

# SF-500, SF-650, SFC-500, SFC-650, SFPBC-500, SFPBC-650 Pin Drive Armature & Spline Drive Armatures

P-202  
819-0482

Installation & Operating Instructions



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**⚠ WARNING** Failure to follow these instructions may result in product damage, equipment damage, and serious or fatal injury to personnel.

Follow the installation instructions in this manual carefully to ensure safe, reliable operation. All stated or implied manufacturer warranties are voided if this product is not installed in accordance with these instructions.



SF-500



SFC-500  
Pin Drive



SFPBC-500

## SFC-500 SFC-650 Clutch-Coupling Pin Drive Armatures

The illustration drawings, parts lists, and exploded views for these units can be found on pages 30, 31 and 34 thru 37.

### A. Aligning the Shafts

In order for the clutch-coupling unit to operate properly, the mounting shafts of the motor and reducer or other hardware must be aligned with respect to each other before the unit is installed. The two shafts should be concentric with each other within .004 T.I.R., and angular alignment should be within 1/2 degree. (Figure 1)

1. Use a straight-edge to check if the shafts are aligned with each other. For a more precise indication of alignment, use a dial indicator.
2. Adjust the position of the motor, reducer, or other hardware as required to achieve the correct alignment.
3. To be sure the shafts stay in alignment, drill holes for tapered dowel pins through the mounting bases of the motor, reducer, or other hardware and into the mounting surfaces. This procedure will ensure that, after the clutch-coupling has been installed, the shafts can easily be placed in proper alignment again by lining up the holes and secured by inserting the dowel pins.

### B. Installing the Conduit Box

Install the conduit box on the field. Instructions for this procedure are supplied with conduit box.

### C. Mounting the Field-and-Rotor Assembly

Either the field-and-rotor assembly or the armature-and-hub assembly can be installed first, depending on the characteristics of each application.

The SFC-500 clutch-couplings are bearing-mounted units. The SFC-650 units are either bearing-mounted or flange-mounted.

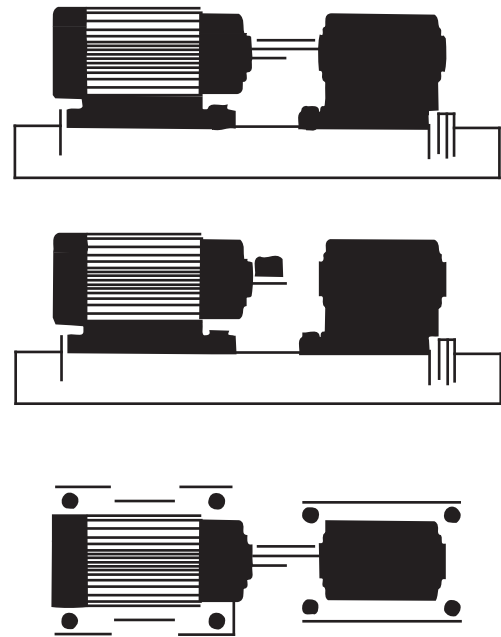


Figure 1

### Bearing Mounted Units

In bearing-mounted units, the field and rotor are shipped as an assembly. Step 1 applies only to the SFC-650 units. Steps 2-5 apply to both the SFC-650 and SFC-500.

1. The SFC-650 field and rotor assemblies are mounted on the shaft with a taperlock bushing. Insert the bushing into the tapered bore, lining up the clearance holes in the bushing flange with the tapered holes in the rotor hub.
2. Insert a key into the keyway in the bore of the rotor and slide the assembly onto the shaft.
3. If the armature has been secured to the shaft first, then adjust the rotor's position to allow approximately 1/32-inch between the two faces. (Figure 11)
4. Secure the assembly on the shaft by alternately tightening the two screws.
5. A tab or torque arm is provided to prevent the field from rotating with the shaft. Insert either a pin in the U-slot or a fork around the torque arm to prevent this rotation. Under no circumstances, however, should the field be so tightly restrained that it preloads the bearing. For more information on torque tabs, see page 18.

## Flange-Mounted Units

The fields and rotors are shipped separately for flange mounted units. On some applications it will be necessary to mount the rotor first, and then bring the field into position. In other instances the field will be mounted first, and then the rotor (mounted on a shaft) will be inserted into place.

In either case, **the rotor and field must be positioned in accordance with the overall axial dimension from the face of the rotor to the back of the field flange** as shown on the illustration drawings (dimension "L," page 34). Holding this dimension will assure the proper axial clearance between the field and the rotor.

1. Care must be taken in selecting the location for mounting the field assembly. Pilot diameters are machined on the field mounting flange to aid in holding the field in the proper position.
2. An appropriate pilot diameter must be provided on the mounting surface as well. (Figure 2)

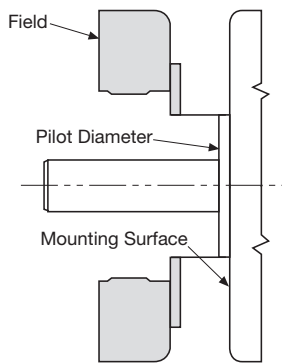


Figure 2

3. The field assembly is then fastened in place with capscrews and lockwashers. (Figure 3)

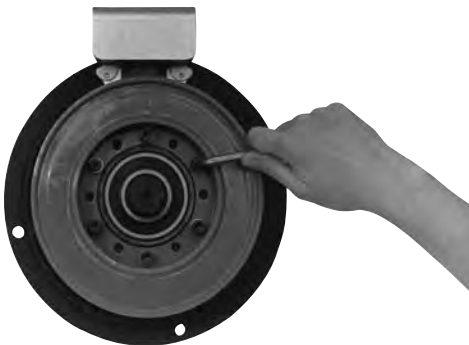


Figure 3

4. Once the unit is in place, it must be square and concentric with the shaft in accordance with the tolerances listed on the drawings. (Figure 4)



Figure 4

5. The rotor is mounted on the shaft with a taperlock bushing. Insert the bushing into the tapered bore.
6. Loosely assemble the two locking screws between the bushing and the rotor.
7. Insert the key into the shaft keyway, and slide the rotor assembly over the key and on to the shaft.
8. Adjust the rotor's position to achieve the overall axial dimension "L" (page 34) **when the bushing is secured.**
9. Secure the assembly in this position by alternately tightening the two locking screws.

## D. Assembling the Armature and Hub

Assemble the armature to the armature hub with the autogap mounting accessory. The hub is reversible. The side on which the armature is mounted will depend on the direction in which the taperlock bushing must enter.

The autogap assembly is a double spring device which allows for automatic armature clearance and adjustment for wear. The smaller or conical spring pushes the armature from the rotor face, leaving a gap of about 1/32 inch, while the straight spring automatically follows up for wear. This combination maintains maximum performance efficiency throughout the life of the unit.

The assembly procedure for the autogap accessory is as follows. (Figure 5)

**Step 1** Place the straight springs over the armature bosses on the back side of the armature. (Figure 6)

**Step 2** Place the armature hub over the straight springs.

**⚠CAUTION** The straight springs must fit into the grooves in the armature hub. (Figure 7)

**Step 3** Compress the conical springs against the retainer rings by sliding the detent springs toward the head of the pins. (All pins) (Figure 8)



Figure 6



Figure 7



Figure 8

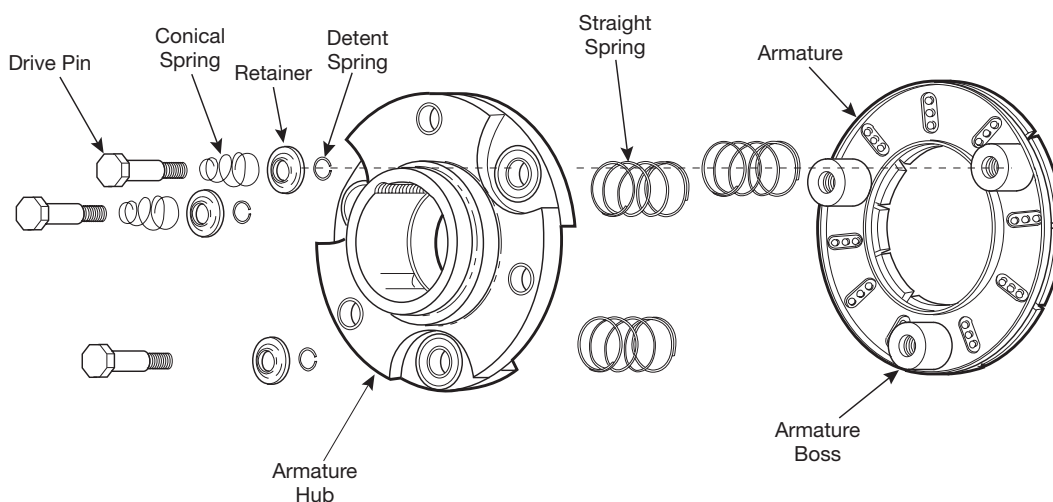


Figure 5

## E. Mounting the Armature Assembly

- Step 4** Insert the assembled drive pins through the armature hub and straight springs and into the threaded armature bosses. Apply grade 290 Loctite Sealant on the drive pin threads. (Figure 9)



Figure 9

- Step 5** Tighten the drive pins until the shoulders of the pins are against the face of the armature bosses. Since the threads are a class No. 3 fit, the pins may seem to bind.

**Note:** Alternately tighten each drive pin a few turns at a time.

- Step 6** Compress the retainers against the armature hub and check to see that the armature hub is held tightly to the armature bosses. Note: This position must not be disturbed during completion of assembly. (Figure 10)



Figure 10

The armature assembly is mounted on the shaft with a taperlock bushing. All parts must be clean and free from burrs and chips before assembling.

1. Place the bushing into the hub and insert the key. The key is a side-to-side fit and should not contact the top of the keyway.
2. Insert the locking setscrews loosely into the bushing and slide the assembly onto the shaft.
3. If the field-and-rotor assembly has been secured to the shaft first, then adjust the armature's position to allow approximately 1/32-inch between the two faces.

Once this 1/32-inch gap has been set, it will be automatically maintained throughout the life of the unit. (Figure 11)

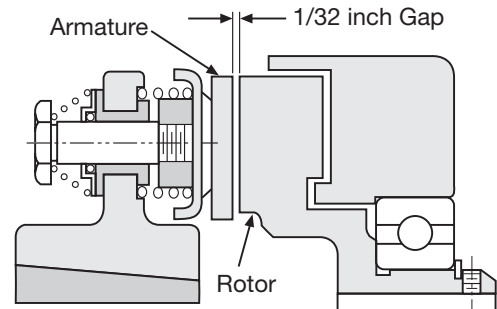


Figure 11

4. Secure the armature's position on the shaft by alternately tightening each setscrew. During the tightening process the bushing should be tapped lightly to make sure it seats-in properly.



## SFC-500 Clutch Coupling Spline Drive

### Armature

The illustration drawing, parts list, and exploded view for this unit can be found on pages 32-33.

The SFC-500 clutch-couplings are bearing-mounted units. Either the field-and-rotor assembly or the armature-and-hub assembly can be installed first, depending on the characteristics of each application.

### A. Aligning the shafts

Before the clutch coupling can be installed, the mounting shafts of the motor and reducer or other hardware must be aligned to each other. Follow the instructions provided for the pin drive units on page 3.

### B. Installing the Conduit Box

Installed the conduit box on the field assembly. Instructions for this procedure can be found on are supplied with conduit box.

### C. Mounting the Field-and-Rotor Assembly

1. Insert a key into the keyway in the bore of the rotor, and slide the assembly onto the shaft.
2. If the armature has been secured to the shaft first, then adjust the rotor's position to allow approximately 1/32-inch between the two faces. (Figure 3)

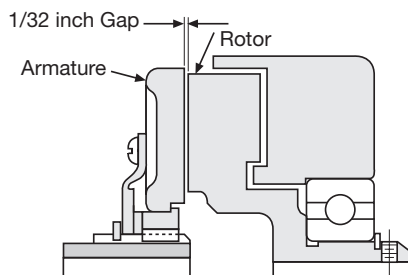


Figure 3

3. Secure the assembly on the shaft by alternately tightening the two setscrews.
4. A tab or torque arm is provided to prevent the field from rotating with the shaft. Insert either a pin in the U-slot or a fork around the torque arm to prevent this rotation. Under no circumstances, however, should the field be so tightly restrained that it preloads the bearing. For more information on torque tabs, see page 18.

### D. Assembling the Armature and Hub

The clutch-coupling units contain spline drive armatures and hubs. The armatures are shipped with a built-in autogap spring accessory. This device automatically maintains a gap of about 1/32" between the armature and magnet faces for the life of the unit. (Figure 3)

These units are shipped with the armature and autogap already assembled. Follow these instructions to assemble the splined armature assembly and hub:

- Step 1** Place the splined hub on a flat surface. The extended portion of the hub, where the set screw holes are located, should be down.
- Step 2** Check the detent ring in the armature assembly to make sure it is centered evenly around the spline. This ring moves freely, but it should be centered for easier assembly of the hub.
- Step 3** Holding the armature with the segmented side up, press the armature onto the splined hub. This is most easily done by applying firm back-and-forth pressure. (Figure 2)



Figure 2

- Step 4** Push the assembly up against the retainer ring.

### E. Mounting the Armature-Hub Assembly

1. Insert a key in the keyway of the hub and slide the armature-hub assembly on to the shaft.
2. If the field-and-rotor assembly has been secured to the shaft first, then adjust the armature's position to allow a 1/32-inch gap between the two faces. (Figure 3)
3. Secure the armature-hub assembly in this position by tightening the two setscrews in the hub.
4. Check the assembly by pressing the armature into contact with the rotor face and then releasing it. The armature should spring back about 1/32". This gap will be automatically maintained for the life of the unit.

## SF-500 SF-650 Clutch Pin Drive Armature

The illustration drawings, parts lists, and exploded views for these units can be found beginning on pages 24 to 29.

### A. Installing the Conduit Box

Install the conduit box on the field assembly. Instructions are supplied with conduit box.

### B. Mounting the Field-and-Rotor Assembly

Follow the instructions provided for the SFC-500 and SFC-650 units, Section C, page 3, for mounting the field-and-rotor assemblies.



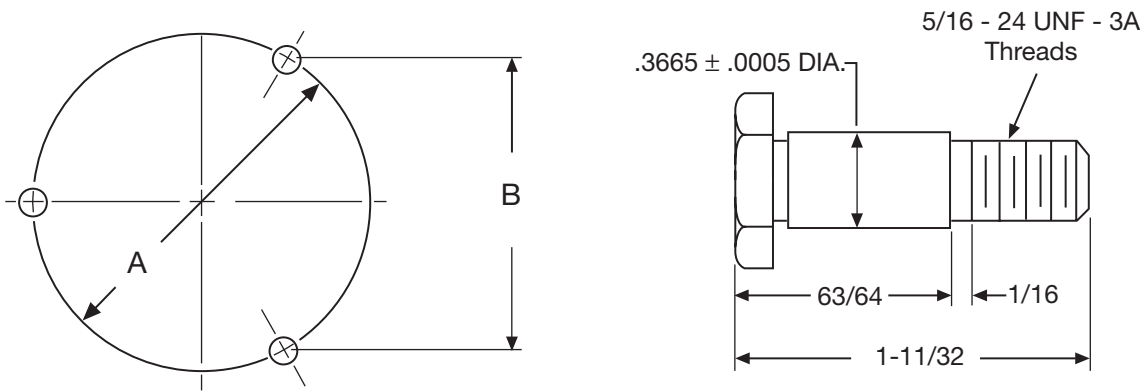
Figure 4

### C. Assembling the Armature

1. A customer may wish to use the autogap accessory to mount a clutch armature to his own pulley, hub, gear, etc. Follow the illustrated dimensions to properly adapt these parts to the armature.
  - a. The chordal dimension must be held for all chords between pin holes.
  - b. Sleeve bearings (Oilite Bronze) with an I.D. of  $.376 \pm .001$  must be provided in the holes of pulley or hub at the chordal and bolt circle dimensions shown below. (Figure 5)
  - c. The drive pins must be square with the plane of the mounting surface and magnet within  $.006$  T.I.R.
2. Once the pulley, gear, etc., has been adapted to the armature according to the above directions, the armature may be mounted to it using the autogap accessory.
3. The autogap assembly is a double spring device which allows for automatic armature clearance and adjustment for wear. The smaller or conical spring pushes the armature from the rotor face, leaving a gap of about  $1/32$  inch, while the straight spring automatically follows up for wear. This combination maintains maximum performance efficiency throughout the life of the unit.



### Machining Instructions for Gear, Sprocket, or Pulley



	<b>A</b>	<b>B</b>
SF-500	3.875 ± .001	3.356 ± .001
SF-650	5.125 ± .001	3.624 ± .001

Figure 5

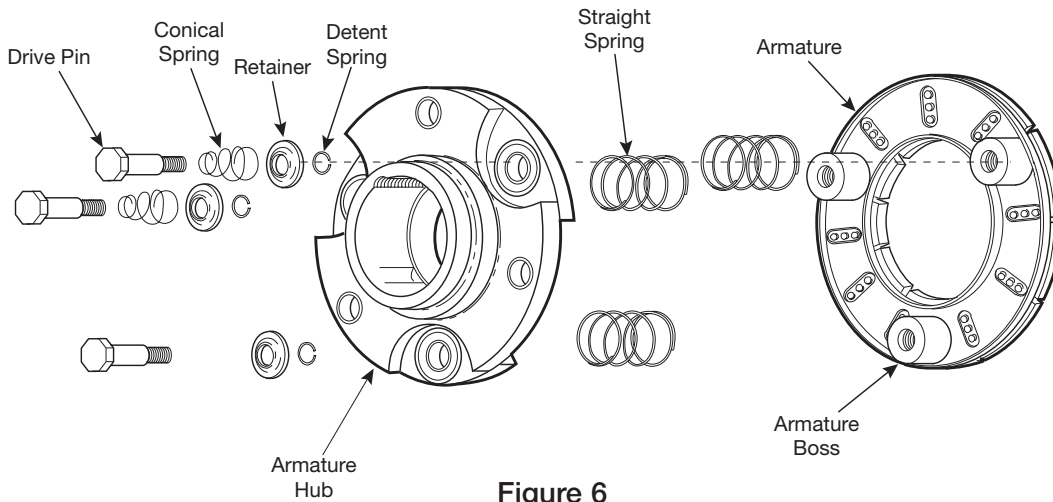


Figure 6

The assembly procedure for the autogap accessory is as follows (see Figure 6):

**Step 1** Place straight springs over armature bosses on back side of armature. (Figure 7)



Figure 7

**Step 2** Compress conical spring against retainer ring by sliding detent spring towards head of pin. (All pins). (Figure 8)



Figure 8

**Step 3** Insert assembled drive pins through armature hub (or customer-supplied part), through the straight springs, and into the threaded armature bosses. Apply grade 290 Loctite Sealant on drive pin threads. (Figure 9)



Figure 9

**Step 4** Tighten drive pins until shoulders of pins are against face of armature bosses. Since threads are class No. 3 fit, pins may seem to bind.

**Step 5** Compress the retainer rings against the armature hub (or customer-supplied part), and check to see that the part is held tightly to the armature bosses. Note: This position must not be disturbed during completion of assembly. (Figure 10)



Figure 10

## D. Mounting the Armature Assembly

1. Slide the armature assembly onto the shaft.
2. If the field-and-rotor assembly has been secured to the shaft or a machine member first, then adjust the armature's position to allow approximately 1/32-inch between the two faces.

Once this 1/32-inch gap has been set, it will be automatically maintained throughout the life of the unit. (Figure 11)

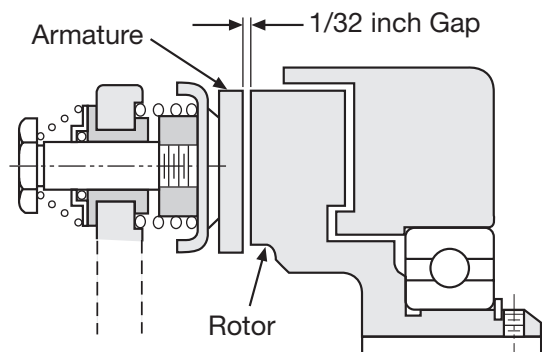


Figure 11

3. Secure the assembly in this position on the shaft.

## SFPBC-500 Spline Drive Armature Clutch/Brake Coupling

This illustration drawing, parts list, and exploded view for this unit can be found on page 40 and 41.

### A. Aligning the Shafts

In order for the clutch-coupling unit to operate properly, the mounting shafts of the motor and the reducer or other hardware must be aligned with respect to each other before the unit is installed. The two shafts should be concentric with each other within 004 T.I.R., and angular alignment should be within 1/2 degree.

1. Use a straight edge to check if the shafts are aligned with each other. For a more precise indication of alignment, use a dial indicator.
2. Adjust the position of the motor, reducer, or other hardware as required to achieve the correct alignment.
3. To be sure the shafts stay in alignment, drill holes for tapered dowel pins through the mounting bases of the motor, reducer, or other hardware and into the mounting surfaces. This procedure will ensure that, after the clutch-coupling has been installed, the shafts can easily be placed in proper alignment again by lining up the holes and secured by inserting the dowel pins.

### B. Installing the Conduit Boxes

Install a conduit box on the brake magnet and on the clutch field. Instructions for this procedure are supplied with a conduit box.

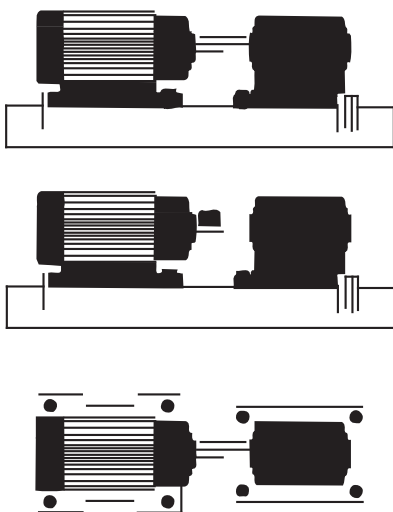


Figure 1

### C. Mounting the Magnet

The brake half of the clutch/brake unit is usually installed first; however, in some cases it may be necessary to start with the clutch portion of the unit to assure a proper assembly when complete.

The brake magnet is mounted to a stationary machine member by a flange. Extreme care must be taken in selecting the location for the mounting of the magnet. Proper positioning is very important for the unit to function correctly.

1. A pilot diameter on the mounting surface is essential to hold the magnet within the required tolerances. (Figure 2)

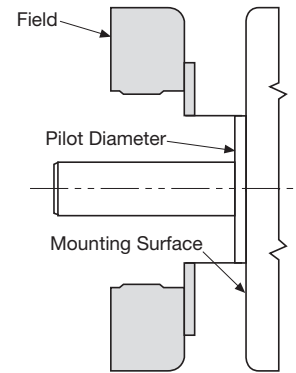


Figure 2

2. A machined pilot diameter is provided on the magnet mounting flange (refer to illustration drawings page 40) to aid in the proper positioning of the magnet.
3. Once the mounting surface has been prepared, the magnet is bolted in place with cap-screws and lockwashers. (Figure 3)

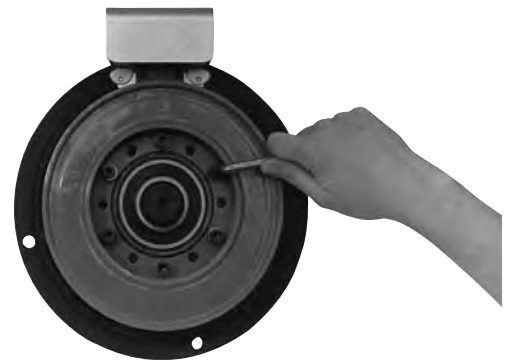


Figure 3

- Use a dial indicator to check the unit for concentricity and squareness to the shaft. The unit should be concentric within .010 T.I.R. and square within .006 T.I.R. (Figure 4)

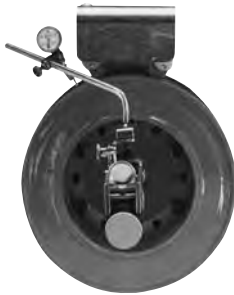


Figure 4

### D. Assembling the Hub and Armatures

The heavy duty units contain spline drive armatures and hubs. The armatures are shipped with a built-in autogap spring accessory. This device automatically maintains a gap of about 1/32" between the armature and magnet faces for the life of the unit.

Use the following method to assemble the armature and splined hub:

- Place the armature hub up on one end.
- Check the detent ring in the armature assembly to make sure it is evenly centered around the spline. This ring moves freely, and it should be centered for easier assembly of the hub.
- Holding one of the armatures with the segmented side up, press the armature on to the hub using firm back-and-forth pressure. (Figure 5)



Figure 5

- Push the assembly up against the retainer ring.
- Turn the hub over and repeat Steps 3 and 4 with the other armature. (Figure 6)



Figure 6

### E. Mounting the Armature-Hub Assembly

- Insert a key in the keyway of the hub and slide the armature-hub assembly on to the shaft.
- Position the assembly so that the face of the armature is about 1/32-inch from the magnet face. (Figure 7)

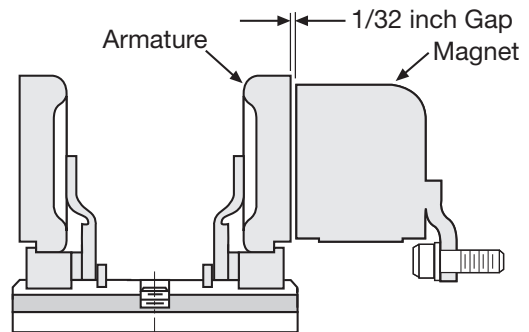


Figure 7

- Secure the armature-hub assembly in this position by tightening the two setscrews in the hub.
- Check the assembly by pressing the armature into contact with the magnet face and then releasing it. The armature should spring back about 1/32". This gap will be automatically maintained for the life of the unit.

## F. Mounting the Field-and-Rotor Assembly

1. Insert a key into the keyway in the bore of the rotor, and slide the assembly onto the shaft.
2. Adjust the rotor's position on the shaft to allow approximately 1/32" gap between the faces of the rotor and armature. (Figure 8)

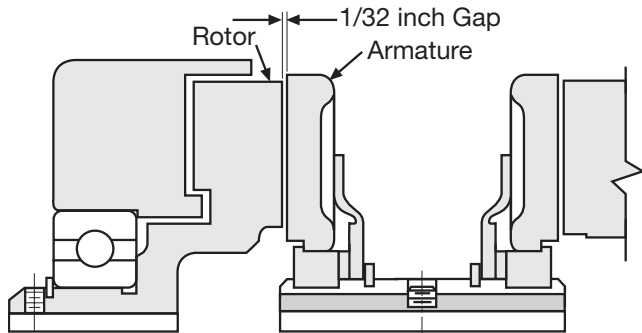


Figure 8

3. Secure the assembly on the shaft by alternately tightening the two setscrews.
4. Set the autogap by pressing the face of the armature into the rotor face. When the armature is released, it will spring back about 1/32". Once this 1/32" gap is set, it will be automatically maintained throughout the life of the unit.
5. A tab or torque arm is provided to prevent the field from rotating with the shaft. Insert either a pin in the U-slot or a fork around the torque arm to prevent this rotation. Under no circumstances, however, should the field be so tightly restrained that it preloads the bearing. For more information on torque tabs, see page 18.

## SFPBC-500 & SFPBC-650 Clutch/Brake Coupling Normal Duty Pin Drive Armature

The illustration drawings, parts lists, and exploded views for these units can be found beginning on pages 38, 39 and 42, 43.

The brake half of the clutch/brake unit is usually installed first; however, in some cases it may be necessary to start with the clutch portion of the unit to assure a proper assembly when complete.

### A. Aligning the Shafts

Before the clutch/brake coupling can be installed, the mounting shafts of the motor and reducer or other hardware must be aligned to each other. Follow the instructions provided on page 11 for the spline drive unit.

### B. Installing the Conduit Boxes

Install a conduit box on the brake magnet and on the clutch field. Instructions are supplied with a conduit box.

### C. Mounting the Magnet

The brake magnet is mounted to a stationary machine member by a flange. Extreme care must be taken in selecting the location for the mounting of the magnet. Proper positioning is very important for the unit to function correctly.

1. A pilot diameter on the mounting surface is essential to hold the magnet within the required tolerances. (Figure 2)

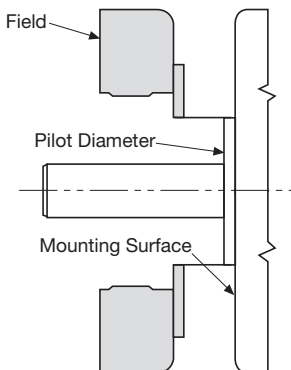


Figure 2

2. A machined pilot diameter is provided on the magnet mounting flange (refer to illustration drawings page 38 & 42) to aid in the proper positioning of the magnet.

3. Once the mounting surface has been prepared, the magnet is bolted in place with capscrews and lockwashers. (Figure 3)

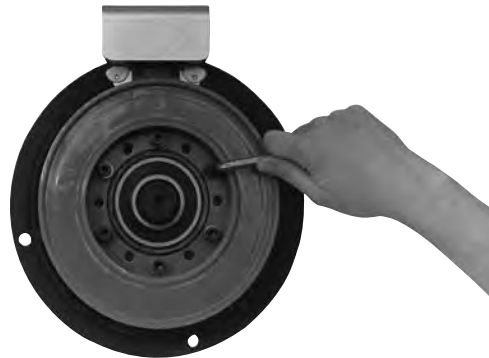


Figure 3

4. Use a dial indicator to check the unit for concentricity and squareness to the shaft. The unit should be concentric within .010 T.I.R. and square within .006 T.I.R. (Figure 4)



Figure 4

### D. Assembling the Armature and Hub

Assemble the armature to the armature hub with the autogap mounting accessory.

The autogap assembly is a double spring device which allows for automatic armature clearance and adjustment for wear. The smaller or conical spring pushes the armature from the rotor face, leaving a gap of about 1/32 inch, while the straight spring automatically follows up for wear. This combination maintains maximum performance efficiency throughout the life of the unit.

The assembly procedure for the autogap accessory is as follows. (Figure 5)



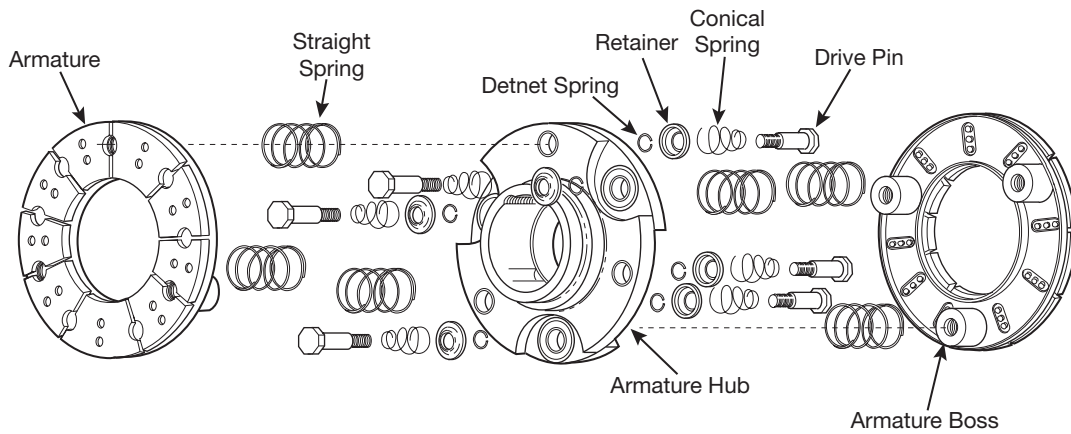


Figure 5

**Step 1** Place straight springs over armature bosses on back side of both armatures (Figure 6).



Figure 6

**Step 2** Compress conical spring against retainer ring by sliding detent spring toward head of pin. (All pins). (Figure 7)



Figure 7

**Step 3** Insert half of the compressed drive pins through the armature hub. The threaded end of the pins must come through on the side of the hub with grooves around the holes. (Figure 8)



Figure 8

**Step 4** Insert the remaining drive pins from the opposite side of armature hub through remaining holes.

**Note:** Apply grade 290 Loctite Sealant on the threads of all drive pins. (Figure 9)



Figure 9

**Step 5** Holding the pins in position, place the armature hub over one armature. Make sure the straight springs on the armature bosses fit into the grooves in the armature hub. (Figure 10)

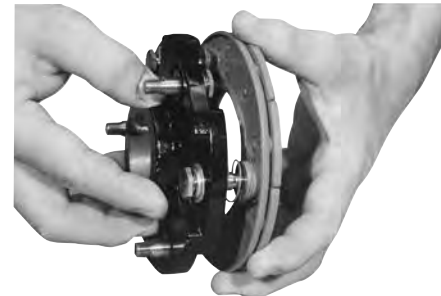


Figure 10

## E. Mounting the Armature Assembly

**Step 6** Tighten these drive pins until shoulders of pins are against face of armature bosses. Since threads are class No. 3 fit, pins may seem to bind.

**Note:** Alternately tighten each drive pin a few turns at a time.

**Step 7** Repeat Steps 5 and 6 for the second armature. (Figure 11)

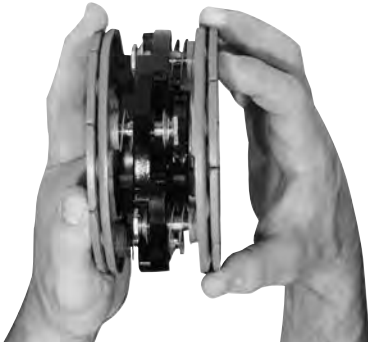


Figure 11

**Step 8** Compress the armature hub and one of the armatures together until the armature hub bottoms on the armature boss. Slide the retainer on each pin down tightly against the armature hub. (Figure 12)

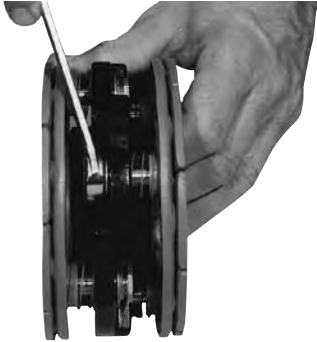


Figure 12

**Step 9** Turn the assembly over and repeat Step 8 for the second armature.

**Note:** This position must not be disturbed during completion of the assembly. (Figure 13)



Figure 13

The armature and armature hub are mounted on the shaft with a taperlock bushing. All parts must be clean and free from burrs and chips before assembling.

1. Place the bushing into the hub and insert the key. The key is a side-to-side fit and should not contact the top of the keyway.
2. Insert the locking setscrews loosely into the bushing and slide the assembly onto the shaft.
3. Place the face of the armature approximately 1/32" from the face of the magnet. Once this gap is set, it will be automatically maintained throughout the life of the unit. (Figure 14)

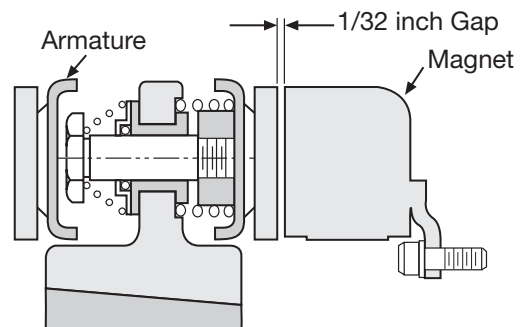
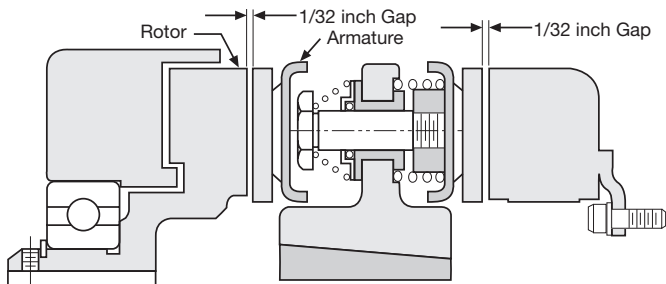


Figure 14

4. Secure the armature's position on the shaft by alternately tightening each setscrew. During the tightening process the bushing should be tapped lightly to make certain it seats in properly.

## F. Mounting the Field-and-Rotor Assembly

1. Insert a key into the keyway in the bore of the rotor, and slide the assembly onto the shaft.
2. Adjust the rotor's position on the shaft to allow approximately  $1/32''$  between the faces of the rotor and armature. Secure the rotor in this position by alternately tightening the two locking screws. Once this  $1/32''$  gap is set, it will be automatically maintained throughout the life of the unit. (Figure 15)



**Figure 15**

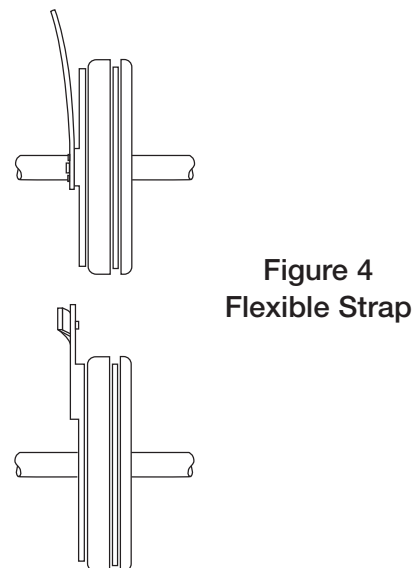
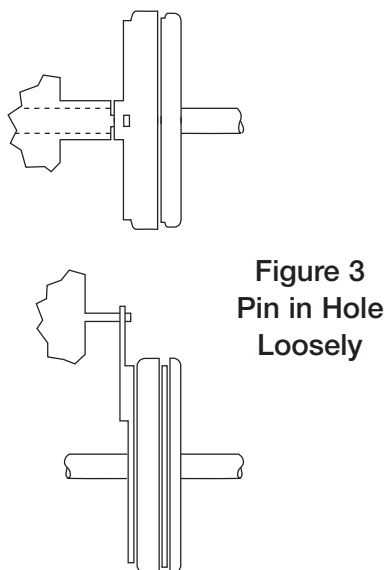
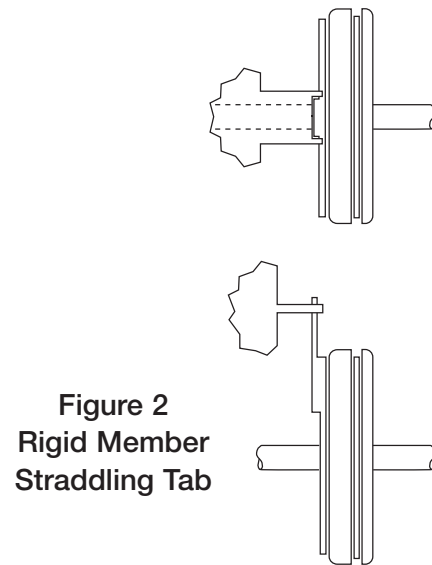
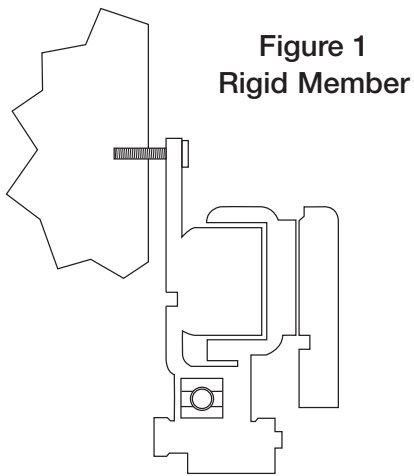
3. Secure the assembly on the shaft by alternately tightening the two setscrews.
4. A tab or torque arm is provided to prevent the field from rotating with the shaft. Insert either a pin in the U-slot or a fork around the torque arm to prevent this rotation. Under no circumstances, however should the field be so tightly restrained that it preloads the bearing. (For more information on torque tabs, see page 18.)

## Torque Tabs

### Clutches

Many Warner Electric clutch assemblies have a bearing mounted stationary field. By design the bearing maintains its proper position between the field and rotor making it easy for the customer to mount the field-rotor assembly. However, the bearing has a slight drag which tends to make the field rotate with the rotor if not restrained. And, since the field has lead wires attached, it must be restrained to prevent rotation and pulling of these wires. To counteract this rotational force, the field has a "torque tab" to which the customer must attach an appropriate anti-rotational restraint.

A few hints regarding proper torque tab restraints are in order. First and foremost, it is important to recognize that the force to be overcome is very small and the tab should not be restrained in any manner which will preload the bearing. For example, if the clutch is mounted with the back of the field adjacent to a rigid machine member the customer should not attach a capscrew tightly between the tab and the machine member. This may pull the tab back against the rigid member as shown in Figure 1 and preload the bearing. The recommended methods are illustrated in Figures 2, 3, and 4. The method selected is primarily a matter of customer preference or convenience.



## Installation Instructions

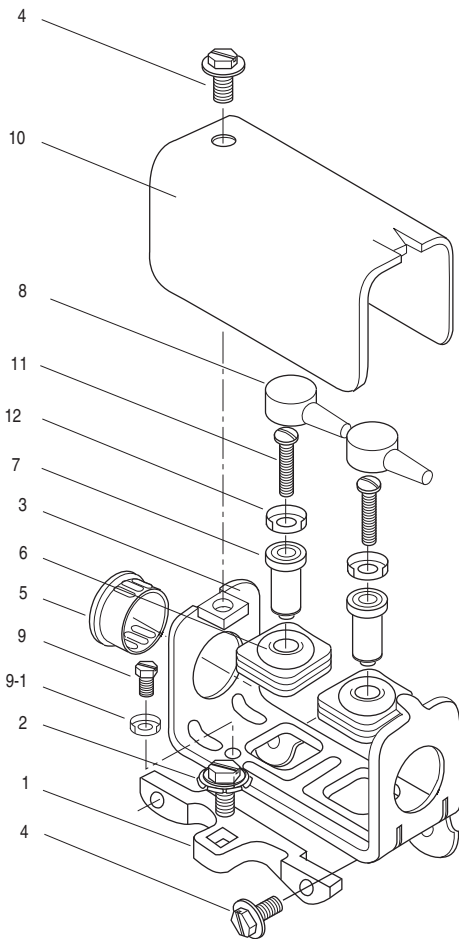
Conduit Box Kit No. 5200-101-010

### Description

This Warner Electric conduit box is designed to provide a proper means for field wiring terminations. It conforms to the requirements of Underwriters Laboratories. Kit No. 5200-101-010, plus magnet terminal accessory kit, contains all components needed to assemble a conduit box for the above mentioned units. Please follow these instructions carefully when installing this conduit box. Failure to comply with these instructions could result in unsafe electrical connections.



### Components



### Parts List for Kit 5200-101-010

Item	Quan.	Part Name
1	1	Bracket
2	1	Screw, Hex, Washer Hd. and Sems Conical Washer
3	1	Box, Conduit
4	3	Screw, Hex. Washer Hd.
5	1	Plug, Protective
6	2	Grommet, Wire
7	2	Spacer, Terminal
8	2	Cap, Terminal
9	1	Screw, Hex. Washer Hd.
9-1	1	Terminal, Ring
10	1	Cover Assembly
*11	2	Screw No. 6 Brass
	2	Screw No. 8 Brass
†12	2	Terminal, Ring

\*The No. 6 screws are required on Sizes 375, 400, and 475. All others use No. 8.

† Terminal Ring provided with terminal accessory kit 5311-101-003, 5311-101-001 respectively, supplied with magnets.

**Note:** All mounting screws are self-tapping.

**Step 1** Fasten bracket (1) to the clutch or brake with one No. 10-32 hex. washer head screw and washer (2). The square projection on the clutch or brake between the terminals is to be assembled into the square hole in the bracket. The bracket flange is installed toward the back of the unit. (See Figure 1)

**Step 2** Assemble a 1/2" flexible conduit fitting into



Figure 1

the desired end of the conduit box (3). If the grounding nut on this conduit fitting is tightened after the conduit box is installed on the magnet or field, avoid using excessive tapping force, which could damage the mounting. (Step 6)

**Step 3** Mount conduit box (3) to the bracket (1). The conduit box flange must be toward the back of the clutch or brake. Secure the box with two No.10-32 hex. washer head screws (4). (See Figure 2)

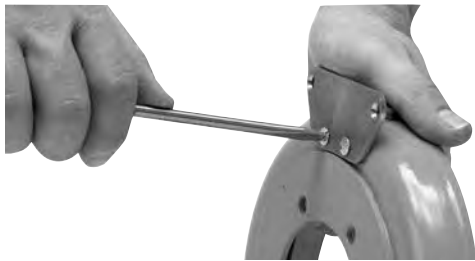


Figure 2

**Step 4** Snap the two rubber grommets (6) into two square holes in the bottom of the conduit box. The grommet crowns should be in the box and the rubber flanges should be on both sides of the metal floor. (See Figure 3)



Figure 3

**Step 5** Push two terminal spacers (7) through the grommets with the spacer flanged ends inside the conduit box. (See Figure 3)

**Step 6** Connect electric supply cable to the fitting installed on the conduit box. Use D.C. supply only.

**⚠CAUTION** Rigid conduit must not be connected directly to the box. A minimum of 12" of flexible cable must be used. It is recommended that flexible "UL" listed liquid-tight, metallic or non-metallic conduit, meeting local codes, be used with appropriate fittings. Flexible cable is required to prevent side loading of bearing on bearing mounted clutches and brakes and possible deformation of the conduit box or components during assembly.

**Step 7** Press protective plug (5) into the unused conduit hole in the box.

**Step 8** Slide one rubber cap (8) onto each of the two supply conductors, small end first. Connect the two supply conductors (with rubber caps) to the magnet or field terminals using two No. 6 or No. 8 screws (11). Use wire retaining ring terminals supplied with the clutch or brake terminal accessory. The stripped wires may be wrapped around the screw between the wire terminal ring and the screw head or other ring type terminals such as "AMP" may be used. The screws are then assembled through the terminal spacers (7) and threaded into the clutch or brake terminals.



## Electrical Coil Data

Unit Size		SF-500			PB & PC-500		
Voltage – DC	6	24	90	6	24	90	
Resistance @ 20°C — Ohms	1.076	14.9	206.1	1.36	23.8	251.1	
Current — Amperes	5.58	1.61	.44	4.4	1.01	.36	
Watts	34	39	39	26	24	32	
Coil Build-up — Milliseconds	82	85	90	84	87	93	
Coil Decay — Milliseconds	40	40	40	38	35	30	
Unit Size		SF-650			PB-650		
Voltage – DC	6	24	90	6	24	90	
Resistance @ 20°C — Ohms	1.16	17.7	225	1.24	18.3	257.2	
Current — Amperes	5.19	1.36	.4	4.84	1.31	.35	
Watts	31	33	36	29	31	32	
Coil Build-up — Milliseconds	110	115	120	100	105	110	
Coil Decay — Milliseconds	50	50	50	50	50	50	

**Notes:** Build-up time equals current to approximately 90% of steady state value and flux to 90%.  
 Decay time equals current to approximately 10% of steady state value and flux to 10%.  
 Approximately because current leads or lags flux by a small amount.

## Burnishing and Maintenance

### Burnishing

Intimate metal to metal contact is essential between the armature and the metal rings (poles) of the magnet or rotor. Warner Electric clutches and brakes leave the factory with the friction material slightly undercut to assure good initial contact.

Normally, the desired wearing-in process occurs naturally as the surfaces slip upon engagement. The time for wear-in, which is necessary to obtain the ultimate torque of the unit, will vary depending on speed, load and cycle duty.

If maximum torque is required immediately after installation, the unit should be burnished by slipping the friction surfaces together at reduced voltage. It is recommended that the burnishing be done right on the application, if at all possible.

Burnishing at high speed will result in a smoother wear-in pattern and reduce the time for burnishing. The voltage should be set at approximately 30% or 40% of the rated value.

The unit should be cycled on and off to allow sufficient time between slip cycles to prevent overheating.

When a Warner Electric brake or clutch is properly assembled and installed, no further servicing, lubrication, or maintenance should be required throughout the life of the unit.

### Maintenance

**Wear Pattern:** Wear grooves appear on the armature and magnet surfaces. This is a normal wear condition, and does not impair functioning of the unit. Normally, the magnet and armature, as a mating pair, will wear at the same rate. It is the usual recommendation that both components be replaced at the same time.

Remachining the face of a worn armature is not recommended. If a replacement armature is to be used with a used magnet, it is necessary to remachine the worn magnet face. In refacing a magnet: (1) machine only enough material to clean up the complete face of the magnet; (2) hold the face within .005" of parallel with the mounting plate; and (3) undercut the molded facing material .002"-.004" below the metal poles.

**Heat:** Excessive heat and high operating temperatures are causes of rapid wear. Units therefore, should be ventilated as efficiently as possible, especially if the application requires fast, repetitive cycle operation.

**Foreign Materials:** If units are used on machinery where fine, abrasive dust, chips or grit are dispelled into the atmosphere, shielding of the brake or clutch may be necessary if maximum life is to be obtained.

Where units are used near gear boxes or transmissions requiring frequent lubrication, means should be provided to protect the friction surfaces from oil and grease to prevent serious loss of torque.

Oil and grease accidentally reaching the friction surfaces may be removed by wiping with a rag dampened with a suitable cleaner, which leaves no residue. In performing this operation, do not drench the friction material.

If the friction materials have been saturated with oil or grease, no amount of cleaning will be completely effective. Once such a unit has been placed back in service, heat will cause the oil to boil to the surface, resulting in further torque loss.

**Torque Loss:** If a brake or clutch slips or loses torque completely, the initial check should be the input voltage to the field as follows:

**90-Volt Series:** Connect a DC voltmeter with a range of 0-100 or more directly across the magnet or field terminals. With the power on and the potentiometer turned up, a normal reading is 90 volts, although 85 to 95 is satisfactory. The reading should drop as the potentiometer control is adjusted counterclockwise.

**24-Volt Series:** Use a DC voltmeter with a range of 0-30 volts or more. A normal reading is approximately 22-26 volts.

**6-Volt Series:** Use a DC voltmeter of approximately 0-15 volt range. A normal reading is from 5.5 to 6.5 volts.

The above checks normally are sufficient. Further checks may be made as follows: a low range ammeter, when connected in series with one magnet lead, will normally indicate approximately .40 amperes for the 90 volt units, 1.0 ampere for the 24 volt, and 3.5 amperes for the 6 volt series. These readings are with the power on and the potentiometer control in the maximum position.

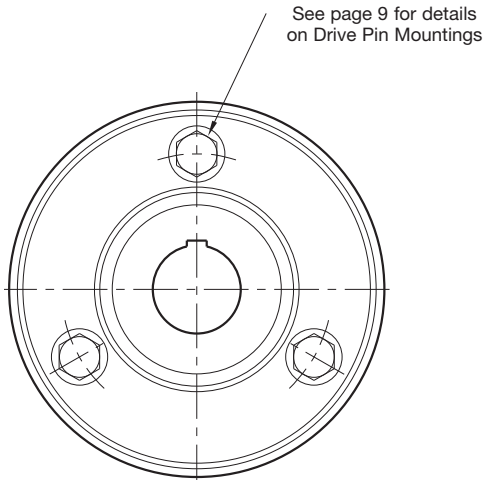
Ohmmeter checks should be made with the power off and the circuit open (to be certain, disconnect one lead to the magnet). Average resistance for the 90 volt series is 220 ohms; for the 24 volt, 20 ohms; and for the 6 volt series, 1.5 ohms. A very high or infinite resistance reading would indicate an open coil.

If the above checks indicate that the proper voltage and current is being supplied to the magnet, mechanical parts should be checked to assure that they are in good operating condition and properly installed.

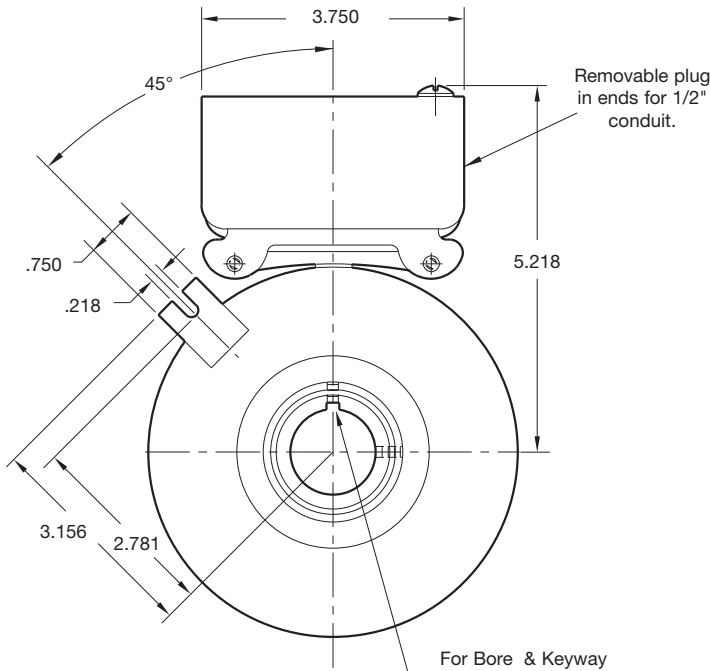


**SF-500 Bearing Mounted Clutch**

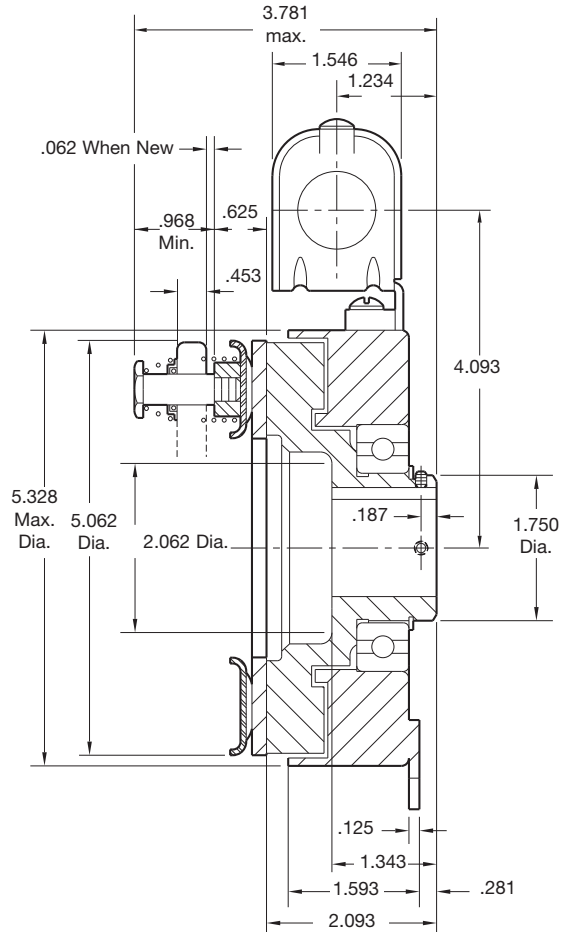
**Drawing I-25715**



**Armature View**



**Field View**



**Bore and Keyway Dimensions**

Rotor Bore Dia.	Keyway
.751/.750	.187 x .093
.876/.875	
.9385/.9375	
1.001/1.000	.250 x .125
1.126/1.125	
1.251/1.250	

Rotor Shaft	.750 – 1.250
Static Torque	50 lb.ft.
Maximum Speed	4,000 RPM
Standard Voltage	D.C. 6, 24, 90

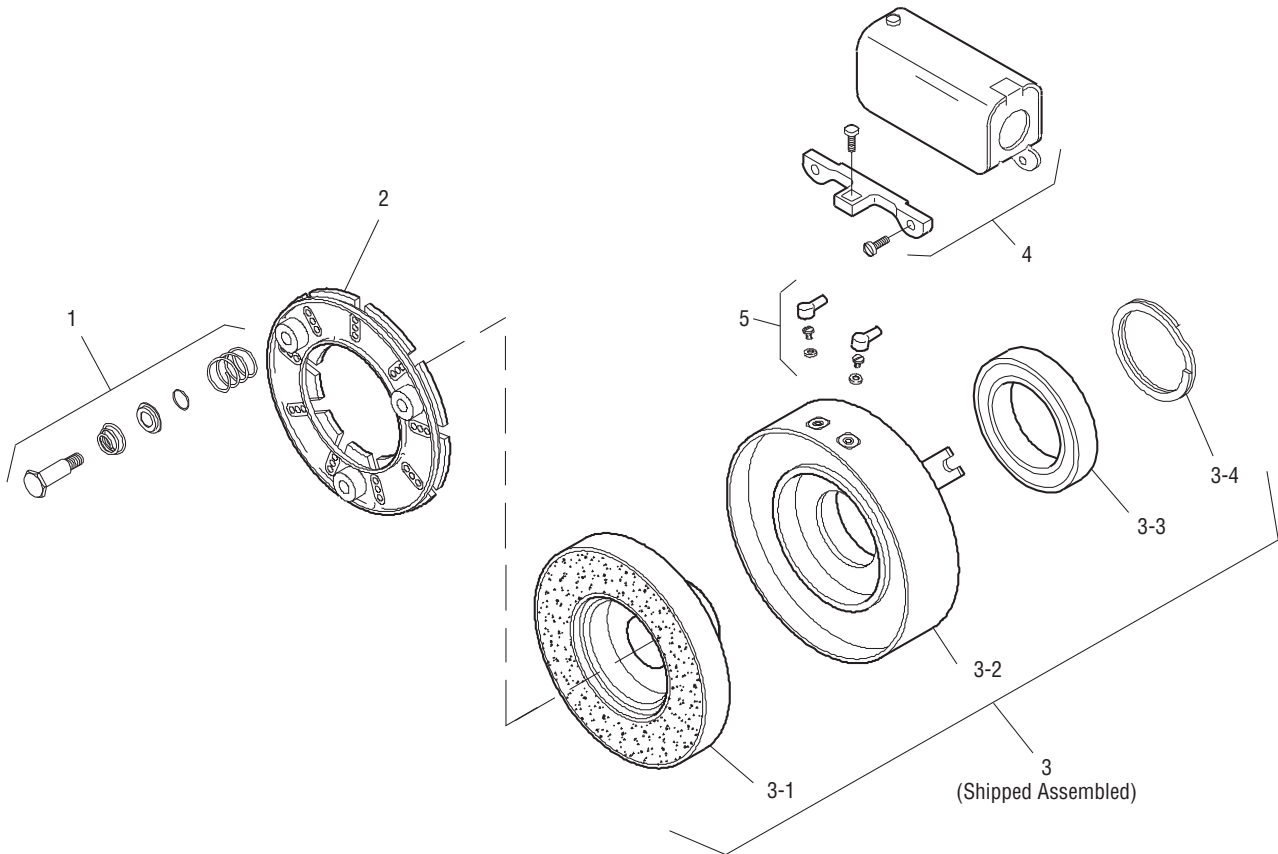
**Customer Shall Maintain:**

1. Armature shafts to be concentric with rotor mounting shaft within .006 T.I.R.

All dimensions are nominal, unless otherwise noted.



## SF-500 Bearing Mounted Clutch



Item	Description	Part Number	Qty.
1	Autogap Accessory	5200-101-009	3
2	Armature	5300-111-002	1
3	Field and Rotor Assembly		1
	6 Volt – 3/4" Bore	5200-452-002	
	24 Volt – 3/4" Bore	5200-452-004	
	90 Volt – 3/4" Bore	5200-452-005	
	6 Volt – 7/8" Bore	5200-452-008	
	24 Volt – 7/8" Bore	5200-452-010	
	90 Volt – 7/8" Bore	5200-452-011	
	24 Volt – 15/16" Bore	5200-452-016	
	90 Volt – 15/16" Bore	5200-452-017	
	6 Volt – 1" Bore	5200-452-020	
	24 Volt – 1" Bore	5200-452-022	
	90 Volt – 1" Bore	5200-452-023	
	6 Volt – 1-1/8" Bore	5200-452-026	
	24 Volt – 1-1/8" Bore	5200-452-028	
	90 Volt – 1-1/8" Bore	5200-452-029	
	6 Volt – 1-1/4" Bore	5200-452-032	
	24 Volt – 1-1/4" Bore	5200-452-034	
	90 Volt – 1-1/4" Bore	5200-452-035	
3-1	Rotor		1
	3/4" Bore	5200-751-002	
	7/8" Bore	5200-751-003	
	15/16" Bore	5200-751-004	
	1" Bore	5200-751-005	
	1-1/8" Bore	5200-751-006	
	1-1/4" Bore	5200-751-007	

Item	Description	Part Number	Qty.
3-2	Field & Bearing Assembly		1
	6 Volt	5200-451-024	
	24 Volt	5200-451-026	
	90 Volt	5200-451-027	
3-3	Ball Bearing	166-0110	1
3-4	Retainer Ring	748-0002	1
4	Conduit Box	5200-101-010	1
5	Terminal Accessory	5311-101-001	1

### How to Order:

1. Specify Bore Size for Item 3.
2. Specify Voltage for Item 3.

### Example:

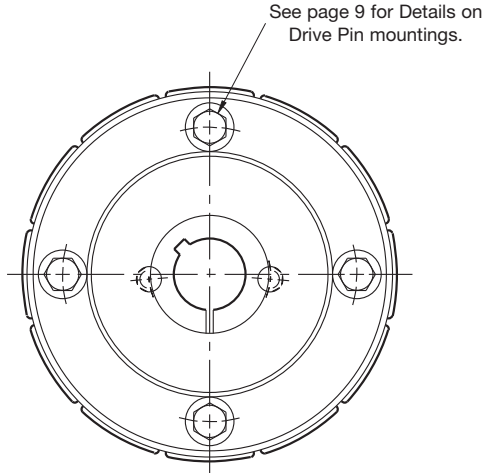
SF-500 Clutch per I-25715 - 90 Volt 3/4" Bore

These units meet standards set forth in UL508 and are listed under guide card #NMTR2, file #59164.

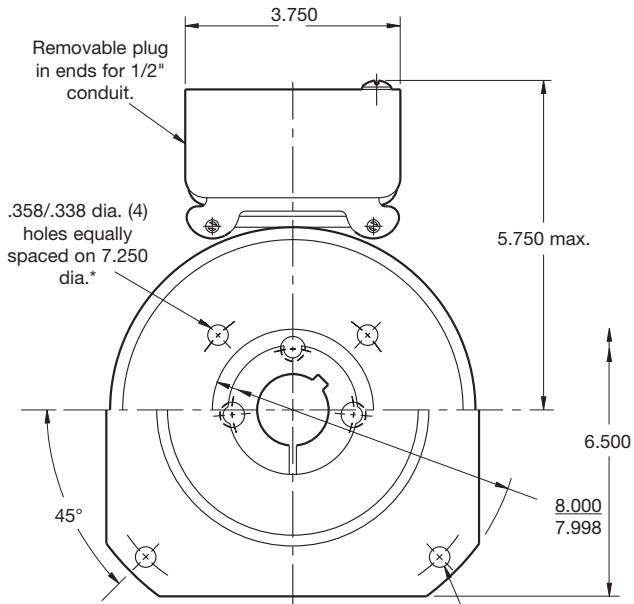
These units are CSA certified under file #LR11543.

# SF-650 Flange Mounted Clutch

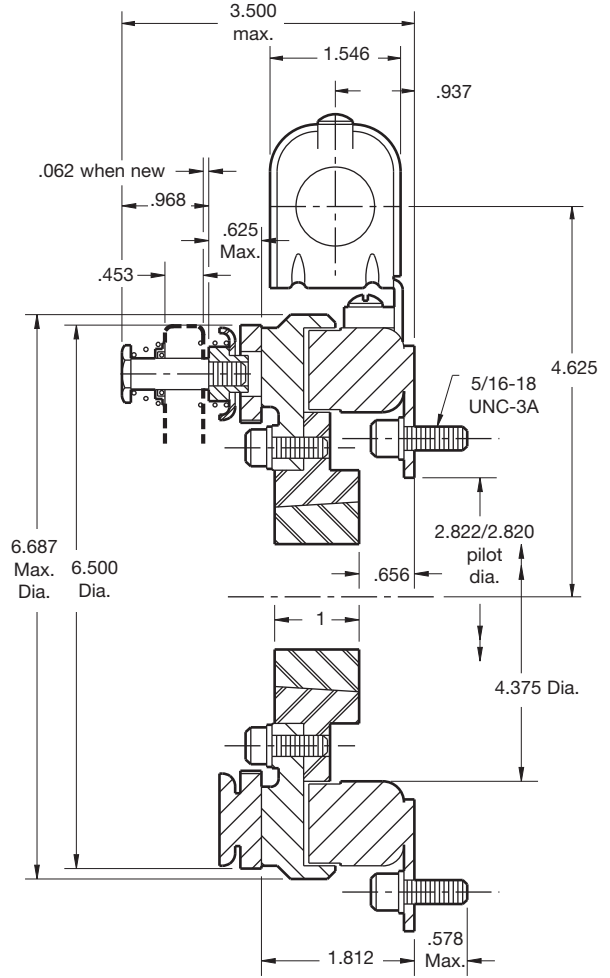
Drawing I-25749



**Armature View**



**Field View  
(Inside & Outside Mounted)**



\* Mounting holes are within .010 of true position relative to pilot diameter.

**Customer Shall Maintain:**

1. Concentricity of field mounting pilot diameter with rotor mounting shaft within .006 T.I.R.
2. Squareness of field mounting face with shaft within .006 T.I.R. measured at field mounting bolt circle.
3. Rotor mounting pilot diameter must be concentric with shaft within .006 T.I.R.

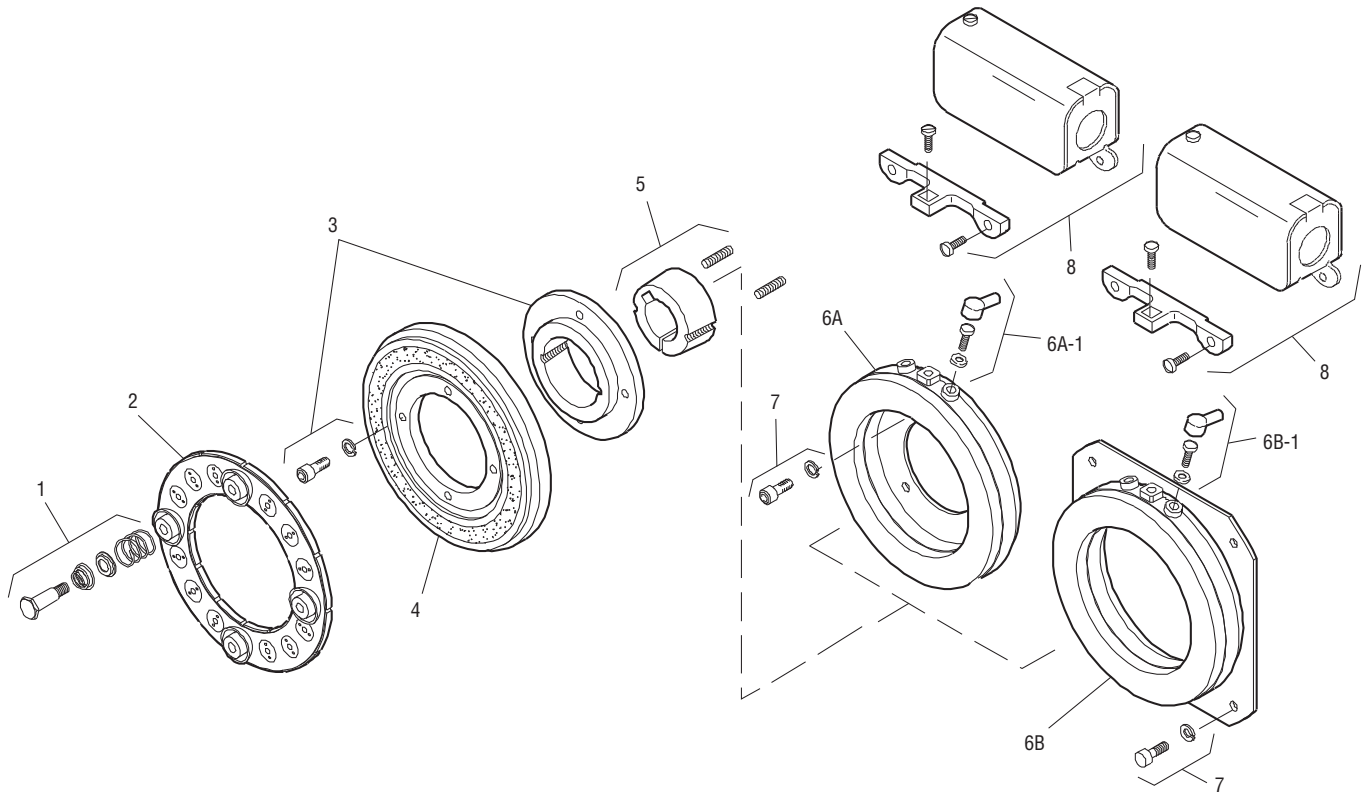
Shaft Size	.500 – 1.625
Static Torque	95 lb.ft.
Maximum Speed	3,600 RPM
Standard Voltage	D.C. 6, 24, 90

All dimensions are nominal, unless otherwise noted.





## SF-650 Flange Mounted Clutch



Item	Description	Part Number	Qty.
1	Armature Accessory	5181-101-010	4
2	Armature	5281-111-002	1
3	Rotor Hub & Mounting Acc.	5207-101-005	1
4	Rotor	5281-751-001	1
5	Bushing*		
	1/2" to 1-5/8" Bore	180-0326 to 180-0344	1
6A	Field - Inside Mounted		1
	6 Volt	5207-451-009	
	24 Volt	5207-451-012	
	90 Volt	5207-451-011	
6A-1	Terminal Accessory	5311-101-001	1
6B	Field - Outside Mounted		1
	6 Volt	5207-451-003	
	24 Volt	5207-451-006	
	90 Volt	5207-451-005	
6B-1	Terminal Accessory	5311-101-001	1
7	Mounting Accessory	5321-101-002	1
8	Conduit Box	5200-101-010	1

\* See page 44 for specific part numbers.

### How to Order:

1. Specify Bore Size for Item 5.
2. Specify Voltage for Item 6.
3. Specify Inside or Outside Mounted for Item 6.

### Example:

SF-650 Clutch per I-25749 - 90 Volt 1" Bore

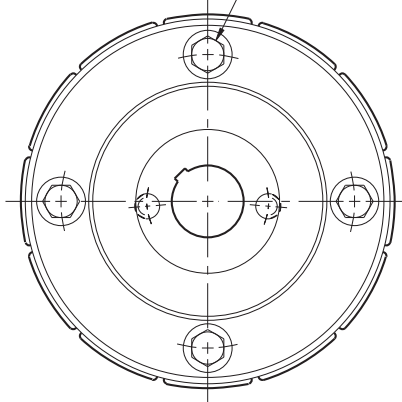
These units, when used in conjunction with the correct Warner Electric conduit box, meet the standards of UL508 and are listed under guide card #NMTR, file #59164.

These units are CSA certified under file #LR11543.

# SF-650 Bearing Mounted Clutch

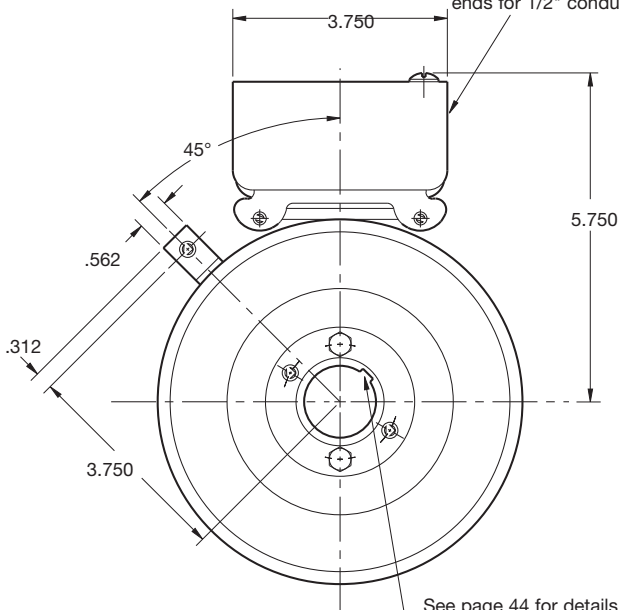
# Drawing I-25750

See page 9 for details on Drive Pin mountings.



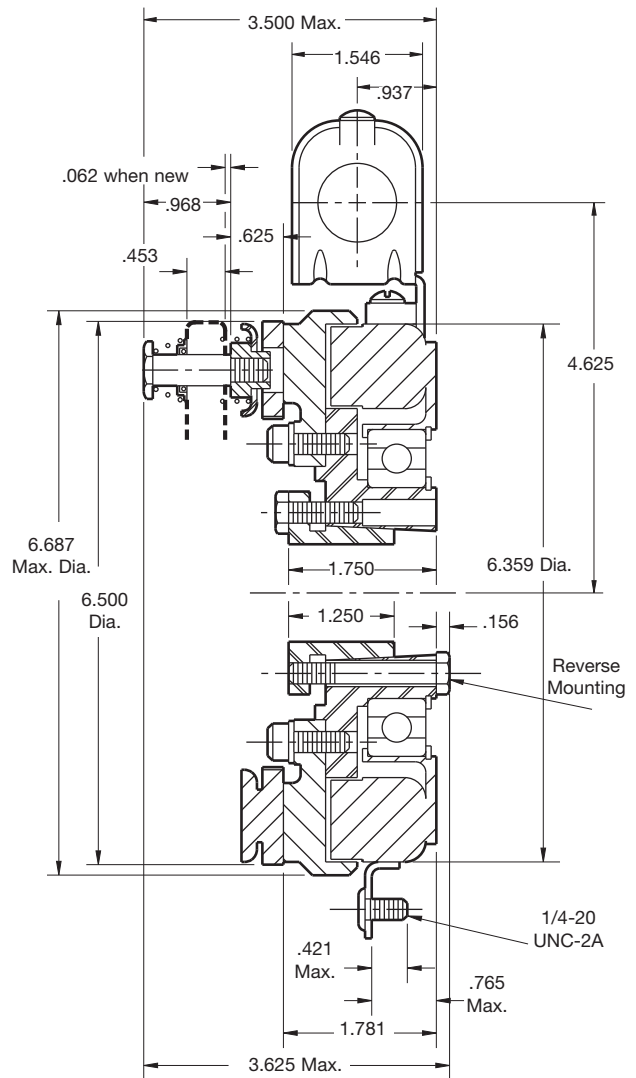
**Armature View**

Removable plug in ends for 1/2" conduit.



**Field View**

See page 44 for details on Bushings.

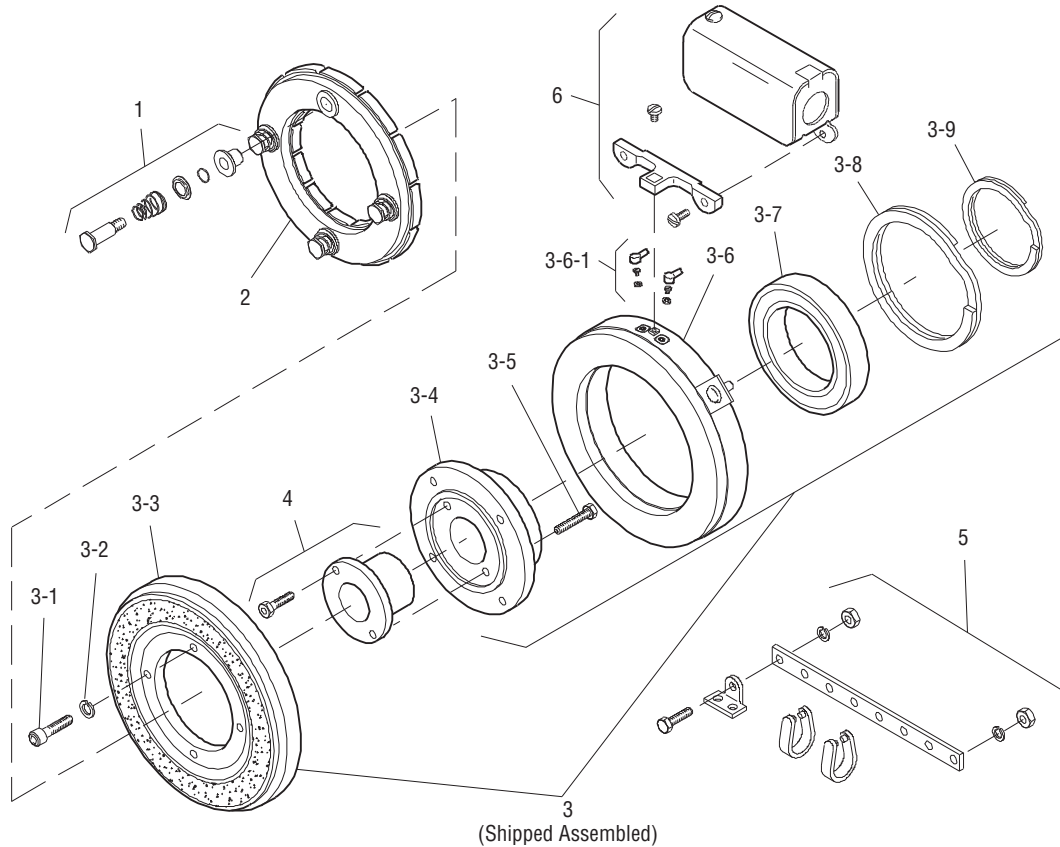


Shaft Size	.500 – 1.500
Static Torque	95 lb.ft.
Maximum Speed	3,600 RPM
Standard Voltage	D.C. 6, 24, 90

All dimensions are nominal, unless otherwise noted.



## SF-650 Bearing Mounted Clutch



Item	Description	Part Number	Qty.
1	Autogap Accessory	5181-101-010	4
2	Armature	5281-111-002	1
3	Field and Rotor Assembly		1
	6 Volt	5207-452-002	
	24 Volt	5207-452-005	
	90 Volt	5207-452-004	
3-1	Capscrew	797-0083	4
3-2	Lockwasher	950-0355	4
3-3	Rotor Assembly	5281-751-001	1
3-4	Rotor Hub	540-0614	1
3-5	Reverse Mounting Accessory	5201-101-005	1
3-6	Field		1
	6 Volt	5281-451-002	
	24 Volt	5281-451-004	
	90 Volt	5281-451-005	
3-6-1	Terminal Accessory	5311-101-001	1
3-7	Ball Bearing	166-0104	1
3-8	Retainer Ring - External	748-0004	1
3-9	Retainer Ring -Internal	748-0104	1
4	Bushing*		
	1/2" to 1-1/2" Bore	180-0002 to 180-0018	1
†5	Torque Arm Accessory	5207-101-003	1
6	Conduit Box	5200-101-010	1

\* See page 44 for specific part numbers.

† Optional—not included in price.

### How to Order:

1. Specify Voltage for Item 3.
2. Specify Bore Size for Item 4.

### Example:

SF-650 Clutch, bearing mounted per I-25750 - 90 Volt, 1" Bore

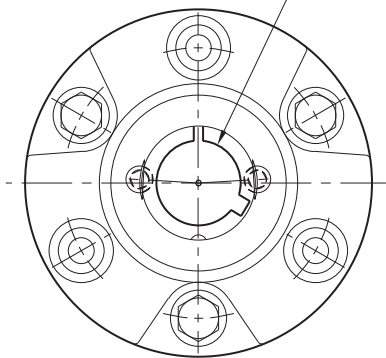
These units, when used in conjunction with the correct Warner Electric conduit box, meet the standards of UL508 and are listed under guide card #NMTR, file #59164.

These units are CSA certified under file #LR11543.

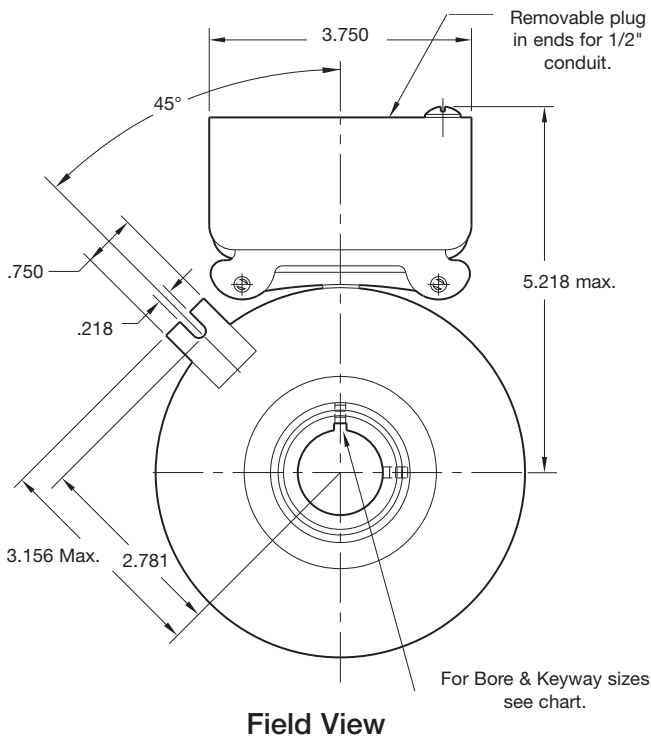
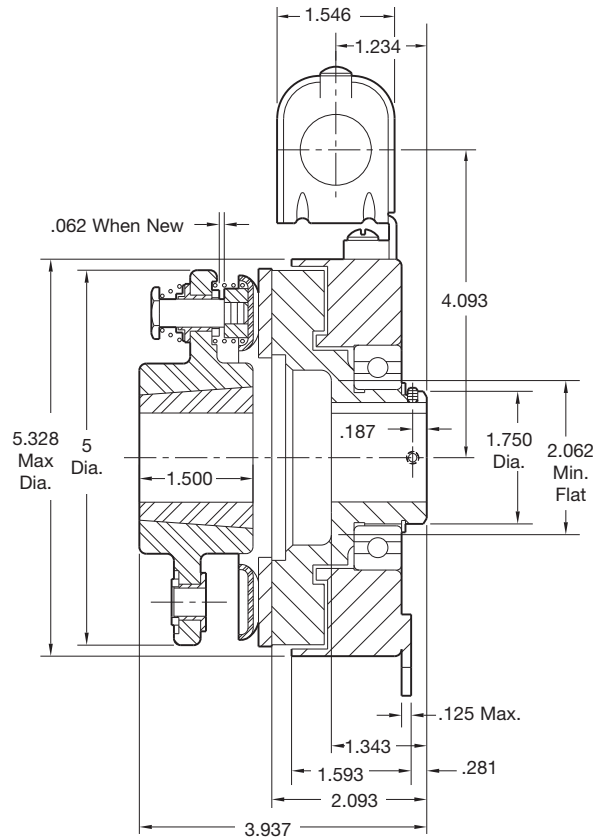
**SFC-500 Bearing Mounted Clutch Coupling  
 Normal Duty**

**Drawing I-25540**

See page 44 for details  
 on Bushings.



**Hub View**



**Field View**

For Bore & Keyway sizes  
 see chart.

**Bore & Keyway Dimensions**

Rotor Bore Dia.	Keyway
.751/.750	.187 x .093
.876/.875	
.9385/.9375	
1.001/1.000	.250 x .125
1.126/1.125	
1.251/1.250	

Armature Shaft	.500 – 1.250
Rotor Shaft	.750 – 1.250
Static Torque	50 lb.ft.
Maximum Speed	4,000 RPM
Standard Voltage	D.C. 6, 24, 90

**Customer Shall Maintain:**

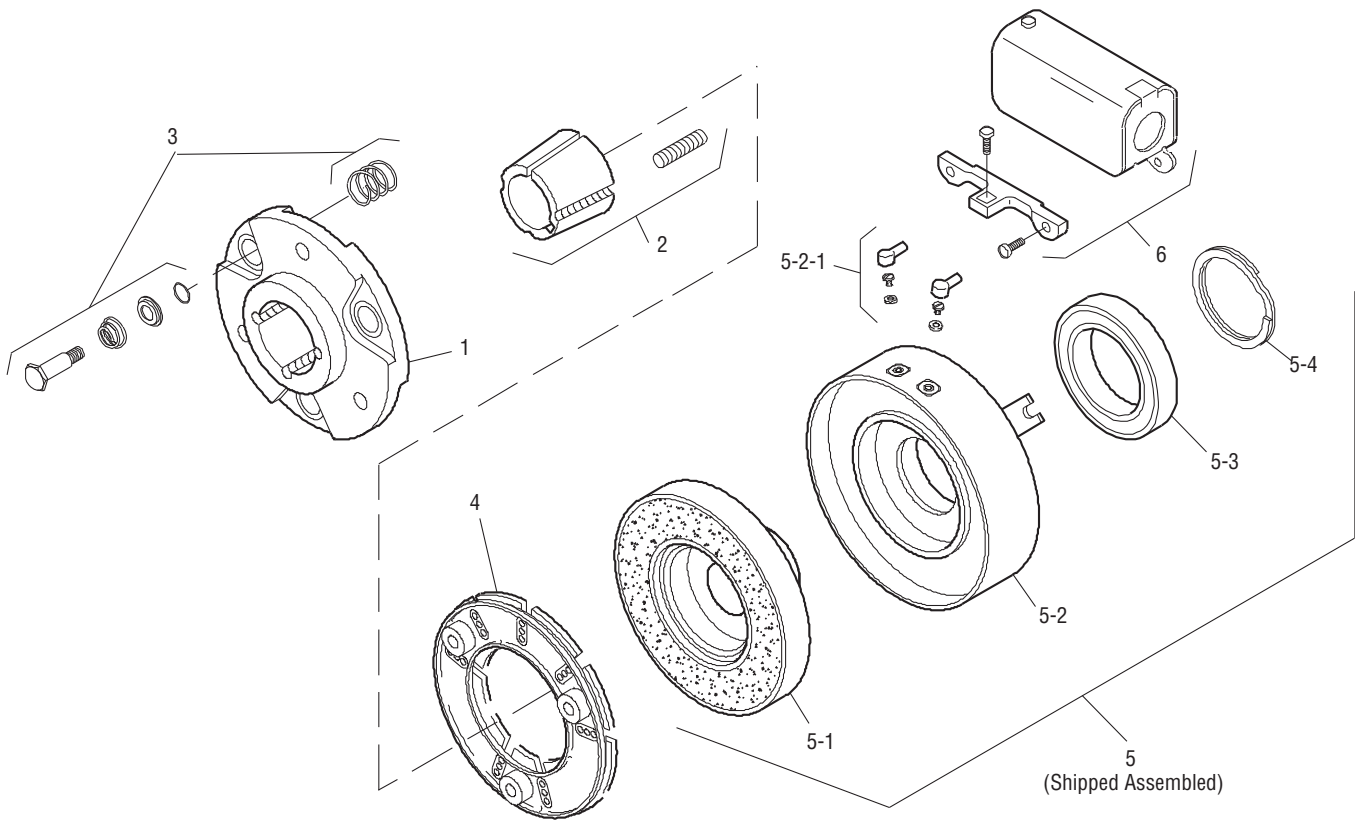
1. Armature mounting shaft to be concentric with rotor mounting shaft within .006 T.I.R.

All dimensions are nominal, unless otherwise noted.



## SFC-500 Bearing Mounted Clutch Coupling

Normal Duty



Item	Description	Part Number	Qty.
1	Armature Hub	5300-541-004	1
2	Bushing*		
	1/2" to 1-1/4" Bore	180-0116 to 180-0128	1
3	Autogap Accessory	5200-101-009	3
4	Armature	5300-111-002	1
5	Field and Rotor Assembly		1
	6 Volt – 3/4" Bore	5200-452-002	
	24 Volt – 3/4" Bore	5200-452-004	
	90 Volt – 3/4" Bore	5200-452-005	
	6 Volt – 7/8" Bore	5200-452-008	
	24 Volt – 7/8" Bore	5200-452-010	
	90 Volt – 7/8" Bore	5200-452-011	
	24 Volt – 15/16" Bore	5200-452-016	
	90 Volt – 15/16" Bore	5200-452-017	
	6 Volt – 1" Bore	5200-452-020	
	24 Volt – 1" Bore	5200-452-022	
	90 Volt – 1" Bore	5200-452-023	
	6 Volt – 1-1/8" Bore	5200-452-026	
	24 Volt – 1-1/8" Bore	5200-452-028	
	90 Volt – 1-1/8" Bore	5200-452-029	
	6 Volt – 1-1/4" Bore	5200-452-032	
	24 Volt – 1-1/4" Bore	5200-452-034	
	90 Volt – 1-1/4" Bore	5200-452-035	
5-1	Rotor		1
	3/4" Bore	5200-751-002	
	7/8" Bore	5200-751-003	
	15/16" Bore	5200-751-004	
	1" Bore	5200-751-005	
	1-1/8" Bore	5200-751-006	

Item	Description	Part Number	Qty.
	1-1/4" Bore	5200-751-007	
5-2	Field & Bearing Assembly		1
	6 Volt	5200-451-024	
	24 Volt	5200-451-026	
	90 Volt	5200-451-027	
5-3	Terminal Accessory	5311-101-001	1
5-4	Ball Bearing	166-0110	1
5-5	Retainer Ring	748-0002	1
6	Conduit Box	5200-101-010	1

\*See page 44 for specific part numbers.

### How to Order:

1. Specify Bore Size for Item 2 and Item 5.
2. Specify Voltage for Item 5.

### Example:

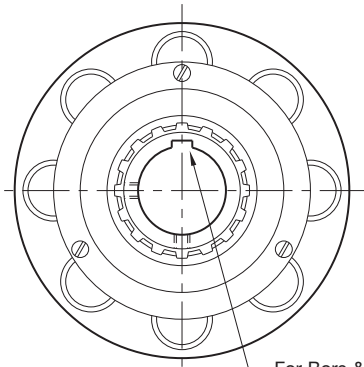
SFC-500 Clutch Coupling per I-25540 - 90 Volt  
 3/4" Bores

These units, when used in conjunction with the correct Warner Electric conduit box, meet the standards set of UL508 and are listed under guide card #NMTR2, file #59164.

These units are CSA certified under file #LR11543.

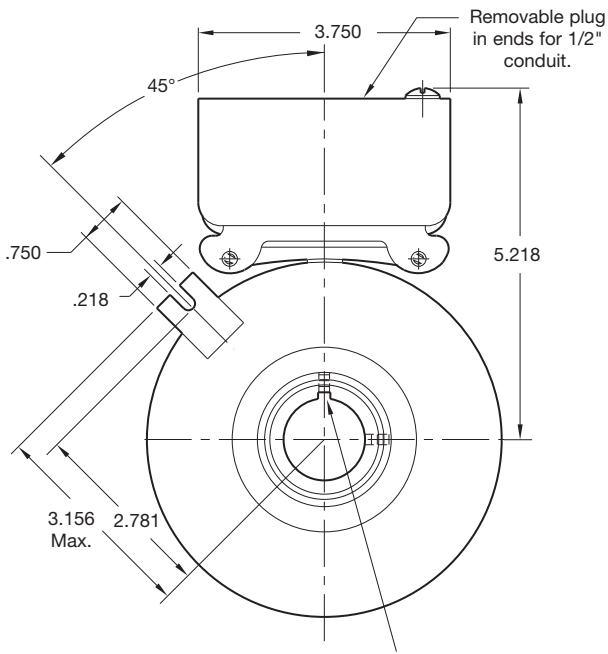
# SFC-500 Bearing Mounted Clutch Coupling Heavy Duty

Drawing I-25541



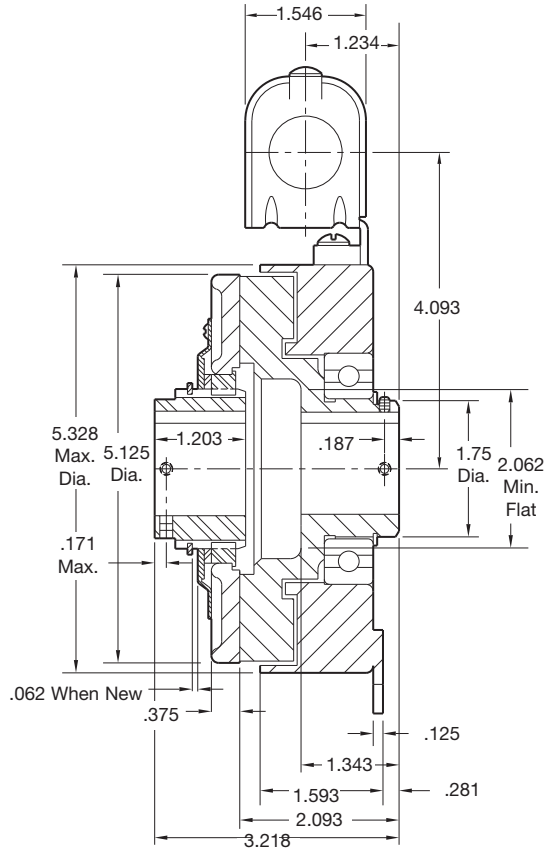
For Bore & Keyway sizes see chart below.

**Armature View**



For Bore & Keyway sizes see chart.

**Field View**



**Bore & Keyway Dimensions**

Rotor Bore Dia.	Keyway
.751/.750	.187 x .093
.876/.875	
.9385/.9375	.250 x .125
1.001/1.00	
1.126/1.125	
1.251/1.250	

Armature Shaft	.750 – 1.250
Rotor Shaft	.750 – 1.250
Static Torque	50 lb.ft.
Maximum Speed	4,000 RPM
Standard Voltage	D.C. 6, 24, 90

**Customer Shall Maintain:**

1. Angular alignment of shafts within 1/2 degree.
2. Armature mounting shaft to be concentric with rotor mounting shaft within .006 T.I.R.

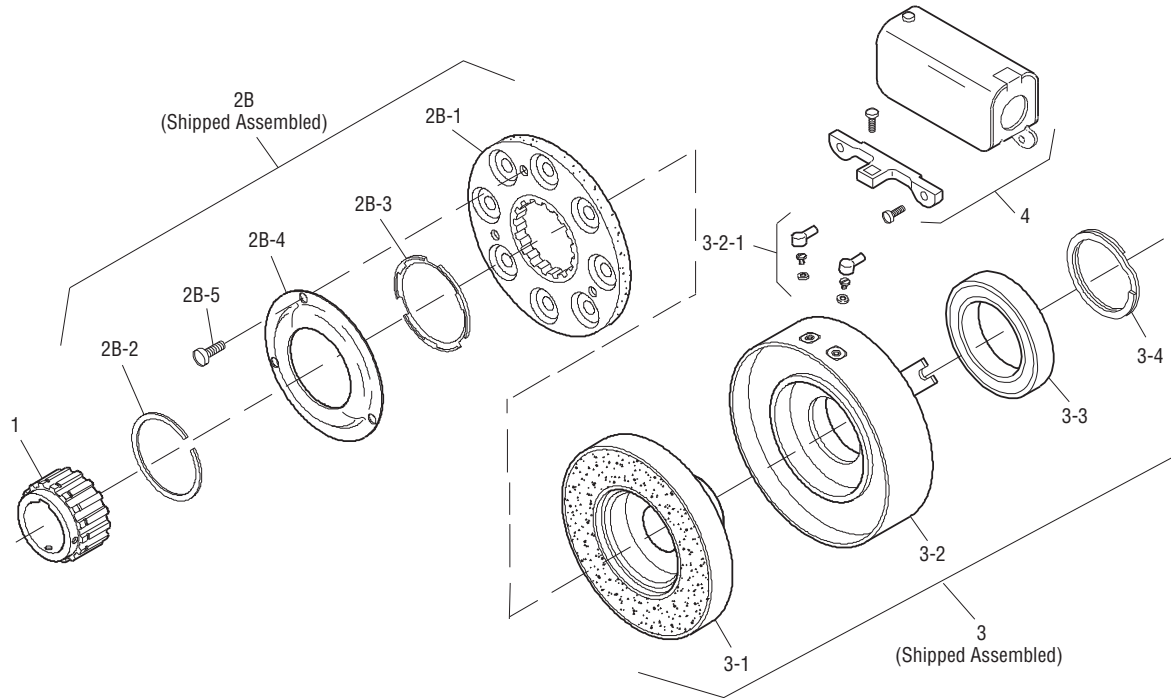
All dimensions are nominal, unless otherwise noted.





# SFC-500 Bearing Mounted Clutch Coupling

Heavy Duty



Item	Description	Part Number	Qty.
1	Armature Hub Assembly		1
	3/4" Bore	5200-541-002	
	7/8" Bore	5200-541-003	
	15/16" Bore	5200-541-004	
	1" Bore	5200-541-005	
	1-1/8" Bore	5200-541-006	
	1-1/4" Bore	5200-541-007	
2B	Armature Assembly w/Autogap	5230-111-002	1
2B-1	Armature	5230-111-001	1
2B-2	Retainer Ring	748-0355	1
2B-3	Autogap Spring	808-0412	1
2B-4	Retainer Plate	748-0364	1
2B-5	Screw	797-0028	3
3	Field and Rotor Assembly		1
	6 Volt - 3/4" Bore	5200-452-002	
	24 Volt - 3/4" Bore	5200-452-004	
	90 Volt - 3/4" Bore	5200-452-005	
	6 Volt - 7/8" Bore	5200-452-008	
	24 Volt - 7/8" Bore	5200-452-010	
	90 Volt - 7/8" Bore	5200-452-011	
	24 Volt - 15/16" Bore	5200-452-016	
	90 Volt - 15/16" Bore	5200-452-017	
	6 Volt - 1" Bore	5200-452-020	
	24 Volt - 1" Bore	5200-452-022	
	90 Volt - 1" Bore	5200-452-023	
	6 Volt - 1-1/8" Bore	5200-452-026	
	24 Volt - 1-1/8" Bore	5200-452-028	
	90 Volt - 1-1/8" Bore	5200-452-029	
	6 Volt - 1-1/4" Bore	5200-452-032	
	24 Volt - 1-1/4" Bore	5200-452-034	
	90 Volt - 1-1/4" Bore	5200-452-035	
3-1	Rotor		1
	3/4" Bore	5200-751-002	
	7/8" Bore	5200-751-003	

Item	Description	Part Number	Qty.
	15/16" Bore	5200-751-004	
	1" Bore	5200-751-005	
	1-1/8" Bore	5200-751-006	
	1-1/4" Bore	5200-751-007	
3-2	Field & Bearing Assembly		1
	6 Volt	5200-451-024	
	24 Volt	5200-451-026	
	90 Volt	5200-451-027	
3-3	Terminal Accessory	5311-101-001	1
3-4	Ball Bearing	166-0110	1
3-5	Retainer Ring	748-0002	1
4	Conduit Box	5200-101-010	1

### How to Order:

1. Specify Bore Size for Item 1 and 1B and Item 4.
2. Specify Voltage for Item 5.

### Example:

SFC-500 Clutch Coupling per I-25541- 90 Volt 3/4" Armature Hub Bore 7/8" Rotor Bore

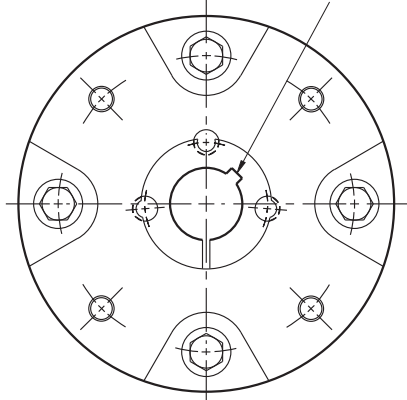
These units, when used in conjunction with the correct Warner Electric conduit box, meet standards set forth in UL508 and are listed under guide card #NMTR2, file #59164.

These units are CSA certified under file #LR11543.

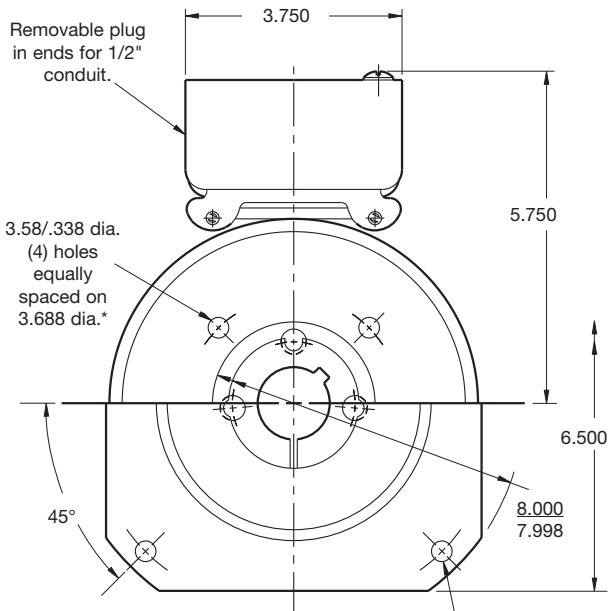
**SFC-650 Clutch Coupling**  
**Flange Mounted**

**Drawing I-25728**

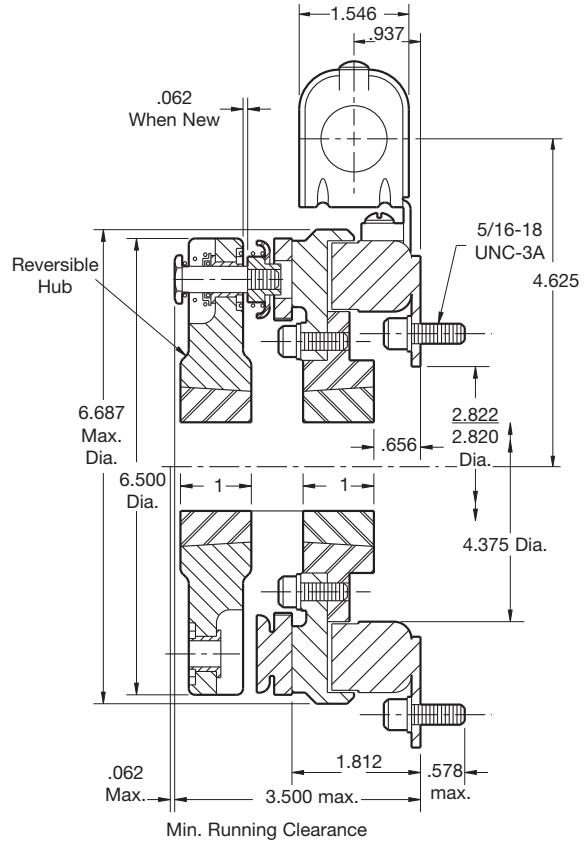
See page 44 for details on Bushings.



**Hub View**



**Field View**  
**(Inside & Outside Mounted)**



\* Mounting holes are within .010 of true position relative to pilot diameter.

**Customer Shall Maintain:**

1. Concentricity of field mounting pilot diameter with rotor mounting shaft within .006 T.I.R.
2. Squareness of field mounting face with shaft within .006 T.I.R. measured at field mounting bolt circle.
3. Rotor mounting pilot diameter must be concentric with shaft within .006 T.I.R.
4. Armature mounting shaft to be concentric with rotor mounting shaft within .006 T.I.R.

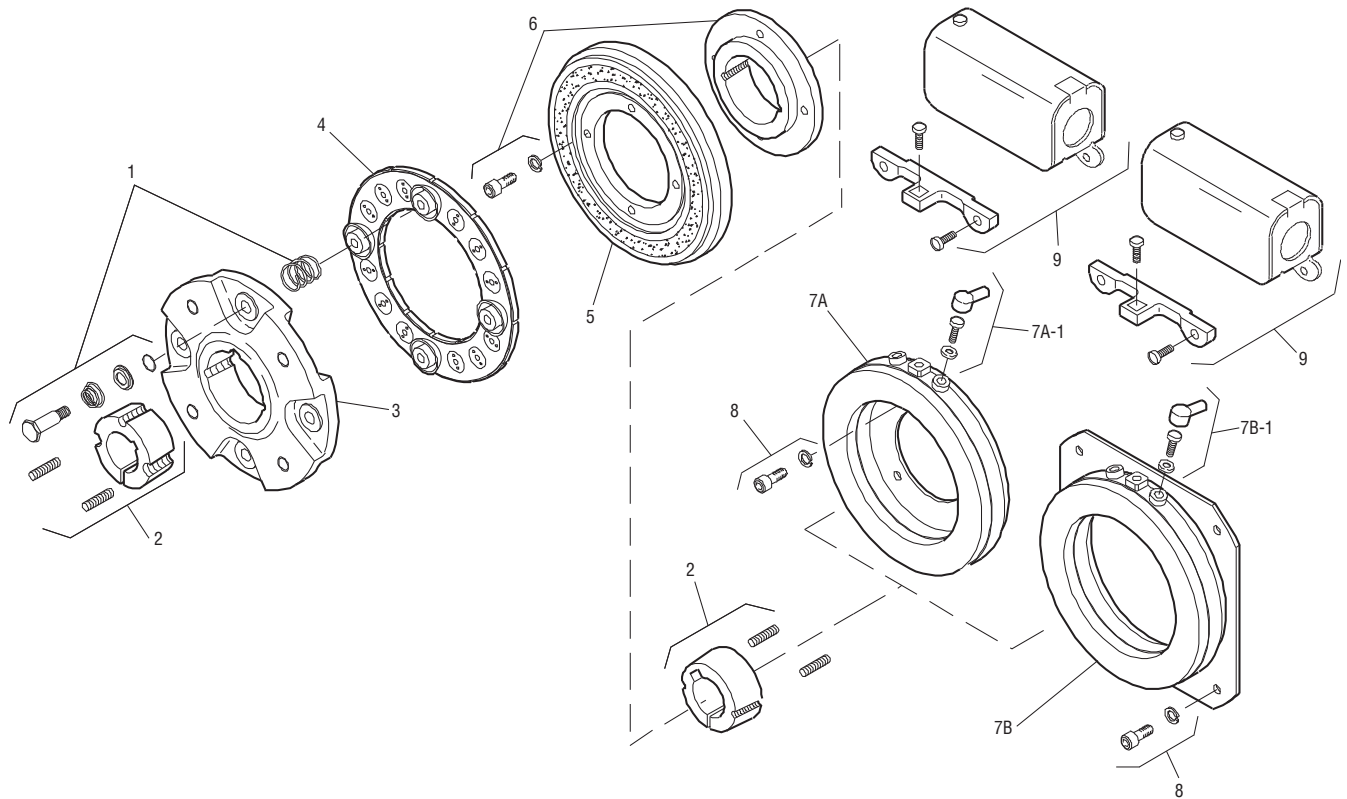
Armature Shaft	.500 – 1.625
Rotor Shaft	.500 – 1.625
Static Torque	95 lb.ft.
Maximum Speed	3,600 RPM
Standard Voltage	D.C. 6, 24, 90

All dimensions are nominal, unless otherwise noted.



## SFC-650 Clutch Coupling

## Flange Mounted



Item	Description	Part Number	Qty.
1	Autogap Accessory	5181-101-010	4
2	Bushing*		
	1/2" to 1-5/8" Bore	180-0326 to 180-0344	2
3	Armature Hub	5207-541-002	1
4	Armature	5281-111-002	1
5	Rotor	5281-751-001	1
6	Rotor Hub & Mounting Accessory	5207-101-005	1
7A	Field - Inside Mounted		1
	6 Volt	5207-451-009	
	24 Volt	5207-451-012	
	90 Volt	5207-451-011	
7A-1	Terminal Accessory	5311-101-001	1
7B	Field - Outside Mounted		1
	6 Volt	5207-451-003	
	24 Volt	5207-451-006	
	90 Volt	5207-451-005	
8	Mounting Accessory	5321-101-002	1
9	Conduit Box	5200-101-010	1

\* See page 44 for specific part numbers.

### How to Order:

1. Specify Bore Size for Item 2.
2. Specify Voltage for Item 7.
3. Specify Inside or Outside Mounted for Item 7.

### Example:

SFC-650 Clutch Coupling Flange Mounted per I-25728  
 -90 Volt 1" Bore

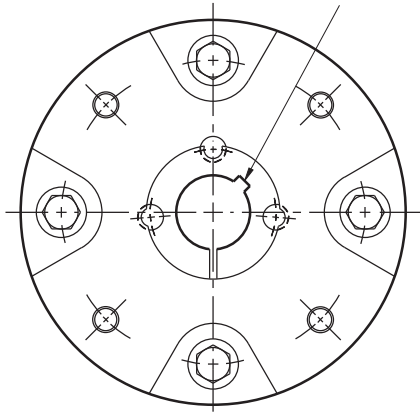
These units, when used in conjunction with the correct Warner Electric conduit box, meet the standards of UL508 and are listed under guide card #NMTR, file #59164.

These units are CSA certified under file #LR11543.

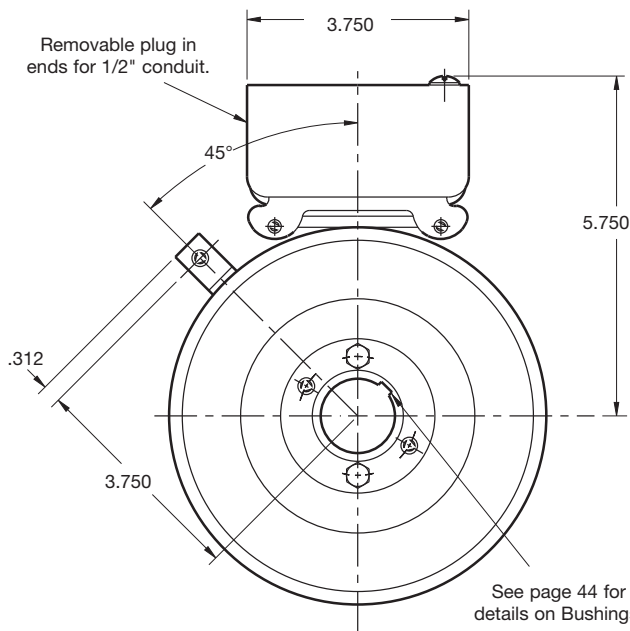
**SFC-650 Clutch Coupling  
 Bearing Mounted**

**Drawing I-25729**

See page 44 for details on Bushings.

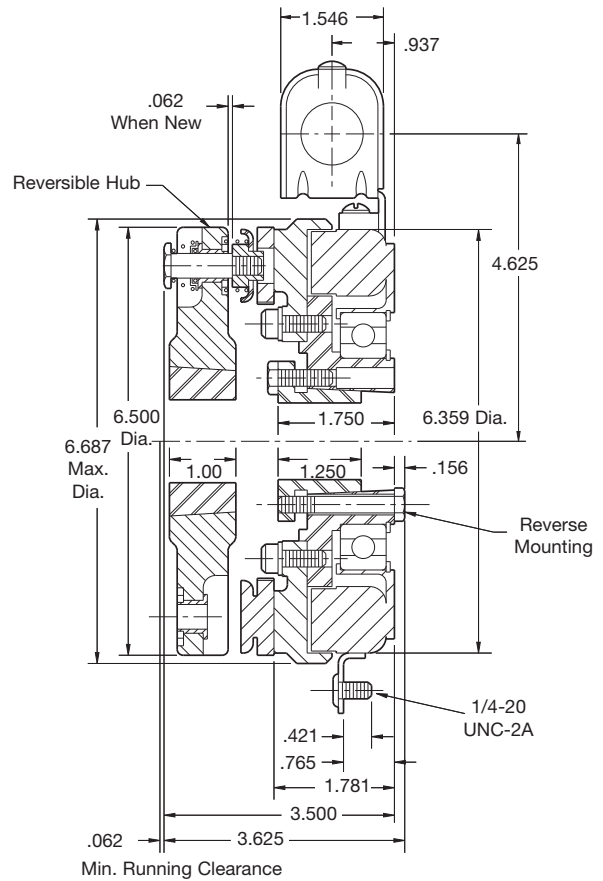


**Hub View**



**Field View**

See page 44 for details on Bushings.



Armature Shaft	.500 – 1.625
Rotor Shaft	.500 – 1.500
Static Torque	95 lb.ft.
Maximum Speed	3,600 RPM
Standard Voltage	D.C. 6, 24, 90

**Customer Shall Maintain:**

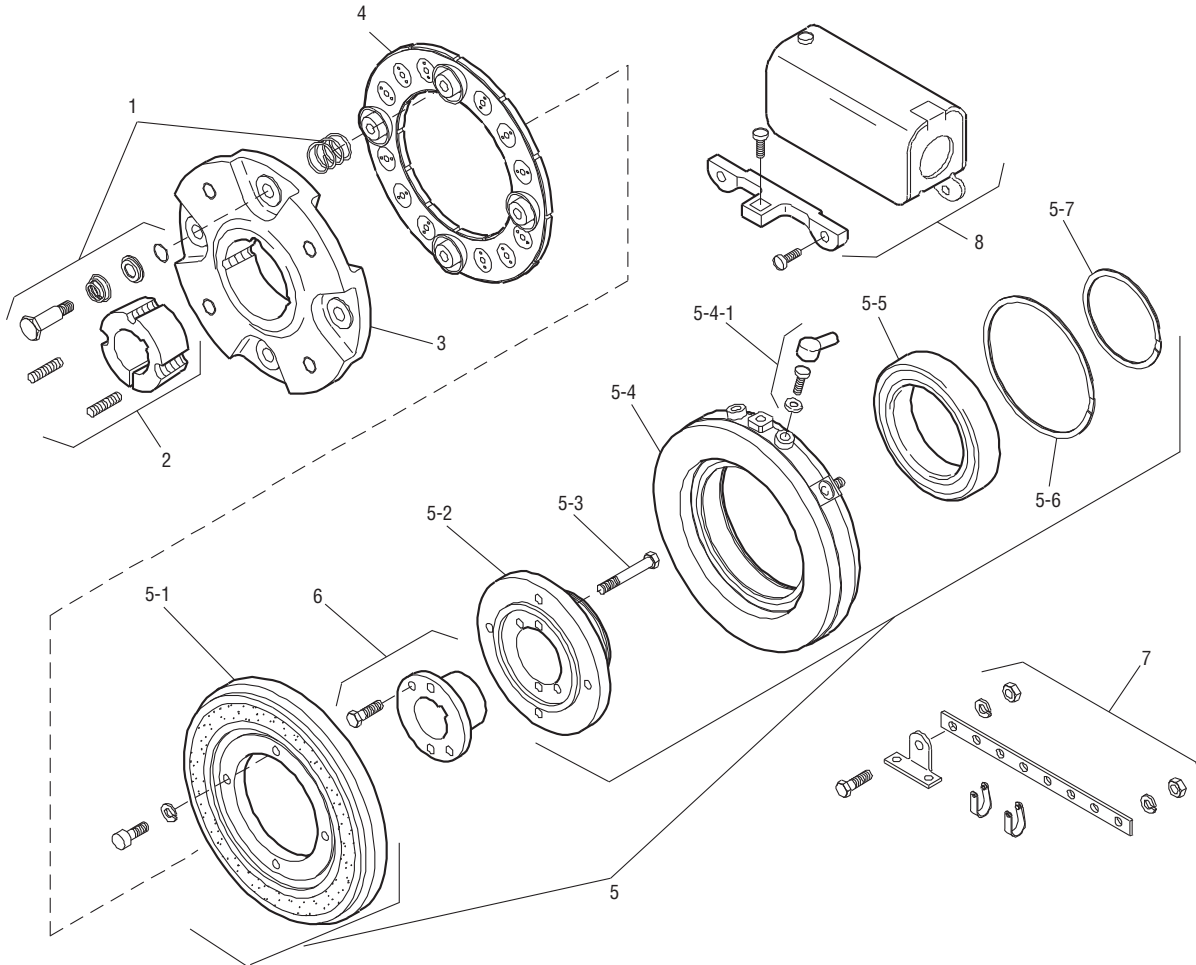
1. Armature mounting shaft to be concentric with rotor mounting shaft within .006 T.I.R.

All dimensions are nominal, unless otherwise noted.



## SFC-650 Clutch Coupling

## Bearing Mounted



Item	Description	Part Number	Qty.
1	Autogap Accessory	5181-101-010	4
2	Bushing*		
	1/2" to 1-5/8" Bore	180-0326 to 180-0344	1
3	Armature Hub	5207-541-002	1
4	Armature	5281-111-002	1
5	Field and Rotor Assembly		1
	6 Volt	5207-452-002	
	24 Volt	5207-452-005	
	90 Volt	5207-452-004	
5-1	Rotor Assembly	5281-751-001	1
5-2	Rotor Hub	540-0614	1
5-3	Reverse Mounting Accessory	5201-101-005	1
5-4	Field Assembly		1
	6 Volt	5281-451-002	
	24 Volt	5281-451-004	
	90 Volt	5281-451-005	
5-4-1	Terminal Accessory	5311-101-001	1
5-5	Ball Bearing	166-0104	1
5-6	Retainer Ring - Exterior	748-0004	1
5-7	Retainer Ring - Interior	748-0104	1
6	Bushing*		
	1/2" to 1-1/2" Bore	180-0002 to 180-0018	1
†7	Torque Arm Accessory	5207-101-003	1
8	Conduit Box	5200-101-010	1

\* See page 44 for specific part numbers.

† Optional - not included in price.

### How to Order:

1. Specify Bore Size of Item 2 and Item 6.
2. Specify Voltage for Item 5.

### Example:

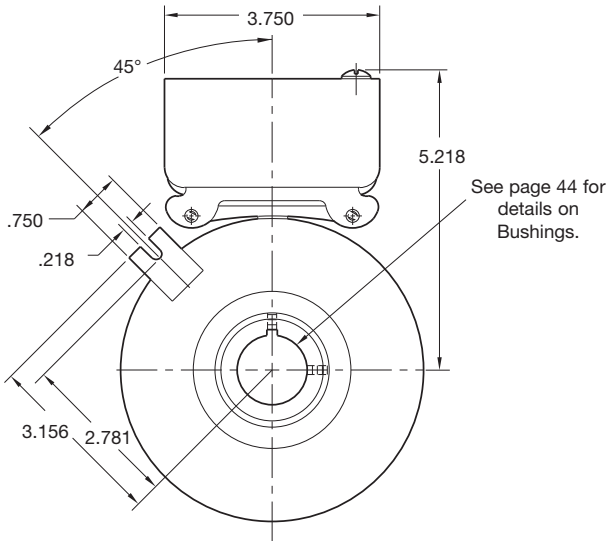
SFC-650 Clutch Coupling, Bearing Mounted per I-25729 - 90 Volt, 1" Bore

These units, when used in conjunction with the correct Warner Electric conduit box, meet the standards of UL508 and are listed under guide card #NMTR, file #59164.

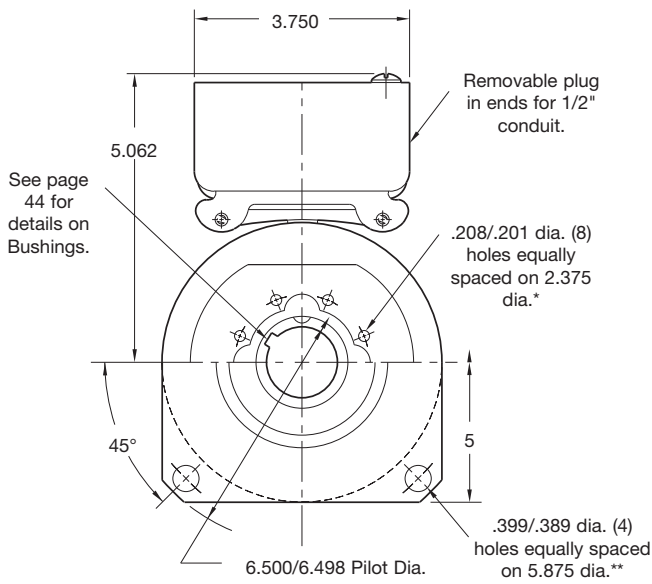
These units are CSA certified under file #LR11543.

**SFPBC-500 Clutch-Brake Coupling**  
**Normal Duty**

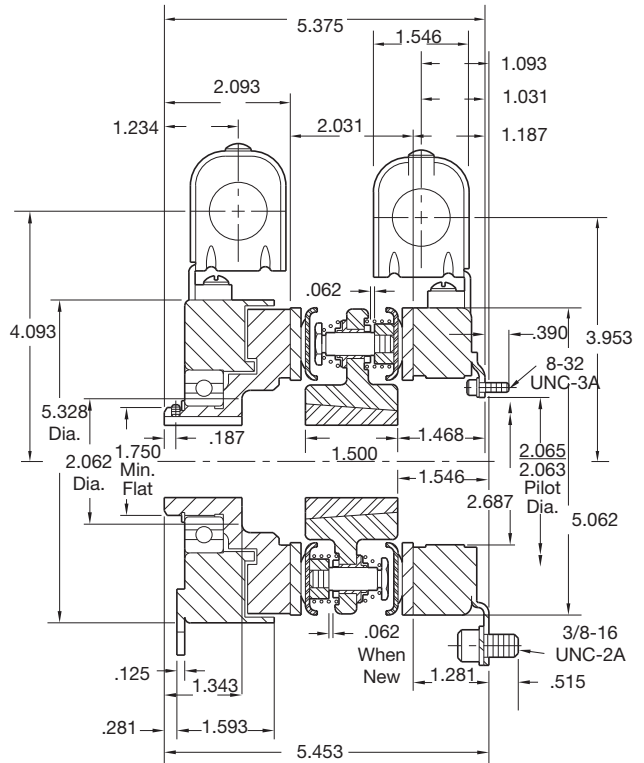
**Drawing I-25546**



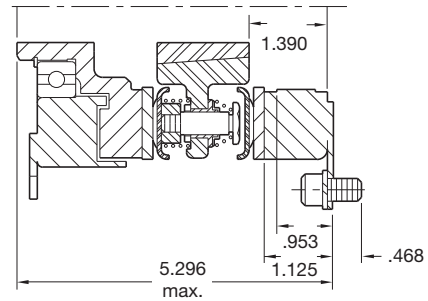
**Field View**



**Magnet View**



**Outside Mounted Offset Backing Plate**



**Outside Mounted Flush Backing Plate**

\* Mounting holes are within .010 of true position relative to pilot diameter.

\*\* Mounting holes are within .008 of true position relative to pilot diameter.

**Customer Shall Maintain:**

1. Squareness of brake mounting face with armature hub shaft within .006 T.I.R.
2. Concentricity of brake mounting pilot diameter with armature hub shaft within .010 T.I.R.
3. Concentricity of clutch magnet hub assembly shaft with armature hub shaft within .006 T.I.R.

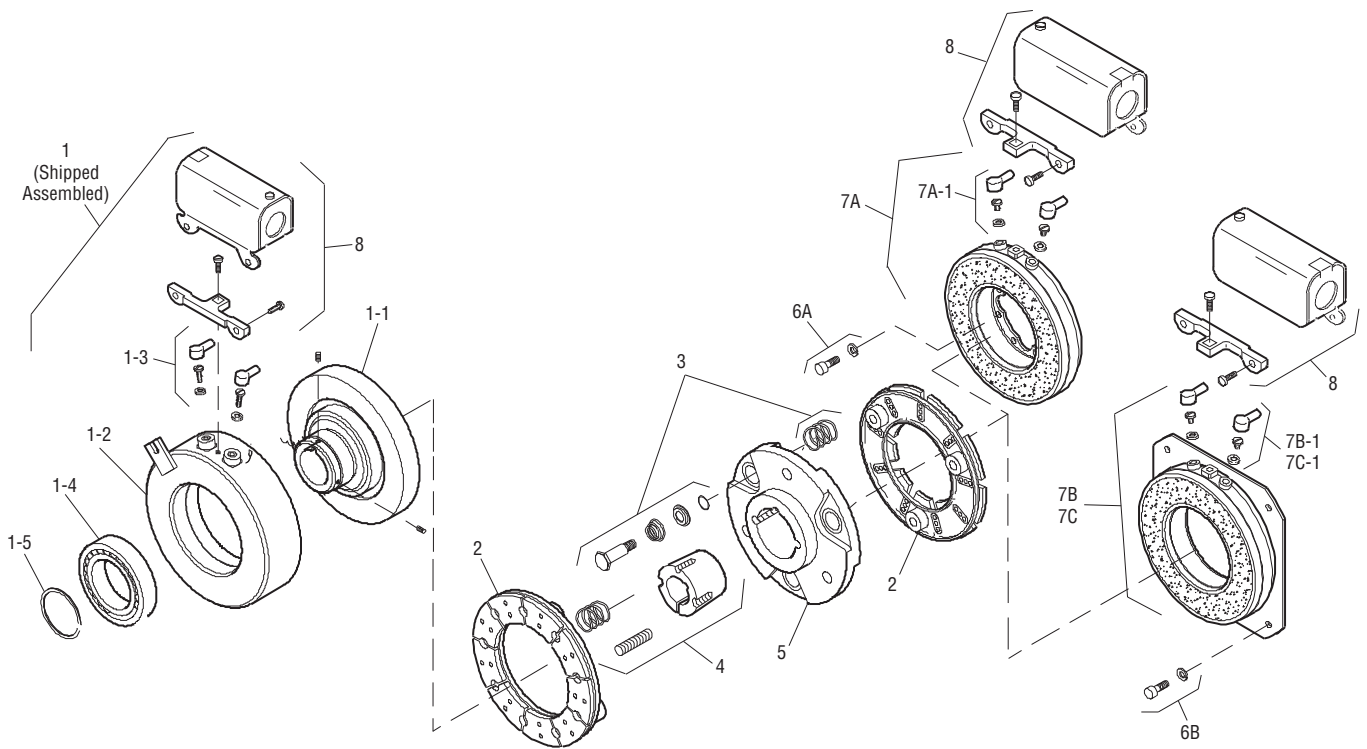
Shaft Size	.750 – 1.250
Static Torque Clutch	50 lb.ft.
Static Torque Brake	40 lb.ft.
Maximum Speed	4,000 RPM
Standard Voltage	D.C. 6, 24, 90





# SFPBC-500 Clutch/Brake Coupling

## Normal Duty



Item	Description	Part Number	Qty.
1	Field and Rotor Assembly		1
	6 Volt - 3/4" Bore	5200-452-002	
	24 Volt - 3/4" Bore	5200-452-004	
	90 Volt - 3/4" Bore	5200-452-005	
	6 Volt - 7/8" Bore	5200-452-008	
	24 Volt - 7/8" Bore	5200-452-010	
	90 Volt - 7/8" Bore	5200-452-011	
	90 Volt - 15/16" Bore	5200-452-017	
	6 Volt - 1" Bore	5200-452-020	
	24 Volt - 1" Bore	5200-452-022	
	90 Volt - 1" Bore	5200-452-023	
	6 Volt - 1-1/8" Bore	5200-452-026	
	24 Volt - 1-1/8" Bore	5200-452-028	
	90 Volt - 1-1/8" Bore	5200-452-029	
	6 Volt - 1-1/4" Bore	5200-452-032	
	90 Volt - 1-1/4" Bore	5200-452-035	
1-1	Rotor		1
	3/4" Bore	5200-751-002	
	7/8" Bore	5200-751-003	
	15/16" Bore	5200-751-004	
	1" Bore	5200-751-005	
	1-1/8" Bore	5200-751-006	
	1-1/4" Bore	5200-751-007	
1-2	Field		1
	6 Volt	5200-451-002	
	24 Volt	5200-451-004	
	90 Volt	5200-451-005	
1-3	Terminal Accessory	5311-101-001	1
1-4	Ball Bearing	166-0110	1
1-5	Retainer Ring	748-0002	1
2	Armature	5300-111-002	2
3	Autogap Accessory	5200-101-009	6
4	Bushing* - 1/2" to 1-1/4" Bore	180-0116 to 180-0128	1
5	Armature Hub	5300-541-004	1
6A	Mounting Accessory - I.M.	5102-101-001	2
6B	Mounting Accessory - O.M.	5300-101-008	1

Item	Description	Part Number	Qty.
7A	Magnet - I.M.		1
	6 Volt	5300-631-002	
	24 Volt	5300-631-003	
	90 Volt	5300-631-005	
7A-1	Terminal Accessory	5311-101-001	1
7B	Magnet - O.M. - Offset		1
	90 Volt	5300-631-014	
7B-1	Terminal Accessory	5311-101-001	1
7C	Magnet - O.M. - Flush		1
	6 Volt	5300-631-009	
	24 Volt	5300-631-010	
	90 Volt	5300-631-011	
7C-1	Terminal Accessory	5311-101-001	1
8	Conduit Box	5200-101-010	2

\* See page 44 for specific part numbers.

### How to Order:

1. Specify Bore Size for Item 1 and Item 4.
2. Specify Voltage for Item 1 and Item 7A, 7B or 7C.
3. Specify Inside Mounted for Item 7A and Outside Mounted (Offset) for Item 7B or Outside Mounted (Flush) for Item 7C.

### Example:

SFPBC-500 Clutch Brake Coupling per I-25546 - 90 Volt, Inside Mounted, 1" Bore

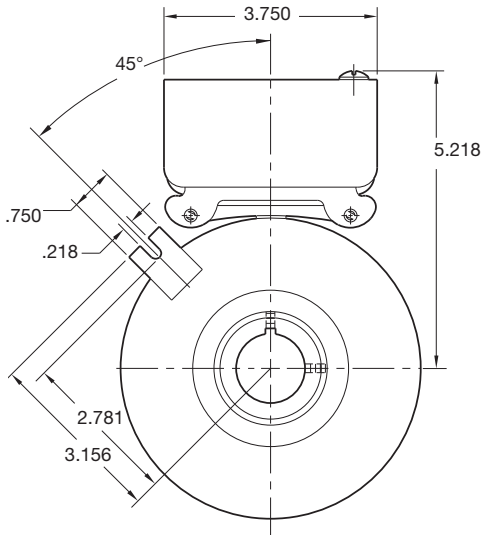
These units, when used in conjunction with the correct Warner Electric conduit box, meet the standards of UL508 and are listed under guide card #NMTR, file #59164.

These units are CSA certified under file #LR11543.

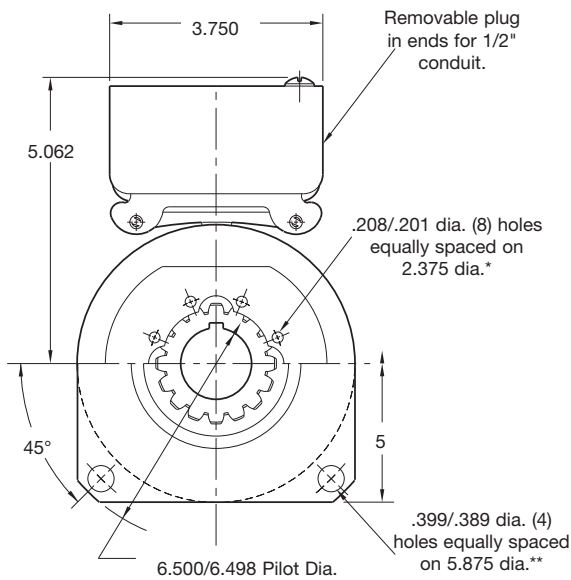


**SFPBC-500 Clutch-Brake Coupling  
 Heavy Duty**

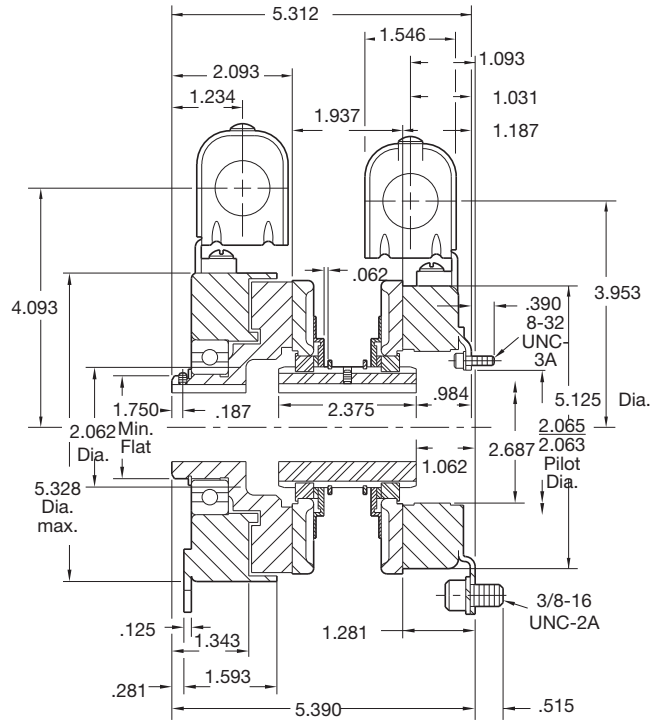
**Drawing I-25554**



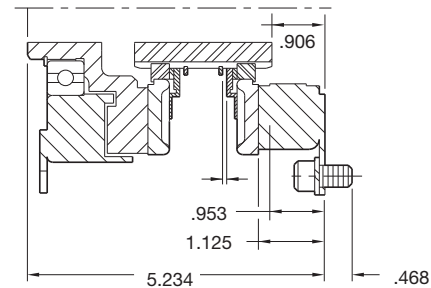
**Field View**



**Magnet View**



**Outside Mounted Offset Backing Plate**



**Outside Mounted Flush Backing Plate**

\* Mounting holes are within .010 of true position relative to pilot diameter.

\*\* Mounting holes are within .008 of true position relative to pilot diameter.

**Customer Shall Maintain:**

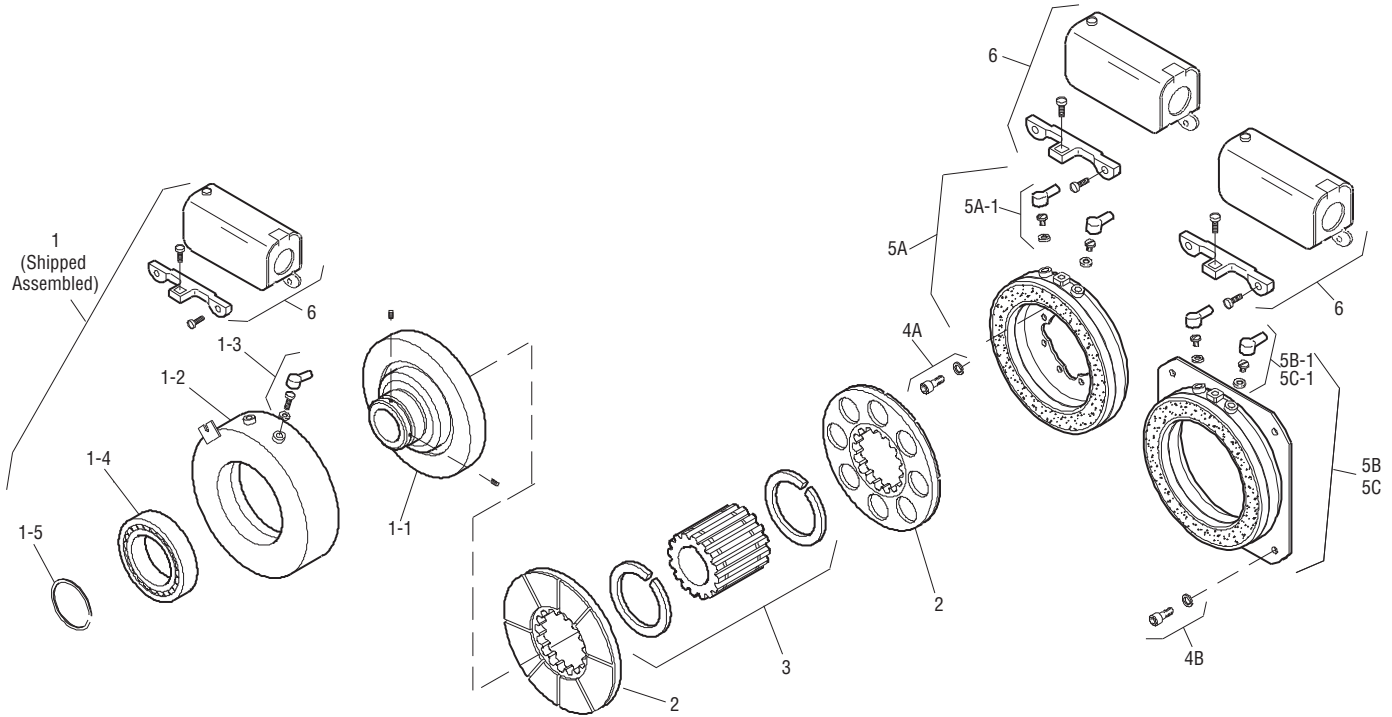
1. Squareness of brake mounting face with armature hub shaft within .006 T.I.R.
2. Concentricity of brake mounting pilot diameter with armature hub shaft within .010 T.I.R.
3. Concentricity of clutch magnet hub assembly shaft with armature hub shaft within .006 T.I.R.

Shaft Size	.750 – 1.250
Static Torque Clutch	50 lb.ft.
Static Torque Brake	40 lb.ft.
Maximum Speed	4,000 RPM
Standard Voltage	D.C. 6, 24, 90



# SFPBC-500 Clutch/Brake Coupling

Heavy Duty



Item	Description	Part Number	Qty.
1	Field and Rotor Assembly		1
	6 Volt - 3/4" Bore	5200-452-002	
	24 Volt - 3/4" Bore	5200-452-004	
	90 Volt - 3/4" Bore	5200-452-005	
	6 Volt - 7/8" Bore	5200-452-008	
	24 Volt - 7/8" Bore	5200-452-010	
	90 Volt - 7/8" Bore	5200-452-011	
	90 Volt - 15/16" Bore	5200-452-017	
	6 Volt - 1" Bore	5200-452-020	
	24 Volt - 1" Bore	5200-452-022	
	90 Volt - 1" Bore	5200-452-023	
	6 Volt - 1-1/8" Bore	5200-452-026	
	24 Volt - 1-1/8" Bore	5200-452-028	
	90 Volt - 1-1/8" Bore	5200-452-029	
	6 Volt - 1-1/4" Bore	5200-452-032	
	90 Volt - 1-1/4" Bore	5200-452-035	
1-1	Rotor		1
	3/4" Bore	5200-751-002	
	7/8" Bore	5200-751-003	
	15/16" Bore	5200-751-004	
	1" Bore	5200-751-005	
	1-1/8" Bore	5200-751-006	
	1-1/4" Bore	5200-751-007	
1-2	Field		1
	6 Volt	5200-451-002	
	24 Volt	5200-451-004	
	90 Volt	5200-451-005	
1-3	Terminal Accessory	5311-101-001	1
1-4	Ball Bearing	166-0110	1
1-5	Retainer Ring	748-0002	1
2	Armature	5230-111-002	2
3	Armature Hub		1
	3/4" Bore	5300-541-006	
	7/8" Bore	5300-541-007	
	15/16" Bore	5300-541-008	
	1" Bore	5300-541-009	
	1-1/8" Bore	5300-541-010	
	1-1/4" Bore	5300-541-011	

Item	Description	Part Number	Qty.
4A	Mounting Accessory - I.M.	5102-101-001	2
4B	Mounting Accessory - O.M.	5300-101-008	1
5A	Magnet - I.M.		1
	6 Volt	5300-631-002	
	24 Volt	5300-631-003	
	90 Volt	5300-631-005	
5A-1	Terminal Accessory	5311-101-001	1
5B	Magnet - O.M. - Offset		1
	90 Volt	5300-631-014	
5B-1	Terminal Accessory	5311-101-001	1
5C	Magnet - O.M. - Flush		1
	6 Volt	5300-631-009	
	24 Volt	5300-631-010	
	90 Volt	5300-631-011	
5C-1	Terminal Accessory	5311-101-001	1
6	Conduit Box	5200-101-010	2

### How to Order:

1. Specify Bore Size for Item 1 and Item 4.
2. Specify Voltage for Item 1 and Item 7A, 7B or 7C.
3. Specify Inside Mounted for Item 7A and Outside Mounted (Offset) for Item 7B or Outside Mounted (Flush) for Item 7C.

### Example:

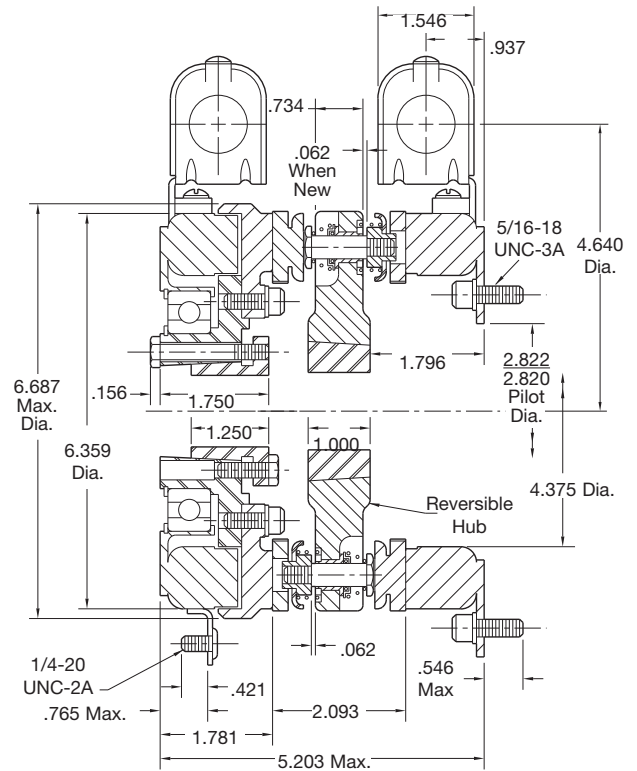
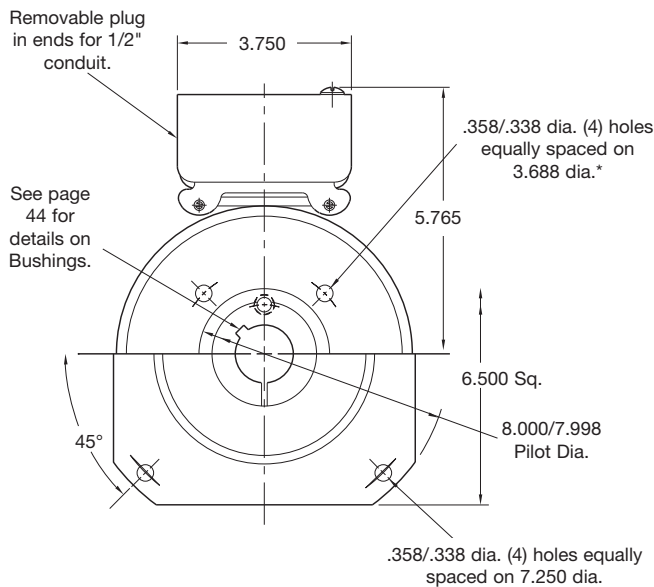
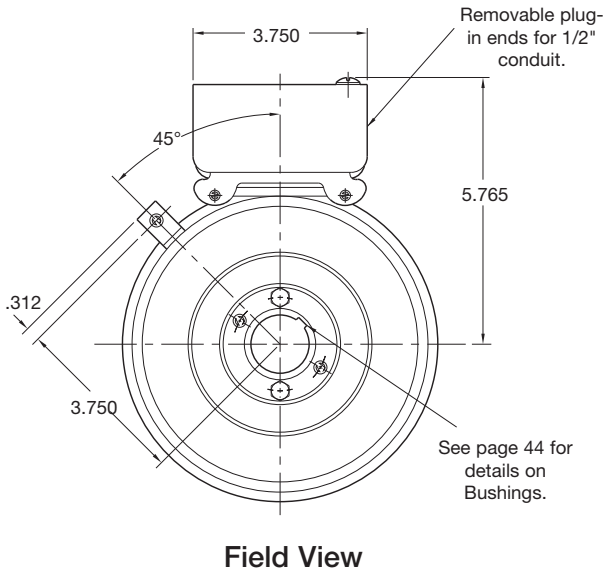
SFPBC-500 Clutch Brake Coupling per I-25554 - 90 Volt, Inside Mounted, 1" Bore

These units, when used in conjunction with the correct Warner Electric conduit box, meet the standards of UL508 and are listed under guide card #NMTR, file #59164.

These units are CSA certified under file #LR11543.

# SFPBC-650 Clutch-Brake Coupling

Drawing I-25751



\* Mounting holes are within .010 of true position relative to pilot diameter.

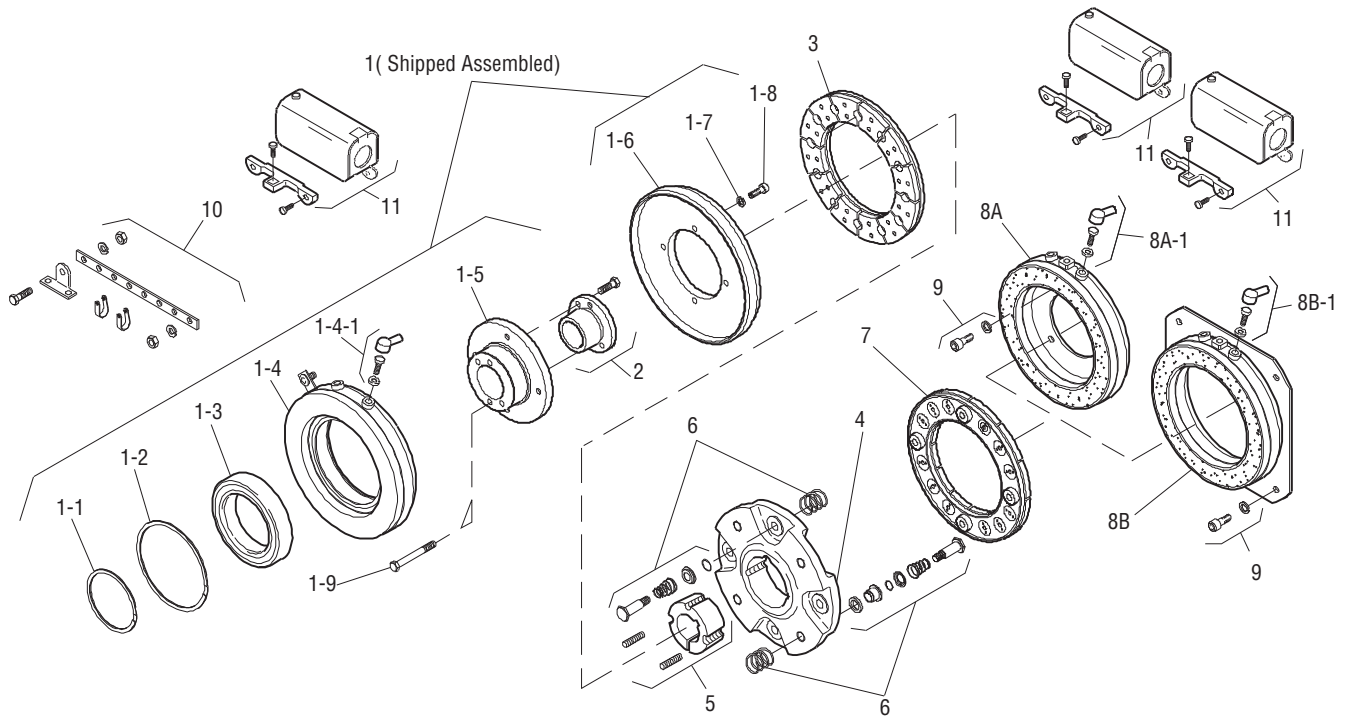
### Customer Shall Maintain:

1. Squareness of brake mounting face with armature hub shaft within .006 T.I.R.
2. Concentricity of brake mounting pilot diameter with armature hub shaft within .010 T.I.R.
3. Concentricity of clutch magnet hub assembly shaft with armature hub shaft within .006 T.I.R.

Shaft Size	.500 – 1.500
Static Torque Clutch	95 lb.ft.
Static Torque Brake	95 lb.ft.
Maximum Speed	3,600 RPM
Standard Voltage	D.C. 6, 24, 90



## SFPBC-650 Clutch/Brake Coupling



Item	Description	Part Number	Qty.
1	Field & Rotor Assembly		1
	6 Volt	5207-452-002	
	24 Volt	5207-452-005	
	90 Volt	5207-452-004	
1-1	Retainer Ring External	748-0004	1
1-2	Retainer Ring Internal	748-0104	1
1-3	Ball Bearing	166-0104	1
1-4	Field Assembly		1
	6 Volt	5281-451-002	
	24 Volt	5281-451-004	
	90 Volt	5281-451-005	
1-4-1	Terminal Accessory	5311-101-001	2
1-5	Rotor Hub	540-0614	1
1-6	Rotor Assembly	5281-751-001	1
1-7	Lockwasher	950-0355	4
1-8	Capscrew	797-0083	4
1-9	Reverse Mounting Accessory	5201-101-005	1
2	Bushing*		
	1/2" to 1-1/2" Bore	180-0002 to 180-0018	1
3	Armature Clutch	5281-111-002	1
4	Armature Hub	5207-541-002	1
5	Bushing*		
	1/2" to 1-5/8" Bore	180-0326 to 180-0344	1
6	Autogap Accessory	5181-101-010	8
7	Armature - Brake	5281-111-002	1
8A	Magnet - Inside Mounted		1
	6 Volt	5369-631-003	
	24 Volt	5369-631-006	
	90 Volt	5369-631-005	

Item	Description	Part Number	Qty.
8A-1	Terminal Accessory	5311-101-001	2
8B	Magnet - Outside Mounted		1
	6 Volt	5369-631-009	
	24 Volt	5369-631-012	
	90 Volt	5369-631-011	
8B-1	Terminal Accessory	5311-101-001	2
9	Mounting Accessory	5321-101-002	1
†10	Torque Arm Accessory	5207-101-003	1
11	Conduit Box	5200-101-010	2

\* See page 44 for specific part numbers.

† Optional - not included in price.

### How to Order:

1. Specify Voltage for Item 1 and Item 8.
2. Specify Bore Size for Item 2 and Item 5.
3. Specify Inside Mounted for Item 8A and Outside Mounted for Item 8B.

### Example:

SFPBC-650 per I-25751 - 90 Volt, 1" Bore

These units, when used in conjunction with the correct Warner Electric conduit box, meet the standards of UL508 and are listed under guide card #NMTR, file #59164. These units are CSA certified under file #LR11543.

## Bushing Part Numbers

### Browning Bushing

Shaft Size	Keyway Size	Bushing Number	
		Warner Electric	Browning
1/2	1/8 x 1/16	180-0002	H-1
9/16	1/8 x 1/16	180-0003	
5/8	3/16 x 3/32	180-0004	
11/16	3/16 x 3/32	180-0005	
3/4	3/16 x 3/32	180-0006	
13/16	3/16 x 3/32	180-0007	
7/8	3/16 x 3/32	180-0008	
15/16	1/4 x 1/8	180-0009	
1	1/4 x 1/8	180-0010	
1-1/6	1/4 x 1/8	180-0011	
1-1/8	1/4 x 1/8	180-0012	
1-3/16	1/4 x 1/8	180-0013	
1-1/4	1/4 x 3/16	180-0014	
1-5/16	5/16 x 7/32	180-0015	
1-3/8	5/16 x 7/32	180-0016	
1-7/16	3/8 x 1/4	180-0017	
1-1/2	3/8 x 7/32	180-0018	
3/4	1/2 x 3/8	180-0026	QI-1
13/16	1/2 x 3/8	180-0027	
7/8	1/2 x 3/8	180-0028	
15/16	1/2 x 3/8	180-0029	
1	1/2 x 3/8	180-0030	
1-1/16	1/2 x 3/8	180-0031	
1-1/8	1/2 x 3/8	180-0032	
1-3/16	1/2 x 3/8	180-0033	
1-1/4	1/2 x 3/8	180-0034	
1-5/16	1/2 x 3/8	180-0035	
1-3/8	1/2 x 3/8	180-0036	
1-7/16	1/2 x 3/8	180-0037	
1-1/2	1/2 x 3/8	180-0038	
1-9/16	1/2 x 3/8	180-0039	
1-5/8	1/2 x 3/8	180-0040	
1-11/16	1/2 x 3/8	180-0041	
1-3/4	1/2 x 3/8	180-0042	
1-13/16	1/2 x 3/8	180-0043	
1-7/8	1/2 x 3/8	180-0044	
1-15/16	1/2 x 3/8	180-0045	
2	1/2 x 3/8	180-0046	QI-2
2-1/16	1/2 x 3/8	180-0047	
2-1/8	1/2 x 3/4	180-0048	
2-3/16	1/2 x 23/32	180-0049	
2-1/4	1/2 x 11/16	180-0050	
2-5/16	5/8 x 5/16	180-0051	
2-3/8	5/8 x 5/16	180-0052	
2-7/16	5/8 x 5/16	180-0053	
2-1/2	5/8 x 5/16	180-0054	
2-9/16	5/8 x 5/16	180-0055	
2-5/8	5/8 x 5/16	180-0056	
2-11/16	5/8 x 5/16	180-0057	

### Dodge Bushing

Shaft Size	Keyway Size	Bushing Number		
		Warner Electric	Dodge	
1/2	1/8 x 1/16	180-0101	1210	
9/16	1/8 x 1/16	180-0102		
5/8	3/16 x 3/32	180-0103		
11/16	3/16 x 3/32	180-0104		
3/4	3/16 x 3/32	180-0105		
13/16	3/16 x 3/32	180-0106		
7/8	3/16 x 3/32	180-0107		
5/16	1/4 x 1/8	180-0108		
1	1/4 x 1/8	180-0109		
1-1/16	1/4 x 1/8	180-0110		
1-1/8	1/4 x 1/8	180-0111		
1-3/16	1/4 x 1/8	180-0112		
1-1/4	1/4 x 1/8	180-0113		
1/2	1/8 x 1/16	180-0116		1215
9/16	1/8 x 1/16	180-0117		
5/8	3/16 x 3/32	180-0118		
11/16	3/16 x 3/32	180-0119		
3/4	3/16 x 3/32	180-0120		
13/16	3/16 x 3/32	180-0121		
7/8	3/16 x 3/32	180-0122		
15/16	1/4 x 1/8	180-0123		
1	1/4 x 1/8	180-0124		
1-1/16	1/4 x 1/8	180-0125		
1-1/8	1/4 x 1/8	180-0126		
1-3/16	1/4 x 1/8	180-0127		
1-1/4	1/4 x 1/8	180-0128		
1/2	1/8 x 1/16	180-0131	1615	
9/16	1/8 x 1/16	180-0132		
5/8	3/16 x 3/32	180-0133		
11/16	3/16 x 3/32	180-0134		
3/4	3/16 x 3/32	180-0135		
13/16	3/16 x 3/32	180-0136		
7/8	3/16 x 3/32	180-0137		
15/16	1/4 x 1/8	180-0138		
1	1/4 x 1/8	180-0139		
1-1/16	1/4 x 1/8	180-0140		
1-1/8	1/4 x 1/8	180-0141		
1-3/16	1/4 x 1/8	180-0142		
1-1/4	1/4 x 1/8	180-0143		
1-5/16	5/16 x 5/32	180-0144		
1-3/8	5/16 x 5/32	180-0145		
1-7/16	3/8 x 3/16	180-0146		
1-1/2	3/8 x 3/16	180-0147		
1-9/16	3/8 x 3/16	180-0148		
1-5/8	3/8 x 3/16	180-0149		
1/2	1/8 x 1/16	180-0155	2012	
9/16	1/8 x 1/16	180-0156		
5/8	3/16 x 3/32	180-0157		
11/16	3/16 x 3/32	180-0158		
3/4	3/16 x 3/32	180-0159		
13/16	3/16 x 3/32	180-0160		
7/8	3/16 x 3/32	180-0161		
15/16	1/4 x 1/8	180-0162		
1	1/4 x 1/8	180-0163		
1-1/16	1/4 x 1/8	180-0164		
1-1/8	1/4 x 1/8	180-0165		
1-3/16	1/4 x 1/8	180-0166		
1-1/4	1/4 x 1/8	180-0167		

## Bushing Part Numbers

### Dodge Bushing

Shaft Size	Keyway Size	Bushing Number	
		Warner Electric	Dodge
1/2	1/8 x 1/16	180-0326	1610
9/16	1/8 x 1/16	180-0327	
5/8	3/16 x 3/32	180-0328	
11/16	3/16 x 3/32	180-0329	
3/4	3/16 x 3/32	180-0330	
13/16	3/16 x 3/32	180-0331	
7/8	3/16 x 3/32	180-0332	
15/16	1/4 x 1/8	180-0333	
1	1/4 x 1/8	180-0334	
1-1/16	1/4 x 1/8	180-0335	
1-1/8	1/4 x 1/8	180-0336	
1-3/16	1/4 x 1/8	180-0337	
1-1/4	1/4 x 1/8	180-0338	
1-5/16	5/16 x 5/32	180-0339	
1-3/8	5/16 x 5/32	180-0340	
1-7/16	3/8 x 3/16	180-0341	
1-1/2	3/8 x 3/16	180-0342	
1-9/16	3/8 x 3/16	180-0343	
1-5/8	3/8 x 3/16	180-0344	
1/2	1/8 x 1/16	180-0410	1008
9/16	1/8 x 1/16	180-0411	
5/8	3/16 x 3/32	180-0412	
11/16	3/16 x 3/32	180-0413	
3/4	3/16 x 3/32	180-0414	
13/16	3/16 x 3/32	180-0415	
7/8	3/16 x 3/32	180-0416	
15/16	1/4 x 1/16	180-0417	
1	1/4 x 1/16	180-0418	
1/2	1/8 x 1/16	180-0421	
9/16	1/8 x 1/16	180-0422	
5/8	3/16 x 3/32	180-0423	
11/16	3/16 x 3/32	180-0424	
3/4	3/16 x 3/32	180-0425	
13/16	3/16 x 3/32	180-0426	
7/8	3/16 x 3/32	180-0427	
15/16	1/4 x 1/16	180-0428	
1	1/4 x 1/16	180-0429	
1-1/16	1/4 x 1/8	180-0430	
1-1/8	1/4 x 1/8	180-0431	
1-3/16	1/4 x 1/8	180-0432	
1-1/4	1/4 x 1/8	180-0433	
1-5/16	15/16 x 5/32	180-0434	
1-3/8	15/16 x 5/32	180-0435	



## Warranty

Warner Electric LLC warrants that it will repair or replace (whichever it deems advisable) any product manufactured and sold by it which proves to be defective in material or workmanship within a period of one (1) year from the date of original purchase for consumer, commercial or industrial use.

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