

Installation, Service Instructions and Parts List for Electromagnetic Super-Mod® and Tor-ac™ Super-Mod® C-Face Power Applied Brakes

SM-20/20MB Series 210/250

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, LLC, Stearns Division, 5150 S. International Dr., Cudahy, WI 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 Super-Mod C-Face Brakes are designed to NEMA standards and can be mounted onto a C-face motor (SM20 and SM20MB) or between a C-face motor and a C-face gear reducer (SM20). A conduit box provides for the electrical connections protection.

This product is a "power-on" design. Nameplate rated line voltage is required to engage the input and/or output drives of this product.

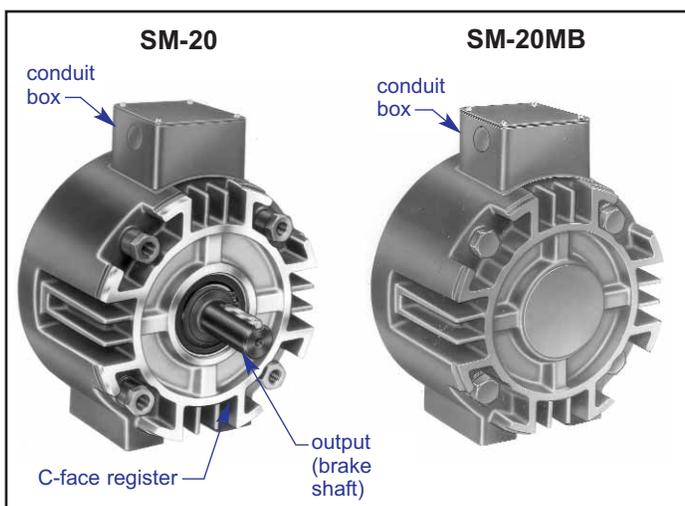


Figure 1

The Stearns Super-Mod series incorporates a Stearns gap feature that provides consistent de-energized armature-to-friction-face air gap. While the Stearns gap feature is desirable in most applications, the SM Series product can be ordered without auto gap for very soft starts and/or stops achieved through under voltage energization of the coil.

Installation

1. The SM 20/20MB Series C-Face Brakes are supplied with a special keyed hub bore. Check to be sure that the key is firmly in position.

Note A: Remove set screw access plug. Be sure the hub set screws are backed out sufficiently to clear the shaft.

2. Position and align the SM-20/20MB to allow the hub to slide onto the motor shaft. **Do not use force.** (If the drive hub will not slide freely onto the motor shaft, polish the shaft and/or keyway until a smooth slip fit is achieved.) Slide the SM-20/20MB onto the motor shaft until the C-face flanges meet.

3. After mating the C-face flanges, insert the four tie bolts or hex head bolts (supplied) and alternately finger tighten, then torque as follows:

Series 20 only between motor and gearbox:
34 lb-ft – SM-210 and SM-250

All Series 20MB, and Series 20 mounted to motor only:
51 lb-ft – SM-210 and SM-250

4. Tighten the hub set screws, using the proper size hex wrench (wrench provided with new unit) to 150 lb-in.

Note B: Set screws are accessible through access hole.

Note C: Set screw alignment can be accomplished by rotating the shaft and hub (motor).

5. Reinstall the set screw access plug.

The brake motor assembly is now complete. At this point the Series 20 brake shaft can be mounted into a C-face gear reducer or have any other power transmission elements such as a pulley, chain sprocket, or coupling device mounted onto it.

Note D: Maximum overhung load capacity for the shaft is 85 lbs. Overhung capacity is based on ISO standards at 50,000 hours continuous operation at 1750 rpm with force 1/2" (13mm) from end of shaft.

Note E: Stearns Super-Mod units are pre-burnished at the factory prior to shipment. Oxidation due to long shelf may cause a lower than rated torque on initial start-up. Unit torque will redevelop during the first 30-50 cycles under load.

Gear reducer mounting

6. Position and align the SM-20 brake shaft into the hollow shaft on coupling in the gear reducer. Slide the assembly into the gear reducer until the C-face flanges meet.

Note F: Grease or anti-seize compound should be used on the brake shaft to aid in assembly and disassembly of the drive train and help prevent fretting corrosion.

7. Bolt the SM-20 to the reducer flange. (Bolts usually furnished with the gear reducer.) Torque these bolts to the manufacturer's specifications. It is advisable to hold the SM-20's tie-bolts with an open end wrench while tightening the gearbox bolts.

Electrical Connection(s)

The voltage to be applied is determined by the rating shown on the nameplate.

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

For Stearns Tor-ac units, the AC input leads of the Tor-ac module should be connected as shown in Figure 2 below.

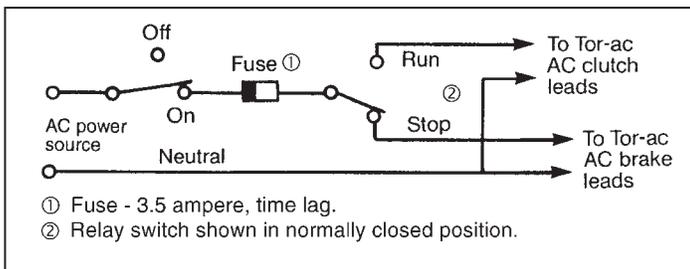


Figure 2

Start-Up

Note: Due to shipping and handling, it is possible for armature to shift on the splined hub and not pull in against the friction face.

With the motor de-energized, proceed as follows:

1. Apply full rated voltage to the brake coil and observe armature movement (.025-.035 inch).
2. If armature is not free to move, insert a screwdriver through the access hole in the conduit box and gently pry the armature toward the friction face until the armature is free to pull in. It may be necessary to rotate the armature so that it can be manually moved around its entire circumference.
3. Install hole cover into or over the access hole in the conduit box before putting the Super-Mod into service.
4. It may also be necessary to initially move the armature away from the friction surface. Try to establish a .010 to .020 air gap as the output shaft or motor is rotated.

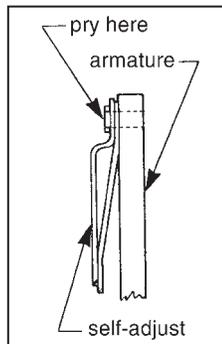


Figure 3

Maintenance

The SM-20/20MB C-Face Brake is designed so as to require a minimum amount of attention during the wear life of the unit.

Troubleshooting for SM-20/20MB C-Face Brakes

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 or coil burned-out

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 for the 115 Vac Tor-ac and 208-240 Vac for the 230 Vac Tor-ac (if variable voltage input is not being used), correct the voltage source and replace burned-out parts. Note that the output voltage for the 115 Vac Tor-ac module should be a full wave rectified 100 Vdc and 1/2-wave rectified 100 Vdc for the 230 Vac Tor-ac module.
4. Is coil resistance correct? Resistance of the 90-100 Vdc coils and coils used in Tor-ac units are tabulated in Table 1. For others, contact factory.

Table 1

Model	24-28 Vdc Coil Resistance	90-100 Vdc and 115/230 Vac Tor-ac Coil Resistance
	ohms (nominal value)	
SM-210	38	589
SM-250	15	237

5. Stop time on brakes normally should not exceed 1 second. If excessive, recheck torque rating versus load characteristics.

B. Loss of torque

1. Check all items above.
2. Check for oil/grease on friction elements. If this is found, replacement is recommended of complete unit or affected elements.
3. Are control (limit) switches operating properly and set in proper place? A switch malfunction may appear to be loss of torque.
4. Unit worn excessively? Replace unit or worn parts.

C. Fuse in DC power supply blows

1. Never use a higher rated fuse; always use a slo-blow type fuse.
2. Check resistance of coil(s), if shorted, replace magnet body and coil assembly.
Check for grounded lead wire(s) between coil and power supply. 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.

D. 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 coil 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.

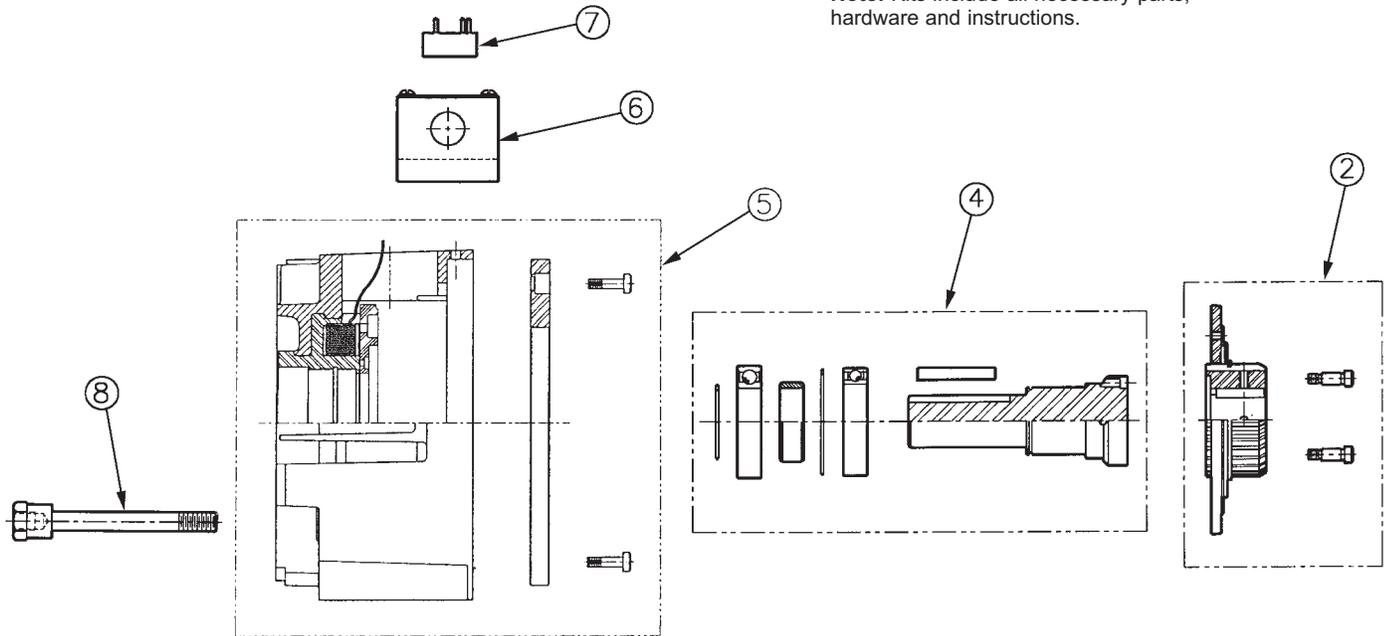
E. Unit fails to engage

See Items under A, B, C and D of the *Troubleshooting Section*.

SM-20 Brake

(see next page for SM-20MB Brake)

Note: Kits include all necessary parts, hardware and instructions.



Components for SM-20 Brake

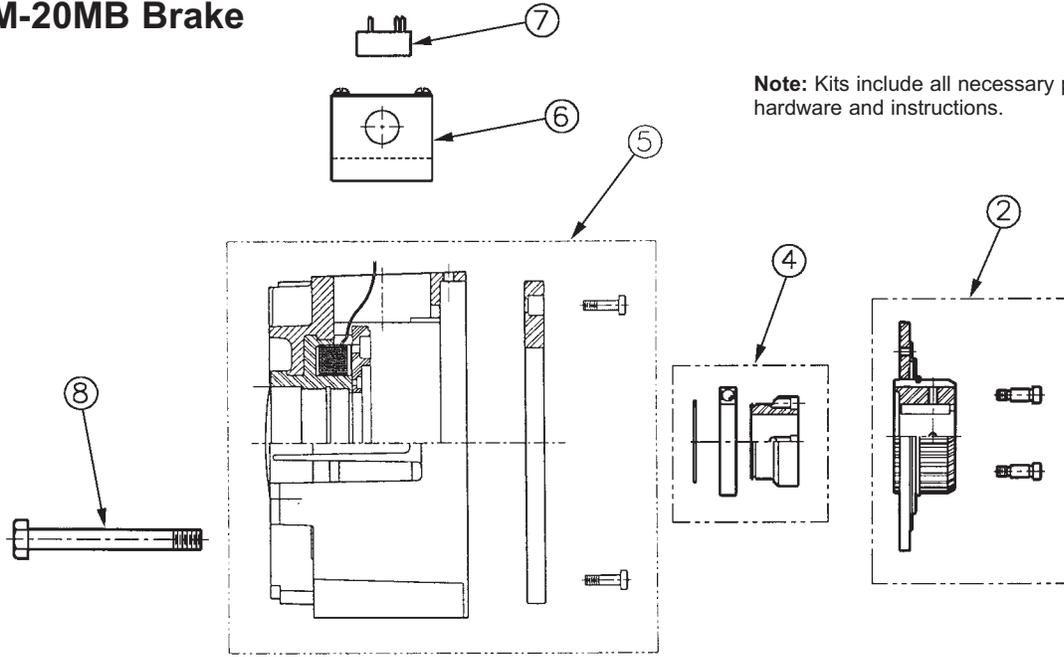
Item	Description	Part Number	2-37-1801-03-A*R		2-37-2101-04-A*U						
			*Supply Voltage								
			DC		AC		DC		AC		
			E (24)	J (90)	N (115)	P (230)	E (24)	J (90)	N (115)	P (230)	
2	Armature and hub kit	5-77-2132-01	1	1	1	1					
		5-77-2532-03					1	1	1	1	
4	Output shaft and bearing kit	5-77-2114-01	1	1	1	1					
		5-77-2514-03					1	1	1	1	
5	Housing kit with brake assembly	5-77-2135-24	1								
		5-77-2135-90		1	1	1					
		5-77-2535-24					1				
		5-77-2535-90						1	1	1	
6	Conduit box kit	5-77-2116-00	1	1	1	1	1	1	1	1	
7	Tor-ac kit	4-1-20194-00			1					1	
		4-1-20290-00				1					1
8	Tie bolts	8-45-7011-01	4	4	4	4	4	4	4	4	4

OPTION NOTE: Super-Mod unit 2-37-1801-03-C*L (use input adapter 5-78-0000-23)
 Super-Mod unit 2-37-2101-04-C*L (use input adapter 5-78-0000-24)

SM-20 – Contents of Kits

Item	Kit Description
2	Armature and hub kit 1 - Armature/hub assembly 4 - Bolts 1 - Allen wrench
4	Output shaft and bearing kit 1 - Shaft 2 - Bearings 2 - Retaining rings 1 - Key 1 - Bearing spacer
5	Housing kit 1 - Housing/brake coil assembly 1 - Output shaft and bearing kit 1 - Seal plate 4 - Plate mounting screws
6	Conduit box kit 1 - Conduit box/cover 6 - Screws 2 - Gaskets
7	Tor-ac kit 1 - Tor-ac module

SM-20MB Brake



Note: Kits include all necessary parts, hardware and instructions.

Components for SM-20MB Brake

Item	Description	Part Number	2-37-1801-03-X*R				2-37-2101-04-X*U				
			*Supply Voltage								
			DC		AC		DC		AC		
			E (24)	J (90)	N (115)	P (230)	E (24)	J (90)	N (115)	P (230)	
2	Armature and hub kit	5-77-2132-01	1	1	1	1					
		5-77-2532-03					1	1	1	1	
4	Hub and bearing kit	5-77-2144-00	1	1	1	1	1	1	1	1	
5	Housing kit with brake assembly	5-77-2145-24	1								
		5-77-2145-90		1	1	1					
		5-77-2545-24					1				
		5-77-2545-90					1	1	1		
6	Conduit box kit	5-77-2116-00	1	1	1	1	1	1	1	1	
7	Tor-ac kit	4-1-20194-00			1				1		
		4-1-20290-00				1				1	
8	Bolts, hex head	9-16-3472-01	4	4	4	4	4	4	4	4	

SM-20MB – Contents of Kits

Item	Kit Description
2	Armature and hub kit 1 - Armature/hub assembly 4 - Bolts 1 - Allen wrench
4	Hub and bearing kit 1 - Bearing 1 - Hub 1 - Retaining ring
5	Housing kit 1 - Housing/brake coil assembly 1 - Hub and bearing kit 1 - Seal plate 4 - Plate mounting screws
6	Conduit box kit 1 - Conduit box/cover 6 - Screws 2 - Gaskets
7	Tor-ac kit 1 - Tor-ac module



Rexnord Industries, LLC
 Stearns Division
 5150 S. International Drive
 Cudahy, Wisconsin 53110
 (414) 272-1100 Fax: (414) 277-4364 www.rexnord.com