

Installation and Service Instructions for Electromagnetic Thru-Shaft Clutches

Important

Please read these instructions carefully before installing, operating, or servicing your Stearns clutch, brake or clutch-brake. Failure to comply with these instructions could cause injury to personnel and/or damage to property if the unit is installed or operated incorrectly. For definition of limited warranty/liability, contact Rexnord Industries, Inc., Stearns Div., 5150 S. International Dr., Cudahy, Wisconsin 53110, (414) 272-1100.

OEM's and subsystem suppliers, please forward these instructions with your components to the final user.

Caution

1. Servicing shall be in compliance with applicable local safety codes including Occupational Safety and Health Act (OSHA). All wiring and electrical connections must comply with the National Electric Code (NEC) and local electric codes in effect.
2. To prevent an electrical hazard, disconnect power source before working on the clutch, brake or clutch-brake. If power disconnect point is out of sight, lock disconnect in the *off* position and tag to prevent accidental application of power.
3. Be careful when touching the exterior of an operating unit. Allow sufficient time to cool before disassembly. Surface may be hot enough to be painful or cause injury.

General Description

The CTS Thru-Shaft Clutch is designed to be assembled on a customer provided shaft. It transmits rotational motion to a parallel shaft by means of a customer installed gear, pulley and belt, or sprocket and chain.

Through a magnetic force when energized, the clutch will attract the armature and a driving torque will develop between the armature and the drive hub friction surfaces. This torque is developed whether the driving force is on the driven hub assembly or on the drive hub assembly. Our standard terms are used to help identify the parts for descriptive purposes and are irrelevant of actual application of the driving force.

Installation

1. Most likely the first step would be to mount your drive system pulley (or gear, or sprocket, etc.) onto the clutch driven hub assembly. The driven hub has a machined outside diameter with a keyway to permit mounting of the chosen device.

Note that this driven hub assembly is provided with sleeve bearings to support the side load applied by the drive system. The bearing under the hubs splined area is additionally positioned, so that it touches the counterbore in the drive hub assembly and establishes a necessary air gap. See ASTM B438 83a (R1989) for guidelines on permissible loads and speeds for copper based sleeve bearings and proper shafting. Other sources of information on sleeve bearings such as engineering manuals may also be helpful.

Note: The following steps shall depict the CTS Clutch being assembled with the driven hub positioned on the shaft first; other methods are possible such as reversing the order of assembly.

2. Slide the driven hub assembly onto the shaft and position it such that the sleeve bearing touches its customer provided

retainer. This retainer may be any one of a number of methods for maintaining position such as, set collars, retaining ring and washers or a shoulder on the shafting. Make sure this assembly will be free to rotate with the shaft.

3. Slide the drive hub - magnet assembly onto shaft so it touches driven hub bearing face making sure the key used is installed beneath the set screw but does not protrude beyond the counterbore face in the drive hub.
4. Tighten the set screws securely, which secures the CTS Clutch onto the shafting. Check the alignment of the drive system, that is supported by the driven hub.
5. Fasten the restraining bracket of the magnet body assembly, in a manner that only prevents rotation of the magnet body. It is recommended that this bracket be secured allowing free movement of at least 1/32 of an inch, both axially and radially to prevent bearing preloading and possible premature bearing failure.

Electrical Connection

The voltage to be applied is determined by the rating shown on the unit nameplate. Resistance and other coil data may be secured by writing to the factory.

A common way to provide voltage for a unit is to use a full wave rectifier control. Connection diagrams provided with the rectifier will depict the proper electrical connections. Due to technical advances in electronics many rectifier controls with a rated 115 VAC, 60 Hz input are able to provide an output of approximately 103 VDC. This is not harmful to a 90-100 VDC rated coil.

For Tor-ac® units, the leads provided and marked AC, from the Tor-ac power module should be connected to a fused relay or switching control source of 105 to 125 VAC, 50-60 Hz. See Figure B for a typical wiring connection.

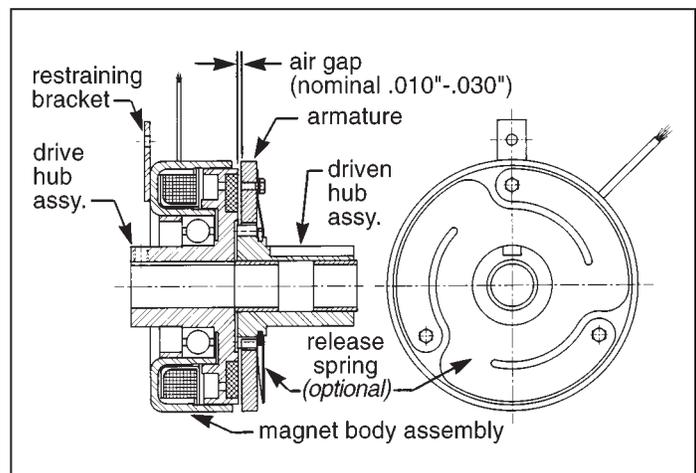


Figure A

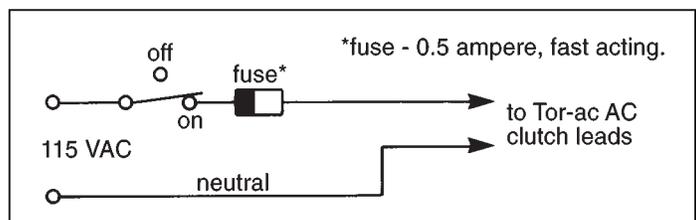


Figure B

On units with cord grips do not remove cap or turn hex portion of fitting. Wires may be twisted and torn off if attempted.

Enclosure

Normally, the machine housing provides sufficient enclosure. Care must be taken to protect unit from grease, oil or airborne materials. Slippage and excess heating of the unit may result if proper protection is not provided.

Ventilation

Care should be taken that high ambient temperatures do not exist. Provide proper ventilation and cooling.

Burnishing

Full rated torque of a new unit will not develop until the mating surfaces have been burnished or *run-in*. Burnishing can be accomplished by cycling the unit under normal operating conditions. Burnishing may also be accomplished by slipping under load at reduced voltage for short periods of time. Consult factory for additional burnishing instructions.

Troubleshooting for Industrial Type Clutches

Note: If DC voltage is measured without the coil being connected, a misleadingly high reading results due to a capacitor in the arc suppression network used with the rectifier.

A. Overheating, coil burned-out or loss of torque

1. Check ambient temperature. Is it above 40°C? Consult factory for assistance.
2. Check thermal capacity of unit versus actual heat dissipation requirements. See Catalog 500 for specifications.
3. Check voltage supply as close to coil as feasible. Compare to nameplate data, if incorrect apply proper voltage.
For Tor-ac units, check voltage supply as close to the Tor-ac module as possible. If this value is not between 105-125 VAC (if variable voltage input is not being used), correct the voltage source and replace burned-out parts.
4. Is coil resistance correct? Resistance of the 90 VDC coils and Tor-ac coils are tabulated in Table 1. For others, contact factory.

Table 1

Size	90-100 VDC and 115 VAC Tor-ac Coil Resistance
	ohms (nominal value)
3	904
3.5	869
5	459

5. Start time on clutches normally should not exceed one second. If excessive, recheck torque rating versus load characteristics.

6. On thru-shaft clutch, check bearings.
7. On release springs, check for broken, missing or substituted springs not of our manufacture.
8. Check for oil/grease on friction elements. If this is found, replacement is recommended of complete unit or affected elements.
9. Are control (limit) switches operating properly and set in proper place? A switch malfunction may appear to be loss of torque.
10. Is unit fully burnished? If not, see Burnishing Instructions.
11. On horizontal or vertical does armature drag excessively on friction surface when de-energized? If so, check for correct air gap and adjust if necessary or convert to spring release if not furnished.
12. Check that the restraining bracket is properly secured. See Step 5 of *Installation*.
13. During the life of the unit, friction material and metal dusts accumulate due to normal cycling. This dust may be removed by vacuuming or brushing. Removal of accumulated dusts and dirt will prolong the unit life.

B. Fuse in power supply blows

1. Never put in a higher rating fuse or replace with a slo-blow type.
2. Check resistance of coil, if shorted, replace magnet body and coil assembly. If not shorted, obtain actual coil resistance and compare to reading in Table 1, or value obtained from factory.
Check for grounded lead wire(s) between unit and fuse. If grounded, correct problem. In above, correct problem before installing a new fuse.
3. If cause was not found in Step 2 above:
 - a) Check Tor-ac module by removing all loads and replacing fuse. If fuse blows when AC is applied to Tor-ac module, module is defective. Replace.
 - b) If cause was not found in Step 2 above, check rectifier bridge by removing all loads and replacing fuse. If fuse blows when AC is applied to rectifier, bridge is shorted. Replace bridge if feasible or discard control and replace.

C. Unit fails to engage

1. See Items under A, this Section.
2. Check armature for free movement on splined hub.
3. Check voltage output from Tor-ac or rectifier control when applying 115 VAC, should be approximately 103 VDC with coil connected. Replace Tor-ac module or rectifier control if it is defective.