

## **BALDOR MN413 Brakes Manual**

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The DODGE D-Series motor brakes are manufactured to NEMA standards for mounting to C-face and double shafted motors. They operate as spring-set, electrically released power-off brakes to provide a holding or parking action.

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# INSTALLATION MANUAL FOR DODGE® D-SERIES POWER-OFF BRAKES (STANDARD AND E-Z KLEEN® ENCLOSURES)

These instructions must be read thoroughly before installation or operation.

## INSTALLATION:

### PRE-INSTALLATION INSTRUCTIONS:

The DODGE D-Series motor brakes are manufactured to NEMA standards for mounting to C-face and double shafted motors. They operate as spring-set, electrically released power-off brakes to provide a holding or parking action.

**These DODGE motor brakes are factory assembled and adjusted allowing for immediate operation after attachment to the motor.** To ensure compatibility with mating motor, measure C-face pilot diameter and motor shaft diameter.

**WARNING: When failure of brake or connecting equipment (gearbox, coupling, etc.) may allow unexpected machine movement, an additional holding device is required at the load. Failure to observe this precaution could result in bodily injury.**

All parts should be examined for any damage during the shipping and handling process. All parts must be clean and free of any foreign material before attempting assembly. Care should be taken to ensure that contaminants (such as grease from the motor, oil from a gearbox, etc.) do not contact the friction faces as this will cause the brake to operate improperly.

**DANGER: This equipment is at line voltage when AC power is connected. Disconnect and lock out all ungrounded conductors of the AC power line. Failure to observe these precautions could result in severe bodily injury or loss of life.**

### INSTALLATION: 56/140/180 DBSC/DBEC MODELS (Single C-face)

**STEP 1. (180 only):** Remove new brake from flange by loosening (4) mounting bolts (3/8-16 UNC).

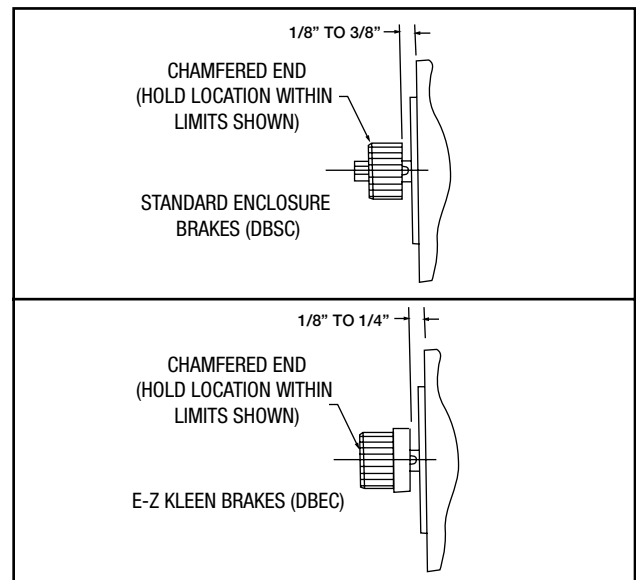
**STEP 2. (180 only):** Mount adapter flange to 180 motor flange with (4) mounting bolts (1/2-13 UNC). Tighten mounting bolts to 900 lb-in of torque.

**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.**

**STEP 3.** Remove any burrs from the motor shaft before attempting to mount the hub. Mount the splined hub onto the motor shaft. The hub utilizes an integral key so that no installation or securing of a key is necessary. See Figure 1 below for proper positioning of the brake hub on the motor shaft. The chamfered end of the splined hub should be positioned away from the motor to provide a lead-in guide when mounting the brake. Secure the two hub setscrews to 75-80 lb-in of torque. The use of anaerobic adhesives on the shaft/hub connection or the hub set screws is not recommended because of the possibility of uncured material contaminating the friction surfaces when the motor is started.

**Note:** Prior to mounting the brake onto the hub, determine how electrical connections will be made. For example, external through the conduit egress in the brake housing or internal from the motor to the brake.

Figure 1: Hub Positioning



For these models wiring may be made easier by bringing the brake leads from the motor out through the lead wire access cover on the label side of the brake before making connections.

**STEP 4.** Mount the brake to the motor taking care to properly engage the splined hub with the splined bore of the friction disc in the brake. If force seems to be needed for proper mounting, look for other problem areas such as foreign matter in the spline or cocking of the brake. **DO NOT HAMMER BRAKE INTO PLACE.** Once the brake contacts the motor face, rotate the brake to align the mounting holes. If the motor shaft is not free to rotate due to an external load, it may be necessary to manually release the brake at this time in order to rotate it so as to align the mounting holes. Secure the (4) mounting bolts (3/8-16 UNC) provided to the motor with 300 lb.-in. of torque. The brake can be mounted in any orientation: horizontal, vertical (either end up) or on an incline without any adjustments.



## INSTALLATION: DBSS/DBES MODELS

(Double C-Face) models are intended to be concentrically located between two pieces of equipment such as a motor and reducer. They are not intended to have a sheave, pulley, sprocket or any overhung load placed on the output shaft.

**Note:** There are two access holes in the brake housing for tightening the hub setscrews. Positioning the hub setscrews in-line with these access holes by releasing the manual release levers and rotating the shaft will make location easier after the brake is positioned onto the motor shaft.

**STEP 1.** Remove slide brake onto motor shaft remove any burrs on the motor shaft. If force seems to be needed for proper mounting, check for other problem areas. **DO NOT HAMMER BRAKE INTO PLACE.** Once the brake contacts the motor face, rotate the entire brake to align the mounting holes. Finger tighten the mounting bolts to secure the brake to the motor.

**STEP 2.** Tighten the (4) mounting thru bolts (3/8-16 UNC) to the motor with 300 lb-in of torque.

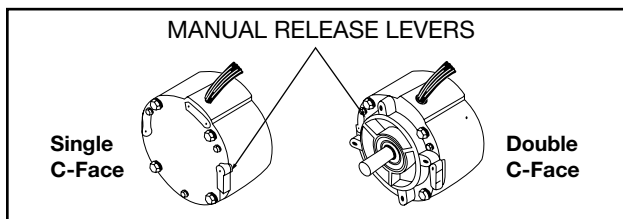
**STEP 3.** Using the access holes in the housing, tighten the two setscrews in the splined hub to 75-80 in-lb. The setscrews should already be aligned with the access holes so that no adjustments or movement of the motor shaft or hub are necessary.

**Note:** Both (2) setscrews must be tightened to the recommended torque levels to ensure proper operation. Realignment of the hub setscrews with the housing access holes, if necessary, requires the use of both manual release levers to release the brake (see Manual Release Operation) and allow brake output shaft to rotate freely.

## MANUAL RELEASE OPERATION:

**WARNING: Do not manually release brake before blocking overhauling loads to prevent unexpected machine movement. Failure to observe this precaution could result in bodily injury.**

Figure 2



The manual release levers are located on the back of the brake opposite the input hub for the single C-face models (see Figure 2). On the double C-face models they are located on the output shaft side.

If it is necessary to manually release the brake, simultaneously turn the (2) levers counterclockwise, approximately 90° to their stop positions. The manual release levers need to be moved into the reset position manually.

## MAINTENANCE GUIDE

**DANGER: This equipment is at line voltage when AC power is connected. Disconnect and lock out all ungrounded conductors of the AC power line. Failure to observe these precautions could result in severe bodily injury or loss of life.**

**WARNING: Do not manually release brake before blocking overhauling loads to prevent unexpected machine movement. Failure to observe this precaution could result in bodily injury.**

## TASK: Wear Adjustment

### PROCEDURE:

**Note:** New brakes DO NOT require wear adjustment. Adjustment of the air gap is necessary if either or both of the following conditions are observed:

1) A decrease in braking torque. Adjustment is recommended when braking torque drops to approximately 80% of its static rating.

2) Complete lack of disengagement (dragging) or motor installed.

**STEP 1.** Before attempting any adjustment to the brake, be sure the power is turned off and there is no possibility of motor start-up. The brake must be de-energized before attempting wear adjustment.

**STEP 2.** For 3 to 25 ft-lb models, remove plastic caps. For 35 and 50 ft-lb models, loosen bolt head locks. (Caution: These plastic caps and locks must be reinstalled after adjustment.) Turn the 3 socket head cap screws (3 hex head cap screws for 35 and 50 ft-lb models) clockwise progressively to 50 in-lb. DO NOT OVERTIGHTEN. Then turn each of the bolts back counter clockwise 1/2 of a full turn (180°). This resets the air gap to the proper amount. Turn power back on and check for normal operation.

If adjustment intervals become more frequent, brake friction disc may be nearing the end of its normal life.

## Task: Rectifier Checks

To determine if a rectifier has been damaged use a multimeter to check resistance. Check the following lead combinations by placing the positive clip on one lead and the negative clip on the other. See table 1

Table 1

(+)	(-)	Resistance
B1	B4	Low
B4	B1	High
B1	B3	High
B3	B1	Low
B2	B4	Low
B4	B2	High
B2	B3	High
B3	B2	Low

If any resistance is measured low where it should be high or vice versa, the rectifier has been damaged and a replacement rectifier (Dodge Part #031385) should be purchased.

Table 2

Coil Voltage Low/High	3 & 6 Ft.-Lb.		10 – 50 Ft.-Lb	
	Current Draw (A)	Resistance (8) (Ohms)	Current Draw (A)	Resistance (8) (Ohms)
115/230 VAC (1)	0.19	562	0.28	387
230/460 VAC (2)	0.10	2078	0.14	1550
287/575 VAC (3)	0.09	2987	0.12	2245
104/208 VAC (4)	0.24	384	0.31	290
190/380 VAC (5)	0.13	1341	0.19	923
250/500 VAC (6)	0.10	2336	0.13	1793
48 VDC	0.48	100	0.58	82
24 VDC	0.97	24.7	1.14	21.7
12 VDC	1.95	6.2	2.24	5.4

**Notes:** Other nameplate voltage capabilities:

1) 115/208–230 VAC 50 or 60 Hz, 133/265 VAC 60 Hz, 110–125 VDC

2) 208–230/460 VAC 50 or 60 Hz, 240/480 VAC 60 Hz, 220/440 VAC 50 Hz, 230 VDC

3) 237/575 VAC 60 Hz, 275/550 VAC 60 Hz, 300/600 VAC 60 Hz

4) 104/208 VAC 50 or 60 Hz, 100/200 VAC 60 Hz, 90–95 VDC

5) 190/380 VAC 50 or 60 Hz, 200/400 VAC 60 Hz, 208/416 VAC 50 Hz

6) 250/500 VAC 50 or 60 Hz

7) Values for other nameplate voltages will vary. Consult DODGE Engineering for actual values.

8) Coil resistance is measured between leads B4 and B5. Measured resistance may vary ±7½% from nominal values.

**ELECTRICAL CONNECTIONS:**  
(See page 4 for Wiring Diagrams)

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

**CAUTION:** If the brake is to be internally wired to the motor, be sure that the lead wires are not pinched when the mating faces are brought together. Failure to observe this precaution could result in damage to or destruction of the equipment.

**CAUTION:** In applications where long lead lengths and DC switching are used, inductive voltage spikes may cause rectifier failure. Surge suppression should be employed to prevent such failures.

**CAUTION:** If electrical soft-start or inverter is used in the system care must be taken to ensure that the brake is supplied with full voltage. Brake must have the full input voltage to ensure proper release and operation.

**CAUTION:**  
**REPLACEMENT/RETROFIT APPLICATIONS:** In order to ensure proper wiring connections when placing this brake in place of another, be sure to trace motor leads back to the motor conduit box. Brake lead markings may differ among brake manufacturers. If in doubt, voltages should be measured.

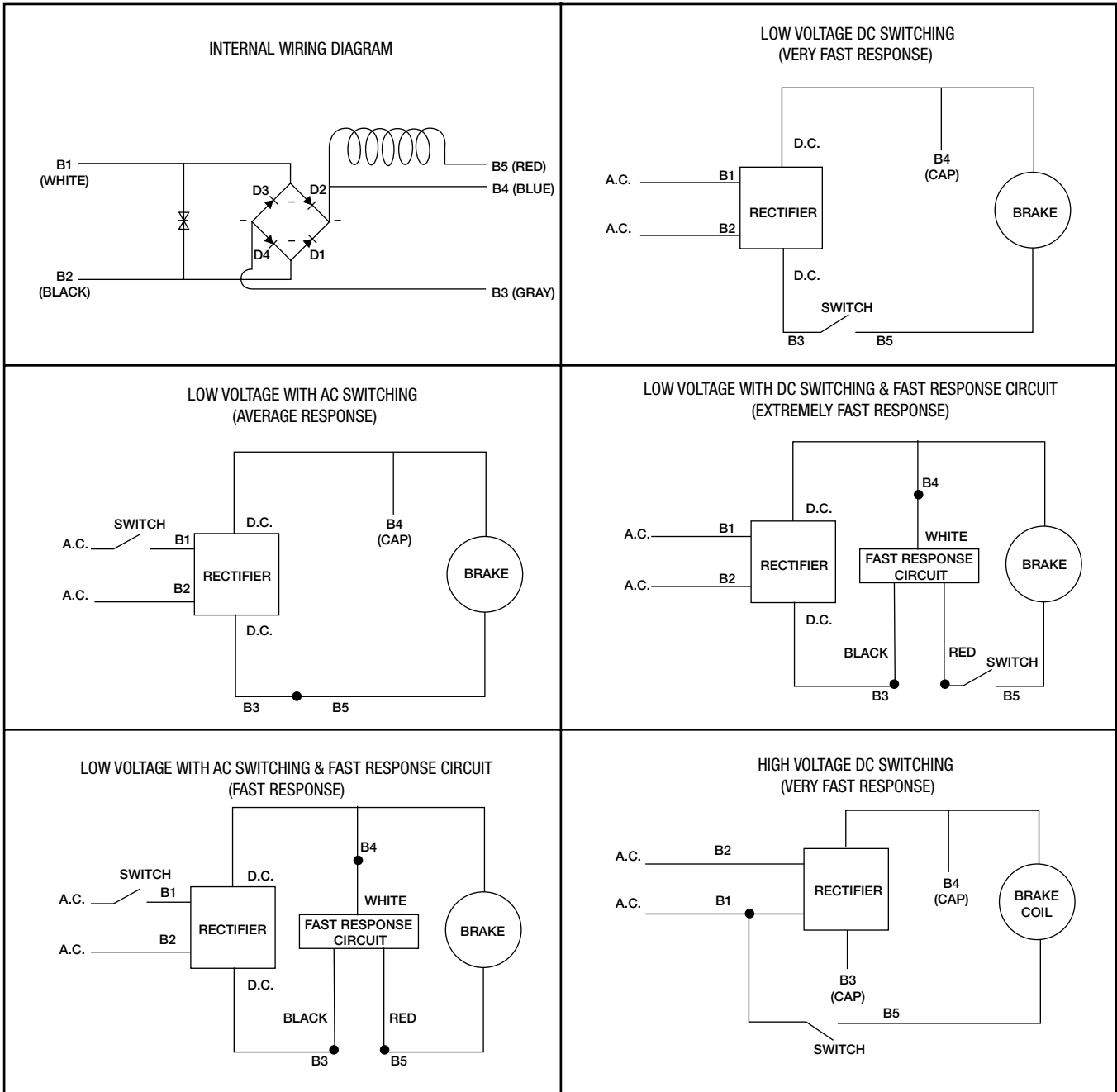
**TROUBLESHOOTING GUIDE**

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

**Table 3**

SYMPTOM	POSSIBLE CAUSE(S)	SOLUTION
1) Loss of Torque (Coasting)	Improper Switching Method	If new brake appears to coast farther than desired, an alternate switching method may be required, such as fast response circuit. Consult DODGE.
	Brake Disc Worn	See Wear Adjustment Procedure-Maintenance Guide
	Brake Too Small	Check Application
	Excessive Cycle Rate (Disc Too Hot/ Torque Fade)	Reduce Cycle Rate & Check Application
	Friction Surfaces Contaminated	Replace Friction Disc
	Brake Worn Out (Frequent Adjustment)	Replace Friction Disc
2) Brake Not Releasing	Open Circuit (Brake Wires Pinched or Broken) (Open Coil)	Check Resistance Between Brake Leads (B4 & B5) for Continuity
	Improper or No Voltage to Brake	Establish Proper Voltage. If input voltage is okay, check for DC voltage across leads B4 & B5. If no voltage exists, rectifier may be blown. Use rectifier replacement kit.
	Requires Adjustment	See Wear Adjustment Procedure-Maintenance Guide
	Manual Release Out of Adjustment	Tighten or loosen the socket head cap screw in each release lever as required. Release levers should remain in the release position with power to the brake off. Release levers should return to the housing with power to the brake on.
3) Motor Stalled	Brake Not Releasing	(See Symptom 2)
4) High Housing Temperature 80°C (176°F) Maximum	Excessive Cycle Rate	Reduce Cycle Rate
	High Ambient Temperature	Reduce Cycle Rate and/or Load Inertia (Add External Cooling Fan)
	Excessive Load Inertia	Reduced Load inertia
	Brake Not Releasing	See symptom 2
	Excessively High Voltage	Reduce voltage input to coil specifications

Figure 3



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