Installation and Service Instructions for Series 103,000

Models 1-103-051, 1-103-061 and 1-103-071

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.

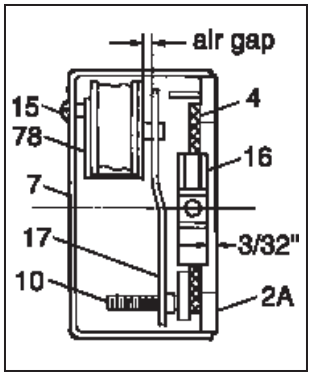


Figure 2

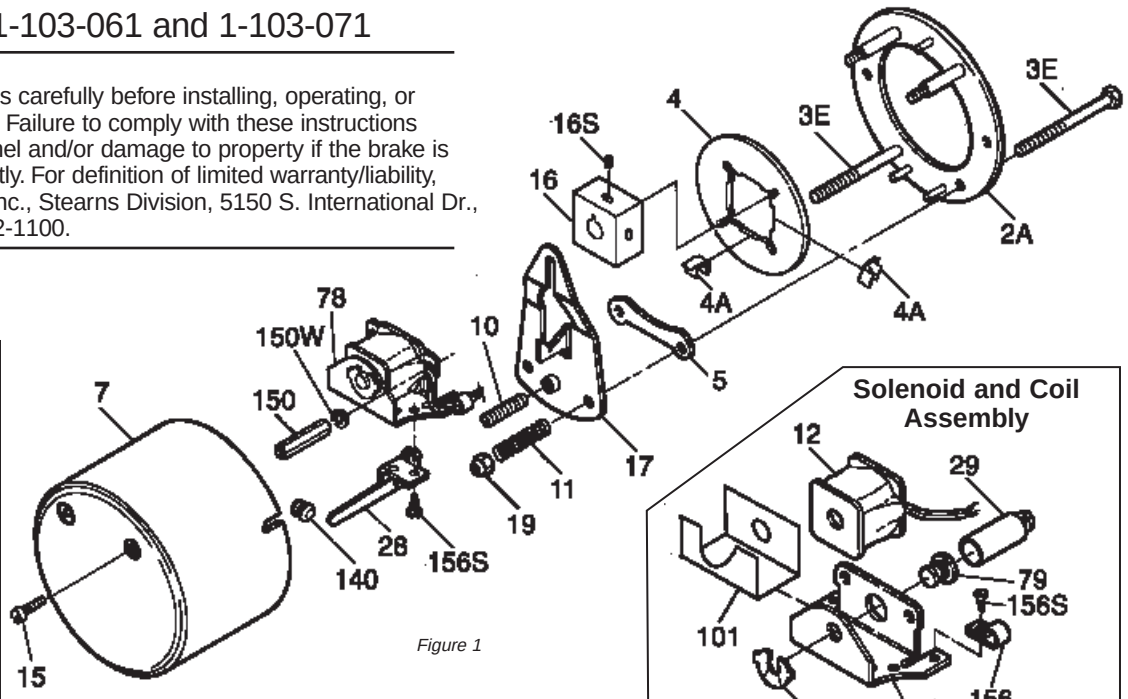


Figure 1

Figure 3

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, corrosive substances, water, oil or dust.
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

This is a spring-set, electrically released brake containing one friction disc driven by a hub which is mounted on the motor shaft.

I. General Installation Notes

Brake mounting can be in any position. Brake is mounted with two #8 socket head cap screws mounted 180° apart.

II. Installation Procedure

1. Remove housing screws (15) and housing (7).
2. Remove hub (16) from brake and slide onto motor shaft and key (when used) to 3/32" from motor mounting surface. Torque both set screws (16S) to 20 lb-in of torque.

Note: Check motor mounting face 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".

3. Attach brake to mounting surface by sliding the brake friction disc (4) onto hub (16), engaging without force. Insure the two stabilizing springs (4A) are located 90° apart as shown above. Brake endplate (2A) is to be tight against mounting face.

Note: See *Friction Disc Replacement*, Step 6 for stabilizing clip positions.

4. Mount the brake to the mounting surface with two #8 socket head cap screws (not furnished). Torque to screw manufacturer's recommendation based on materials being used. Brake mounting can be in any position.
5. Verify solenoid air gap is 5/32". Push in plunger and allow it to snap out. Check air gap. See Figure 2. If adjustment is required, see *Wear Adjustment*.
6. See *Electrical Connection* for coil connection.
7. Replace housing.

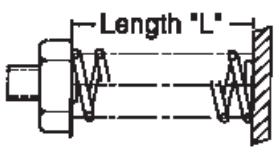
III. Torque Adjustment

The brake is factory set for nominal rated torque. No further adjustment to increase torque may be made. The approximate compressed torque spring length to produce nominal rated torque is given in Table A.

To increase stopping time on .75 and 1.5 lb-ft brakes, turn torque adjusting nuts (19) counterclockwise equal amounts to increase spring length. For the .75 and 1.5 lb-ft brakes, one full turn on the nut will reduce the nominal torque approximately 12%. Do not reduce torque to less than 50% of nominal rated. Torque for the .5 lb-ft brake may not be reduced. Spring length must not be shorter length than Table A length.

Table A

Brake Torque (lb-ft)	Length "L" (in.)
.5	3/4
.75	7/8
1.5	15/16



IV. Electrical Connection

CAUTION: 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.

Note: 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.

General
All coils are single-phase alternating current (AC).

Single voltage coil connection
Connect coil (12) to any two wires of a single-phase or three-phase power source of appropriate voltage. For operation with a motor control, connect to any two motor leads with correct voltage.

V. General Maintenance

1. **Warning!** Any mechanism or load held in position by the brake should be secured to prevent possible injury to personnel and/or damage to equipment before any disassembly of the brake is attempted or before the manual release lever is operated on the brake.
2. Observe all cautions listed at the beginning of this manual before attempting to service brake.
3. Remove housing screws (15) and housing (7).

Wear adjustment

1. Normal friction disc wear will cause solenoid air gap to become large from the original set 5/32" air gap. An increase in stopping time and a slight reduction in torque will consequently occur. See Figure 2.
2. When the solenoid air gap increases to 1/4", the brake must be adjusted. The gap is measured between the top surface of the lever (17) and the bottom surface of the coil assembly bracket (78).
3. To decrease air gap, turn the wear adjusting screw (10) clockwise until an air gap of 5/32" minimum is attained. To increase gap, turn screw counterclockwise.
4. After adjustment, push in plunger and allow it to snap out. Recheck air gap.
5. Replace friction disc when wear area is one half original disc thickness of 3/16".

Friction disc replacement

1. Disconnect power source to brake.
2. Unscrew the two hex housing studs (150). Remove the two lock washers (150W) and the coil assembly (78) from the solenoid studs (3E) of endplate. See Figure 1.
3. Unscrew the two torque adjusting nuts (19) from the spring studs (3E). Remove the lever (17) with the plunger remaining in its upper slot.
4. Remove the stationary disc (5) from the spring studs (3E).
5. Replace the worn friction disc (4) with the new disc.
6. Transfer the two stabilizing springs (4A) onto the new disc, 90° apart. Make sure the open end of one stabilizing clip faces outwards while the other faces inwards. See Figure 1. If the brake is mounted vertically below the motor, make sure the open end of both stabilizing clips face downward.
7. Reassemble in reverse order. Before reinstalling lever 17, unscrew wear adjust screw (10) counterclockwise 2-1/2 to 3 turns.
8. Adjust spring length to Table A length. Adjust air gap per *Wear Adjustment* instructions.

Coil replacement

1. De-energize and disconnect coil (12) from circuit.
2. Unscrew the two hex housing studs (150). Remove the two lock washers (150W) and the coil assembly (78) from the solenoid studs (3E) of endplate.
3. Use screwdriver to compress retaining ring (79R) until its prongs enter shading pole groove, allowing ring to be pushed off. See Figure 3.
4. Remove shading pole (79), tapping lightly if necessary.
5. Old coil can now be pried out with screwdriver. Note lead position of old coil. New coil must be installed with leads in same place.
6. New coil must be installed with bobbin (190) guide lip fitting into large (bottom) hole in coil support bracket (79A). Be careful not to shear lip off, but once it has started into "U" frame, a rod can be used in that (large) hole to work coil into place, until lip snaps into hole.

   Note: In some cases it may be necessary to spread "U" frame slightly to start coil, a thin putty knife is suitable. It can be reformed, if necessary, by carefully compressing in a vice after coil has been assembled.
7. Replace shading pole, and assemble retaining ring by placing it next to groove, compressing it with a screwdriver, and pushing it forward until prongs have passed through groove and snapped into place against outside diameter of shading pole.
8. Reassemble the coil support bracket assembly back onto the endplate's solenoid studs. Guide the plunger into the coil.
9. Reconnect coil.
10. Replace housing.

VI. Troubleshooting

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

1. Is brake manually released rather than electrically released while motor is running?
2. Is friction disc excessively worn, charred, or broken?
3. Has hub become loose and shifted on shaft.
4. Is hub clean, and does friction disc slide freely?
5. Does stationary plate slide freely on spring studs?
6. Are pressure springs improperly set or broken? See *Torque Adjustment*.
7. Is solenoid air gap adjusted correctly? See *Wear Adjustment*.
8. Does solenoid linkage move freely?
9. Is voltage supply at coil correct?
10. Are controls which govern start or stop of braking cycle operating properly?
11. Is brake coil energized at same time or prior to energization of motor, and de-energized at same time or after de-energization of motor?
12. Is stopping time more than 1 second (rule of thumb) and/or is application more than five stops per minute? If so, consult factory. Check thermal requirements of load versus thermal rating of brake.
13. Replace friction disc when worn area is one half of original thickness of 3/16".

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

1. Voltage supply at coil versus coil rating and connection.
2. Is solenoid air gap excessive?
3. Shading coil may be broken.
4. Solenoid coil guide and plunger may be excessively worn.
5. Is solenoid dirty?
6. The two hex housing studs may have become loose causing the coil support bracket to loosen. Plunger may then seat improperly.
7. Does solenoid linkage move freely?
8. Check for excessive voltage drop in motor line when motor is started. Check wire gauge of supply line against motor starting current and solenoid inrush current. Measure voltage drop at solenoid coil leads during maximum inrush current condition. To accomplish this, connect voltmeter at brake coil. Insert a block of wood, or other non-magnetic material, between solenoid plunger and frame. Block thickness should approximately equal solenoid air gap. Energize motor and brake simultaneously, take reading and immediately shut down. (This is to prevent motor, brake, or solenoid burn up, since brake will be set during procedure.)
9. Are pressure springs equal length? Pressure spring length must not be shorter length than Table A length.

C. If disc noise occurs, check:

1. If friction disc (4) becomes noisy, check stabilizing spring (4A) to be sure it is installed.
2. Check motor mounting face specifications are met. See Note of Section II *Installation Procedure*.
3. Check that the brake endplate is tight against the mounting face.

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

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