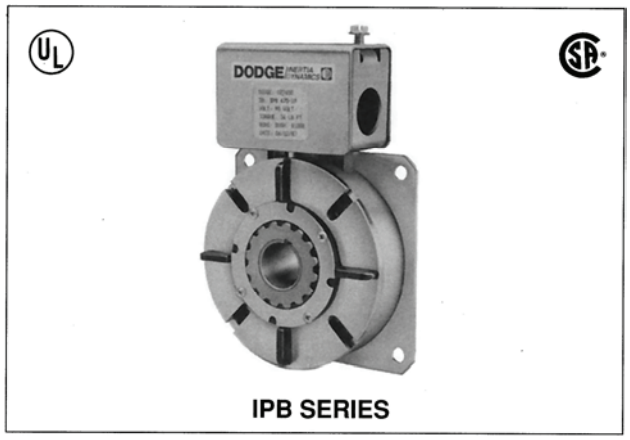
INSTRUCTION MANUAL FOR DODGE®
IPB SERIES FLANGE MOUNTED POWER-ON BRAKES
SIZES IPB-400, 500 & 650



IPB SERIES

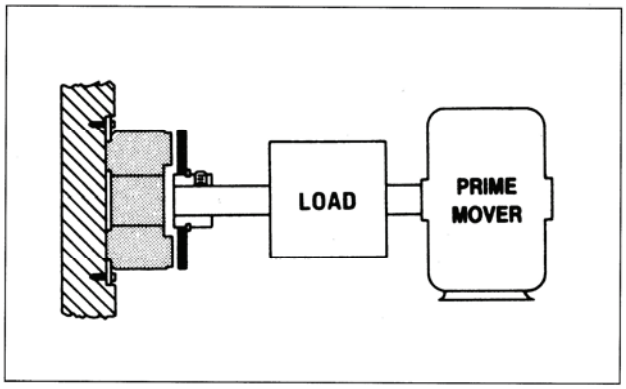


FIGURE 1

PREASSEMBLY INSTRUCTIONS

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

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.

MOUNTING THE MAGNET

STEP 2 Mount the brake magnet using the 4 holes in the mounting flange. Concentricity between the brake mounting pilot diameter and the shaft should be held to .010 inch T.I.R. IPB brakes have an inside and outside pilot to ensure proper alignment. The brake flange should be bolted tightly to the mounting surface as it is the reaction member for the brake torque.

MOUNTING THE ARMATURE/HUB ASSEMBLY

STEP 3 Pre-position the TAPER-LOCK® bushing in the armature hub before sliding onto the shaft. Do not completely draw-in the TAPER-LOCK bushing. (**Note:** For straight bore sizes this step is not necessary.)

STEP 4 Position the armature within 0.25 inches of the end of the armature hub. (See Figure 2.) The armature will slide on the hub with hand pressure, although it will be stiff. This is normal.

STEP 5 Slide the armature/hub assembly onto the shaft so that the armature face is $^1/_8$" from the friction material face. For straight bore sizes, IPB-400, secure the armature/hub assembly with the set screws. Tighten the two set screws to 78 in-lbs. For bushed sizes, secure the TAPER-LOCK bushing per the bushing instruction manual. Do not use lubricant with or on the bushing.

DANGER

The user is responsible for conforming with the National Electrical Code and all other applicable local codes. Wiring practices, grounding, disconnects and overcurrent protection are of particular importance. Failure to observe these precautions could result in severe bodily injury or loss of life.

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.

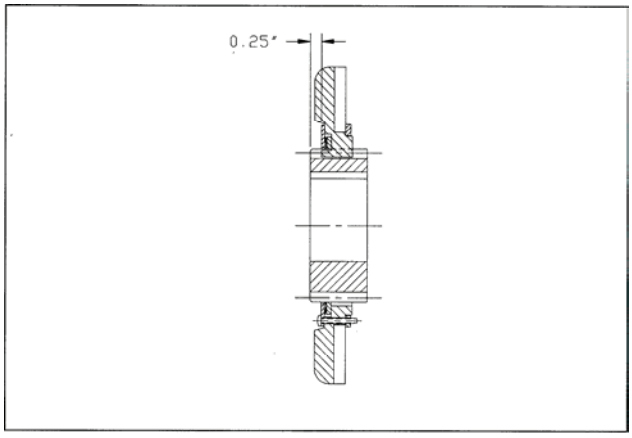


FIGURE 2: Armature Positioning

ELECTRICAL CONNECTIONS

STEP 6 DODGE IPB series brakes operate on standard DC voltage. To operate the brake with alternating current an AC to DC power supply is required. **Do not connect AC voltage directly to the coil leads.** Wire the two leads to the power supply. DODGE power supplies are available with a wiring diagram showing the proper electrical connections.

SETTING THE AIR GAP

STEP 7 With the shaft secured from rotation, apply the appropriate power (i.e. 90VDC for 90VDC coils, 24VDC for 24VDC coils) to the brake.

STEP 8 With even pressure press the armature towards the magnet until it pulls in and makes contact. (See Figure 3.) Turn power off to the brake. The armature should spring back leaving a 0.030 to 0.050 inch air gap between the armature and friction material face. (See Figure 3.) If not, repeat steps 5, 7 & 8. The air gap is now established and the DYNA-GAP™ mechanism will maintain the air gap as wear occurs.

NOTE: DODGE IPB brakes are factory tested to ensure proper operation. However, due to the fact that alignment of friction surfaces is dependent on the concentricity of the mounting pilot diameter relative to the shaft, additional burnishing may be necessary to achieve rated static torques.

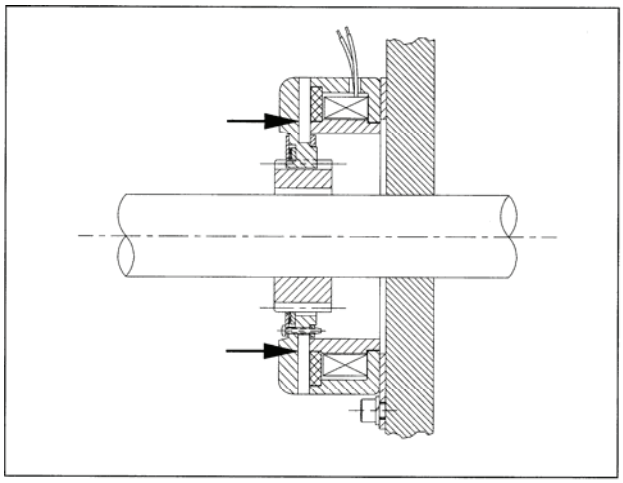


FIGURE 3: Air Gap Setting

STEP 9 After unit has operated for a short period, recheck air gap. Repeat step 8, if necessary.

MAINTENANCE GUIDE

(See Reference Sheet Drawings—page 5)

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.

TASK	PROCEDURE
1. Armature replacement.	**Remove the snap ring from the back of the splined hub.** Remove the worn armature by rotating and gradually prying the armature off the splined hub. You must overcome the gripping force of the grip ring, therefore, the use of a small puller simplifies this task. You must over-come this same gripping force when installing the new armature. Care must be taken so that you do not bend the armature washers during assembly. A soft mallet and/or block of wood can be used to start the armature onto the spline. With the finned armature surface facing away from the friction surface, push the brake armature flush against the brake magnet friction surface and release. The DYNA-GAP feature will automatically set the air gap.
2. Replacing the Brake Magnet.	**This requires complete removal of the brake.** After the brake has been removed, begin reinstallation of the new brake magnet as described for the installation of a complete new brake. **NOTE:** This unit may also require burnishing the new friction surfaces together.

TROUBLE SHOOTING GUIDE

(See Reference Sheet Drawings—page 5)

DANGER

Subsequent steps require rotating parts and/or electrical circuits to be exposed. Stay clear if unit must be running or disconnect and lockout or tag power source if contact must be made. Failure to observe these precautions could result in severe bodily injury or loss of life.

SYMPTOM/CAUSE	SOLUTION
1. Armature rubbing, periodic noise to constant rubbing.	**Disconnect power to motor.** Adjust the armature position by using a screwdriver to pry the armature away (.060 to .090 inch) from the friction surface on which it is rubbing. Energize the coil. Using even pressure, push the armature toward the friction surface until it is fully engaged. It should pull in by itself when it gets close enough. Remove pressure and de-energize the coil. The DYNA-GAP self-adjusting feature will automatically maintain the proper air gap (.030 to .050 inch).
2. No engagement when coil is energized. (1) Coil may be shorted to ground (2) Armature air gap is too large.	**(1) Check the coil resistance as follows:** Disconnect power to motor. Connect ohmmeter to the two brake leads. Check value with values listed in Electrical Coil Data chart. If O.K., proceed for solution for checking armature air gap to follow. If not O.K., this is indication of some electrical problem with the coil. Proceed to the procedure for replacing the brake magnet in the Maintenance Guide. (2) Disconnect power to motor. Energize the coil. Using even pressure, push the armature toward the friction material surface until armature engages fully. If armature still does not engage properly, see symptom #1.
3. Excessive overlap. Unit will not cycle repeatedly.	**Customer switch should be on the DC side of the rectifier (power supply).** A counter or timer mechanism may include a time constant circuit or diode which may create overlap. Check components.
4. Rapid wear or short life. Brake may be cycling too rapidly and/or operating at high temperatures (component selection may need review). The unit may be operating in a harsh environment. Actuation times may need adjustment.	(1) **Rapid Cycling:** Fast, repetitive cycling will result in more rapid wear and higher temperatures. High temperatures will also accelerate wear rates. Ensure the unit is being ventilated for maximum cooling to maximize life. (2) Exposure to harsh environments such as on machinery that produces abrasive dust or grit may shorten the life of the unit. In these types of environments, an effort should be made to shield the brake from abrasive materials. (3) Minor adjustments to the actuation time can prevent premature failure of the brake. If the power supply has a control potentiometer, it can be adjusted to a lower setting to extend the actuation time, which can result in a longer operating life.
	CAUTION: **Only personnel familiar with wear patterns and the possible effect on the operation of the product's performance should adjust the potentiometer setting.**
	NOTE: Normal wear conditions will result in grooves appearing on the friction surfaces. Machining away these grooves can result in premature failure of the unit.
5. Loss of torque. Improper input voltage can cause complete loss of torque. Brake may be nearing the end of its normal life or friction surface may be contaminated with grease or oil.	**If a complete loss of torque occurs,** initially check the input voltage to the brake magnet as follows: Connect a DC voltmeter with the proper range across the brake magnet terminals. With the power to the coil and the potentiometer (if present) turned to the highest setting, the voltage should read within 10% of the unit's voltage rating. As the potentiometer knob is adjusted counterclockwise (lower), the voltage should drop. If these checks prove that proper voltages are being provided, then mechanical components of the unit should be checked to ensure the unit has not been damaged or improperly installed. A slight loss in torque may become evident as the brake nears the end of its normal life. Grease or oil contamination can result in a substantial loss of torque. If the brake is positioned near any machinery which requires

5. Loss of torque (cont.)

frequent lubrication, care must be taken to avoid grease or oil contacting the friction surfaces. Should oil or grease reach the friction area, immediately clean the friction surfaces and general area with a cloth that has been dampened with a degreaser. Do not drench or soak the friction material. Continued loss of torque will result if friction material is completely contaminated with oil or grease. Heat developed at the friction surface will cause the oil to bleed to the surface, resulting in torque loss. In this case, the friction surfaces must be replaced.

BURNISHING PROCEDURE

For consistent engagement and full rated torque it may benecessary to burnish the brake. Use the following procedure.

Burnishing is a wearing-in or mating process to ensure that the highest possible output torques will be obtained from the brake.

NOTE: Burnishing is an important maintenance step. Running the unit without an initial burnishing break-in period may cause the equipment to operate erratically. Full rated torque will not be developed until friction surfaces develop full contact.

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 their final application, mount units in a test stand observing concentricity, alignment and air gaps.

NOTE: If burnishing capability is not available, cycle the brake (several hundred stops may be necessary) to wear unit in and allow torque to increase.

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). Then reduce voltage to 30-40% of rated coil voltage.

4. Rotate the brake armature at suggested RPM (see chart below) while holding the brake magnet stationary to obtain a forced slip while the unit is energized.

RECOMMENDED BURNISHING RPM

UNIT SIZE	BURNISHING RPM ± 10%
IPB-400	30
IPB-500	7
IPB-650	7

5. De-energize the unit after a 3-minute forced slip.

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.

6. Measure the static (or break away) torque of the unit with both friction members of the brake stationary at rated voltage.

7. Static torque should be at the catalog rating (see chart below). If the unit does not measure catalog rating, repeat steps 3 & 4 after a cool down period of 5 minutes until the unit comes up to the rated torque.

STANDARD STATIC TORQUES

UNIT SIZE	STATIC TORQUE (FT.-LBS.)
IPB-400	22
IPB-500	34
IPB-650	100

NOTES:

(1) If brake is required to decelerate 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 brakes 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 the application as torque will automatically improve with normal cycling (especially on high speed, high inertia load applications).

(2) Do not prolong burnish beyond 3 minutes duration. Long burnish time will cause excessive heat build-up at the friction faces resulting in poor performance.

(3) Care must be taken to prevent contamination of the friction faces with oil or dirt particles during the burnishing process.

ELECTRICAL COIL DATA

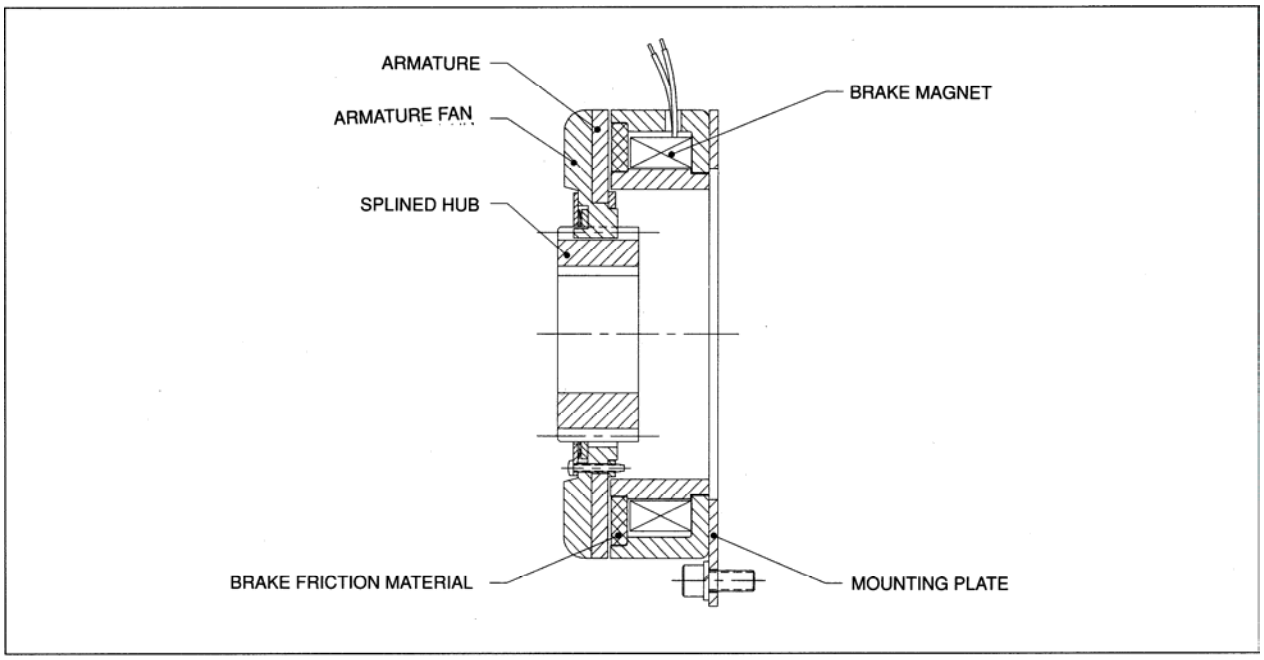
IPB-400			
Voltage – DC	90	24	6
Resistance @ 20ºC – Ohms	458	30	1.97
Current – Amperes	.196	.800	3.05
Watss	17.6	19.2	18.3
Coil Build-up – milliseconds	35	36	32
Coil Decay – milliseconds	6	6	6

IPB-500			
Voltage – DC	90	24	6
Resistance @ 20ºC – Ohms	476	32.3	2.06
Current – Amperes	.189	.743	2.92
Watss	17.0	17.8	17.5
Coil Build-up – milliseconds	96	91	91
Coil Decay – milliseconds	16	16	16

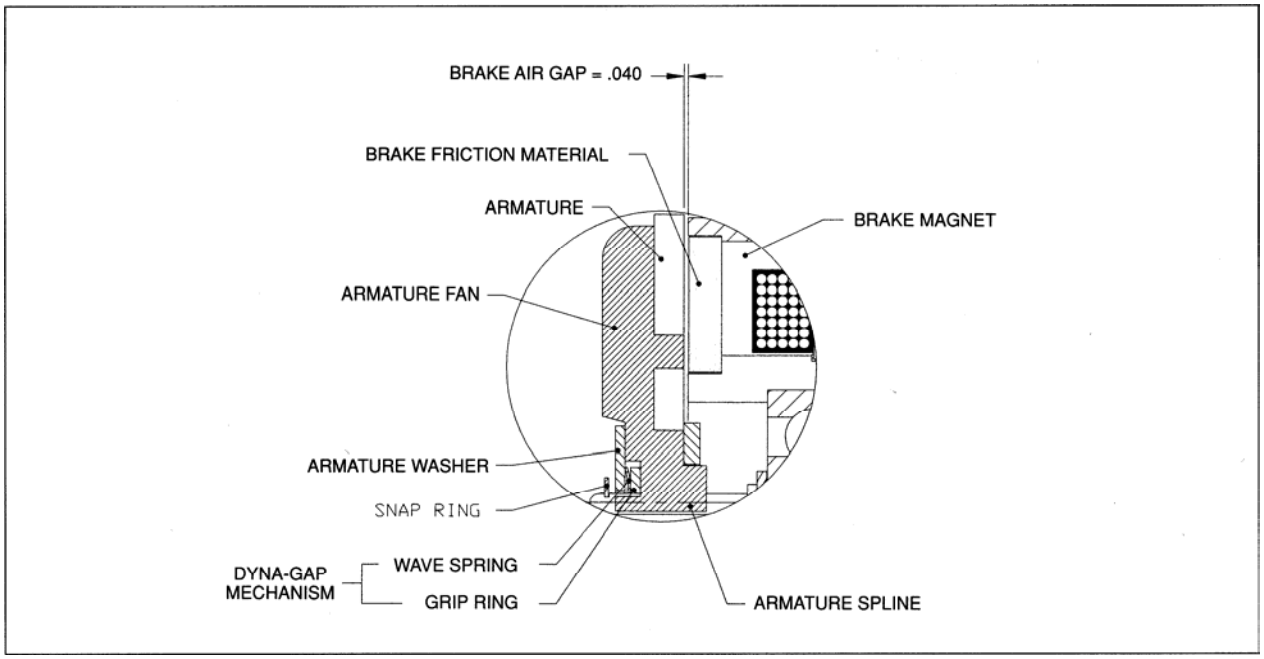
IPB-650			
Voltage – DC	90	24	6
Resistance @ 20ºC – Ohms	250	16.2	.910
Current – Amperes	.36	1.48	5.4
Watss	32	36	32
Coil Build-up – milliseconds	115	112	110
Coil Decay – milliseconds	20	20	20

NOTE: Coil build-up to 80% of Rated Current. Coil Decay Time with DODGE Power Supply. Due to variations in other manufacturers' supplies, the delay time may vary.

REFERENCE SHEET



BRAKE CROSS SECTION



ARMATURE DETAIL

IPB REPLACEMENT PARTS/COMPLETE UNITS

(Refer to Brake Cross Section Drawing – page 5)

DESCRIPTION	IPB-400	IPB-500	IPB-650
90V Magnet Assembly	029925	029928	029931
24V Magnet Assembly	029926	029929	029932
6V Magnet Assembly	029927	029930	029933
Armature Assembly	027549	027649	027749
Conduit Box Kit	032328	032328	032328
COMPLETE UNITS 90VDC ½" 90VDC 5/8" 90VDC ¾" 90VDC 7/8"	 029900 029901 029902 029903		
24VDC ½" 24VDC 5/8" 24VDC ¾" 24VDC 7/8"	029918 029919 029920 029921		
6VDC ½" 6VDC 5/8" 6VDC ¾" 6VDC 7/8"	029909 029910 029911 029912		
90VDC TAPER-LOCK		029904	029905
24VDC TAPER-LOCK		029922	029923
6VDC TAPER-LOCK		029913	029914

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