

Installation and Service Instructions for 333 Series Armature Actuated Brakes 333-7, 333-8, and 333-9

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.

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 brake. If power disconnect point is out of sight, lock disconnect in the *off* position and tag to prevent accidental application of power to system.
3. To avoid damage to internal power supply, hipot testing should not exceed 1500 volts for one second. Brake coil leads must be connected together.
4. Heat developed during normal operation (135°C) of the brake may be hot enough to be painful or cause injury. Be careful when touching exterior surfaces. Allow sufficient time for the brake to cool before servicing.
5. After usage, the brake will contain burnt and degraded friction material dust. This dust should 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.
 - 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.
6. Maximum operating ambient temperature for these brakes should not exceed 40°C (104° F).

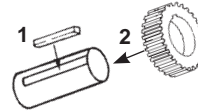
I. Installation

Note 1: Position of hub should allow full engagement of friction disc without interfering with the movement of the armature. **Motor shaft end float should not exceed .020". Shaft runout should be within .002" TIR. Motor mounting surface should be flat and perpendicular to within .004" of motor shaft.**

Note 2: Keep grease and oil from contacting friction surfaces.

Note 3: Hub should be a tight sliding fit. **For shrink fit hub consult the factory.**

I. Installation

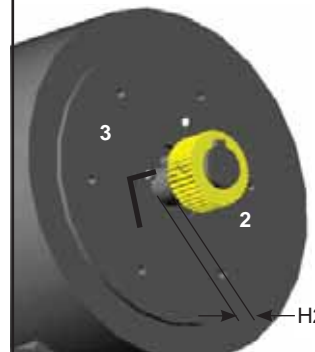


Step 1

1. Place key in motor shaft.
2. Position hub per Table A.

Table A (H2)

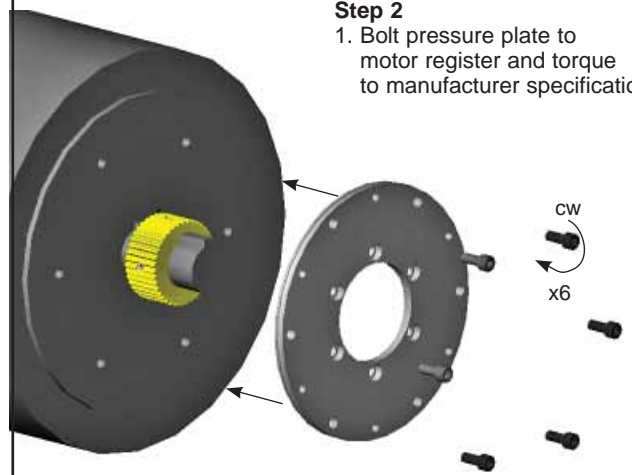
Brake Model	Bolt Circle	Metric	English
333-7	196	14.5 mm	.577"
333-8	230	15.7 mm	.619"
333-9	278	17.2 mm	.678"



3. Tighten set screws per Table B.

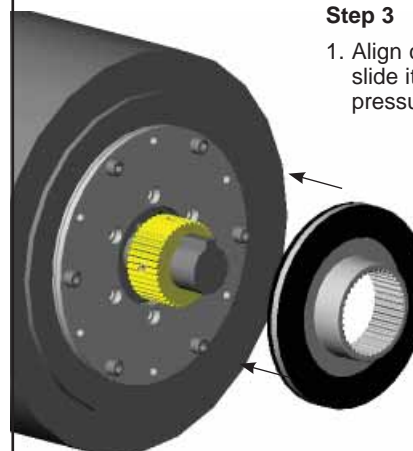
Table B

Brake Model	Bolt Circle	Metric	English	Hex Wrench
333-7	196	32.5 Nm	24 lb-ft	3/16"
333-8	230	32.5 Nm	24 lb-ft	3/16"
333-9	278	70.5 Nm	52 lb-ft	1/4"



Step 2

1. Bolt pressure plate to motor register and torque to manufacturer specifications.

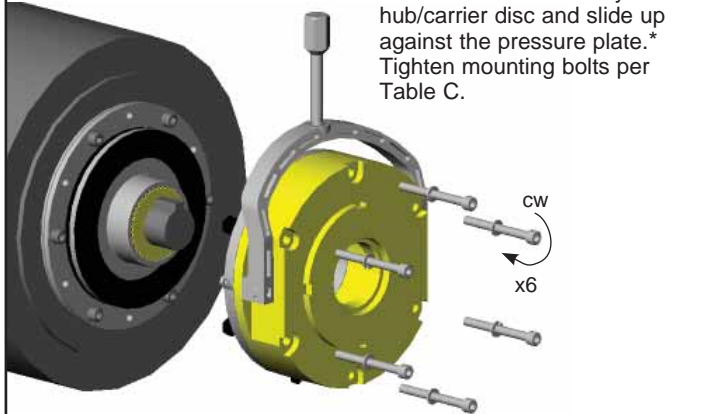


Step 3

1. Align carrier disc with hub and slide it into place against the pressure plate.

Step 4

1. Position brake assembly over hub/carrier disc and slide up against the pressure plate.* Tighten mounting bolts per Table C.



CW
x6

Brake Model	Bolt Circle	Mounting Bolt Torque		Hex Wrench
		Metric	English	
333-7	196	19 Nm	14 lb-ft	6 mm
333-8	230	38 Nm	28 lb-ft	8 mm
333-9	278	38 Nm	28 lb-ft	8 mm

*Manual release is optional

II. Air Gap Setting and Wear Adjust

Air gap is factory set per Table D. Set air gap is measured at the adjusting bolts, between the armature and magbody.

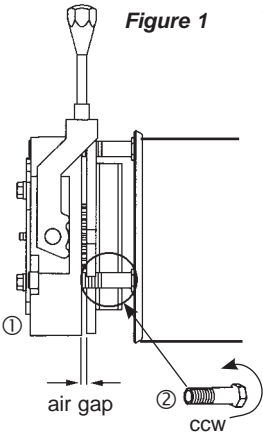


Table D - Minimum Air Gap

Brake Model	Bolt Circle	Air Gap with Brake Release Indicator Switch
333-7	196	.508-.610 mm
		.020-.024"
333-8	230	.508-.610 mm
		.020-.024"
333-9	278	.508-.610 mm
		.020-.024"

Normal friction disc wear will cause air gap to increase from original setting (Table D). Air gap should be readjusted when gap reaches dimension shown in Table E.

Table E - Maximum Air Gap

Brake Model	Bolt Circle	Hex Wrench	Max Gap	
			Metric	English
333-7	196	3/4"	.89 mm	.035"
333-8	230	3/4"	1.09 mm	.043"
333-9	278	3/4"	1.40 mm	.055"

Table F - Disc Maximum Wear

Brake Model	Bolt Circle	Min. Thickness	
		Metric	English
333-7	196	9.27 mm	0.365"
333-8	230	11.68 mm	0.460"
333-9	278	12.57 mm	0.495"

Wear Adjustment

- Loosen six mounting bolts 1/2 turn.
- Rotate three alternate adjusting screws 1-1/2 turns counter-clockwise.
- Rotate three remaining adjusting screws ccw to achieve original gap (Table D).
- Retighten mounting bolts.
- Recheck gap. Repeat above procedures as necessary.
- Rotate three alternate adjust screws clockwise until snug with pressure plate.

Note 1: 90° ccw rotation is approximately 0.38mm (0.015") air gap increase.

Note 2: Brake discs should be replaced when they reach the thickness shown in Table F. Normally this will occur after 4-5 adjustments.

III. Torque Adjust

All standard brakes are shipped with the brakes set at the **maximum torque setting**. To adjust torque:

- Rotate adjusting plate with spanner wrench as shown in Figure 2. Refer to Table G for approximate torque reduction per rotation.

Table G - Torque Reduction

Brake Size	333-7	333-8	333-9
% Torque Change per rotation	18%	12%	10%
Maximum turns	3	4	4

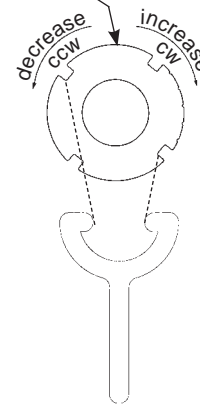
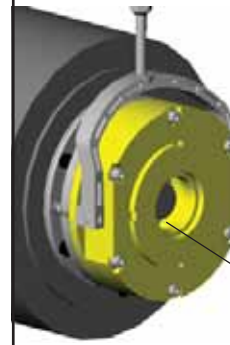
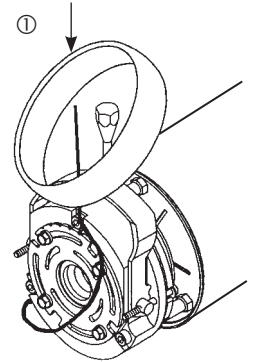


Figure 2

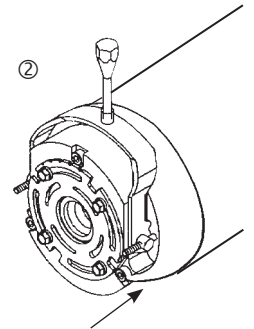
IV. Boot Seal (Optional)

Note: For brake supplied with a boot seal, the seal must be placed over the lead wires and manual release before wiring the brake to the power source.

- Position the boot seal over the manual release (if supplied) and lead wires.



- Stretch the seal over pressure plate and magbody coil assembly. If boot seal has optional drain hole, place hole at bottom facing downward. Check to make sure that the seal is flat against the brake and covers the open area around the brake.



Electrical Considerations

V. Coil Wiring

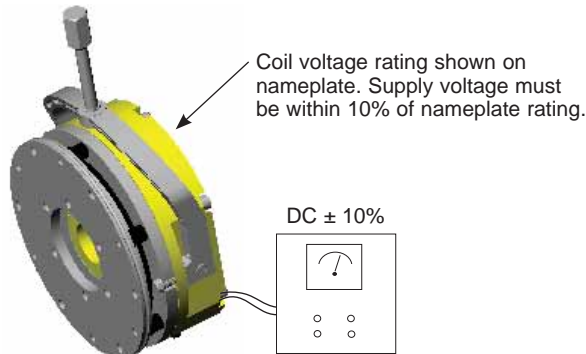
Caution: Brake wiring should only be carried out by qualified personnel.

Stearns brake coils are wound for DC voltage input at $\pm 10\%$ of nameplate rating. Coil resistances shown below are for reference purposes. For applications where AC voltage is being rectified refer to AC control switching shown on this page.

Table H

Bolt	196	230	278
Brake Model	333-7	333-8	333-9
Voltage Rating	Ohm (nominal value)*		
24	7.28	5.62	5.11
90	110.3	85.4	77.9
103	138.2	107	97.7
180	426.8	330.7	302.6
205	534.6	414.3	379.3
258	669	650	605
414/432	1726	1649	1484

* Resistance values at 20°C



Caution: Electrical work should only be performed by qualified personnel.

Note 1: All 333 series brakes have DC wound coils designed to accept DC line voltage at $\pm 10\%$ of nameplate rating.

Note 2: When using a rectifier for AC line input, use table K to determine the proper DC coil rating requirement.

Table K

Line Voltage (AC)	Rectifier Type	Recommended Coil Voltage Rating	Stearns Rectifier Part Number	Rectifier Output Voltage
100	full	90	412-0291-01K	90
110	full	103	412-0291-01K	99
115	full	103	412-0291-01K	104
127	full	103	412-0291-01K	115
208	full	180	412-0291-01K	187
220	full	205	412-0291-01K	198
230	full	205	412-0291-01K	207
240	full	205	412-0291-01K	216
220	half	103	412-0591-01K	99
230	half	103	412-0591-01K	103
240	half	103	412-0591-01K	108
380/400	half	180	412-0591-01K	171/180
415	half	180	412-0591-01K	187
460	half	205	412-0591-01K	207
575	half	258	412-0591-01K	259

Note: Fullwave rectifier output is 90% of AC line input. Halfwave rectifier output is 45% of AC line input.

* 1 indicates 0.8 amp rating } Refer to Table L to determine current rating
 * 2 indicates 1.6 amp rating }

Table L

Coil Voltage	Current Rating in Amps		
	196	230	278
414/432 Vdc	0.25	0.26	0.29
24 Vdc	3.30	4.27	3.85
90 Vdc	0.82	1.05	1.19
103 Vdc	0.75	0.96	1.08
180 Vdc	0.42	0.54	0.61
205 Vdc	0.38	0.49	0.56
258 Vdc	0.38	0.40	0.44

Contact factory for non-standard coils.

AC Switching with Standard Rectifier

Switching on the AC line is the most common method of control when the rectifier is wired through the motor windings or motor contacts. However, brake engagement can take up to 5 times longer than DC switching. Switching on the AC line is not suitable for hoist and crane applications.

Crane and Hoist Applications

For descending loads such as cranes and hoists or high inertia loads, the motor windings can develop regenerative voltage during deceleration which can delay the engagement of the brake when switching on the AC supply.

For these type of applications it is important to switch on the DC side of the rectifier or use a Quick Set device. Stearns rectifiers have a built in suppression circuit to protect the rectifier. However, it may still be necessary to protect the switching contacts with a separate suppression device. (see Figure 1 and Figure 2).

Figure 1

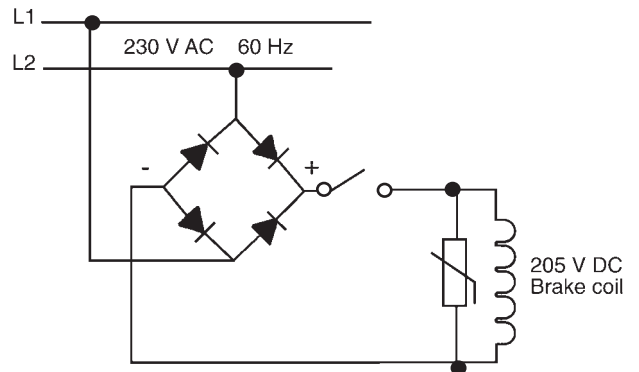
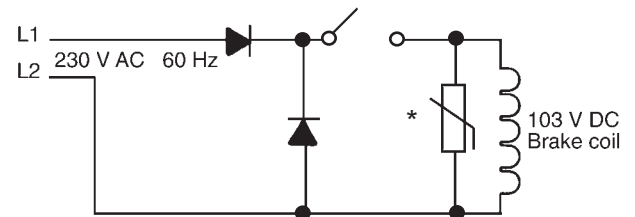
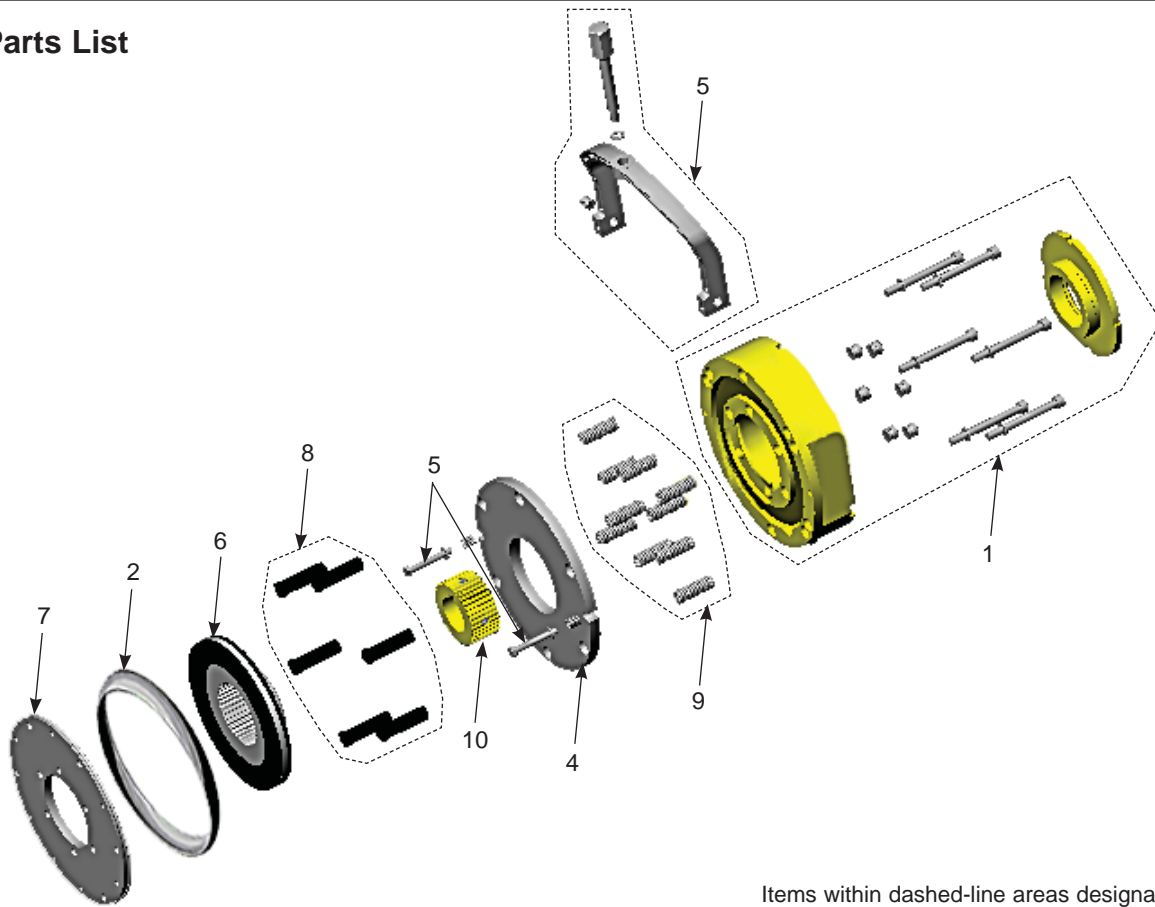


Figure 2



* A suppression device is required when switching on the DC side of the line and using the half wave rectifier (412-0591-01K)

333-X Parts List



Items within dashed-line areas designate a kit.

Table M

Item	Torque Rating Description	333-7	333-8	333-9	
1	Mag body & coil assembly (ref: Table N for voltage)	5-04-0985-00-0[]JK	5-04-0990-00-0[]JK	5-04-0995-00-0[]JK	
2	Boot Seal Kit	8-075-106-0K	8-075-107-0K	8-075-108-0K	
4	Armature Kit	8-405-985-0K	8-405-990-0K	8-405-995-0K	
5	Manual Release Kit	8-419-985-0K	8-419-990-0K	8-419-995-0K	
6	Carrier Disc Kit	5-14-0985-0K	5-14-0990-0K	5-14-0995-0K	
7	Pressure Plate	8-438-985-0K	8-438-990-0K	8-438-995-0K	
8	Adjusting Bolt Kit	8-434-985-0K	8-434-990-0K	8-434-990-0K	
9	Spring Kit	9-70-0985-0K	9-70-0990-0K	9-70-0990-0K	
10	Hub (ref: Table P)	English Bore Metric Bore	5-16-0981-01-01[] 8-016-980-00-M[]	5-16-0991-01-01[] 8-016-990-00-M[]	5-16-0995-01-01[] 8-016-995-00M[]

Kit Contents

Item	Description
1	Mag Body & Coil Assembly Adjust Plate Inner Plate Screws Adjust Plate Screws Mounting Bolts (2)
5	Release Arm Release Handle Release Pivots Release Springs Washers Assembly Screws
9	Outer Pole Springs

Table N Coil Voltage

Item Magbody & Coil Assembly Voltage Identifier -0[]JK	
Voltage	Insert
24 VDC	0 [E]K
90 VDC	0 [J]K
103 VDC	0 [K]K
180 VDC	0 [L]K
258 VDC	0 [S]K
414/432 VDC	0 [B]K

Table P

Bore Diameters			
English Bore	Insert []	Metric Bore	Insert []
1 3/8	G	30 mm	30
1 1/2	M	35 mm	35
1 5/8	H	38 mm	38
1 3/4	I	40 mm	40
1 7/8	J	42 mm	42
2	L	45 mm	45
2 1/8	N	48 mm	48
		50 mm	50
		55 mm	55
		60 mm	60
		70 mm	70



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