

# Instruction Manual for DODGE® SL & BSL Series Electric Clutches

These instructions must be read thoroughly before installing or operating this product.



## PREASSEMBLY INSPECTION

1. All parts should be examined for any damage during the shipping and handling process. Measurements should be taken to ensure parts meet mounting requirements. All parts must be clean and free of any foreign material before attempting assembly.

## INSTALLATION OF KEY

2. Install key in shaft. Key should fit keyseat with a tight fit on the sides and slight clearance over the key.

## CLUTCH INSTALLATION

**WARNING: To ensure that drive is not unexpectedly started, turn off and lock out or tag power source before proceeding. Failure to observe these precautions could result in bodily injury.**

3. Mount the drive component (sprocket, gear or sheave) to the armature according to manufacturer's recommendation. Care should be taken to ensure the component is mounted square with the hub so as to minimize runout.
4. Slide the armature hub with drive component and rotor and field assembly over the drive shaft. Make sure the armature hub spins freely without binding on the shaft. Tighten the setscrews on the rotor and field assembly. See recommended tightening torques in Table 1.

Table 1 - Recommended Tightening Torques	
Setscrew Size	Recommended Tightening Torque (In.-Lbs.)
#4	5.0
#5	9.5
#6	9.5
#8	19.4
#10	33.5
1/4"	78.0

5. Pin anti-rotation tab on field assembly. Do not bolt tab to a bulkhead as it may bind field bearings.
6. Wire field to control power supply. DODGE power supplies are available with a wiring diagram showing the correct electrical connections.

**WARNING: Because of the possible danger to persons(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Baldor Electric Company nor are the responsibility of Baldor Electric Company. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.**

7. Burnish if desired. See Burnishing Procedure for details. SL/BSL Series clutches are not supplied preburnished.
8. After unit has operated for short period, re-check air gaps, drive component mounting, setscrew torques.

Air gaps are pre-set at the factory. Normal operating air gaps should range from 0.005" to .020".

Clutch fields are bearing mounted for easy installation. Properly sized sprockets, gears or sheaves may be pressed and/or setscrew mounted to the armature hub.

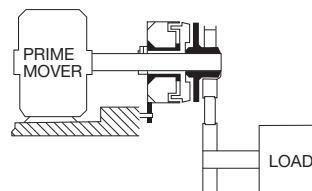


Figure 1 - SL/BSL Series Clutches

## BURNISHING PROCEDURE

For consistent engagement and full rated torque it is necessary to burnish the clutch. Unless it is required to accelerate a large inertia load, the normal slip that will occur when the load is engaged is frequently sufficient to cause the unit to become burnished. DODGE clutches typically will produce 50%-90% of their rated torque "out-of-box" without burnishing. Customer should determine if "out-of-box" torques are adequate for application as torque will automatically improve with normal cycling. If burnishing is required, use the following procedure.

Burnishing is a wearing-in or mating process to ensure that the rated torque will be obtained from the individual unit. Care must be taken to prevent contamination of the friction faces with oil or dirt particles during the burnishing process.

1. If possible, burnish units in their final application or location to ensure alignment of the mated parts.
2. If units cannot be burnished in final application, mount units in a test stand.
3. Using a filtered DC power supply, energize unit at 100% of rated coil voltage for 5 seconds maximum (this assures proper armature engagement against magnet assembly). Then reduce voltage to 30%-40% of rated coil voltage.
4. Rotate the clutch armature at suggested RPM (see Table 2), while holding the clutch magnet stationary to obtain a forced slip while the unit is energized.

Table 2 - Rotation Torque		
Unit Size	Burnishing RPM $\pm 10\%$	Standard Static Torque Rating
08	250	2.5 Inch-Lbs.
11	250	6 Inch-Lbs.
15	190	10 Inch-Lbs.
17	160	15 Inch-Lbs.
19	150	25 Inch-Lbs.
22	130	50 Inch-Lbs.
26	60	80 Inch-Lbs.
30	50	125 Inch-Lbs.
42	30	250 Inch-Lbs.



- De-energize the unit after a three (3) minute forced slip. Do not prolong burnish beyond a three (3) minute duration. Long burnish time will cause excessive heat buildup at the friction faces resulting in poor performance.
- Measure the static (or break away) torque of the unit with both friction members stationary at rated unit voltage.
- Static torque should be at the rating shown in Table 2. If the unit does not produce this rating, repeat steps 3, 4 & 5 after a cool down period of five (5) minutes, until unit comes up to the rated torque.

Series	Rated Static Torque Lb.-In.	Torque Build-Up Time - Milliseconds (MS)		Torque Deay Time - MS
		80% of Rated Torque	100% of Rated Torque	10% of Rated Torque
08	2.5	4.8	7.5	6.6
11	6	7.2	10.5	11
15	10	9	12	17
17	15	10	14	14
19	25	33	48	35
22	50	27	42	20
26	80	22	40	30
30	125	43	60	36
42	250	45	70	50

#### NOTES:

- Torque decay time is dependent on the type of arc suppression circuit used. Decay times shown in table assumes use of a diode in parallel with the coil for arc suppression. If no arc suppression is used, torque will decay almost instantly.
- Actual response times depend on several factors such as inertia being accelerated, speed, load torque, and type of switching used.
- Time to full torque can be shortened by using an overexcited DC power supply intended for this purpose.
- The time to full torque is also dependent on the voltage supply. If the clutch is underpowered (low voltage), a decrease in torque will result. The clutch should be sized based upon the worst case voltage condition. The DC voltage supply should be filtered full wave for highest efficiency. Half wave DC voltage will result in lower torque output.

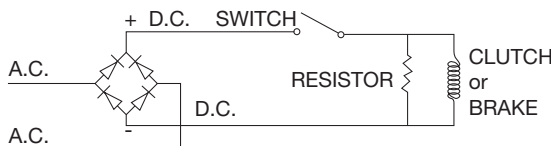
#### ARC SUPPRESSION

When the clutch is de-energized, a reverse voltage is generated in the coil. The reverse voltage can be very high and may cause damage to the coil and switch in the circuit. To protect the coil and switch the voltage should be suppressed using an arc suppression circuit. Arc suppression does not affect the clutch engagement time.

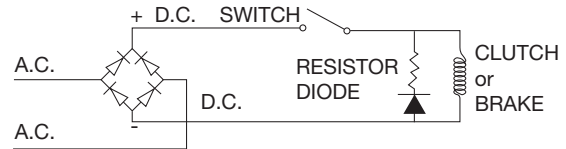
#### RESISTOR/DIODE/ZENER DIODE—

##### Normal Disengagement Time

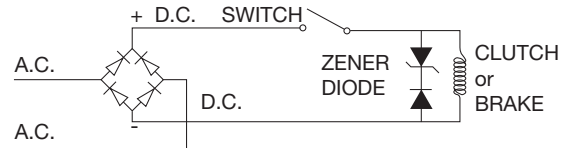
For most applications a resistor connected in parallel with the clutch coil is adequate. The resistor should be rated at six times the coil resistance and approximately 25% of the coil wattage.



To eliminate the added current draw, a diode may be added as shown.



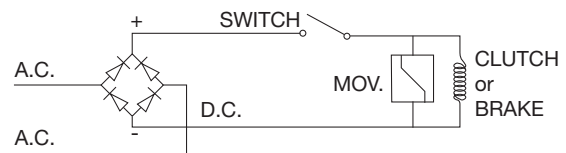
For faster release use a zener diode with a rating two times the coil voltage.



#### METAL OXIDE VARISTOR (MOV)

##### Fast Disengagement Time

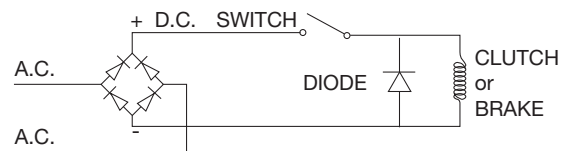
For applications requiring fast clutch disengagement, a or MOV connected in parallel with the clutch coil should be used.



#### DIODE

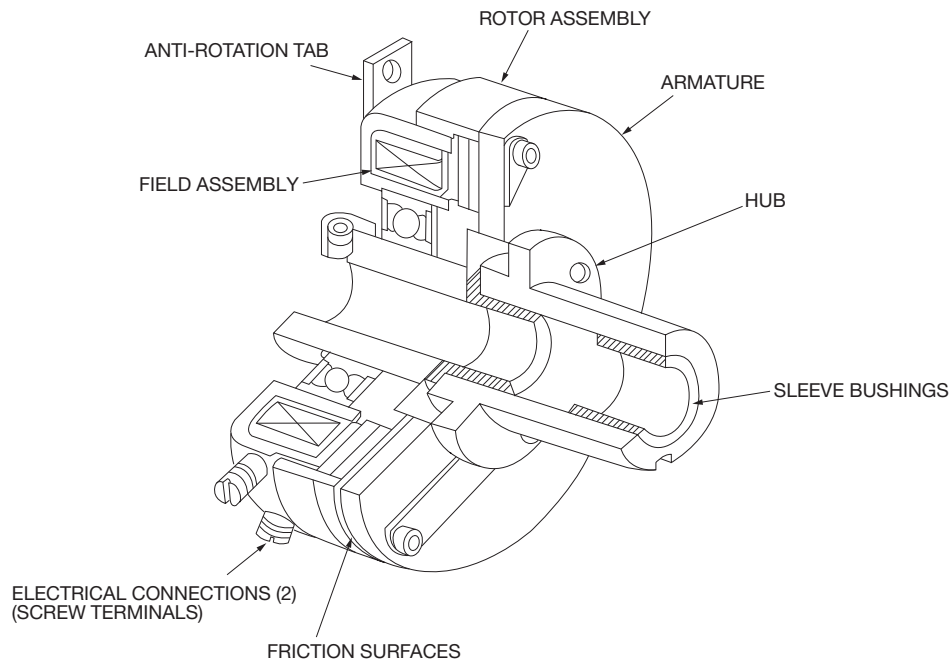
##### Slow Disengagement Time

For applications where a delayed disengagement is desired, a diode should be used in parallel with the clutch/brake coil or switch the A/C side of the circuit.



Unit Size	RPM	Intertia (Lb.-In <sup>2</sup> )			
		5	10	50	100
08	225	300	200	30	12
	900	30	12	2	1
11	225	-	300	60	30
	900	45	20	3	2
15	225	-	350	120	60
	900	60	30	6	3
17	225	-	-	150	100
	900	80	40	7	4
19	225	200	120	20	8
	900	9	5	1	-
22	225	250	150	25	10
	900	12	6	1	-
26	225	300	200	30	12
	900	20	9	2	1
30	225	350	250	40	20
	900	25	12	3	1
42	225	-	300	60	30
	900	30	20	4	2

① Chart intended as a guide. For other speeds and intertias consult DODGE Product Support.



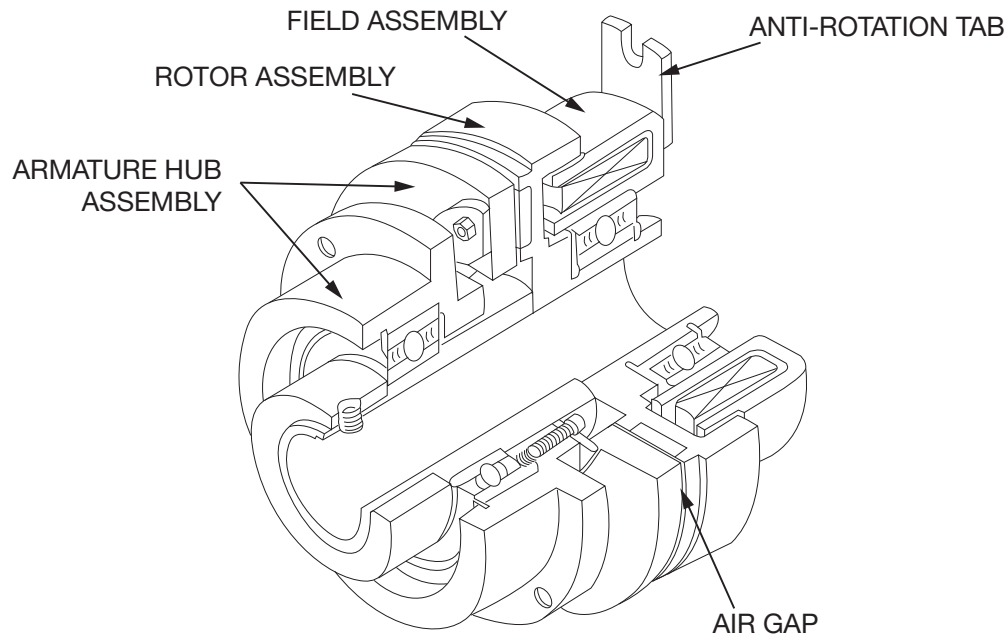
Spare Parts List SL Series Clutches						
Unit Size	Clutch Part No.	Volts DC	Bore In.	Replacement Parts		
				Field Assembly Part No.	Rotor Assembly Part No.	Armature Hub Assembly Part No.
SL08	024000 024001	90	3/16 1/4	024071	024081 024080	024091 024090
	024002 024003	24	3/16 1/4	024073	024081 024080	024091 024090
SL11	024100 024101	90	1/4 5/16	024171	024182 024181	024192 024191
	024102 024103	24	1/4 5/16	024173	024182 024181	024192 024191
SL15	024200 024201	90	5/16 3/8	024271	024283 024282	024293 024292
	024202 024203	24	5/16 3/8	024273	024283 024282	024293 024292
SL17	024300 024301	90	5/16 3/8	024371	024383 024382	024393 024392
	024302 024303	24	5/16 3/8	024373	024383 024382	024393 024392
SL19	024400 024401	90	3/8 1/2	024471	024484 024483	024493 024494
	024402 024403	24	3/8 1/2	024473	024484 024483	024493 024494
SL22	024500 024501	90	3/8 1/2	024571	024584 024583	024594 024593
	024502 024503	24	3/8 1/2	025073	024584 024583	024594 024593
SL26	024600 024601	90	1/2 5/8	024671	024685 024684	024695 024694
	024602 024603	24	1/2 5/8	024673	024685 024684	024695 024694
SL30	024700 024701	90	1/2 5/8	024771	024687 024686	024697 024696
	024702 024703	24	1/2 5/8	024773	024687 024686	024697 024696
SL42	024800 024801 024802	90	1/2 5/8 3/4	024871	024885 024886 024887	024895 024896 024897
	024803 024804 024805	24	1/2 5/8 3/4	024873	024885 024886 024887	024895 024896 024897

**Note:**

**Field Assembly:** Includes the field assembly and bearing

**Rotor Assembly:** Includes rotor, shaft hub & friction material & snap rings

**Armature Assembly:** Includes armature, hub & bearing



Spark Parts List BSL Series Clutches						
Unit Size	Part No.	Volts	Bore	Replacement Parts		
				Field Assembly Part No.	Rotor Assembly Part No.	Armature Hub Assembly Part No.
BSL11	025030 025031	90	3/16 1/4	025040	025050 025051	025045
	025032 025033	24	3/16 1/4	025041	025050 025051	025045
BSL17	025055 025056 025057	90	1/4 5/16 3/8	025063	025066 025067 025068	025065
	025058 025059 025060	24	1/4 5/16 3/8	025064	025066 025067 025068	025065
BSL26	024900 024901	90	1/2 5/8	024971	024984 024985	024998
	024902 024903	24	1/2 5/8	024973	024984 024985	024998
BSL42	025104 025100 025101	90	3/4 7/8 1	025171	025186 025187 025188	025199
	025102 025103	24	7/8 1	025173	025187 025188	025199

**Note:**

**Field Assembly:** Includes the field assembly and bearing

**Rotor Assembly:** Includes rotor, shaft hub & friction material & snap rings

**Armature Assembly:** Includes armature, hub & bearing



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