MAGNE POWER

INSTALLATION AND MAINTENANCE

MAGNECLUTCH MAGNETIC PARTICLE CLUTCH BASE & FLANGE MOUNTED

MAGNECLUTCH MODELS:

10MC*90B20
10MC90F20
50MC*90B20
50MC90F-22/20
100MC*90B20
100MC90F-22/20

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DESCRIPTION:

The **base mounted** Magneclutch is a dry magnetic particle device combining 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.

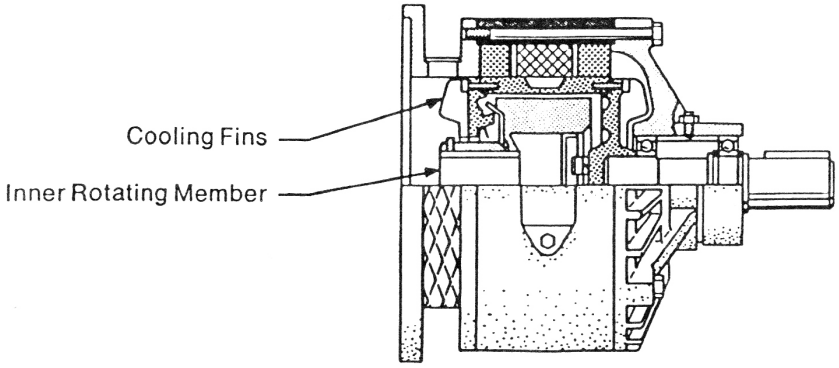
Containing only one set of bearings and supporting the output shaft, the **flange mounted** Magneclutch is designed to mount directly on the shaft of a NEMA C-face electric motor. Model 10MC90F20 mounts to NEMA frame 143TC, and 145TC. Model 50MC90F22/20 will mount on NEMA frames 213TC and 215TC. With Bore Adapter Kit, A-50, the 50MC90F22/20 can be extended to fit NEMA frames 182TC and 184TC. Model 100MC90F22/20 mounts directly to motor NEMA frames 254TC and 256TC.

INSTALLATION:

The Magneclutch may be rotated in any position within a plus or minus 30° of the horizontal shaft position. Before applying power, rotate the clutch members by hand to check for binding or scraping and to disperse the magnetic medium. Shaft alignment should be fully observed to prevent undue bearing wear. Flexible couplings should be used for shaft to shaft connections. For base mounted models, 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. For flange mounted models, the bore is the input side, however, heat dissipation is still related to outer rotating member shaft rpm.

Flange Mounted Magneclutch

1. To assure proper centering of the inner rotating member, it should be positioned on the mounting shaft so that the end of the inner rotating member is in line with the edge of the cooling fins. The exception is the 10MC90F20. The bore should be moved on the motor shaft to both extremes and the set screws tightened at the mid position.



2. With the 10MC90F20, use four studs .375 - 16UNC x 1.50 long, four nuts, and four washers for mounting.
3. With the 50MC90F22/20, use four studs .500 - 13UNC x 1.75 long, four nuts, and four washers for mounting.
4. With the 100MC90F22/20, use four studs .500 - 13UNC x 1.75 long, four nuts, and four washers for mounting.

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Electrical
Direct current coil power may be derived from any suitable DC power source. Connect the two wires in the terminal box to the DC power source. Nameplate torque is obtained with less than nameplate current. Nameplate current is based on nominal voltage rating of unit. Standard coils are nominally 90 VDC.

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 or units may be returned to the factor for evaluation and repair. **DO NOT LUBRICATE THE BEARINGS. THE SET SCREWS ON THE BEARING CYLINDERS HOLD ACCURATELY ALIGNED SLEEVES AND ARE NOT TO BE REMOVED FOR LUBRICATION PURPOSES.**

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

NOTE: Nominal resistance for the standard 90 VDC coils:
10MC*90B20 / F-20 273 OHMS @ 20°C
50MC*90B20 / F-22/20 127 OHMS @ 20°C
100MC*90B20 / F-22/20 68 OHMS @ 20°C

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 low - current low; check power supply.
   c) Voltage normal - Current normal; disassemble, clean parts, add new charge of magnetic medium.
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.

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DISASSEMBLY PROCEDURE:

Base-Mounted Magneclutch

1. Remove terminal cover screws and disconnect leads.
2. Remove bolts holding the end shield and mounting bracket to the stator frame, and the mounting brackets.
3. Loosen and remove the set screw located on the end shield bearing chamber.
4. Heat the end shield bearing chamber until hot to the touch and remove from the stator outer housing. A rubber mallet can be used to loosen the end shield from the stator frame while the hot bearing chamber will allow the end shield to slip over the shaft bearings.
5. Repeat items 2 and 3 removing the other end shield from the stator housing.
6. Remove entire rotating assembly from the stator frame.
7. Coil may be removed by lifting out the inner housing rings and removing the coil from the outer housing being careful to feed coil leads through the hole in the outer housing.
8. The inner and outer rotating members are separated by removing the six screws holding the seal end cover to the outer rotating member.

Note: Magnetic medium will spill out when the seal end cover is removed from the outer rotating member. Dispose of the used magnetic medium and clean the clutch parts with a dry brush.

9. Bearings are removed from both shafts by removing the retaining rings and spacer sleeves.

Flange-Mounted Magneclutch

1. The procedure for disassembly of the flange mounted clutch is identical to the procedure for the base mounted unit except the flange is substituted for the end shield.
2. There is no need to heat the flange for disassembly since there are no bearings on the flange end.

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ASSEMBLY PROCEDURE:

Assembly of the clutch should be performed in a clean area. The clutch components must be cleaned with solvent and be TOTALLY FREE OF ANY GREASE OR OIL. Discard all bearings, magnetic powder, insulators, seals and gaskets from disassembled clutch as these are repair kit parts and should be replaced at overhaul. ANY OIL OR GREASE on the rotor or the inside of the cylinder will cause premature failure when the unit is rebuilt.

1. Assemble the seal cover with the new seal over the inner rotating subassembly shaft with the lip pointing to the rotor.
2. Replace bearings, retaining rings and spacer sleeves on the inner and outer rotating shafts. Outer rotating shaft may also have an insulator.
3. Heat one of the end shield bearing chambers until hot to the touch and assemble outer rotating subassembly to the end shield by slipping the heated end shield over the bearings. Align the groove in the bearing spacer sleeve with the end shield bearing set screw hole. Replace and tighten the set screw to a torque of 20-25 lb. in. Then replace the jamming nut torquing it to 30-35 lb. in.
4. Pour a fresh quantity of magnetic medium into the outer rotating subassembly.
5. Place the inner rotating subassembly into the outer rotating cylinder aligning the two small fins on the seal cover with the two small fins on the drive cover (50MC and 100MC models only).
6. The six seal cover screws should be torqued to 20-25 lb. in.
7. Place coil and inner housing rings into outer housing being careful to properly route leads.
8. Place the outer housing, coil, and inner rings over the outer rotating subassembly.
9. Heat the other end shield bearing chamber until hot to the touch and assemble inner rotating subassembly to the end shield by slipping the heated end shield over the bearings. Align the groove in the bearing spacer sleeve with the end shield bearing set screw hole. Replace and tighten the set screw to a torque of 20-25 lb. in. Then replace the jamming nut torquing it to 30-35 lb. in.
10. Replace mounting brackets and four bolts holding all components together. The four bolts should be torqued to 140-145 lb. in. When correctly assembled the end shield set screws on the bearing chambers should be visible from the top of the unit.
11. For the flange mounted unit, assemble the flange the same as the end shield except no heat is needed.