

# SensiFlex®

## Installation & Maintenance Instructions

### SENSIFLEX® TENSION CONTROL BRAKES

Patent No. 6,578,691 B1



#### Catalog Products:

[38BK](#) & [38BK-ULOW](#)

[58BK](#) & [58BK-ULOW](#)

[78BK](#) & [78BK-ULOW](#)

[98BK](#) & [98BK-ULOW](#)

*And non-catalog variations  
of this brake design*

CLICK on product numbers above to  
obtain the product detail sheet which  
includes dimensional data helpful during  
installation.

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Spec sheets and 3D models are available on the Mach III website:

<http://www.machiii.com/Products/Tension-Control/Pneumatic-Brake/SensiFlex-Tension-Control-Brakes.asp>

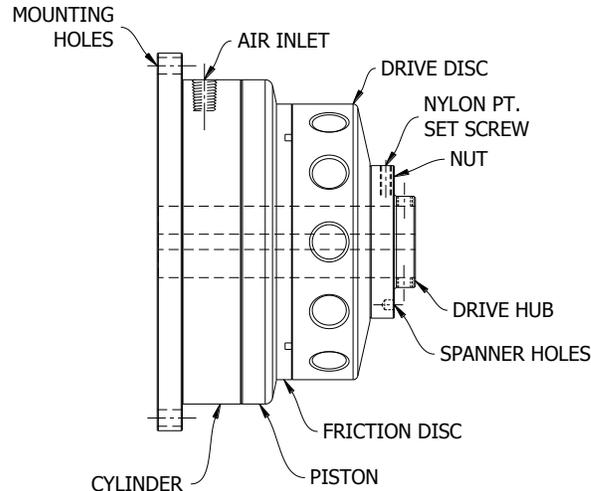
Please contact Mach III to obtain parts list drawings.



**These products include rotating equipment and should be guarded according to OSHA requirements and other Federal, State and local regulations. It is the responsibility of the user to provide the necessary guarding.**

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## Reference Diagram:



### **\*\*IMPORTANT\*\***

The gap between the friction and drive surface is factory set between 0.010 and 0.020 Inch.  
This is the ideal clearance for proper performance.  
Increasing this gap may result in air leaks and damage to the diaphragm actuator.  
Decreasing this gap prevents full disengagement of the brake.

## I. Installation

### A. SHAFT PREPARATION & MOUNTING

Mach III Clutch products are bored to fit a precision plug gauge for the specified bore size and should slide-fit your shaft. Make certain that the shaft is free of burrs or nicks. It may be necessary to file or sand the shaft to assure a slide fit. **Never hammer the brake onto the shaft.** Hammering on the brake may cause evident damage or subtle injury that will shorten the wear life of the unit, and will void the warranty.

1. Apply the anti-seize (E-Z Break) ® lubricant from the packet provided, or equivalent, to the shaft.
2. Slide the brake over the key on the shaft and tighten the set screws.
3. If the surface that the brake is to be mounted to *is absolutely perpendicular* to the shaft, use the four (4) flange mounting holes of the brake to insert bolts and tighten to the machine.
4. If the mounting plate *is not perfectly perpendicular* to the shaft, it is recommended that the brake be mounted using shoulder bolts to allow the brake housing to float. If the brake is mounted with strain on the bearing, premature bearing failure is likely to occur.

### B. AIR LINE CONNECTION

Air supply should be both filtered and regulated. Contamination in the air supply will cause damage to the brake, particularly to the diaphragm actuator. Connect a flexible airline to the air inlet using a thread sealing compound. **Do not use rigid piping.** Cycle the brake with the machine off to assure engagement and release.



**II. Operation**

Torque (stopping force) is proportional to air pressure. SensiFlex® brakes are designed for use in slip applications, typically to maintain tension on a web during unwinding or other tension control applications. Mach III Clutch, Inc. should *always* be consulted to assist with selection of a SensiFlex® Brake to assure that required tension can be maintained while dissipating the heat caused by constant slip.

**III. Routine Maintenance**

Friction discs are a “wear” item and in a constant slip application, periodic replacement of the friction disc will be necessary. The frequency of disc replacement varies with each application. Screws are used to mount the friction disc on the piston. Wear on the friction disc should be monitored so that it can be replaced prior to the point at which the heads of the mounting screws would make contact with the face of the drive disc. See following chart for replacement point recommendations.

**Friction Disc Replacement Recommendations**

Product	Original Thickness of Friction Disc	Replace When Worn To A Thickness of
38BK/38BK-ULOW	3/16 Inch	9/64 Inch
58BK/58BK-ULOW	1/4 Inch	1/8 Inch
78BK/78BK-ULOW	5/16 Inch	3/16 Inch
98BK/98BK-ULOW	7/16 Inch	5/16 Inch

**Repair Parts & Services**

Kits Available	Contents	Part Numbers
Facing Kit	Friction Disc & Mounting Screws	38BK-FCGK, 38BK-ULOW-FCGK, 58BK-FCGK, Etc.
Repair Kit	Friction Disc, Mounting Screws, Spring(s), Diaphragm	38BK-RPRK, 38BK-ULOW-RPRK, 58BK-RPRK, Etc.

For parts not included in the kits, please contact Mach III Clutch, Inc. or your distributor. Factory repair is also available. A return materials authorization (RMA) number must be obtained prior to sending any unit in for repair. Mach III Clutch is not responsible for products returned without authorization.

**IV. Repair Procedure**

<b>Tools Needed</b>	<b>Compounds Required</b>
Hex wrench set Spanner wrench Retainer (snap) ring pliers Flat head screw driver Scraper (if replacing bearings) 0.010 Inch feeler gauge	Grease O-Ring lubricant Loctite® #609 Retaining Compound Anti-Seize Lubricant



## A. Friction Disc Replacement

Loosen set screws and bolts from flange and slide the brake off of the shaft. Place brake in a horizontal position with the cylinder facing downward. Loosen nylon point set screw in retainer nut. Using a spanner wrench remove the retainer nut. Next, remove drive disc which should slide easily off of drive hub. Inspect the drive surface which contacts the friction disc. Grooves in the surface would indicate that the friction disc should have been replaced sooner and the heads of the mounting screws have made contact. This surface must be free from grooves, burrs and foreign materials in order for the brake to operate properly. If damage is pronounced, please contact Mach III Clutch or your distributor for a replacement. In addition, the drive disc surface should be inspected for discoloration (turning blue). If discoloration is present, the unit is being operated beyond its capacity and Mach III Clutch should be contacted for assistance. To replace the friction disc, remove brass screws which affix the disc to the piston. Remove the worn friction disc and make sure the mounting surface is smooth and free from contamination. Mount new friction disc by snugging all screws using an alternating sequence. Do not over-tighten. If no other components require replacement, skip to section 3b (*Reassembly*) for the proper procedure for reassembling the brake.

## B. Diaphragm and/or Bearing Replacement

*Diaphragm replacement should rarely be necessary if the air supply is regulated and free of contamination and if the gap between the friction and drive disc is properly set. Care should be taken when mounting the brake to insure maximum bearing life. See "Shaft Preparation & Mounting" for guidelines*

### 1. Diaphragm Replacement

First, follow disassembly instructions above under Procedure for Friction Disc Replacement. Friction disc can remain mounted on piston during this procedure. Wave spring should be removed and set aside. Next, turn assembly so that the retainer rings in the air cylinder end are accessible. Remove innermost retainer ring. Bearing ID is a slide fit on the hub and is affixed to the hub with a thin coating of Loctite®. You will need to strike the hub or an object inserted into the hub with a rubber mallet or similar soft face hammer while pulling the cylinder upwards to break the Loctite® seal. Once seal is broken, remove hub from assembly.

To gain access to the diaphragm remove stud & coil springs, then separate the air cylinder and piston. Pinch the diaphragm and pull from the grooves which retain it. Make sure that the retaining grooves and surface underneath the diaphragm are clean & free from debris.

Lubricate the new diaphragm with an O-ring lubricant such as Dow Corning® #4. Install with the lips located on the ID and OD of the diaphragm facing downward. Press the lips into the grooves

#### **Diaphragm Replacement (Continued)**

by applying pressure while gliding a finger along each perimeter of the diaphragm and then assure that the lips are fully seated by running your thumb across the surface of the diaphragm in a clockwise motion several times.

### 2. Bearing Inspection & Replacement

Check bearing for external damage (missing seal, etc.). Make sure the bearing rotates freely and smoothly by hand. OD of bearing is press fit into the cylinder. If bearing replacement is necessary, remove additional retainer ring (at the bearing OD). The bearing should be removed from the cylinder using an arbor press. New bearing should be pressed back into the cylinder and outer retainer ring must next be replaced.

If new bearing was not installed, gently scrape away any Loctite® residue from the inside diameter of the bearing in the air cylinder and assure that surface is clean.



## C. REASSEMBLY

### 1. Reassembly from the point of diaphragm and/or bearing replacement:

Make sure that face of diaphragm is free from debris. Apply a thin coat of grease (such as Molykote® G-N Metal Assembly Paste) to the polygon shaped I.D. of the piston. Reconnect air cylinder and piston by carefully lining up clearance holes in piston over threaded holes in cylinder. Place springs over studs and snug-screw studs into cylinder. **DO NOT OVER-TIGHTEN.**

Apply a *thin* coat of Loctite® #609 retainer compound to the inside diameter of the bearing, then slide the air cylinder assembly over the drive hub. Applying an excessive amount of Loctite® will make future disassembly more difficult. Replace the inner retainer ring at cylinder end of the drive hub (outer retainer ring should have already been replaced) making sure that it is fully seated in the groove provided in the hub.

### 2. Reassembly from the point of friction disc replacement:

Replace wave spring if worn. Wave spring should be placed over the drive hub and seated onto the flange located above the studs. Apply a thin coat of grease (such as Molykote® G-N Metal Assembly Paste) to the hex shaped I.D. of the drive disc. Replace drive disc. Place nut on threads and tighten using spanner wrench to a point where a 0.010 - 0.020 gap remains between the friction and drive disc surfaces. It is recommended that a 0.010 feeler gauge be used.

The drive disc member should turn freely after reassembly. If you can feel contact between the friction and drive surface when rotating, loosen adjustment nut just enough to provide clearance. Tighten set screw in adjustment nut snugly when proper clearance has been achieved.

See *Installation of Brake* section of this document for the proper re-installation procedure.

Technical assistance is available by contacting Mach III Clutch, Inc.

Mach III Product Warranty  
<http://www.machiii.com/Resources/Warranty-Info.asp>

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