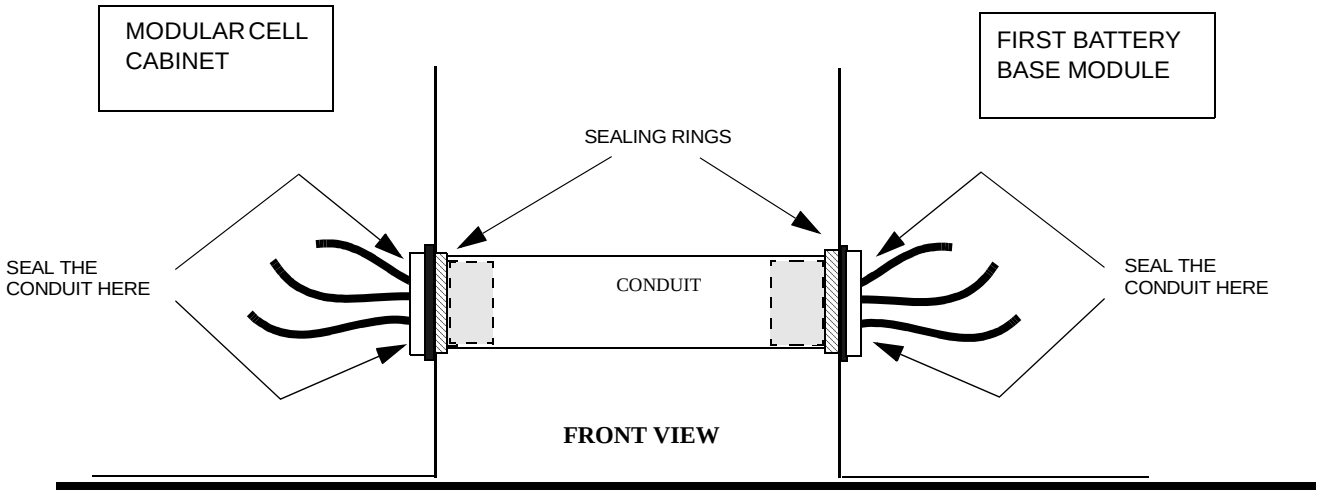
Seal both ends of the cable conduit inside of the first battery base module.

Perform the following steps to seal both ends of the cable conduit inside of the first battery base module.

1 Check that all cables from the first battery base module, inside the Modular Cell cabinet, have sufficient length to reach their connection points. Refer to the figure on Page A - 66

2 Remove any excess slack in the cables inside the battery base module.

3 Insert the electrical duct seal into the chase nipple at both ends of the cable conduit and pack it around the cables in such a way the conduit is completely sealed. Refer to the figure below.



How to identify, route and connect the first EZBFo battery base module cables in the Modular Cell 4.0B cabinet

Overview

Purpose

Important! The four DC cables will not be un taped or connected in the Modular Cell cabinet at this time.

This section provides instructions for routing and connecting all first EZBFo battery base module cables (except DC) in the Modular Cell 4.0B Modular Cell cabinet.

Instructions are given for right-hand (primary cabinet) installation. Left hand installation (4.0B Dual Band cabinet) is the same except for the routing of the cables into and through the 4.0B Dual Band cabinet. This alternate routing is provided.

All alarm cables and the AC cable will be routed and connected in the Modular Cell cabinet.

How to identify cables and the HPDA in the Modular Cell 4.0B cabinet

Overview

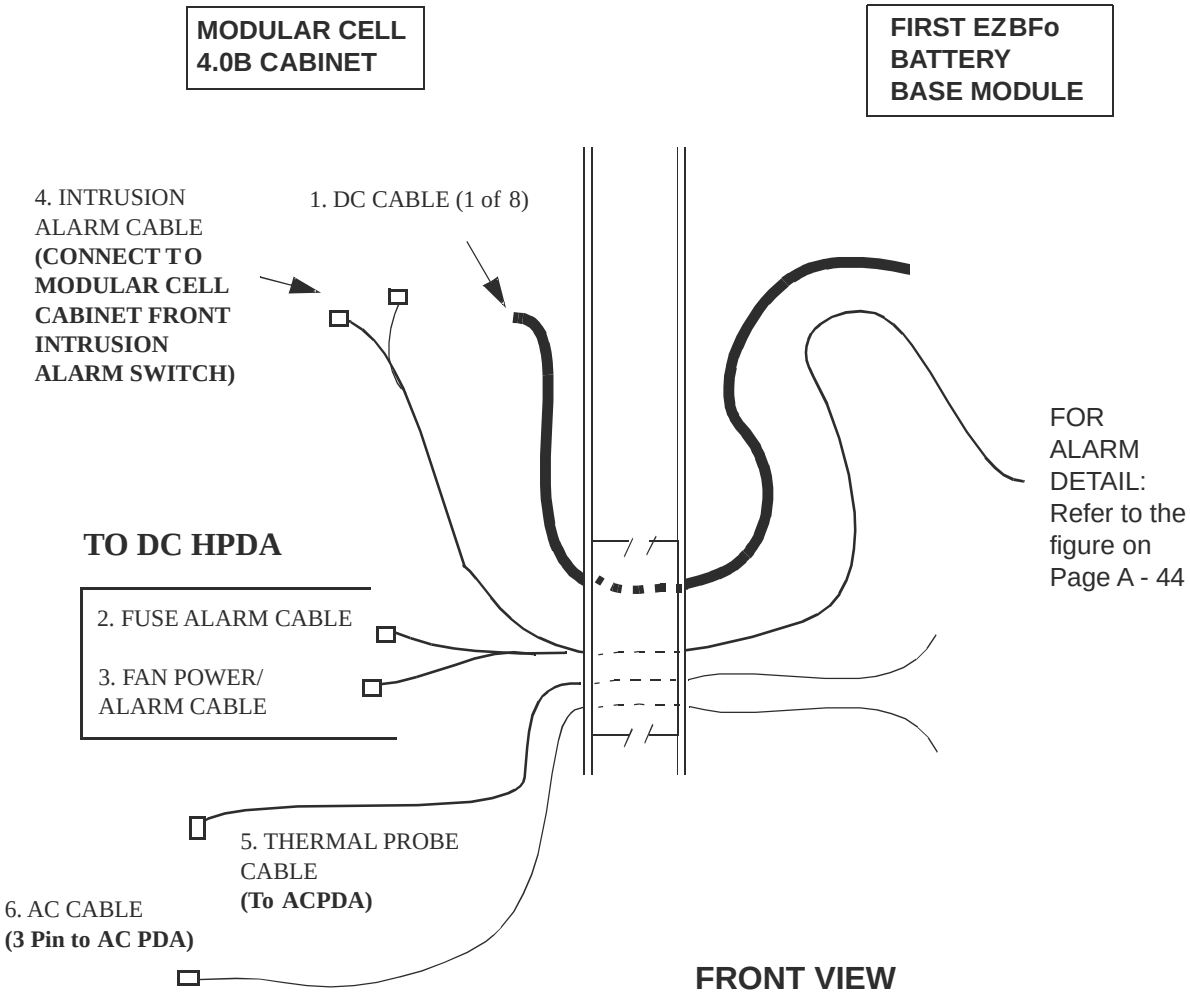
The following illustrations and text are provided to enable the installer to identify the cables from the EZBFo battery base unit inside of the Modular Cell Cabinet, and to identify the HPDA to which some of the cables will be connected.

The following instructions are provided.

Identify the individual cables on the Modular Cell cabinet side

Identify the following cables/connectors that, except for the DC cables, will be routed and connected inside of the Modular Cell cabinet. Refer to the figure below for cable identification on the Modular Cell cabinet side.

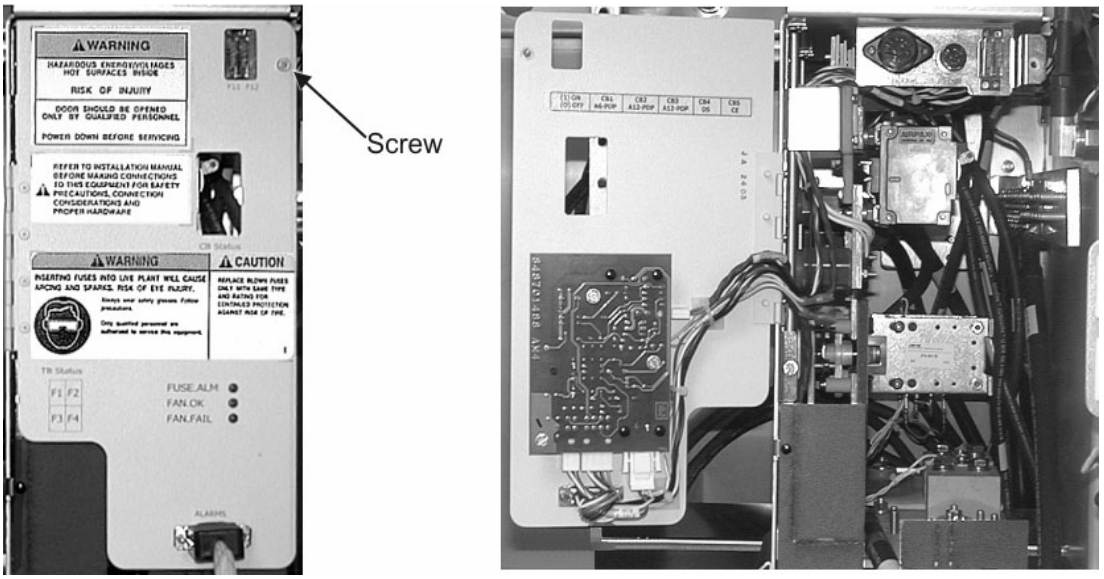
1. The DC cables (not to be connected at this time)
2. The fuse alarm cable (J309)
3. The first battery base module fan power/alarm cable (P2)
4. The intrusion alarm cable (SW1-COM and SW1-NC)
5. The thermal probe cable
6. The AC cable



Identify the HPDA in the 4.0B Modular Cell cabinet

When installing a first battery base module it is necessary to identify the HPDA (high power distribution assembly) in the Modular Cell cabinet.

1 Identify the HPDA in the 4.0B Modular Cell cabinet. Refer to the figure below.



How to route and connect the signal and AC cables in the Modular Cell 4.0B cabinet

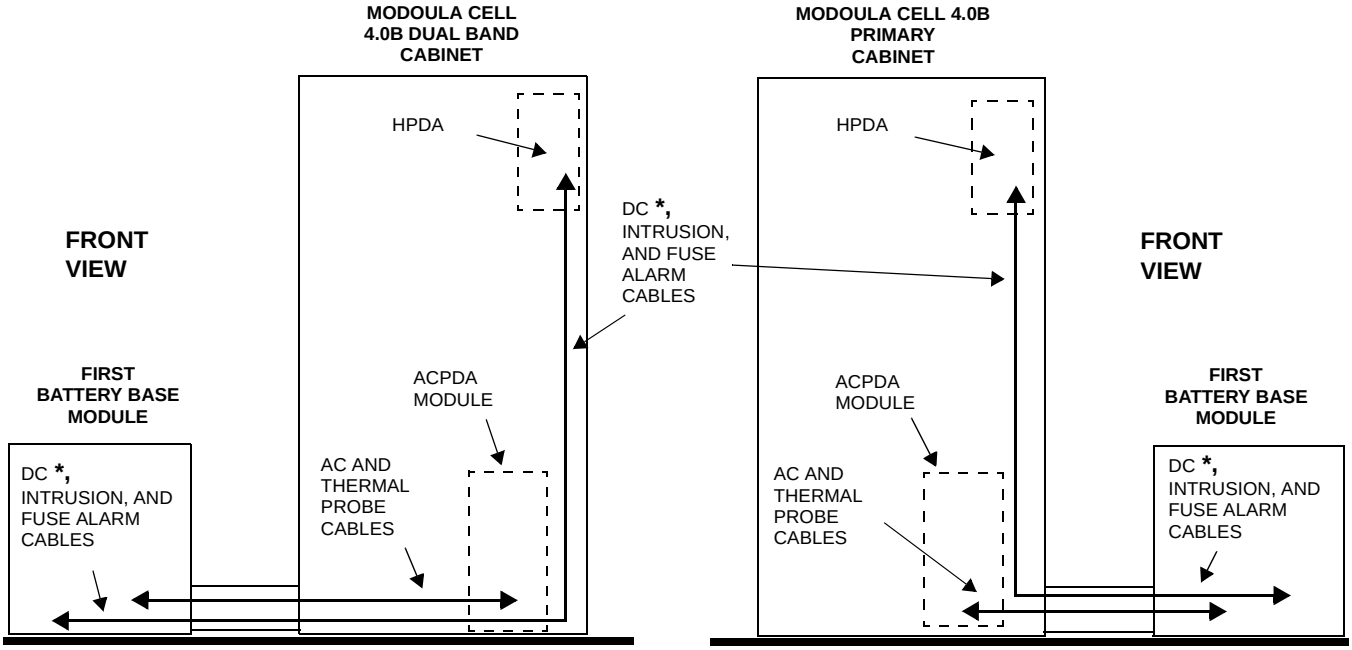
Overview

The following illustrations and text are provided to enable the installer to route and connect the signal and AC cables from the EZBFo battery base unit inside of the Modular Cell Cabinet.

The following instructions are provided.

Signal and AC cable routing

Refer to the figure for signal and AC cable routing for an 4.0B primary cabinet and a 4.0B dual band cabinet.



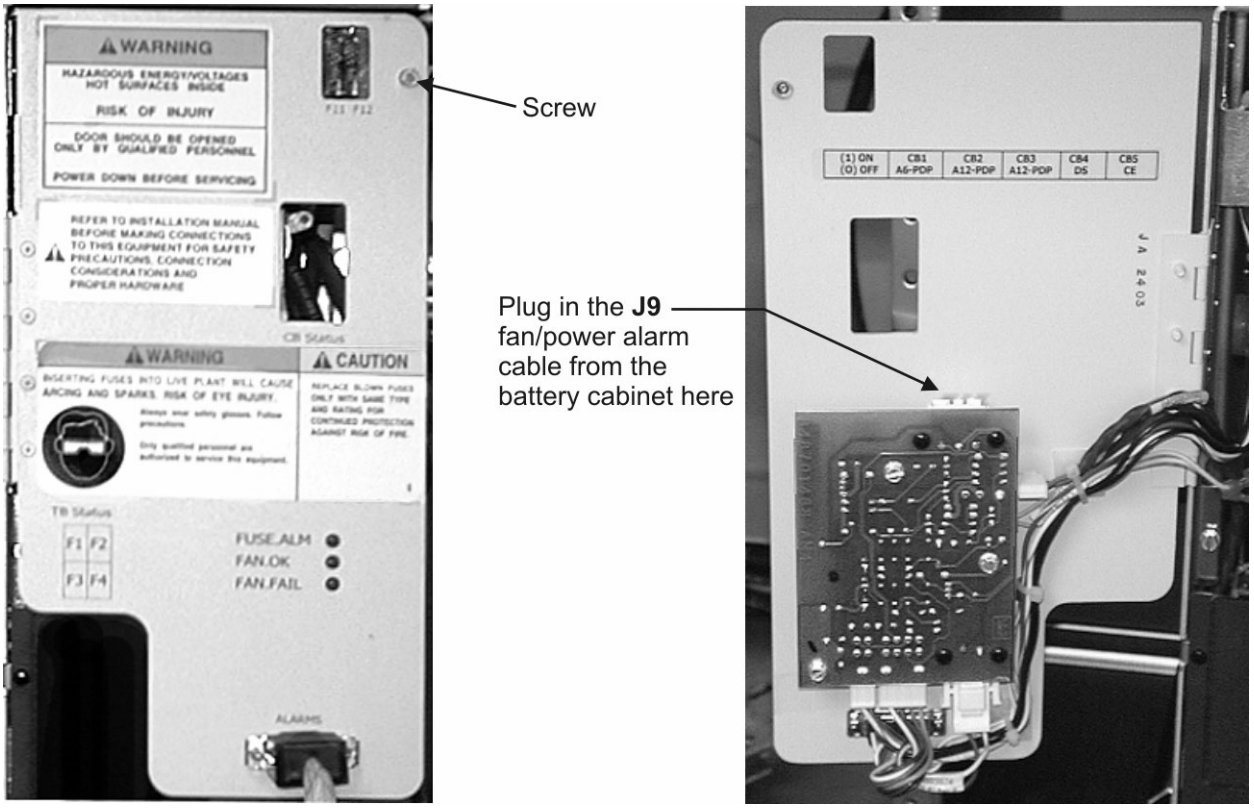
*** DC cables must not be connected at this time**

Route and connect the fuse alarm and fan power/alarm cables in the Modular Cell 4.0B cabinet

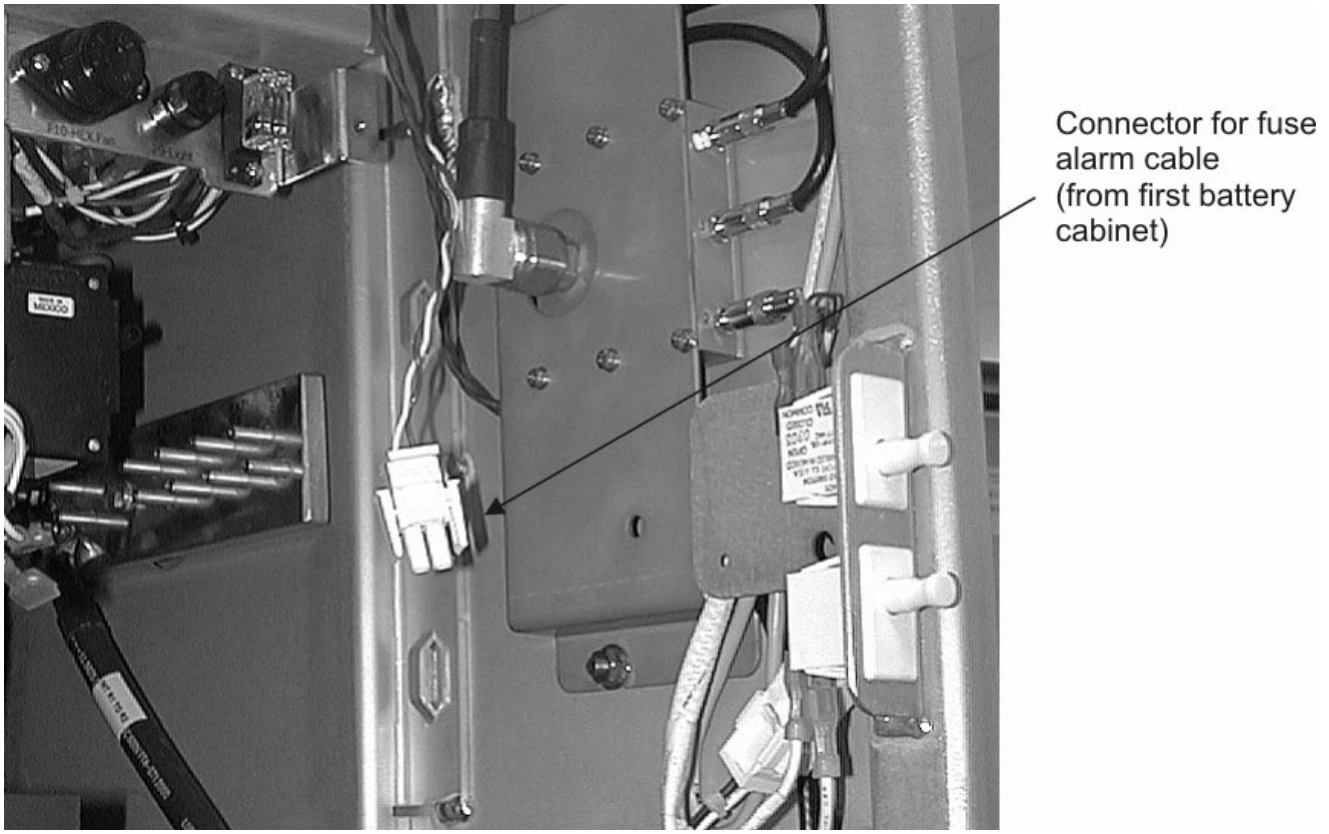
Perform the following steps to route and connect the fuse alarm and fan power/alarm cables in the Modular Cell 4.0B cabinet. Refer to the figure on Page A - 39 for cable identification.

1 Loosen the thumb screws and open the door of the HPDA (High Power Distribution Assembly).

2 Connect the fan power/alarm cable connector (P2) to the connector on the circuit board that is mounted on the inside of the HPDA door in the Modular Cell 4.0B cabinet. Refer to the figure below for the connector location in the HPDA.



3 Connect the fuse alarm cable connector (J309) to the fuse alarm cable connector located to the right of the HPDA in the Modular Cell 4.0B cabinet. Refer to the figure below for the connector location in the HPDA.

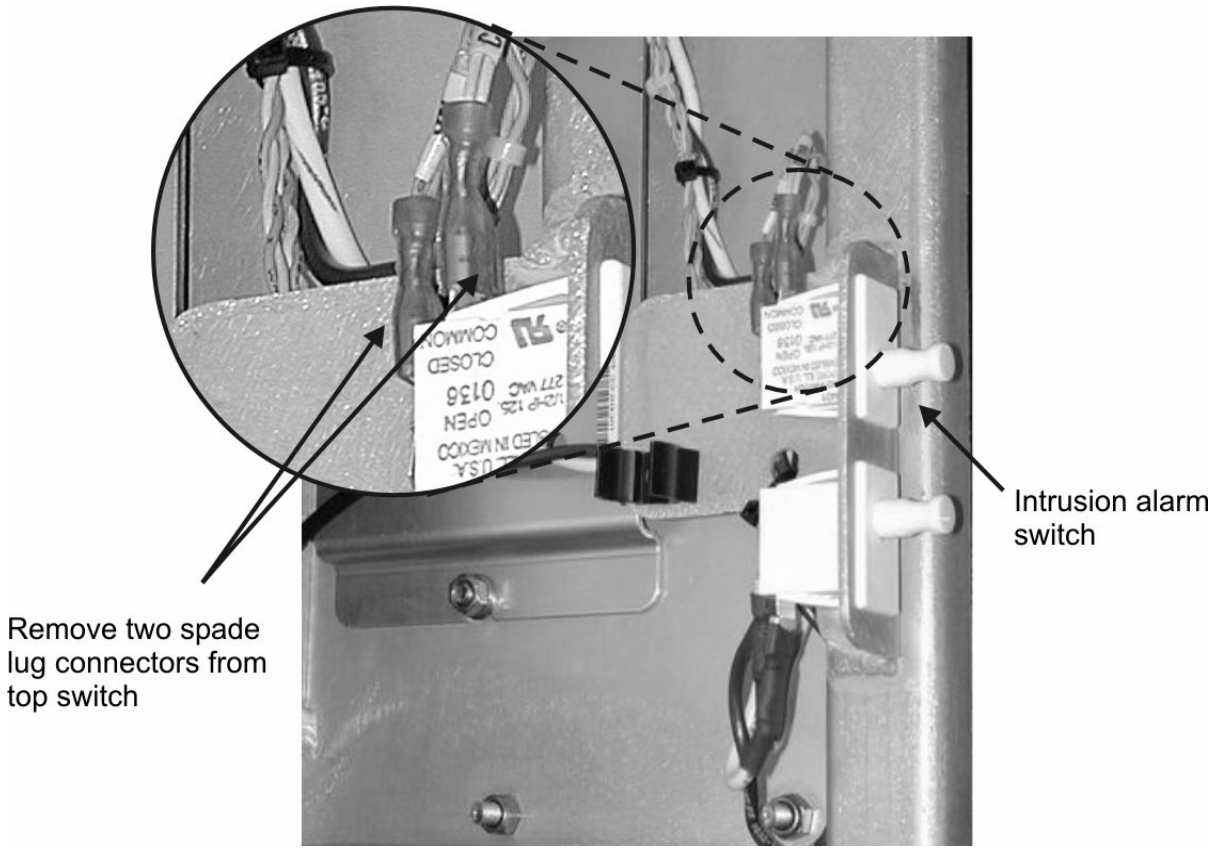


4 Using wire ties, dress the excess cable down the interior right side of the cabinet. Do this in such a way that they do not interfere with HPDA door opening and closure, or installation/replacement of parts.

Route and connect the intrusion alarm cable in the Modular Cell 4.0B cabinet

Refer to the figure below and perform the following steps to route and connect the intrusion alarm cable in the Modular Cell 4.0B cabinet.

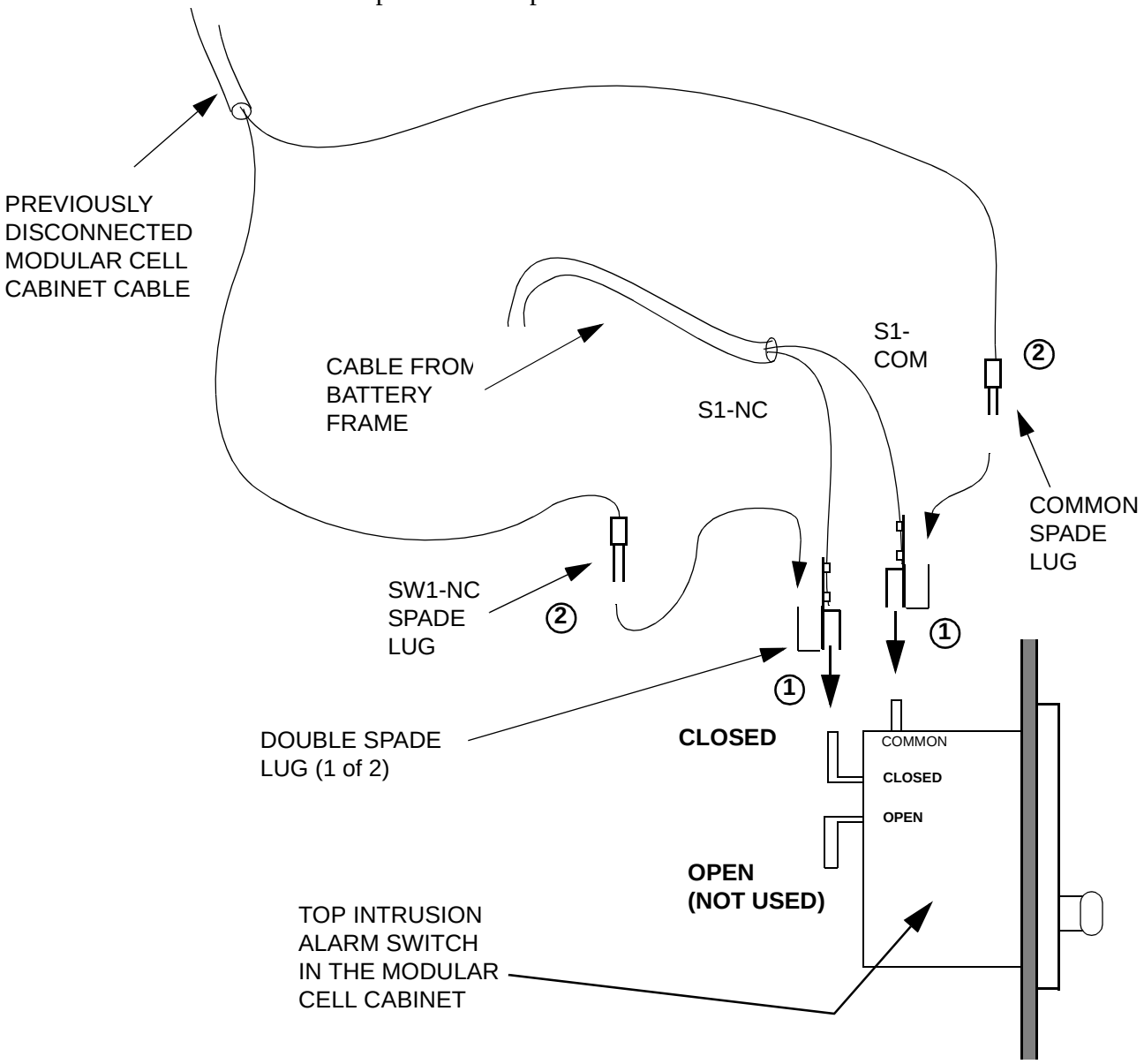
1 Disconnect the cable attached to the front intrusion alarm switch (two wires with spade lugs, C (Common) and NC (Closed). Refer to the figure below.



2 Attach double spade lugs on the end of the intrusion alarm cable to the front intrusion alarm switch S1-NC to CLOSED and S1-COM to COMMON lugs. Refer to the figure on Page A - 72, item 1.

3 Attach the spade lug connectors of the cable disconnected in Step 1, to the intrusion alarm cable double spade lug CLOSED and COMMON connections on the intrusion switch, where they were connected in the previous step. Refer to the figure below, item 2.

4 Using the cable ties dress the excess cable down the interior right side of the Modular Cell cabinet. Do this in such a way that they do not interfere with HPDA door opening and closure, or installation/ replacement of parts.



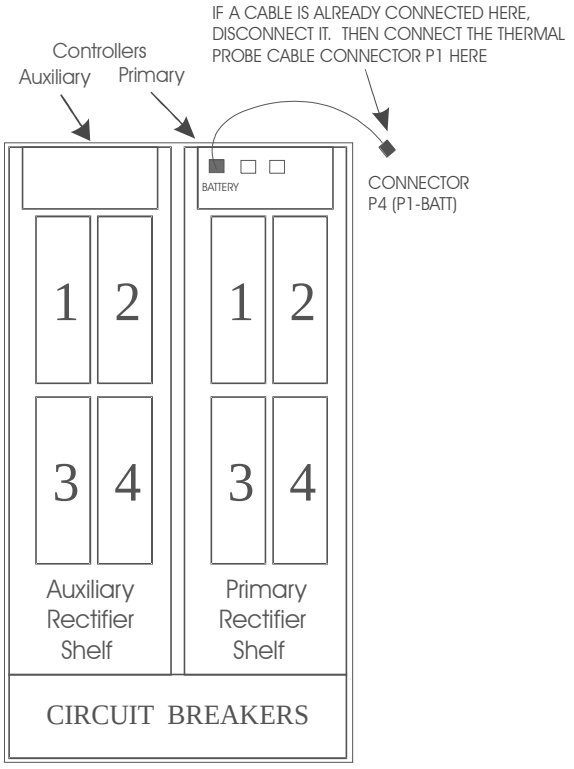
Route and connect the thermal probe cable in the Modular Cell 4.0B cabinet

Perform the following steps to route and connect the thermal probe cable in the Modular Cell 4.0B cabinet.

1 Route the thermal probe cable to the AC PDA. Refer to the figure below.

2 Disconnect the existing cable from the pigtail connector P4. Refer to the figure below. Secure it in a safe location where it will not interfere with door closure or parts removal.

3 Connect the thermal probe cable to the 3-pin connector P1 to P4 as shown in the figure below.



ACPDA

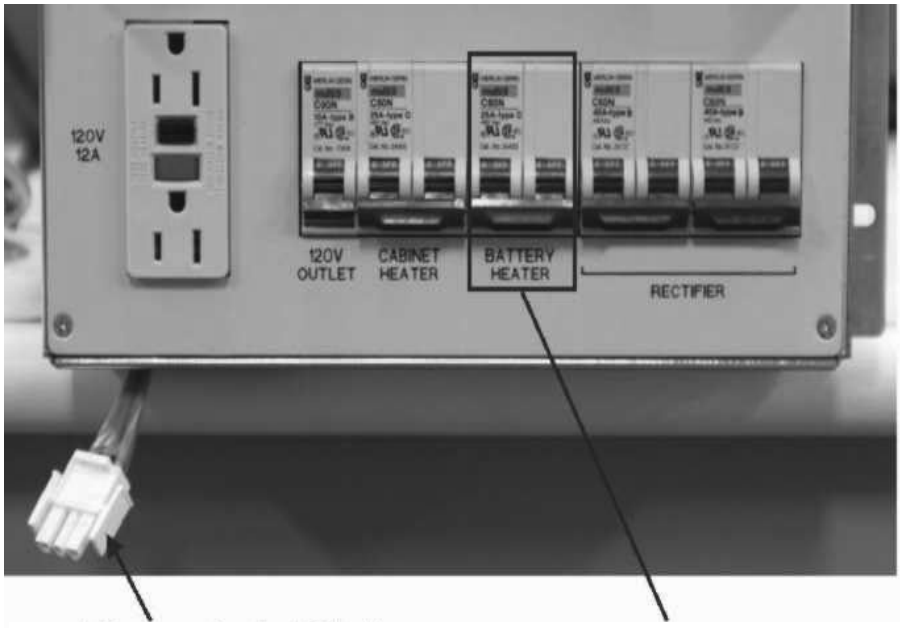
4 Using wire ties, dress the excess thermal probe cable to the bottom of the Modular Cell cabinet. Do this in such a way that it does not interfere with door opening and closure, or installation/replacement of parts.

Connect the heater pad kit AC cable in the Modular Cell cabinet

Perform the following steps to connect the heater pad kit AC cable in the Modular Cell 4.0B cabinet.

1 In the Modular Cell 4.0B cabinet, place the circuit breaker "BATTERY HEATER" to the off position. Refer to the figure below.

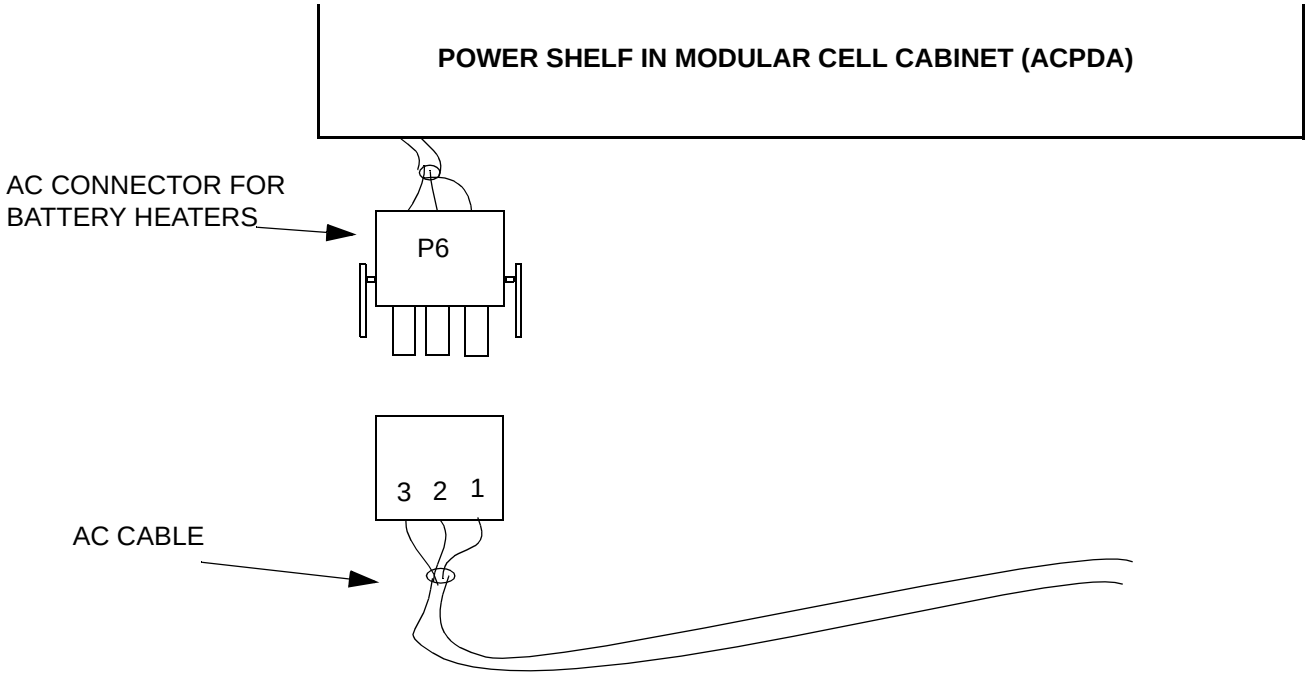
2 Locate the three-pin connector (P6) at the bottom left of the power shelf. Refer to the figure below.



P6 connector for AC battery heater power cable (to first battery base module)

Battery Frame heater circuit breaker

3 Attach the three-pin AC cable connector to the connector shown in the figure below.



4 Using wire ties, dress the excess AC cable at bottom of the Modular Cell cabinet. Do this in such a way that it does not interfere with door opening and closure, or installation/replacement of parts.

5 If additional battery modules remain to be installed, proceed to the next page. If not, proceed to How to install the batteries in the EZBFo battery modules on Page A - 124 to install the batteries.

How to install an EZBFo battery add-on module on an existing EZBFo battery module

Overview

Purpose

Important! If additional battery modules remain to be installed, proceed below. If not, proceed to How to install the batteries in the EZBFo battery modules on Page A - 124 to install the batteries.

This section provides instructions for the installation of a two shelf add-on battery module on the EZBFo battery base module.

> **Important!** A second add-on module cannot be installed on a EZBFo battery frame installed in Zone 4 unless a zone 4 field kit is installed at the time of the installation of the second add-on module**.** Refer to the instructions in the kit before starting the installation of the second add-on module.

In this section the installer will perform the following procedures:

- Physically attach, prewire and ground an add-on module
- Route and connect the AC cable from the add-on module AC block to the AC block in the lower battery module
- Route and connect the intrusion alarm cable and thermal probe
- Route and connect the module to module DC cables

Contents

Step-by-step instructions are provided for the following tasks:

Description and wiring overview for adding additional battery modules to a battery base module

Description

Important! Before performing the wiring procedures, unplug any battery disconnect connectors in the Modular Cell cabinet, as well as the battery cables from the load and return buses on all lower battery shelves. Do not reconnect them until instructed to do so.

Also disconnect the 24V Return cables in the Modular Cell cabinet. Refer to Connect (or reconnect) the 24V Return cables from the first battery base module to the return bus in the Modular Cell 4.0B cabinet on Page A - 146. which illustrates were they are reconnected.

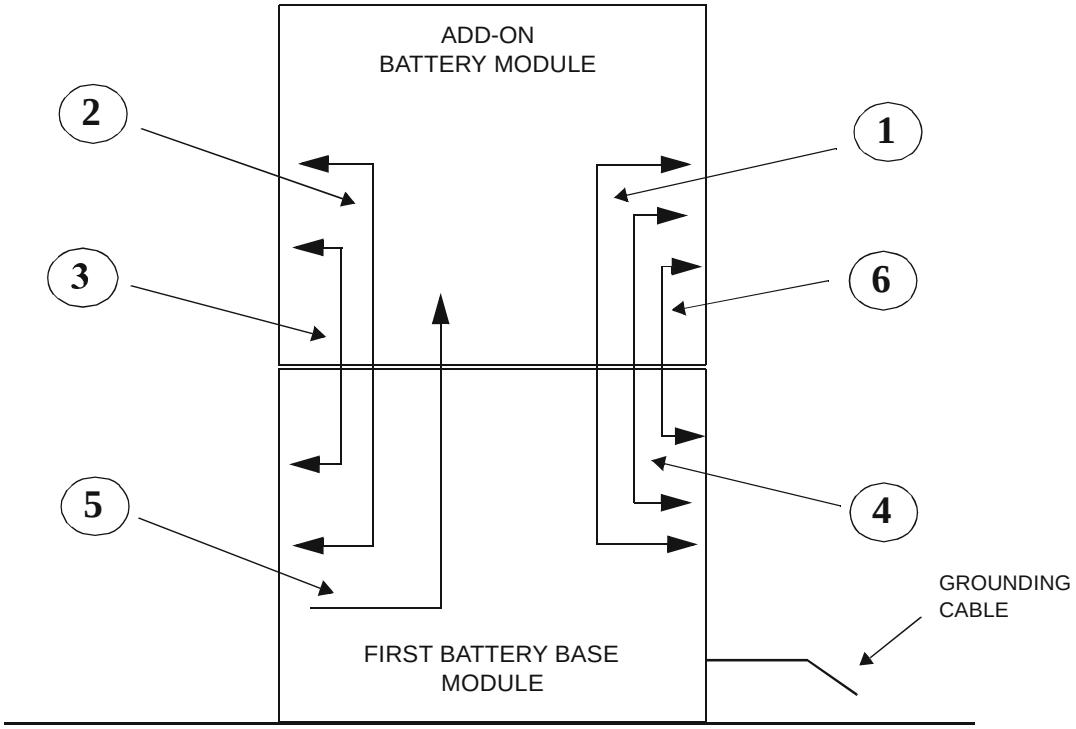
The battery base module provides two battery shelves. Two additional battery modules may be stacked above the first battery base module, each module providing two battery shelves each. Each battery shelf holds:

- Four L1-100Ah-12VDC batteries per shelf: Two 12VDC batteries are connected in series to provide two 24VDC strings per shelf, four strings per module, and up to twelve strings per frame. Individual shelves may be populated
- Three 12IR125 batteries per shelf: Each of the two shelves is populated with three 12VDC batteries connected in parallel. to provide two 12VDC shelves. The two shelves connected in series to provide a 24VDC module. Both shelves *must* be populated.

Wiring overview

This section provides instructions for the interconnections from an added EZBFo battery module to the EZBFo battery base module, and a Modular Cell 4.0B cabinet. This procedure also applies to a second add-on module being installed above a first add-on module. Refer to the figure below for a key to the following numbered list.

1. Battery +24V DC load cables (2) between the added EZBFo battery module and the EZBFo battery base module
2. Battery 24V Return cables (2) between the added EZBFo battery module and the EZBFo battery base module
3. Intrusion alarm cable to the added EZBFo battery module.
4. Internal ground cable from the existing battery module to the added EZBFo battery module.
5. Thermal probe and cable (moved from base module)
6. AC cable (for heater pad kit) to the added EZBFo battery module.



FRONT VIEW

How to physically attach, prewire and ground an add-on module

Overview

This procedure module provides instructions for physically attaching an add-on module to the first EZBFo battery base module.and its grounding.

Step-by-step instructions are provided for the following tasks:

Description of physically attaching and grounding an add-on module

An add-on module is physically attached on top of the previous module with four bolts. The add-on module requires two ground cables: one attached between the outer and inner frames and one attached between the outer frames of the add-on module and the module below it.

WARNING

Personnel injury or equipment damage

When moving the battery base module, use appropriate lifting devices and a sufficient number of personnel. Two persons are required.

Attach an add-on module to an existing battery module and attach the internal ground cable

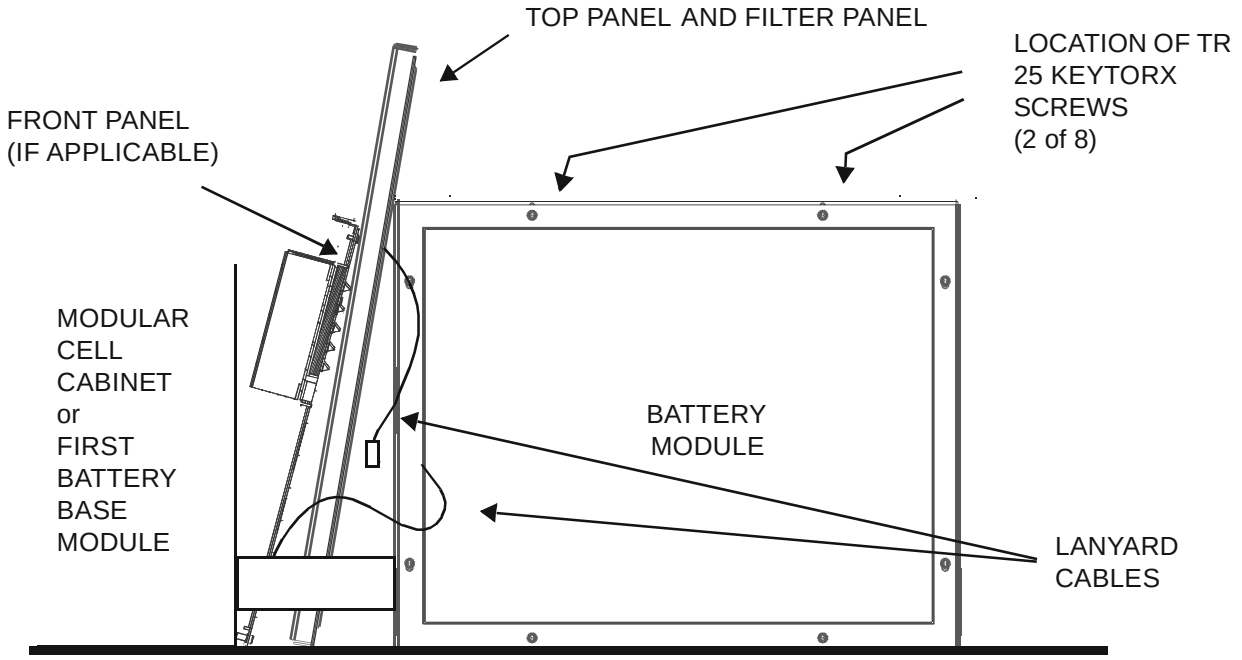
Perform the following steps to attach a two shelf add-on module to an existing battery module. and attach the internal ground cable

1 Remove the top panel and filter panel from the battery module on which the add-on module will be placed. Refer to Remove the top and filter panels from the battery base module on Page A - 14.

Important! When performing the next steps care must be taken since the fan power and alarm cable is attached to the front panel.

2 If applicable, remove the eight TR 25 Keytorx screws and remove the front panel from the existing battery module. Place the front panel on the left side of the battery module. Do not disconnect the lanyard cable. Refer to the figure below.

3 If applicable, loosen the eight quarter-turn screws and open the front door of the existing module. Refer to the figure below for screw locations.



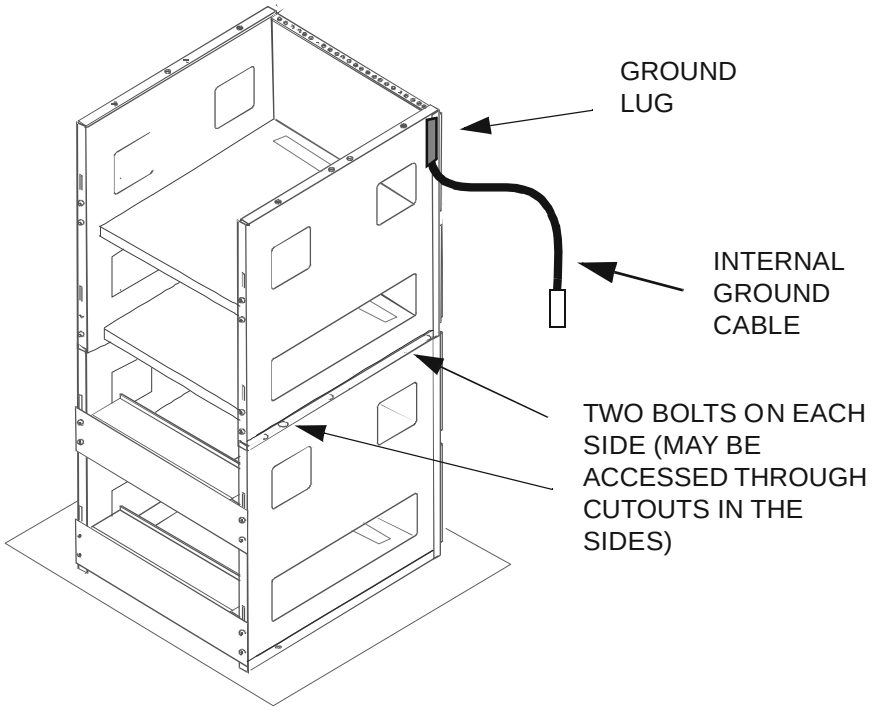
FRONT VIEW

4 Install the four lifting eyebolts on the top of the add-on inner module. Refer to the Step 3 figure on Page A - 29.

5 Place the add-on battery module inner frame on top of the existing battery module inner frame and attach it with the four 1/2-inch bolts provided. Torque according to the table in Chapter 1 and remove the lifting eye bolts. Refer to the figure below.

6 Attach one end of the supplied 300 mm (11.8- inch) internal ground cable (Step 1 figure on Page A - 28) to the inner frame using the bolts and washers provided. Torque according to the table in Chapter 1. Refer to the figure below.

OUTER FRAMES OF THE BATTERY BASE MODULE NOT SHOWN FOR CLARITY



Install the heater pads and outer frame wiring (Reference)

Important! Refer to How to install the battery heater pad kit in an EZBFo battery module on Page A - 19 to continue the installation.

After installing the heater pad kit, skip to Install the battery module outer frame over the inner frame and attach the internal ground cables on Page A - 82 to continue the installation.

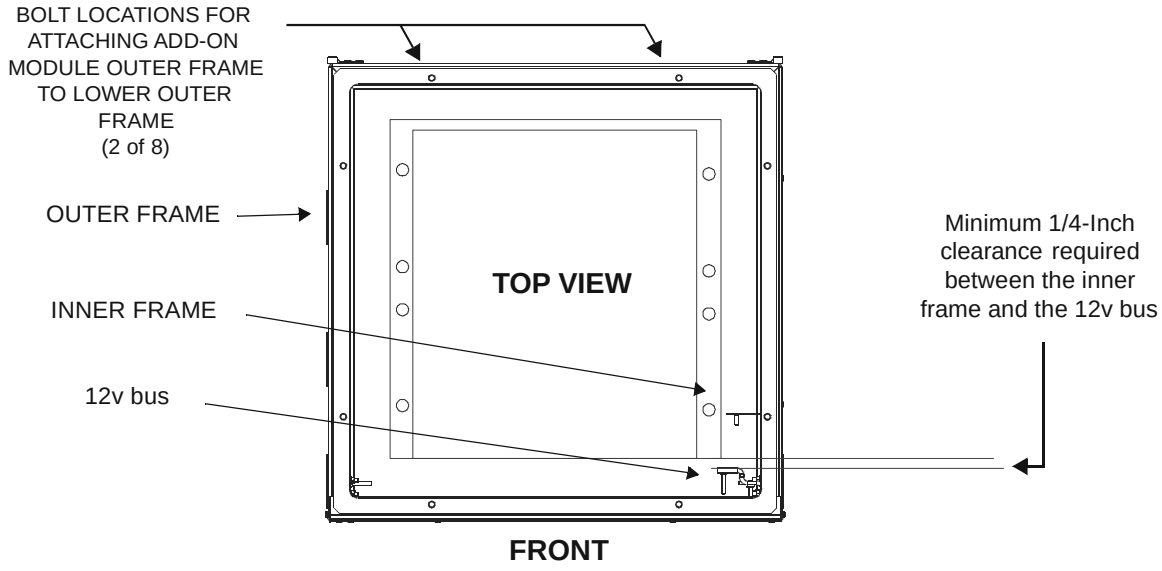
Install the battery module outer frame over the inner frame and attach the internal ground cables

Perform the following steps to install the battery module outer frame over the inner frame and attach the internal ground cable.

1 Detach the front panel from the add-on outer frame and place it on the top of the frame. Do not disconnect the lanyard cable. Refer to the Step 5 figure on Page A - 11.

> **Important!** When performing the next step, take great care not to damage the heater pads at the rear of the inner frame as it is lowered into the outer frame.

2 Place the outer frame over the inner frame an attach it with the eight bolts provided (shipped loose). Access to the rear bolts is through the two openings in the rear of the inner fame. Torque according to the table in Chapter 1. Refer to the figure below and the Step 6 figure on Page A - 26.



3 Using the nuts and washers provided, attach the ground cable from the inner frame to the threaded studs on the outer frame. Torque according to the table in Chapter 1. Refer to Step 7 on Page A - 30.

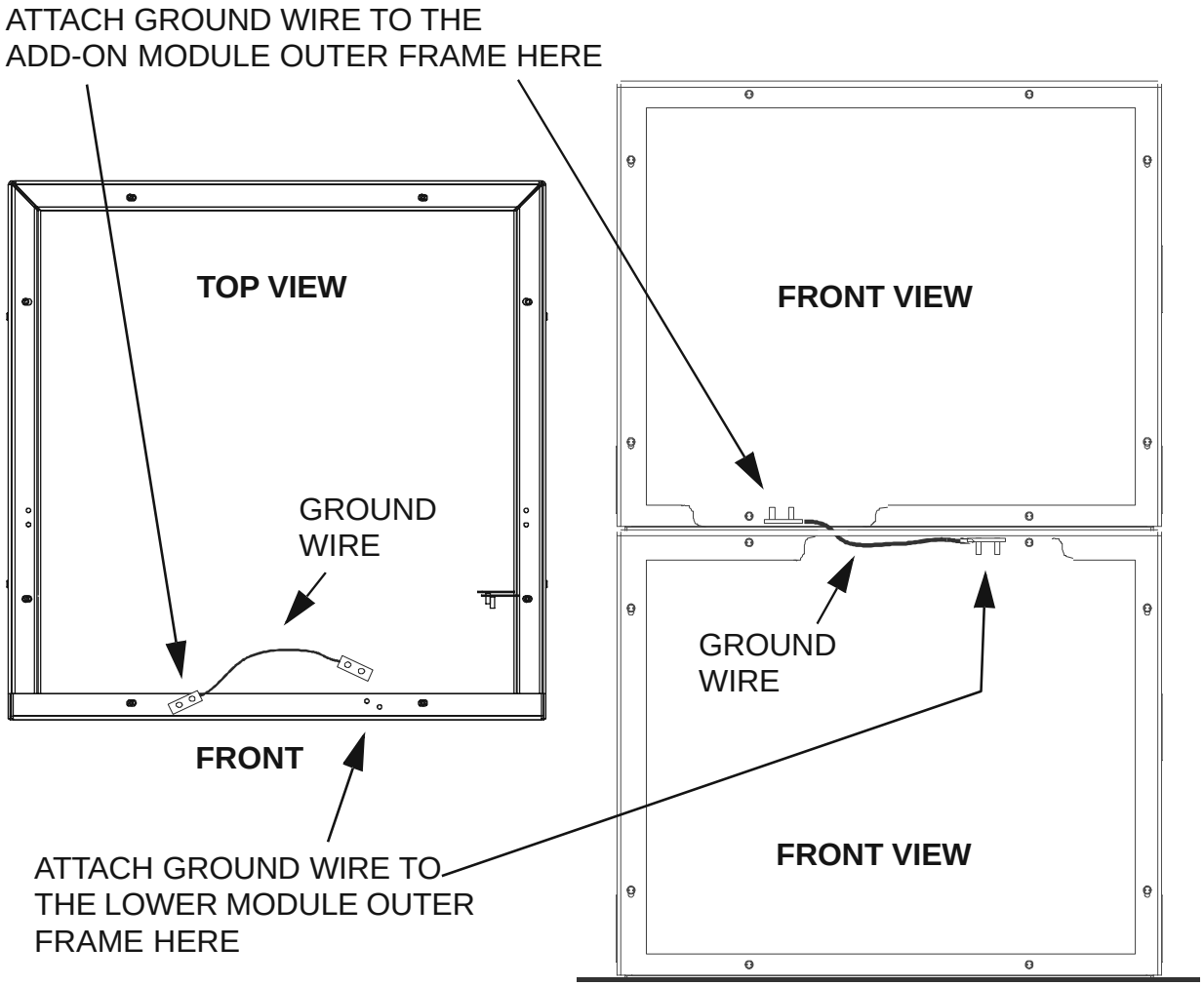
4 Connect the heater pads to the AC connectors. Refer to Step 8 on Page A - 31 and the associated figure.

Attach the internal ground cable between the add-on module and the module below it

Perform the following steps to attach the internal ground cable between the add-on module and the module below it.

1 Attach one end of the supplied 300 mm (11.8- inch) internal ground cable (Step 1 figure on Page A - 28) to the outer frame using the nuts and washers provided. Torque according to the table in Chapter 1. Refer to the figure below.

2 Attach the other end of the supplied 300 mm (11.8- inch) internal ground cable to the outer frame of the lower module using the nuts and washers provided. Torque according to the table in Chapter 1. Refer to the figure below.



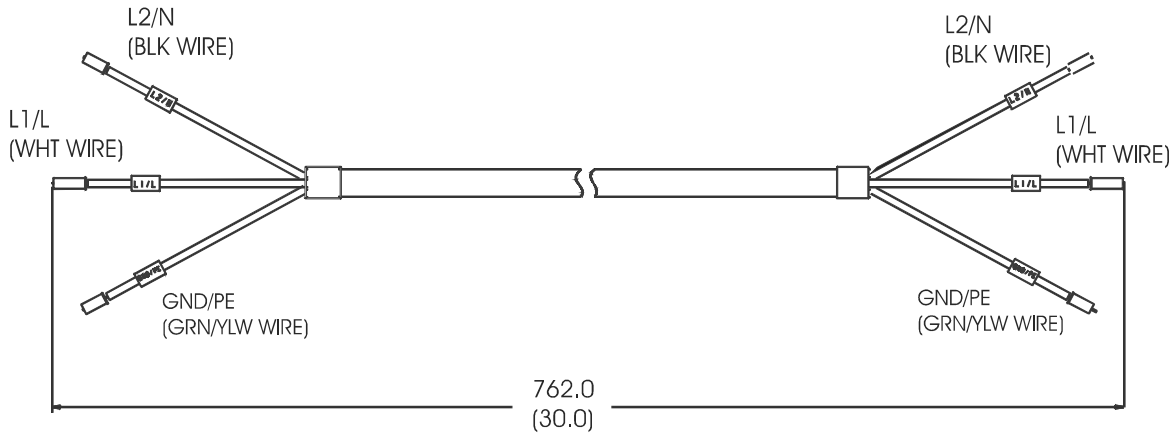
How to route and connect the AC cable (for the heater kit) from the add-on module AC block to the AC block in the lower battery module

Route and connect the AC cable from the add-on module to the next lower module

Perform the following steps to route and connect the AC cable from the add-on module to the next lower module.

1 Turn off and/or disconnect the AC source in the Modular Cell Cabinet. Refer to Step 3 on Page A - 75.

2 Locate the AC 3-wire cable. Refer to the figure below.

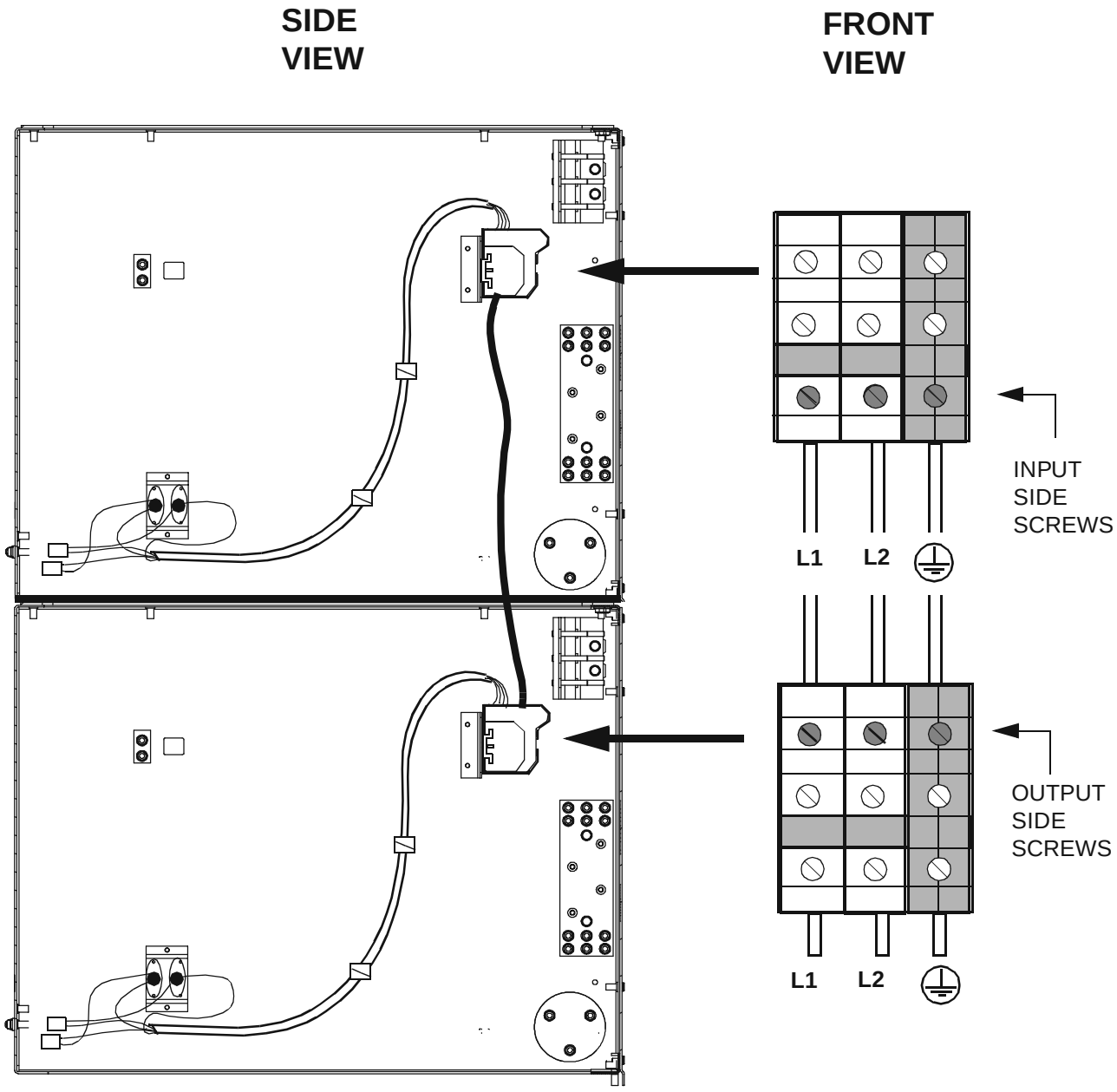


3 Attach the wires to the bottom terminals of the AC terminal block in the add-on module and tighten the screws. Torque screws to 1.5 to 1.8 Nm (1.1 to 1.3 ft.- lb.). Refer to the figure on Page A - 85

4 Route the cable to the top of the AC terminal block in the lower module.

5 Attach the wires to the top front terminals of the AC terminal block in the add-on module and tighten the screws. Refer to the figure below

6 Tighten the AC terminal block screws on the lower module block. Torque screws to 1.5 to 1.8 Nm (1.1 to 1.3 ft.- lb.).



How to route and connect the intrusion alarm cable and thermal probe

Overview

This procedure module provides instructions on how to route and connect the intrusion alarm between the add-on module and the battery module below it.
Also provided are instructions for moving the thermal probe from the lower battery module to the add-on module.

Step-by-step instructions are provided for the following tasks:

Description of intrusion alarm cable and thermal probe installation

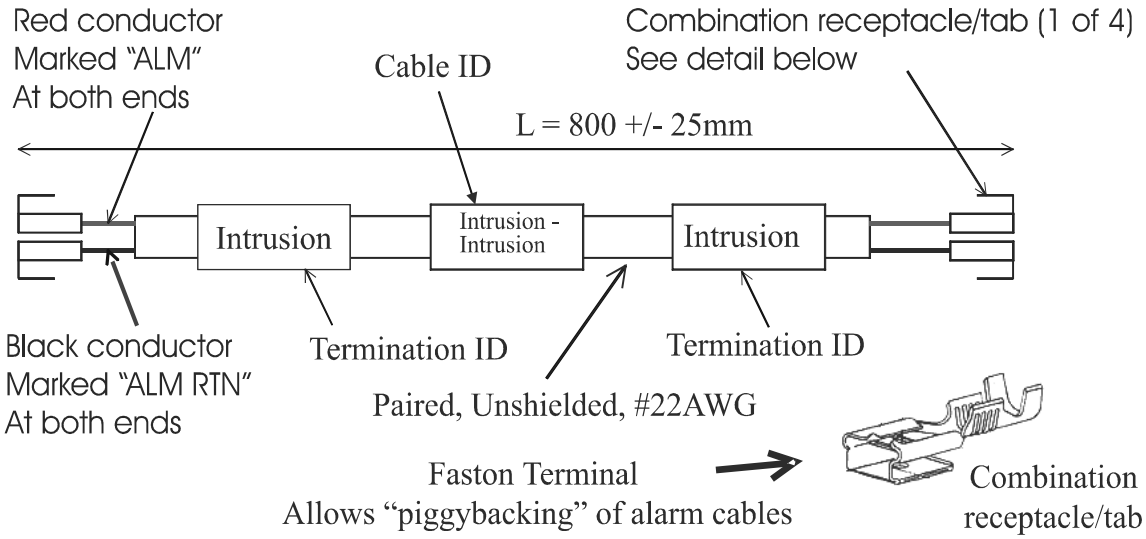
> **Important!** Note that the procedure for attaching the module to module intrusion alarm cable in the lower module differs if the lower module is the battery base module, or the first add-on module.

An intrusion alarm cable will be routed and connected between the add-on module and the battery module below it. Also, the thermal probe will be moved from the lower battery module to the add-on module.

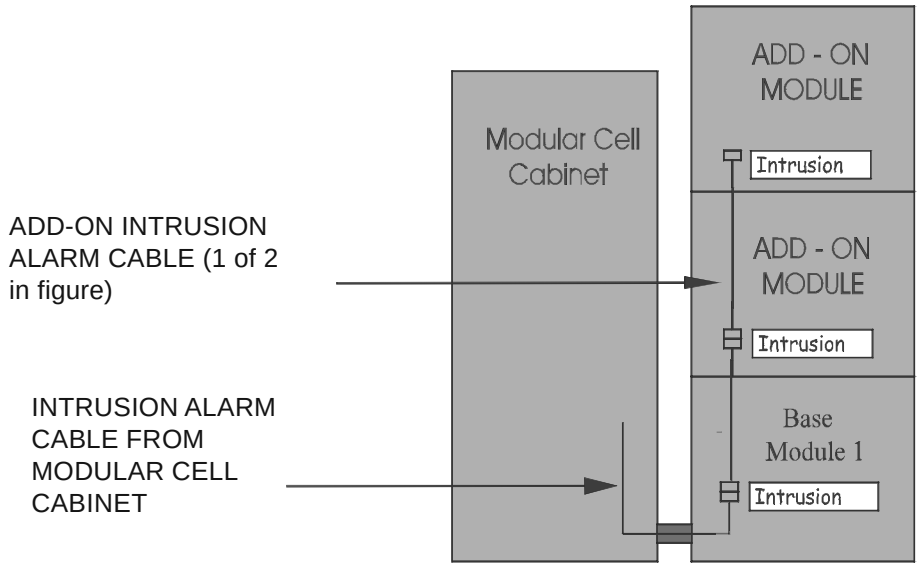
Route and connect the intrusion alarm cable from the existing battery module and connect it in the add-on module being installed

Perform the following steps to route and connect the intrusion alarm cable from the existing battery module and connect it in the add-on module being installed

1 Locate the module to module intrusion alarm cable. This cables has two double spade lugs on each end. Select one end.



2 Refer to the figure below for module to module intrusion alarm cable routing in add-on modules.



Important! On battery modules that have a front door instead of a panel, the intrusion alarm switch is located at the bottom front, on the opposite side from the door hinge, either the left or right side, as applicable. Refer to the Step 3 figure on page A - 10

3 If installing:

- a second add-on module or
- a first add-on module on a second battery base module

Skip to Step 9.

If installing a first add-on module on a first battery base module proceed to the next step.

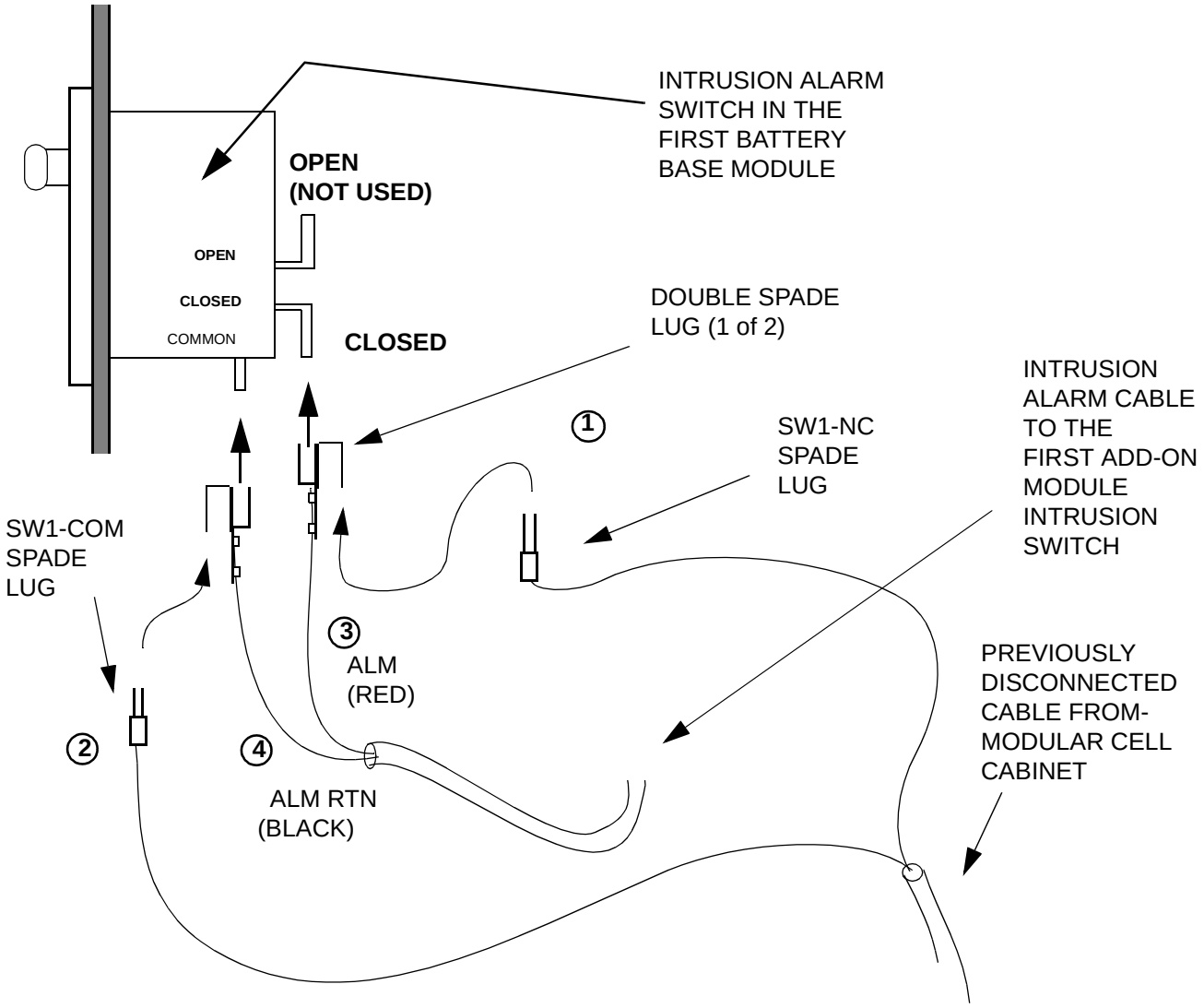
4 If installing a first add-on module on a first battery base module, locate the intrusion alarm cable from the Modular Cell cabinet and disconnect the SW1-NC and SW1-COM wire single spade lugs from the intrusion alarm switch in the first battery base module. Refer to the figure on Page A - 89, items 1 and 2.

5 Attach the “ALM” double spade lug of the module to module cable to the CLOSED lug on the intrusion alarm switch in the first battery base module. Refer to the figure on Page A - 89, item 3.

6 Attach the “ALM RTN” double spade lug of the module to module cable to the COMMON lug on the intrusion alarm switch in the first battery base module. Refer to the figure on Page A - 89, item 4.

7 Locate the wires disconnected in Step 4. Reattach the SW1-NC and SW1-COM wire single spade lugs on the intrusion alarm cable from the Modular Cell cabinet, to the intrusion alarm switch in the first battery base module as follows. Refer to the figure below.

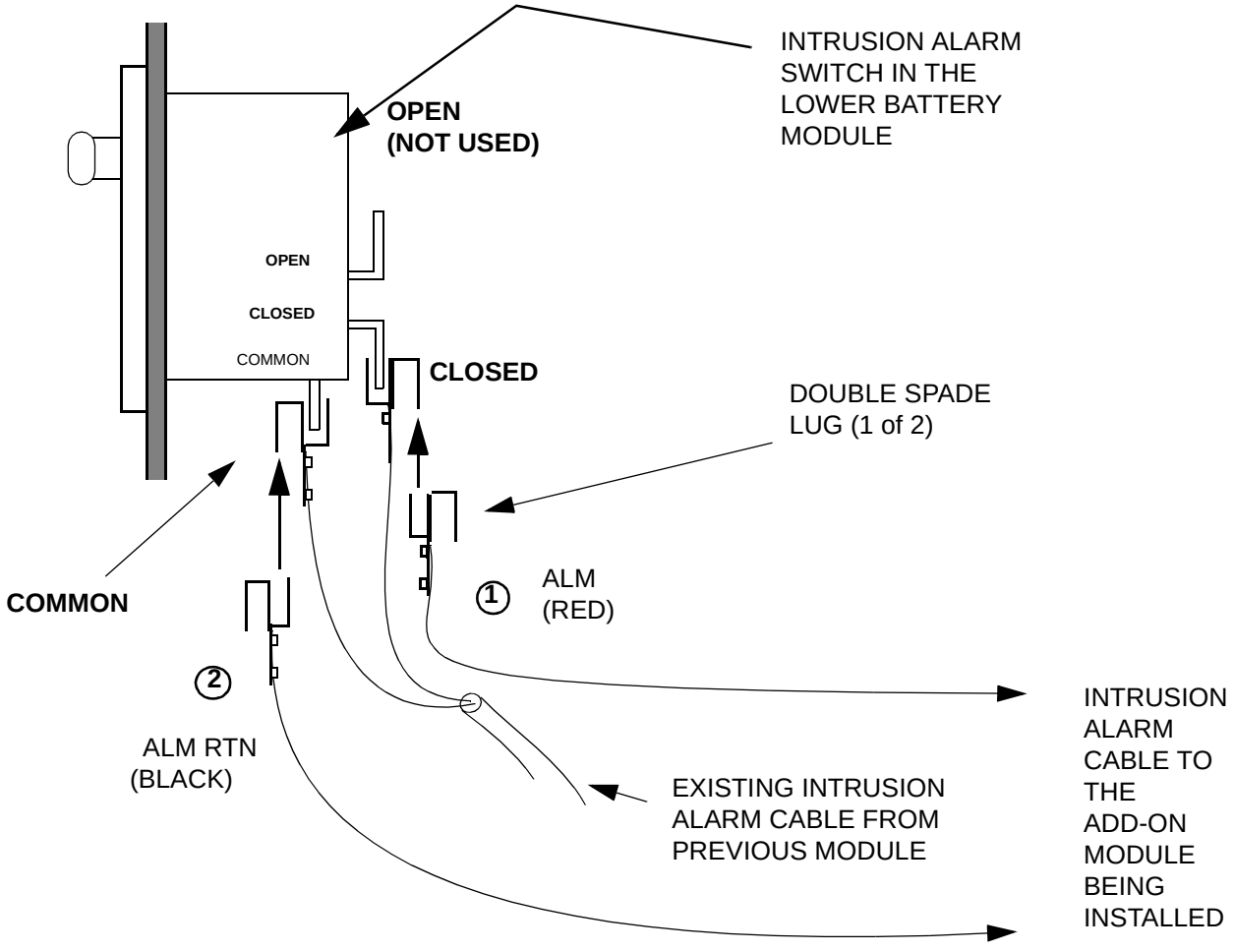
- SW1-NC to CLOSED (item 1)
- SW1-COM to COMMON (item 2).



8 If installing a first add-on module, skip to Step 10.

9 If installing a second add-on module, or a first add-on module on a second battery base module, attach the module to module cable as follows: Refer to the figure below.

- Attach the "ALM" double spade lug (item 1) of the module to module cable to the *existing* double spade lug on the CLOSED lug of the intrusion alarm switch in the lower add-on module.
- Attach the "ALM RTN" double spade lug (item 2) of the module to module cable to the *existing* double spade lug on the COMMON lug of the intrusion alarm switch in the lower add-on module.

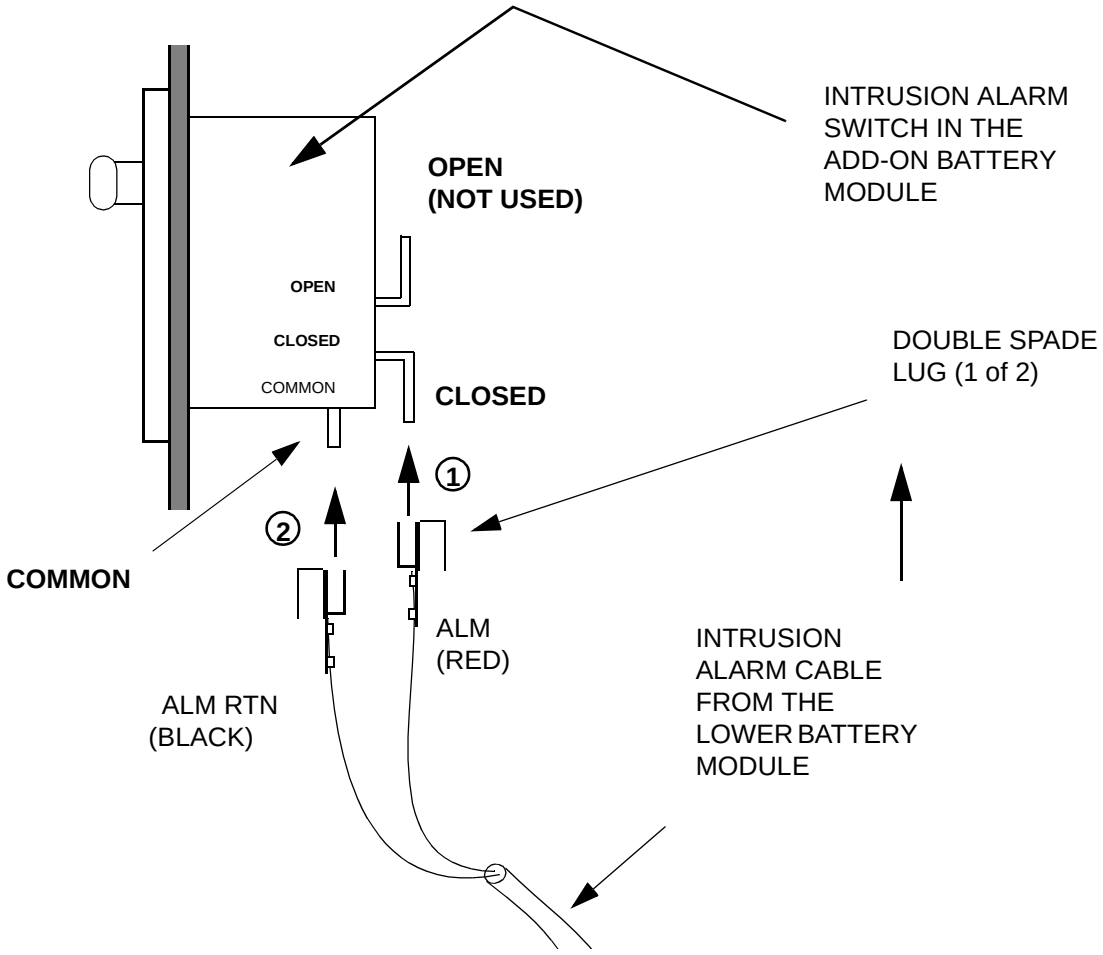


10 Route the intrusion alarm cable up to the intrusion alarm switch in the add-on module.

11 Attach the "ALM" double spade lug to the CLOSED spade lug at the intrusion alarm switch in the add-on battery module. Refer to the figure below, item 1.

12 Attach the "ALM RTN" double spade lug to the COMMON spade lug at the intrusion alarm switch in the add-on battery module.

13 Route and dress the cable using the cable ties and self-stick anchors provided.



Move the thermal probe from the existing battery module and mount it in the add-on module being installed

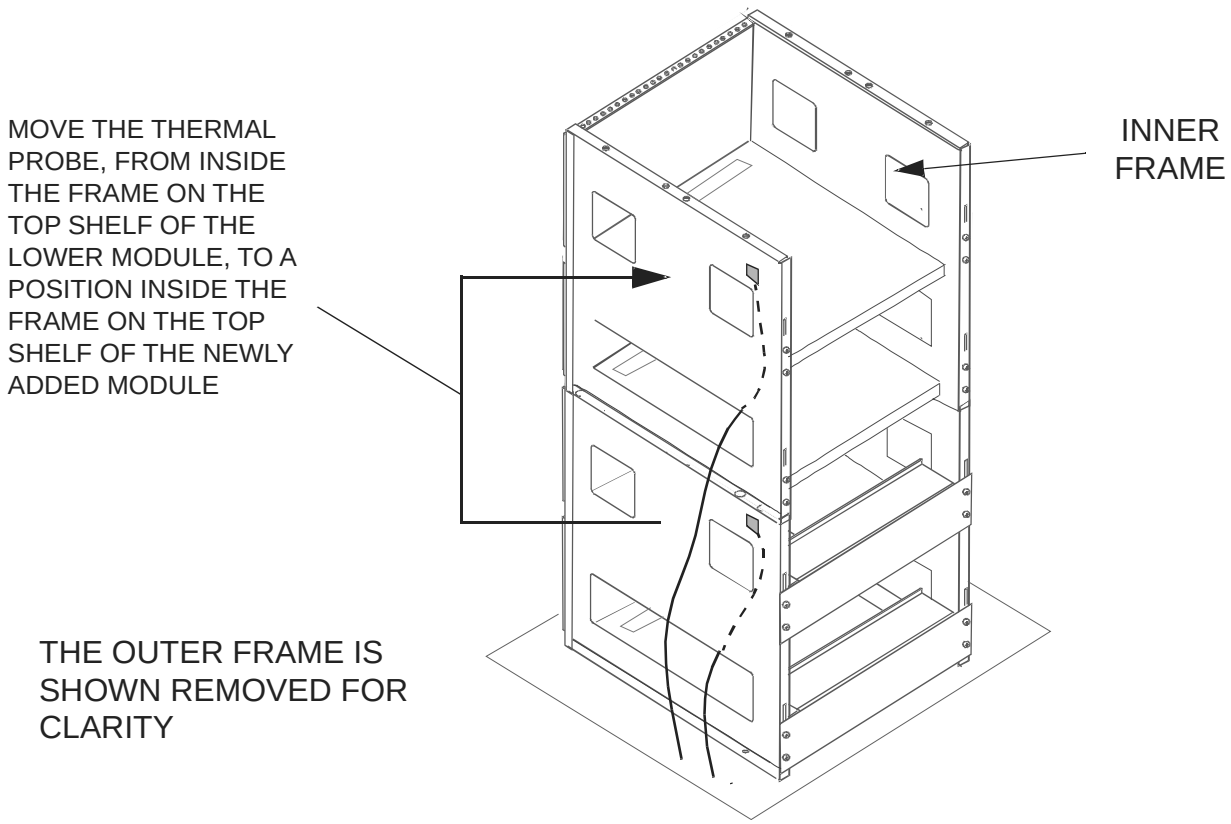
Perform the following steps to move the thermal probe from the existing battery module and mount it in the add-on module being installed

> **Important!** Note that the thermal probe cable is made long enough for all applications. Therefore, excess cable should be properly dressed.

1 Locate the thermal probe cable in the top inside location on the existing lower battery module frame.

> **Important!** If installing a second add-on module, or a first and second add on modules in the same installation, move the thermal probe to the *top* module when performing the next step.

2 Using the self-stick mounting bracket and cable ties, move the thermal probe up to the same inside location on the add-on module as shown in the figure below.



How to route and connect the module to module DC cables

Overview

This procedure module provides instructions for the installation of four 2 AWG DC power cables (two +24V DC load and two 24V Return) from an add-on battery module to the battery module below it.

Step-by-step instructions are provided for the following tasks:

Description of DC power cable routing and connection to an add-on module

Four DC power cables [two +24V DC load cables (+) and two 24V Return cables (-)] will be routed and connected between the add-on module and the battery module below it.

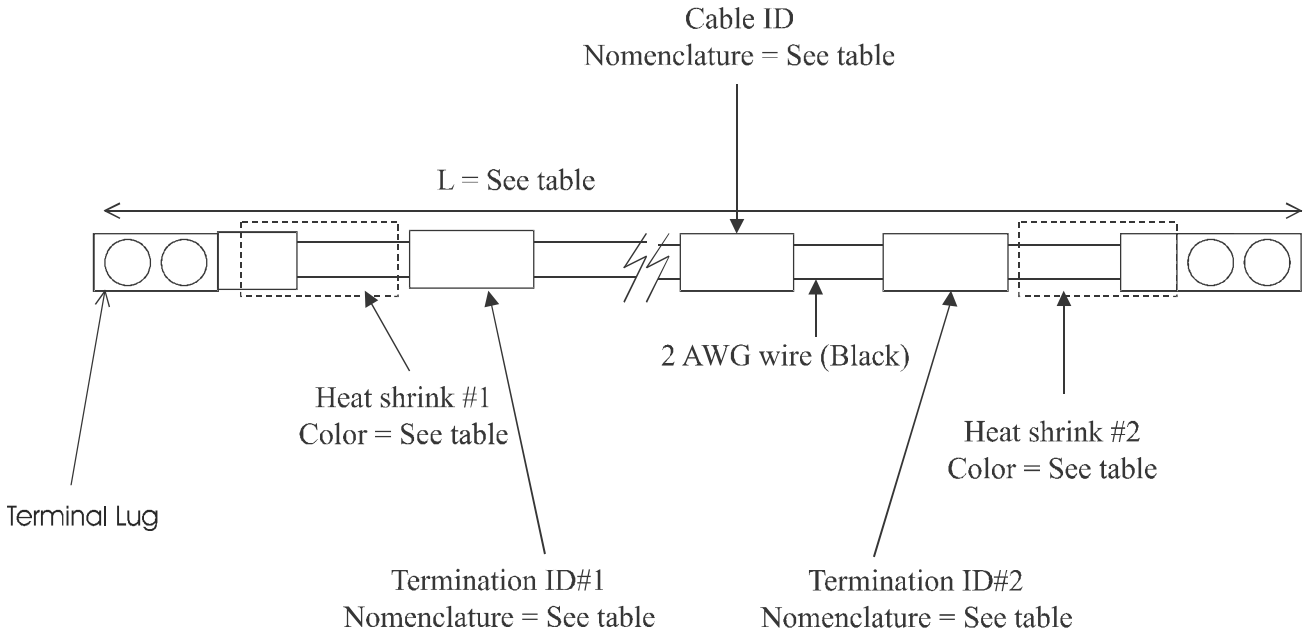
> **Important!** The two pre-terminated +24V DC load cables (and two 24V Return cables) are supplied with the module.

Identify the module to module DC cables and wiring

Perform the following steps to identify the module top module DC cables and the wiring diagram for connecting the four 24V DC cables from the add-on module to the battery module below it.

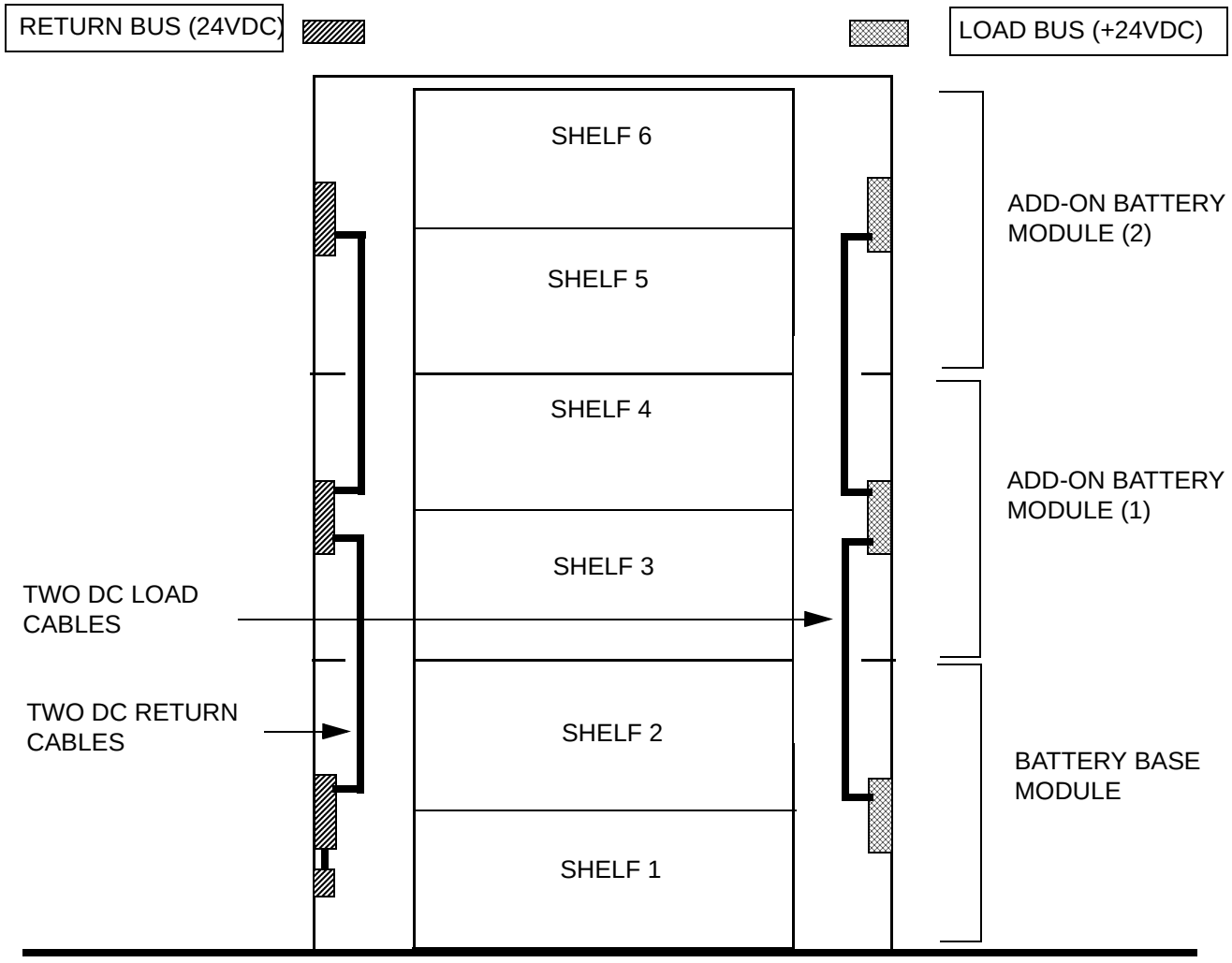
Important! Note that the cables are of different lengths. The +24V DC load (positive) cables are longer than the 24V Return (negative) cables.

1 Refer to the figure below for an illustration of one of the module to module DC cables to be connected. Note that the load (positive) cables have a red identification and the return (negative) cables have a black identification.



Cable ID	Heat shrink #1 color	Termination ID#1	Length (mm) +/-12mm	Termination ID#2	Heat shrink #2 color
RTN	Black	RTN BUS - BASE/GWTH	450	RTN BUS - GWTH	Black
24V	Red	24V BUS - BASE/GWTH	550	24V BUS - GWTH	Red

2 Refer to the figure below for an illustration of the DC module to module DC wiring.



FRONT VIEW

Route and connect the two +24V DC load and two 24V Return cables from the add-on module to the battery module below it

Perform the following steps to route and connect the two +24V DC load and two 24V Return cables from the add-on module to the battery module below it

> **Important!** When performing this procedure, unplug any battery disconnect connectors in the Modular Cell cabinet, as well as the battery cables from the load and return buses on all *lower* battery shelves. Do not reconnect them until instructed to do so. Also disconnect the 24V Return cables in the Modular Cell cabinet. Refer to Connect (or reconnect) the 24V Return cables from the first battery base module to the return bus in the Modular Cell 4.0B cabinet on Page A - 146. which illustrates were they are reconnected.

1 Remove the plastic cover that shields the 12V and 24V bus bars in the add-on module and the module below it. Refer to the Step 2 figure on Page A - 58. Do not replace the cover until instructed later.

2 Locate and identify the +24V DC load (positive) cables identified red at each end.

3 Locate the +24V DC load bus at the right-hand side of the add-on module. Refer to the figure on Page A - 97.

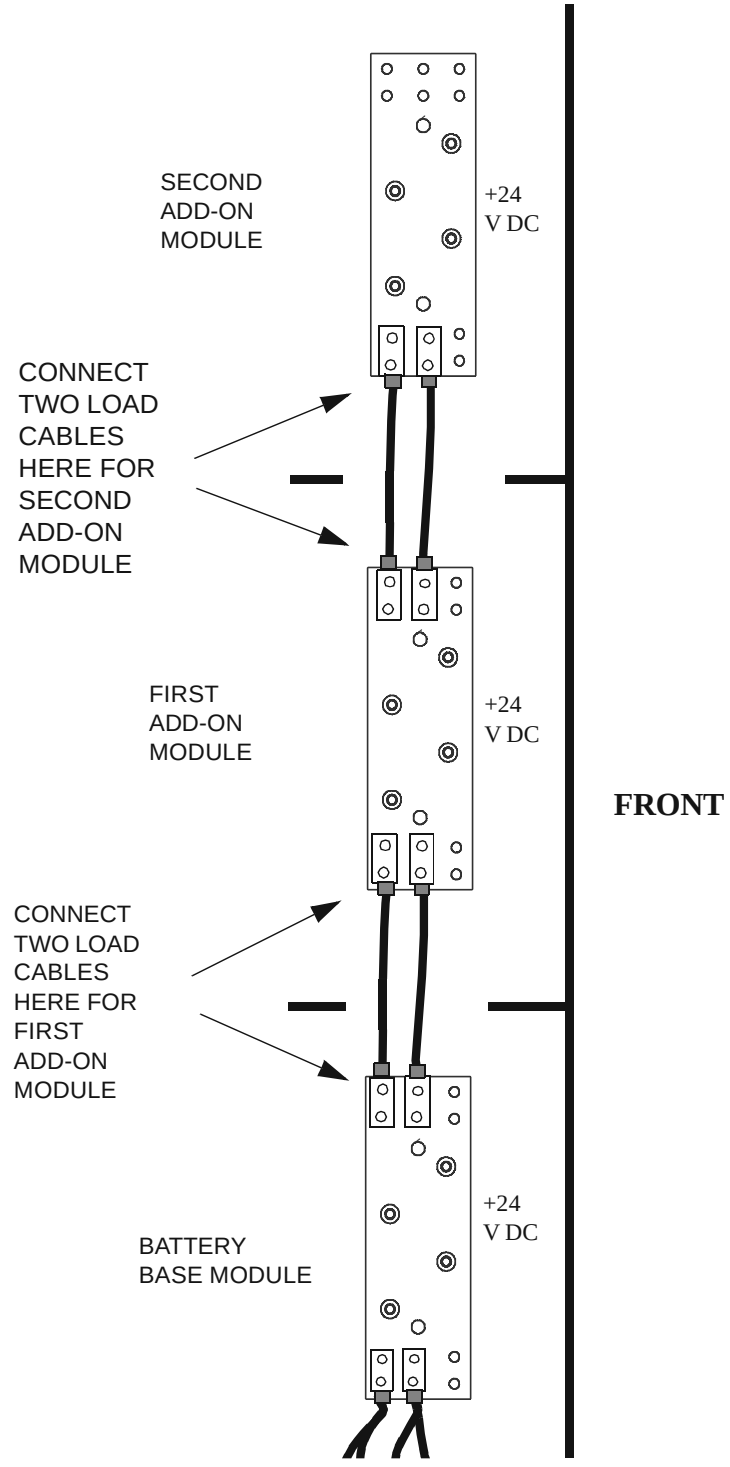
4 Attach the two +24V DC load (red ends) cables to the threaded studs on the add-on module load bus in the illustrated positions using the supplied serrated nut/washers.

5 Route the two load cables down to the next lower battery module. Refer to the figure on Page A - 97

6 Locate the +24V DC load bus at the right-hand side of the lower module. Refer to the figure on Page A - 97.

7 Attach the two +24V DC load (red ends) cables to the threaded studs on the lower module load bus in the illustrated positions using the supplied nuts and washers. Torque to 28Nm (250 in.-lb.). Refer to the figure below.

LOAD BUS
BATTERY BASE MODULE TO FIRST ADD-ON MODULE
AND
FIRST ADD-ON MODULE TO SECOND ADD-ON MODULE



RIGHT INSIDE VIEW

8 Locate and identify the 24V Return (negative) cables, identified with black ends.

9 Locate the return bus (labeled RTN) at the left-hand side of the add-on module. Refer to the figure on Page A - 99.

10 Attach the two 24V Return (black ends) cables to the threaded studs on the add-on module return bus in the illustrated positions using the supplied nuts and washers.

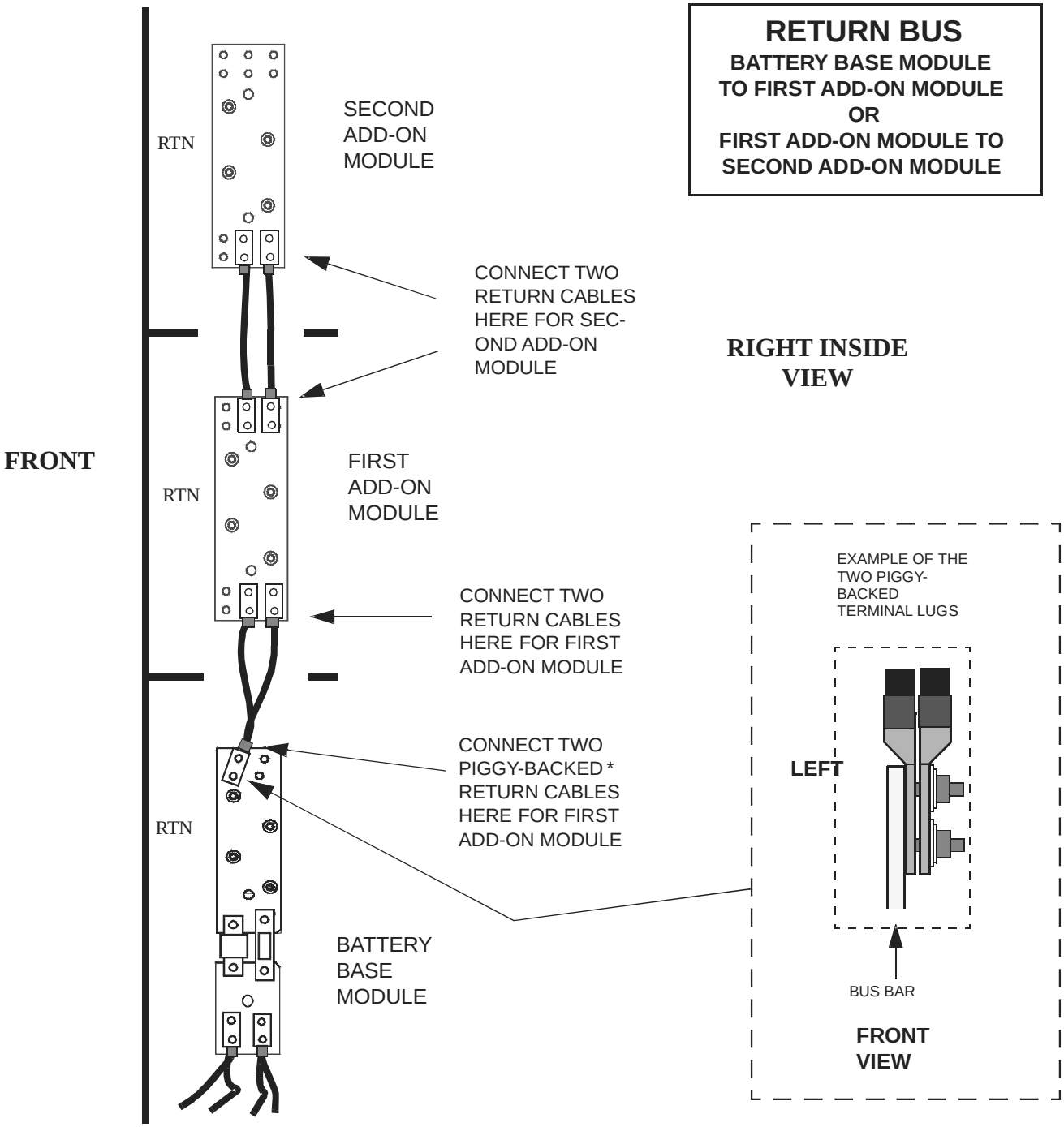
11 Torque to 28Nm (250 in.-lb.).

12 Replace the plastic cover that shields the 12V and 24V bus bars in the the module below the add-on module. Do not replace the cover in the add-on module until instructed later. Refer to the Step 2 figure on Page A - 58.

13 Route the two return cables down to the next lower battery module. Refer to the figure on Page A - 99

14 Locate the return bus at the left-hand side of the lower module. Refer to the figure on Page A - 99.

15 Attach the two 24V Return (black) cables to the threaded studs on the lower module return bus in the illustrated positions using the supplied nuts and washers. Torque to 28Nm (250 in.-lb.). Refer to the figure below.



*REQUIRED BECAUSE THE SECOND SET OF THREADED STUDS WILL BE USED LATER

16 Repeat Steps 1 through 15 if installing an additional battery add-on battery module.

17 Do not reconnect the battery disconnect connectors in the Modular Cell cabinet or at the battery buses at this time.

18 If not installing an additional battery base module at this time, skip to How to install the batteries in the EZBFo battery modules on Page A - 124 to continue the installation.

If installing an additional battery base module at this time, proceed to the next page to continue the installation

How to install a second EZBFo battery base module

Overview

Purpose

This section contains the following procedures:

This section provides instructions for the installation of a second EZBFo battery base module.

In this module the installer will perform the following procedures:

- Place, anchor and prewire the second battery base module
- Route and connect the signal cables from the first battery frame and the second battery base module
- Route and connect the AC cable from the first battery frame and the second battery base module
- Route and connect the DC cables from the first battery base module and the second battery base module

Important! EZBFo frames are installed on the left side of 4.0B Dual Band cabinets. Therefore, the following instructions should performed on the left side of the first battery base module.

Contents

Step-by-step instructions are provided for the following tasks:

Description and wiring diagram for adding a second battery base module

Important! EZBFo frames are installed on the left side of 4.0B Dual Band cabinets. Therefore, the following instructions should performed on the left side of the first battery base module.

Important! Before performing the wiring procedures, unplug any battery disconnect connectors in the Modular Cell cabinet, as well as the battery cables from the 24V Return buses on all existing battery modules. Do not reconnect them until instructed to do so.

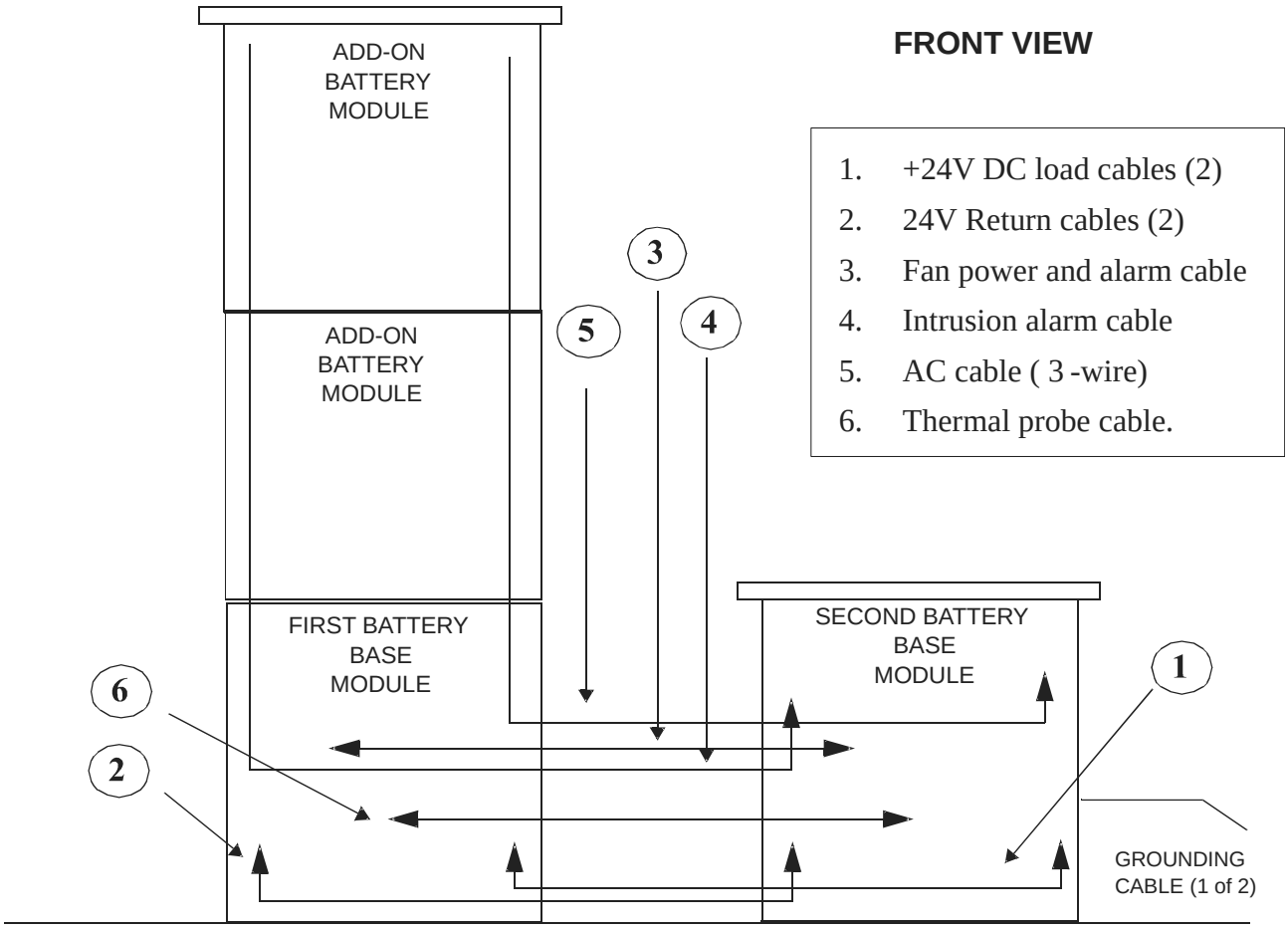
Also disconnect the 24V Return cables in the Modular Cell cabinet. Refer to Connect (or reconnect) the 24V Return cables from the first battery base module to the return bus in the Modular Cell 4.0B cabinet on Page A - 146. which illustrates were they are reconnected.

The battery base module provides two battery shelves. Two additional battery modules may be stacked above the first battery base module, each module providing two battery shelves each. Each battery shelf holds:

- With four L1-100Ah-12VDC batteries per shelf: Two 12VDC batteries are connected in series to provide two 24VDC strings per shelf, four strings per module, and up to twelve strings per frame. Individual shelves may be populated
- With three 12IR125 batteries per shelf: Each of the two shelves is populated with three 12VDC batteries connected in parallel. to provide two 12VDC shelves. The two shelves connected in series to provide a 24VDC module. Both shelves *must* be populated.

Wiring overview

This section provides instructions for the interconnections from the first EZBFo battery base module to a second EZBFo battery base module. Refer to the figure below for a key to the following numbered list. The first battery base module was previously grounded to the grounding system.



Note: EZBFo frames are installed on the left side of the 4.0B Dual Band cabinets. In this case the second battery base module should installed on the left side of the first battery base module.

How to place, anchor and prewire the second battery base module (Reference)

Place, anchor and prewire the second battery base module (Reference)

To place anchor and prewire the second battery base module refer to How to perform placement, anchor, and prewire procedures for installation of the first or second EZBFo battery base modules on Page A - 8.

Perform all of the indicated procedures from Page A - 8 to Page A - 34 before returning to this section.

How to route and connect the signal cables from the first to the second battery base module

Overview

This procedure module provides instructions on how to route and connect the signal and ground cables from the first to the second battery base module.

Step-by-step instructions are provided for the following tasks:

Description of signal cable wiring installation in the battery base module

The fan power and alarm and intrusion alarm cables from the first battery frame will be routed and connected. The thermal probe cable will also be routed from the first battery frame and one of the thermal probes moved to the second battery base module.

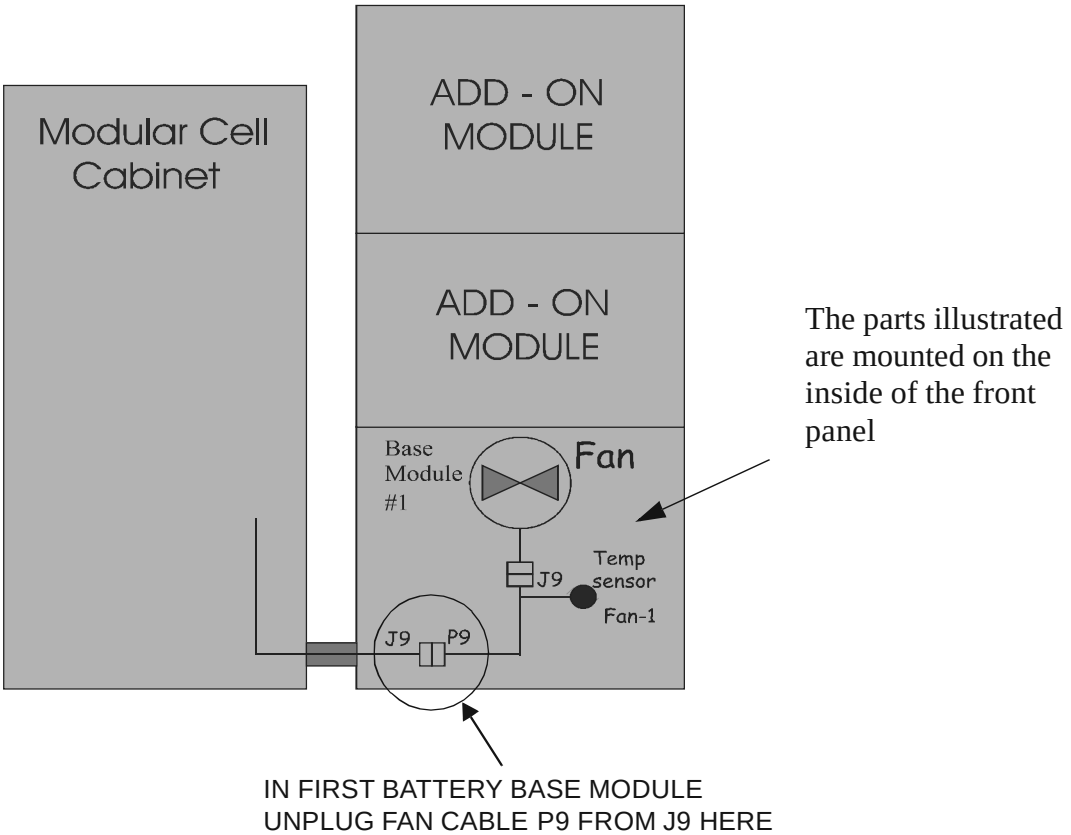
Route and connect the fan power and alarm cable between the first battery frame and the second battery base module

Important! The fan, temperature sensor, and cable are located on the front panel of the battery module. Therefore the front panel must be connected to the outer frame via the lanyard cable when connecting the fan power and alarm cable.

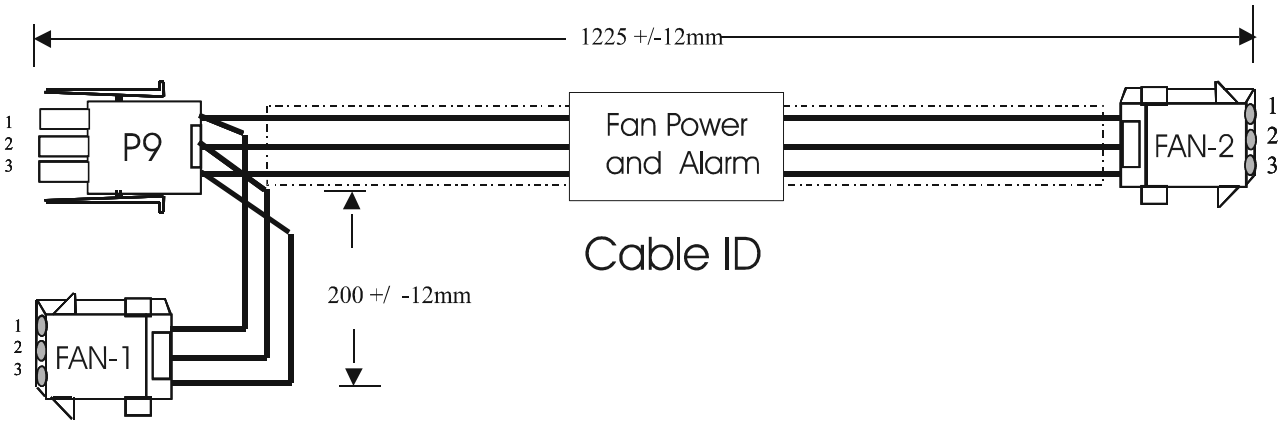
Perform the following steps to route and connect the fan power and alarm cable between the first battery base module and the second battery base module.

1 Remove the eight TR 25 Keytorx security screws front panel of the first battery base module, and remove the front panel or open the front door as applicable. Do not disconnect the lanyard cable.

2 In the first battery base module, disconnect the fan cable P9 connector from the J9 connector of the cable coming from the Modular Cell cabinet. Refer to the figure below.



3 Identify the second battery base module fan power and alarm cable. Refer to the figure below.



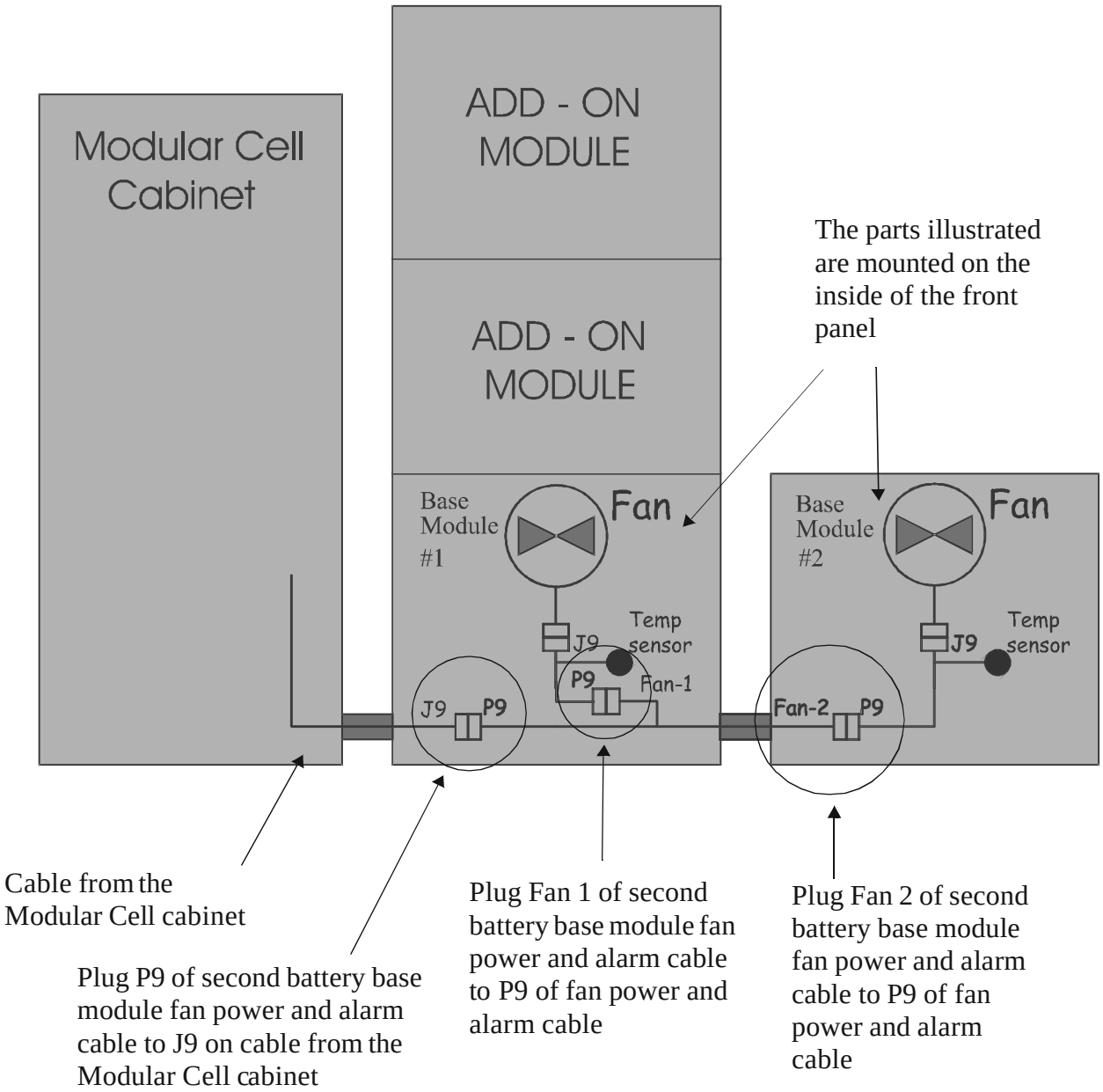
4 Route the end of the cable that has only one connector (FAN 2) through the conduit into the second battery base module. Refer to the figure on Page A - 108

5 In the first battery base module connect the P9 connector to the J9 connector on the cable from the Modular Cell cabinet. Refer to the figure on Page A - 108

6 In the first battery base module connect the FAN 1 connector to the P9 connector on the fan power and alarm cable. Refer to the figure on Page A - 108

7 In the second battery base module connect the FAN 2 connector to the P9 connector on the fan power and alarm cable. Refer to the figure below.

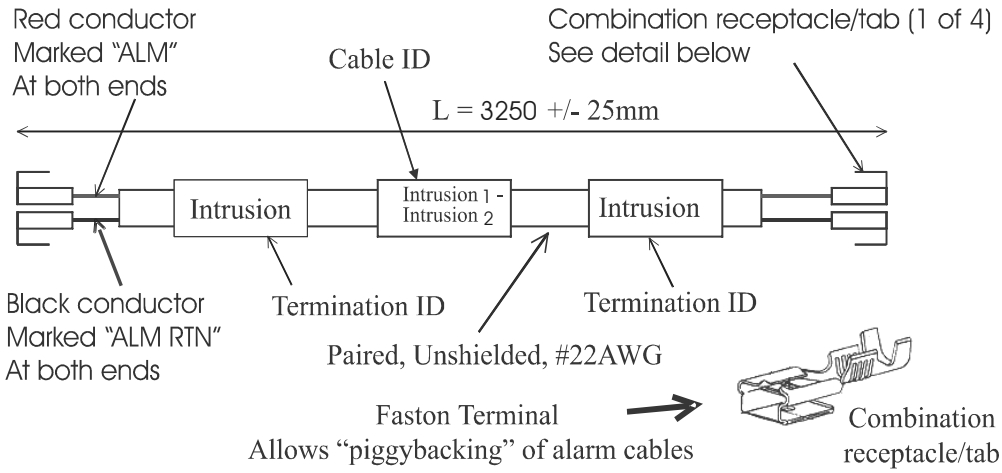
8 Route and dress the cable using the cable ties and self-stick anchors provided. The slack allowed in the cable must be at least as long as the lanyard cable.



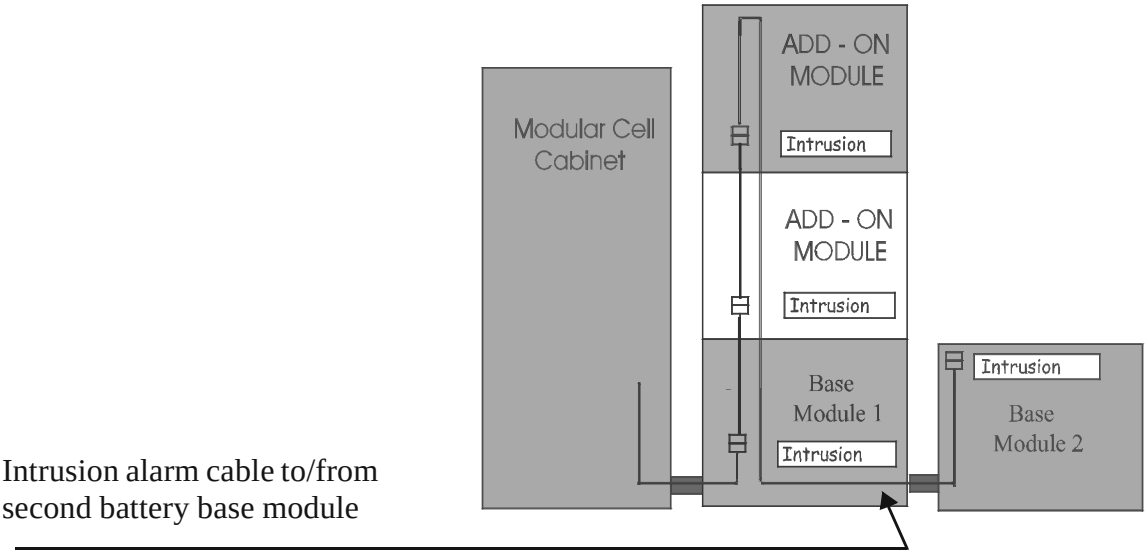
Route and connect the intrusion alarm cable between the first battery frame and the second battery base module

Perform the following steps to route and connect the intrusion alarm cable between the first battery frame and the second battery base module

1 Identify the second battery base module intrusion alarm cable. Refer to the figure below.



2 Refer to the figure below for the intrusion alarm routing in add-on modules.



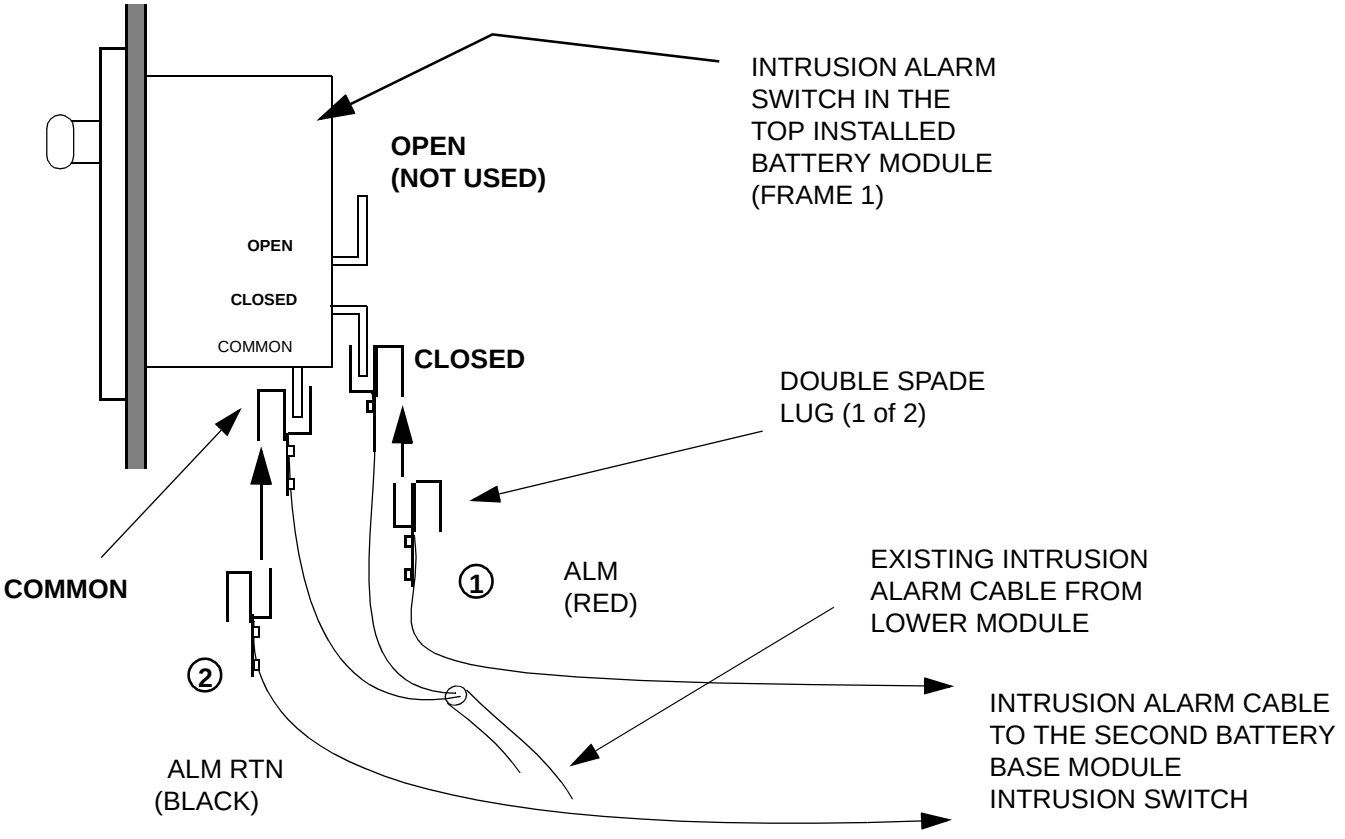
3 Route the "Intrusion 2" end of the cable through the conduit into the second battery base module. Refer to the figure above.

Important! On battery modules that have a front door instead of a panel, the intrusion alarm switch is located at the bottom front, on the opposite side from the door hinge, either the left or right side, as applicable. Refer to the Step 3 figure on page A - 10

4 In the first battery base module route the “Intrusion 1" end of the cable up through to the top installed battery module. Refer to the figure on Page A - 108

5 In the top installed battery module connect the "ALM" double spade lug to the double spade lug at the CLOSED lug on the intrusion alarm switch. Refer to the figure below, 2.

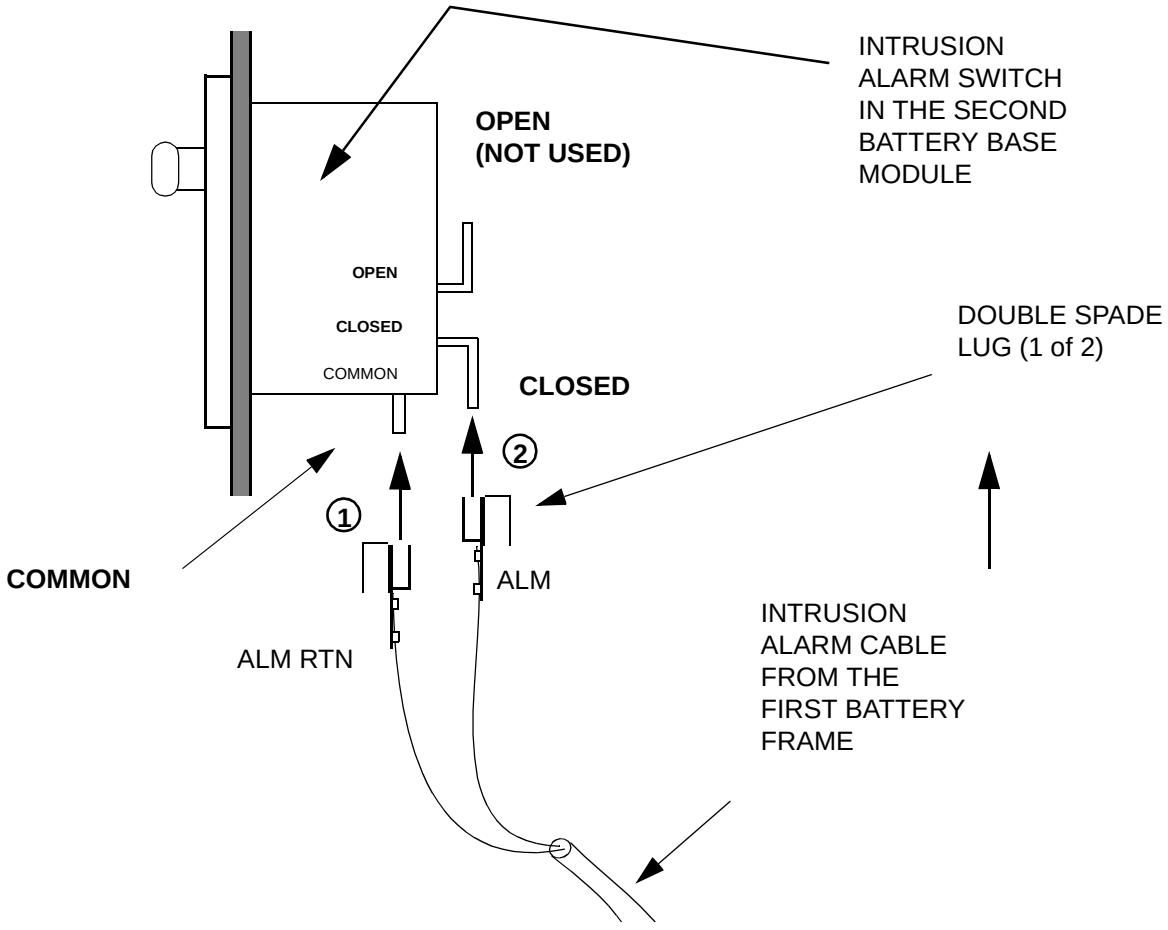
6 In the top installed battery module connect the "ALM RTN" double spade lug to the double spade lug at the COMMON lug on the intrusion alarm switch. Refer to the figure below, 1.



7 In the second battery base module connect the "ALM" double spade lug to the CLOSED lug on the intrusion alarm switch. Refer to the figure below, 2.

8 In the second battery base module connect the "ALM RTN" double spade lug to the COMMON lug on the intrusion alarm switch. Refer to the figure below, 1.

9 Route and dress the cable using the cable ties and self-stick anchors provided.



Relocate the thermal probe from the first battery frame to the second battery base module

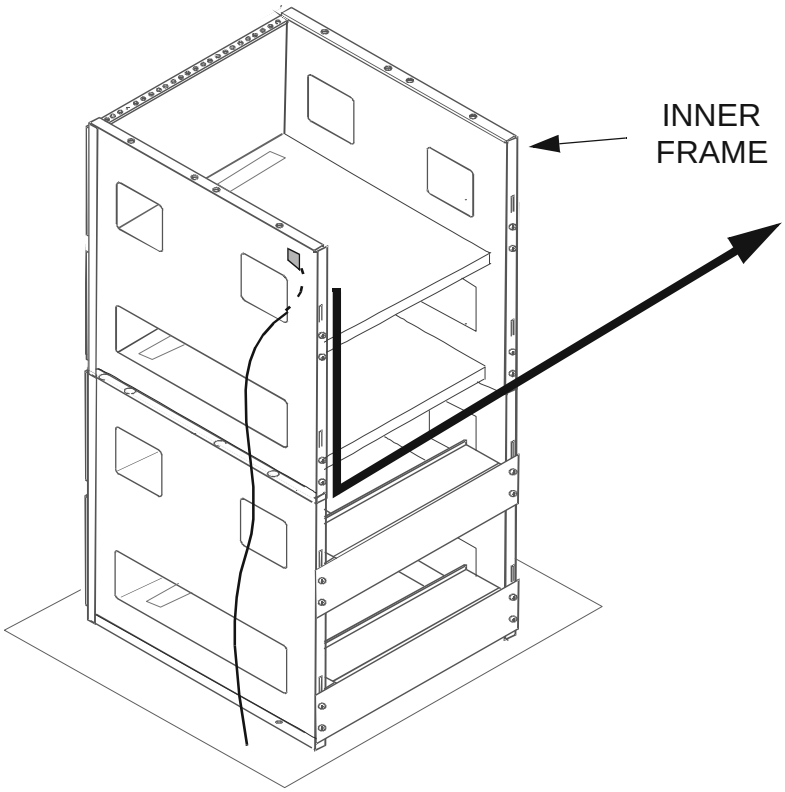
Perform the following steps to relocate the thermal probe from the first battery frame to the second battery base module

1 Locate the thermal probe located in the highest position in the first battery frame assembly. Refer to the figure below

2 Disconnect the thermal probe from the thermal probe cable. Refer to the figure below

3 Attach the supplied extension cable to the connector from which the thermal probe was removed.

4 Route the extension cable to the second battery base module. Refer to the figure below



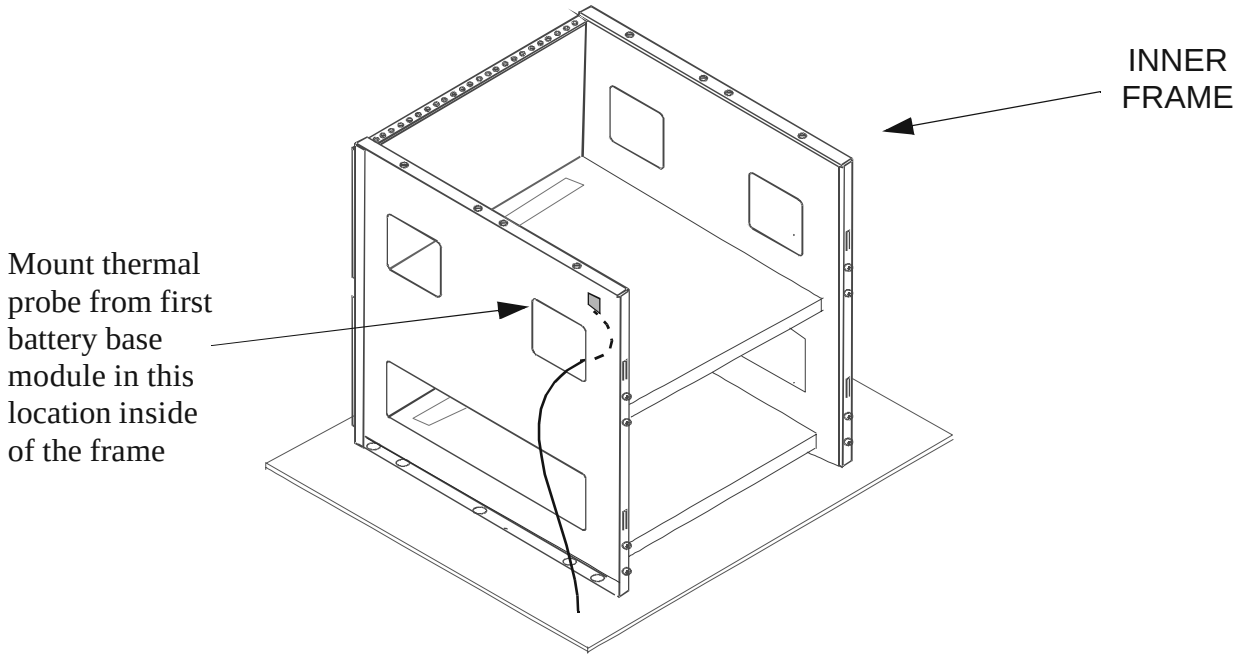
DISCONNECT THE THERMAL PROBE (LOCATED IN THE HIGHEST POSITION IN FIRST MODULE) FROM THE THERMAL PROBE CABLE. RELOCATE THE THERMAL PROBE TO A POSITION INSIDE THE FRAME ON THE TOP SHELF OF THE NEWLY ADDED BASE MODULE. INSTALL THE THERMAL PROBE CABLE, SUPPLIED WITH THE NEWLY ADDED BASE MODULE, BETWEEN THE THERMAL PROBE CABLE IN THE FIRST FRAME AND THE RELOCATED THERMAL PROBE IN THE NEWLY ADDED BASE MODULE.

THE OUTER FRAME IS SHOWN REMOVED FOR CLARITY

5 Route the extension cable to the top shelf of the newly added base module.

6 Attach the thermal probe to the end of the extension cable.

7 Use the self-stick mounting bracket and wire tie to attach the thermal probe in the location inside the frame shown in the figure below.



THE OUTER FRAME IS SHOWN REMOVED FOR CLARITY

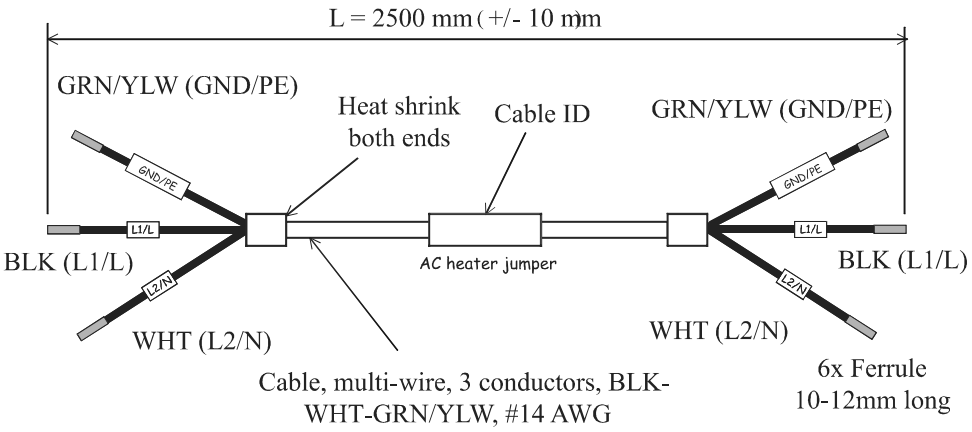
How to route and connect the AC cable from first battery frame to the second battery base module

Route and connect the AC cable from the first battery frame to the second battery base module

Perform the following steps to route and connect the AC cable from the first battery frame to the second battery base module.

1 Disconnect the AC source in the Modular Cell Cabinet. Refer to Step 3 on Page A - 75.

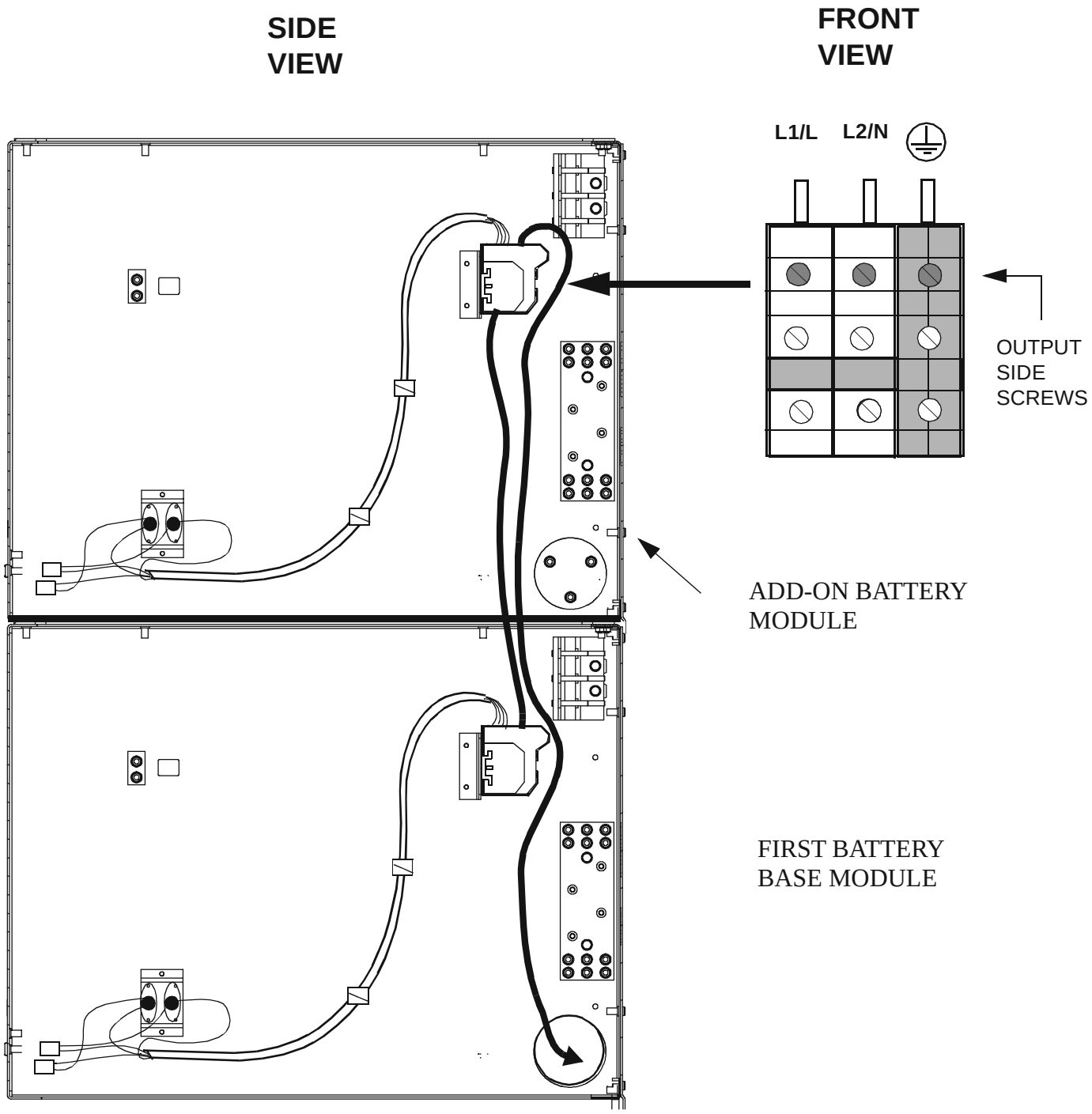
2 Locate the AC 3-wire cable. Refer to the figure below.



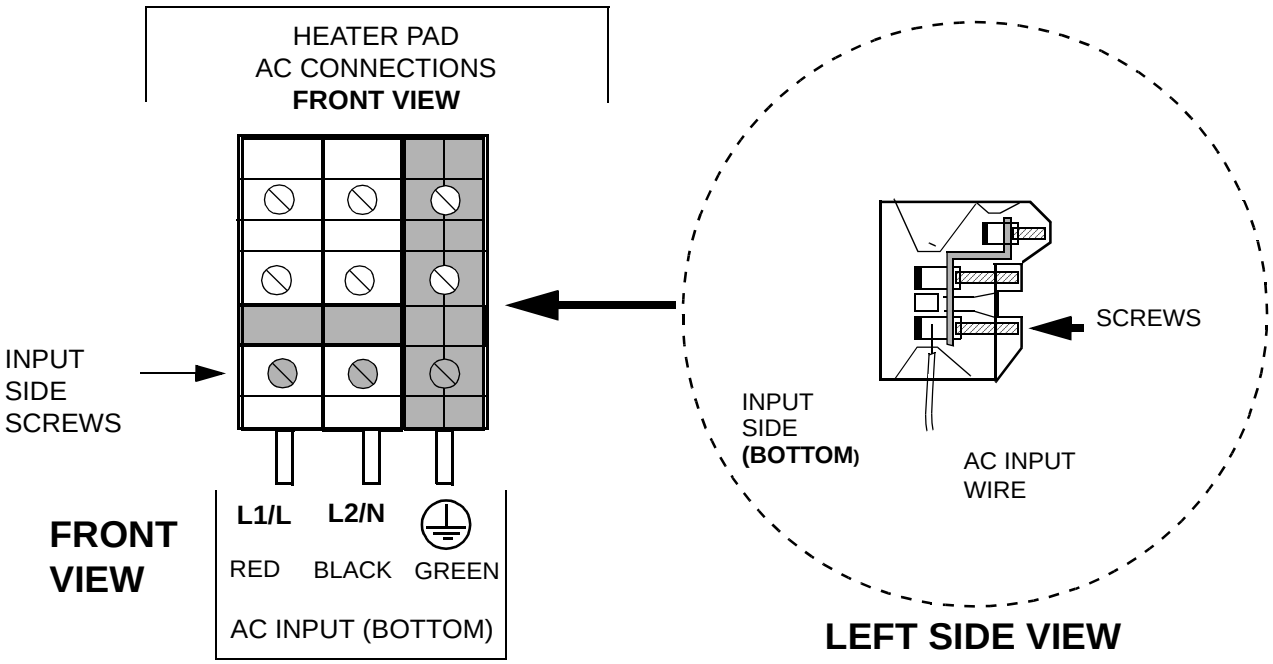
3 Attach the wires to the top front terminals of the AC terminal block in the top battery module in the first battery frame and tighten the screws. Torque screws to 1.5 to 1.8 Nm (1.1 to 1.3 ft.- lb.). Refer to the figure on Page A - 115

4 Tighten the AC terminal block screws on top module AC terminal block.

5 Route the cable down to the bottom module, through the conduit, and into the second battery base module.



6 Attach the wires to the bottom terminals of the AC terminal block in the second battery base module and tighten the screws. Torque screws to 1.5 to 1.8 Nm (1.1 to 1.3 ft.- lb.). Refer to the figure below.



SECOND BATTERY BASE MODULE

7 Route and dress the cable on the inside wall of the outer frame using the supplied self-stick anchors and cable ties.

8 Tighten the AC terminal block screws on the battery base module AC terminal block Torque screws to 1.5 to 1.8 Nm (1.1 to 1.3 ft.- lb.).

How to route and connect DC cables from the first to the second battery base module

Overview

This procedure module provides instructions for the installation of four #2 -AWG DC power cables (two +24V DC load and two 24V Return) from a second EZBFo battery base module to the first EZBFo battery base module.

Step-by-step instructions are provided for the following tasks:

Description of DC power cable routing and connection

Important! Before performing the wiring procedures, unplug any battery disconnect connectors in the Modular Cell cabinet, as well as the battery cables from the +24V DC load and 24V Return buses on all lower battery shelves. Do not reconnect them until instructed to do so. Also disconnect the 24V Return cables in the Modular Cell cabinet. Refer to Connect (or reconnect) the 24V Return cables from the first battery base module to the return bus in the Modular Cell 4.0B cabinet on Page A - 146. which illustrates were they are reconnected.

The second EZBFo battery base module requires four DC power cables from the first EZBFo battery base module: Two +24V DC load cables (+) and two 24V Return cables (-).

Important! Two pre-terminated +24V DC load cables (and two 24V Return cables) are supplied in the cable and hardware kit for the second Battery Base Module. Note that the load and return cables are of different lengths: the longer are the return cables and the shorter are the load cables.

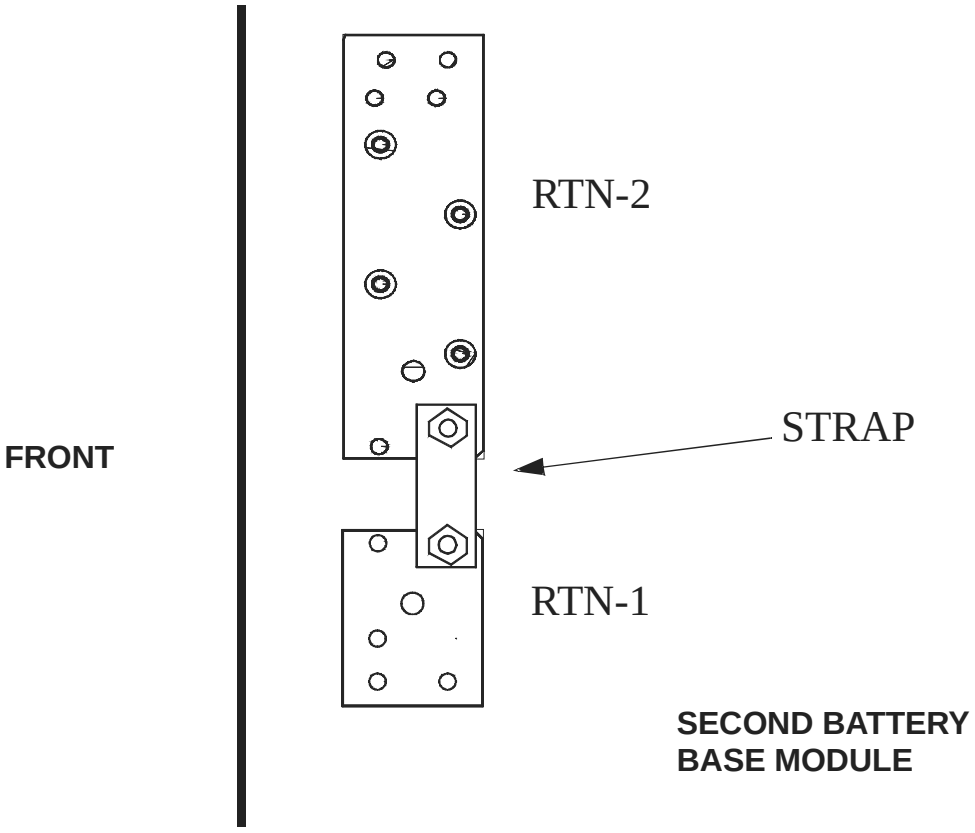
Install the strap between the lower (RTN-1) and upper (RTN-2) 24V Return bus in the second battery base module

Perform the following steps to install the strap between the lower and upper return bus in the second battery base module

1 Mount the strap between the upper and lower return bus bars which are mounted on the inside front left side of the outer frame. Refer to the figure below.

2 Attach the strap with the two sets of nuts and washers provided.

3 Torque the nuts to 28Nm (250 in.-lb.).

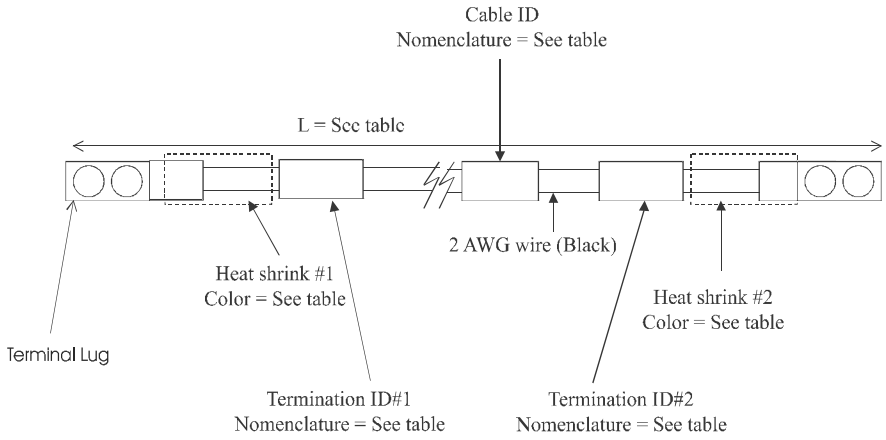


Route and connect the four DC cables between the first and second battery base modules

Important! When performing the next step, unplug any battery disconnect connectors in the Modular Cell cabinet, as well as the battery disconnect connectors at all battery bases in the first battery frame. Do not reconnect the cables until instructed.

Use the following procedure to connect the +24V DC load and 24V Return cables to the applicable bus in the first EZBFo battery base module, route them through the conduit to the second battery base module, and connect them to the applicable bus. The cables are shipped in a box separate from the battery base module.

1 Refer to the figure below for an illustration of the DC cables.



Quantity	Cable ID	Heat shrink #1 color	Termination ID#1	Length (mm) +/-12mm	Termination ID#2	Heat shrink #2 color
2	RTN	Black	RTN BUS – BASE#1	1600	RTN BUS – BASE#2	Black
2	24V	Red	24V BUS – BASE#1	1200	24V BUS – BASE#2	Red

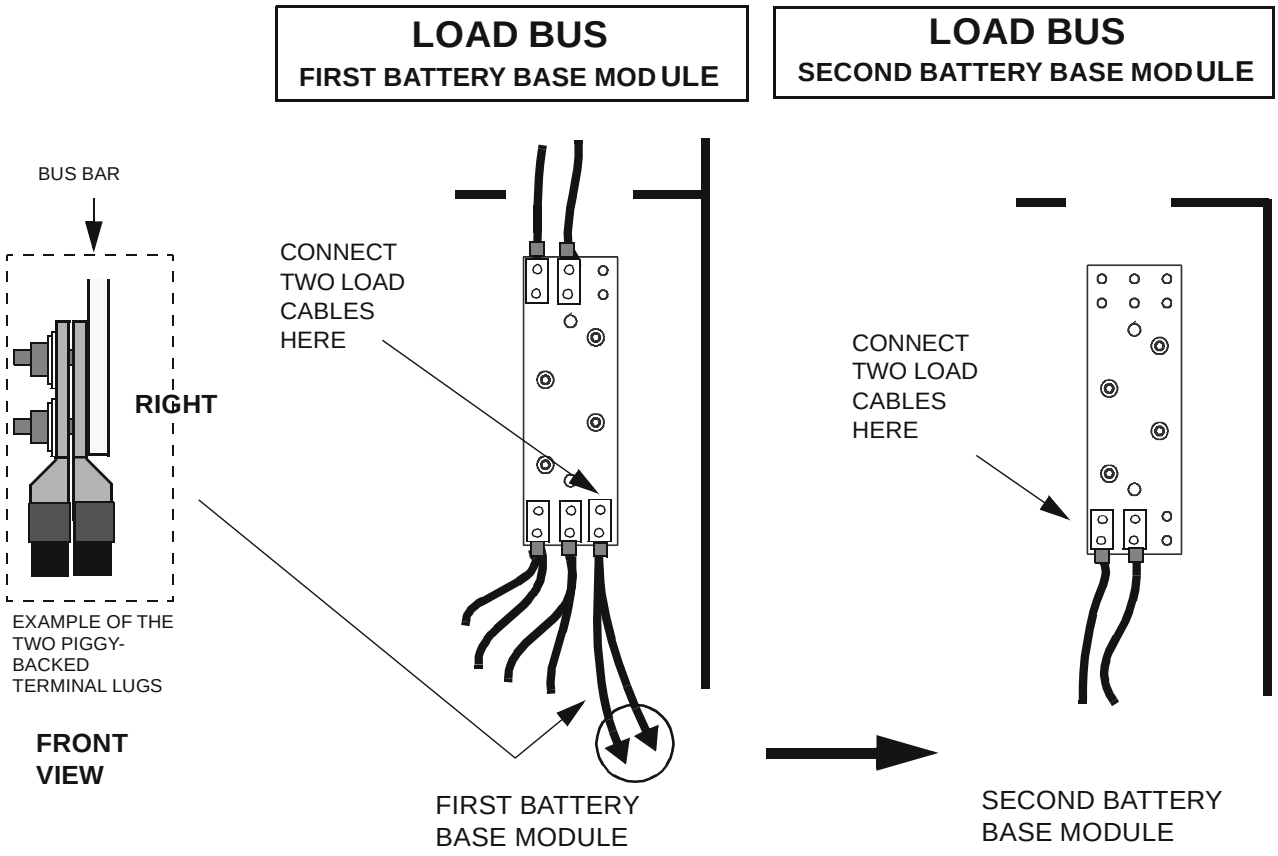
2 Select the two load cables, the two shorter cables (1200 mm) of the four supplied. These cables are coded red.

3 Remove the plastic cover that shields the 12V and 24V bus bars in the the first and second battery base modules. Do not replace the covers until instructed later. Refer to the Step 2 figure on Page A - 58.

4 Connect the two cables to the +24V DC load bus on the inside right frame of the first battery base module, using antioxidant compound. Refer to the figure on Page A - 120

5 Route these two load cables through the conduit to the second battery base module.

6 Connect the two cables to the load bus on the inside right frame of the second battery base module, using antioxidant compound. Refer to the figure below. Torque the nuts to 28Nm (250 in.-lb.).



7 Replace the plastic cover that shields the 12V and 24V bus bars in the the first base module. Do not replace the cover in the second base module until instructed later. Refer to the Step 2 figure on Page A - 58.

8 Select the two return cables, the two longer cables (1600 mm) of the four supplied. These cables are coded black.

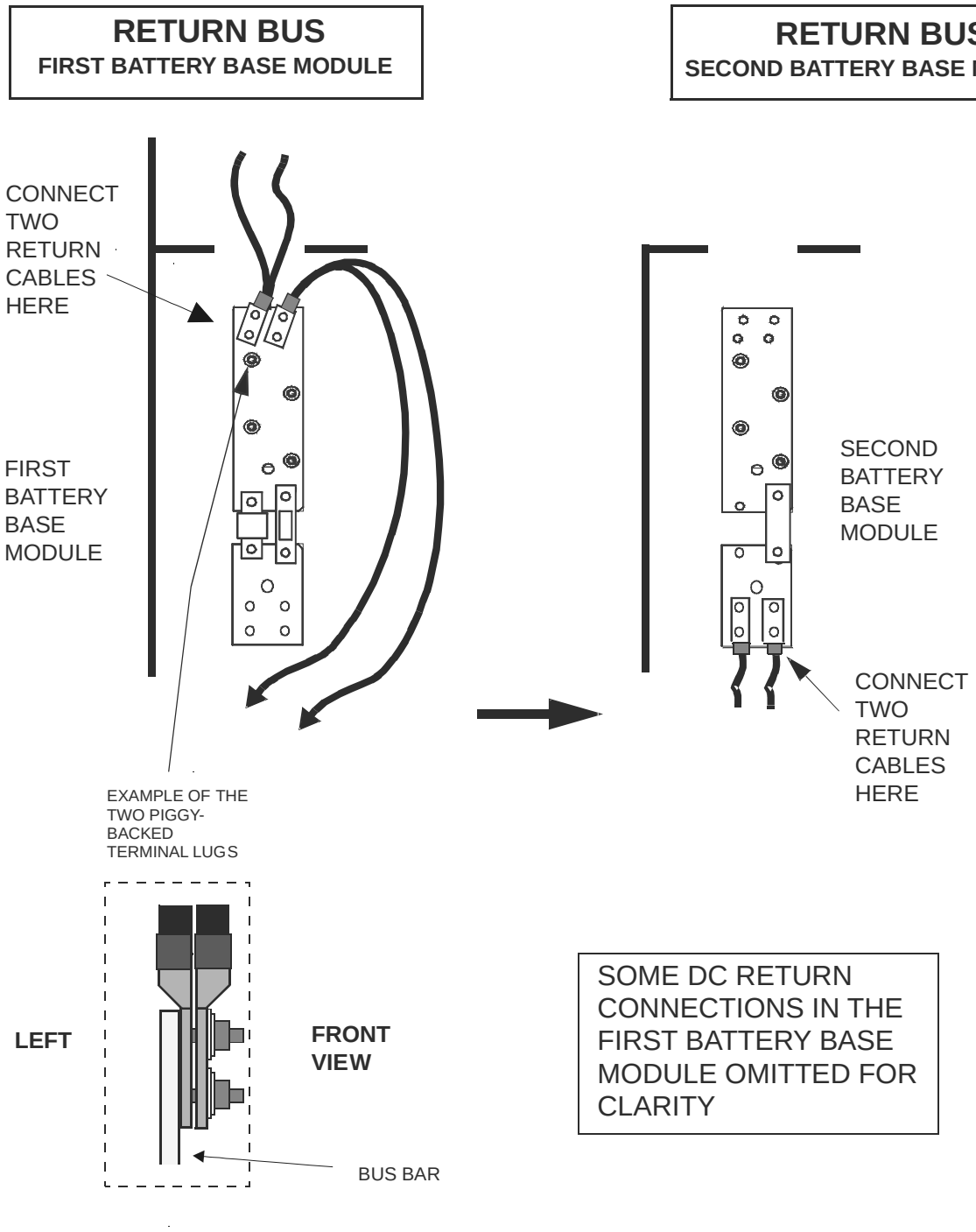
9 Remove the nuts and washers that are attaching the two existing cables to the top of the return bus bar located on the inside left frame of the first battery base module and place the terminal lugs of the two 24V Return cables onto the same threaded studs. Refer to the figure on Page A - 122

10 Attach the two cables to the return bus, using the removed nuts and washers and antioxidant compound. Refer to the figure below.

11 Route these two return cables through the conduit to the second battery base module.

12 Connect the two cables to the return bus on the inside left frame of the second battery base module, using antioxidant compound. Refer to the figure below.

13 Torque the nuts to 28Nm (250 in.-lb.).



How to add additional battery modules to the second battery base module battery (reference)

Refer to How to install an EZBFo battery add-on module on an existing EZBFo battery module on Page A - 76 to add battery modules to the second battery base module.

How to install the batteries in the EZBFo battery modules

Overview

Purpose

Step-by-step instructions are provided for the following tasks:

Approved batteries

You will need the following recommended materials or equivalent.

Quantity:	Name
As required per site specification	Power CSL-12100 L1-type batteries (four minimum) with interconnection bus bars Marathon GNB M12V100FT L1-type batteries (four minimum) with interconnecting bus bars and spacers (One per battery) 12IR125 (six minimum)

Battery Safety

Battery safety and precautions

Your understanding of the following information is important to ensure a proper and safe installation of the batteries.

CAUTION

To batteries in this product can present a risk of high short circuit and fire. The following precautions should be observed when working on batteries:

- *Remove watches, rings, or other metal objects*
- *Use insulated tools*
- *Wear rubber gloves and boots*
- *Disconnect charging source prior to connecting or disconnecting battery terminals*

DANGER

Injury to Personnel - Chemical Burns

The batteries contain electrolyte (sulfuric acid and water), which can generate hydrogen gas, even under open circuit conditions. Extreme caution must be taken when handling batteries. Carefully follow all applicable procedures.

WARNING

Injury to Personnel

Lifting of the batteries by one person can result in a serious injury. Always use two people (or use a lifting device) to handle the batteries.

WARNING

High Energy hazard

The following procedures are the safest method to install and connect the batteries. If these procedures are not followed in the exact sequence listed, a serious electrical shock hazard will result. Ensure that loose cables cannot cause a short circuit. Since the batteries are charged, do not touch battery terminals or cross terminals with metal objects. Do not remove the insulated cover from the battery terminals until you are preparing to complete each connection.

CAUTION

To reduce the risk of fire or injury to persons, read and follow these instructions:

- *Use only batteries approved for use with this product. Refer to* Approved batteries *on Page* ***A - 124*** *for the list of approved batteries*
- *Do not dispose of the batteries in a fire. The cell may explode. Check with local codes for possible disposal instructions*
- *Do not open or mutilate the batteries. Released electrolyte is corrosive and may cause damage to the eye and skin. It may be toxic if swallowed*
- *Exercise care in handling batteries in order not to short the battery with conductive materials such as rings, bracelets, and keys. The battery or conductor may overheat and cause burns*
- *Do not mix old and new batteries in this product.*

□

How to install L1 batteries in the EZBFo battery modules

Overview

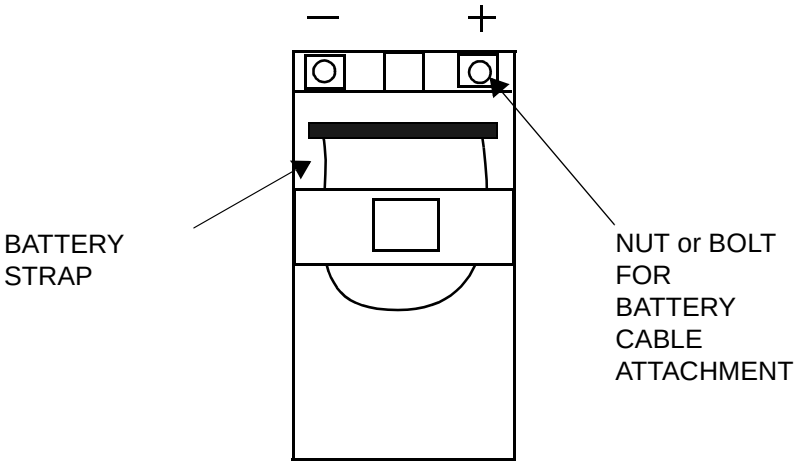
This procedure module provides instructions for the installation of L1 batteries.

Important! The batteries will be installed on the shelves and the battery cables will be connected to the batteries in this section. The battery cables must not be connected to the bus bars until later. Refer to How to make final DC connections on Page A - 140.

Step-by-step instructions are provided for the following tasks:

Description of L1 batteries

The L1-type battery terminals are located on the front end of the battery. Positive and negative terminals are clearly labeled "+" and "-". Dual strap handles are permanently attached to the battery along its top. An example Power CLS-12100 L1 battery is shown in the figure below.



Important! An insulated cover is factory-installed over the terminals on the batteries to prevent an inadvertent electrical short during battery installation. Do not remove this cover until you are preparing to complete the battery connection.

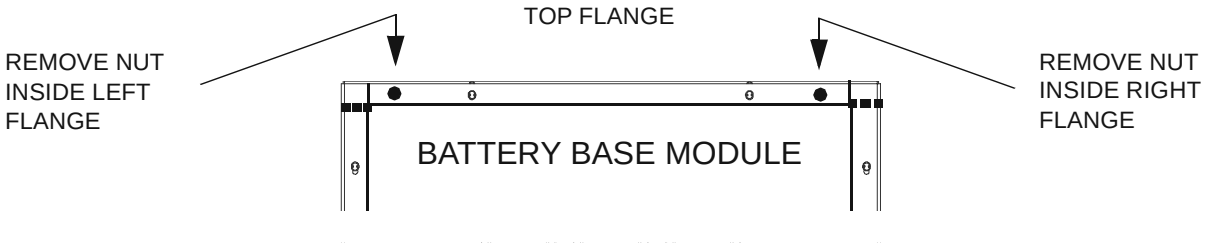
Place batteries on a shelf

Use the following procedure to place batteries on a shelf, starting with Shelf 1 (bottom).

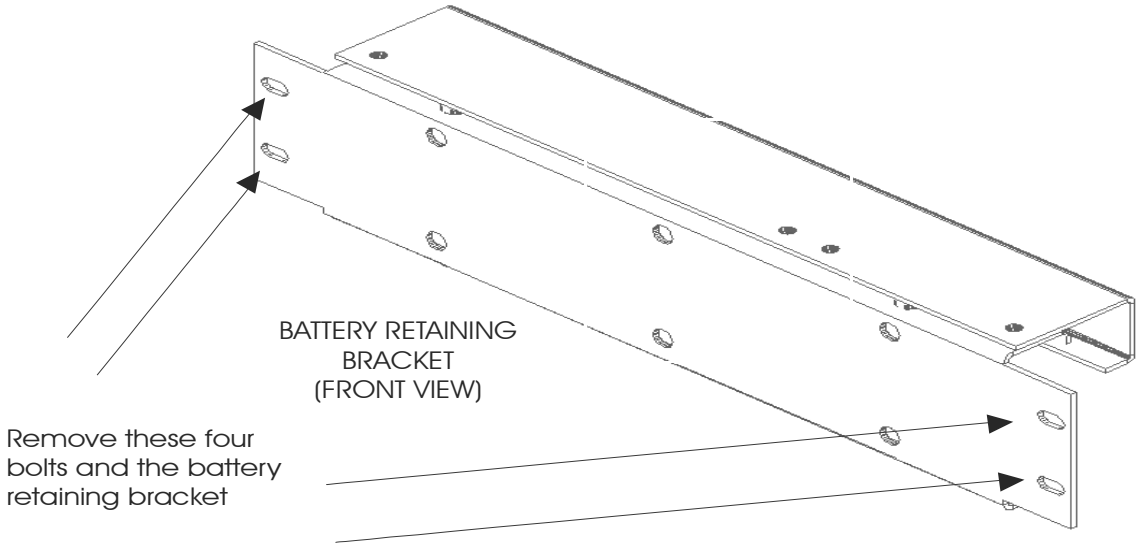
1 Check and record battery initial voltages and record all battery date codes.

> **Important!** The next step is not required if the top panel has been removed from the module, since the batteries may be installed on the top shelf through the top

2 Remove the two nuts and remove the top flange from the front of the battery module. Refer to the figure below.

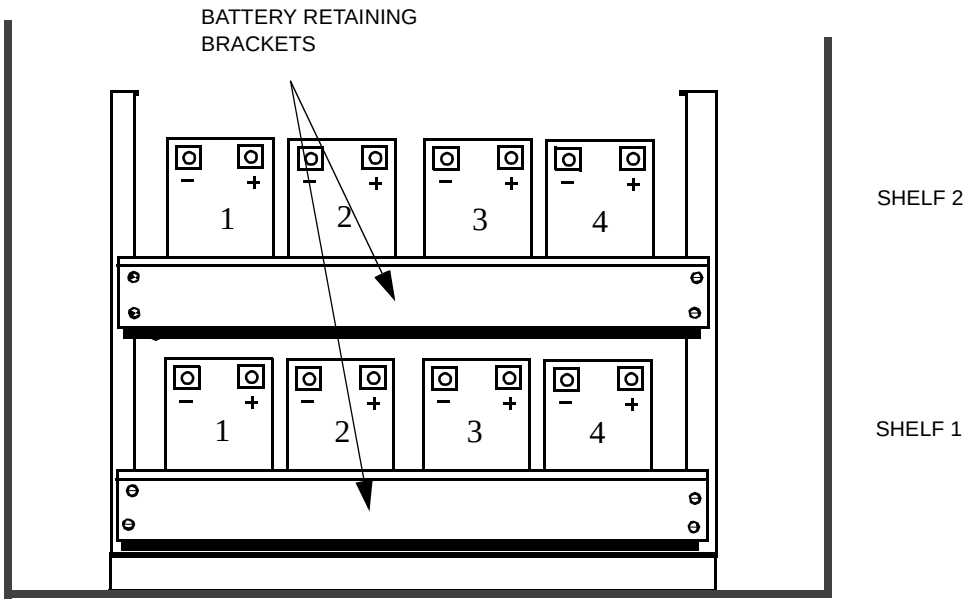


3 If it has not been previously removed, remove the four bolts and the battery retaining bracket from the shelf to be populated with batteries. Start with the lowest battery shelf. Do not disassemble the two part battery retaining bracket.



4 Lift and place each of the four batteries on the bottom battery shelf, with the battery terminals facing the front of the battery shelf.

5 Replace the battery retaining bracket.



6 Torque the bolts according to the table in Chapter 1.

7 Repeat Steps 1 through 6 for all battery shelves to be populated.

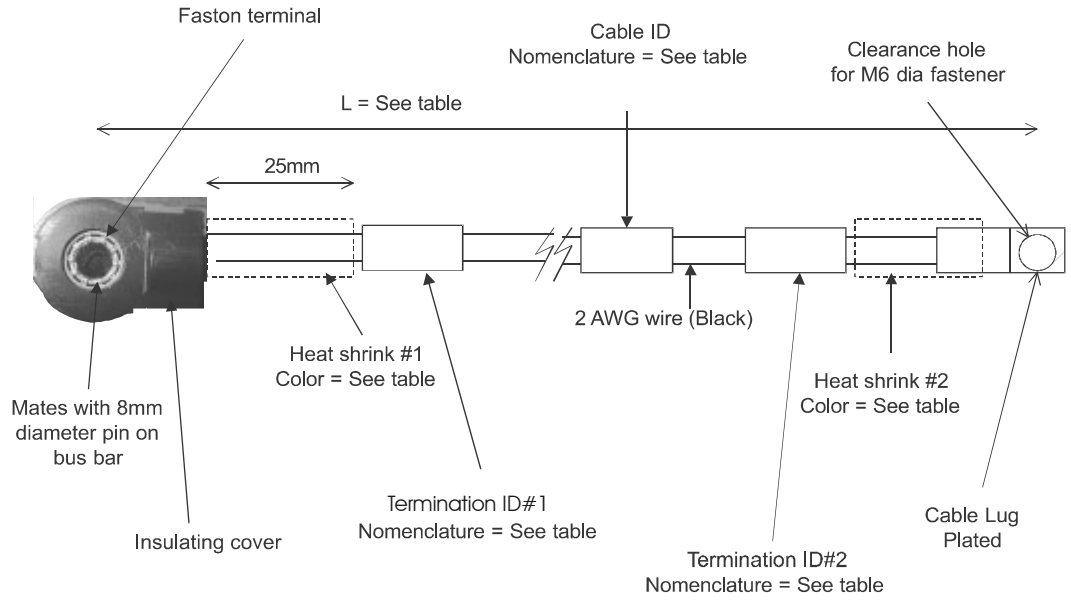
8 Replace the top flange removed in Step Important!

Connect the battery cables to all batteries

Perform the following steps to connect the battery cables to all batteries. Route all cables downward from their battery connections.

Important! Do not attach the battery cables to the bus bars at this time.

1 Refer to the figure below for an illustration of the battery cable to be attached to the batteries and a table showing the four different cables required per shelf.



Cable #	Cable ID	Heat shrink #1 color	Termination ID#1	Length (mm) +/-12mm	Termination ID#2	Heat shrink #2 color
1	RTN	Black	RTN BUS	425	BAT1(-)	Black
2	24V	Red	24V BUS	425	BAT2(+)	Red
3	RTN	Black	RTN BUS	575	BAT3(-)	Black
4	24V	Red	24V BUS	575	BAT4(+)	Red

Important! A battery wiring diagram is shipped with the cables

2 Remove the attaching hardware from the positive (+) terminals of batteries 2 and 4, and the negative (-) terminals of batteries 1 and 3.

Important! If installing Marathon GNB M12V100FT L1-type batteries <u>install the supplied spacer</u> before making the battery cable connections (using the extra long bolt) in the next two steps. Place the spacers on the terminals identified with an * in the figure below. This applies to all battery shelves.

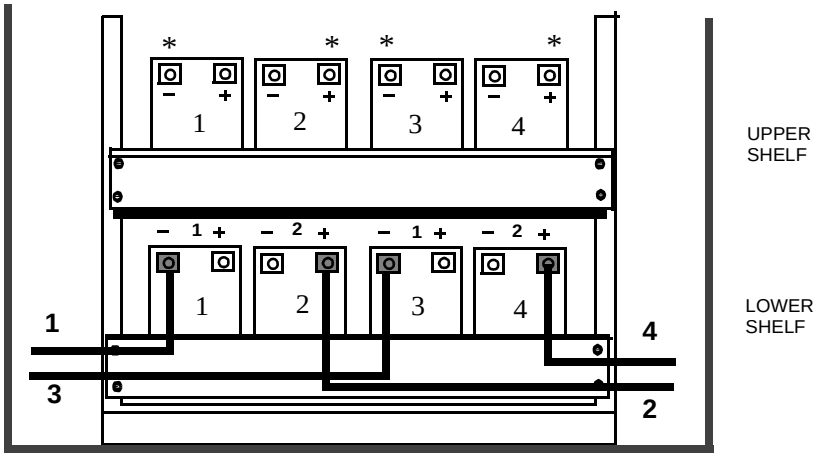
3 Using the previously removed attaching hardware (and antioxidant compound), connect the one-hole lug end of each battery cable to the batteries in the following order. Refer to the figure below and the table on Page A - 130.

- Cable #2 marked **BAT2(+)** to positive (+) terminal of battery **2**
- Cable #4 marked **BAT4(+)** to positive (+) terminal of battery **4**
- Cable #1 marked **BAT1(-)** to negative (-) terminal of battery **1**
- Cable #3 marked **BAT3(-)** to negative (-) terminal of battery **3**

4 **Double check** that the BAT 1 to 4 cables are each attached to the correct battery, and that the black marked cable is attached to the negative terminal and the red marked terminal is attached to the positive terminal.

5 Repeat steps 2 through 4 for all remaining populated battery shelves.

6 Torque the battery connections to the value shown on the batteries.



Attach interconnecting bus bars to all battery strings

CAUTION

High Energy hazard

Do not connect the battery cables to the bus bars until told to do so.

Perform the following steps to connect the interconnecting bus bars to all battery strings.

1 Starting with batteries 1 and 2 on the left side of Shelf 1, remove the attaching hardware from the positive (+) terminal of Battery 1 and the negative (-) terminal of Battery 2. Refer to the figure on Page A - 133.

2 Remove the interconnecting bus bar from the kit that is provided with each pair of batteries and polish the bus bar.

3 Apply antioxidant compound to the interconnecting bus bar.

4 Apply antioxidant compound to the positive (+) terminal of Battery 1 and the negative (-) terminal of Battery 2.

5 Place the interconnecting bus bar between the positive terminal of the left-hand battery (#1) and the negative terminal of the right-hand battery (#2).