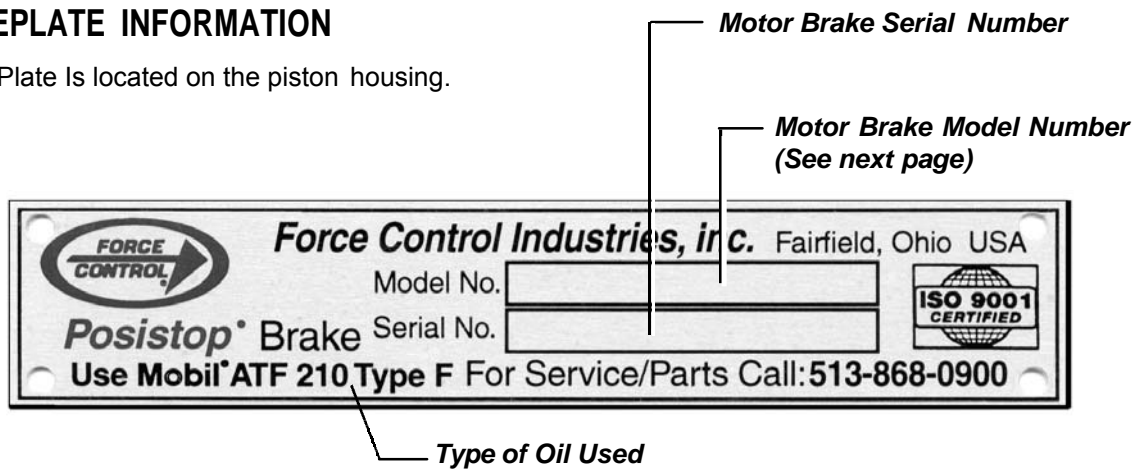
The models covered in this manual are:

MB-180 o MB-210 o MB-210L

Parts are identified on the exploded view drawing (Figure 8.1) with Part Reference Numbers. These numbers are the same as used in the parts listing.

8-2 NAMEPLATE INFORMATION

This Name Plate Is located on the piston housing.



8-3 ORDERING REPAIR PARTS

When ordering any repair parts, please specify all of the following information:

1. COMPLETE MODEL NUMBER (On Name plate)
2. SERIAL NUMBER (On Name plate)
3. PART REFERENCE NUMBER
(From Parts List and Exploded View Drawing)
4. PART NAME (From Parts List)
5. QUANTITY (As Required)
6. COMPLETE SHIPPING INFORMATION

IMPORTANT - Failure to include all of the above information will only delay your parts order. Unless another method is specified for Shipping Information, parts weighing less than 150 lbs. will be shipped United Parcel Service. Parts weighing over 150 lbs. will be shipped motor freight. Air freight and other transportation services are available but only if specified on your order.

8-4 FACTORY REBUILD SERVICE

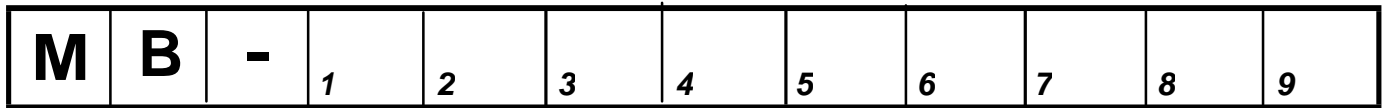
Reconditioning Service is offered by Force Control Industries at the factory. Before returning a unit for this service, be sure to first contact the Service Sales Department at Force Control Indus. for authorization and shipping Instructions. Force Control cannot be responsible for any units returned to the factory without prior notice and authorization.

Care must be given to the packaging of returned units. Always protect mounting feet and flanges by attaching to a suitable skid. Shipment -damaged units always delay repairs. It is usually Impossible to recover damage costs from the carrier. Whenever possible describe the problems you are having with your motor brake on your shipping papers.

Return to:

**FORCE CONTROL INDUSTRIES, INC.
3660 DIXIE HIGHWAY
FAIRFIELD, OHIO 45014
Telephone: 513-868-0900
Fax: 513-868-2105**

8-5 Posistop MODEL NUMBERS



SIZE (1, 2, 3)

MOTOR
FRAME

1	8	0	182
			184
2	1	0	213
			215
2	1	L	254
			256

REVISION (9)
By Force Control

STATIC TORQUE - (5, 6, 7)

0	2	0	= 20 Lb. Ft.
0	3	0	= 30 Lb. Ft.
0	4	5	= 45 Lb. Ft.
0	6	0	= 60 Lb. Ft.
0	7	5	= 75 Lb. Ft.
0	9	0	= 90 Lb. Ft.

SHAFT DIA. (8)

0	= 7/8"
1	= 1-1/8"
3	= 1-3/8"

TYPE (4)

S	= Std. Shaft	2	= Std. Vertical Brake Down
T	= Thru Shaft	3	= Thru Vertical Brake Up
1	= Std. Vertical Brake Up	4	= Thru. Vertical Brake Down

REPAIR PARTS LIST

MB-180, MB-210 & MB-210L

Posistop Motor Brake

REF. No.	PARTNAME	QTY.
Δ 2	Hub	1
3	Piston	1
8	Housing	1
9	End Housing	1
10	Piston Housing	1
*12	Drive Plate	
	20 Lb. Ft. Static Torque	6
	30, 45, 60 and 90 Lb. Ft. Static Torque	4
*13	Friction Disc	
	20 Lb. Ft. Static Torque	2
	30, 45, 60 and 90 Lb. Ft. Static Torque	3
*18	Drive Plate w/rievet (Vertical Units Only)	
	20 Lb. Ft. Static Torque	2
	30, 45, 60 and 90 Lb. Ft. Static Torque	3
*30	O-Ring	1
*31	Oil Seal	1
Δ*32	Wear Sleeve	1
*34	O-Ring	1
*36	Compression Spring	
	20 and 30 Lb. Ft. Static Torque	2
	45 Lb. Ft. Static Torque	3
	60 Lb. Ft. Static Torque	4
	90 Lb. Ft. Static Torque	6
*39	O-Ring	1
*40	O-Ring	2
*42	Liner, I.D. Sealing	1
*43	Liner, O.D. Sealing	1
*45	Air Breather, 1/4" N.P.T.	1
*46	Sight Gauge	1
64	Square Hd. Magnetic Pipe Plug 1/8" N.P.T.	1
72	Socket Hd. Cap Screw	8
73	Countersunk Pipe Plug, 1/8" N.P.T.	2
74	Sq. Hd. Magnetic Pipe Plug, 1/4" N.P.T.	1
75	Countersunk Pipe Plug 1/2" N.P.T.	1
76	Reducer Bushing 1/2" x 1/4" N.P.T.	1
Δ*81	Copper Washer	1
Δ 94	Hub Locking Screw	1
*104	O-Ring	6
Δ 110	Collet	1
126	Seal Washer	4
128	Lockwasher	14
152	Socket Hd. Cap Screw	4
153	Socket Hd. Cap Screw	6
158	Dowel Pin	1

* Indicates Parts Included in Overhaul Kit.

Δ Indicates Part Included in Hub Replacement Kit.

Posistop MB-180, MB210 & MB-210L Motor Brake

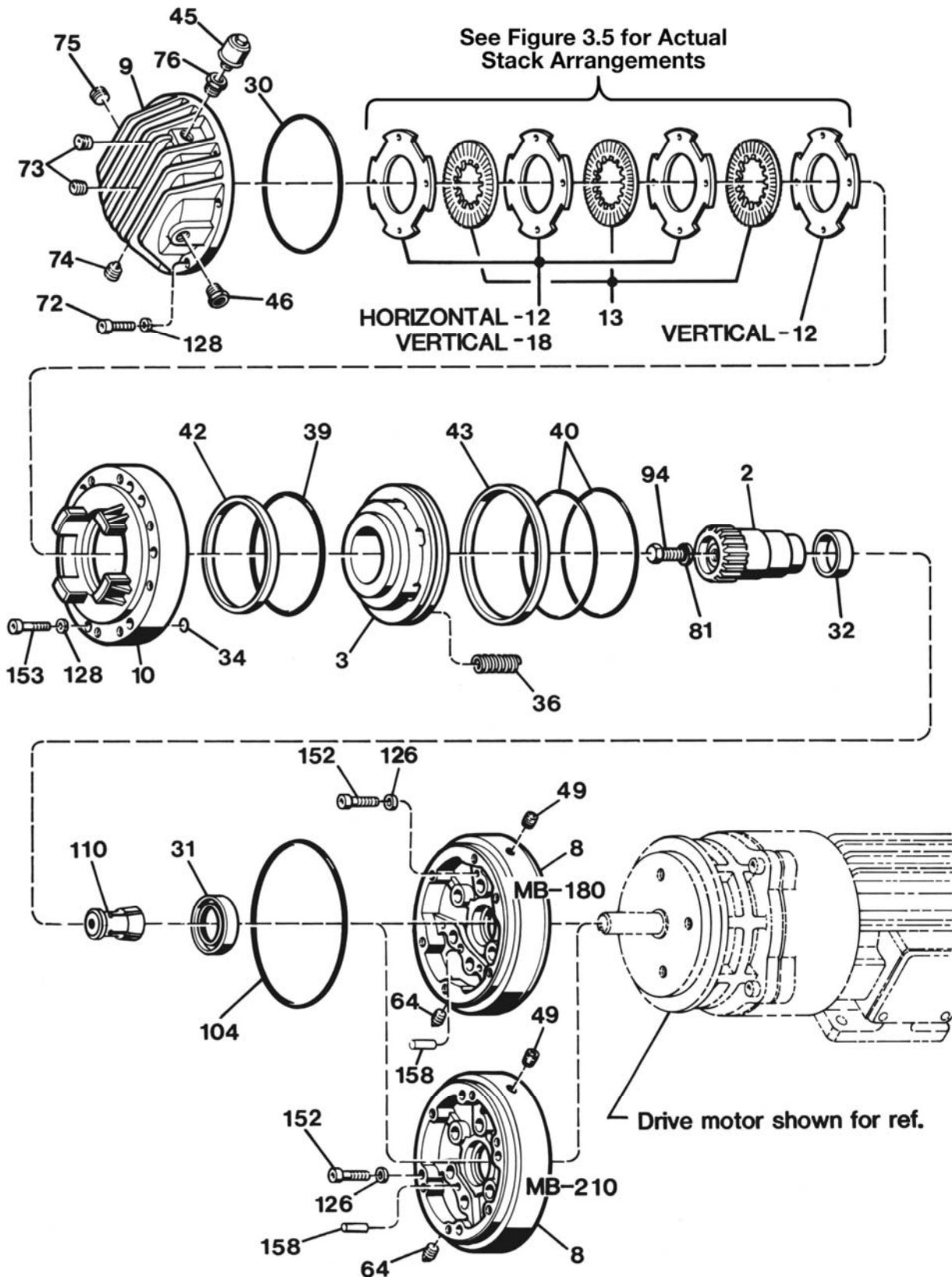
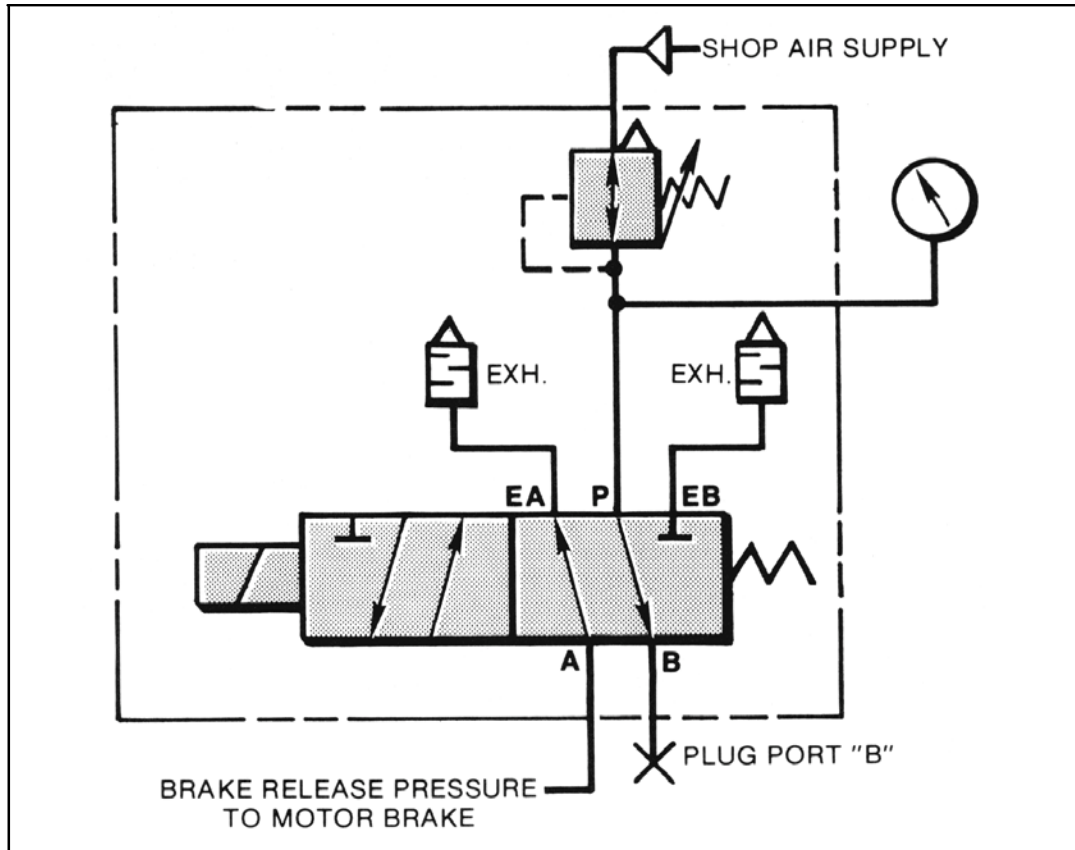


Figure 8.1 - Motor Brake Exploded View Drawing

TYPICAL PNEUMATIC CONTROL SYSTEM

PNEUMATIC SCHEMATIC



The above schematic illustrates a typical Pneumatic Control System for a *Posistop* Motor Brake. Valving to be 3/8" NPT minimum and located as close to the brake as possible.

See Page 4 for Brake Release Pressure.

FORCE CONTROL INDUSTRIES, INC.

Worldwide Leader in Oil Shear Technology

*Providing today's industries with
Oil Shear Clutch/Brake Drives
and Servo Drive Systems
that delivers:
Flexibility • Efficiency
Endurance • Performance
Dependability*

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