P/N 8-078-925-07
effective 10/1/97

Installation and Service Instructions for 55,700 Double C-Face Coupler

With 1985 design brake shaft (35) and hub (16) coupled to motor shaft.

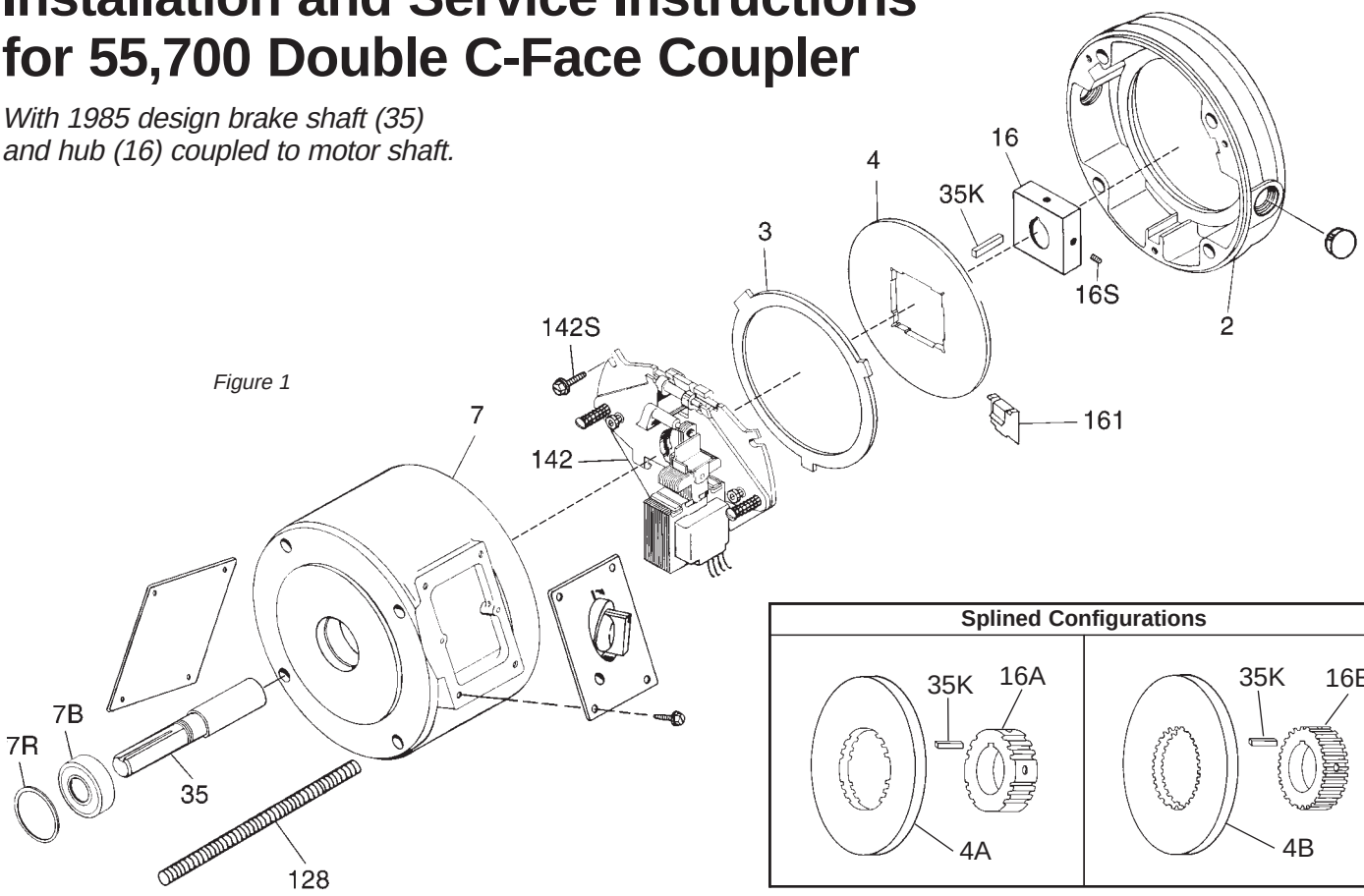


Figure 1

Splined Configurations

Important

Please read these instructions carefully before installing, operating, or servicing your Stearns 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, WI 53110, (414) 272-1100.

Caution

1. Installation and servicing must be made in compliance with all 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. Do not install the brake in atmospheres containing explosive gases or dusts.
3. To prevent an electrical hazard, disconnect power source before working on the brake. If power disconnect point is out of sight, lock disconnect in the *off* position and tag to prevent accidental application of power.
4. Make certain power source conforms to the requirements specified on the brake nameplate.
5. Be careful when touching the exterior of an operating brake. Allow sufficient time for brake to cool before disassembly. Surfaces may be hot enough to be painful or cause injury.
6. Do not operate brake with housing removed. All moving parts should be guarded.
7. Installation and servicing should be performed only by qualified personnel familiar with the construction and operation of the brake.
8. For proper performance and operation, only genuine Stearns parts should be used for repairs and replacements.
9. After usage, the brake interior will contain burnt and degraded friction material dust. This dust must be removed before servicing or adjusting the brake.

   DO NOT BLOW OFF DUST using an air hose. It is important to avoid dispersing dust into the air or inhaling it, as this may be dangerous to your health.

   a) Wear a filtered mask or a respirator while removing dust from the inside of a brake.

   b) Use a vacuum cleaner or a soft brush to remove dust from the brake. When brushing, avoid causing the dust to become airborne. Collect the dust in a container, such as a bag, which can be sealed off.

General Description

The 55,700 Series coupler is a spring-set, electrically released brake, containing either one or two rotating friction discs driven by a hub mounted on the motor shaft. The double C-face allows the brake to directly couple a C-face motor to a C-face gear reducer. Or, for in-line application the brake can be mounted directly to a foot mounted C-face motor, using the bearing mounted output shaft as a drive shaft.

Operating Principle

The 55,700 Series utilizes one or two rotating friction discs driven by a hub mounted on the motor shaft. When the brake is wired into the motor circuit, starting the motor will energize the solenoid and compress the pressure springs. This action removes the force against the disc pack components and allows the friction discs to rotate freely.

Stopping the motor de-energizes the solenoid and restores pressure spring force against the disc pack, thereby stopping and holding the load.

When the motor is off and the load is to be moved without energizing the motor, the manual release knob should be used. This removes the holding torque from the motor shaft, allowing it to be rotated by hand, however drag may be noted. The brake will remain in the manual release position until the release knob is returned manually to its *set* position, or until the brake is re-energized electrically and the release knob returns to its *set* position automatically.

Note: The motor should not be run with the brake in the manual release position to avoid overheating of friction discs.

I. Installation Procedure

Note 1: Check face of motor to which brake is to be mounted, to be sure NEMA dimensions of 0.004" T.I.R. on concentricity and face run out are met. Shaft run out is to be within 0.002" T.I.R. Maximum shaft end float is 0.020". Use standard length NEMA shaft.

Note 2: The effectiveness of the dust-tight waterproof brake enclosure depends on a fully enclosed motor C-face as the brake face is not sealed.

1. Remove hub (16) from brake assembly, using caution to preserve alignment of friction disc, or discs, (4) for ease of brake assembly to motor.
2. Remove and discard all shipping nuts (Palnuts) from four mounting studs (128). Brake can now be separated at junction of housing (7) and endplate (2). Use caution so as not to depress solenoid plunger, which would release and misalign friction discs.
3. Assemble mounting studs securely into mounting face of motor.
4. Using key (35K), slide hub onto motor shaft to within 1/4" of motor mounting face. Key must extend to motor shaft end. (See Figure 2). A dimple drilled into shaft for set screw at 90° from keyway is recommended to preclude possible hub shift on certain applications especially vertical. Torque both set screws to 78 in-lbs on 1/4" diameter set screws and 156 in-lbs on 5/16" diameter set screws.

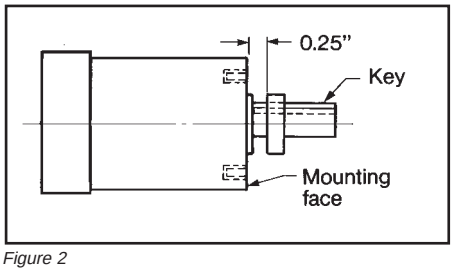


Figure 2

5. Slide endplate (with gasket on enclosed style) with friction discs and support plate assembly in place carefully onto mounting studs. Be sure solenoid is in a vertical position (plunger above frame). Rotate motor shaft to align and engage hub into friction discs, and seat brake on motor C-face. Use caution so as to prevent damage to friction discs.

Note: If reducer or motor is to be ceiling or horizontally wall mounted, entire brake may have to be rotated 180° or 90° so it will be positioned with plunger (29) above frame (79) at final assembly, for preferred positioning.

6. Complete electrical connections (see Section II, *Electrical Connection of Brake*) and operate brake a few times to be certain correct solenoid air gap has been maintained. (See Section IV *Adjustment for Friction Disc Wear* for proper gap measurement.)
7. **Remove access covers (104)** and slide housing and shaft assembly onto mounting studs, rotating shaft (35) to engage key (35K) into shaft keyway. Be sure housing is assembled with access windows aligned in same relative position to support plate shown in Figure 1.

   On dust-tight waterproof brakes install gasket provided between endplate to housing and housing to motor reducer.
8. Mount and secure brake/motor combination to mounting face of reducer using nuts (3/8 - 16) and lock washers (not supplied). If bearing mounted brake shaft is to be used as an output drive, secure brake to motor using nuts (3/8 - 16) and lock washers (not supplied).
9. Replace access covers, use gaskets on dust-tight waterproof style.

Caution! If brake has manual release, do not run motor with brake in manual release position. It is intended only for emergency movement of the driven load, not as a substitute for full electrical release.

II. Electrical Connection of Brake

CAUTION 1: Inverter Motor and Special Control Systems. This brake contains either a single phase AC coil or DC coil that requires instantaneous power within ± 10% of rating at the coil. A separate power source is required when this brake is used in conjunction with a motor or control system that limits voltage or current input (i.e. inverter motors) or causes a ramping of the power supply.

CAUTION 2: Class H coils with terminals. Do not bend lead wire crimp connection as this causes a fatigue in the metal which may break under vibration.

Note 1: Brake coil connections described here cover common motor connections. For nonstandard motor or control connection, contact respective supplier or Stearns Division.

Note 2: On brakes with space heater, connect to appropriate power source. Heater is to be energized continuously, even during storage, if rusting may occur.

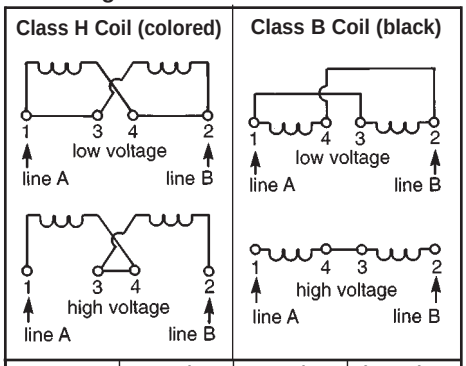
Note 3: Be sure lead wires to coil are not tight or pinched, and that leads will not be rubbed by friction disc, trapped between solenoid plunger and frame, caught between lever arm and endplate, or by linkage.

A. AC coils – single and dual voltage

1. All Stearns AC coils are single-phase. Connect single voltage coils to any two wires of single or three-phase power source, or, for operation with motor control, to any two motor leads of proper voltage.

   Method of connecting dual voltage coil for use on high or low voltage is shown in Figure 3. Observe the lead numbering sequence for proper connection as shown.

AC Voltage Coil Connection



For	Power Line A	Power Line B	Tie Leads
Low voltage	1 and 3	2 and 4	–
High voltage	1	2	3 and 4

Figure 3

2. To use a 230 volt coil (or a dual voltage coil connected for 230 volts) with a 230/460 dual voltage three-phase motor, the brake leads are connected across two motor terminals as shown, or other equivalent combinations. If a 230 volt brake coil is connected as shown in Figures 4 or 5, the motor can be operated on either 230 volts or 460 volts with no effect on brake operation.

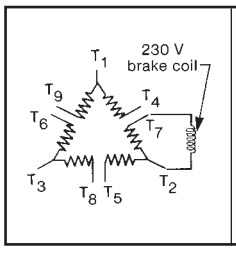


Figure 4

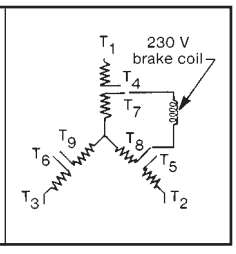


Figure 5

B. DC coils

1. All Stearns DC coils are single voltage, dual windings. A high current pull-in winding is initially energized to start

Table 1

Series	Nominal Static Torque (lb-ft)	Maximum Counter-clockwise Turns	% Torque Reduction per Turn	Required Torque Adjust Screw Length (inches)	Compressed Original Spring Height (inches)
55,700	3, 6 & 10	4	12	2	7/8
	15	3	16	2-3/4	1-27/32

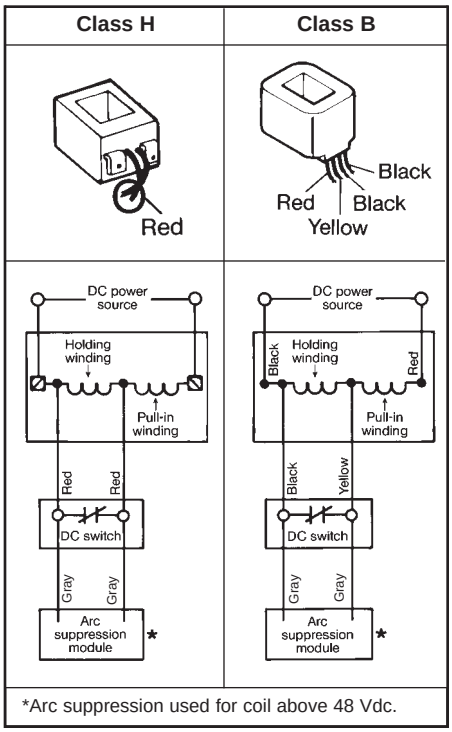
solenoid plunger movement, while a low current holding winding is momentarily short circuited via a normally closed switch mounted on solenoid frame. When the plunger is almost seated, an actuator bar on the plunger opens the switch, removes the short circuit from the holding winding, and inserts it in series with the pull-in winding. Due to the high initial current demand of a DC solenoid, a separate DC power source of adequate current capacity is usually required.

Caution! Never use a series resistor to drop power supply voltage as brake malfunction will result! For electrical release of brake, apply full rated solenoid coil voltage by the closing of a switch. DO NOT increase voltage to coil slowly.

2. Connect proper power source to two terminals of coil or the two free leads (red and black) of four lead coil. Polarity is immaterial. Two coil leads are preconnected to DC switch on solenoid at factory.

   In addition, all models over 48 Vdc are supplied with an arc suppression module. It is connected across the DC switch terminals to protect its contacts from arc erosion and suppress E.M.I. (Electro Magnetic Interference).

DC Voltage Coil Connection



*Arc suppression used for coil above 48 Vdc.

Figure 6

III. Torque Adjustment

These series of brakes are factory set for nominal rated static torque which is maximum torque. Torque may be decreased for increased stopping time, see Table 1. The torque on the 1-1/2 lb-ft brake may not be reduced.

Note 1: Torque adjustment screws on older brakes are 1/4" shorter than shown in Table 1. For replacement screws use part number 8-009-501-00 and specify 2" length needed or use part number 8-009-503-00 and specify 2-3/4" length needed, based on series and torque from Table.

Note 2: Both torque adjustment screws (11), Figure 7, must be turned equal amounts counterclockwise to decrease torque. Housing must be removed to adjust torque.

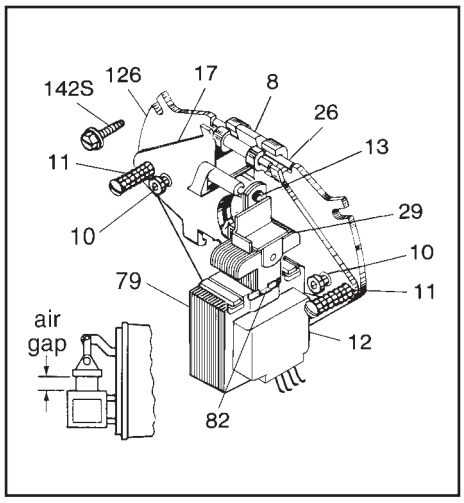


Figure 7

IV. General Maintenance

Warning! Any mechanism or load held in position by the brake should be secured to prevent possible injury to personnel or damage to equipment before any disassembly of the brake is attempted. Observe all *cautions* listed at the beginning of this manual before attempting to service brake.

Note 1: Replacement part kits for many items are available and contain retrofit instructions.

Note 2: Do not lubricate any part of the brake as this may cause a malfunction and/or a loss of torque.

A. Adjustment for friction disc wear
(See Figures 1 and 7, also Table 2)

Table 2: *Air Gap Settings*

Nominal Static Torque (lb-ft)	55,700 Series
1.5 and 3	13/32
6 and 10	1/2
15	9/16

Note: Wear adjustment can be performed without having to disassemble the drive system. By removing the two side plates, access can be gained to the solenoid assembly and adjusting screws. On brakes built after August 1989, a 3/16" hex tool is used. For brakes built before August 1989, a right angle screwdriver is used.

1. Manually lift solenoid plunger to maximum travel. Depress and allow solenoid plunger to snap out several times. Measure solenoid air gap between mating ground surfaces of solenoid frame and solenoid plunger. See Figure 7. (On vertically mounted brakes, it will be necessary to push solenoid plunger into solenoid frame to the point where spring pressure is felt, before measuring solenoid air gap.) As friction disc wear occurs the air gap will increase, as well as stopping time. If solenoid air gap exceeds 11/16", adjustment is necessary.
2. The solenoid air gap may be decreased by turning both wear adjustment screws (10) equal amounts clockwise, approximately 1/8 turn, until solenoid gap is attained. Counterclockwise rotation will increase gap.

B. Friction disc replacement

Replace friction disc(s) when wear surface thickness is not less than one half original disc thickness. Replacement discs are available as kits, see Parts List, P/N 8-078-915-07 (Sheet 314).

To inspect friction disc(s) remove housing (7), screws (142S) and support plate assembly (142). Stationary disc(s) (3) and friction disc(s) (4) may now be removed. Be sure all items slide freely when reassembling. If brake was modified for vertical mounting, replace springs in same order of removal. See P/N 8-078-935-07 (Sheet 301.5) if correct sequence is in doubt.

C. Coil replacement

NEMA AC voltage coils are available as kits. Select required coil kit from Parts List, P/N 8-078-915-07 (Sheet 314). DC coils are available as assemblies, see P/N 8-078-915-07 (Sheet 314).

D. Miscellaneous parts replacement
(See Figures 1 and 7)

All parts shown in Figures 1 and 7 are available as kits, assemblies, or components. Consult Parts List, P/N 8-078-915-07 (Sheet 314) for ordering information.

V. Troubleshooting

Warning! Any mechanism or load held in position by the brake should be secured to prevent possible injury to personnel or damage to equipment before any disassembly of the brake is attempted. Observe all *cautions* listed at the beginning of this manual before attempting to service brake.

A. If brake does not stop properly or overheats, check the following:

1. Are friction discs excessively worn, charred, or broken?
2. Hub may have become loose and shifted on shaft. Recheck Section I, Step 4.
3. Is hub clean, and do friction discs slide freely?
4. Do stationary discs slide freely in the endplate? Check slots of endplate for wear at the areas where stationary discs are located. Grooves in the slots can cause hang-up of ears of stationary discs. If grooving is noted, replace endplate.
5. On vertically mounted brakes, are springs in place in disc pack? See P/N 8-078-935-07 (Sheet 301.5) if correct sequence is in doubt.
6. With brake de-energized and housing assembly (7) removed, check compressed length of pressure springs (11). Compare to tabulated values in Table 1 and adjust to correct height if necessary.
7. Is solenoid air gap adjusted correctly? See Section IV, Item A and refer to *Air Gap Settings*, Table 2.
8. Solenoid may not be energizing and releasing the brake. Check voltage at the coil and compare to the coil and/or nameplate voltage rating.
9. Whether brake is AC or DC a voltage drop may be occurring during energization. If excessive drop in voltage is noted check wire size of power source. Correct as needed.

Note: A method to check voltage at coil is to insert a block of wood of the approximate thickness of the solenoid air gap between the solenoid frame and plunger. (The block will prevent brake from releasing when coil is energized.) Connect voltmeter leads at the coil terminals or lead wires. Energize coil. Voltmeter reading will not fluctuate. Reading should be taken immediately and the coil de-energized to prevent overheating of the coil. Compare voltage reading with coil rating and minimum voltage permitted.

10. If brake is DC solenoid style, check switch actuation and condition of switch contacts. The switch should open with a 3/16” approximate air gap. (This is plunger travel remaining before plunger seats to frame.)
11. Check linkage for binding. This approximate pressure applied to the top of the solenoid link to move plunger is:

Table 3

#4 coil	2 to 3-1/2 lbs
#K4 coil	5 lbs

If excessive force is required, determine cause of binding and correct. Do not overlook bent, worn or broken plunger guides as a possible cause for binding. Check plunger to frame alignment.

12. Are controls which govern start of braking cycle operating properly?
13. Brake coil should be energized at same time or prior to energization of motor, and de-energized at same time or after de-energization of motor.
14. If stopping time is more than one second (rule of thumb) and/or application is more than five stops per minute, check thermal requirements of load versus thermal rating of brake.
15. Does motor C-face and shaft run out conform to NEMA specifications? See Section I, Note 1.
16. Replace friction disc(s) when worn area is one half of original thickness (3/16 inch).
17. Check to be sure wear adjust screws are of equal height. Measure from inboard side of support plate with depth micrometer. Turn one screw to obtain equal height, reassemble and see *Adjustment for Friction Disc Wear.*

B. If brake is noisy, shatters friction discs, or appears prematurely worn, check the following:

1. A-2 through A-5, A-15 and A-17.
2. Is brake output shaft excessively side loaded?
3. Are motor bearings worn? (Excessive shaft side play would be indicative of this condition.)
4. If brake is reducer mounted, check that reducer mounting face conforms to AGMA specifications, the same as NEMA tolerances, Item A-15. Check bearings(s) of reducer.

C. If brake hums, solenoid pulls in slowly, or coil burns out, check the following:

1. Check A-6 through A-13.
2. Check for broken shading coil.
3. Plunger guides may be excessively worn. Does solenoid plunger rub on solenoid frame laminations?
4. Solenoid frame and plunger may be excessively worn.
5. Is solenoid dirty?
6. Solenoid mounting screws may have become loose, causing frame to shift and plunger to seat improperly.

D. General checks:

1. Check for *homemade* or substitute parts that were not manufactured or supplied by Rexnord Corporation. Usually the substituted parts can be recognized because they do not have the *finished* manufacturing appearance. Check, especially, such items as pressure spring, friction discs and hubs.
2. Check nameplate to see if it has been restamped. Incorrect information on nameplate may lead to ordering or obtaining incorrect parts or incorrect installation of brake.
3. Use only Stearns replacement coils. Substitute coils may not have the same pull characteristics as original coils and can either fail or cause damage to the solenoid.
4. If a heater is supplied and excess rusting has occurred in brake, check power source to heater to be sure it is operating and that heater is not burned out.
5. If brake coil is separately controlled, check for proper sequence and power supply. Use of voltmeter is usually sufficient.

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