



MAGNE POWER

INSTALLATION AND MAINTENANCE

MAGNECLUTCH MAGNETIC PARTICLE CLUTCH

MAGNECLUTCH
MODELS:
5MC90B



DESCRIPTION:

The Magneclutch is a dry magnetic particle device consisting of a stationary frame, two rotating members, a coil, and a measured amount of specially prepared steel powder called magnetic medium. The magnetic medium partially fills a gap between the two rotating members, one of which is enclosed in, but does not touch the other. The stationary frame houses the coil and contains bearings to support the shafts of the rotating members.

When clutching action is required, electrical current is passed through the coil located in the stationary frame. The energized coil develops a magnetic field causing particles of the magnetic medium to cling together between the two rotating members resulting in torque being transmitted. The amount of clutching action is controlled by changing the current through the coil. The Magneclutch can be used as a braking device by holding the inner rotating member stationary or at a speed below that required at the outer rotating member shaft.

INSTALLATION:

Mechanical

The Magneclutch may be mounted in any position within $\pm 30^\circ$ of the horizontal shaft position. The rotating members should be rotated by hand before applying voltage to check for binding or scraping. The outer rotating member, the shaft that spins the inner fins, is the preferred input side since heat dissipation is dependent on the speed of the outer rotating member.

Electrical

Direct current coil power may be derived from any suitable DC power source. Standard coils are nominally 90 VDC. Nameplate torque is obtained with less than nameplate current. Nameplate current is based on nominal voltage rating of unit.

WARNING: IN APPLYING MAGNETIC PARTICLE DEVICES CERTAIN PRECAUTIONS SHOULD BE EXERCISED. PROVISIONS SHOULD BE MADE FOR CONNECTING THE CLUTCH AND BRAKE FRAME TO AN EFFECTIVE GROUND. PROPER GUARDING OF ALL ROTATING COMPONENTS SHOULD BE ACCOMPLISHED. FAILURE TO EXERCISE THESE PRECAUTIONS COULD RESULT IN SERIOUS PERSONAL INJURY, UP TO AND INCLUDING DEATH. MAGNE IN NO WAY IMPLIES THAT IF APPLICATION SUGGESTIONS ARE ADOPTED THAT A PIECE OF EQUIPMENT WILL MEET APPLICABLE SAFETY STANDARDS. MAGNE RECOMMENDS THAT ALL DESIGN APPLICATIONS INCORPORATING ITS CLUTCHES, BRAKES AND CONTROLS BE FULLY EVALUATED AND SUBMITTED TO APPROPRIATE REGULATORY AGENCIES FOR TESTING SPECIFICALLY RELATED TO SAFETY CONSIDERATIONS.

MAINTENANCE:

With normal maintenance, the service life of a Magneclutch is exceptionally long. Bearings, magnetic medium, and rotating seals may require replacement sometime during the service life of the clutch. Self repair kits are available from the factory or units may be sent back for evaluation and repair.

NOTE: Nominal resistance for the standard 90 VDC coil:
5MC90B 306 OHMS @ 20°C

Use the following outline as a guide for determining the cause for improper operation.

- 1. No Clutching Action:** Check current through clutch coil and voltage across the coil.
 - a) Voltage normal - Current zero; probable open coil - replace coil.
 - b) Voltage low - Current low or zero; check power source for proper output.
- 2. Lower Than Normal Clutching Action:** Check current through clutch coil and voltage across the coil.
 - a) Voltage normal or low - Current high; probable shorted coil - replace coil.
 - b) Voltage normal - Current normal; disassemble, clean parts, add new charge of magnetic medium.
 - c) Voltage low - Current low; check power supply.
- 3. Excessive Noise or Vibration:** Check for loose connections and proper mounting. If problem is isolated at clutch, disassemble and check bearings. Replace if necessary.
- 4. Intermittent/Erratic Operation:** Check clutch power supply. Check coil. If normal, disassemble clutch, clean parts and add new charge of magnetic medium.

DISASSEMBLY PROCEDURE:

Model 5MC*B

1. Remove terminal cover screws and disconnect leads.
2. Remove three bolts holding the two stator halves to the base. Remove the base from the stator frame assembly.
3. Remove the hex head set screw on one end of the stator frame assembly.
4. Pull one half of the stator frame off the rotating assembly. The bearings are slip fitted into the stator frame. Heat bearing chamber, if necessary, to remove stator frame.
5. Remove the hex head set screw on the other half of the stator frame.
6. Remove the entire rotating assembly from the other stator frame.
7. The coil may be removed from the stator frame without further disassembly.
8. The inner and outer rotating members are separated by carefully removing the seal cover end shield from the outer rotating member. The end shield is press fitted to the outer rotating member.

NOTE: Magnetic medium will spill out when the end shield is removed. Dispose of the used magnetic medium and clean magnetic medium from all parts with a dry brush.

9. The bearings may be removed from the outer and inner rotor shaft by using a bearing puller. Remove the end play washers and retaining rings before attempting to remove the bearings from either shaft.

ASSEMBLY PROCEDURE:

1. Replace bearings, spacer end play washers and retaining rings on outer rotating member and inner rotating member shafts.

NOTE: The end shield, packing seal and retainer ring must be placed on the inner rotating shaft before bearings, etc. A new packing seal is included in the repair kit.

2. Pour a fresh quantity of magnetic medium into the outer rotating member. The repair kit contains a measured amount of magnetic medium.
3. Place the inner rotating assembly into the outer rotating assembly. Press the end shield packing seal assembly into place.
4. Replace the coil in one of the stator halves being careful to properly route leads.
5. Slide rotating assembly into one of the stator halves aligning the bearing spacer hole with the set screw hole in the stator frame, tighten screw.
6. Slide the other half of the stator frame onto the rotating assembly aligning the bearing spacer hole with the hole in the stator frame, tighten screw.
7. Assemble the clutch and clutch base using three bolts, lockwashers and nuts.
8. Replace lead cover.