



Installation & Maintenance Manual

SPRING ENGAGED FRICTION CLUTCHES THROUGH SHAFT MOUNT - BALL BEARING PILOT REGULAR DUTY



Catalog Products:

[E3A2R-STH](#)

[E4A2R-STH](#)

[E5A2R-STH](#)

[E6A2G-STH](#)

*And non-catalog variations
of this clutch design.*

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

Mach III Technical Support

Toll Free: 866-291-0849

International: 001-859-291-0849

Email: engineering@machiii.com
www.machiii.com

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

<http://www.machiii.com/Products/Clutches/Through-Shaft-Regular-Duty-Spring-Applied-Clutches.asp>

Please contact Mach III to obtain assembly and 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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I. New Clutch Torque

New clutch torque is approximately 40% less than rated design torque until the friction and drive discs are worn in (lapped, burnished). The length of time for wear-in to occur depends upon the application.

II. Installing a Sprocket or Pulley

Mach III units are typically shipped from the factory with the required sprocket or pulley preinstalled. This section pertains only to those who need to install or replace a pulley or sprocket in the field. Please use the links on page one of this document to obtain the detail sheet for your unit. This sheet will include the pilot diameter and other dimensions needed to machine the sprocket or pulley.

Bore the sprocket or pulley for clearance (slide fit) over pilot and drill standard clearance holes for the number and type of screws on corresponding bolt circle. The cap screws used to attach the sprocket or pulley should not be longer than the sum of the depth of the threaded hole plus the thickness of the sprocket or pulley. Otherwise, the cap screws may bottom out. Tighten all screws to uniform torque based on screw size and use proper Loctite[®] (or equivalent) compound to assure a permanent mount.

III. Clutch 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 the mating 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 clutch onto the shaft.** Hammering on the clutch 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) Insert key (customer supplied) onto the shaft.
- (3) Slide clutch over key on the shaft, align the sprocket or pulley.
- (4) Tighten set screws to secure the clutch to the shaft.

B. AIR LINE CONNECTION

Refer to the dimensional spec sheet for NPT size to obtain correct fitting. Install fitting using a thread sealing compound to prevent air leakage. Connect a flexible air line to the fitting. **Do not use rigid piping.** Air supply should be both filtered and regulated. Contamination in the air supply may damage the clutch.

C. ANTI-ROTATION (REACTION) ARM CONNECTION

The air cylinder portion of a Mach III through shaft style clutch is designed to remain stationary. Due to friction in the bearing housed in the air cylinder, this member will rotate unless an anti-rotation arm (a.k.a. reaction arm) is installed. A threaded hole is provided in the cylinder for the installation of this arm. Please refer to Mach III's *Anti-Rotation (Reaction) Arm Installation Instructions* document for illustrations of proper mounting. This document is available from the Mach III website: <http://www.machiii.com/pdf/ReactionArmInstallation.pdf> or by calling Mach III to have a copy sent by email or fax.

Note that in all cases, the machine frame or bracket should not be tight against the housing of the clutch as contact may impede piston movement and will shorten bearing life.

D. FINAL INSPECTION & TESTING

Check alignment of the sprocket or pulley. Cycle the clutch with the machine off to check for air leaks and to ensure proper engagement and release. After a short run, check set screws and alignment.

IV. Clutch Operation

The maximum operating pressure should not exceed 90 PSI.

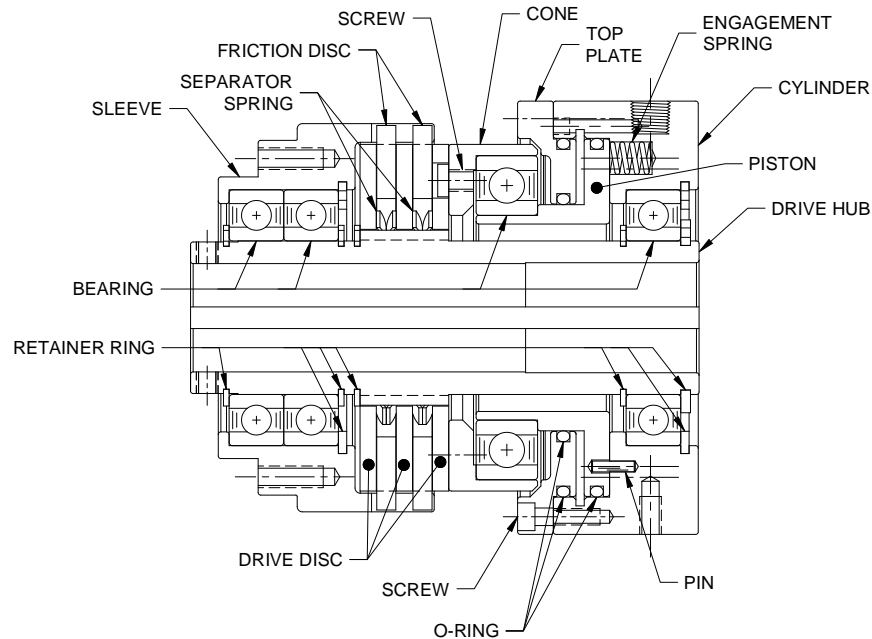
Special Note Regarding Friction Disc Contamination:

The friction material used in this product will absorb oil, water, chemicals and other contaminants. Depending on the type of contamination, clutch may either seize up entirely or lose torque capacity. If friction discs become contaminated, they should be replaced. See repair kit ordering information below.

V. Routine Maintenance

When installed and operated according to the preceding guidelines, Mach III Clutch products should require little or no routine maintenance. A repair kit is available which contains all parts subject to typical wear: friction discs, springs and O-rings.

VI. Parts diagram



Repair Kit:	Part number = Clutch Product Number + %RPRK+(e.g. E3A2R-STH-RPRK)
Additional Parts:	Contact Mach III to obtain a complete listing of additional parts kits available for your specific clutch. Please reference product number when calling or e-mailing.
Repair services:	Factory repair is available. A return materials authorization (RMA) number must be obtained prior to sending any unit in for repair

VII. Repair Kit Installation Procedure

Tools Required	Compounds Required
Hex Wrench Set	Grease
Rubber Mallet or similar soft face hammer	O-ring Lubricant
Retainer (snap) Ring Pliers	Loctite® #609 Retaining Compound
Scraper	Anti-Seize Lubricant (for re-installation)

A. DISASSEMBLY

- (1) Remove clutch from shaft and place in vertical position with cylinder end facing upward.
- (2) Apply air pressure to cylinder to relieve pressure from engagement springs.
- (3) Remove retainer ring from drive hub.
- (4) Remove air cylinder sub-assembly with bearing from drive hub. The air cylinder bearing is a slide fit on the drive hub and is affixed to the drive hub with a thin coating of Loctite®. You may need to strike the hub, or an object inserted in the hub with a rubber mallet or similar soft face hammer, while pulling the cylinder upwards to break the Loctite® seal.
- (5) Remove inner retainer ring from the drive hub.
- (6) The disc package (consisting of friction discs, drive discs & separator springs) will now be accessible. Note that the first drive disc contains a milled hole. **It is important that this disc is returned to the top during reassembly to line up with the screw in the cone.**

B. FRICTION DISC & SPRING REPLACEMENT

- (1) Remove the drive discs, springs and friction discs.
- (2) Drive discs should be clean, dry and free of burrs or nicks.
- (3) Reassemble drive & friction disc section according to reference drawing using new friction discs, springs and steel drive discs as necessary.
- (4) Assure that drive discs move freely on the drive hub and that the lugs of the friction discs move freely in the drive slots of the sleeve.

Note Regarding Wave Spring Alignment:

The beginning of the coil of each spring should be placed in the same relative (O-Clock) position to the drive hub to assure equal separation of the drive disc.

C. O-RING REPLACEMENT

- (1) Remove air pressure from cylinder. Separate cylinder and piston/bearing/cone sub-assembly by removing screws in top plate.
- (2) Press piston out of inner race of bearing to access inner o-ring. The piston bearing is a slide fit on the piston and is affixed to the piston with a thin coating of Loctite®.
- (3) Inspect O-ring seals. If worn, replace using new O-rings that have been lubricated with an O-ring lubricant such as Dow Corning® #4 Compound or equivalent.
- (4) A very *thin* coat of O-ring lubricant should also be applied to the wall of the cylinder and piston.

D. REASSEMBLY

- (1) Inspect the inside diameter of the bearing in the air cylinder. If Loctite® residue is present, gently scrape and assure that the surface is clean.
- (2) Reassemble cylinder sub-assembly consisting of the piston, top plate and cone as shown in the diagram using a Loctite® adhesive at the bearing connection while making sure the pins of the piston are aligned with the holes in the cylinder and springs are properly seated in the pockets in the cylinder. In some models there are more spring pockets than springs. In this instance, make sure the springs are symmetrically located in the pockets in the cylinder.



- (3) Replace inner retainer ring on drive hub.
- (4) Apply a thin coat of Loctite® #609 retainer compound to the inside diameter of the bearing (applying excessive Loctite® will make future disassembly more difficult).
- (5) Apply air pressure to the cylinder to relieve pressure from engagement springs and place the cylinder sub-assembly over drive hub making sure the screw head in the cone is inserted in the corresponding hole milled in the drive disc. This prevents the cone from skidding on the drive disc.
- (6) Make sure that all components are well seated and replace the outer retainer ring.
- (7) See %Clutch Installation+ portion of these instructions for the proper procedure for reinstalling the clutch.

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

Mach III Product Warranty

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

Mach III Clutch, Inc.

101 Cummings Drive • Walton, KY 41094

Toll free 866.291.0849 • International 859.291.0849 • Fax 859.655.8362

info@machiii.com • engineering@machiii.com • www.machiii.com