Regulator Board Installation Instructions for FlexPak 3000 Version 4.x Drives

M/N 920FK004x

Instruction Manual D2-3419

ATTENTION: Only qualified personnel familiar with the construction and operation of this equipment should install, adjust, operate, and/or service this equipment. Read and understand this instruction manual in its entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.

ATTENTION: All interconnecting wiring must be sized and installed in conformance with applicable local, national, and international codes. Failure to observe this precaution could result in damage to, or destruction of, the equipment.

This manual provides instructions for replacing the Regulator board in your FlexPak 3000™ drive with a new version 4.x Regulator board. It is intended for qualified electrical personnel. The Regulator board is sold individually as O-58770-4xx.

The installation procedure consists of replacing the Regulator board and restoring your drive configuration. Perform the instructions in the order in which they are presented in this manual. The board replacement procedure is the same for all FlexPak 3000 drives.

You will need to refer to FlexPak 3000 drive instruction manuals as you perform the installation procedure. These manuals are shipped with the FlexPak 3000 drive. The current FlexPak 3000 *Software Reference* manual also ships with this kit.

Kit Contents

The FlexPak 3000 Version 4 Regulator Board kit (M/N 920FK004x) consists of the following:

Part Number	Description	Quantity
O-58770-4xx	Regulator Board	1
	Grounding Harness	1
	Double Space Terminal	1
2CS3000	Control and Configuration Software	1
D2-3405	FlexPak 3000 Software Reference Manual	1

Getting Assistance From Reliance Electric

If you have any questions or problems with the products described in this instruction manual, contact your local Reliance Electric sales office. For technical assistance, call 1-800-726-8112.

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Installing Regulator Board O-58770-4xx

ATTENTION: Only qualified personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, and/or service this equipment. Read and understand this instruction manual in its entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.

Use the following procedure to replace the Regulator board (P/N O-58770-4xx) in FlexPak 3000 drives. Refer to figures 1 through 7 as you perform the procedure. Note that if the Power Module has been panel-mounted, this procedure will be easier to perform if the Power Module is removed from the panel.

Also note that the Regulator board replacement procedure is much easier to perform if you use the CS3000 software to upload and download the drive configuration. Otherwise, after the new Regulator board is installed, you will need to re-configure any drive parameters that must be changed from their default values.

Record the Drive Configuration Parameter Values

If the Regulator board being replaced is still operational, begin with step 1; otherwise, skip to the next section, "Remove the Old Regulator Board from the Card Carrier."

Step 1. Turn on power to the drive.

If you are using the Control and Configuration software (CS3000), continue to step 2. Otherwise, proceed to step 3.

Step 2. Use the CS3000 Upload command to save your drive configuration to a personal computer. Refer to the CS3000 instruction manual for this procedure.

After you have uploaded the configuration, proceed to the next section, "Remove the Old Regulator Board from the Card Carrier."

Step 3. Without changing any parameter values, perform the Quick Start procedure (described in the FlexPak 3000 OIM or DCM manual). This will allow you to quickly review many of the parameters whose values you need to record. Also refer to the Parameter Settings Record in the the FlexPak 3000 Software Reference (D2-3405) manual and make sure that the values of all parameters that have been changed from their default values have been recorded. You will need these values so that you can enter them for the new Regulator board.

Step 4. In addition to the parameters which appeared in the Quick Start procedure, also record the following parameter values:

Parameter (Menu Location)	Parameter Number	Value
CT TURNS RATIO (Tp/Tn) (CMI Feedback Scaling menu)	P.010	
MAXIMUM CURRENT (% FLA) (CMI Feedback Scaling menu)	P.007	
NOMINAL AC LINE VOLTS (Three Phase AC Line menu)	P.307	

Remove the Old Regulator Board from the Card Carrier

ATTENTION: The drive is at line voltage when connected to incoming AC power. Disconnect, tag, and lockout all incoming power to the drive before performing the following steps. Failure to observe this precaution could result in severe bodily injury or loss of life.

Step 1. Disconnect, tag, and lockout power to the drive.

ATTENTION: The drive contains printed circuit boards that are static sensitive. An anti static wrist band should be worn by any person who touches the drive's components, connectors, or leads. Failure to observe this precaution may result in erratic machine operation and damage to, or destruction of, equipment.

Step 2. Remove the OIM (or DCM) cover by loosening the two (2) cover retaining screws (refer to figure 1). Set the cover aside.

Step 3. Disconnect cable connector J9 from the lower left side of the Regulator board (refer to figure 2).

Step 4. Remove the four (4) screws which secure the OIM (or DCM) assembly to the card carrier. Disconnect the OIM/DCM ground wire. Set the OIM (or DCM) assembly aside.

Step 5. Note the wire lead connections to the Regulator board terminal strip. If these connections are not documented elsewhere, record them now. Then disconnect these wire leads from the Regulator board terminal strip.

Step 6. Disconnect ribbon cables J5, J6, and J7 from the Regulator board (refer to figure 3). If the drive uses a Field Current Regulator (M/N 911F K0041, 911F K0101, or 911F K0151), also remove cable J25.

Step 7. Remove the three (3) screws which secure the Regulator board to the card carrier. Two screws are located at the bottom corners of the board; one is located at the center of the board. If the drive is in an upright position, be careful not to let the Regulator board slip out of the card carrier when the last screw is removed.

Set the screws aside for later use. Then slide the old Regulator board out of the card carrier.

Step 8. Note the settings of the jumpers, listed below, on the old Regulator board. Figure 4 and figure 5 show the locations of these jumpers.

JUMPER	OPTIONS (bold = default)	SETTING
J15 REGULATOR TYPE	**Speed** / Current	
J16 OIM PROGRAM	**Enable** / Disable	
J20 FIELD LOSS DETECT	**Enable** / Disable	
J21 FIELD SUPPLY JUMPER	**B-C** / AC	
J19 MANUAL REF	Ext / **Pot**	
J14 TACH V RANGE	250 / **62**	
J11 TACH V SCALE	62 / 31 / **16**	
J10 AUTO REF	(**10 Volts** / 4-20 mA / 10-50 mA	
J12 AUTO REF	**Volts** / Milliamps	
J18 ARM I FB RB	Position **1** / 2 / 3 / 4	
J26	(not used)	Do Not Use
J27 SPARE 1	(not used)	Do Not Use
J28 FILTER SELECT	(not used)	Do Not Use
J29 SPARE 2	(not used)	Do Not Use
J30 POWER UNIT	**LOW**	Do Not Change

Install the New Regulator Board in the Card Carrier

Step 1. Remove the new Regulator board from its anti-static wrapper and set the jumpers on the new Regulator board so that they are identical to those on the old board.

Step 2. Lay out the grounding harness provided with the kit as shown in figure 6. Attach the 4 connectors to the spade terminals (labeled F1 through F4) in each corner of the Regulator board.

Step 3. Locate the Power Supply board on the back side of the carrier (see figure 7). Remove the 2 screws that fasten the Power Supply board in place. The ribbon cables will hold it in place.

Step 4. Slide the new board into the card carrier, routing the grounding harness connector at the top left of the Regulator board through the opening in the carrier and to the Power Supply board.

Step 5. Disconnect the ground connector (labeled 2 in figure 7) from the Power Supply board. Attach the grounding harness connector (labeled 1 in figure 7) to the spade terminal on the Power Supply board and then re-connect the ground connector to the terminal provided on the grounding harness connector.

Step 6. Re-attach the Power Supply board using the two screws removed earlier.

Step 7. Attach the new Regulator board to the card carrier using the screws removed in step 7 of the Regulator board removal procedure.

Step 8. Reconnect ribbon cables J5, J6, and J7 to the Regulator board. If the drive uses a Field Current Regulator, also reconnect cable J25.

Step 9. Reconnect all wire lead connections to the Regulator board terminal strip.

Step 10. Install the double spade terminal on the OIM/DCM ground stud. Connect the right angle spade connector (shown in figure 6) to the OIM/DCM ground stud.

Step 11. Reinstall the OIM (or DCM) assembly to the card carrier using the screws removed in step 4 of the Regulator board removal procedure.

Step 12. Reconnect cable connector J9 to the Regulator board.

Step 13. Reinstall the OIM (or DCM) cover.

Step 14. Remove the lockout and tag, and apply power to the drive. The drive will perform power-up diagnostics. Verify that power-up diagnostics are completed successfully. The drive may power up with a FACTORY DEFAULTS RESTORED fault. Press <CANCEL> to clear this error and any other fault/alarm messages that may appear.

Restoring the Drive Configuration

Step 1. Perform a Restore Defaults operation (described in the FlexPak 3000 OIM or DCM manual).

If you have the CS3000 software, continue to step 2. Otherwise, proceed to step 3.

Step 2. Use the CS3000 Download command to load the drive configuration from the personal computer to the drive. Refer to the CS3000 instruction manual for this procedure.

After you have downloaded the configuration, proceed to step 5.

Step 3. Set ARM TURNS RATIO, MAXIMUM CURRENT, and NOMINAL AC LINE VOLTS to the values recorded earlier.

Step 4. Perform the Quick Start procedure, and set the parameter values to those recorded earlier. Also set any other parameters whose values you recorded earlier.

Step 5. Verify that the hardware jumper positions match those recorded earlier.

Step 6. (This step must be performed while the drive is stopped.) The armature voltage and analog tach feedback channels must be adjusted to compensate for any offset that may exist. From the Speed/Voltage Loop (SPD) Feedback menu, adjust ARM VOLTAGE ZERO ADJ up or down until ARMATURE VOLTAGE is zero. Adjust ANALOG TACH ZERO ADJ up or down until ANALOG TACH FEEDBACK is zero.

Step 7. Perform a Memory Save procedure (described in the FlexPak 3000 OIM or DCM manual) to save the parameter values to retentive memory.

Step 8. **Do not cycle power.** Press the OIM <FAULT> key to display the Fault menu. Scroll down to select the Clear Fault Log and Reset Faults menu item. Press <ENTER>. A LINK FAILURE message may appear. If so, wait for about 30 seconds for the OIM to reconnect and then press <CANCEL> to clear the Link failure message.

Step 9. Cycle power to the drive and verify that the drive powers up with no fault or alarm messages.

This completes the Regulator board replacement procedure.

Troubleshooting the Installation

The following table describes possible installation problems and their corrective actions. The FlexPak 3000 drive instruction manuals also contain guidelines for troubleshooting the drive.

Description of Problem	Corrective Action
Replacement board is too big/too small.	Check the part number on the replacement board.
Analog speed reference is non-zero when the drive is stopped.	Re-adjust ANALOG TACH ZERO ADJUST.
Alarm code A00050 (CML FEEDBACK SCALING ERROR) is displayed.	Armature current feedback could not be scaled properly based on the values entered for MOTOR RATED ARM AMPS and MAXIMUM CURRENT. Verify that these parameters are correct for your application. Verify that CT TURNS RATIO has been set to the value recorded in step 4 of the installation procedure.
OIM shows only numbers for some drive parameters.	The OIM on a version 2 drive will show only numbers for version 3 or version 4 parameters. Upgrade the OIM to version 4.

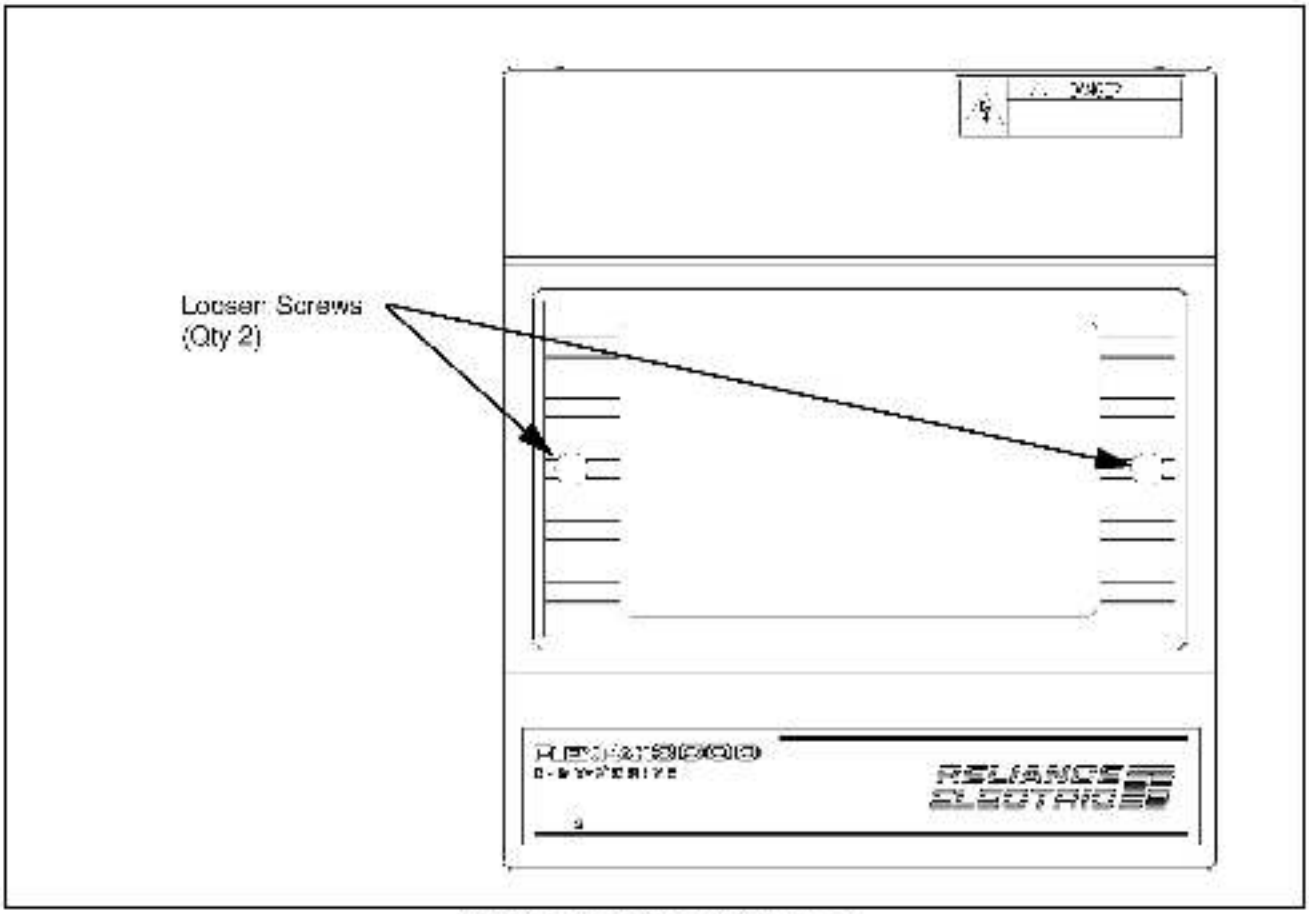

Figure 1 Removing the OIM/OIM Cover

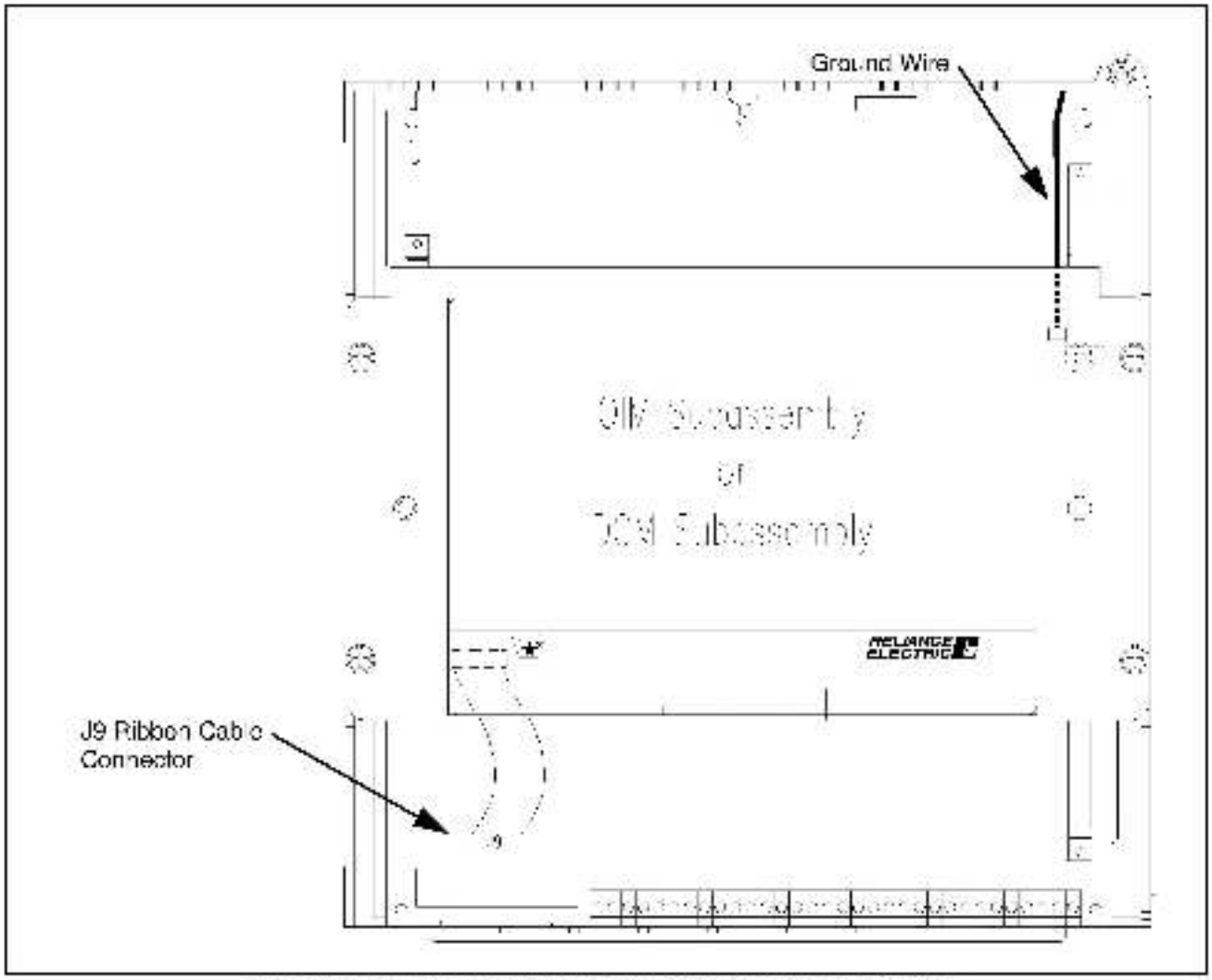

Figure 2 – Removing the J9 (OIM/DCM) Ribbon Cable and Terminal Strip Wiring

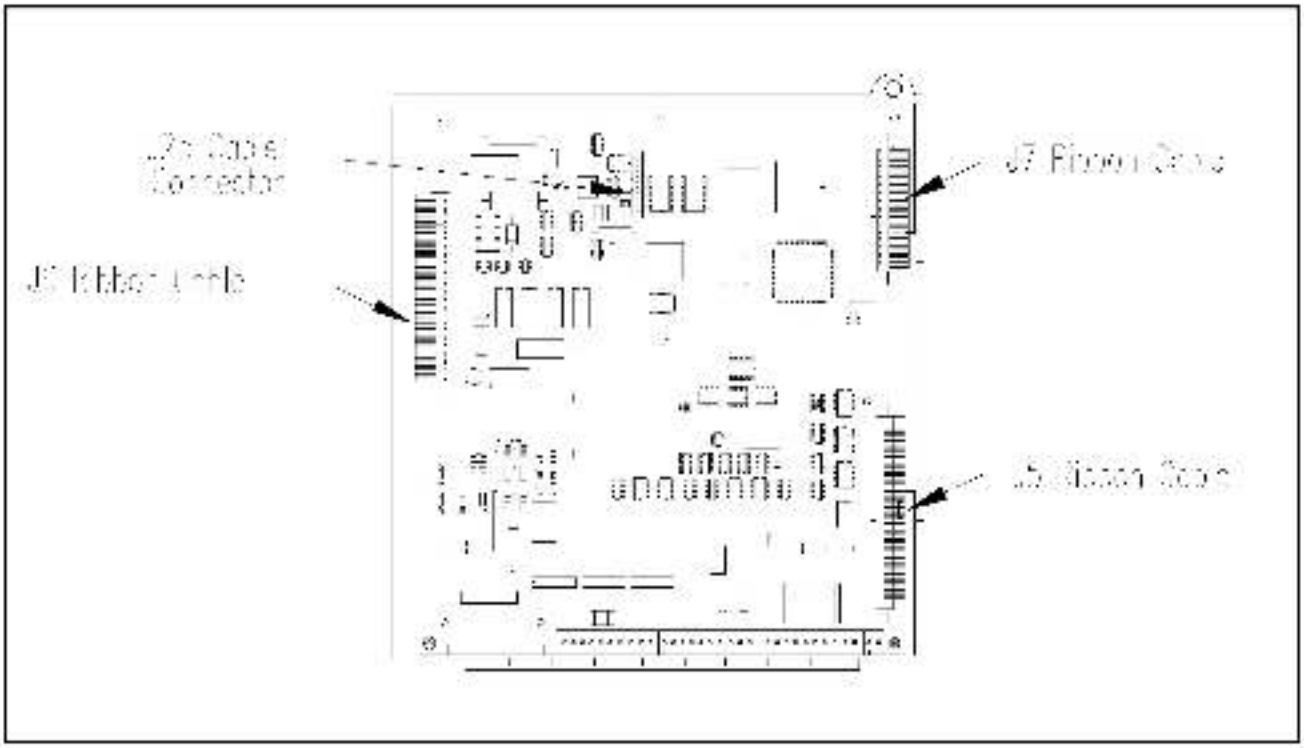

Figure 3 — Removing the Ribbon Cable Connectors

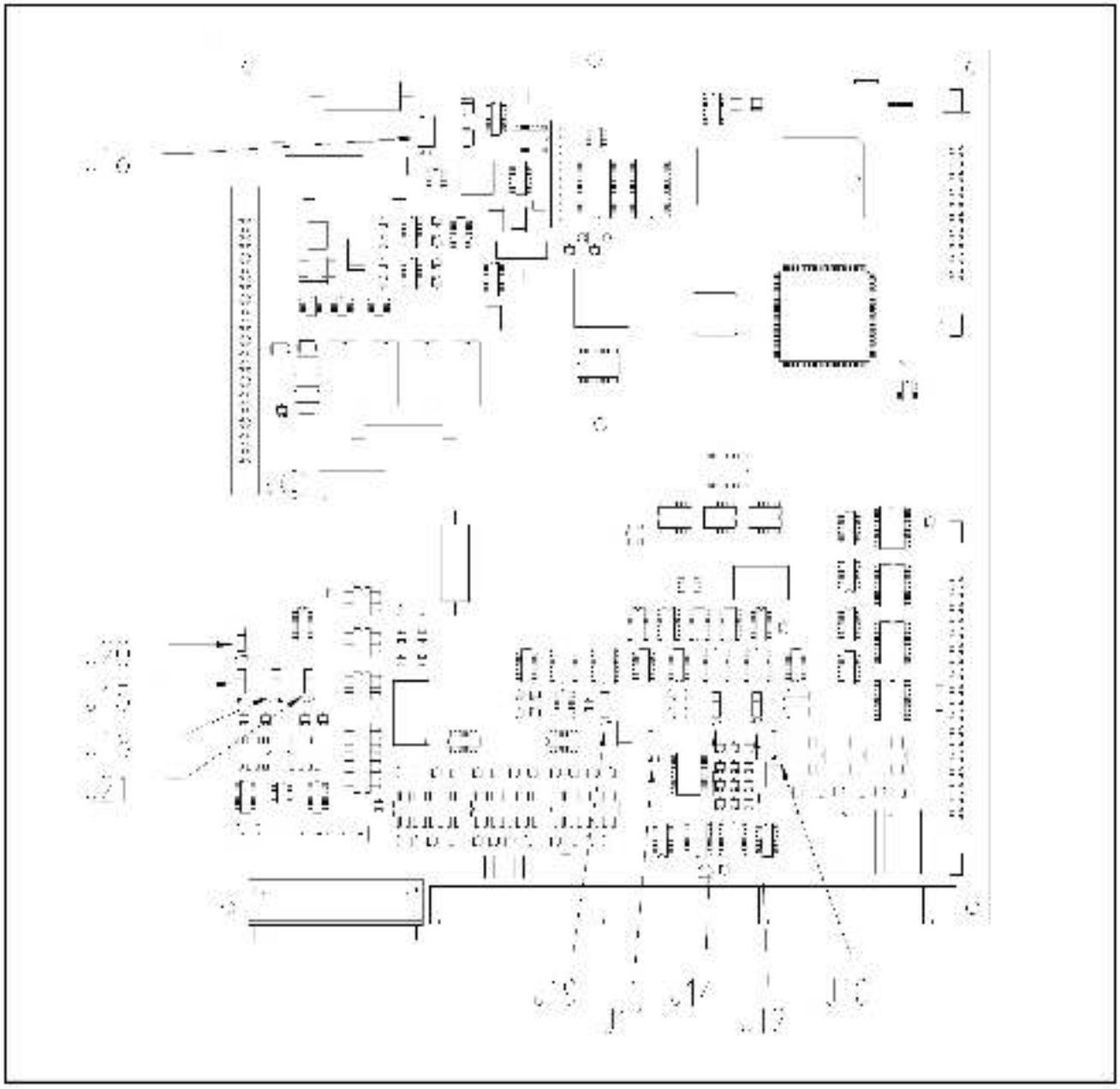

Figure 1 – Version 5.x Regulator Board Jumper Locations

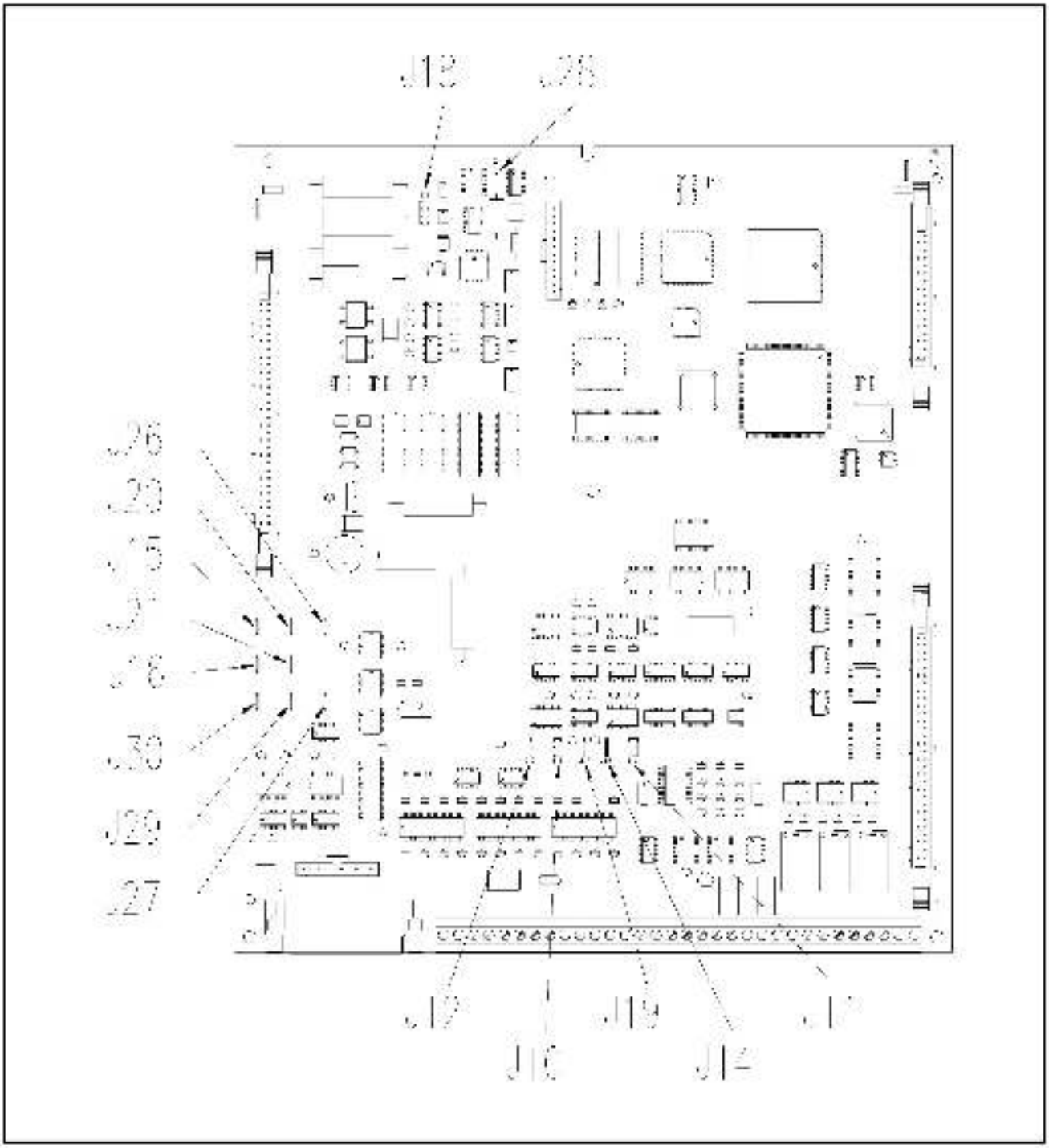

Figure 5 – Version 4.x Regulator Board Jumper Locations

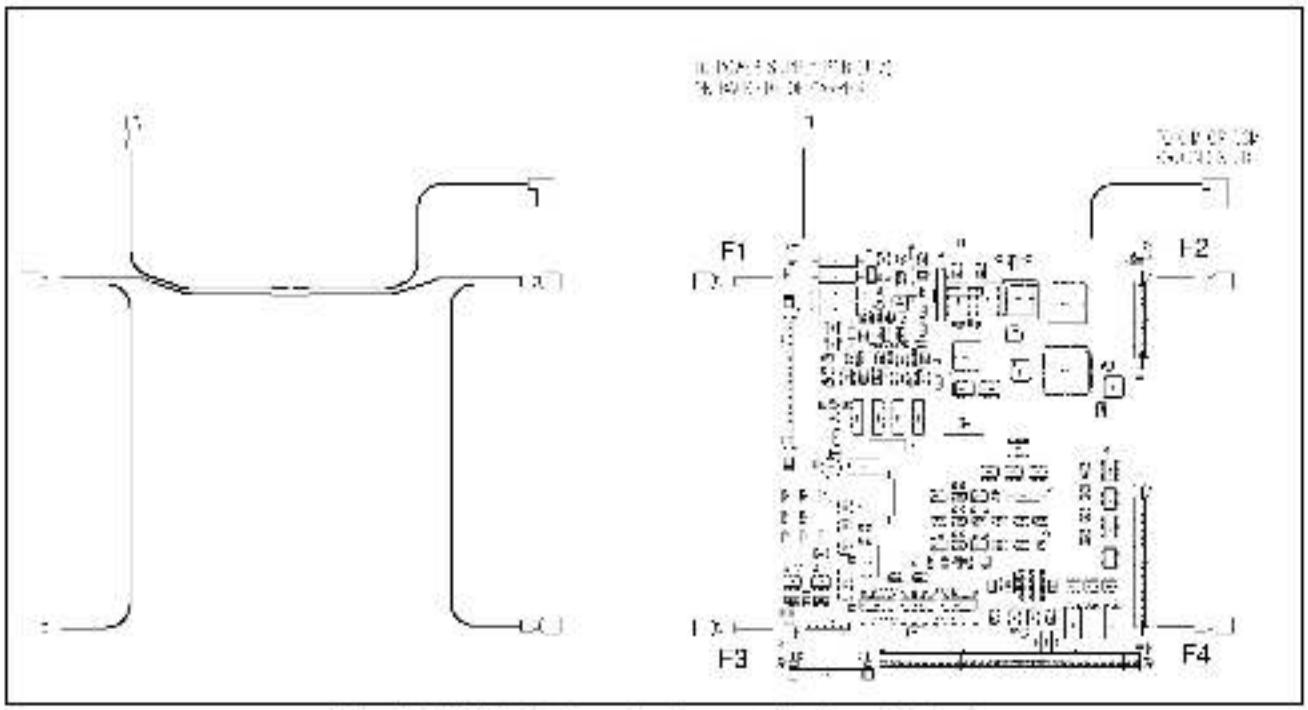

Figure 6 – Attaching the Grounding Harness to the Regulator Board

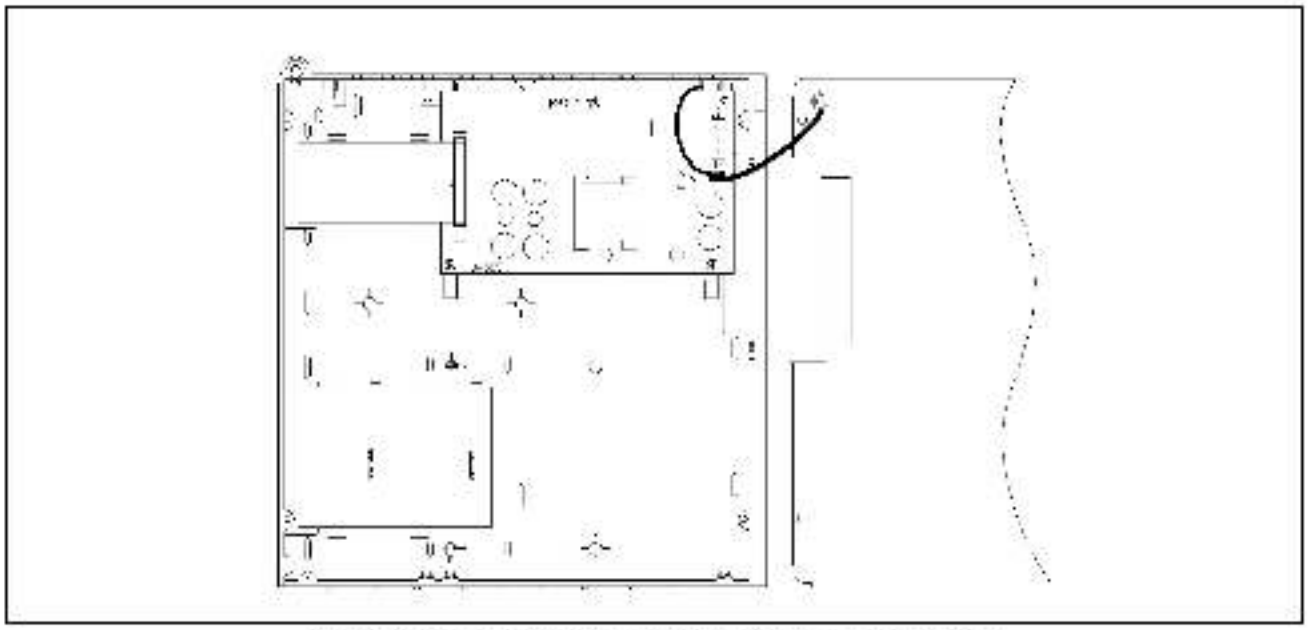

Figure 7 – Attaching the Grounding Harness to the Power Supply Board

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