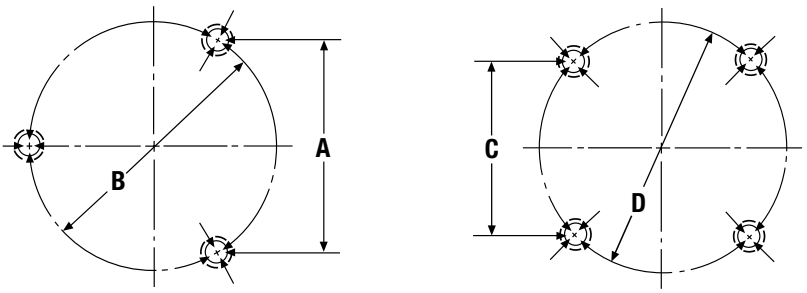
# Drive Pin Mounting

**Machining instructions for gear, sprocket or pulley**




| Unit Size | A | B | C | D |
|---|---|---|---|---|
| 500 | 3.356 ± .001 | 3.875 ± .001 | | |
| 650 | | | 3.624 ± .001 | 5.125 ± .001 |
| 825 | 3.085 ± .001 | 3.563 ± .001 | | |
| 1000 | 4.548 ± .002 | 5.252 ± .002 | | |
| 1225 | | | 4.155 ± .002 | 5.877 ± .002 |
| 1525 | | | 6.010 ± .002 | 8.500 ± .002 |

1. Chordal dimensions must be held for all chords between pin holes.

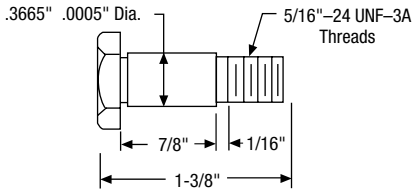
### Size 825-1525

2. Drill 27/64 inch diameter holes to a sufficient depth and tap for 1/2-13 UNC-3B, one inch minimum full threads. Pin holes must be concentric with mounting shaft within .010 T.I.R. and parallel with mounting shaft within .002 T.I.R., surface that pins seat against to be square with mounting shaft within .004 T.I.R.
3. Ream .500/.501 to a 3/8 inch depth and to be concentric with tapped holes.

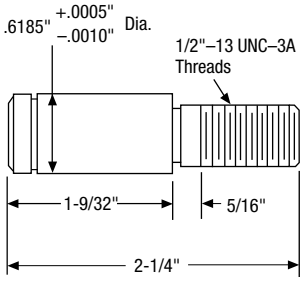
### Size 500 and 650

4. Sleeve bearings (oilite bronze) must be provided in the holes of pulley or hub with an I.D. of .376 ± .001 at the chordal and bolt circle dimensions shown above.
5. The drive pin holes must be concentric with mounting shaft within .006 T.I.R. and parallel with mounting shaft within .002 T.I.R.

**Size 500-650 Drive Pin**




**Size 825-1525 Drive Pin**



# Autogap® Application

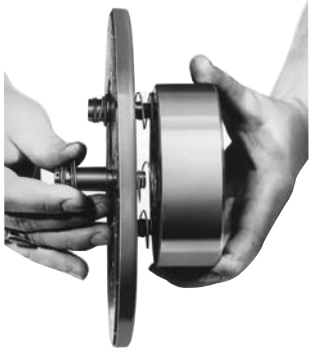
### Autogaps – When Not To Use

The Autogap is a system designed to separate the armature from the friction face. This spacing is automatic and occurs prior to total magnetic decay, effectively eliminating noise by preventing drag. Although Autogaps are desirable and necessary in the vast majority of applications, they should be removed when using over-excitation controls for fast response and high accuracy or when very soft starts and stops with low voltage to the clutch or brake are required. Removing the Autogap assembly closes the gap between the armature and magnet or field, resulting in reduced engagement time, improved repeatability, and the ability to engage the armature at very low voltage settings required for very soft starts and stops.

### Pin Drive Applications

On pin drive armatures, the Autogap can be removed by taking out the entire assembly except the armature backup spring, which should remain in place to slightly preload the armature against the friction face. On Electro-Modules, the Autogap device is contained within the retaining cup screwed onto each armature.

To disable the assembly, only the Autogap spring should be removed and the balance of the cup contents should be reinstalled. With spline drives, the Autogap system must first be removed and then the detent spring should be placed directly behind the armature to prevent spinback from vibration.



### Heavy Duty Spline Drive Autogaps

Warner Electric's patented Autogap system is the reason Warner Electric clutches and brakes require no adjustment and offer consistent performance throughout the life of the unit. Without a wear take-up system, armature and magnet or rotor wear will eventually prevent the magnet coil from "pulling in" the armature and the clutch or brake will fail to respond when energized. A wear compensating system which maintains a constant, optimal space between the armature and the magnet or rotor is necessary to achieve consistent performance without manual adjustment.

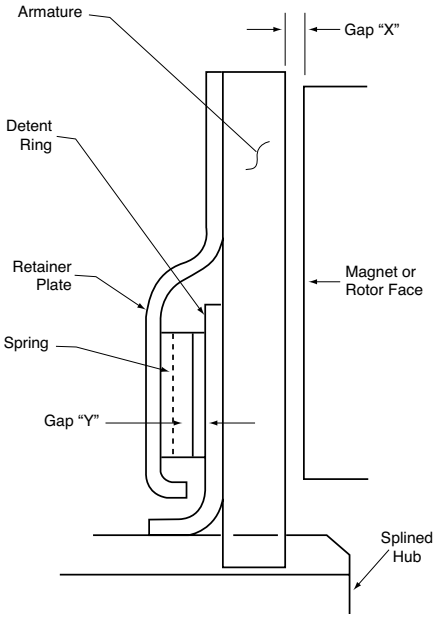
Spline drive hubs which utilize the Autogap system pictured are found on all Warner Electric heavy duty Custom Design clutches and brakes, as well as Electro Modules, Electro Packs and Advanced Technology (AT) clutches and brakes.

### How They Work

As material wears off the magnet or rotor and armature during operation, gap "X" increases. When the clutch or brake is energized, the armature is magnetically pulled to the magnet or rotor. If gap "X" is larger than gap "Y", the lip on the retainer plate will push on the detent ring overcoming the grip force between the detent ring and outside diameter of the splined hub, moving the detent ring. This adjusts gap "X" to be the same as gap "Y", and will maintain that gap over the life of the unit. When the unit is de-energized, the spring pushes against the detent ring and the retainer plate, which is secured to the armature. The armature assembly automatically moves away from the magnet or rotor by gap "X" each time the clutch or brake is cycled.

### How to Set

If the armature does not engage when the unit is energized, gap "X" has increased to a point where the magnetic pull cannot overcome the excess gap.




This can happen with excess vibration or mishandling. To reset the autogap, move the armature assembly toward the magnet or rotor. This can be done by 1) or 2) below:

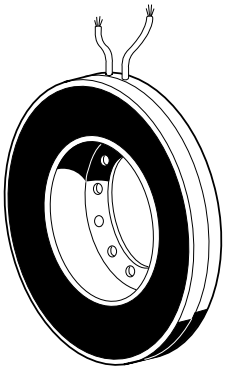
1) Preferable – If an adjustable power supply is available, voltage can be increased for a short time to overcome the excess gap and pull the armature in to reset the gap.

2) If increased voltage is not available or is inadequate, the armature must be manually pushed toward the magnet or rotor until available voltage will pull it in. Slots are provided in electromodule fans for access to the armatures. When pushing the armature, the force must be applied against the retainer plate outer ring and not against the detent ring itself.

If the detent ring has been moved too close to the magnet or rotor, reducing gap "X" and causing drag, the armature must be manually moved away from the unit and then be readjusted as described above.

## LK Friction Material

Warner Electric offers a special low coefficient (LK) friction material for many standard clutches and brakes. Since two friction materials are available, a comparison of LK to standard is in order.



Since LK has a lower coefficient of friction, lower torque capability results. With LK facing, static torque capacity is only about 60% of catalog rating for any given size. So if a specific size clutch or brake is chosen for its rated torque capacity and LK facings are substituted for standard, a larger size unit will be needed to provide the same torque.

If lower torque ratings can be considered a disadvantage, what are the advantages of LK material? The first is longer life. An ideal situation for LK use is a constant slip application which requires a large unit for high heat dissipation. Another feature of LK is "softer" pickup. Since more slippage will occur, engagement time is increased and shock is reduced. LK material will also reduce engagement noise, so it can be successfully employed where high noise levels are a problem. It is the standard facing in all tension brakes and motor brake magnets. LK has been a popular special feature for many years, enabling us to offer it in the following sizes with no special handling charge. Delivery can usually be made in 30 days, and quite often immediately from our stock. No hard and fast rules can be written to cover LK application, but this option can be used to solve application problems. For price, delivery, and further information, contact your Warner Electric Distributor.

LK can be added to any magnet or rotor. For those not shown below added lead time and cost will be required. Consult factory for additional details.

### Stationary Field Clutches

| Description | Page No. | Rotor Part No.- LK | Replaces Standard Rotor |
|---|---|---|---|
| SF-825, F.M., N.D. | 36 | 5201-751-007 | 5201-751-003 |
| SF-825, F.M., H.D. | 40 | 5201-751-007 | 5201-751-003 |
| SFC-825, F.M. | 114 | 5201-751-007 | 5201-751-003 |
| SF-825, B.M., N.D. | 38 | 5201-751-014 | 5201-751-008 |
| SF-825, B.M., H.D. | 42 | 5201-751-014 | 5201-751-008 |
| SFC-825, B.M. | 116 | 5201-751-014 | 5201-751-008 |
| SF-1000, F.M., N.D. | 44 | 5202-751-007 | 5202-751-003 |
| SF-1000, F.M., H.D. | 48 | 5202-751-007 | 5202-751-003 |
| SFC-1000, F.M. | 118 | 5202-751-007 | 5202-751-003 |
| SF-1000, B.M., N.D. | 46 | 5202-751-007 | 5202-751-003 |
| SF-1000, B.M., H.D. | 50 | 5202-751-007 | 5202-751-003 |
| SFC-1000, B.M. | 120 | 5202-751-007 | 5202-751-003 |
| SF-1225, F.M., N.D. | 52 | 5203-751-004 | 5203-751-001 |
| SF-1225, F.M., H.D. | 54 | 5203-751-004 | 5203-751-001 |
| SFC-1225, F.M. | 122 | 5203-751-004 | 5203-751-001 |
| SF-1225, B.M., N.D. | 56 | 5203-751-004 | 5203-751-001 |
| SF-1225, B.M., H.D. | 58 | 5203-751-004 | 5203-751-001 |
| SFC-1225, B.M. | 124 | 5203-751-004 | 5203-751-001 |
| SF-1525, F.M., N.D. | 60 | 5204-751-004 | 5204-751-002 |
| SF-1525, F.M., H.D. | 62 | 5204-751-004 | 5204-751-002 |
| SFC-1525, F.M. | 126 | 5204-751-004 | 5204-751-002 |
| SF-1525, B.M., N.D. | 64 | 5204-751-004 | 5204-751-002 |
| SF-1525, B.M., H.D. | 66 | 5204-751-004 | 5204-751-002 |
| SFC-1525, B.M. | 128 | 5204-751-004 | 5204-751-002 |

### Primary Clutches

| Description | Page No. | Magnet Part No.- LK | Replaces Standard Magnet No. |
|---|---|---|---|
| PC-825, N.D., 90V | 74 | 5301-631-011 | 5301-631-005 |
| PC-825, H.D., 90V | 76 | 5301-631-011 | 5301-631-005 |
| PCC-825, 90V | 138 | 5301-631-011 | 5301-631-005 |
| PC-1000, N.D., 90V | 78 | 5302-631-001 | 5302-631-005 |
| PC-1000, H.D., 90V | 80 | 5302-631-001 | 5302-631-005 |
| PCC-1000, 90V | 140 | 5302-631-001 | 5302-631-005 |
| PC-1225, N.D., 90V | 82 | 5303-631-001 | 5303-631-008 |
| PC-1225, H.D., 90V | 84 | 5303-631-001 | 5303-631-008 |
| PCC-1225, 90V | 142 | 5303-631-001 | 5303-631-008 |
| PC-1525, N.D., 90V | 86 | 5304-631-002 | 5304-631-010 |
| PC-1525, H.D., 90V | 88 | 5304-631-002 | 5304-631-010 |
| PCC-1525, 90V | 144 | 5304-631-002 | 5304-631-010 |

### Primary Brakes

| Description | Page No. | Magnet Part No.- LK | Replaces Standard Magnet No. |
|---|---|---|---|
| PB-500, N.D., I.M., 90V | 154 | 5300-631-020 | 5300-631-005 |
| PB-500, N.D., O.M., 90V | 154 | 5300-631-025 | 5300-631-011 |
| PB-500, H.D., I.M., 90V | 156 | 5300-631-020 | 5300-631-005 |
| PB-500, H.D., O.M., 90V | 156 | 5300-631-025 | 5300-631-011 |
| PB-825, N.D., I.M., 90V | 160 | 5311-631-011 | 5311-631-004 |
| PB-825, N.D., O.M., 90V | 160 | 5311-631-012 | 5311-631-008 |
| PB-825, H.D., I.M., 90V | 162 | 5311-631-011 | 5311-631-004 |
| PB-825, H.D., O.M., 90V | 162 | 5311-631-012 | 5311-631-008 |
| PB-1000, N.D., I.M., 90V | 164 | 5312-631-001 | 5312-631-006 |
| PB-1000, N.D., O.M., 90V | 164 | 5312-631-002 | 5312-631-012 |
| PB-1000, H.D., I.M., 90V | 166 | 5312-631-001 | 5312-631-006 |
| PB-1000, H.D., O.M., 90V | 166 | 5312-631-002 | 5312-631-012 |
| PB-1225, N.D., I.M., 90V | 168 | 5313-631-001 | 5313-631-007 |
| PB-1225, N.D., O.M., 90V | 168 | 5313-631-002 | 5313-631-011 |
| PB-1225, H.D., I.M., 90V | 170 | 5313-631-001 | 5313-631-007 |
| PB-1225, H.D., O.M., 90V | 170 | 5313-631-002 | 5313-631-011 |
| PB-1525, N.D., I.M., 90V | 172 | 5314-631-001 | 5314-631-005 |
| PB-1525, H.D., I.M., 90V | 174 | 5314-631-001 | 5314-631-005 |

### Clutch/Brake Combinations

For all clutch/brake combinations, for magnets other than those listed below, use the corresponding LK magnets from the PC and PB sections at left and above.

| Description | Page No. | Replaces Magnet Part No.- LK | Replaces Standard Magnet No. |
|---|---|---|---|
| PCB-1225/1000, N.D., 90V | 196 | 5333-631-013 | 5333-631-009 |
| PCB-1225/1000, H.D., 90V | 198 | 5333-631-013 | 5333-631-009 |

### How to Order:

Specify "LK facing" and substitute LK part number for standard part number.

## Theory of Operation

Warner Electric designed product uses electromagnetism to engage the clutches and brakes. When electric current is passed through a wire, lines of magnetic flux are created. Warner Electric uses coils of wire embedded into a C-shaped iron "shell". When the electrical current is passed through the coil the shell is magnetized with the magnetism concentrating at the ends of the shell. These are also called "poles". When a steel or iron plate is close to the poles it is attracted to them, and the two pieces clamp together. To accomplish stable operation, DC power is required for electric clutches and brakes.

In a PC type clutch or a brake, a cross section will appear like Figure 1. When DC power is applied a magnetic field causes the armature to clamp against the magnet. Since magnetism is the engaging force, it is appropriate in Warner Electric designs for the metal poles of the magnet to engage directly against the metal plate of the armature. Friction material is included in industrial clutches and brakes to provide longer life, greater heat dissipation and to reduce noise during engagement.

SF style clutches (Figure 2) have a stationary field and rotor in place of the magnet. They function in a similar manner. When current is applied to the field coil, magnetism is created. The magnetism travels to the rotor face where it engages the armature.

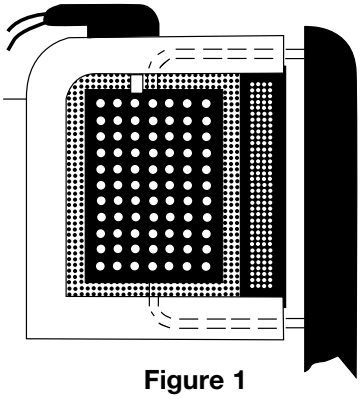


**Figure 1**

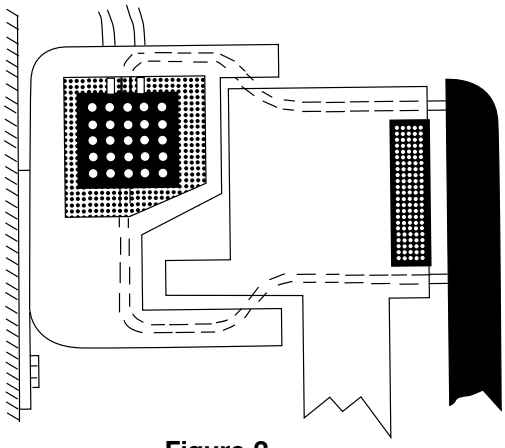


**Figure 2**