Stearns® *Spring-Set Disc Brakes*

P/N 8-078-920-00

effective 4/3/89

General Instructions Installation and Service Instructions

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, Wisconsin 53110, (414) 272-1100

Caution

1. Installation and servicing must be 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.

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 or before the manual release knob or lever is operated on the brake.

Find brake model in Table 1, then choose appropriate service instructions. Turn to section given and follow instructions.

For renewal of friction disc on all series, refer to Section B. For installation on all series, refer to Section D.

Consult factory for installation and service instructions on brakes not covered in this sheet.

Table 1
Brake Instruction Index

Brake Series	Instruction Section	
	Adjust for Wear	Coil Replacement
H-40	A-6	C-3
H-50	A-6	C-3
H-60	A-2 or A-5	C-1
H-70	A-2 or A 5	C-1
H-80	A-2 or A-5	C-1
H-1000	A-2 or A-5	C-1
H-1200	A-3 or A-4	C-2
H-1300	A-3 or A-4	C-2
HT-50	A-6	C-3
HT-70	A-1 or A-4	C-1
R-80	A-2 or A-5	-
R-1000	A-2 or A-5	C-1
R-1300	A-3 or A-4	C-2
HTA-70	A-1 or A-4	C-1
HTS-70	A-1 or A-4	C-1
HTC-50	A-6	C-3
HTCS-50	A-6	C-3
HTCR-50	A-6	C-3
HS-50	A-6	C-3
HRA-50	A-6	C-3
HCA-50	A-6	C-3
BA-50	A-6	C-3
HK-1200	A-3 or A-4	C-1
AL-50	A-6	C-3
AL-70	A-2 or A-5	C-1
AL-80	A-2 or A-5	C-1
46,000	A-2 or A-5	C-1
47,000	A-1 or A-4	C-1
ALT-70	A-1 or A-4	C-1
ALTA-70	A-1 or A-4	C-1
ALTB-70	A-1 or A-4	C-1
42,000	A-1 or A-4	C-1
UH-50	A-6	C-3
UHF-50	A-6	C-3
UH-70	A-5	C-1
UHF-70	A-5	C-1
UH-80	A-5	C-1
UHF-80	A-5	C-1
EXG-70	A-5	C-1
EXGF-70	A-5	C-1
67,000	A-5	C-1
77,000	A-5	C-1

Table 2
Solenoid Air Gaps

Brake Series	Brake Size ("X" denotes variable number)	Static Torque (lbs-ft)	Factory Set Solenoid Air Gap (approx.)
40 *(H)*	42 44	1 3	7/16 5/16
50 *(H, HT, HTC, UH, AL, BA,* etc.) *(55,000; 55,200 and 55,400)*	52 and 52A 54 56, 56A and 58	1.5 and 3 6 9, 10 and 15	13/32 1/2 9/16
67,000	1-067-0XX	10, 15 and 25 35 and 50 75 and 105	7/16 9/16 5/8
77,000	1-077-0XX	10, 15 and 25 35 and 50 75 and 105	7/16 9/16 5/8
60 *(H,* etc.)	62 64 66	1.5 3 4.5	13/32 1/2 9/16
70 *(H, HT, UH, EXG, AL, ALT,* etc.)	72 thru 72C 74C, 74 and 74A 76 and 76A	10 thru 25 35, 50 and 70 75 and 105	7/16 9/16 5/8
80 *(H, R, UH, UHF, AL,* etc.)	82 thru 82C 84B 86B	3 thru 35 50 and 75 75 and 90	7/16 9/16 5/8
1000 *(H, R,* etc.)	1004 1006	125 175	9/16 3/4
1200 *(H, HK,* etc.)	1204 thru 1208A	230 thru 575	1 1/8
1300 *(H, R,* etc.)	1304C thru 1308D	230 thru 575	1 3/16
42,000	1-042-XXX	125 thru 575	3/4
46,000	1-046-XXX	500, 750 & 1000	1 1/16

Note 1: Brake series numbers like 42,000 and 67,000 have specific model numbers such as 1-042-011-1 or 1-067-041. The last two digits will vary according to torque rating, enclosure or other variables.

Note 2: For "Clapper" type direct current brakes, the air gap between the magnet body and the armature should be approximately .042 in the 60 and 80 Series, .075 on the R-1004, and .093 on the R-1006.

Note 3: Gap increases as wear occurs. See Section A for adjustment instructions.

SECTION "A"—ADJUSTMENT FOR FRICTION DISC WEAR

HOW TO DETERMINE IF BRAKE IS IN NEED OF ADJUSTMENT

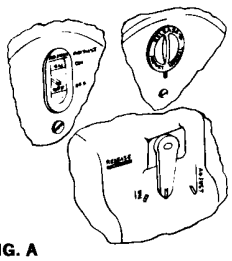


FIG. A

If indicator or knob is at "ADJUST" or release lever is beyond "SET" (on HORIZONTALLY MOUNTED*– plunger above frame–BRAKES), if a definite increase in stopping time is noted, or if solenoid air gap* is excessive (see Table No. 2), adjust brake as described in "STEPS" below (see Table No. 1 for proper "SECTION").

*NOTE: For VERTICALLY MOUNTED BRAKES, or horizontally mounted brakes rotated with solenoid plunger on horizontal centerline, remove plastic cover (if present) and depress lever, or turn knob in release direction, until spring pressure is felt to determine need for adjustment. To MEASURE SOLENOID AIR GAP on these brakes, remove housing, grasp solenoid link to hold plunger in a free horizontal position, and move toward solenoid frame until spring pressure is felt. Holding firmly in this position, measure air gap between mating (ground) surfaces on solenoid frame and solenoid plunger. Adjust to proper gap (see Table No. 2), and check by again holding plunger as directed.

SECTION A-1

STEPS

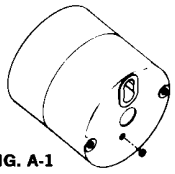


FIG. A-1

1. Remove pipe plug in Housing.
2. Insert Screwdriver and turn Adjusting Stud in Clockwise direction until indicator returns to the "ON" or "NORMAL" position.
3. Replace pipe plug.

SECTION A-2

STEPS

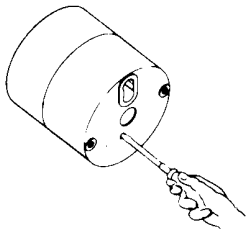


FIG. A-2

1. Remove pipe plug in Housing.
2. Insert Screwdriver and turn Adjusting Stud in Counter-Clockwise direction until indicator returns to the "ON" or "NORMAL" position. (For 46,000 Series, turn both Adjusting Studs equal amount until "ON" position is reached.)
3. Replace pipe plug.

SECTION A-3

STEPS

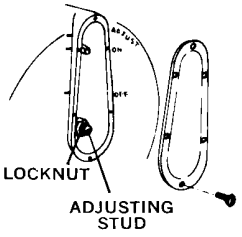


FIG. A-3

1. Remove Manual Release Cover.
2. Loosen Locknut by turning in a Counter-Clockwise direction.
3. Insert Screwdriver into slot in Adjusting Stud and turn Clockwise until indicator is at approximately the "ON" position.
4. Tighten Locknut against Adjusting Stud and replace Manual Release Cover.

SECTION A-4

STEPS

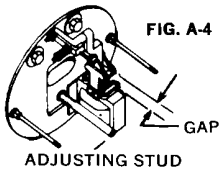


FIG. A-4

1. Remove Housing.
2. Insert Screwdriver and turn Adjusting Stud in Clockwise direction until proper solenoid gap is attained. (See Table No. 2, SOLENOID GAPS.)
3. Replace Housing.

SECTION A-5

STEPS

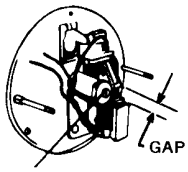


FIG. A-5

1. Remove Housing.
2. Insert Screwdriver and turn Adjusting Stud in Counter-Clockwise direction until proper solenoid gap is attained. (See Table No. 2, SOLENOID GAPS.) (For 46,000 Series, turn both Adjusting Studs equal amount to maintain equal Solenoid Gaps.)
3. Replace Housing.

SECTION A-6

STEPS

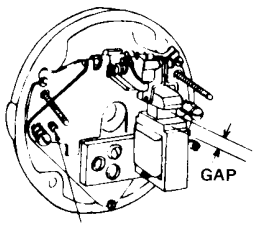


FIG. A-6

1. Remove Housing.
2. Turn both Adjusting Screws equal amounts, approximately 1/8 turn Clockwise, until proper solenoid gap is attained. (See Table No. 2, SOLENOID GAPS.)
3. Maximum torque may be obtained after operating brake several times, then turning Adjusting Screws very slightly either way and noting which position of fine adjustment provides satisfactory stopping without changing solenoid gap.
4. On Brakes with manual release Knob or button integral with housing, turn housing so Knob assembly is about 20° to left of vertical centerline. After mating with endplate rotate housing to right to align with mounting studs. In other models, mount and attach.

NOTES: 1. After brake has been adjusted, energize coil or depress plunger to close gap, then manually rotate shaft (DO NOT START MOTOR) and make certain that shaft rotates freely. This will insure sufficient turning clearance exists between frictional parts.

2. **WARNING:** DO NOT ATTEMPT TO ALTER TORQUE RATING BY READJUSTING SOLENOID GAP.

3. **WARNING:** DO NOT RUN MOTOR WITH BRAKE MANUALLY RELEASED. BRAKE IS TO BE ROTATED MANUALLY ONLY.

SECTION "B"—RENEWAL OF FRICTION DISCS

STEPS

1. Follow Step 1 of Installation Instructions. (Section "D")
2. Follow Step 4 of Installation Instructions. (Section "D"), replacing old Friction Disc(s). To insure proper brake operation, be sure that Friction Discs move freely but not loosely, on hub. If snug, file internal edges lightly until free movement is attained.
3. "Turn Out" (reverse direction than for adjusting) Adjusting Stud or Screws to compensate for adjustments that had been made to brake (for proper direction, see ADJUSTMENT for WEAR, Section "A") before assembling Support Plate Assembly to Endplate. If it becomes difficult to tighten Support Plate Screws, "turn out" Adjusting Stud or Screws further.
4. Adjust brake as described in Section "A" – Adjustment for Wear. (See Table No. 1 for proper instruction section.)
5. Replace Housing and Housing Screws.

SECTION "C"—COIL REPLACEMENT

SECTION C-1

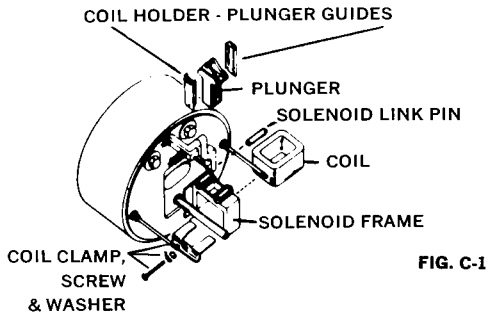


FIG. C-1

STEPS

1. Disconnect Solenoid from circuit.
2. Remove Solenoid Link Pin.
3. Lift Plunger from Solenoid Frame.
4. Remove Coil Clamp, Screw and Lockwasher. There is no coil clamp with encapsulated coil.
5. Slide coil sideways from frame. To reassemble, follow preceding steps in reverse order. If replacing a tape wound coil with an encapsulated coil, discard the coil clamp.

SECTION C-2

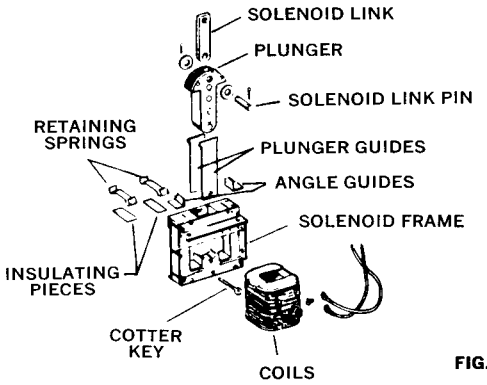


FIG. C-2

STEPS

1. Disconnect Solenoid from circuit.
2. Remove Solenoid Link Pin.
3. Lift Plunger from Solenoid Frame.
4. Remove cotter key from bottom of Solenoid Frame, remove Plunger Guides and Angle Guides.
5. Press Coil downward and remove top half of two piece coil by moving to side. Remove Retaining Springs and Insulating Pieces.
6. The new coil must be assembled in the same relative position as the old one. Top and bottom sections can be identified by numbers found on each section. To install new coil, simply reverse the process described above.

SECTION C-3

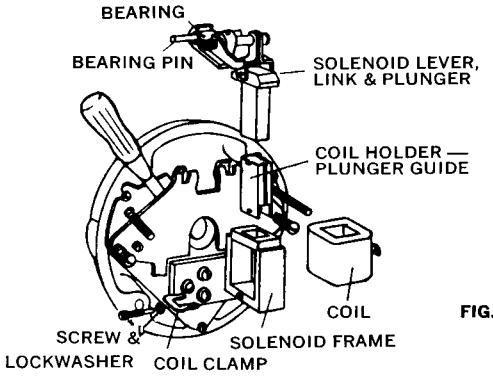


FIG. C-3

STEPS

1. Disconnect Solenoid from circuit.
2. Insert Screwdriver between Support Plate and Lever Arm, wedge apart and remove Bearing Pin, and Solenoid Lever with Solenoid Link and Plunger.
3. Remove Screw and Lockwasher. Coil Clamp and Coil Holder–Plunger Guide. There is no coil clamp with encapsulated coil. If replacing a tape wound coil with an encapsulated coil, discard the coil clamp.
4. Slide Coil sideways from frame. To reassemble, follow preceding steps in reverse order.

TROUBLE SHOOTING

FAILURE TO STOP

If brake does not stop properly:

1. Check to see if brake is in need of adjustment for lining wear.
2. Friction discs may be badly worn or broken and must be replaced.
3. Check to see if hub has shifted on shaft.

EXCESSIVE HUMMING

If excessive humming is heard from brake solenoid, the plunger isn't seating properly. This may cause Coil failure.

To correct:

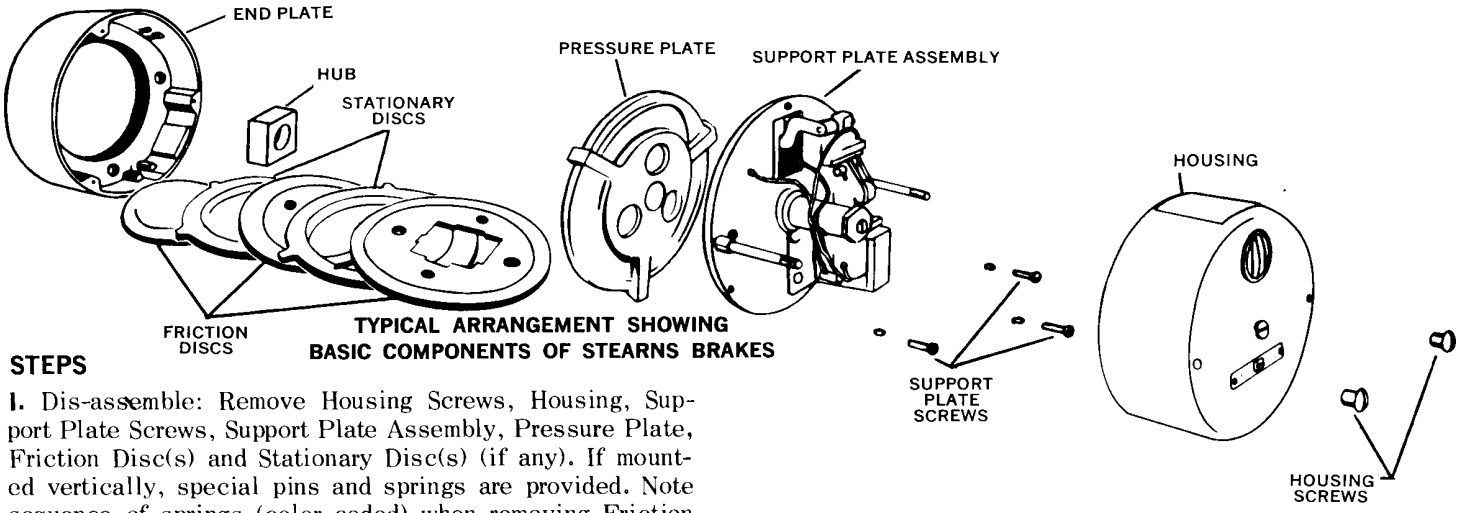
1. Clean solenoid of dirt or foreign matter between plunger and coil frame.
2. The coil frame may have shifted from use and isn't seating properly. Align coil frame so plunger seats properly and tighten screws.
3. Check if shading coils are broken.

FAILURE TO RELEASE

If brake does not release when solenoic is energized, check for the following:

1. Broken lead.
2. Low voltage. If voltage is too lo for the solenoid, the plunger ma make an effort to pull in, but may no pull in completely. This could caus coil failure.
3. Coil failure. A coil may be burned out due to low voltage, poor voltag regulation, too rapid cycling, ove voltage or improper seating plunger (humming). Before installin new coil, check for above causes an correct.

SECTION "D"—INSTALLATION PROCEDURES



TYPICAL ARRANGEMENT SHOWING BASIC COMPONENTS OF STEARNS BRAKES

STEPS

1. Dis-assemble: Remove Housing Screws, Housing, Support Plate Screws, Support Plate Assembly, Pressure Plate, Friction Disc(s) and Stationary Disc(s) (if any). If mounted vertically, special pins and springs are provided. Note sequence of springs (color coded) when removing Friction Disc(s) and Stationary Disc(s) (if any).

2. Attach Endplate to Motor Endbell. Mounting requires bolts to secure brake to Motor Flange. In the case of Floor Mounted Brakes, secure floor mounting bracket to foundation. Floor mounted brakes must be carefully installed, with respect to Brake and Shaft, to within .005" on parallel and angular alignment. The use of dowels to insure permanent positioning is suggested. For an intergral motor-brake, where Endplate is Motor Endbell, consult motor manufacturer's installation instructions.

3. Position Hub on Motor Shaft, key and set screw securely.

Some motor manufacturers cut shaft to required length for Hub to fit flush with motor shaft. Hub should extend 1/16" beyond face of Friction Disc for 40, 50, 60, 70 and 80 Series Brakes (Up to 105 lb. ft. torque) and 1/8" beyond face of Friction Disc for 1000, 1200, 1300 and 42,000 Series Brakes. (Torque higher than 105 lb. ft.).

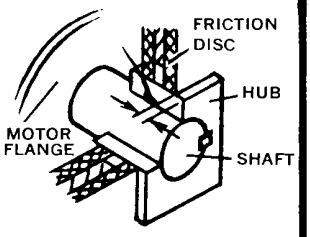


FIG. D-2

NOTE: On "Hazardous Atmosphere" brakes square portion of hub should be within 1/16" of Heat Barrier (End Plate hub on UH-80), except on EXG-70 this dimension is 1/8".

4. Reassemble Friction Disc(s), Stationary Disc(s) (if any) and Pressure Plate. If mounted vertically, replace springs in proper sequence.

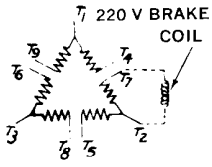
5. Mount Support Plate Assembly to Endplate with the solenoid in a vertical position (Plunger above Frame) as shown. Complete electrical connections.

6. Replace Housing and Housing Screws.

EXCEPTION: It is not necessary to disassemble 40 and 50 series open brakes which use one Friction Disc. These brakes may be mounted by (1) Install Hub on Motor shaft approximately 1/4" from motor flange face, (2) remove Housing, (3) attach Endplate with assemblage to motor endbell and (4) replace Housing.

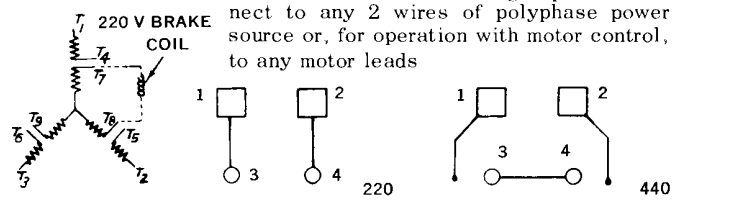
CONNECTING AC SOLENOID COILS ON DUAL VOLTAGE 220/440 POLYPHASE MOTORS

To use a 220 volt coil (or a 220/440 dual voltage coil connected for 220 volts) with a 220/440 dual voltage polyphase motor, the brake leads are connected across two motor terminals as shown or other equivalent combinations. (Left) Brake will operate on 220 volts whether motor is connected for 220 or 440 volts.



(Below) Method of connecting DUAL VOLTAGE 220/440 coil for use on 220 or 440 volts.

All Stearns coils are single phase—connect to any 2 wires of polyphase power source or, for operation with motor control, to any motor leads



IF FRICTION LINING BREAKS

1. Is unit kept in adjustment? If not, adjust periodically.
2. Do stationary discs and friction discs slide freely? If not, find cause of hang-up and correct.
3. Does linkage mechanism move freely? If not, find cause of bind and correct.
4. Do friction discs fully engage hub, both inboard and outboard discs? If not, move hub to proper position.
5. Is brake overheating? If so, check Thermal Rating versus heat buildup caused by stopping load on the basis of cycles per minute of stopping.

IF A HAZARDOUS ATMOSPHERE BRAKE is mounted on totally enclosed fan cooled motor? Check:

1. Mount Dial Indicator base on motor shaft, and Dial Indicator against machined surface of endplate. Observe total runout, maximum allowed is .005". If greater runout is observed, remove endplate to check if dirt, etc. may not allow square mounting of end plate on "C" flange. Determine cause of excess runout and correct.
2. Where close tolerance is maintained Hub to Endplate, is hub rubbing the bore of the endplate? If so, determine cause, e.g. bad bearing in motor, small diameter shaft with long overhang of hub from bearing, excess shaft runout, concentricity of shaft to "C" face register, etc., and correct.