



# REPLACEMENT/RETROFIT INSTRUCTIONS

## FOR THE DIGITAL CONTROL MODULE

(KIT PART NOs. 12-8061-85, -88, -91, -92)

### PURPOSE

These instructions describe the steps for replacing the model 22-409/-809 Digital Control Module (DCM-2). A systematic replacement procedure is provided.

### REQUIRED TOOLS

- 7/16" hex socket wrench
- 1/2" hex socket wrench
- Torque wrenches (appropriate for 50 lb-in and 10 lb-ft)
- Communications device for calibration



#### CAUTION

To prevent Electro-Static Discharge damage to the electronics, wear a grounding strap during this procedure.

### PROCEDURE

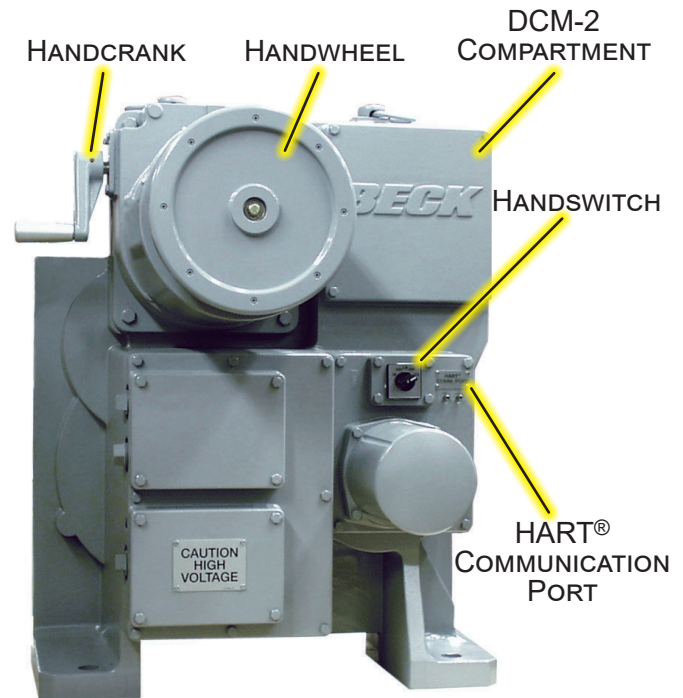
During this procedure, refer to Figure 2 (back cover) for the location of components.

The DCM-2 is located in the DCM Compartment (see Figure 1, at right, for identification). To remove the DCM Compartment cover, loosen the (4) captive 5/16-18 hex mounting screws.

For the replacement DCM-2 to operate properly, the DCM-2 settings must match the existing application. It is particularly important to verify the actuator rotation corresponding to an increasing Demand signal (CW or CCW). It is also important to verify the travel (degrees) setting. Table 1 lists other important settings.

If HART® or Serial communication is still possible with the DCM-2 being replaced, read and record the values listed in Table 1. These values can be obtained through a HART® handheld communicator or through the RS-232 connection (J20) and the Beck Serial Commands. Refer to Beck instruction manual 80-4280-02 for specific procedures.

If it is not possible to obtain the values listed in Table 1 through the DCM-2 being replaced, contact the factory with your actuator serial number to obtain the configuration settings "as-shipped". The factory default values are shown in Table 1.



Model 22-809 Shown

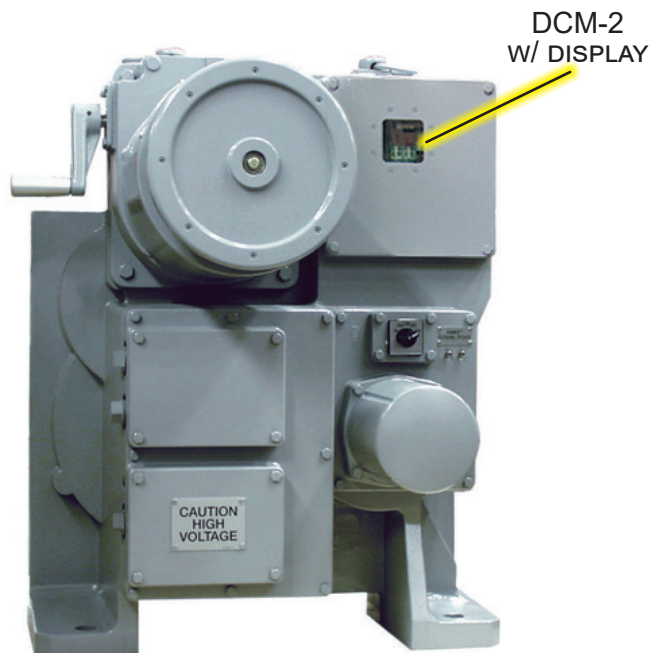


Figure 1

**Table 1**

(These values will be used to check the calibration of the actuator after the replacement DCM-2 is installed).

Operating Parameters	Recorded Value	HART Interface		Serial Interface	
		Variable Name	Default Value	Command	Default Value
Actuator Rotation (Increasing Signal)		Drive Dir	CW	drvrotation	0 (CW)
Operation Mode		Op Mode	Follow	opmode	0 (follow)
Torque Zero		Trq Null	0*	torq0k	0*
Torque Constant		Trq Const	550*	torqconst	550*
CPS Volts at 0 Degrees		CPS Zero%	1.300	cpsvat0deg	1.300
CPS Volts per 100 Degrees		CPS Span	2.400	cpsvper100deg	2.400
Travel		Travel	100.0	travel	100.00
Demand LOS Threshold (mA)		DemLimLwr	3.20	demlos	3.20
Demand LOS Mode		LOS Mode	Stay	demlos	sip
Demand LOS Go To Position (%)		LOS Pos	50.00	demlosgtp	50.00
0% Demand (mA)		DemRngLwr	4.00	dem0pctma	4.00
100% Demand (mA)		DemRngUpr	20.00	dem100pctma	20.00
Stall Time (Sec)		Stall Time	300	stalltime	300
Demand Function		Dem Curve	Linear	demfunc	linear
Step Size		Step Size	0.10	stepsize	0.10
IO Mode		Feedback	Enabled	iomode	1 (fdbk)
0% Feedback (mA)		FB RngLwr	4.00	fdbk0pctma	4.00
100% Feedback (mA)		FB RngUpr	20.00	fdbk100pctma	20.00
Torque Enable		Trq/Thrust	Enabled	torqenable	1 (enabled)
Over Torque Stop		Ovt Prot	Disabled	ovtstop	0 (go)
Polling Address		Poll Addr	0	polladdr	0
Actuator Model		Model#	22-409 or 22-809	drvmodel	13 (22-409) or 14 (22-809)

\*Default values only--the specific numbers for these values are unique to each actuator and are determined during manufacture. These specific numbers are noted on a tag affixed to the actuator body within the Electronics Compartment. Default values should only be used if the specific numbers are unknown.



### WARNING

**Electrical shock hazard—disconnect power before proceeding. Remove the actuator from line voltage and shut off any external power sources feeding the auxiliary switches.**

*Remove the existing DCM-2 assembly:*

1. Place the Handswitch in STOP.
2. Ensure power to the actuator has been disconnected.
3. Disconnect the (5) wiring connectors shown in Figure 2.
4. Loosen the (6) hex mounting screws with a 7/16" socket wrench.
5. Using the handles, remove the DCM-2 from the DCM Compartment.

*Install the new DCM-2 assembly:*

1. Position the new DCM-2 in the DCM Compartment.
2. Align the locating pin holes in the DCM-2 with the pins in the rear wall of the DCM Compartment as the DCM-2 is seated.
3. While pushing the DCM-2 back on its mounting surface, tighten the (6) hex mounting screws with a 7/16" socket wrench. Torque to 50 lb-in (6 N•m).
4. Reconnect the (5) wiring connectors.
5. Reconnect power to the actuator.
6. Ensure that the DCM-2 is configured properly.
7. Check the state of the LEDs on the DCM. If either the FWD or REV LED is lit, the actuator will reposition when the Handswitch is returned to AUTO. If desired, change the Demand signal or reposition the actuator using the Handwheel or Handcrank until both the FWD and REV LEDs are out. With both LEDs out, when the Handswitch is returned to normal the actuator will not reposition.

*Check Actuator Calibration:*

Ensure that the actuator calibration is correct and the values previously recorded in Table 1 are correctly set in the new DCM-2. If you were unable to obtain these values from the DCM being replaced, contact the factory with the actuator serial number to obtain the configuration settings "as-shipped". Factory default settings for these values are shown in Table 1. Note that the "as-shipped" or factory default settings are not necessarily correct for the application, since settings are often changed during installation of the actuator. Values should be entered by using a HART® handheld communicator or the RS-232 connection and the Beck Serial Commands.

Also, ensure that the gear ratio setting is appropriate for the stroke timing of the actuator (see table below).

<b>Model Number</b>	<b>Output Torque lb-ft [N•m]</b>	<b>Stroke Timing (seconds/100°) Configurable</b>	<b>Gear Ratio*</b>
22-809	8,000 [10839]	15-300	250
22-409	4,000 [5423]	15-300	250
	2,500 [3387]	10-180	155
	2,000 [2710]	08-150	123

\*If necessary, gear ratio may be changed using Beck Serial command "gearratio" (see instruction manual 80-4280-02, Rev. 7.8 or later).

In order for the torque functions of the actuator to operate properly, accurate torque sensor range values (torque zero & torque constant) must be entered. These values are specific to each actuator and are recorded on a tag inside the DCM Compartment.

If the actuator fails to position properly, refer to instruction manual 80-4280-02 for actuator calibration procedures.

*Before replacing the DCM compartment cover:*

1. Examine the gasket for damage (cuts, tears, missing sections, etc.). If the gasket is damaged, follow steps 2–4 below to replace the gasket; if the gasket does not need replacing, skip to step 4.
2. Clean the mating surface of the actuator body by removing old gasket material and adhesive. Ensure that the mating surface is free of defects or gouges.
3. Peel the backing off the replacement gasket and carefully apply to the actuator body.
4. Replace the DCM compartment cover. If retrofitting a DCM-2 with display, attach the provided new DCM compartment cover with the display window (kit part number 12-8061-92). Torque the (4) captive 5/16-18 x 1.75" mounting screws to 10 lb-ft (14 N•m).

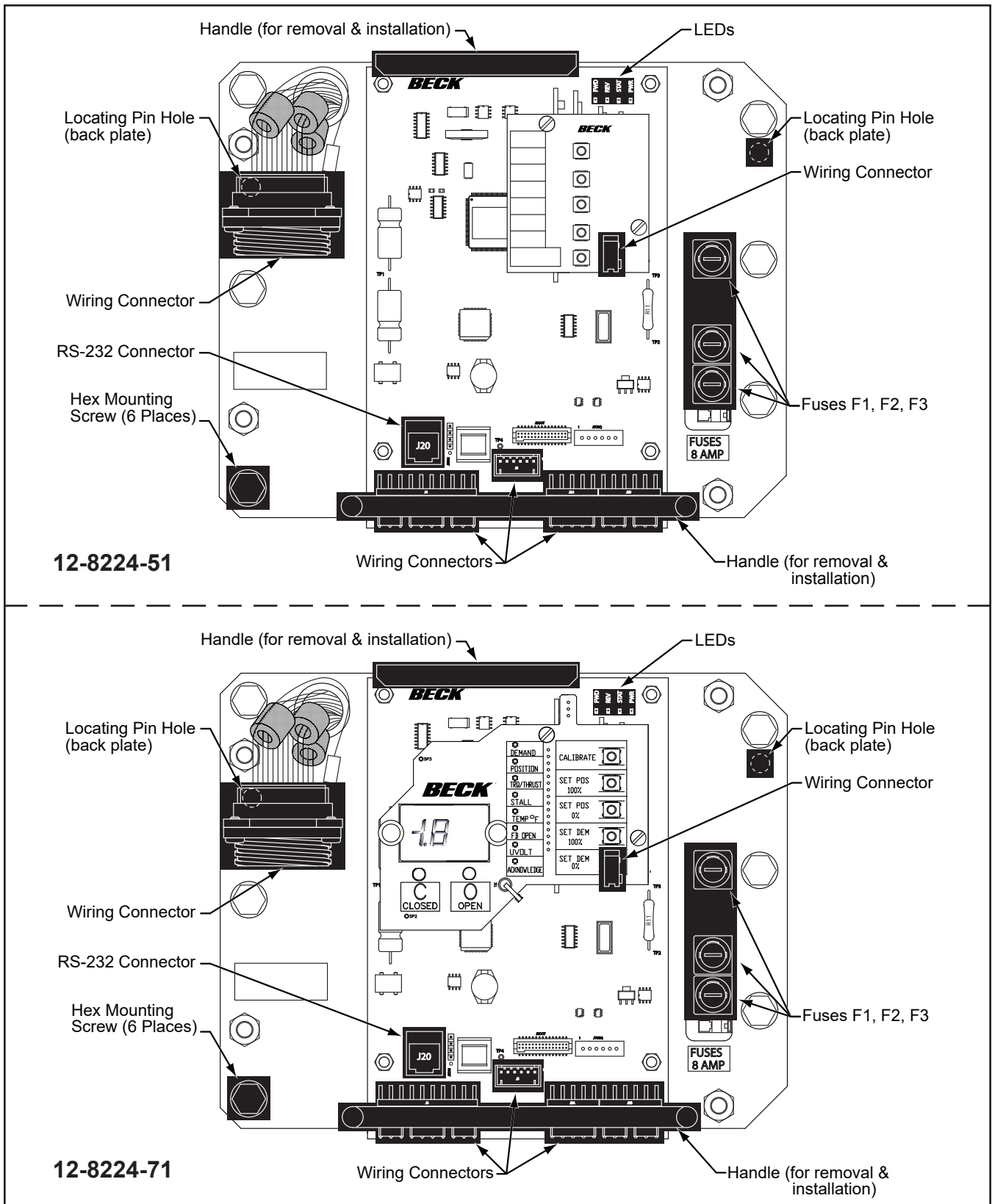


Figure 2

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