MODEL 22-309

REPLACEMENT INSTRUCTIONS

FOR THE DIGITAL CONTROL MODULE
(KIT PART NOs. 12-8061-75, -78, -81)

PURPOSE

The following instructions describe the steps necessary for replacing the Group 22-309 Digital Control Module (DCM-2) or the DCM-2 with display.

NOTE: After this procedure is complete, ensure you have the latest revision of the instruction manual. Go to haroldbeck.com to download instruction manual 80-4280-02.

REQUIRED TOOLS

1/2" socket wrench
#3 Phillips head screwdriver
Torque screwdriver with #3 Phillips head bit appropriate for 50 lb-in (6 N•m)
Torque wrench appropriate for 10 lb-ft (14 N•m)
Communications device for calibration

CAUTION

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

PROCEDURE

Refer to Figure 2 for DCM-2 component location.

The DCM-2 is located in the DCM Compartment (see Figure 1). Loosen the (4) captive hex head screws (1/2" socket wrench) and remove the DCM Compartment cover.

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 instruction manual 80-4280-02 for specific procedures.



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
Drive 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
Drive Model		Model#	22-309	drvmodel	12 (22-309)

*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. The default values listed should only be used if the specific numbers are unknown.

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.



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. While holding the DCM-2 handle, loosen the (4) captive mounting screws with a #3 Phillips head screwdriver.
5. Using the handle and a gentle rocking motion, remove the DCM-2 from the DCM Compartment and set it aside.

Install the new DCM-2 assembly:

6. Position the new DCM-2 in the DCM Compartment.
7. 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.
8. While pushing the DCM-2 back on its mounting surface, tighten the captive mounting screws. Torque to 50 lb-in (6 N•m).
9. Inspect the DCM Compartment gasket and replace if the gasket shows any wear or damage. If the gasket is in good condition, skip steps 10–11.
10. Clean the mating face of the actuator body to remove any remaining gasket material and adhesive. Ensure that the mating surface is free of defects such as dents or gouges.
11. Peel the backing off the replacement gasket and carefully apply to the actuator body.
12. Reconnect the five wiring connectors.
13. Reconnect power to the actuator.
14. Ensure that the DCM-2 is configured properly.
15. Check the state of the LEDs on the DCM-2. If the FWD or REV LED is lit, the actuator will begin to position when the Handswitch is returned to AUTO. If desired, change the Demand signal or reposition the actuator using the Handwheel until both the FWD and REV LEDs are out. When both LEDs are out, the Handswitch can be returned to AUTO without the actuator moving position.

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 which was replaced, contact the factory with the actuator serial number to obtain the "as-shipped"' configuration settings. Alternatively, 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.

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.

Replace the DCM Compartment cover and torque the four captive hex head cover screws to 10 lb-ft (14 N•m) torque.

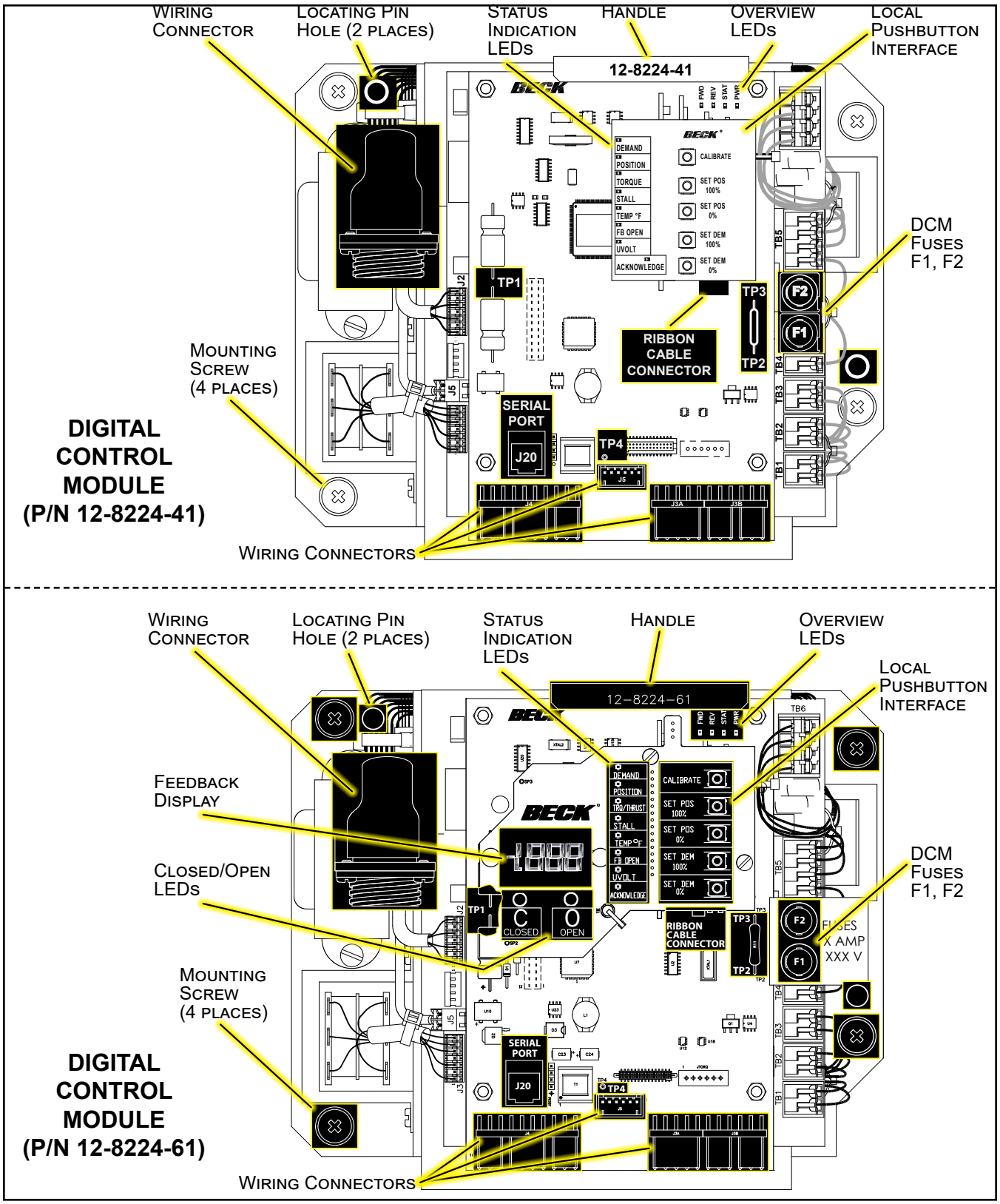

Figure 2

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