Installation, Service and Parts List for 36X Series Armature Actuated Brakes

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, LLC, 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 continuous 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 factory.**

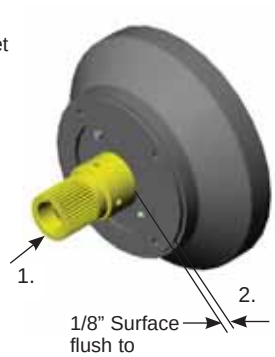
I. Installation

Step 1

1. Position hub and key on motor shaft (set screw end toward motor).
2. Locate hub 1/8" (±1/16") outward from the register face.
3. Tighten set screws per Table A.

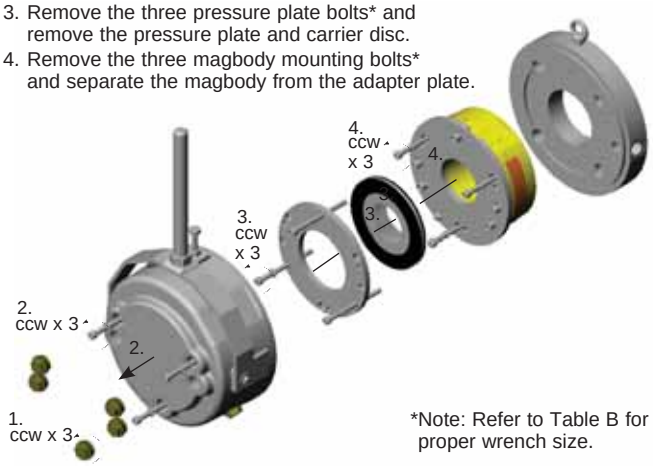
Table A

Brake Model	Bolt Circle	Bolt Torque		Hex Wrench
		Metric	English	
36X-6	7.25 9.00	*32.5Nm*	23lb-ft	3/16"
36X-7	7.25 9.00	*32.5Nm*	23lb-ft	3/16"
36X-8	9.00 11.00	*32.5Nm*	23lb-ft	3/16"
36X-9	11.00 14.00	*76.5Nm*	52lb-ft	1/4"



Step 2

1. Remove the three access plugs using a 22mm wrench.
2. Remove the three housing bolts using a 6mm hex wrench, and lift the housing from the brake.
3. Remove the three pressure plate bolts* and remove the pressure plate and carrier disc.
4. Remove the three magbody mounting bolts* and separate the magbody from the adapter plate.

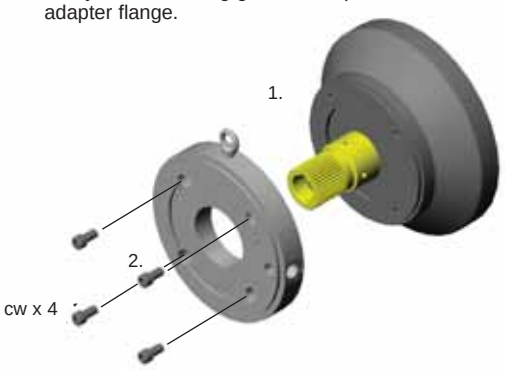


*Note: Refer to Table B for proper wrench size.

Step 3

1. Position adapter plate on motor register.
2. Bolt adapter plate to motor register with four mounting bolts. (Not provided) (1/2-13 x 1.25" for 7.25 and 9.00" BC and 5/8-11 x 1.25" for 11.00" BC. and 14.00" BC.) Tighten to manufacturers specification using 3/8" hex wrench for 7.25" and 9.00 BC mounting. Use 1/2" hex wrench for 11.00" BC and 14.00" BC. mounting.

Note: Verify that the O-ring gasket is in place on the motor side of the adapter flange.



Installation procedure continued on reverse side.

Installation continued

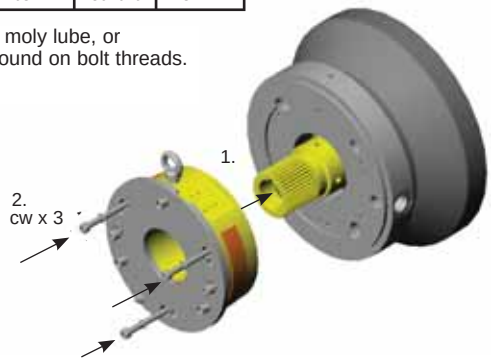
Step 4

1. Position armature/magbody assembly over hub and on to the adapter.
2. Tighten socket head cap screws per **Table B**.

Table B

Brake Model	Bolt Circle	Bolt Torque		Hex Wrench
		Metric	English	
36X-6	170	*38Nm*	28 lb-ft	*6mm*
36X-7	196	*38Nm*	28 lb-ft	*6mm*
36X-8	230	*68Nm*	50 lb-ft	*8mm*
36X-9	278	*68Nm*	50 lb-ft	*8mm*

Note: Apply dry moly lube, or anti-seize compound on bolt threads.



Step 5

1. Slide carrier disc onto the splined hub, with flat side of disc outward from motor.
2. Position pressure plate over carrier disc.
3. Tighten socket head cap screws per Table C.

Note 1: Apply dry moly lube, or anti-seize compound on bolt threads.

Note 2: Verify air-gap as shown in Table D.

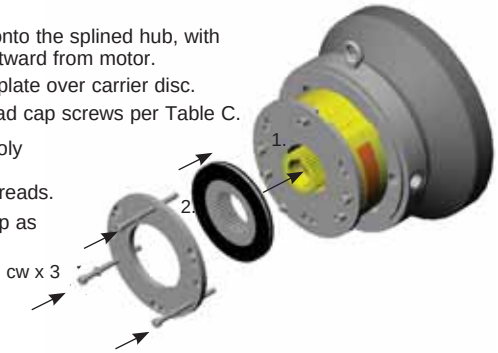


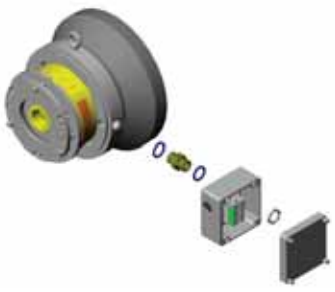
Table C

Brake Model	Bolt Circle	Bolt Torque		Hex Wrench
		Metric	English	
36X-6	170	*19Nm*	14 lb-ft	*6mm*
36X-7	196	*38Nm*	28 lb-ft	*6mm*
36X-8	230	*68Nm*	50 lb-ft	*8mm*
36X-9	278	*68Nm*	50 lb-ft	*8mm*

Note: Apply dry moly lube, or anti-seize compound on bolt threads.

Step 6 Leadwire Connection Optional Conduit Box

1. Loosen NPT plug and four (4) cover plate screws from junction box and remove.
2. Route leadwires into junction box and connect conduit to box.
3. Connect wiring as shown for either the IP 56 or IP 65 conduit box assembly.
4. Replace junction box cover and tighten screws to seal.



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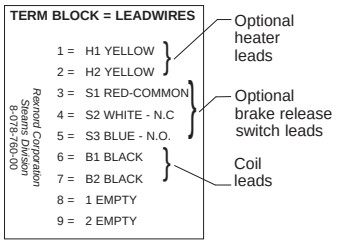
IP 56 Assembly



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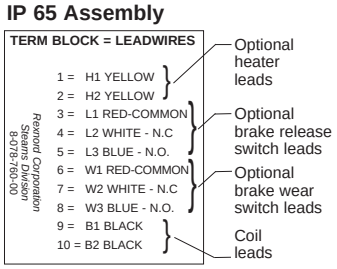
IP 65 Assembly

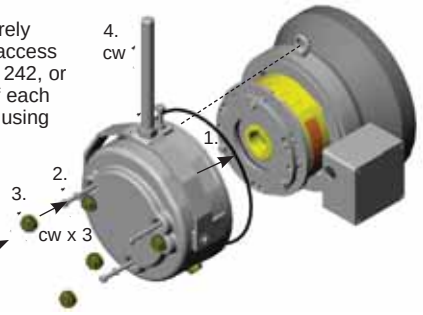


CAUTION: Be sure all internal wiring is clear of housing flange before replacing housing.

Installation continued

Step 7

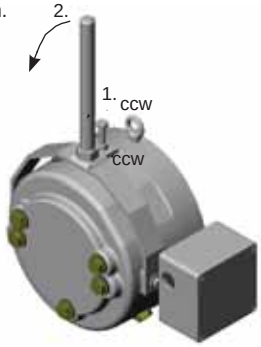
1. Slide housing over brake, align the manual release handle with the lifting lug position on the adapter plate. Verify that the O-ring gasket is in position in the housing.
2. Insert the three housing bolts and tighten to 11 lb-ft with a 6mm hex wrench.
3. Ensure that gasket is securely located on the face of the access plug. Add a drop of Loctite 242, or equivalent, to the thread of each plug and tighten to 28 lb-ft using a 22mm wrench.
4. Thread release handle into place and tighten jam nut with a 30mm wrench. Insert and tighten the stabilizing bolt against the housing, and tighten the jam nut using a 13mm wrench.



IIA Manual Release Operation (Deadman)

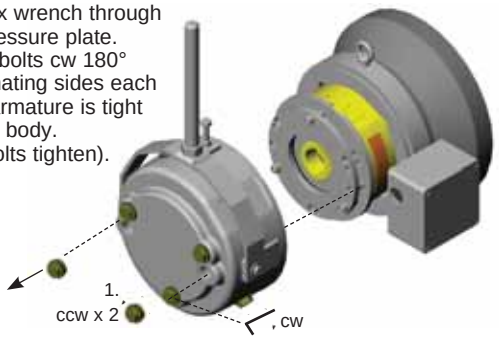
1. Loosen jam nut 1/2 turn, and stabilizing bolt one full turn, using a 13mm wrench.
2. Pull back on manual release handle.

Retighten stabilizing bolt and jam nut when finished.



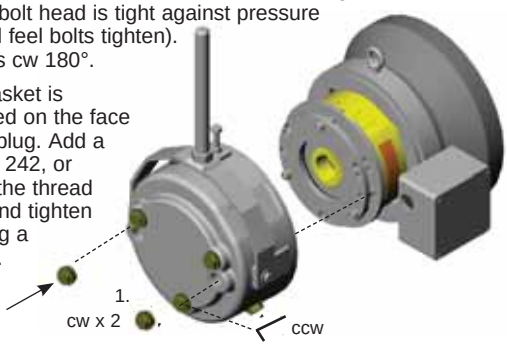
II Manual Release Engagement (Maintained)

1. Remove two manual release access plugs using a 22mm wrench.
2. Insert 6 mm hex wrench through housing and pressure plate. Rotate release bolts cw 180° at a time, alternating sides each half turn, until armature is tight against magnet body. (You will feel bolts tighten).

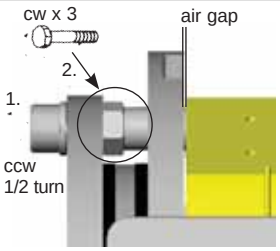


II Manual Release Disengagement (Maintained)

1. Insert 6mm hex wrench through housing and pressure plate. Rotate release bolts ccw 180° at a time, alternating sides each half turn, until bolt head is tight against pressure plate. (You will feel bolts tighten). Then turn bolts cw 180°.
2. Ensure that gasket is securely located on the face of the access plug. Add a drop of Loctite 242, or equivalent, to the thread of each plug and tighten to 28 lb-ft using a 22mm wrench.



IV. 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
36X-6 36X-7 36X-8	170 196 230	.020"
36X-9	278	

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	Hex Wrench	Max Gap	
		Metric	English
36X-6	3/4"	*.89mm*	.039"
36X-7	3/4"	*.89mm*	.035"
36X-8	3/4"	*1.09mm*	.043"
36X-9	3/4"	*1.40mm*	.055"

Table F - Disc Maximum Wear

Brake Model	Min. Thickness	
	Metric	English
36X-6	*8.74mm*	0.344"
36X-7	*9.27mm*	0.365"
36X-8	*11.68mm*	0.460"
36X-9	*12.57mm*	0.495"

Wear Adjustment

1. Loosen six mounting bolts 1/2 turn.
2. Rotate three adjusting screws cw to achieve original gap (Table D). Also see Note: 1.
3. Retighten mounting bolts (Table B).
4. Recheck gap. Repeat procedure as necessary

Note 1: 90° cw rotation is approximately 0.010mm (.25mm") for the 36X-6 size brake, and 0.15" (0.38mm) for the 36X-7, 36X-8 and 36X-9 size brake.

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

V. Coil Wiring

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

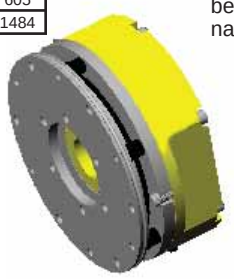
Stearns brake coils are wound for DC voltage input at ± 10% of nameplate rating. Coil resistances shown below are for references purposes. For applications where AC voltage is being rectified refer to AC control switching shown under Electrical Conditions.

Table G

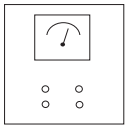
Bolt Circle	170	230	278	278
Brake Model	36X-6	36X-7	36X-8	36X-9
Voltage Rating ↓	Ohm (nominal value)*			
24	8.56	7.28	5.62	5.11
90	129.3	110.3	85.4	77.9
103	129.3	138.2	107	97.7
180	499.7	426.8	330.7	302.6
205	499.7	534.6	414.3	379.3
258	783	669	650	605
414/432	1922	1726	1649	1484

* Resistance values at 20°C

—Coil voltage rating shown on nameplate Supply voltage must be within 10% of nameplate rating.



DC ± 10%



Electrical Considerations

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

Note 1: All 36X series brakes have DC wound coils designed to accept DC line voltage at ± 10% of nameplate rating.

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

Table H

Line Voltage (AC)	Rectifier Type	Recommended Coil Voltage Rating	Stearns Rectifier Part Number*	Rectifier Output Voltage
100	full	90	412-0292-01K	90
110	full	103	412-0292-01K	99
115	full	103	412-0292-01K	103
127	full	103	412-0292-01K	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	260	412-0591-01K	259

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

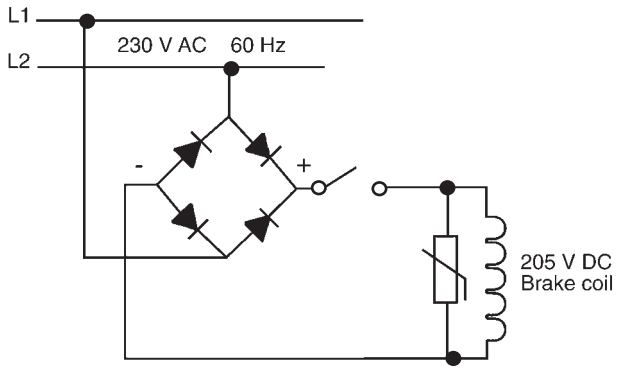
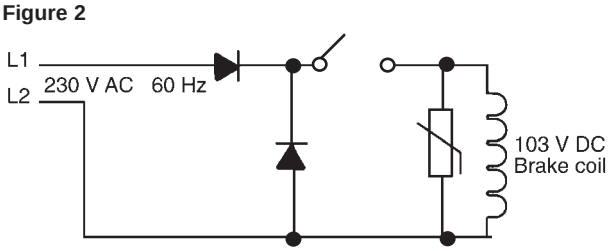


Figure 2



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

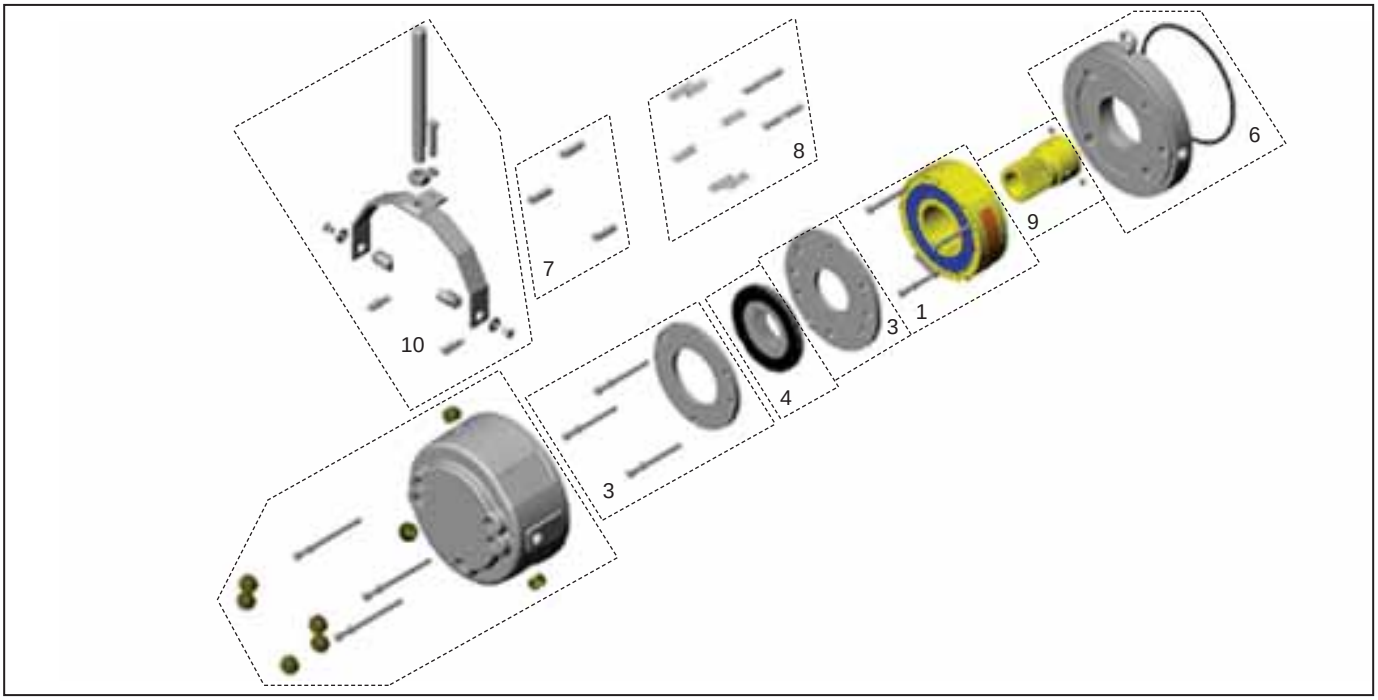


Table I

Item	Torque Rating Description		36X-6	36X-7	36X-8	36X-9
1	Mag body & coil assembly (see table J for voltage)		5-04-0977-00-0[ ]K	5-04-0987-00-0[ ]K	5-04-0992-00-0[ ]K	5-04-0997-00-0[ ]K
3	Armature & Pressure Plate Kit		8-405-977-0K	8-405-987-0K	8-405-992-0K	8-405-997-0K
4	Carrier disc kit		5-14-0976-0K	5-14-0985-0K	5-14-0990-0K	5-14-0995-0K
5	Housing kit		8-007-130-0K	8-007-131-0K	8-007-132-0K	8-007-133-0K
6a	Adapter plate kit-Aluminum 7.25" B.C.		8-001-909-1K	8-001-910-1K		
	-Steel 7.25" B.C.		8-001-911-1K	8-001-920-1K		
6b	Adapter plate kit-Aluminum 9" B.C.		8-001-909-4K	8-001-910-2K	8-001-912-1K	
	-Steel 9" B.C.		8-001-911-4K	8-001-920-2K	8-001-913-1K	
6c	Adapter plate kit-Aluminum 11" B.C.				8-001-912-2K	8-001-914-1K
	-Steel 11" B.C.				8-001-913-2K	8-001-915-1K
6d	Adapter plate kit-Aluminum 14" B.C.					8-001-914-4K
	-Steel 14" B.C.					8-001-915-4K
7	Adjust bolt kit		8-434-975-0K	8-439-985-0K	8-434-990-0K	8-434-990-0K
8	Sprink kit	Outer pole	9-70-0965-0K	9-70-0985-0K	9-70-0990-0K	9-70-0995-0K
		Inner pole	9-70-0975-0K①	*	*	*
9	Hub (see table K)	English bore	5-16-0972-01-01[ ]	5-16-0982-01-01[ ]	5-16-0992-01-01[ ]	5-16-0997-01-01[ ]
		Metric bore	8-016-972-00-M[ ]	8-016-982-00-M[ ]	8-016-992-00M[ ]	8-016-997-00M[ ]
10	Deadman/maintained release kit		8-419-977-0K	8-419-987-0K	8-419-992-0K	8-419-997-0K

* Inner and outer pole springs are in same kit
①Size 170 brakes w/derated torque do not require inner pole spring kit

Table J Coil Voltage & Current Ratings

Magbody & Coil Assembly Voltage Identifier -0[ ]K		Current Rating			
Voltage	**Insert**	**170**	**196**	**230**	**278**
24 Vdc	0 [E]K	2.80	3.30	4.27	3.85
90 Vdc	0 [J]K	.70	.82	1.05	1.19
103 Vdc	0 [K]K	.80	.75	.96	1.08
180 Vdc	0 [L]K	.36	.42	.54	.61
205 Vdc	0 [M]K	.41	.38	.49	.56
258 Vdc	0 [S]K	.33	.38	.40	.44
414/432 Vdc	0 [B]K	.22	.25	.26	.29

Table K

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

Kit Contents

Item	Description
1	Mag body & coil assembly Mounting bolts (3) & lockwasher (3)
3	Armature & pressure plate Mounting bolts (3) & lockwasher (3)
5	Housing Mounting bolts (3) & lockwasher (3) (8) access plugs Housing flange O-ring
6	Adapter plate Adapter-to-mounting face O-ring
8	Outer and inner pole springs Torque adjust plugs
10	Manual release bow Manual release handle Stabilizing bolt & locknut Release pivot (2) & O-rings (2) Release bolts (2) & washers (2) Maintained release bolts, washers & springs

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