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Stearns® *Industrial Clutches and Brakes*

Installation and Service Instructions for Electromagnetic CB and Tor-ac® CB Clutch-Brakes

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 brake is installed or operated incorrectly. For definition of limited warranty/liability, contact Rexnord, Industries, Inc., Stearns Division, 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 CB consists of a packaged clutch and a brake, equipped with extension shafts for input and output, in an aluminum foot mounted housing. An integral terminal box is provided for the units electrical connections on all sizes except the Size 8 CB.

Installation

Note 1: On CB units, if clutch has drag when brake is set, the input and output shafts may have been moved from the factory installed position. Determine which shaft was displaced and return to original position.

Note 2: On units with cord grip (two conductor cord), **DO NOT** remove cap or turn hex portion of fitting. Wires may be twisted and torn off.

Note 3: If rectifier voltage is measured without the coil being connected, a misleadingly high reading may result due to a capacitor in the arc suppression network used with the rectifier.

The housing is provided with mounting feet, so that the CB unit may be secured to a suitable support with four bolts or screws.

The two shaft extensions provide the means of mechanically connecting the CB to the drive and driven elements in a system, by means of direct coupling, V-sheaves and belts, sprockets and chains, other pulley and belt combinations, or any combinations of these methods.

Electrical Connection(s)

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 for voltages other than shown in Table 1.

Table 1

Size/Style	90-100 VDC
	ohms (nominal value)
3 CB	800
5 CB	392
5.5 CB	267
8 CB	232

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 Stearns Tor-ac units, the leads provided by the Tor-ac module should be connected to a fused relay or switching control source of 105 to 125 VAC, 50-60 Hz. See Figure A for a typical wiring connection of Tor-ac controlled units.

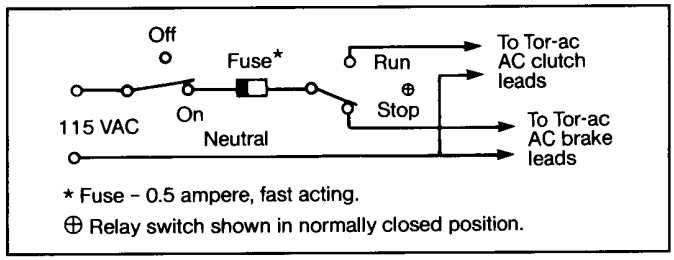

Figure A

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

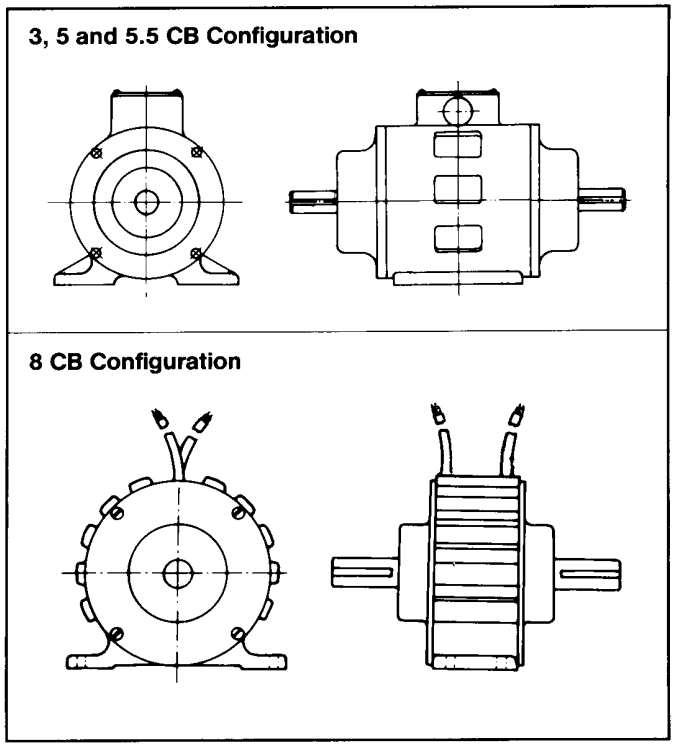

Figure B

conditions. Burnishing may also be accomplished by slipping under load at reduced voltage for short periods of time. Consult factory for additional burnishing instructions. If normal cycling does not provide for sufficient burnishing in your application, be prepared to discuss specifics, such as, horsepower, rpm, position and environment when talking to factory personnel.

Maintenance

The CB units are designed so as to require a minimum of service maintenance during the wear life of the unit. The friction material and metal particles that accumulate from wear, should be occasionally cleaned off and the unit checked to see that armatures engage properly. The armatures can be observed through the vent holes in the housing. Remove wear particles and dust by vacuuming or carefully brushing off. Removal of other dusts and dirt will help prolong the units life.

When the space (air gap) between the armature and friction face on either side of the CB exceeds 3/32" (5/32" for the 5.5 and 8 Sizes) or at the time the units fail to engage due to excessive air gap, the following parts are to be replaced:

Armature - clutch and brake
Drive hub (rotor) - clutch
Friction face - brake

Other parts which are to be replaced when they become worn or malfunction:

Ball bearings
Coils (replace magnet body)
Splined output hub and brake shaft

Troubleshooting for Industrial Clutch-Brakes

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 Table 2.
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 burnt-out parts.
4. Is coil resistance correct? See Table 1 for resistance of 90-100 VDC rated coils. For others contact factory.
5. Stop time on brake and start time on clutches normally should not exceed one second. If excessive, recheck torque rating versus load characteristics.
6. On units installed with overhung loads check that overhung load and rpm is not excessive. See Table 2.
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 or convert to spring release if not furnished.
12. 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, 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. Fuse in line before Tor-ac module blows

1. Never put in a higher rated fuse than suggested or replace with a slo-blow or time delay fuse.
2. Check the Tor-ac module by removing all loads (disconnect from the coils and insulate output leads), and replace the fuse. If the fuse now blows when AC power is applied, the module is defective or damaged. Replace the module after locating the cause of damage.

D. Unit fails to engage

1. See Items under A, B and C, this Section.
2. Check armature for free movement on splined hub.

Table 2

Size	Nominal Static Torque (lb-in)	Nominal Dynamic Torque @ 1800 RPM (lb-in)	Maximum RPM	Inertia ($lb\text{-}ft^2$)		Thermal Capacity (HP sec/min)①	Maximum Overhung Load (lbs)②	Approximate Weight (lbs)	Maximum Power (watts per side)
				Clutch Side	Brake Side				
3	60	40	7000	2.5×10^{-3}	6.2×10^{-3}	3	250	7.5	8.3
5	240	160	5000	1.7×10^{-2}	2.8×10^{-2}	8	420	16	14
5.5	600	400	3600	4.9×10^{-2}	9.5×10^{-2}	15	420	33	26
8	1740	1160	1800	4.85×10^{-1}	8.6×10^{-1}	30	850	110	32

① Thermal capacity rating is based on ambient temperature of 70°F at 1750 RPM.
② At 1800 RPM and at ½" from end of shaft.