

E1135C PDU and Pod Upgrade Procedure

E4030-90010 Rev. B 12/2003

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Objectives

This document will guide you through the installation of two upgrades to the Agilent 3070 system:

- **E1135C PDU** — Upgrades the system's PDU.
 - If your system has an E1131A PDU, it must be upgraded to the latest E1135C PDU.
 - If your system has an E1135A, E1135B or E1135C PDU, you do not need to upgrade it.
 - If you upgrade the testhead PDU, you must also upgrade the pod because the old pod will not accommodate the E1135C PDU.
 - If your system includes a Support Bay with an E1131A PDU, that PDU must be removed, and the Support Bay will be powered by the E1135C PDU in the testhead.
- **Wider Pod** — Upgrades the right pod of the testhead to a wider pod. This is needed to accommodate the latest system controller and the E1135C PDU.

NOTE

These upgrades may only be performed on Series II or Series 3 systems, not on Series I systems.



About the Controller...**NOTE**

If you are also doing a controller upgrade, that procedure is covered in a separate document, *UNIX-to-MS Windows Controller Upgrade* (E9959-90000). As you do the PDU and pod upgrades, leave the controller intact. Just move it out of the way while doing the PDU and pod upgrades.

Tools Needed

- Safety glasses
- Needle-nosed pliers
- 6-mm (1/4-inch) flat-blade screwdriver
- 3-mm (1/8-inch) flat-blade screwdriver
- Wire strippers
- Wire cutters
- Digital Multimeter
- T10 Torx screwdriver
- T15 Torx screwdriver
- T20 Torx screwdriver
- 5/16-inch nut driver

Contents of the Upgrade Kits**Table 1** PDU Upgrade Kit E1135-80005

Part Number	Qty	Description
0400-0397	2	strain relief
0151-0377	2	screw
0515-1922	4	screw
0535-0066	2	nut
0535-0076	2	nut
0590-2271	2	lock nut
1400-0482	20	cable tie
8120-1575	1	power cord for controller
E4000-61623	2	outlet assy
E4000-61624	2	cord assy
E7733-0001	1	filler panel

Table 2 Pod Upgrade Kit E9959-80002

Part Number	Qty	Description
0515-0335	2	screw
0515-1922	7	screw
0515-2044	4	screw
0535-0076	2	nut
1400-0249	1	cable tie
1400-1328	1	cable tie mount
1400-0426	2	screw cover
2680-0601	1	screw
3160-0410	1	fan
3160-0551	2	finger guard
E1135-00216	1	PDU mounting ear
E4000-00177	1	wide pod cover
E4000-00178	1	wide pod door
E9900-00149	1	bracket
E9900-00181	1	PDU bracket
E9900-44601	1	filter
E9900-61603	1	fan cable
E4030-90010	1	PDU upgrade manual

Table 3 PDU Field Upgrade Kit E1135-97003

Part Number	Qty	Description
1252-5562	4	IEC320 20/16A 250VAC connector
1400-1513	5	Label
1253-4798	4	Posi-Lock connector
E9900-61620	2	Control cable with connector
5185-6718	1	Marking pen
E1135-90004	1	Installation Procedure
0510-0571	8	loop fastener
0510-0572	8	hook fastener
1400-0482	4	cable tie

Installation Procedures

Verifying the Power Option of the New PDU

Before installing the new E1135C PDU, verify that it is the correct power option for the system's "mains" input power:

- E1135-97000 — For 200–240V 3-phase delta (Opt. 3PD)
- E1135-97001 — For 220/380–240/415V 3-phase wye with Neutral (Opt. 3PN)
- E1135-97002 — For 208–220V 3-phase wye (Opt. 3PY)

Shutting Down the System

WARNING



Voltages capable of causing injury or death are present in the PDU. These procedures should be performed only by a 3070 service-trained and qualified individual.

NOTE

The "mains" wiring should be performed by an electrician, not a 3070 service person.

- 1 Suspend testing and power down the testhead (testhead power off).
- 2 Switch off the testhead PDU.

- 3 Disconnect the ac mains from the source. Use the [Lock-Out Tag-Out Procedure](#) below.

Lock-Out Tag-Out Procedure

This "lock-out tag-out" procedure is for electricians.

Locate the switch controlling mains power to the power cord going to the PDU. Turn the mains power off and place a hasp (padlock) through the mains power switch. Place a tag on the lock that provides the following information: the name of the person who locked the switch, when it was locked, what work is being performed, when the lock will be removed, and the name of the electrician's supervisor.

Only the electrician who installed the lock or the supervisor may remove the lock and restore mains power.

Removing the PDU from the Support Bay

NOTE

If the system has a Support Bay, and if the Support Bay has an E1131A PDU, do the steps below. Otherwise, proceed to [Removing the Pod Door and Cover](#) on page 6.

- 1 Switch off the Support Bay PDU.
- 2 Disconnect the ac mains from the source. Use the [Lock-Out Tag-Out Procedure](#) above.

- 3 Open the rear door of the Support Bay.
- See **Figure 1** for the following steps.
- 4 Unplug all instrument power cords from the outlet boxes in the Support Bay.
- 5 Remove the outlet boxes from the Support Bay.
- 6 Remove the E1131A PDU from the Support Bay. If it has remote shutdown wires going to the testhead PDU, disconnect the wires from the E1131A. Discard the PDU, outlet boxes and power cords.
- 7 Install a filler panel (E7733-0001) in the bay where the PDU was.
- 8 Install two new outlet box assemblies (E4000-61623) in the Support Bay where the old outlet boxes were.
- 9 Route two power cord assemblies (E4000-61624) through the bottom of the Support Bay and up to the new outlet box assemblies. Connect the plugs together.
- 10 Use cable ties to secure the power cords in the Support Bay and route the power cords over to the testhead PDU. You will connect them later.

CAUTION


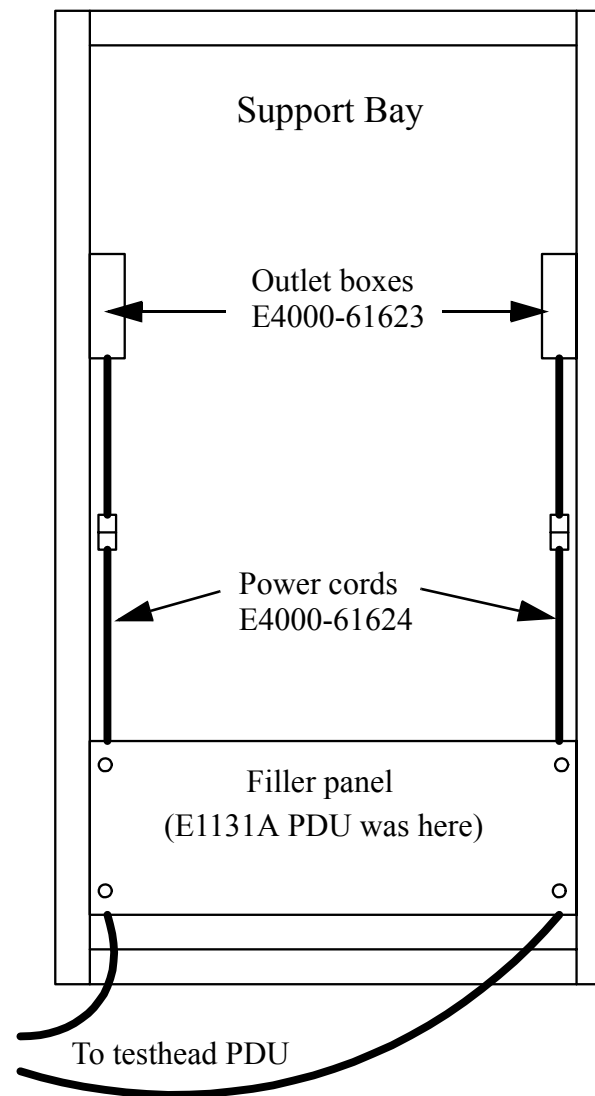
 DO NOT plug the instrument power cords into the new outlet box assemblies until you have verified the voltage later.

Figure 1 Installing outlet boxes



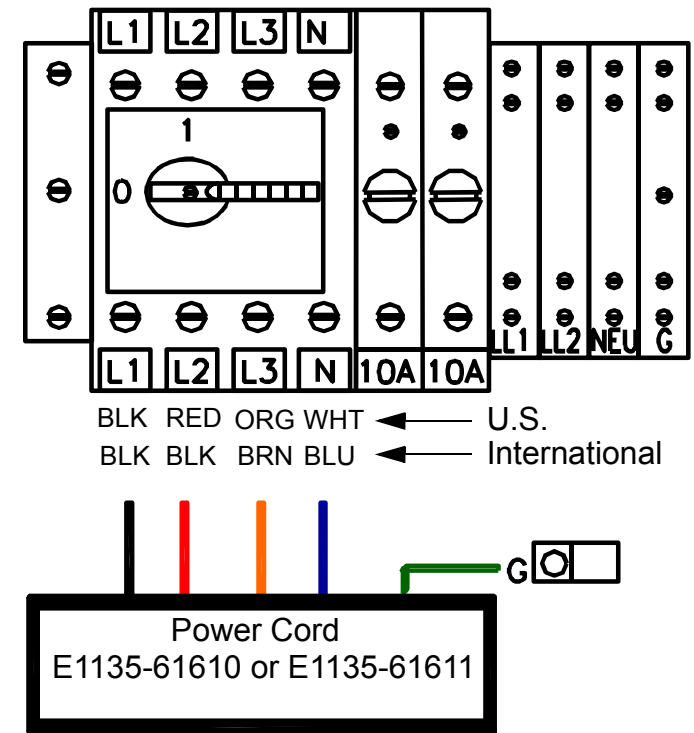
Removing the Pod Door and Cover

- 1 On the testhead, open the door, lift it up, and remove it from the pod.
- 2 Using a Torx driver, remove five screws to remove the right pod cover.
- 3 Remove the front left panel from the old PDU.

Removing the Old PDU

- 1 Unplug all power cords from the old PDU's rear panel receptacles (outlets).
- 2 Remove the old PDU from the mounting bracket.
- 3 Remove the left front panel from the PDU.
- 4 Disconnect the mains wires from the input terminal block in the PDU.
- 5 Remove the mains power cord and the front panel strain relief from the old PDU's panel.
- 6 Install the strain relief from the old PDU on the front left panel of the new PDU.
- 7 Route the power cord through the strain relief and connect the power cord to the new PDU as shown in [Figure 2](#). You can use the power cord that you just removed from the old PDU, or you can install a new power cord of the type that is currently being supplied with new systems. These new power cords must be ordered separately (for 3-phase only):
 - Outside the U.S.: E1135-61610
 - Inside the U.S.: E1135-61611

Figure 2 Wiring the mains power cord

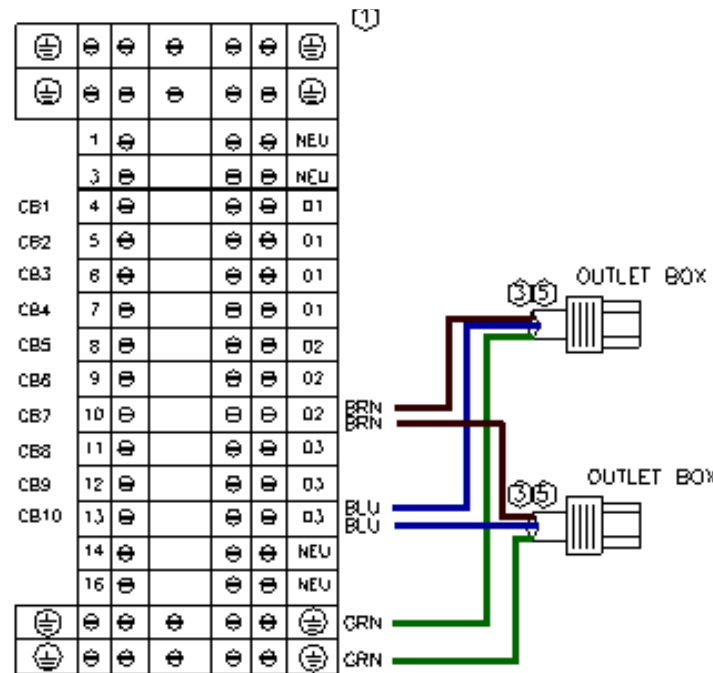


- 8 If you installed new outlet box assemblies in the Support Bay:
 - a Route the outlet box power cords from the Support Bay through the two holes in left front panel of the new PDU ([Figure 6](#) on page 8).
 - b Remove the right front panel of the PDU.
 - c Wire the power cords to the output terminal block as shown in [Figure 3](#) on page 7.

- d Install strain reliefs (0400-0397) on the power cords where they pass through the PDU panel.

9 Reinstall the front panel(s) on the new PDU.

Figure 3 Wiring the outlet boxes



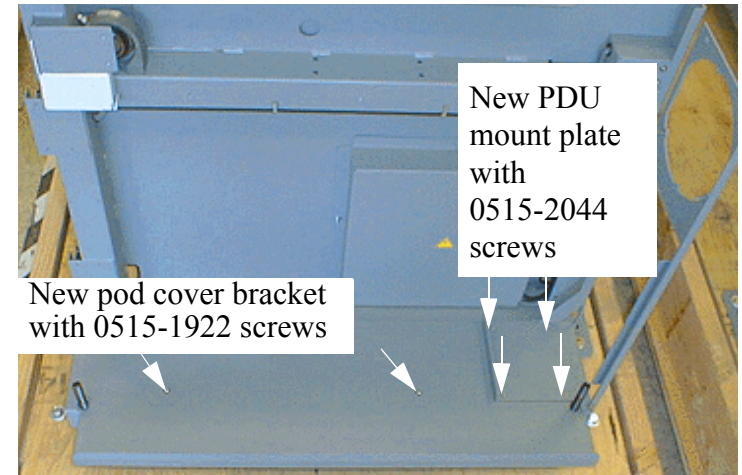
Upgrading the Pod

Replace the Pod Cover Bracket

- 1 Remove the two existing pod cover bracket screws (**Figure 4**); then remove the pod cover bracket.

- 2 Place the new pod cover bracket in position and secure it with two 0515-1922 screws.

Figure 4 Pod cover bracket and PDU mount plate installed



Replace the PDU Mount Plate

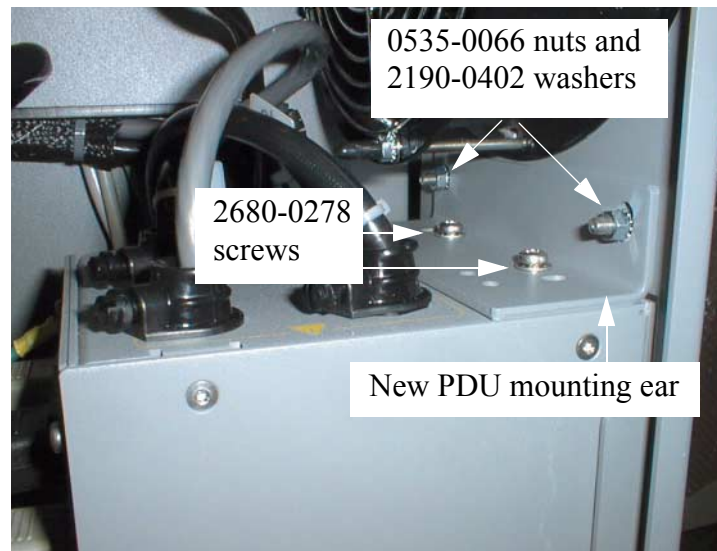
The new PDU mount plate accommodates a new fan to help cool the controller.

- 1 Remove the PDU mount plate screws (**Figure 4**), then remove the PDU mount plate.
- 2 Place the new PDU mount plate in position and secure it with four 0515-2044 screws.

Installing the New PDU

- 1 Route the PDU power cord through the newly-installed PDU mount plate.
- 2 Replace the PDU in the pod and re-secure it with two screws that you removed earlier.
- 3 Attach the new PDU mounting ear to the PDU with two 2680-0278 screws (**Figure 5**).
- 4 Secure the new PDU mounting ear to the PDU mount plate with two 0535-0066 nuts and 2190-0402 flat washers.

Figure 5 The PDU mounting ear installed



Install the Pod Fan on the Rear Pod Sheet Metal

- 1 Install the two long screws (0515-0335) through a fan finger guard (3160-0551) and then through the new PDU mount plate (**Figure 6**).

Figure 6 Right pod ready for the pod cover (shown with new, wider controller)



- Slide the fan onto the screws, then add the other finger guard. Install two 0535-0076 locknuts to secure the assembly (**Figure 7**).

WARNING


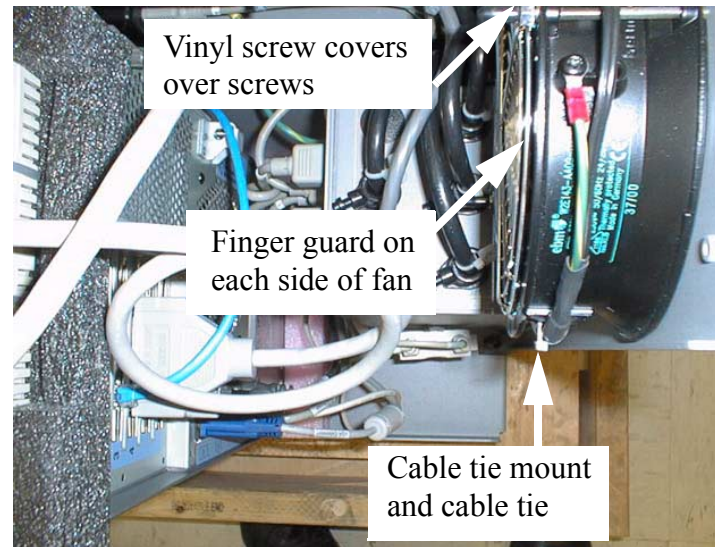
 To prevent injury, make sure that TWO finger guards are installed, one on each side of the fan. Also add a 1401-0426 vinyl screw cover over each of the two exposed screw ends.

Figure 7 Installed fan assembly – top view



Installing the E1135 PDU Field Upgrade

NOTE

The parts for this are listed in are in the Table 3, “PDU Field Upgrade Kit E1135-97003,” on page 3.

- Cut all hard-wired power cords entering the side panel of the PDU. These are the power cords going to the outlet boxes in the testhead. Cut the power cords between the PDU and the labels to save the labels. You will refer to these labels later to re-connect the power cords.

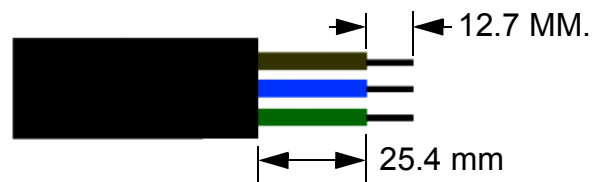
Installing Connectors on the Power Cords

NOTE

Before installing a new connector, remove the existing label and place a new label 64 millimeters (2.5 inches) or more from the cut end of the cable. Mark each label with the same number that you removed.


- 1 Strip the wires on the power cords going to the module outlet boxes (**Figure 8**):
 - a Remove 25.4 millimeters (1 inch) of black insulation from each module power cable.
 - b Strip each wire 12.7 millimeters (0.5 inch).

Figure 8 Stripping the power cord wires



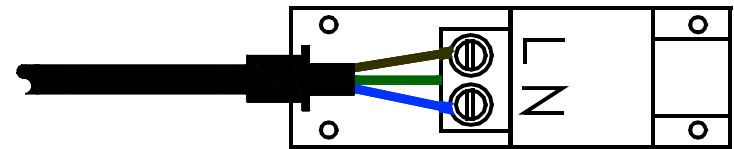
- 2 Connect the stripped wires to an IEC320 connector (1252-5562) to each module power cable (**Figure 9**):
 - a Open the connector with flat-blade screwdriver.
 - b Slide cable into the strain relief.
 - c Place the brown wire in terminal **L** and tighten the screw.
 - d Place the blue wire in terminal **N** and tighten the screw.
 - e Place the green wire in the terminal marked as **ground** and tighten the screw.

CAUTION

 The terminal screws must be tightened to 1–1.4 N•m (9–12 in•lb) of torque to ensure reliable electrical connections.

- f Close the connector and tighten the screws.

Figure 9 Installing the power connectors




NOTE

The kit includes four of these connectors. Your system may not need all the connectors in the kit.

- 3 Verify that every module outlet box power cord is labeled with the correct module number. If the cable is not labeled, add labels (1400-1513) from the kit.
- 4 Use a multimeter and verify continuity from the module outlet box to the new connector or perform a visual inspection.

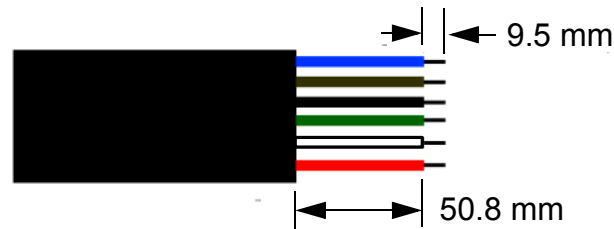
CAUTION

 DO NOT connect any of the module outlet box power cords to these connectors yet.

Installing a Connector on the Control Cable

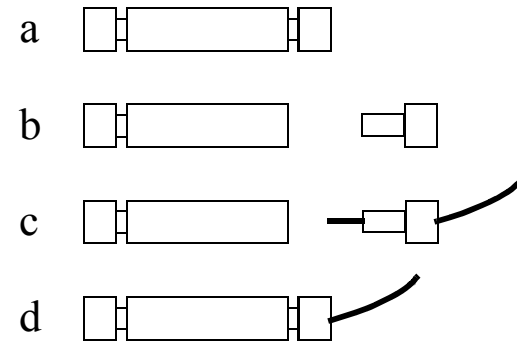
- 1 Strip the wires on the control cable (**Figure 10**):
 - a Remove 50.8 millimeters (2 inches) of gray insulation from the control cable jacket.
 - b Strip each wire 9.5 millimeters (0.4 inch).
- 2 Remove the red and white wire; cut them back to the cable jacket.

Figure 10 .Stripping the control cable wires



- 3 Install a Posi-Lock Connector (1253-4798) on each of the remaining four wires (**Figure 11**):
 - a Obtain a connector from the kit.
 - b Unscrew one end of the connector.
 - c Insert the stripped end of the wire into the connector until the bare wire extends out the end of the connector.
 - d Screw the connector back together.

Figure 11 Posi-Lock Connector — first wire



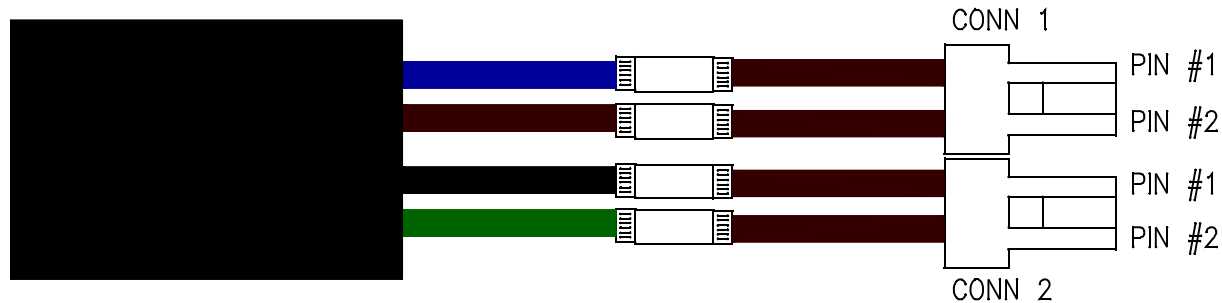
- 4 Obtain the control cables (E9900-61620) from the kit.
 - a Insert the stripped end of the control cable wires into the opposite ends of each Posi-Lock Connector and tighten the connector (**Figure 12**).

- b Wire the connectors as follows (**Figure 13**):
 - Connector #1: wire the blue wire to Pin #1
 - Connector #1: wire the brown wire to Pin #2
 - Connector #2: wire the black wire to Pin #1
 - Connector #2: wire the green wire to Pin #2

Figure 12 Posi-Lock Connector — second wire




Figure 13 Connecting the control cables.



Verifying the Operation of the New PDU

- 1 Turn on the PDU by switching the **Main Disconnect** switch to **1** and the green **Enable** switch to **1**.

WARNING

 The PDU carries line voltage of up to 415 volts ac, capable of causing severe burns or death. Use extreme care when troubleshooting or testing the PDU.

- 2 Verify that the green **Enable** switch and the green LED are illuminated. This verifies that the PDU has

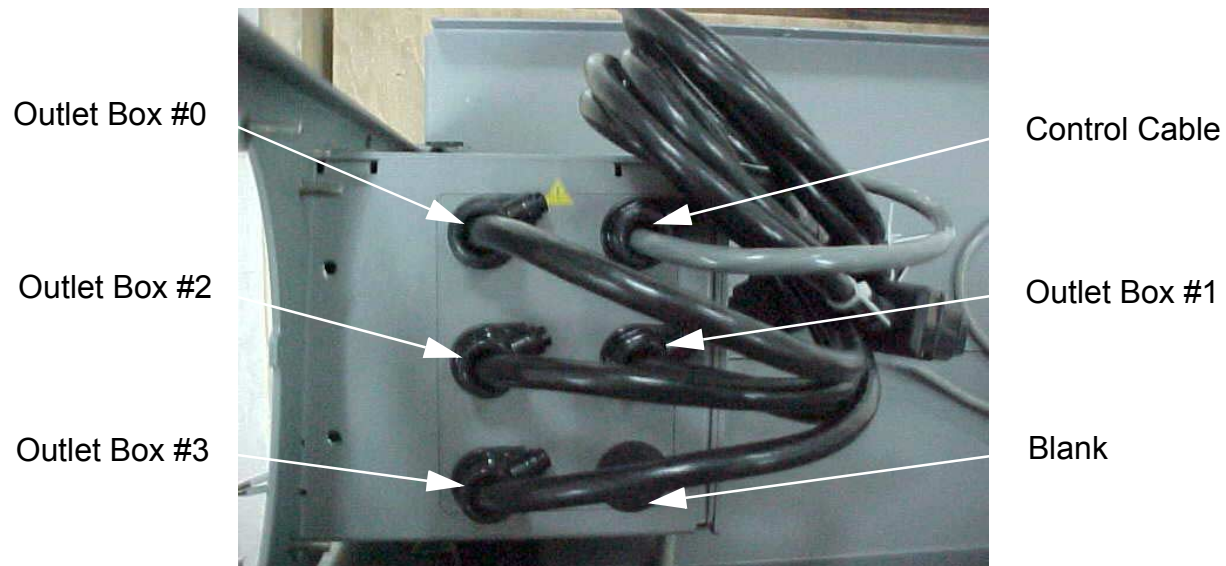
been wired for the correct power option. Use a multimeter to measure the voltage on the PDU rear panel receptacles and at each connector (a voltage between 200–240 volts ac should be measured).

- 3 Turn off the PDU **Enable** switch (**0** position) and **Main Disconnect** switch (**0** position).

Reconnecting the Outlet Boxes

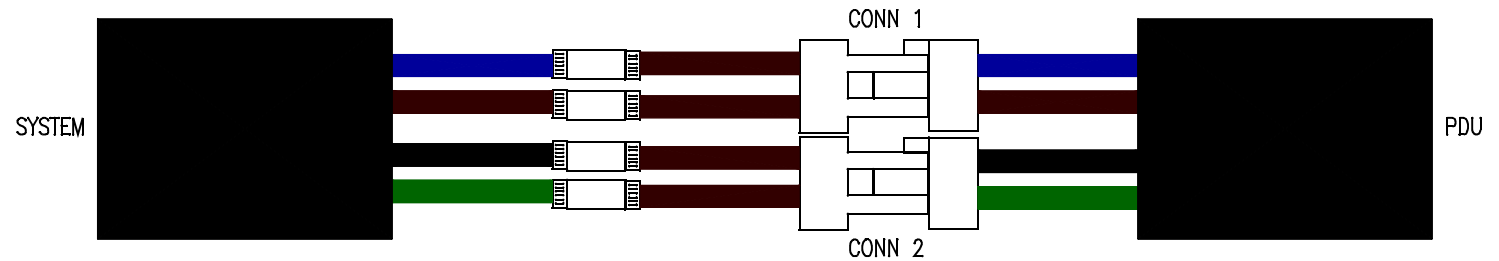
- 1 Plug each outlet box power cord into the corresponding power cord on the new PDU ([Figure 14](#)).

Figure 14 Connecting the module outlet power cords to the new PDU.



- 2 Plug the control cable into the corresponding connector on the new PDU ([Figure 15](#)).
- 3 If you installed new outlet boxes in the Support Bay, plug the Support Bay instruments into the outlet boxes.

Figure 15 Connecting the control cable



Wiring the Pod Fan

- 1 Press the fan power cord onto the fan power connector, then plug the power cord into an available outlet on the PDU.
- 2 Use a 2680-0601 screw to connect the fan power cord ground wire to the fan (shown connected in [Figure 7](#) on page 9).
- 3 Provide power cable strain relief (shown completed in [Figure 7](#) on page 9):
 - a Apply the 1400-1328 cable tie mount to the side of the fan.
 - b Use the 1400-0249 cable tie to secure the fan power cord.

Securing the Power Cords in the Pod

In this procedure, you will affix hook-and-loop fasteners to the plugs on the PDU power cords and to the plugs on the outlet box power cords. The plugs will then be attached to the wall of the pod.

CAUTION

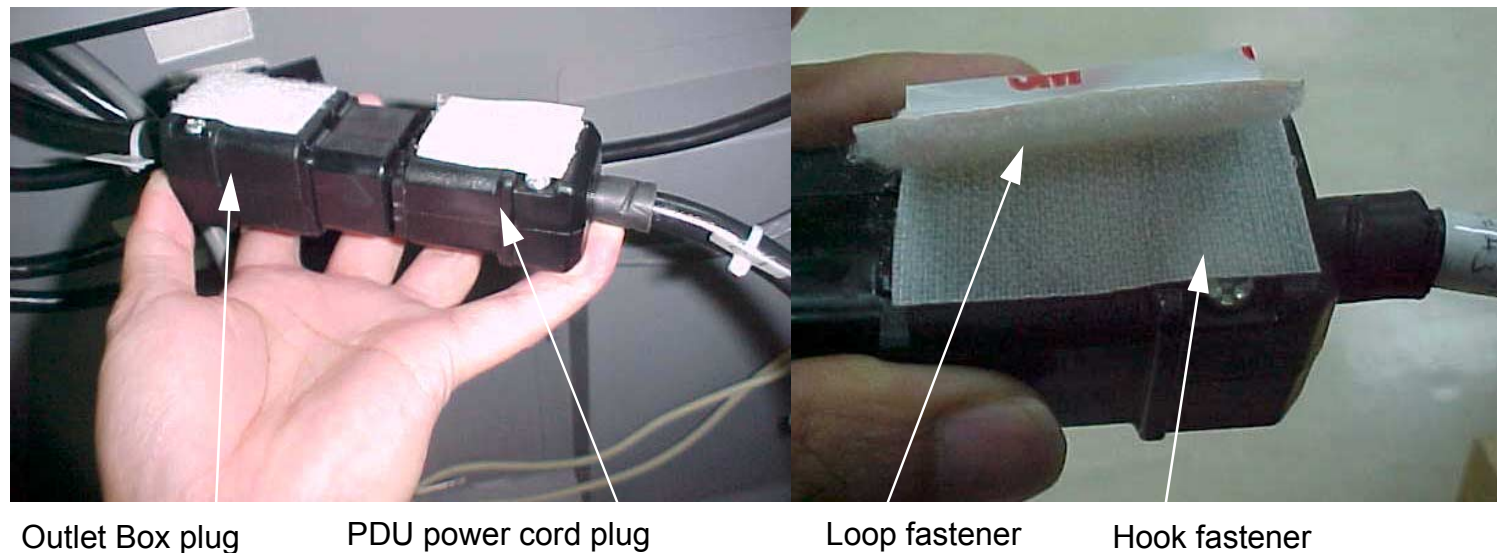
⚠ Attaching the plugs to the wall of the pod with hook-and-loop fasteners is required to ensure that the plugs remain securely connected.

CAUTION

⚠ When putting the hook-and-loop fasteners on the plugs, the hook-and-install fasteners must be on the same side of both mated plugs.

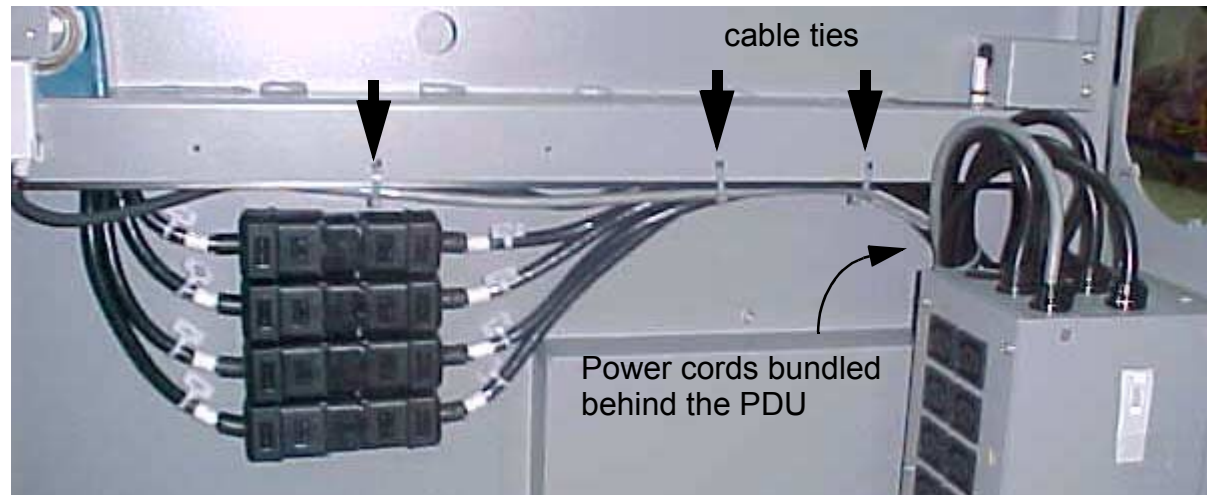
- 1 Attach the eight pieces each of hook fasteners (0510-0572) and loop fasteners (0510-0571) together.
- 2 Remove the film from the hook side of a hook-and-loop fastener and affix the fastener to a plug. Repeat this for all PDU power cord plugs and all outlet box power cord plugs ([Figure 16](#)).

Figure 16 Installing the hook-and-loop fasteners



- 3 Remove the film from the other side of the hook-and-loop fasteners and press the plugs to the wall of the pod (**Figure 17**).
- 4 Secure the power cords and control cable with cable ties (1400-0482) where shown (arrows in **Figure 17**).

Figure 17 Attaching the plugs to the pod wall



- 5 Bundle the power cords and control cable neatly together, secure them with a cable tie, and tuck the bundle behind the PDU (**Figure 17**).

Completing the Upgrade

This concludes the PDU and pod upgrade procedures. If you are going to upgrade the controller, do that now. Otherwise, install the new pod cover and door assemblies.