Disconnect first battery cabinet 24-VDC return wires in the Modular Cell 4.0B primary cabinet

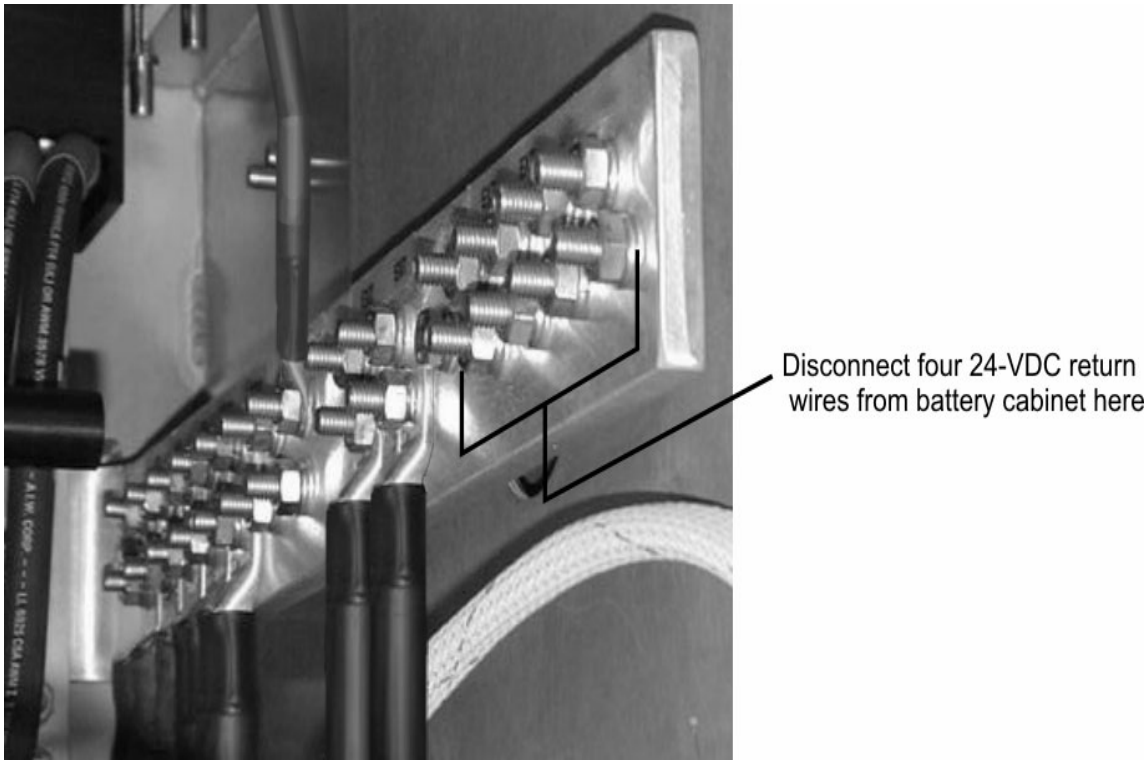
DANGER

Electrical Shock and Equipment Damage Hazard

When performing the following procedure, power should not be applied to the Modular Cell 4.0B primary cabinet.

Before the installation of the second battery cabinet can begin, the following steps must be performed to disconnect DC power from the Modular Cell 4.0B primary cabinet to the first battery cabinet.

1 Refer to the figure below and disconnect (and tape or insulate) the four DC return lugs (to/from the first battery cabinet) in the Modular Cell 4.0B primary cabinet.



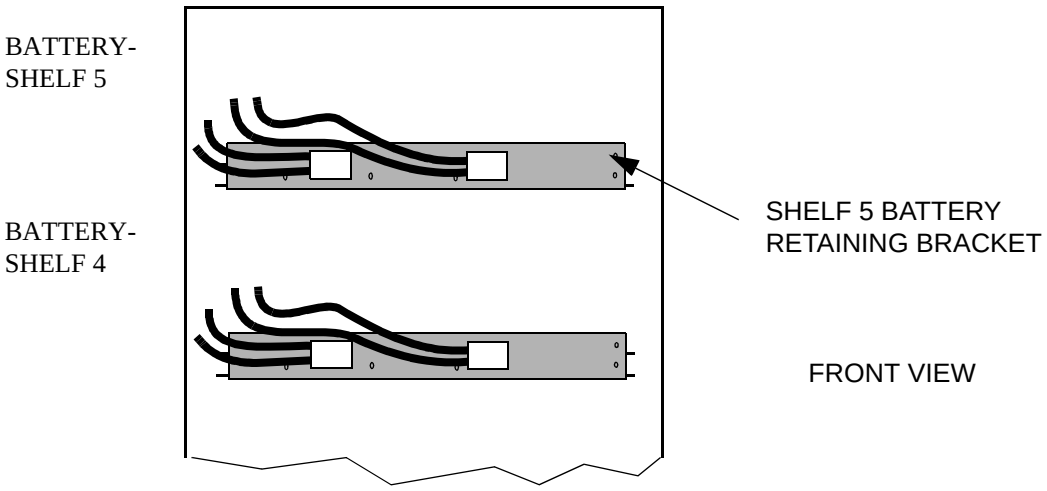
How to route and connect the DC cables between the first and second WNG24-BC battery cabinets

Prepare the first and second battery cabinets for connection of the DC cables

Perform the following steps to prepare the first and second battery cabinets for connection of the DC cables.

> **Important!** To determine the battery shelf type, refer to Determine the battery shelf type on Page 4 - 19. If the battery cabinet has type 1 battery shelves, skip the first step.

1 Remove the top (shelf 5) battery retaining bracket from the second battery cabinet (and also from the first battery cabinet if you have not already done so). Refer to the figure below. Refer to the figure on Page 4 - 49, as well.



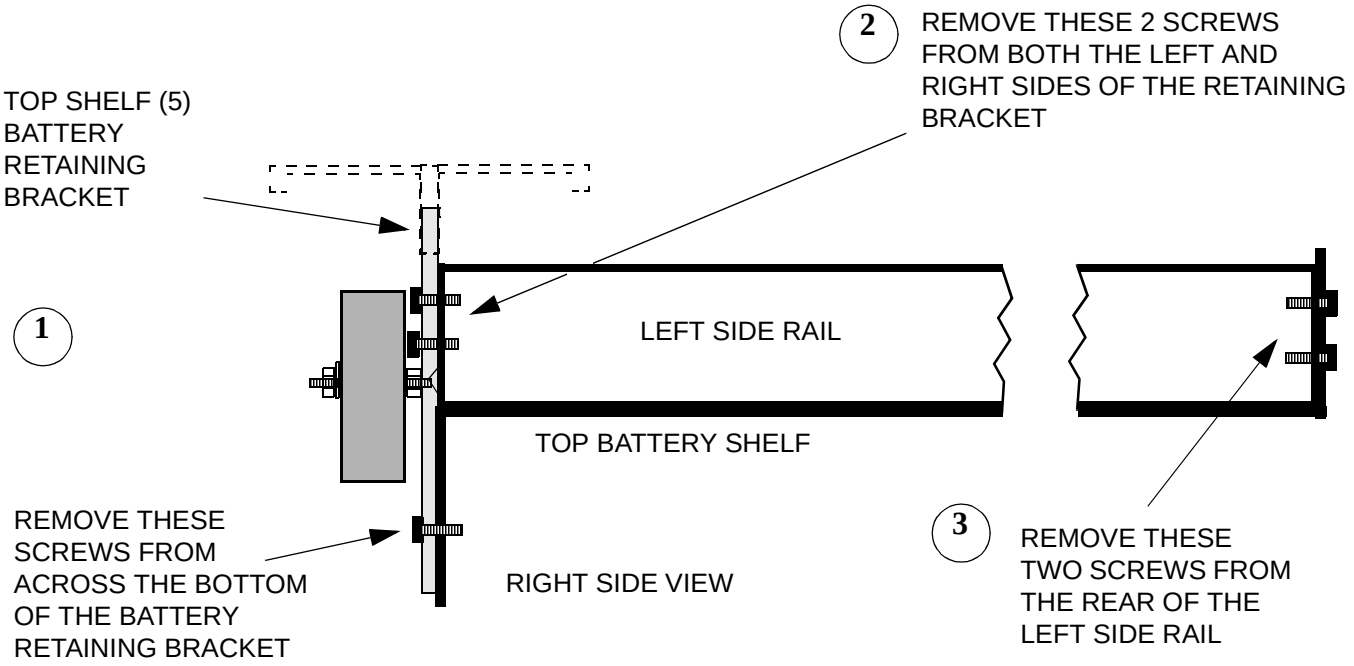
> **Important!** When performing the next step, carefully note the proper battery connections before disconnecting cables and/or removing bus bars.

2 Disconnect and remove the following batteries from the top shelf (5) of the first battery cabinet.

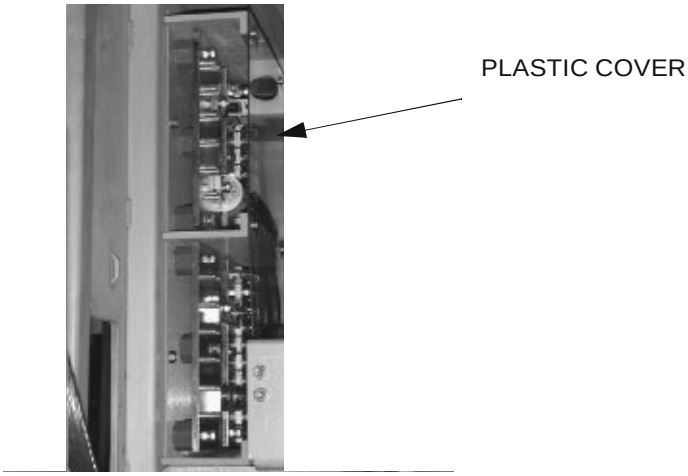
- L1, L2, and 12IR125 batteries: The left-hand string (9)
- C-11 batteries: The left-hand three batteries (1, 2, and 3)

Important! If the battery cabinet has type 1 battery shelves, skip the next step.

3 Refer to the figure below, and remove the left-hand side rail from the top shelf (5) in the second battery cabinet.



4 Remove the plastic cover from the DC bus bar panel in both battery cabinets. Refer to the figure below.



Connect the DC cables in the second battery cabinet

Perform the following steps to connect the DC cables in the second battery cabinet.

1 Connect the two +24-VDC cables (marked red) to the +24-VDC (lower) bus bar in the bottom two positions, leaving the top four positions blank. Refer to the figure on Page 4 - 51.

2 Connect the two 24-VDC return cables (black) to the 24-VDC return (upper) bus bar in the bottom two positions, leaving the top four positions blank. Refer to the figure on Page 4 - 51.

3 Torque all four DC cable connections. Refer to the electrical torque specifications provided in Chapter 1.

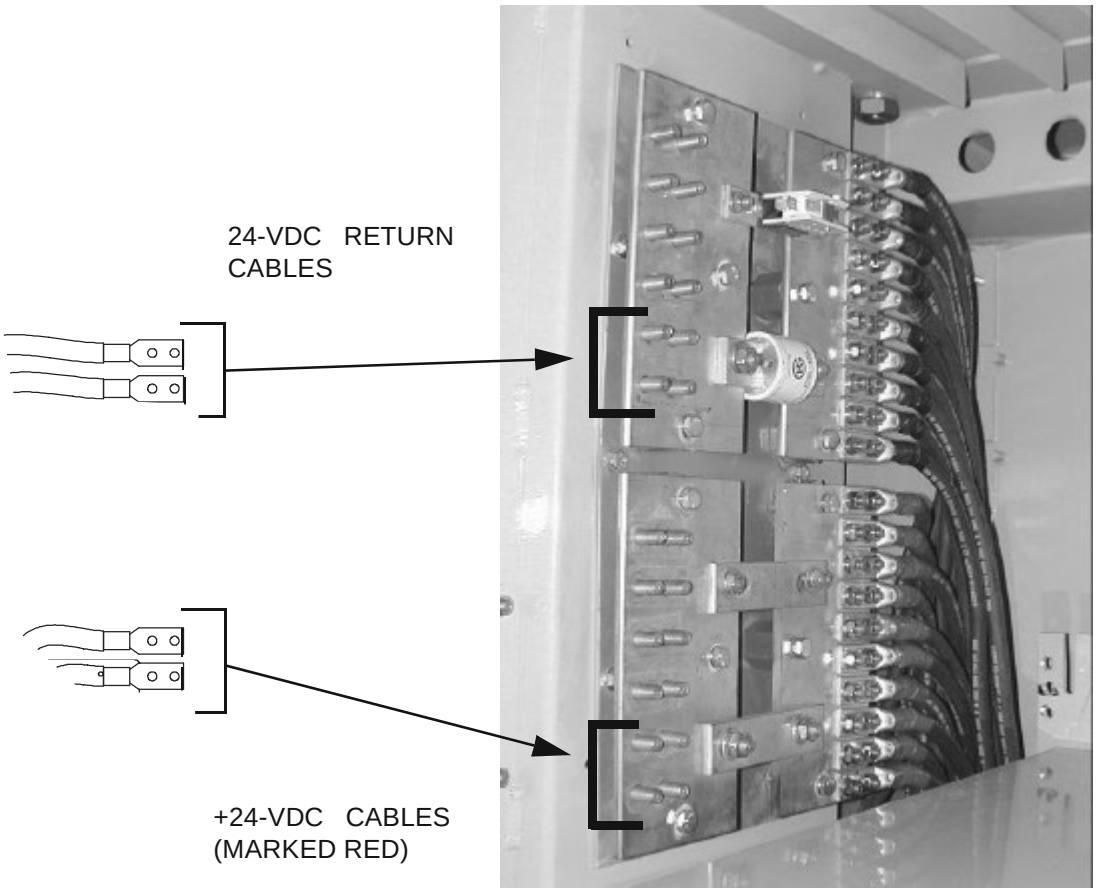
4 Route the cables into the first battery cabinet through the square opening between the cabinets.

5 Using wire ties, dress the DC cables to the interior left side of the second battery cabinet.

6 Do not replace the plastic cover on the DC bus bar panel or the left-hand side rail, if applicable (in the second battery cabinet), at this time. The fuse alarm connection remains to be completed.

> **Important!** If the battery cabinet has type 1 battery shelves, skip the next step.

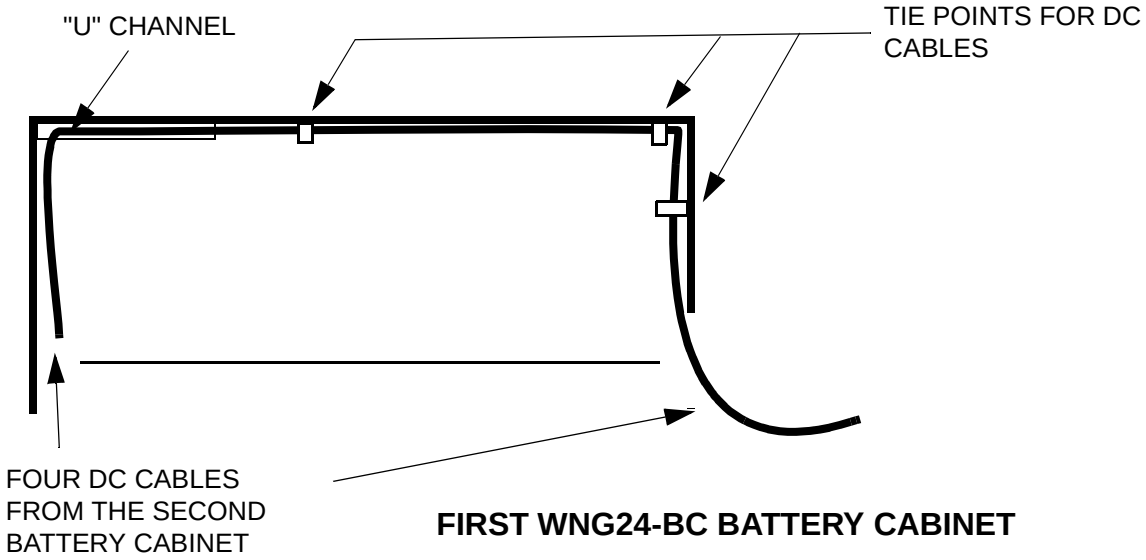
7 Do not replace the top shelf battery retaining bracket in the second battery cabinet (batteries must be installed prior to reinstallation of the retaining bracket).



Connect the battery cabinet cables in the first battery cabinet

Perform the following steps to connect the DC cables in the first WNG24-BC battery cabinet.

1 Route and dress the DC cables from the second battery cabinet to the DC bus bars in the first battery cabinet. Do this in such a way that they do not interfere with replacement of batteries or door closure. Refer to the figure below.



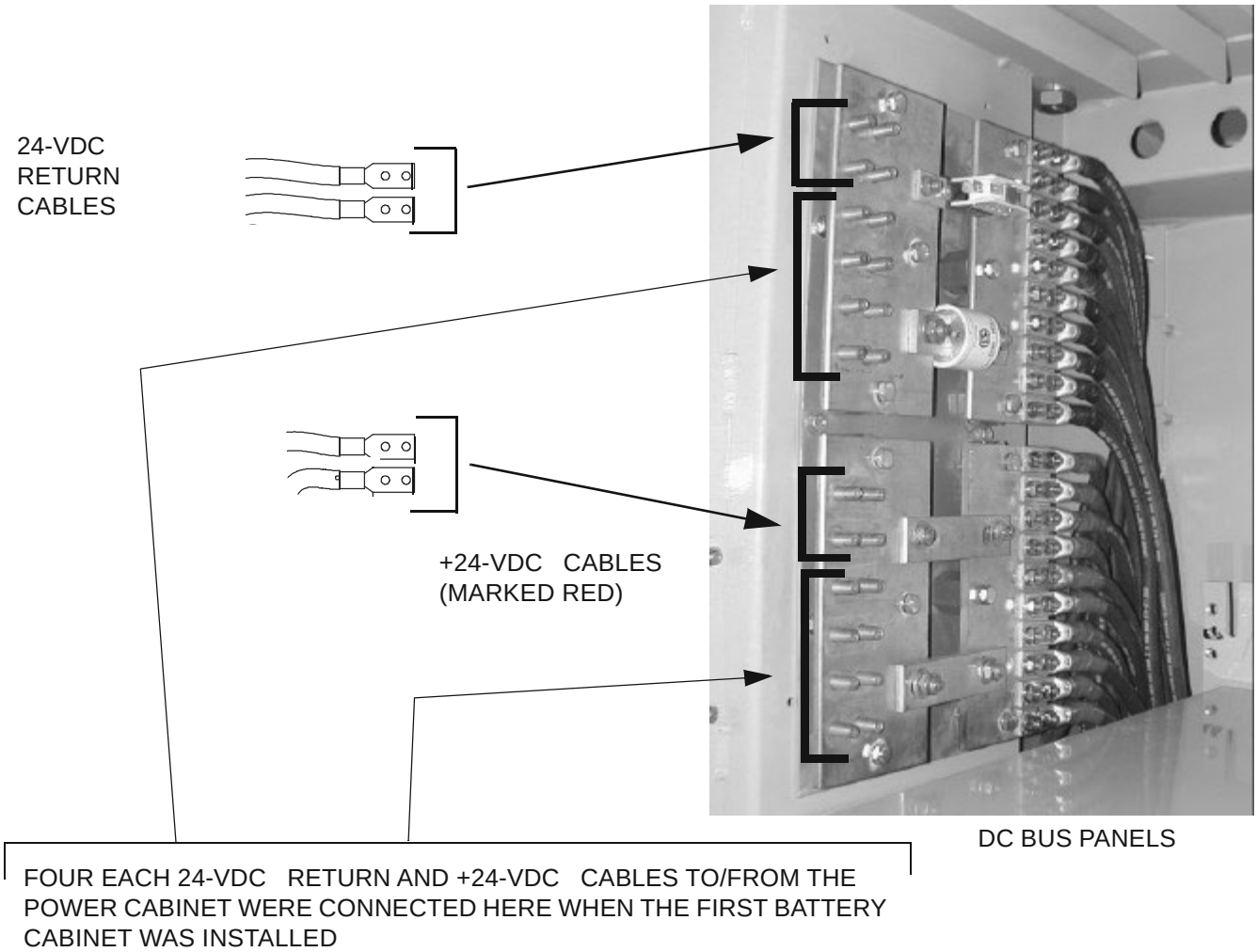
FIRST WNG24-BC BATTERY CABINET

2 Connect the two +24-VDC cables (marked red) to the +24-VDC (lower) bus bar in the top two positions. Refer to the figure on Page 4 - 53.

3 Connect the two 24-VDC return cables (black) to the 24-VDC return (upper) bus bar in the top two positions. Refer to the figure on Page 4 - 53.

4 Torque all four DC cable connections. Refer to the electrical torque specifications provided in Chapter 1.

5 Replace the plastic cover on the DC bus bar panel (in the first battery cabinet). Refer to the figure below.



6 Replace the batteries that were previously removed.

Important! When performing the next step, do not plug in the battery connectors on the retaining bracket.

7 Replace the top shelf battery retaining bracket.

How to route and connect the alarm and fan power/alarm cables in the second WNG24-BC battery cabinet

Overview

The AC cable was shipped already terminated in the second WNG24-BC battery cabinet. The remaining cables, all of which will pass between the two battery cabinets, are not yet terminated in the second battery cabinet.

Identify and place the alarm and fan power/alarm cables between the two battery cabinets

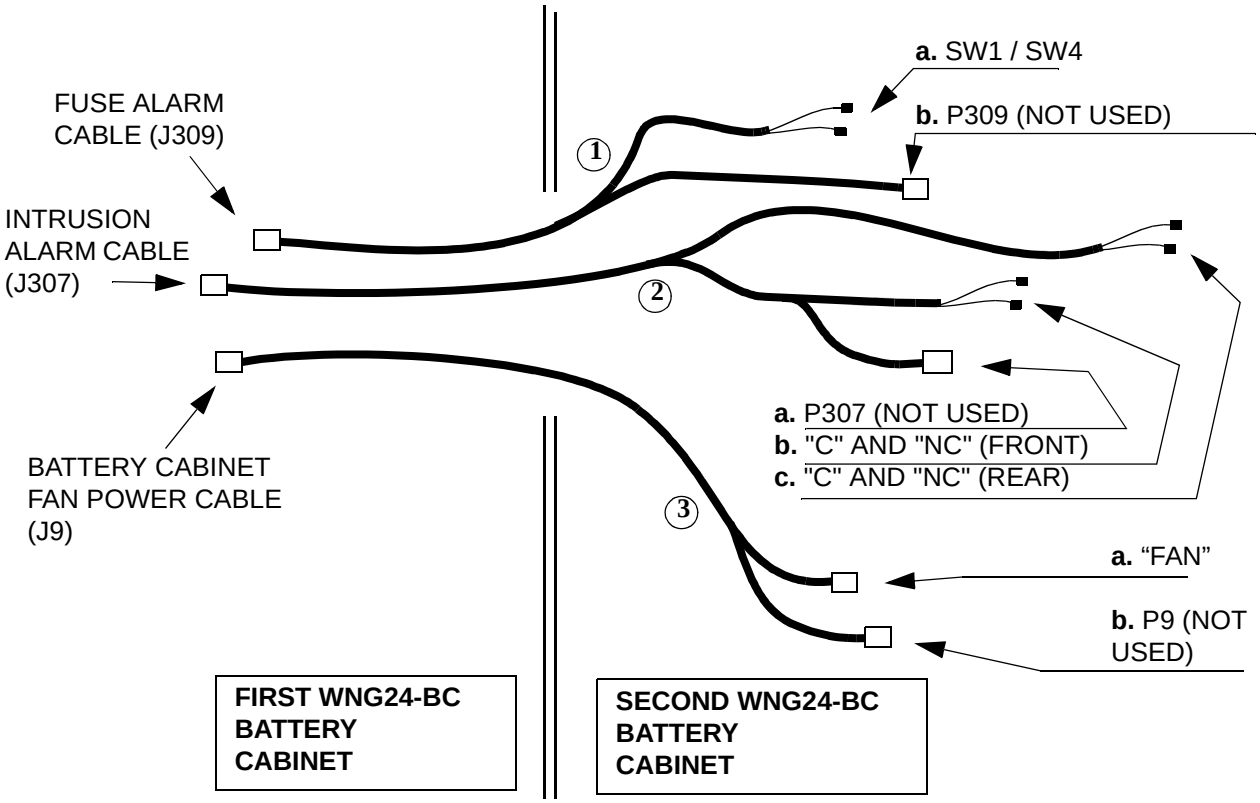
Perform the following steps to place the alarm and fan power/alarm cables between the two battery cabinets and identify the second battery cabinet ends.

1 Identify the following cables shipped with the second WNG24-BC battery cabinet. Refer to the figure on Page 4 - 55 cable and connector identification.

1. The fuse alarm cable
   a. Connectors SW1 and SW4
   b. Connector P309 (not used)
2. The intrusion alarm cable
   a. Connector P307 (not used)
   b. Connectors "C" and "NC" FRONT
   c. Connectors "C" and "NC" REAR
3. The fan power/alarm cable
   a. Connector "FAN" (the fan power/alarm connector)
   b. P9 (not used)

Important! A thermal probe cable and thermal probe are not shipped with the second battery cabinet. A thermal probe cable and probe, shipped with the first battery cabinet, was installed in the first battery cabinet. This cable and probe will be moved to the second battery cabinet after installation of the batteries. Refer to Chapter 5

2 Place the cables through the square opening between the cabinets as shown in the figure below.



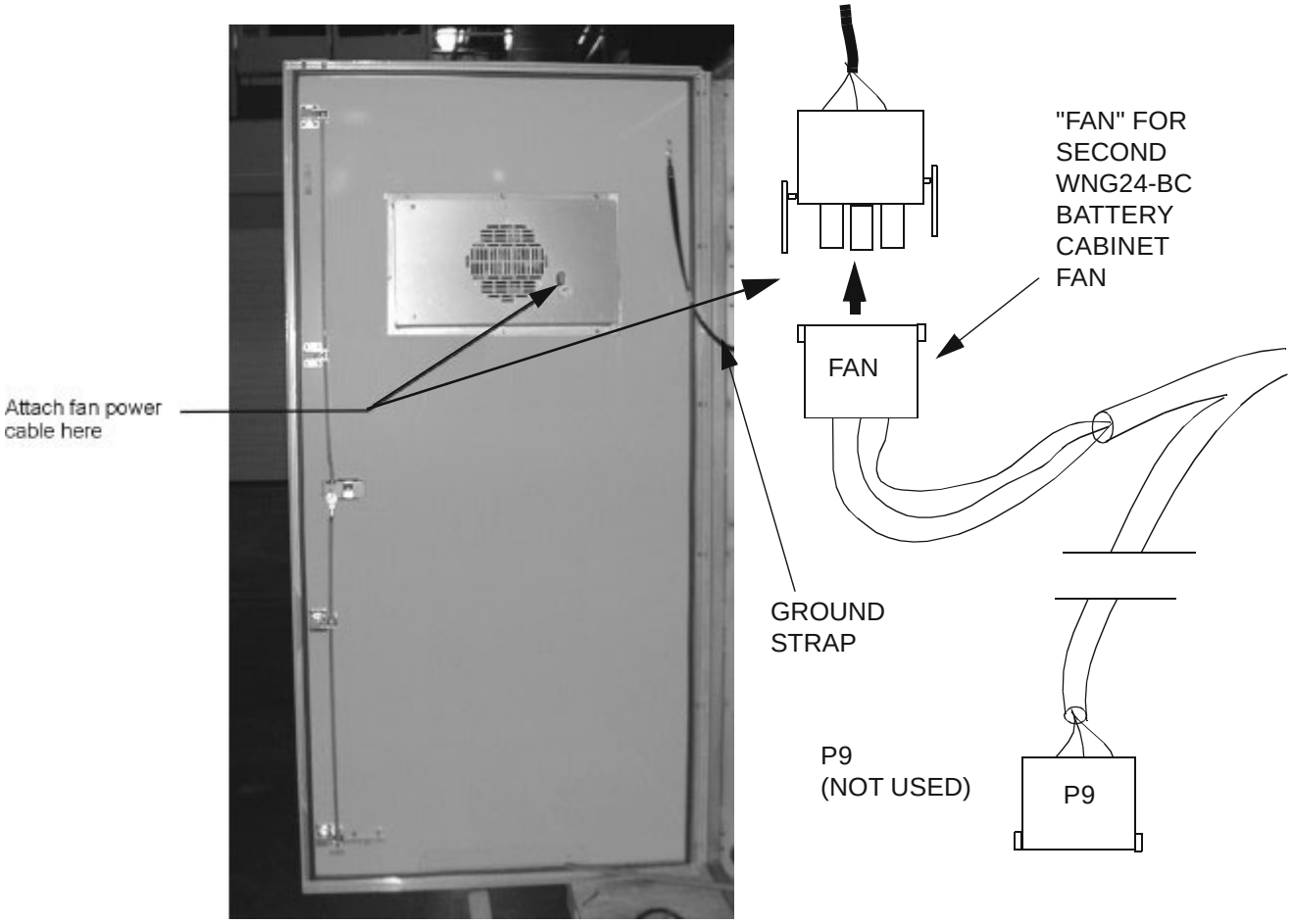
Route and connect the fan power/alarm cable in the second WNG24-BC battery cabinet

Perform the following steps to route and connect the fan power/alarm cable in the second WNG24-BC battery cabinet.

1 Attach the fan power/alarm cable (labeled "FAN") in the second WNG24-BC battery cabinet. Refer to the figure on Page 4 - 57.

2 Using wire ties, dress the fan power/alarm cable and the P9 cable connector to the left interior wall of the battery cabinet.

3 Route and attach the cables in such a way that they do not interfere with door closure or installation/replacement of parts. Refer to the figure below.



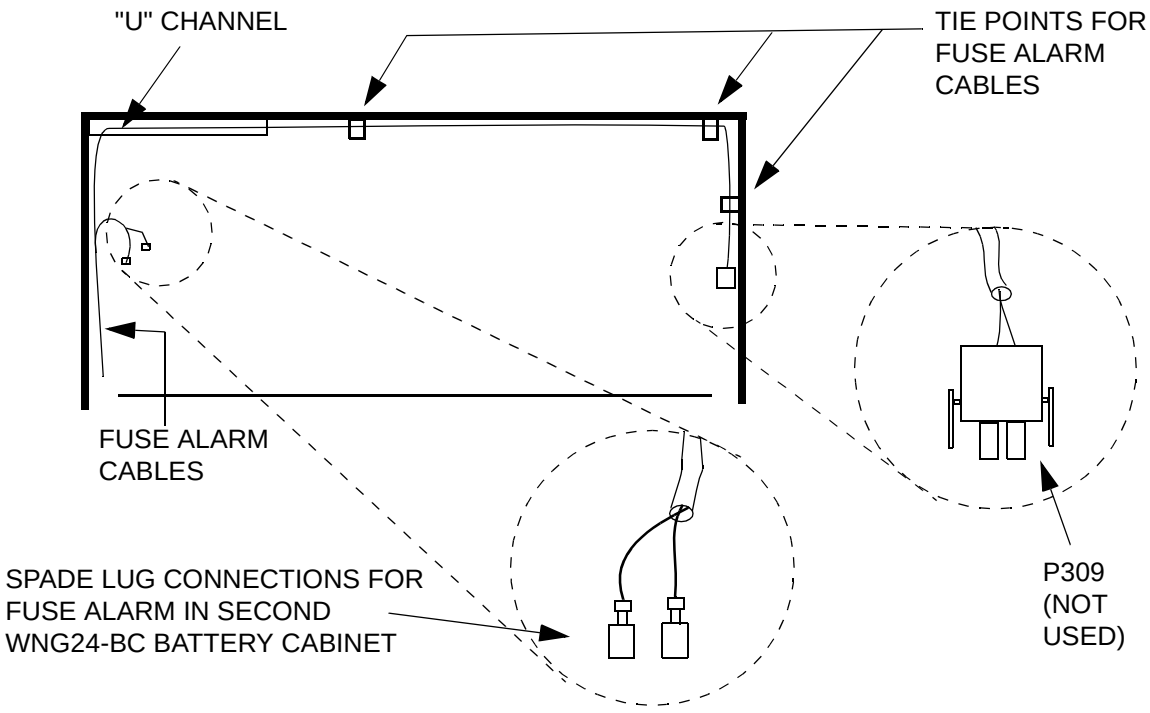
Route and connect the fuse alarm cable in the second WNG24-BC battery cabinet

Perform the following steps to route and connect the fuse alarm cables in the second WNG24-BC battery cabinet.

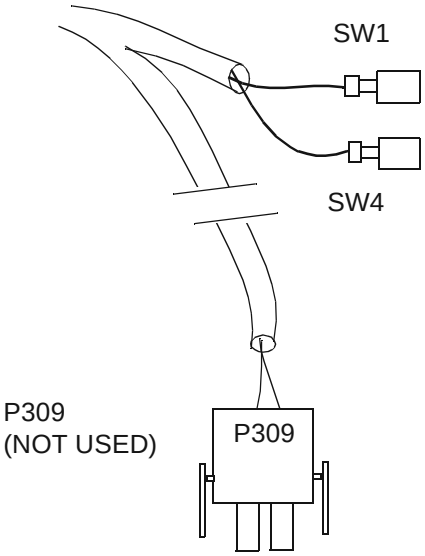
1 Dress the fuse alarm cable that have spade lugs to the interior left wall of the battery cabinet and secure it with wire ties. Refer to the figure below.

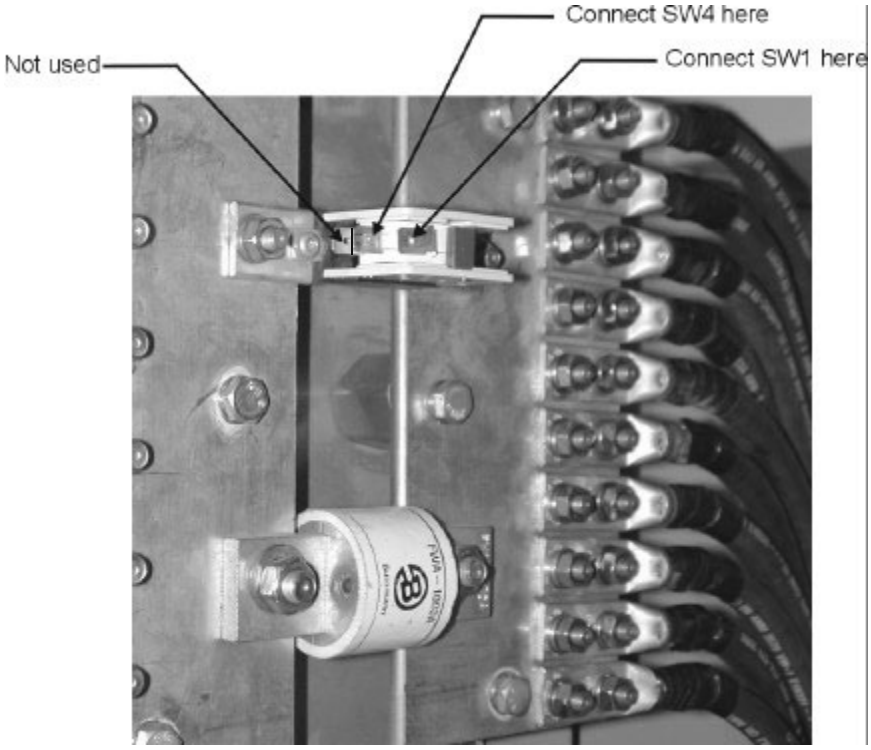
2 Route the P309 cable and connector across the interior top of the cabinet to the square opening. (on the right side of the cabinet). Refer to the figure below.

3 Secure the P309 fuse alarm cable to the interior top of the battery cabinet with wire ties at the "U" channel, and at the tie point locations. Refer to the figure below.



4 Connect the fuse alarm cable. Refer to the figure below.





5 Replace the plastic cover on the DC bus bar panel in the second battery cabinet, putting the four screws in the top four locations, only.

Important! If the battery cabinet has type 1 battery shelves, skip the next step.

6 Replace the left-hand side rail on the top battery shelf in the second battery cabinet.

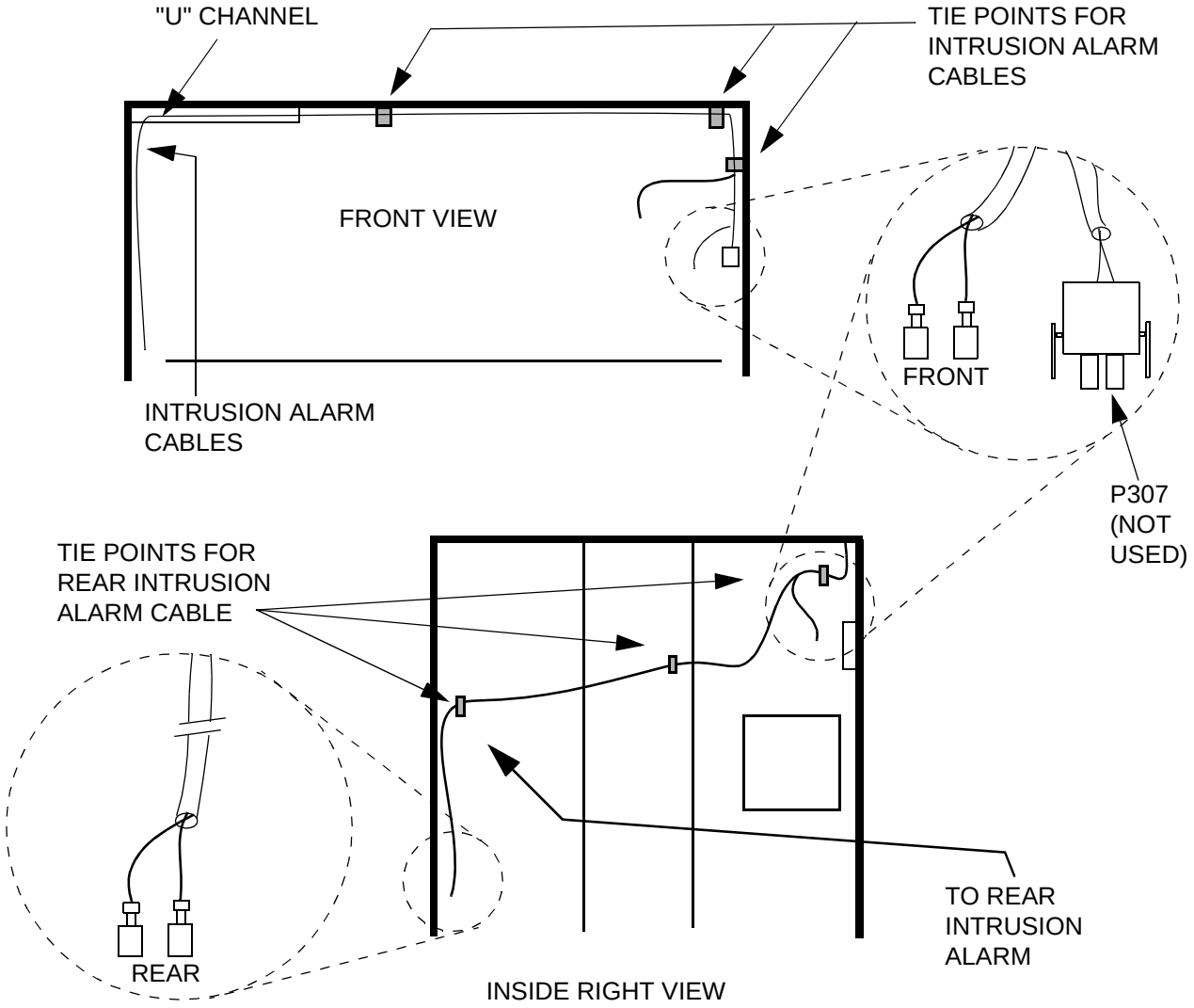
Important! If the battery cabinet has type 1 battery shelves, do not reinstall the top shelf battery retaining bracket at this time, unless the top shelf will not be populated with batteries.

Route and connect the intrusion alarm cables in the second WNG24-BC battery cabinet

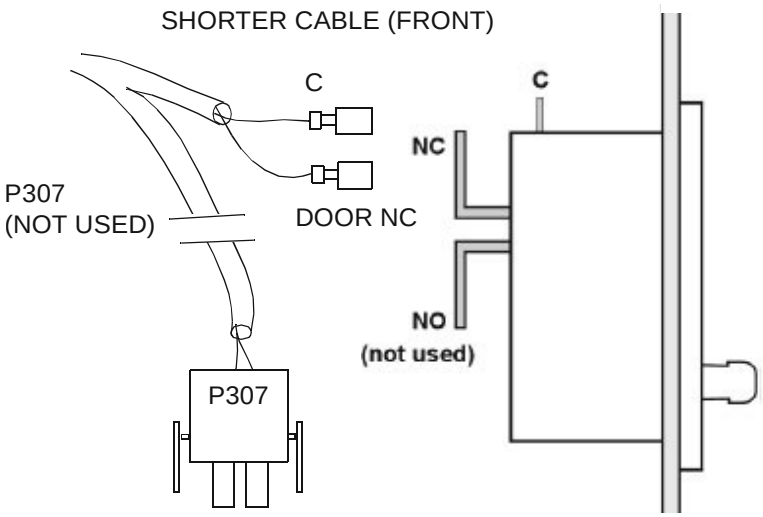
Perform the following steps to route and connect the intrusion alarm cables in the second WNG24-BC battery cabinet.

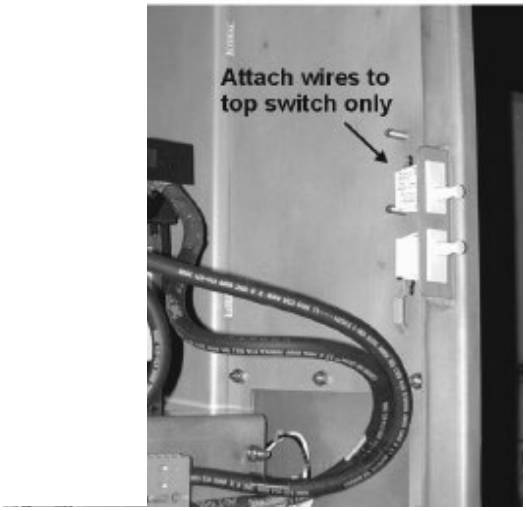
1 Route the intrusion alarm cables across the interior top of the cabinet to the square opening (on the right side of the cabinet). Refer to the figure below.

2 Secure the cables to the interior top of the battery cabinet with wire ties at the "U" channel, and at the tie point locations shown. Refer to the figure below.



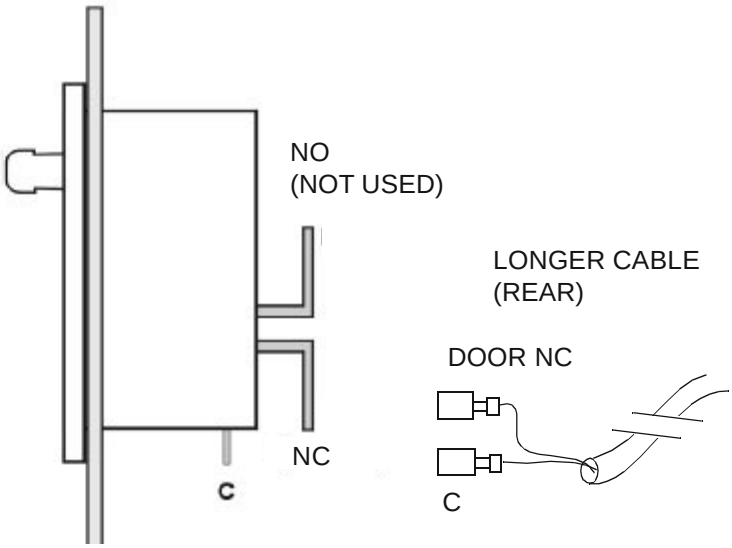
3 Connect the front intrusion cable as shown. Refer to the figure below.





4 Route and secure the rear intrusion cable to the interior right side of the battery cabinet with wire ties at the tie point locations. Refer to the figure on Page 4 - 60.

5 Connect the rear intrusion cable as shown. Refer to the figure below.



How to route and connect the alarm and fan power/alarm cables in the first WNG24-BC battery cabinet

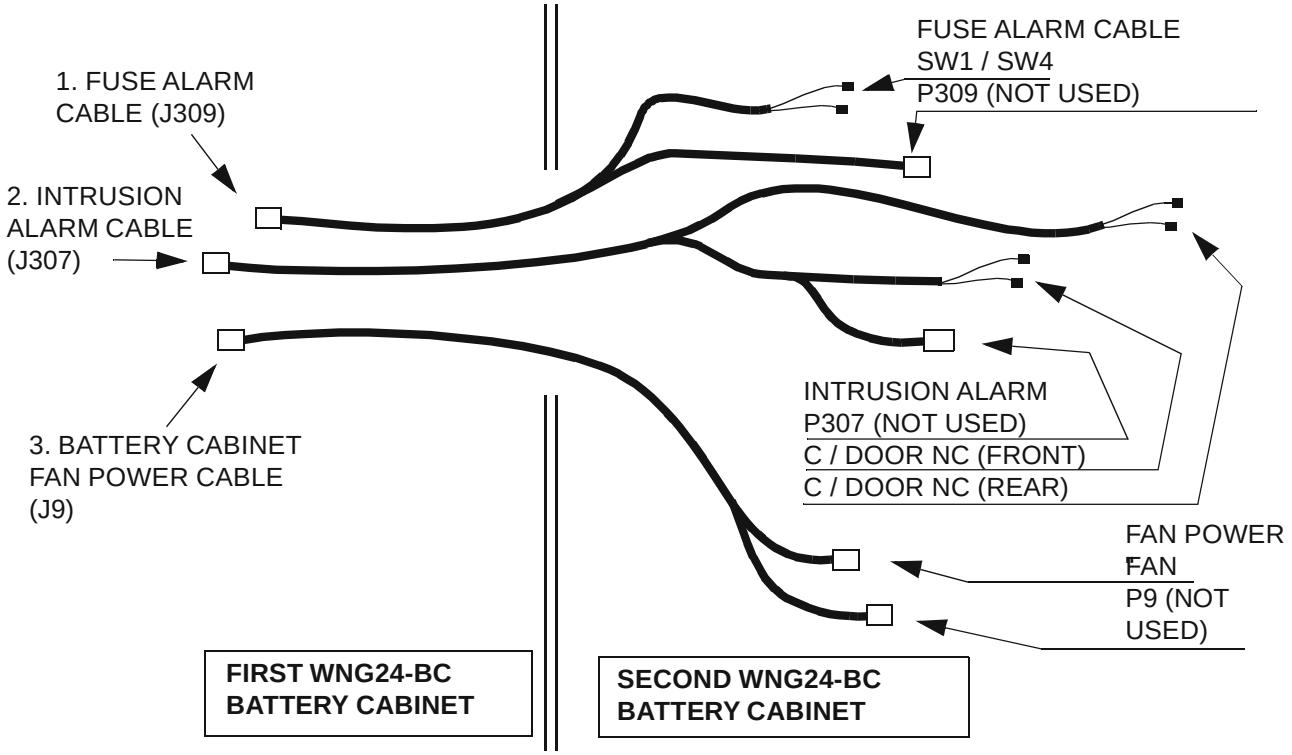
Overview

This section provides instructions on how to route and connect the alarm and fan power/alarm cables in the first WNG24-BC battery cabinet.

Route alarm and fan power/ alarm cables in the first WNG24-BC battery cabinet

Perform the following steps to route the alarm and fan power/alarm cables in the first WNG24-BC battery cabinet.

1. The fuse alarm cable (J309 on the first battery cabinet end)
2. The intrusion alarm cable (J307 on the first battery cabinet end) Refer to the figure below.
3. The battery cabinet fan power/alarm cable (J9 on the first battery cabinet end)



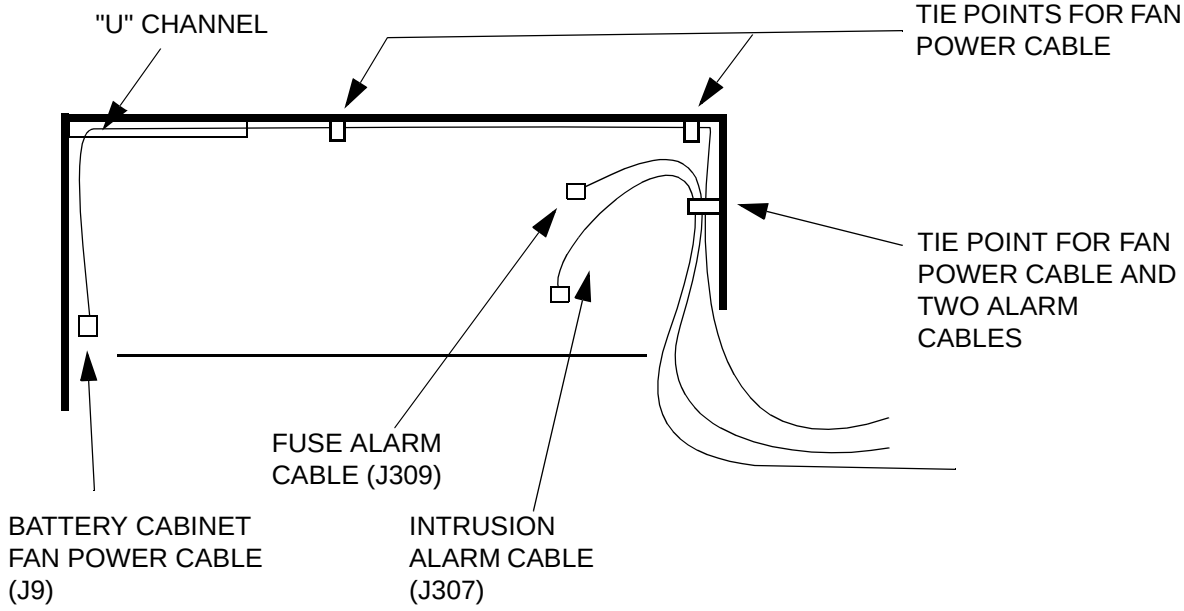
6 Route the identified cables from the second WNG24-BC battery cabinet, into the first, and to the locations shown in the figure below.

- Route the fuse alarm cable (J309) and intrusion alarm cable (J307) to right side of the first battery cabinet, just above the feed-through opening from the second cabinet.
- Route the fan power/alarm cable (J9) across the top of the first battery cabinet, through the "U" channel, to the left side of the cabinet.

Important! When performing the next step, the tied-down cables must not interfere with:

- Replacement of batteries
- Opening or closure of the first WNG24-BC battery cabinet front door

7 Using wire ties, secure the cables to the "flash" tie point locations. Refer to the figure below.



FIRST WNG24-BC BATTERY CABINET

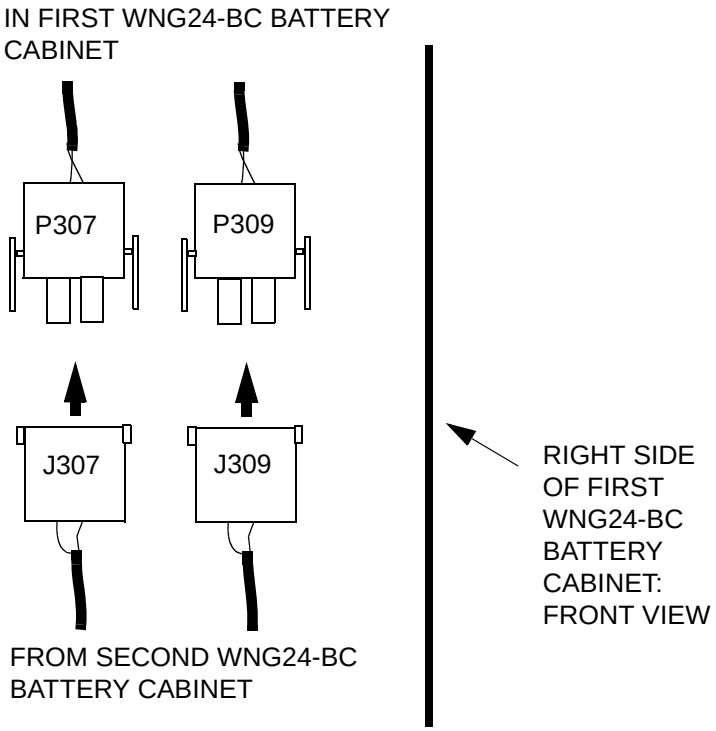
Connect alarm cables in the first WNG24-BC battery cabinet

Perform the following steps to connect the alarm cables in the first WNG24-BC battery cabinet.

1 Connect the J307 connector to connector P307 in the first WNG24-BC battery cabinet. Refer to the figure below.

2 Connect the J309 connector to connector P309 in the first WNG24-BC battery cabinet. Refer to the figure below.

3 Using wire ties, dress the alarm cables to the interior right side of the first WNG24-BC battery cabinet. Do this in such a way that they do not interfere with door opening and closure, or installation/replacement of parts. Refer to the figure below.

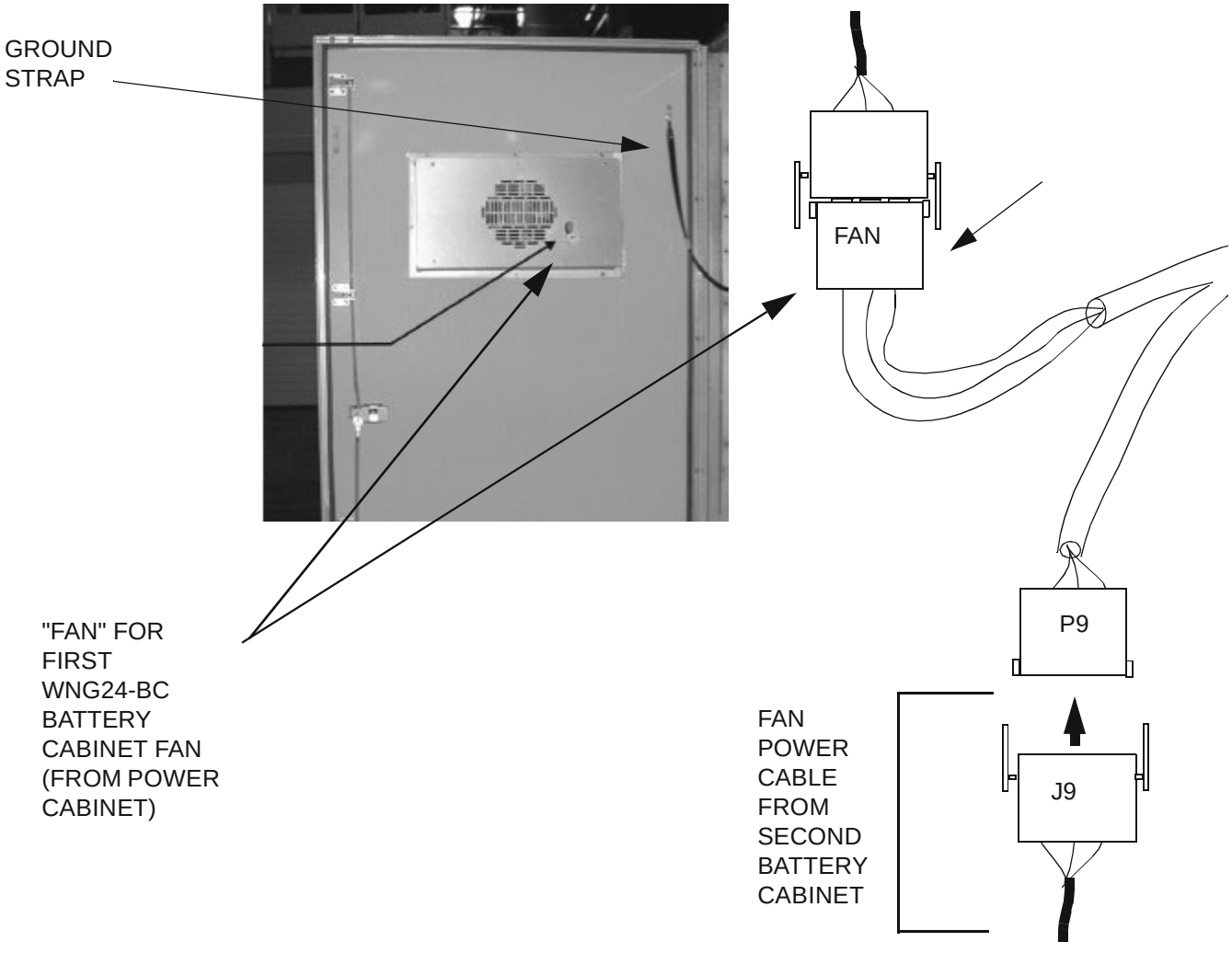


Connect the fan power/ alarm cable in the first WNG24-BC battery cabinet

Perform the following steps to connect the fan power/alarm cable in the first WNG24-BC battery cabinet.

1 Attach the fan power/alarm cable (labeled "J9") to "P9" in the first WNG24-BC battery cabinet. Refer to the figure below.

2 Using wire ties, dress the fan power/alarm cables to the interior left side of the first battery cabinet. Do this in such a way that they do not interfere with door opening and closure, or installation/replacement of parts.



How to route and connect the AC power cable in the first battery cabinet

DANGER

Electrical Shock Hazard

Failure to follow the order of the installation procedure (as written) can result in an energized AC or DC circuit, which creates an electrical shock hazard.

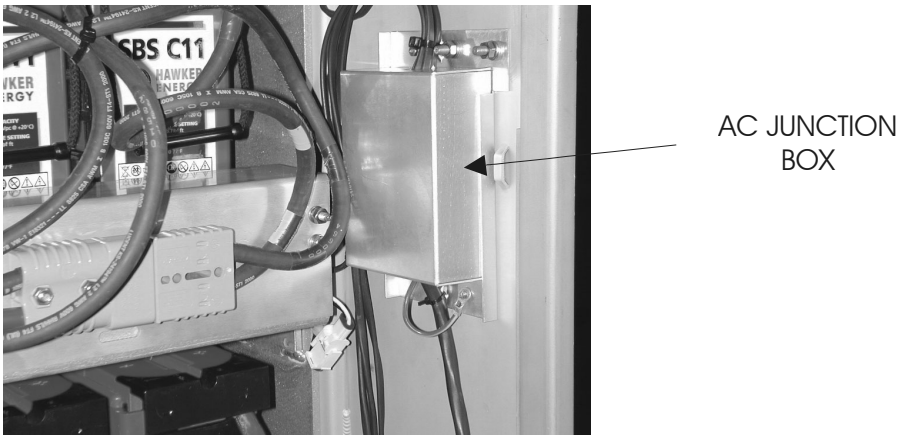
Follow these rules:

1. *Make sure that the battery cabinet heater AC circuit breaker, in the primary cabinet, is in the OFF position.*
2. *Perform installation steps in the order provided. Do not connect AC power until instructed to do so.*
3. *Do not connect battery connectors.*
4. *Observe and strictly follow all safety precautions.*
5. *When completing electrical connections, always use tools that are properly insulated.*

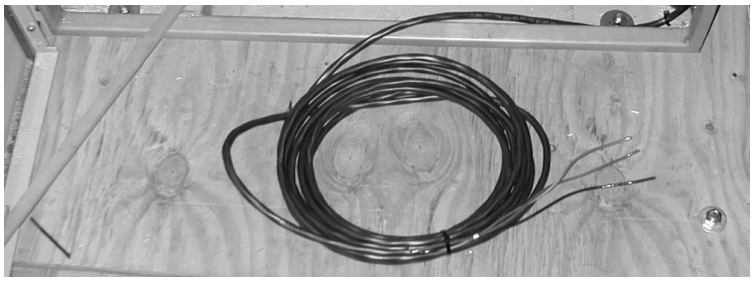
Route the AC power cable into the first WNG24-BC battery cabinet

Perform the following steps to route the AC power cable into the first WNG24-BC battery cabinet.

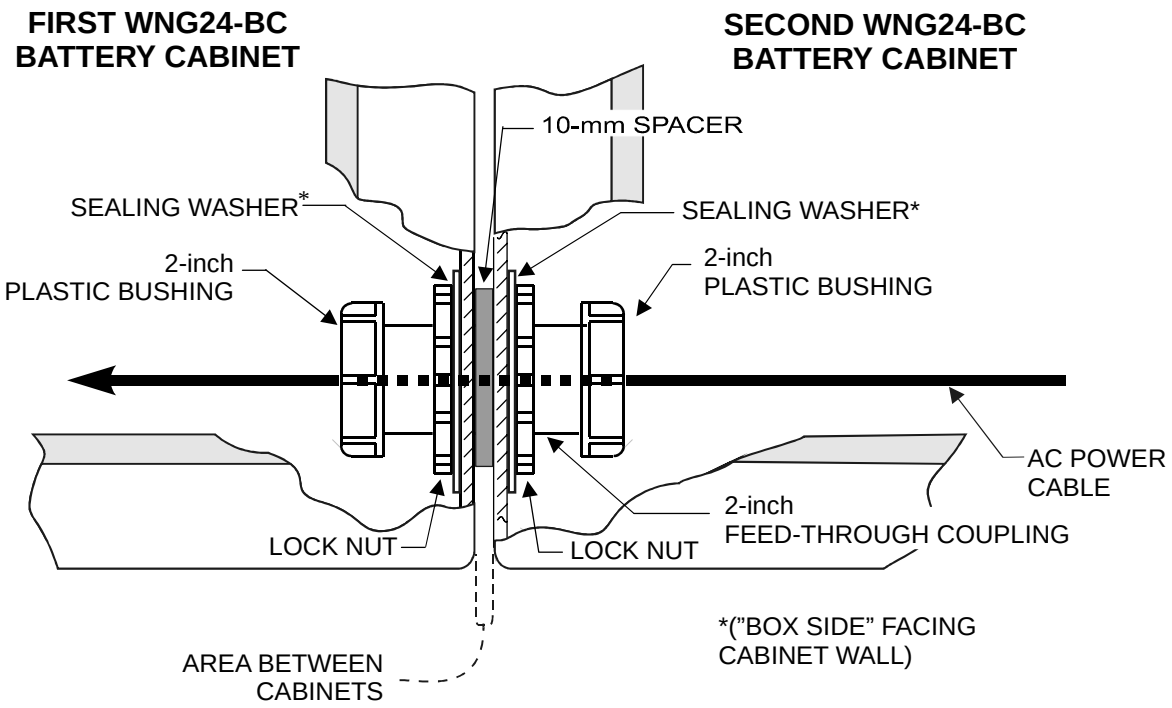
1 The AC power cable is shipped already terminated at the AC junction box in the second WNG24-BC battery cabinet. The AC power cable is shipped coiled in the bottom of the battery cabinet. Refer to the figure on Page 4 - 67 and the figure below.



2 Remove the AC power cable from the bottom of the second battery cabinet and uncoil. Refer to the figure below.



3 Thread the AC power cable through the AC coupling into the first WNG24-BC battery cabinet. Refer to the figure below.



BOTTOM FRONT VIEW

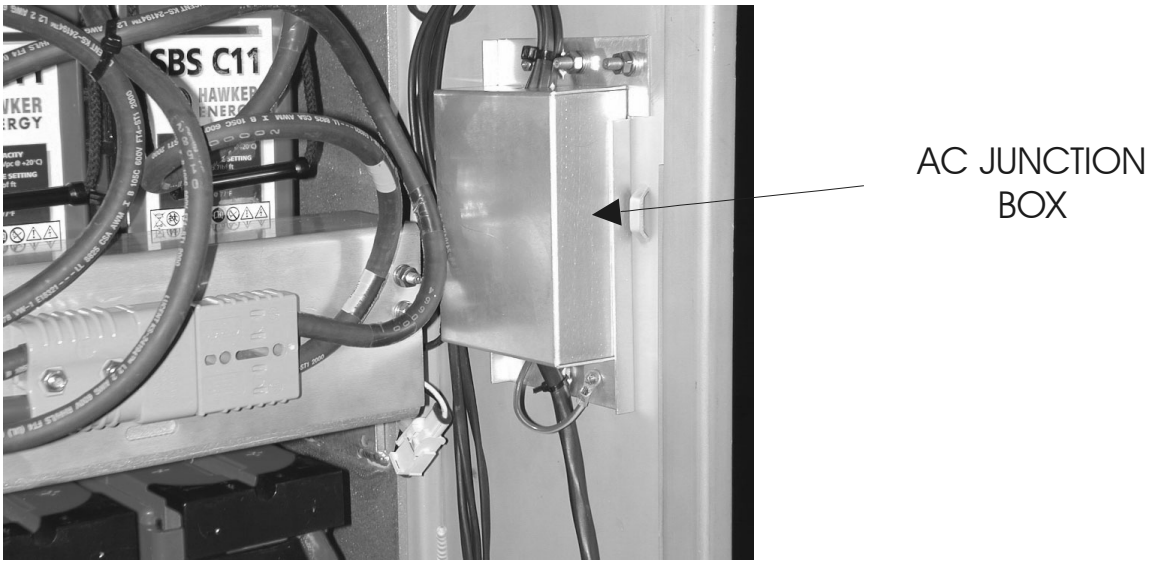
4 Route the AC cable up the interior right wall of the first battery cabinet. Refer to the figure on Page 4 - 69.

Connect AC cable in the first WNG24-BC battery cabinet

Perform the following steps to connect the second WNG24-BC battery cabinet AC cable in the first WNG24-BC battery cabinet.

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

2 Route the AC cable to the AC junction box in the first battery cabinet. Refer to the figure below.



3 Remove the AC junction box cover.

4 Cut the AC cable to the desired length.

5 Remove the outer cable insulation to expose the individual wires and strip 15 mm (3/8 inch) of insulation from each wire.

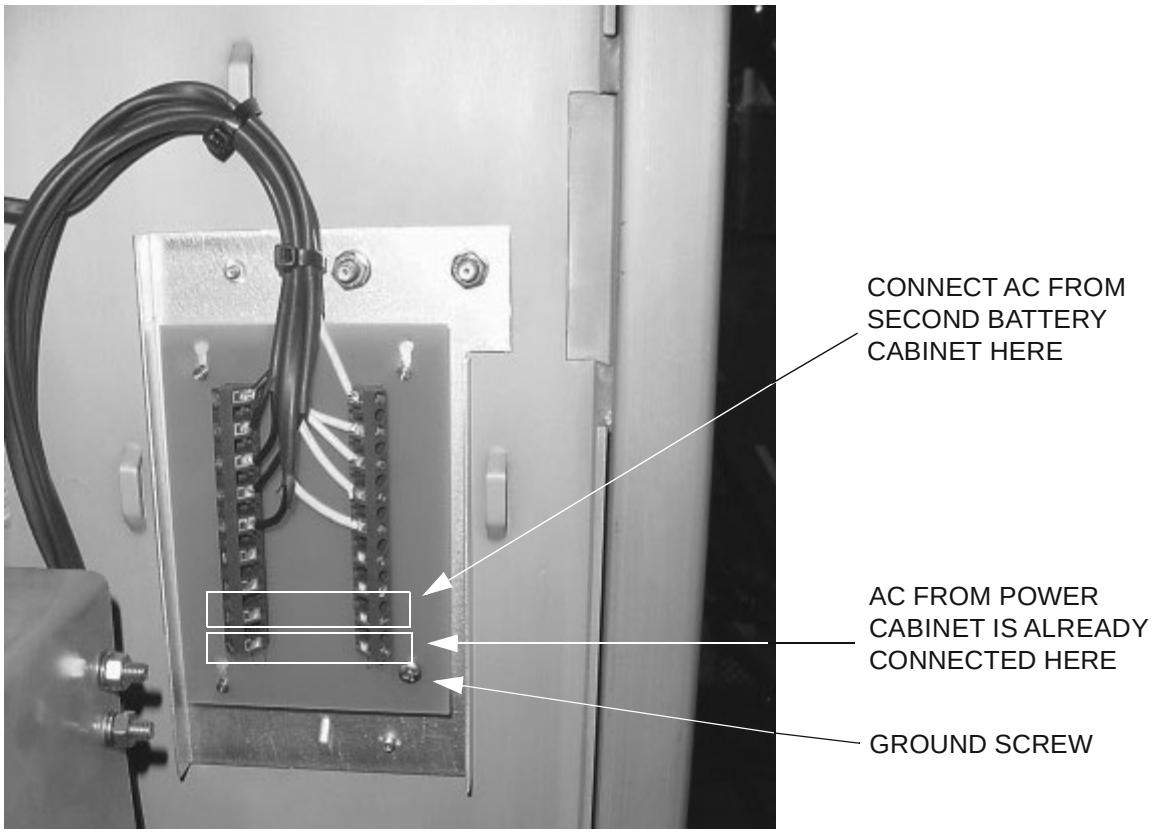
> **Important!** When performing the next step, it may be necessary to remove the entire AC junction box from the cabinet wall, in order to access the screws for the black (left) wires.

6 Connect the wires of the AC cable to the terminal strip and the grounding screw as follows. Refer to the figure below.

- Black (L1) to left terminal strip
- Red (L2) to right terminal strip
- Green to grounding screw

7 Replace the AC junction box cover.

8 Using wire ties, dress the AC cable in both cabinets so that it will not interfere with door closure or installation/replacement of parts.



9 If not installing a growth cabinet at this time, skip to Chapter 5 to install the batteries in the second battery cabinet, and reconnect DC power.

END OF STEPS

How to install 60ECv2 battery cabinets with a 4.0B primary cabinet with integrated power (reference)

How to install a first 60ECv2 battery cabinet with a 4.0B primary cabinet

Refer to: Comcode 109559757, *Interface Kit for Attachment of 60EC or 60ECv2 Battery Cabinets to Modular Cell 3.0/4.0B Cabinets with Integrated Power.*

For general installation instructions, refer to the table below. For changes in battery cables and bus bar wiring, refer to Current and revised battery cables on Page 4 - 72 and Revised power wiring to the cabinet bus bars on Page 4 - 74

How to install a second 60ECv2 battery cabinet with a 4.0B primary cabinet

A second 60ECv2 battery cabinet may be installed with a first 60ECv2 battery cabinet using instruction provided in the *Outdoor Flexent Modular Cell 1.0/2.0 Cabinet Installation Manual*, 401-710-123. Refer to the chapter and revised battery cable references below:

Step-by-step instructions are provided in the following chapters of the above document.

- Chapter 5:
  - Battery cabinet optional mounting base installation
- Chapter 5B
  - Second 60ECv2/60ECv2G battery cabinet installation
- Revisions to referenced Chapter 5B:
  - Battery Cables
    (Revisions to existing procedures in Chapter 5B of *Flexent*® *Modular Cell Outdoor 1.0/2.0 Cabinet Installation Manual*, 401-710-123)
  - Refer to Current and revised battery cables on Page 4 - 72 and Revised power wiring to the cabinet bus bars on Page 4 - 74

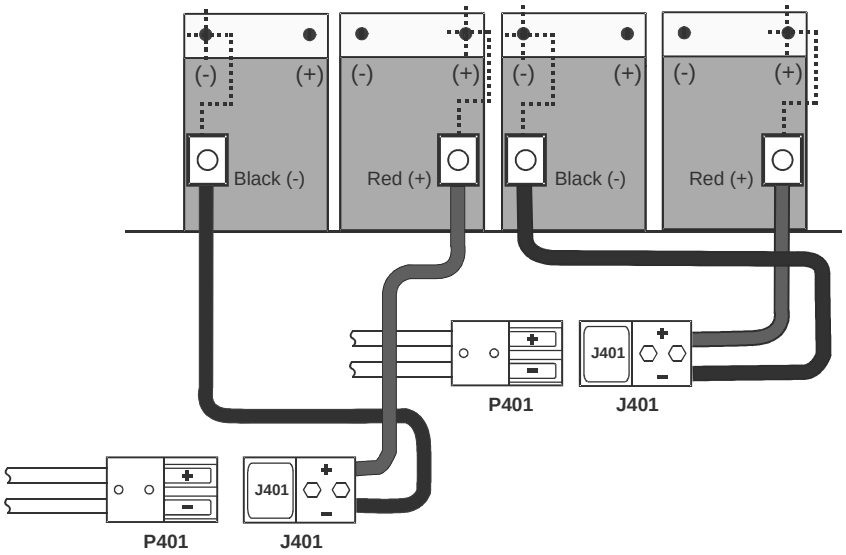
Important! Note that the battery cable and bus bar wiring revisions were made to reduce the battery installation time, and cable congestion in the 66ECv2 battery cabinet

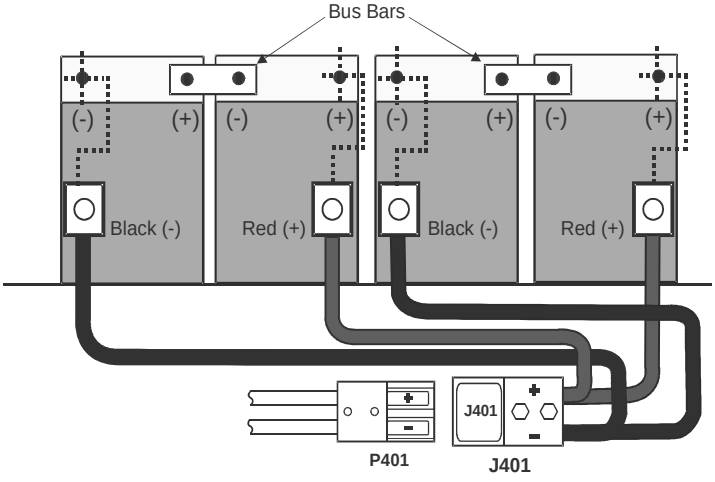
Current and revised battery cables

The following figures illustrate the current and revised battery cables with both 12IR125 and SBS C11 batteries. Note that C11 battery installation was not covered in the referenced document.

CURRENT 12IR125 BATTERY WIRING

Two quick-disconnect connectors.



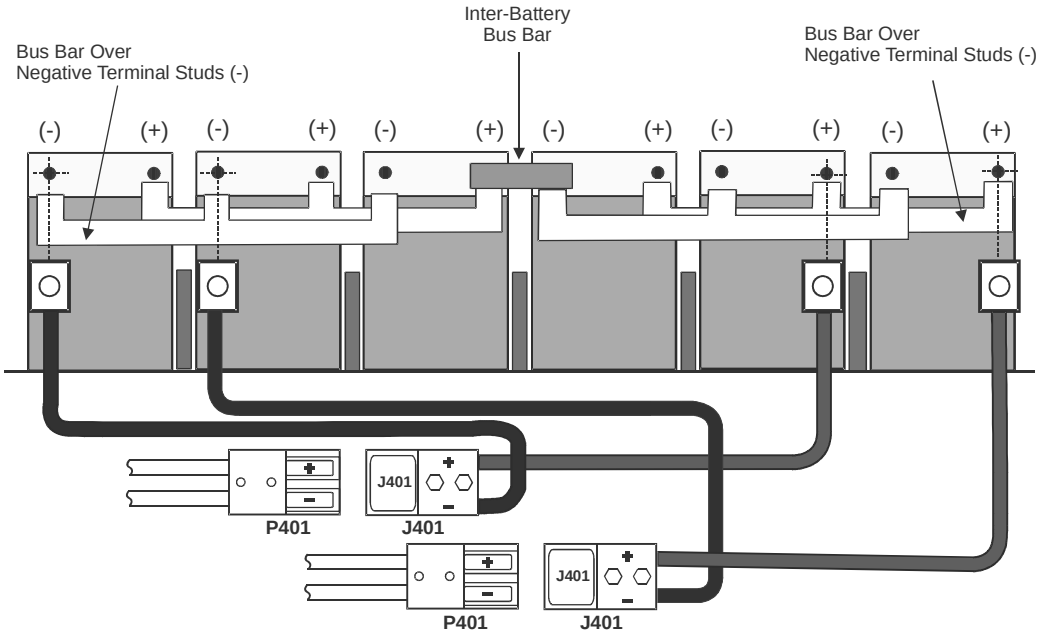


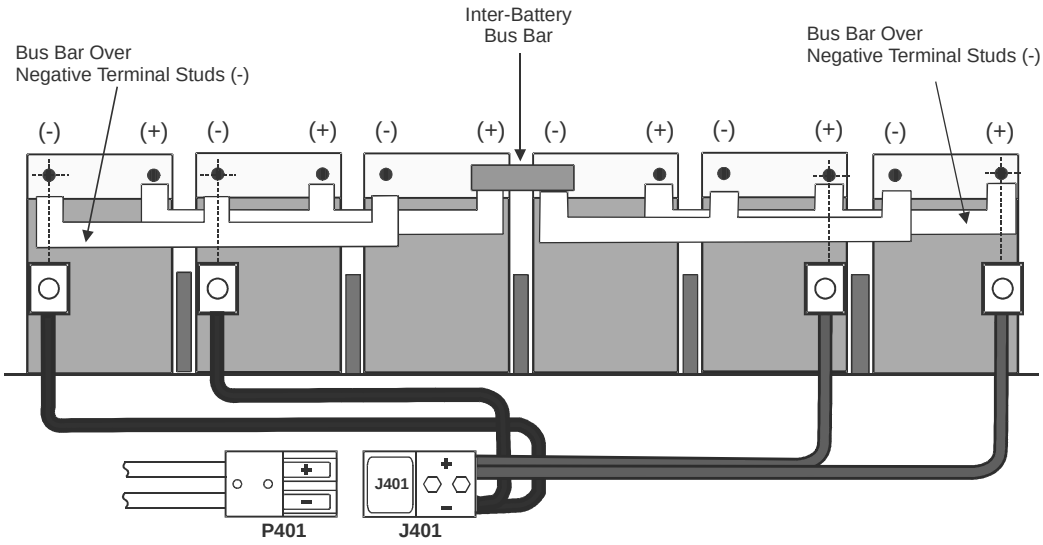
REVISED 12IR125 BATTERY WIRING

One quick-disconnect connectors.

CURRENT SBS C11 BATTERY WIRING

Two quick-disconnect connectors.





REVISED SBS C11 BATTERY WIRING

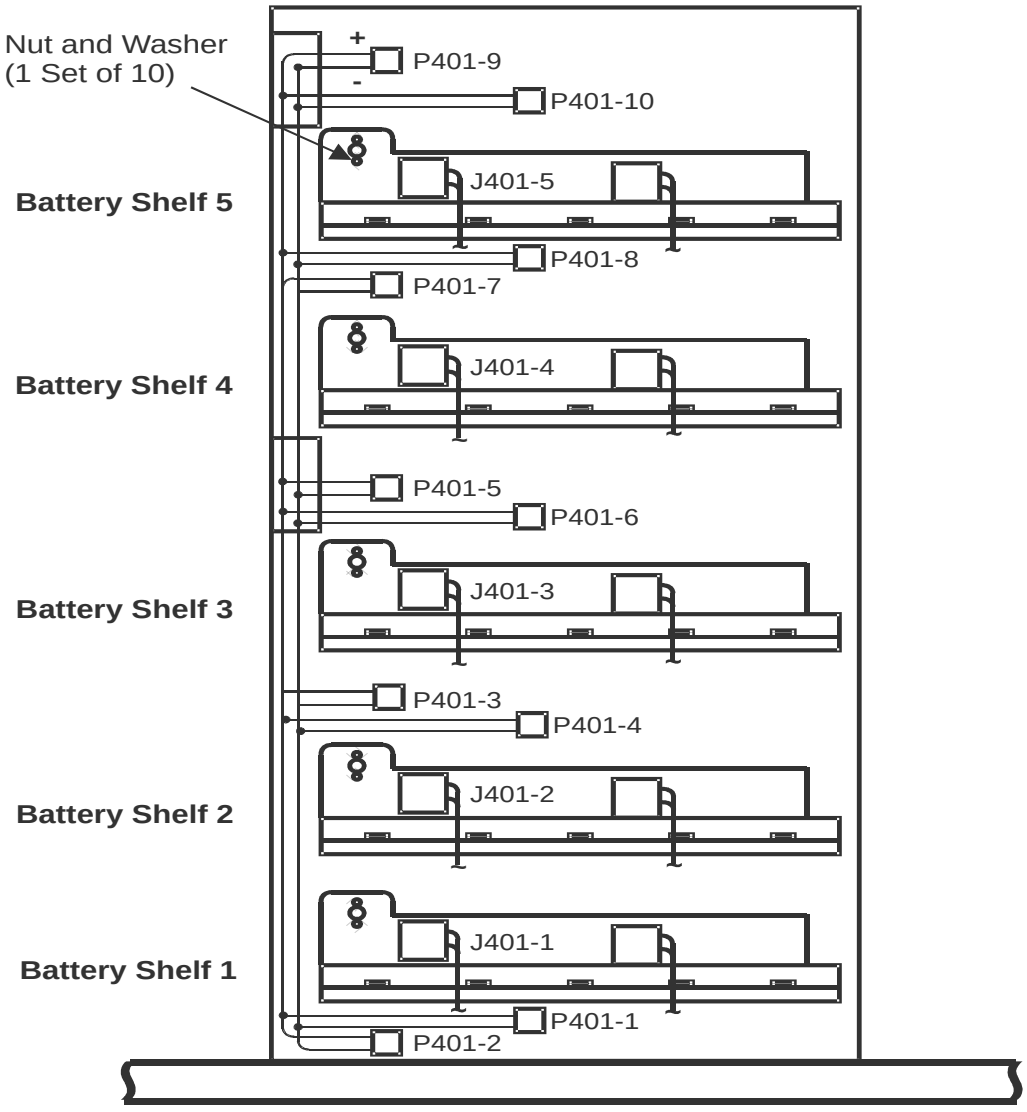
One quick-disconnect connectors.

Revised power wiring to the cabinet bus bars

The following figures illustrate the current and revised factory installed power wiring to the cabinet bus bars

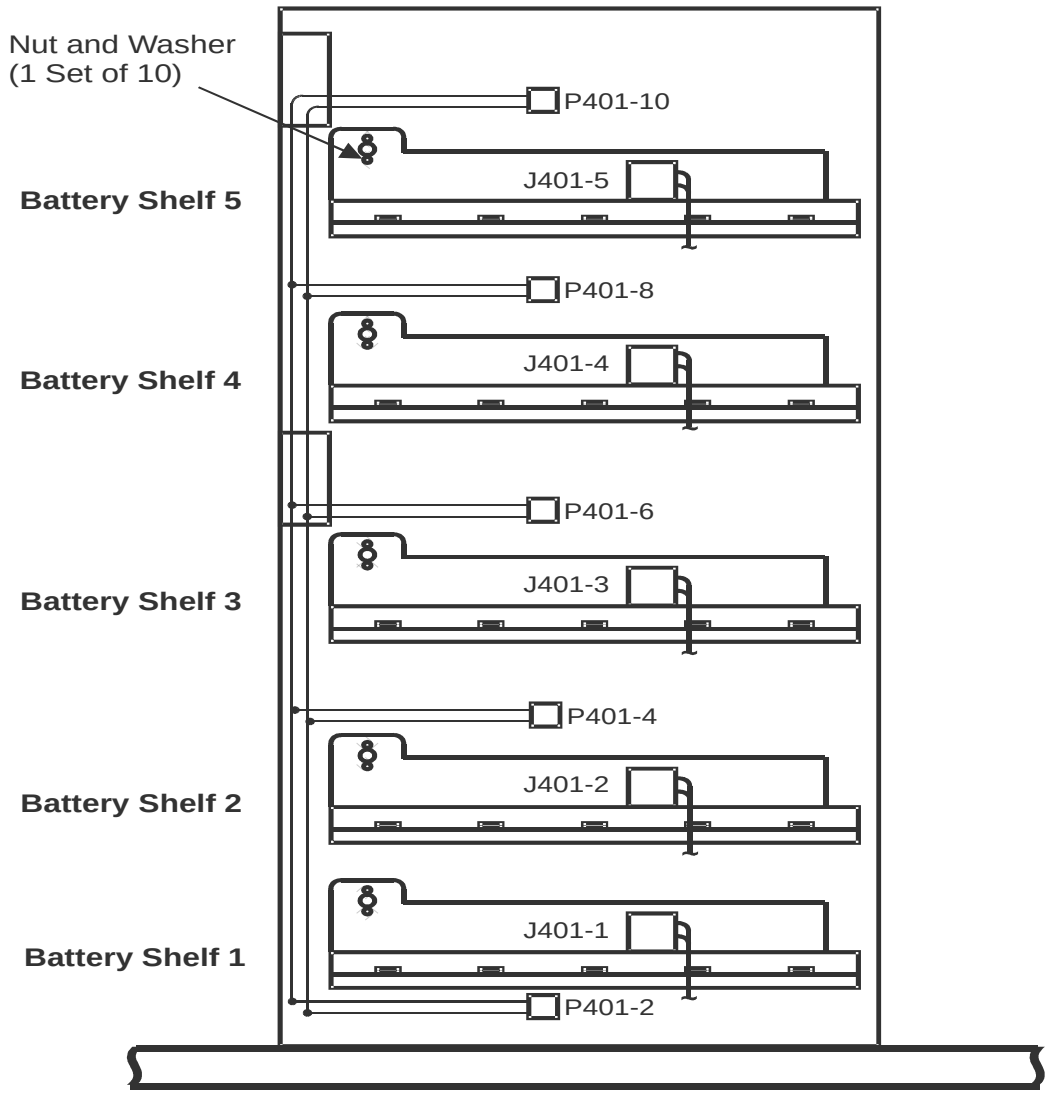
CURRENT WIRING TO CABINET BUS BARS

Ten sets of battery cables to the bus bars



CURRENT WIRING TO CABINET BUS BARS

Five sets of battery cables to the bus bars



5 Component installation in the Modular Cell 4.0B and the WNG24-BC battery cabinets

Overview

Purpose

This chapter provides instructions for the installation of rectifiers in integrated power Modular Cell 4.0B cabinets, and for the installation of batteries in integrated power Modular Cell 4.0B cabinets and WNG24-BC battery cabinets connected to primary cabinets. Also provided are instructions for thermal probe installation and final connection of DC cables *after* installation of batteries in a newly installed battery cabinet.

Contents

This chapter contains the following sections.

How to install components in Modular Cell 4.0B cabinets

Overview

Purpose This section contains the following procedures.

How to install rectifiers in Modular Cell 4.0B cabinets

Install rectifiers in a Modular Cell 4.0B primary cabinet

The rectifiers required for a given cabinet configuration are shipped already installed in the Modular Cell 4.0B cabinets. Rectifiers may need to be added as part of a field upgrade, in which case the instructions are included in the upgrade kit. These instructions are provided for the convenience of the installer only. Perform the following steps to install rectifiers in a Modular Cell 4.0B cabinet.

1 Consult the following table to obtain the rectifier quantity required to support the installation of the cabinet being installed, depending upon the number of carriers, as well as the cabinet model and configuration.

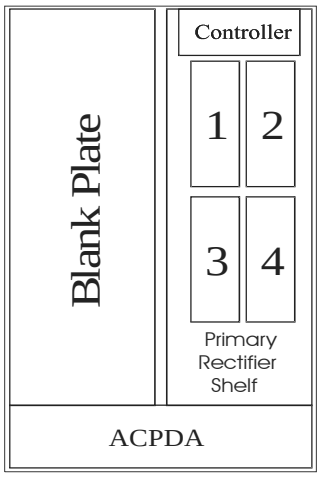
2 The table on Page 5 - 4 identifies the rectifiers needed (N+1) for a PCS or 850 Modular Cell 4.0B primary cabinet. Refer to the figure on Page 5-4 for rectifier positions.

3 When performing the following steps, install the rectifiers in the order shown on the front of the AC module. Refer to the figure on Page 5-4.

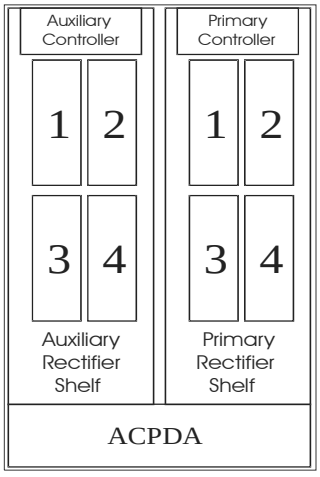
4 Remove the blank rectifier panel, if applicable. Refer to the figure on Page 5-4.

5 Slide the rectifier into the enclosure.Refer to the figure on Page 5-4.

6 Tighten the thumb screws.



Integrated Power Configuration (up to 4 rectifiers)



Integrated Power Configuration (>5 rectifiers)

Modular Cell 4.0B cabinet	Total carriers	Rectifiers needed per cabinet (N+1) PCS	Rectifier positions for PCS P = Primary Controller. A = Auxiliary Controller	Rectifiers needed per cabinet (N+1) 850	Rectifier positions for 850 P = Primary Controller. A = Auxiliary Controller
Modular Cell 4.0B Primary Cabinet	1	3	1,2,3 P	3	1,2,3 P
	2	3	1,2,3 P	3	1,2,3 P
	3	4	1,2,3,4 P	4	1,2,3,4 P
	4	5	1,2,3,4 P / 1 A	4	1,2,3,4 P
	5	5	1,2,3,4 P / 1 A	5	1,2,3,4 P / 1 A
	6	6	1,2,3,4 P / 1,2 A	5	1,2,3,4 P / 1 A
	7	7	1,2,3,4 P / 1,2,3 A	6	1,2,3,4 P / 1,2 A
	8	7	1,2,3,4 P / 1,2,3 A	N/A	N/A
	9 (PCS only)	8	1,2,3,4 P / 1,2,3,4 A	N/A	N/A
	10 (PCS only)	8	1,2,3,4 P / 1,2,3,4 A	N/A	N/A

How to install batteries in Modular Cell 4.0B cabinets

CAUTION

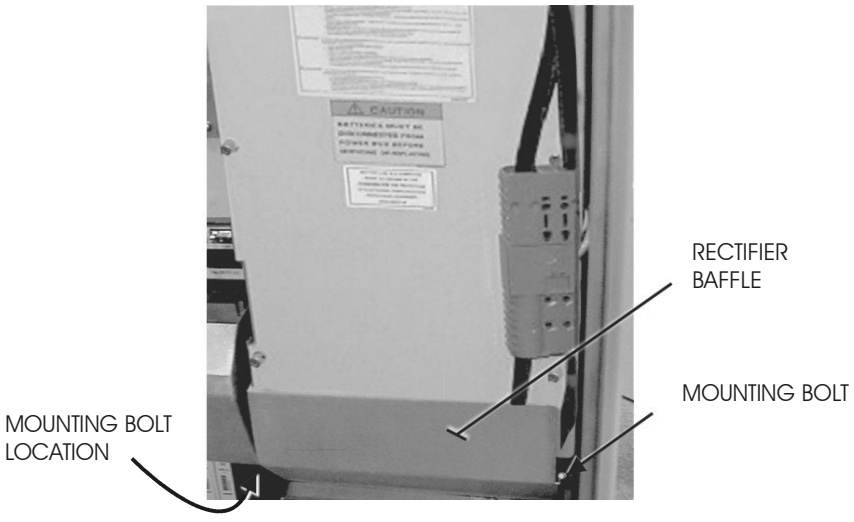
Damage to equipment

The battery cables in the primary cabinet must not be connected until after the AC utility wires are connected and AC power is turned on at the main panel. Do not connect the battery cables until instructed to do so in Chapter 7 "Finishing the installation".

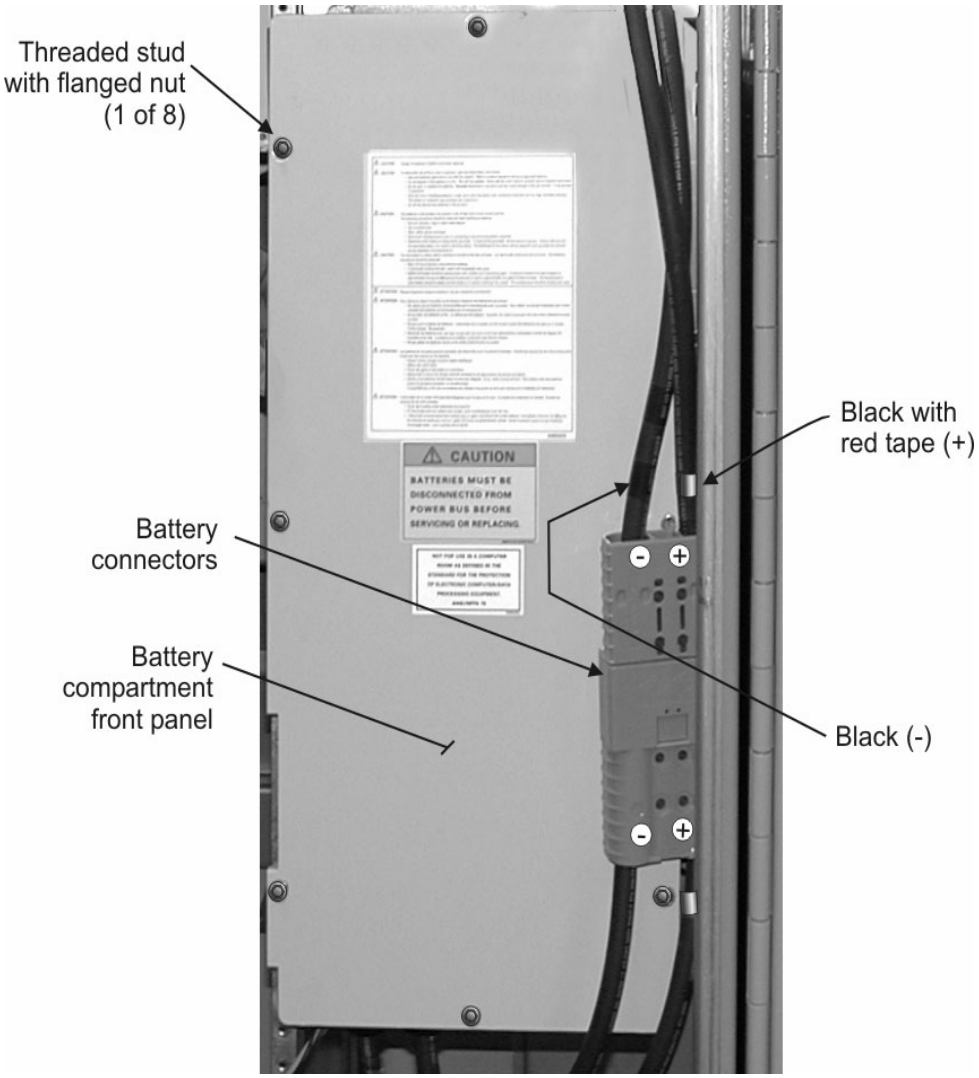
Install batteries in a Modular Cell 4.0B cabinet

The batteries required for a given cabinet configuration are shipped already installed in the Modular Cell 4.0B primary cabinet. Under certain circumstances, batteries may need to be installed. These instructions are provided for the convenience of the installer. Perform the following steps to remove and install batteries in a Modular Cell 4.0B cabinet.

1 Remove the two bolts shown in the figure below, and remove the air baffle from above the rectifier module.



2 Unplug the battery connectors. Refer to the figure below.



3 Remove the eight flanged nuts that hold the battery front panel in place. Refer to the figure on Page 5-7.

4 Remove the battery module front panel. Refer to the figure below.

5 Lay aside the battery compartment front panel.

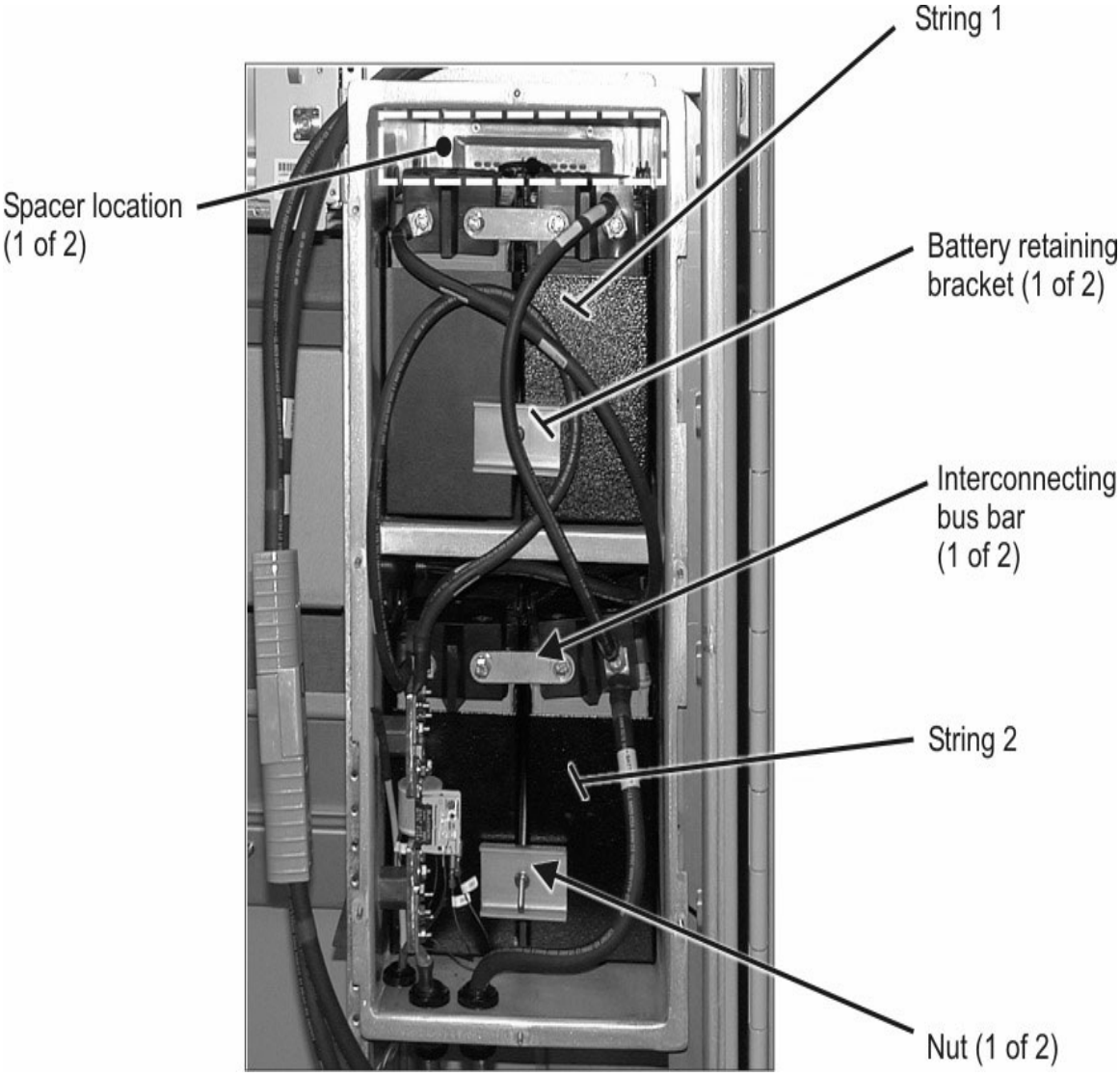
6 Remove the top spacer from the applicable shelf. Refer to the figure on Page 5-8.

7 Unscrew the nut and remove the battery retaining bracket.

8 Remove the interconnecting bus bar.

9 Remove the positive and negative battery cables from the batteries, and the two batteries from the shelf.

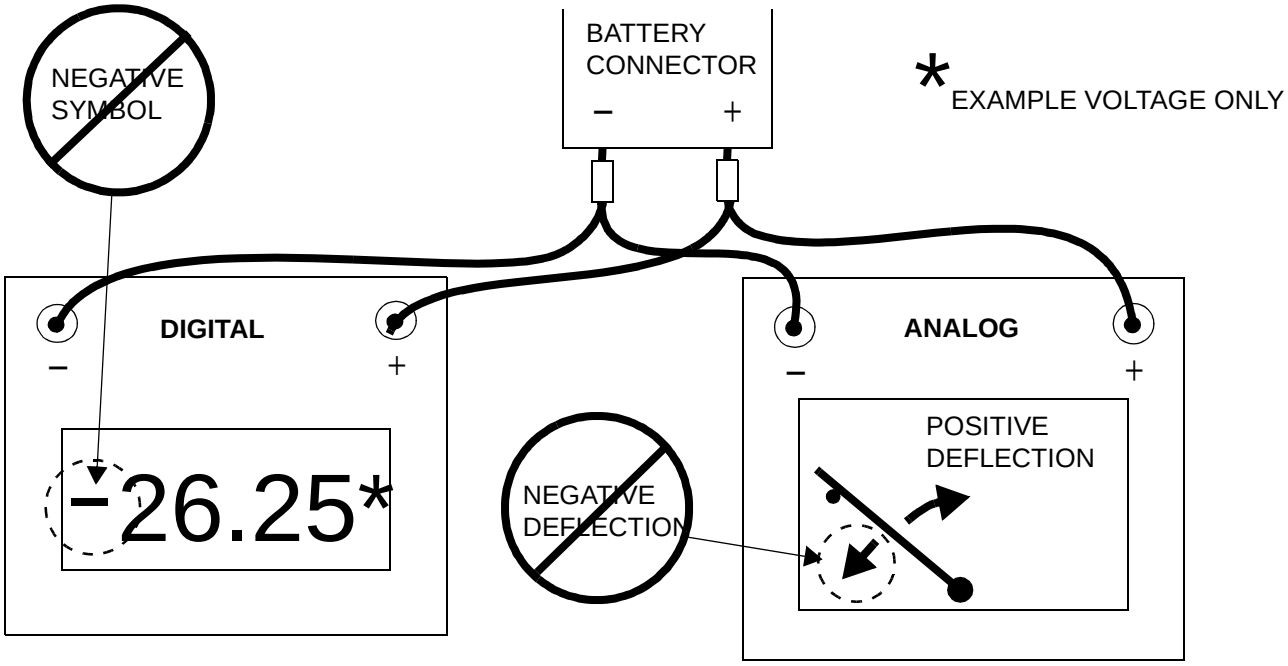
10 Install the batteries by reversing the previous four steps. Refer to the figure below. Carefully observe the polarity while reconnecting the battery cables.



11 Measure the voltage at the battery cable external connector to determine that the polarity is correct. Refer to the figure below.

- Digital meter - no symbol or positive symbol = **correct** connection.
- Digital meter - negative symbol = incorrect connection.
- Analog meter - positive deflection = **correct** connection.
- Analog meter - negative deflection = incorrect connection.

All of the above assume correct meter lead connection.



12 If necessary, rewire the battery cables found to be incorrectly wired.

13 Replace the front panel and air baffle.

14 Reconnect the battery connector.

END OF STEPS

□

How to install batteries in a WNG24-BC battery cabinet

Overview

Purpose

This section provides the instructions for the installation and connection of the batteries. The instructions are the same for both a first or second battery cabinet, except in the case of thermal probes, where the exceptions are noted.

Important! If installing an EZBFo battery module, proceed to Appendix A.

This section contains the following procedures.

Contents

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

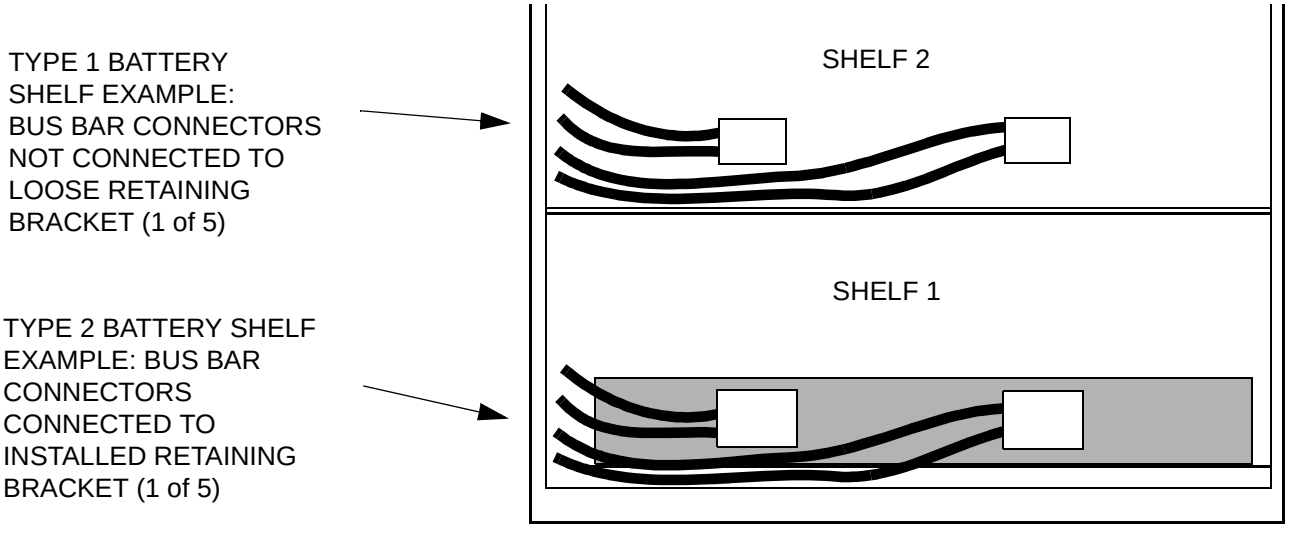
To reduce the risk of fire or injury to persons, read and follow these instructions:

- *Use only batteries approved for use with this product. Refer to* Approved batteries *on Page* ***5 - 14*** *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.*

Description of the battery compartment

The battery cabinet provides facilities to support five shelves of batteries. The bottom shelf (shelf 1) is the initial shelf for installation purposes. Each shelf provides space for four 12IR125 batteries (two strings) or six C-11 batteries (one string). During installation, batteries will be connected together to form strings. Battery heaters are located under each shelf. Battery heater thermostats are present for each battery shelf. The battery compartment has battery cables preinstalled from the bus bars for all five shelves. For type 1 shelves, the bus bar cable connectors are not attached to the uninstalled retaining brackets. For type 2 shelves, the bus bar cable connectors are attached to the installed retaining brackets. Refer to the figure below.



Approved batteries

The following batteries are approved for use in the WNG24-BC battery cabinet.

QUANTITY	WNG24 - BC SHELF TYPE	BATTERY TYPE
As required per site specification and battery type	Shelf type 1	Power CSL-12100 L1-type batteries
	Shelf type 1	Marathon GNB M12V100FT L1-type batteries
	Shelf types 1 and 2	12IR125
	Shelf types 1 and 2	C-11

How to determine battery shelf type

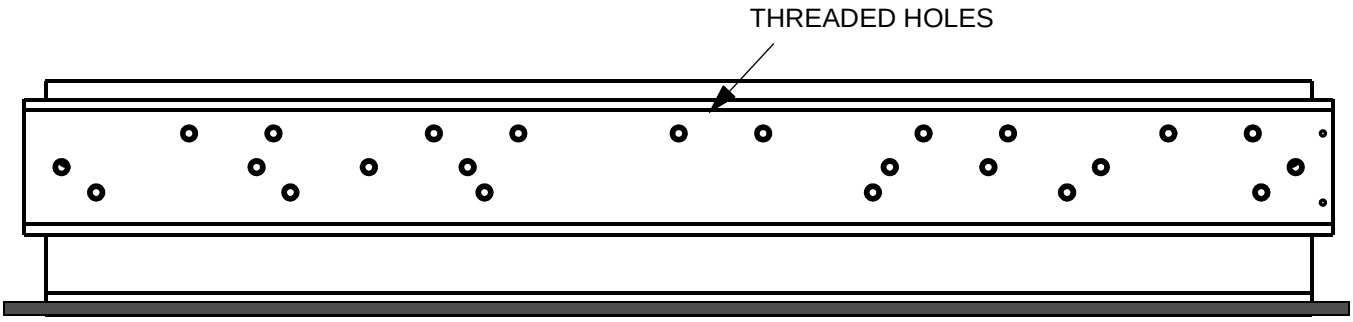
Overview

Before proceeding to battery installation, it is necessary to determine the specific battery shelf, type 1 or type 2, that is installed in the WNG24-BC battery cabinet. The following figures illustrate both battery shelves. Note that type 1 shelves have twenty-four threaded holes in the rear shelf bracket, while the type 2 shelf has none.

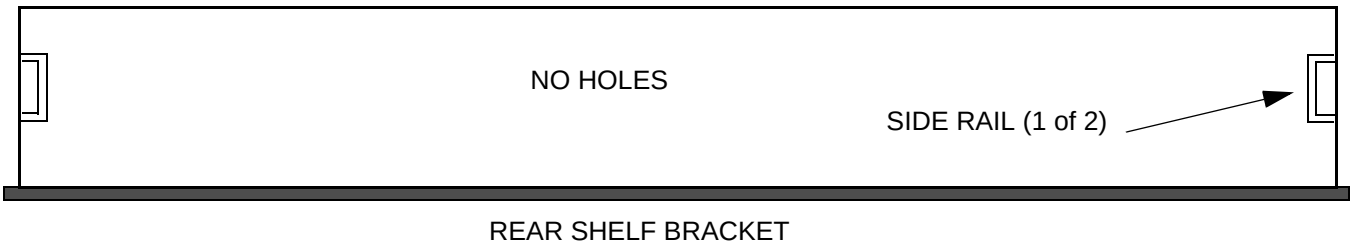
If the battery shelf is type 1, proceed to How to install L1, L2, and 12IR125 batteries on type 1 battery shelves on Page 5 - 16 or How to install C-11 batteries on type 1 battery shelves on Page 5 - 32 to continue the installation.

If the battery shelf is type 2, skip to How to install 12IR125 type batteries on type 2 battery shelves on Page 5 - 49, or to How to install C-11 type batteries on type 2 battery shelves on Page 5 - 63, as applicable, to continue the installation.

Type 1 shelf



Type 2 shelf



How to install L1, L2, and 12IR125 batteries on type 1 battery shelves

Overview

This section provides instructions for the installation and connection of L1, L2, and 12IR125 batteries on type 1 battery shelves. The instructions are the same for both a first or second battery cabinet (that have type 1 shelves), except in the case of thermal probes, where the exceptions are noted. This section contains the following procedures

Read battery installation procedure overview

Important! In the event that the battery compartment is removed from the primary cabinet because of an upgrade that adds the A6 amplifier shelf (carriers 5 and 6), up to four spare L1 batteries will result. The end user may wish to use these batteries in the battery cabinet, in which case a shelf must be left vacant. Therefore, while performing any task involving a type 1 top battery shelf (shelf 5), it may be desirable to plan on leaving that shelf empty when installing the batteries.

The battery cabinet can contain up to twenty L1, L2, or 12IR125 batteries that are wired in a series/parallel configuration which provides 24-volt backup. For L1, L2, or 12IR125 batteries, two strings (four batteries) can be mounted on each of the five type 1 battery shelves. Refer to the figure on Page 5-18.

Prepare the batteries for installation

To prepare the batteries, follow all appropriate standard practices for the storage and handling of batteries. Complete the warranty procedures and the following steps.

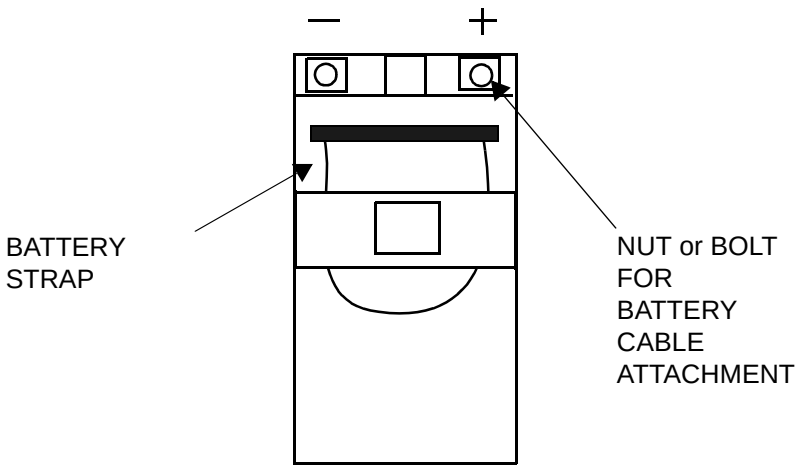
1 Check and record battery initial voltages and all battery date codes.

2 Include this information with documentation supplied to the customer.

END OF STEPS

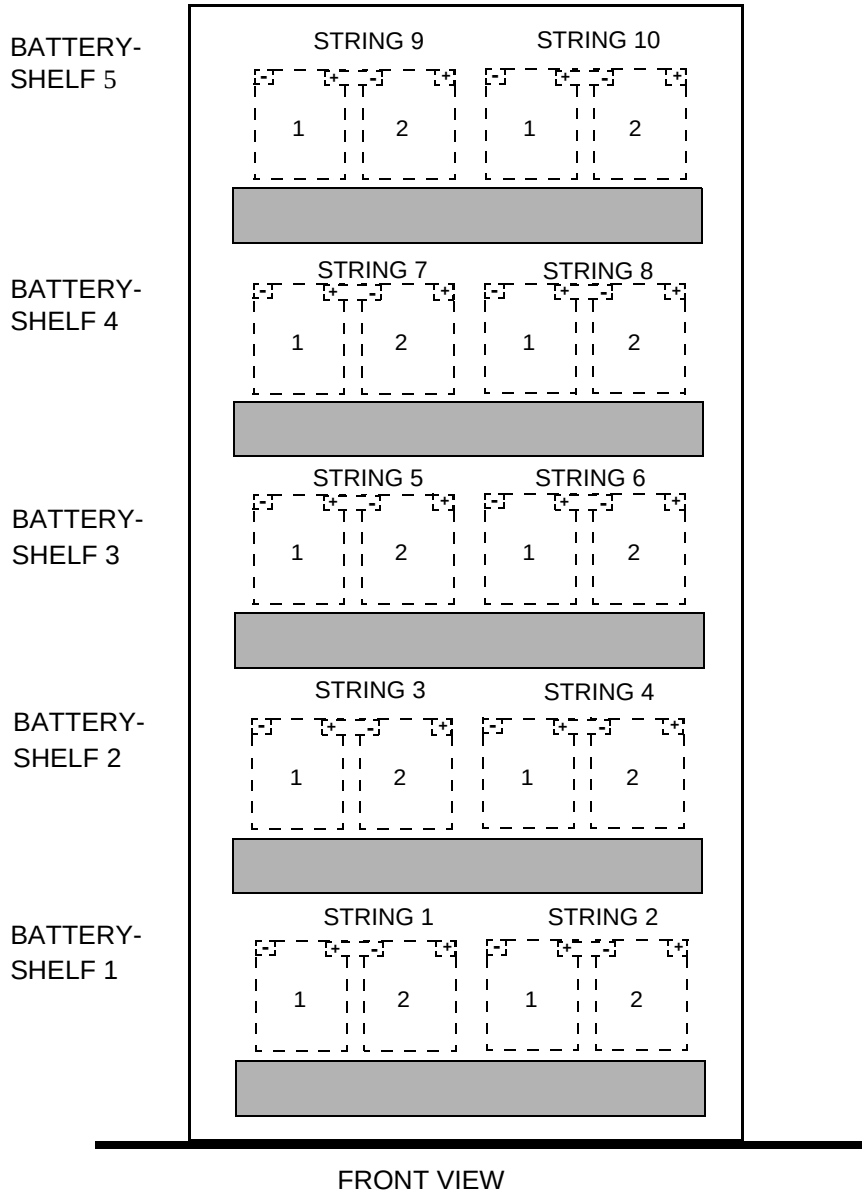
Description of the batteries

The battery terminals are located on one end of the battery. Positive and negative terminals are clearly labeled "+" and "-". Terminals are either threaded studs or threaded holes, depending upon the battery type. Strap handles are permanently attached to the battery. Refer to the example figure below.



Important! To prevent an inadvertent electrical short during battery installation, certain battery types have an insulated cover that is factory-installed over the terminals on the individual batteries. Do not remove this cover until you are preparing to complete each connection.

The figure below illustrates the battery string positions and battery numbers for L1, L2, and 12IR125 batteries on type 1 shelves.



Place the batteries on a shelf

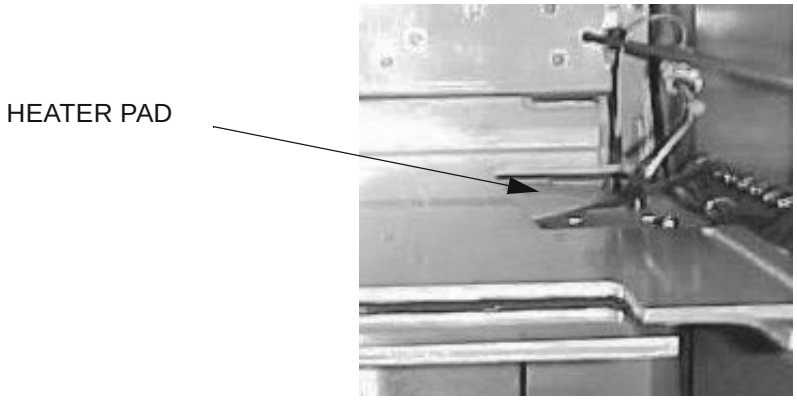
Use the following procedure to place batteries on a shelf, starting with shelf 1 (bottom).

Important! This procedure, and the illustrations it contains, uses 12IR125 batteries as an example. Refer to Examples of L1 and L2 battery shelf positions on Page 5 - 24 for examples of L1 and L2 battery shelf positions.

1 Locate the 25 threaded rods shipped with the cabinet. Five will be used per shelf. Thread a rod into the center hole of the rear bracket as shown in the Step 5 figure on Page 5- 20, **item 1**.

Important! To avoid damage to the heater pad and wires when performing the next step, the right-hand (or right-most) battery (especially 12IR125 and C-11 types) should be tilted forward (at the front of the shelf) as it is slid onto the shelf. Refer to the figure below for the heater pad location.

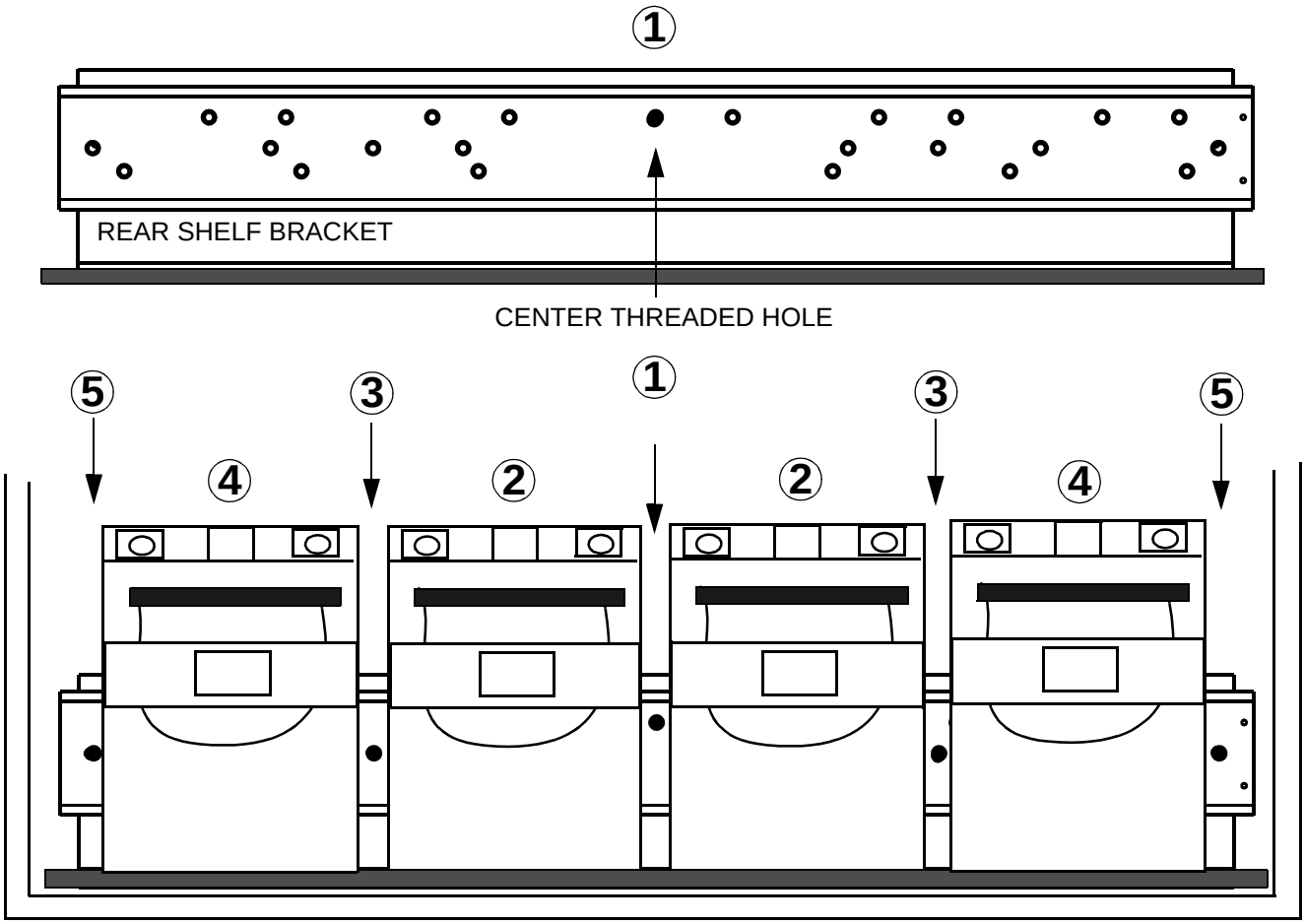
2 When installed, the battery terminals on the front, narrow end of the battery should face out of the cabinet. Slide two batteries onto the shelf, one on each side of the center threaded rod. Refer to the figure on Page 5-20, **item 2**.



3 Thread a rod into the appropriate hole on the outside of the two batteries installed in the previous step. Refer to the figure on Page 5-20, **item 3**.

4 Slide two batteries onto the shelf, one on each side of the threaded rods installed in the previous step. Refer to the figure on Page 5-20, **item 4**.

5 Thread a rod into the appropriate hole on the outside of the two batteries installed in the previous step. Refer to the figure below, **item 5**.



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

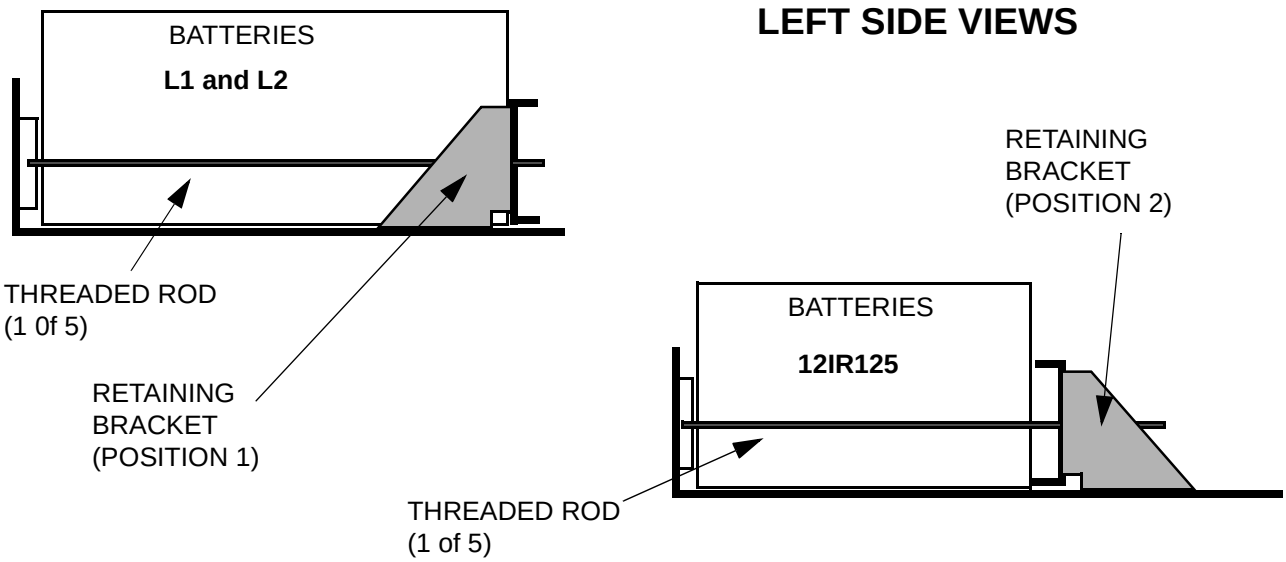
> **Important!** Up to four batteries may be subsequently removed from the primary cabinet. Therefore, it may be desirable to provide future space for these batteries by leaving the top battery cabinet shelf empty when installing the batteries in the following steps.

7 Carefully wrap and store the remaining threaded rods, retaining bracket and associated hardware on all shelves not being populated with batteries at this time.

Install the battery retaining bracket

Perform the following steps to install the battery retaining bracket.

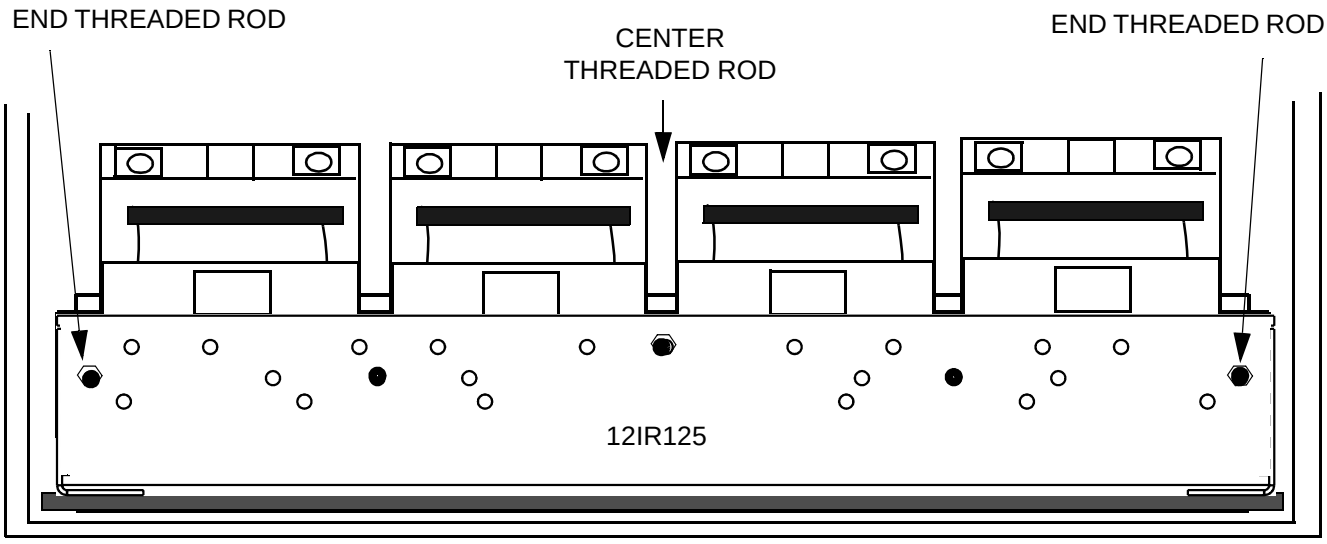
1 Preposition the retaining bracket in position 1 for L1 and L2 batteries, or position 2 for 12IR125 batteries, as applicable. Refer to the figure below.



Important! This procedure, and the illustrations it contains, uses 12IR125 batteries as an example. Refer to Examples of L1 and L2 battery shelf positions on Page 5 - 24 for examples of L1 and L2 battery shelf positions.

2 Slide the retaining bracket over the installed threaded rods.

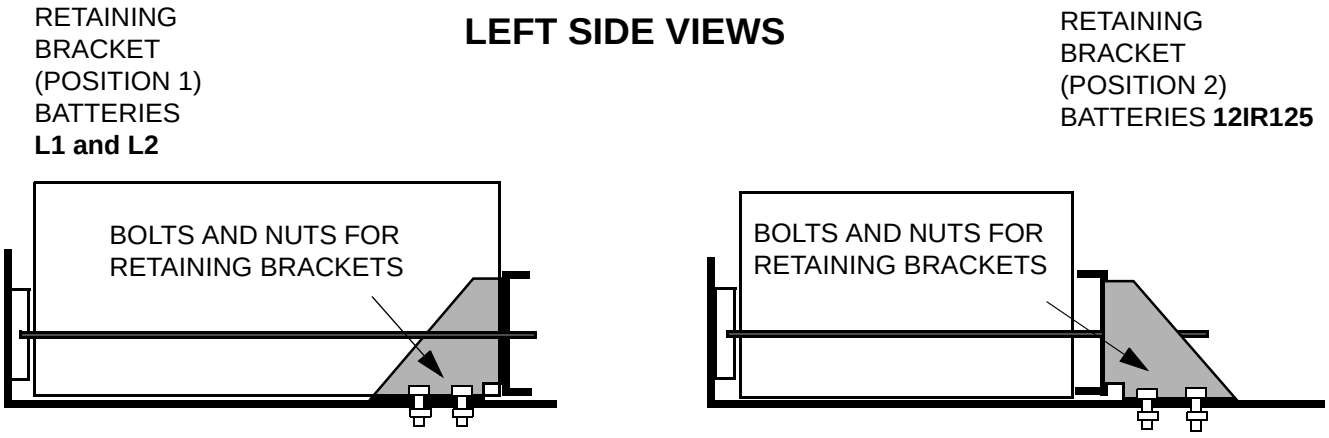
3 Using the nuts and washers provided, attach the retaining bracket at the center and end threaded rods only. Do not tighten the nuts.



4 Using the supplied bolts, washers and nuts, attach the retaining bracket to the shelf. Four sets of hardware are used, two on each side of the bracket. Refer to the figure below.

5 Repeat Steps 1 through 4 for all populated battery shelves.

LEFT SIDE VIEWS



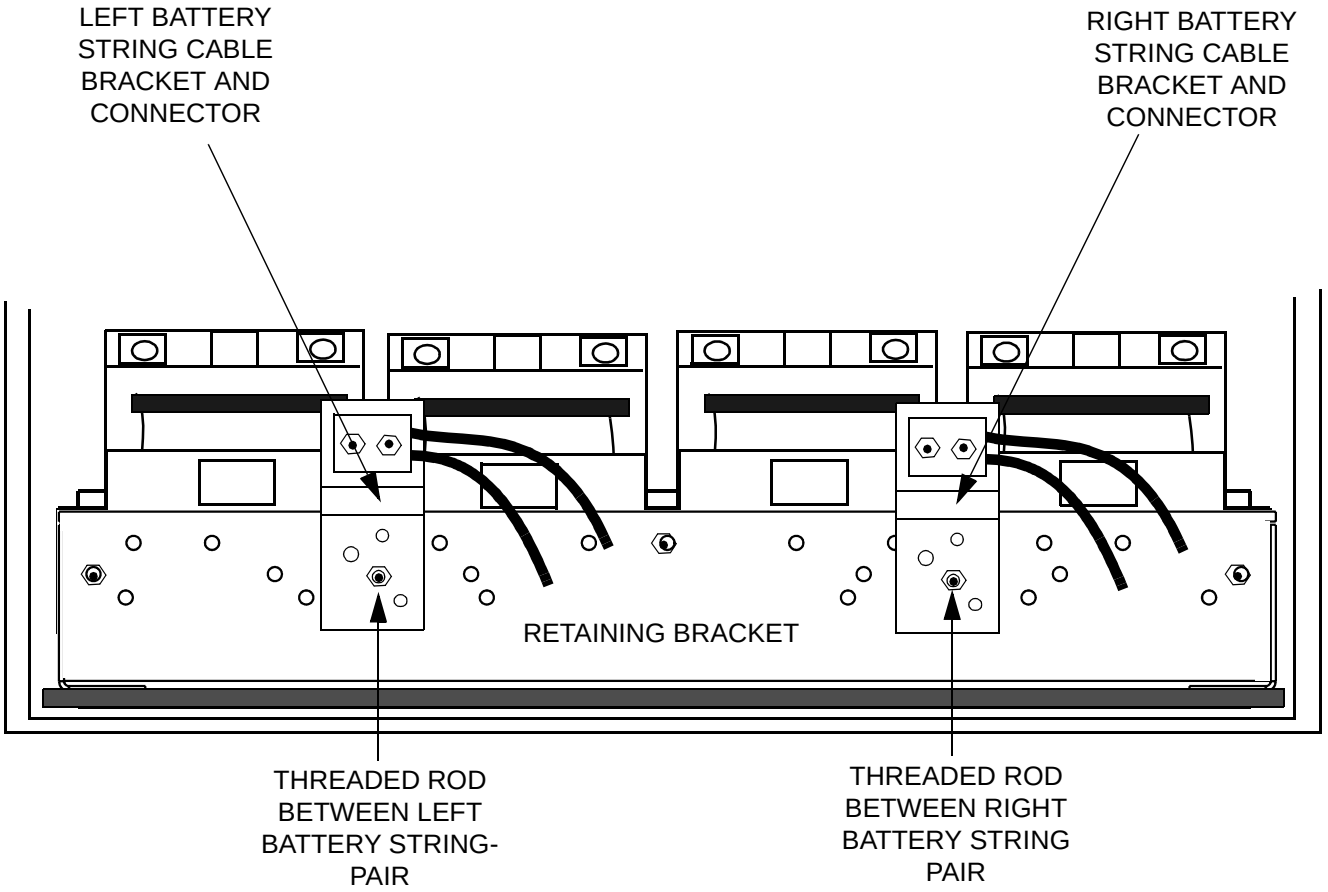
Attach the two battery cable assemblies to the retaining bracket (L1,L2, and 12IR125 batteries only)

Important! This procedure, and the illustrations it contains, uses 12IR125 batteries as an example. Refer to Examples of L1 and L2 battery shelf positions on Page 5 - 24 for examples of L1 and L2 battery shelf positions.

Perform the following steps to attach the battery cable assemblies to the retaining bracket (for L1, L2, and 12IR125 batteries only).

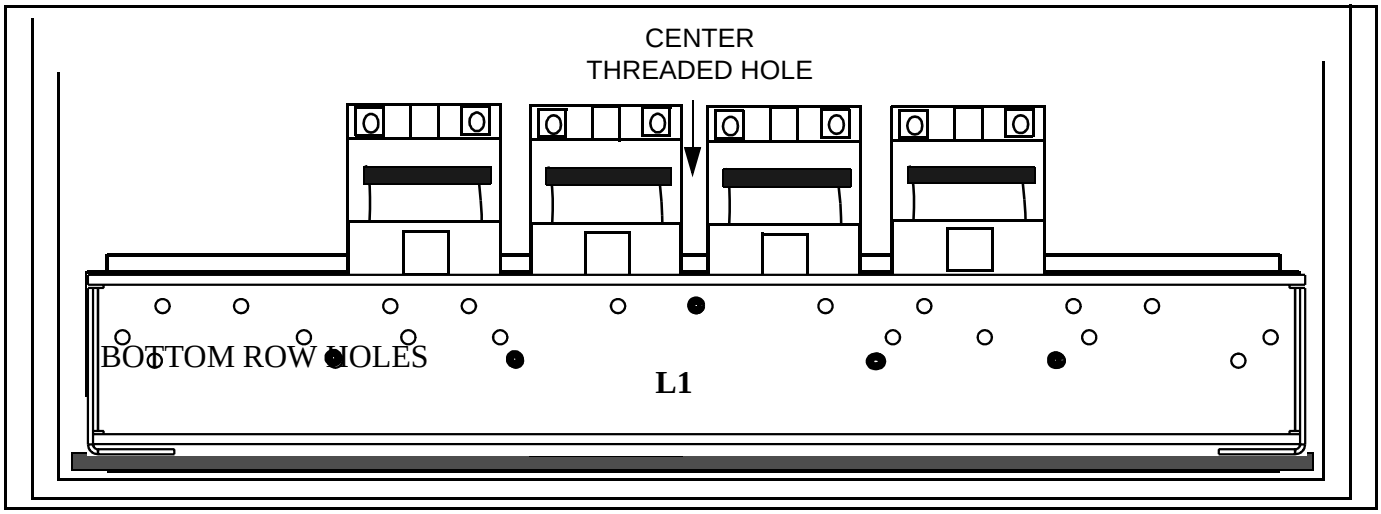
1 Attach the battery cable assemblies to the threaded rods that are positioned between the left and right pair (string) of batteries, using the nuts and washers provided. Do not connect the cables to the batteries at this time. Refer to the figure below.

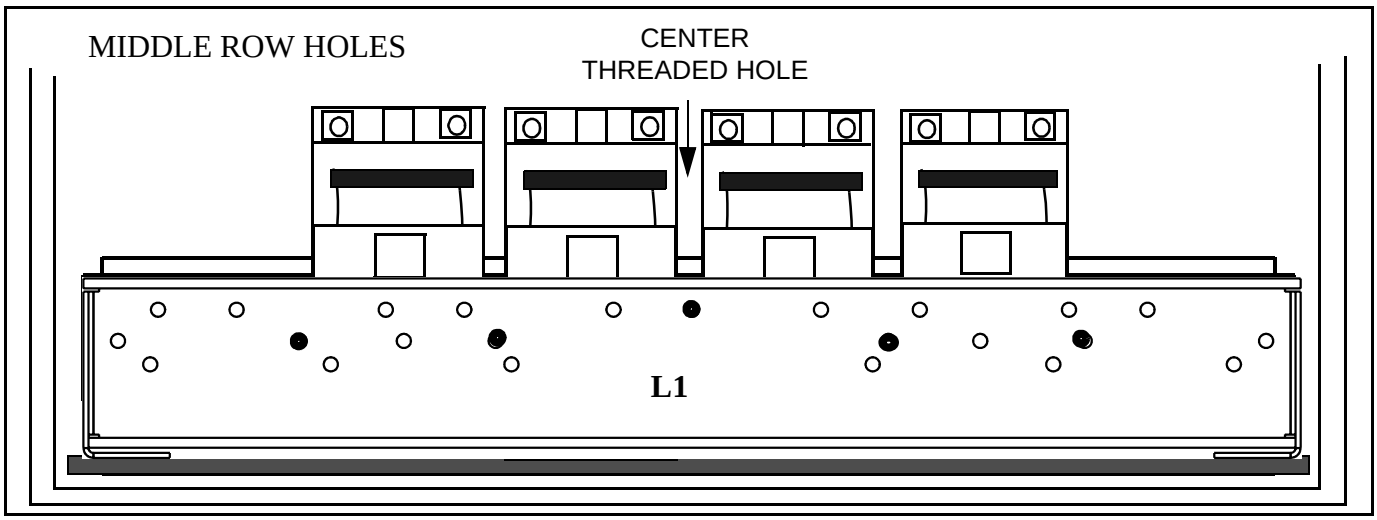
2 Repeat the previous step for all populated shelves.

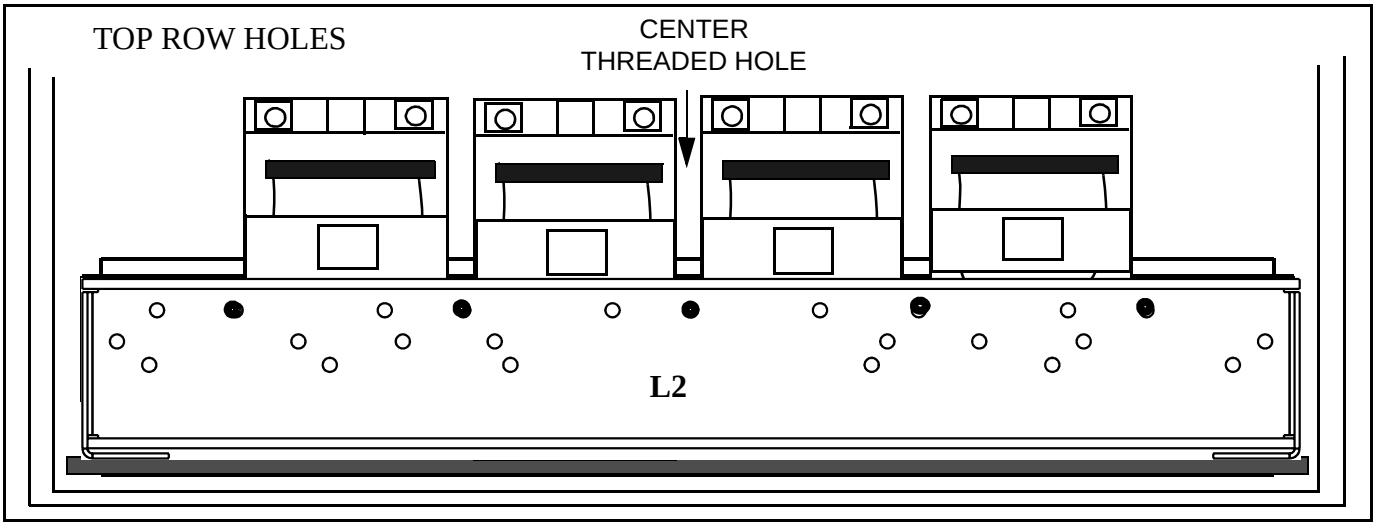


Examples of L1 and L2 battery shelf positions

Refer to the three figures below for examples of L1 and L2 battery shelf positions.






TOP ROW HOLES
CENTER
THREADED HOLE
L2

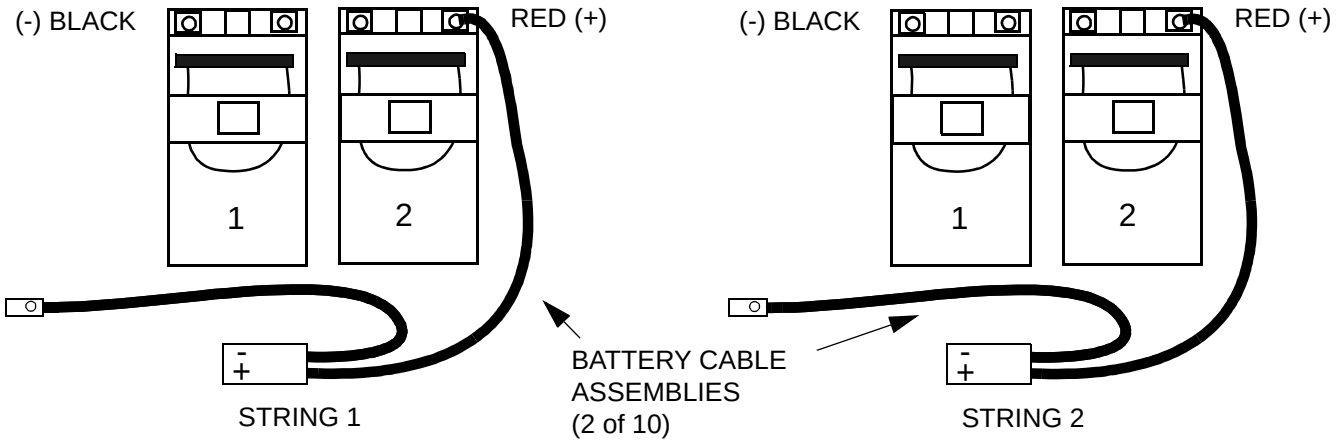
Connect positive battery cables to all battery strings

Important! When performing the following steps, do not connect the negative battery cables. The negative battery cables are not connected until after the interconnecting bus bars have been installed in the next procedure.

Perform the following steps to connect the positive battery cables to all battery strings.

1 Locate the ten battery cable assemblies. Refer to the figure below.

2 Starting with string 2 on the right side of shelf 1, remove the protective cap (if present) from the terminals of battery 2. Refer to the figure below.



3 Apply antioxidant compound to the positive (+) terminal of battery 2 of string 2.

4 Connect the positive (+) battery cable to the positive (+) terminal on battery 2 of string 2, using either:

- a flat washer, lock washer and nut, or
- a flat washer, lock washer and bolt, if applicable

Refer to the figure on Page 5-29 for a top view of a typical battery cable connection.

5 Torque the positive battery connections using an insulated socket and torque wrench set at 60 in.-lb. (6.8 Nm). Do not use the torque specifications provided in Chapter 1.

6 Repeat Steps 1 through 5 for the number 2 battery in all remaining battery strings.

END OF STEPS

Attach interconnecting bus bars to all battery strings

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

1 Starting with string 2 on the right side of shelf 1, remove the protective cap (if present) from the terminals of battery 1.

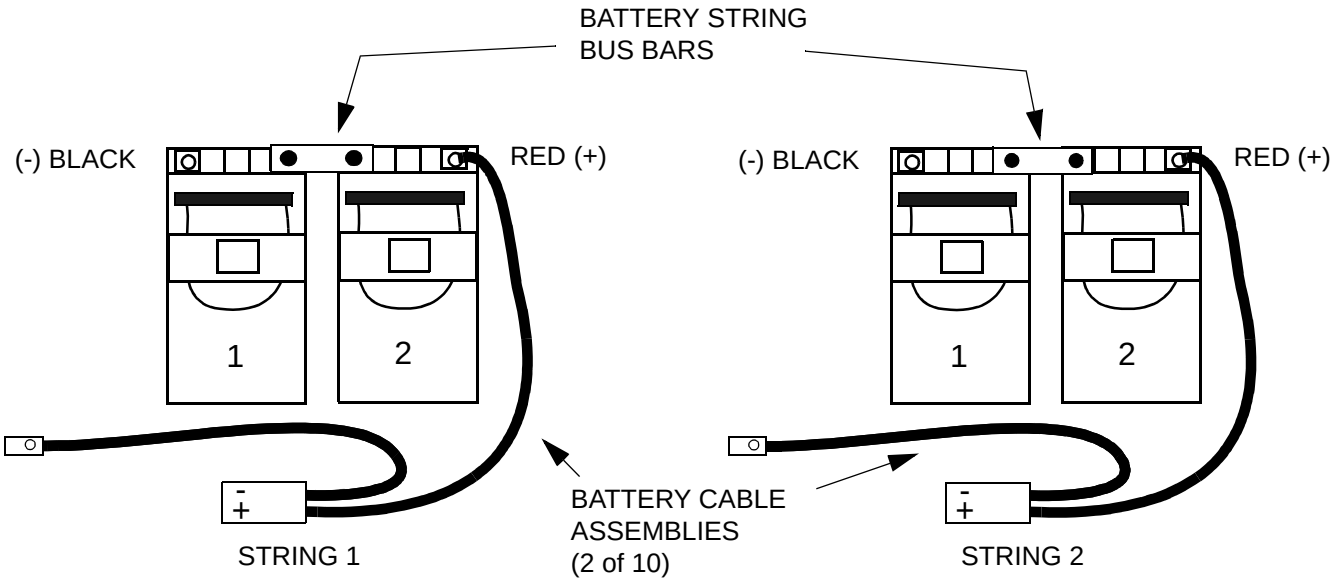
2 Remove the interconnecting bus bar from the kit that is provided with each pair of batteries.

3 Polish the interconnecting bus bar.

4 Apply antioxidant compound to the interconnecting bus bar.

5 Apply antioxidant compound to the positive (+) terminal of battery 1 and the negative (-) terminal of battery 2 of string 2.

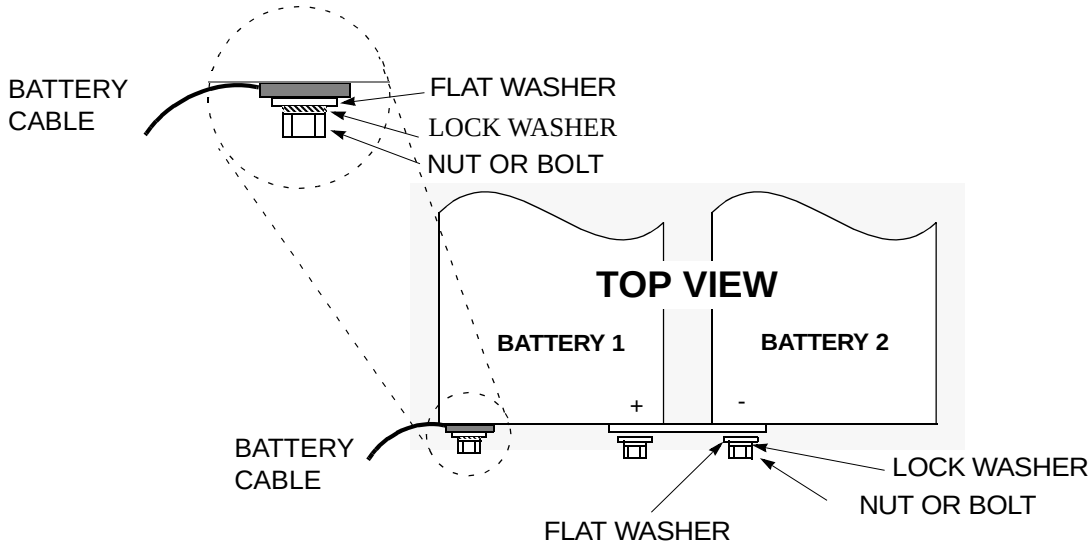
6 On string 2, place an interconnecting bus bar between the positive terminal of the left-hand battery (#1) and the negative terminal of the right-hand battery (#2). Refer to the figure below.



7 Connect the interconnecting bus bar using either:

- a flat washer, lock washer and nut, or
- a flat washer, lock washer and bolt, if applicable

Refer to the figure below, which illustrates the interconnecting bus bar installation, including the installation order of the washers.



8 Torque the two bus bar connections using an insulated socket and torque wrench set at 60 in.-lb. (6.8 Nm). Do not use the torque specifications provided in Chapter 1.

9 Repeat Steps 1 through 8 for the remaining battery strings.

END OF STEPS

Connect the negative battery cables to all battery strings

Perform the following steps to connect the negative battery cables to all battery strings. Refer to the figure below.

1 Apply antioxidant compound to the negative (-) terminal of battery 1 of string 2.

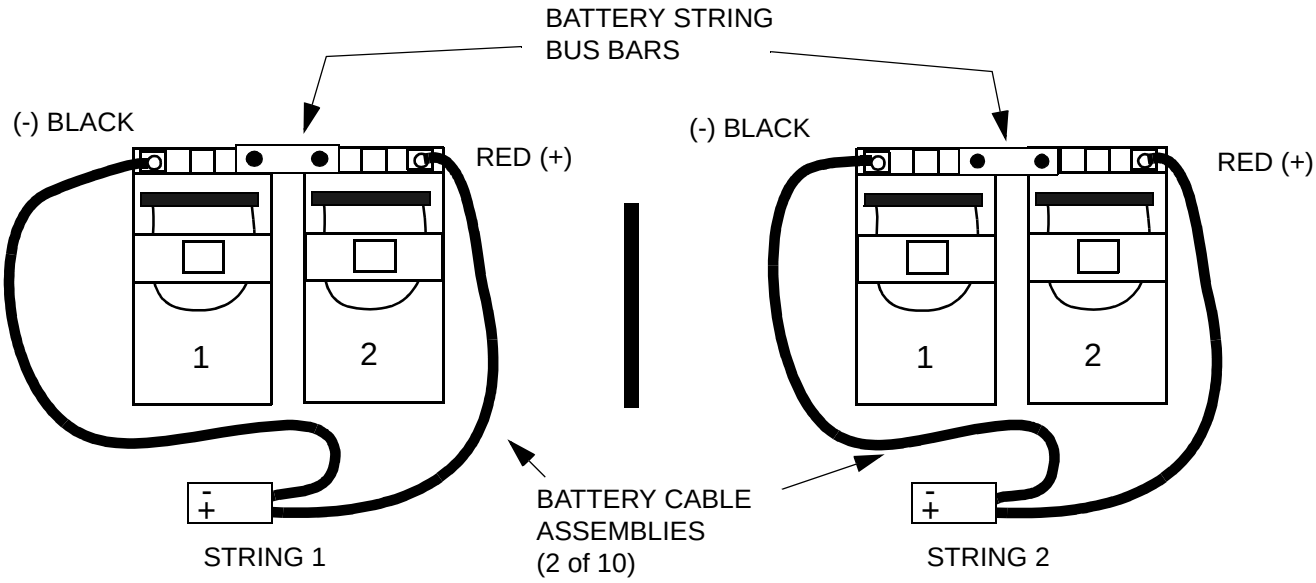
2 Place the negative (-) battery cable on the negative (-) terminal on battery 1, string 2, using either:

- a flat washer, lock washer and nut, or
- a flat washer, lock washer and bolt, if applicable

Refer to the figure on Page 5-29 for a top view of a typical battery cable connection. Refer to the figure on Page 5-31 for negative battery cable connections.

3 Repeat Steps 1 and 2 for all remaining battery strings.

4 Torque the negative battery connections using an insulated socket and torque wrench set at 60 in.-lb. (6.8 Nm). Do not use the torque specifications provided in Chapter 1.



Important! Skip to How to route the thermal probe cable(s) and mount the thermal probe(s) in the battery cabinets on Page 5 - 81 to continue the installation.

END OF STEPS

How to install C-11 batteries on type 1 battery shelves

Overview

This section provides instructions for the installation and connection of C-11 batteries on type 1 battery shelves. The instructions are the same for both a first or second battery cabinet (that have type 1 shelves), except in the case of thermal probes, where the exceptions are noted. This section contains the following procedures.

Read battery installation procedure overview

Important! In the event that the battery compartment is removed from the primary cabinet because of an upgrade that adds the A6 amplifier shelf (carriers 5 and 6), up to four spare L1 batteries will result. The end user may wish to use these batteries in the battery cabinet, in which case a shelf must be left vacant. Therefore, while performing any task involving a type 1 top battery shelf (shelf 5), it may be desirable to plan on leaving that shelf empty when installing the batteries.

The battery cabinet can contain up to thirty C-11 batteries that are wired in a series/parallel configuration which provides 24-volt backup. For C-11 batteries, one string (six batteries) can be mounted on each of the five type 1 battery shelves. Refer to the figure on Page 5-34**.**

Prepare the batteries for installation

To prepare the batteries, follow all appropriate standard practices for the storage and handling of batteries. Complete the warranty procedures and the following steps.

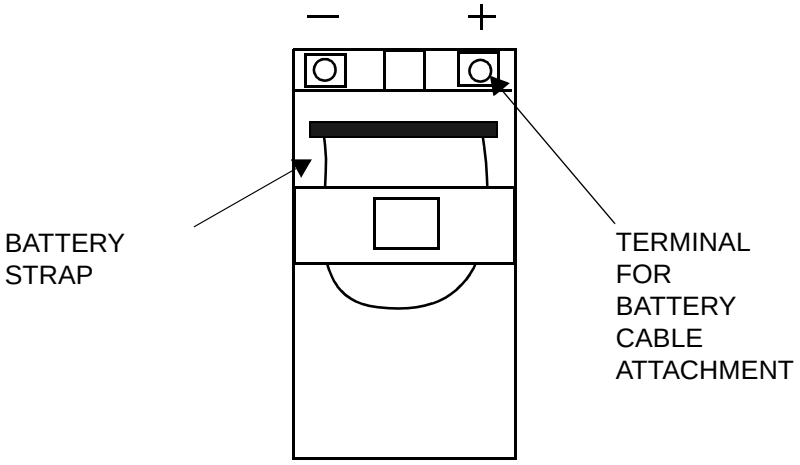
1 Check and record battery initial voltages and all battery date codes.

2 Include this information with documentation supplied to the customer.

END OF STEPS

Description of the batteries

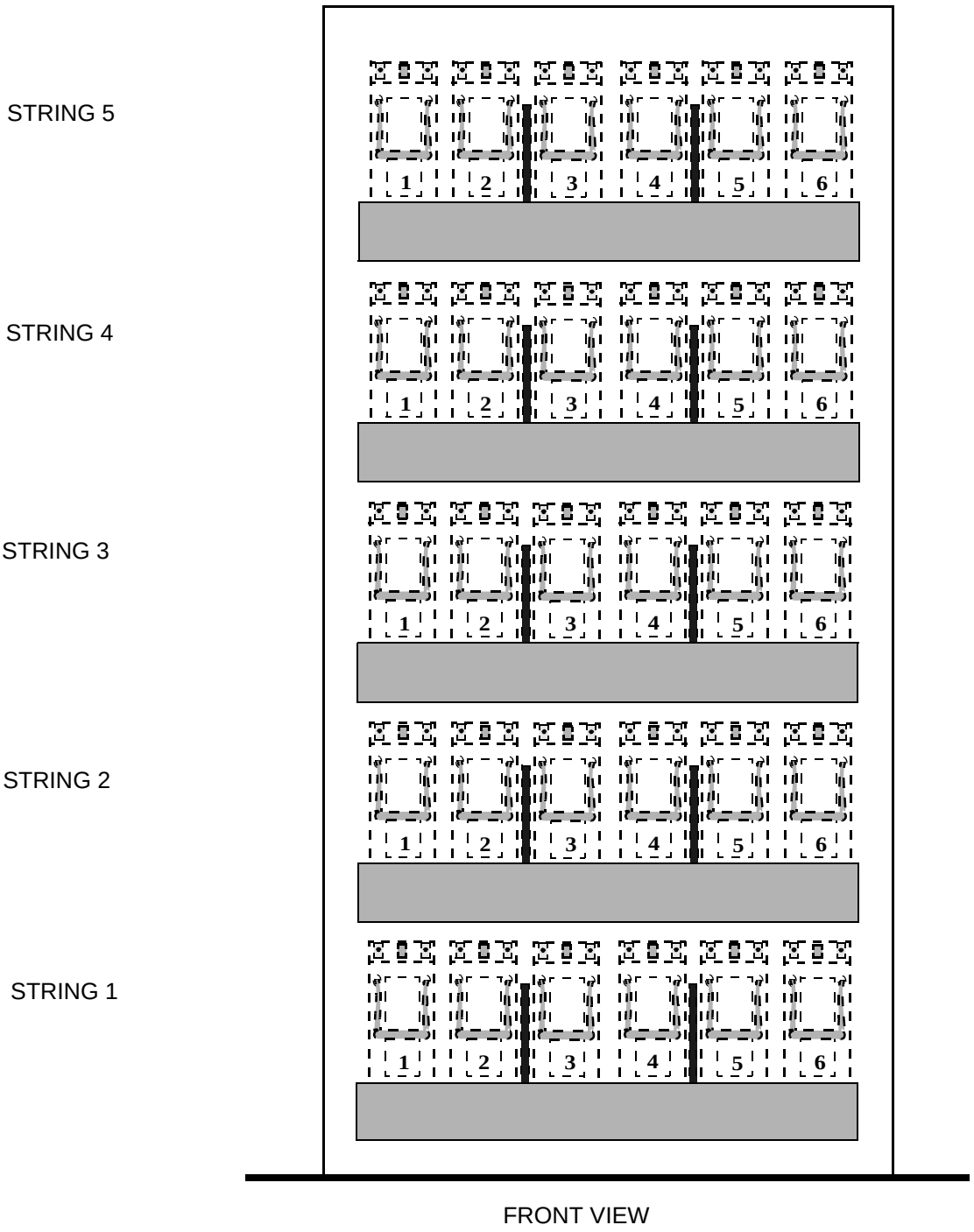
The battery terminals are located on one end of the battery. Positive and negative terminals are clearly labeled “+” and “-”. Strap handles are permanently attached to the battery. Refer to the example figure below.



Important! To prevent an inadvertent electrical short during battery installation, the C-11 batteries have an insulated cover that is factory-installed over the terminals on the individual batteries. Do not remove this cover until you are preparing to complete each connection.

□

The figure below illustrates the battery string positions and battery numbers for C-11 batteries on type 1 shelves.



Place the C-11 batteries on a shelf

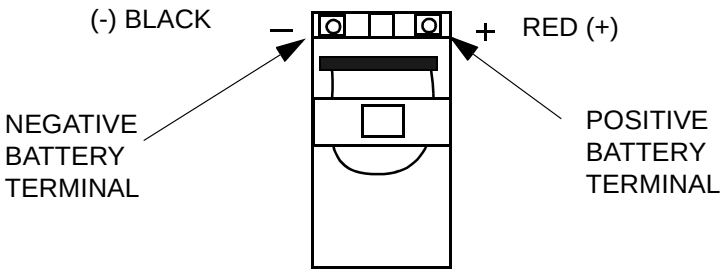
Use the following procedure to place batteries on a shelf, starting with shelf 1 (bottom).

Important! This procedure, and the illustrations it contains, are generic in nature, in order that they may be used for all battery types.

1 Locate the 25 threaded rods shipped with the cabinet.

2 Thread a rod into the center hole of the rear bracket as shown in the Step 8 figure on Page 5- 36, **item 1**.

3 Slide two batteries onto the shelf, one on each side of the center threaded rod. Refer to the figure on Page 5-36, **item 2**.



Important! When installed, the battery terminals on the front, narrow end of the battery should face out of the cabinet. Refer to the figure below.

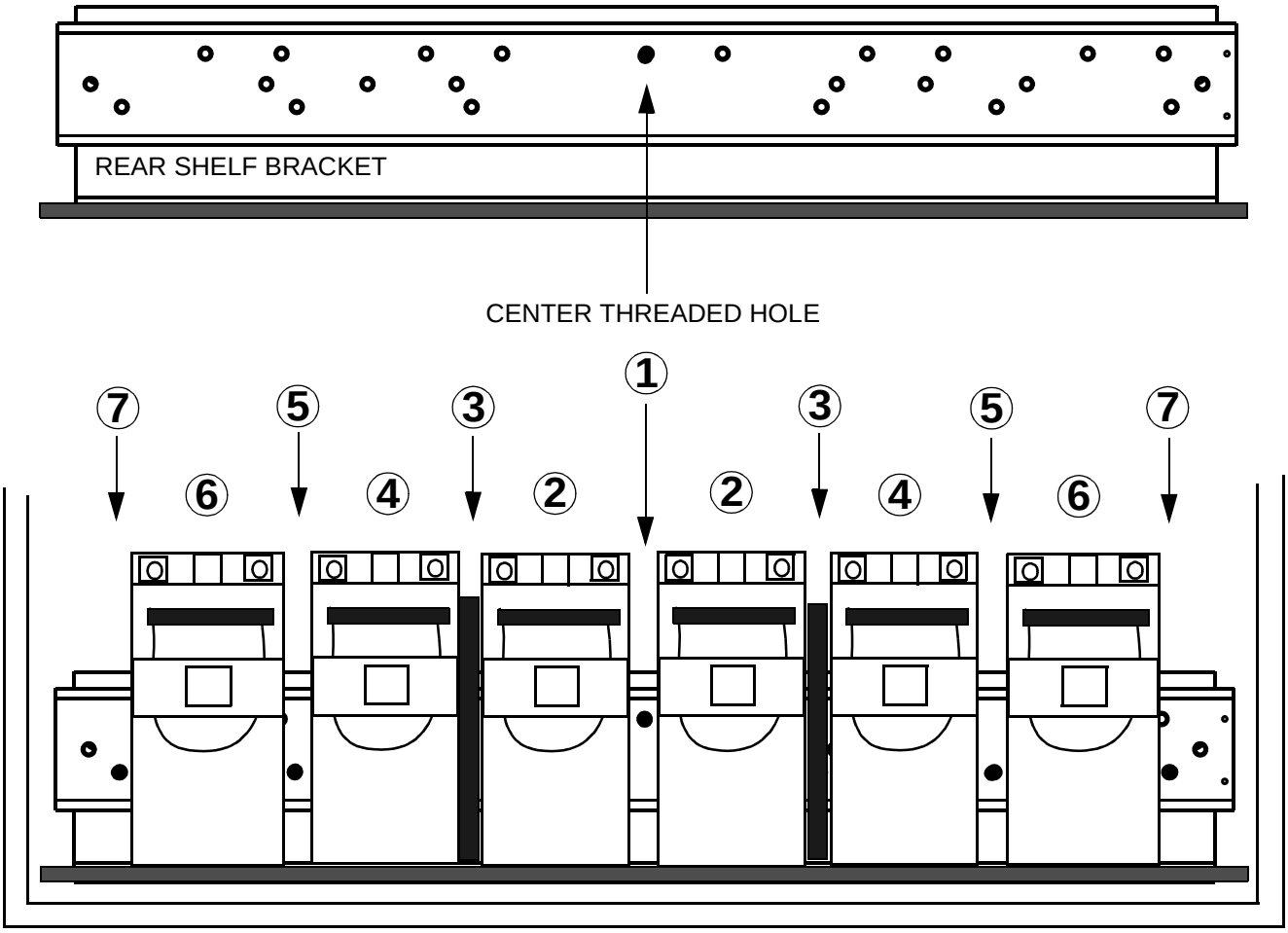
4 Place a **spacer** (supplied with the batteries) on the outside of the two batteries installed in the previous step. Refer to the figure on Page 5-36, **item 3**.

5 Slide two batteries onto the shelf, one on each side of the spacers installed in the previous step. Refer to the figure on Page 5-36, **item 4**.

6 Thread a rod into the appropriate hole on the outside of the two batteries installed in the previous step. Refer to the figure below, **item 5**.

7 Slide the last two C-11 batteries onto the shelf on each side of the threaded rods installed in the previous step. Refer to the figure below, **item 6.**

8 Thread a rod into the appropriate hole on the outside of the last two batteries installed in the previous step. Refer to the figure below, **item 7.**



9 Repeat Steps 1 through 8 for all battery shelves to be populated.

Important! In the event of an upgrade of the primary cabinet that adds the A6 amplifier shelf, the battery compartment is removed. This results in four spare L1 batteries.

Therefore, it may be desirable to plan on leaving the top shelf empty when installing the batteries.

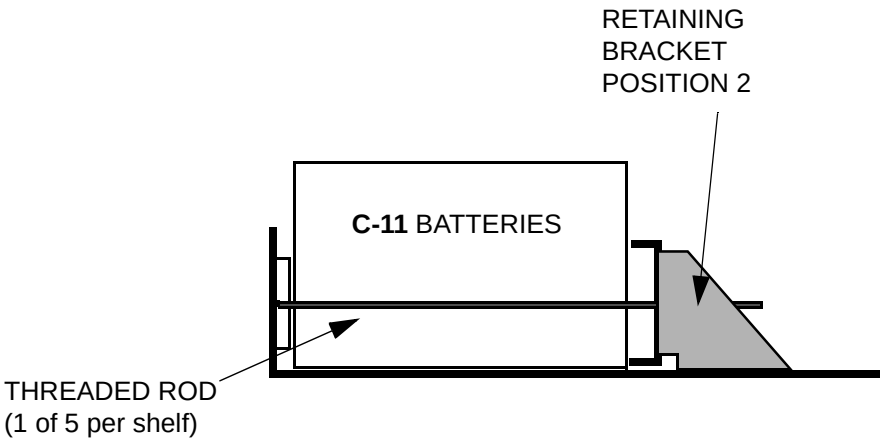
10 Carefully wrap and store the remaining threaded rods, retaining bracket and associated hardware on all shelves not being populated with batteries at this time.

Install the battery retaining bracket

Perform the following steps to install the battery retaining bracket.

1 PrepositION the retaining bracket in the position shown below for C-11 batteries.

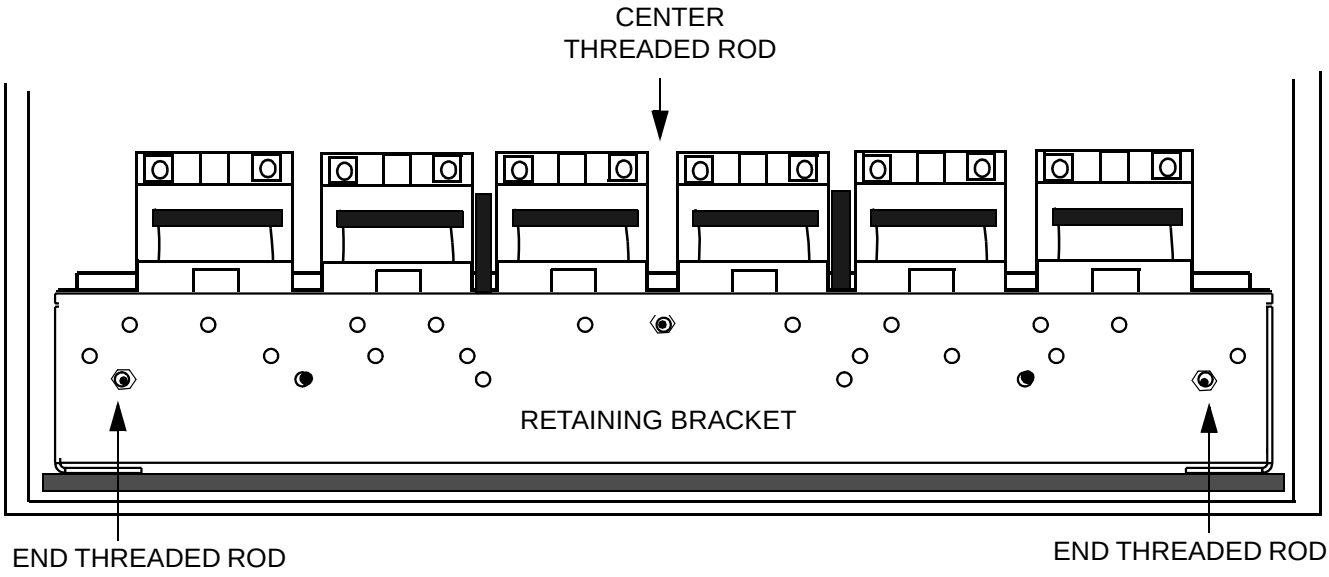
LEFT SIDE VIEW



Important! When performing the next steps, note that the figure illustrates an example only.

2 Slide the retaining bracket over the installed threaded rods.

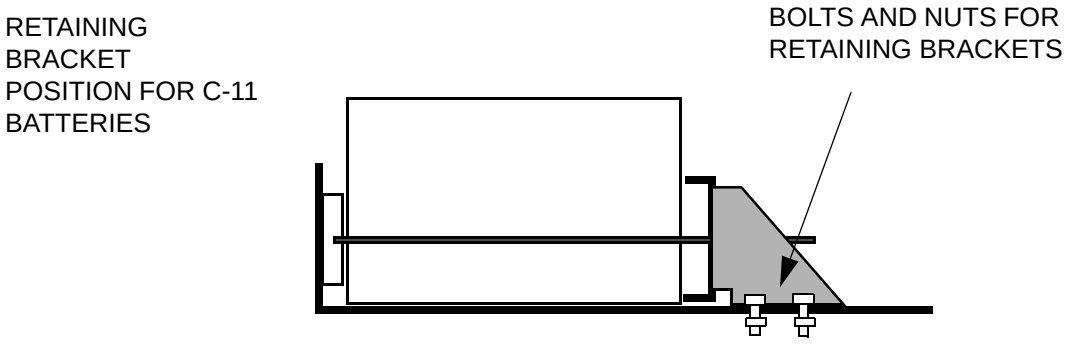
3 Using the nuts and washers provided, attach the retaining bracket at the center and end threaded rods only. Do not tighten the nuts.



4 Using the supplied bolts, washers and nuts, attach the retaining bracket to the shelf. Four sets of hardware are used, two on each side of the bracket. Refer to the figure below.

5 Repeat Steps 1 through 4 for all populated battery shelves.

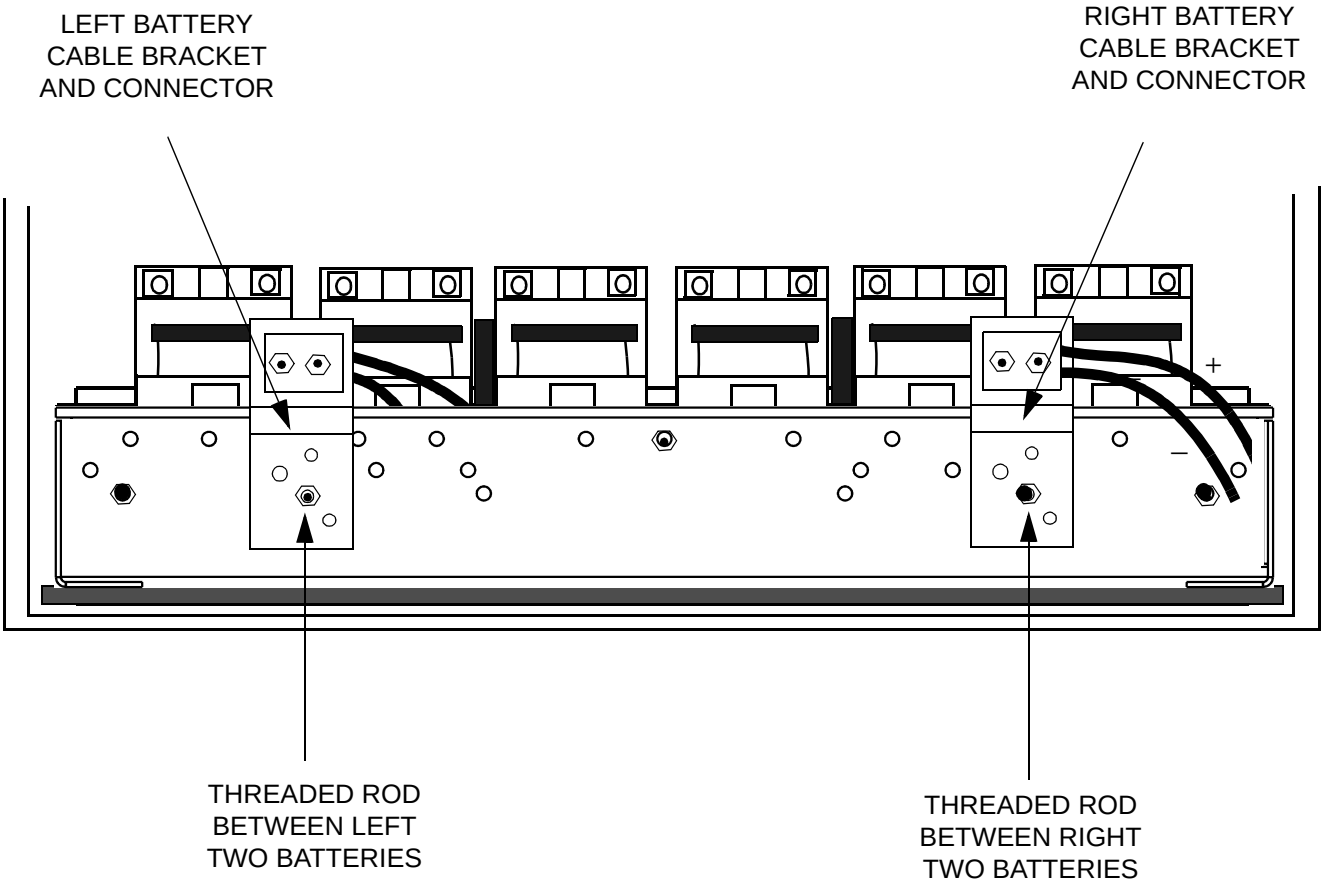
LEFT SIDE VIEW



Attach the two battery cable assemblies to the retaining bracket (C-11 batteries only)

Perform the following steps to attach the battery cable assemblies to the retaining bracket (for C-11 batteries only).

1 Attach the battery cable assemblies to the threaded rods that are positioned between the left two batteries and between the right two batteries. Do not connect the cables to the batteries at this time. Refer to the figure below.



2 Tighten all five nuts.

END OF STEPS

Place the battery negative and positive bus bars

Important! Although all four parallel bus bars are identical, observe that the orientation of the positive and negative parallel bus bars is different on the left three batteries (1, 2 and 3) than on the right three batteries (4, 5 and 6). Also observe that the negative and positive pairs are positioned in a reverse orientation to each other. Refer to the figure on Page 5-41.

Refer to the figure on Page 5-41, and perform the following steps to connect the negative and positive bus bars.

1 Apply antioxidant compound to the positive (+) terminal and negative (-) terminal of all batteries.

Important! When performing the next two steps, refer to the Step 5 figure on Page 5- 41. For batteries 1, 2, and 3, use "A" for positive bus bar installation and "B" for negative bus bar installation. For batteries 4, 5, and 6, use "C" for negative bus bar installation and "D" for positive bus bar installation.

2 Place bus bars on batteries 1, 2, and 3.

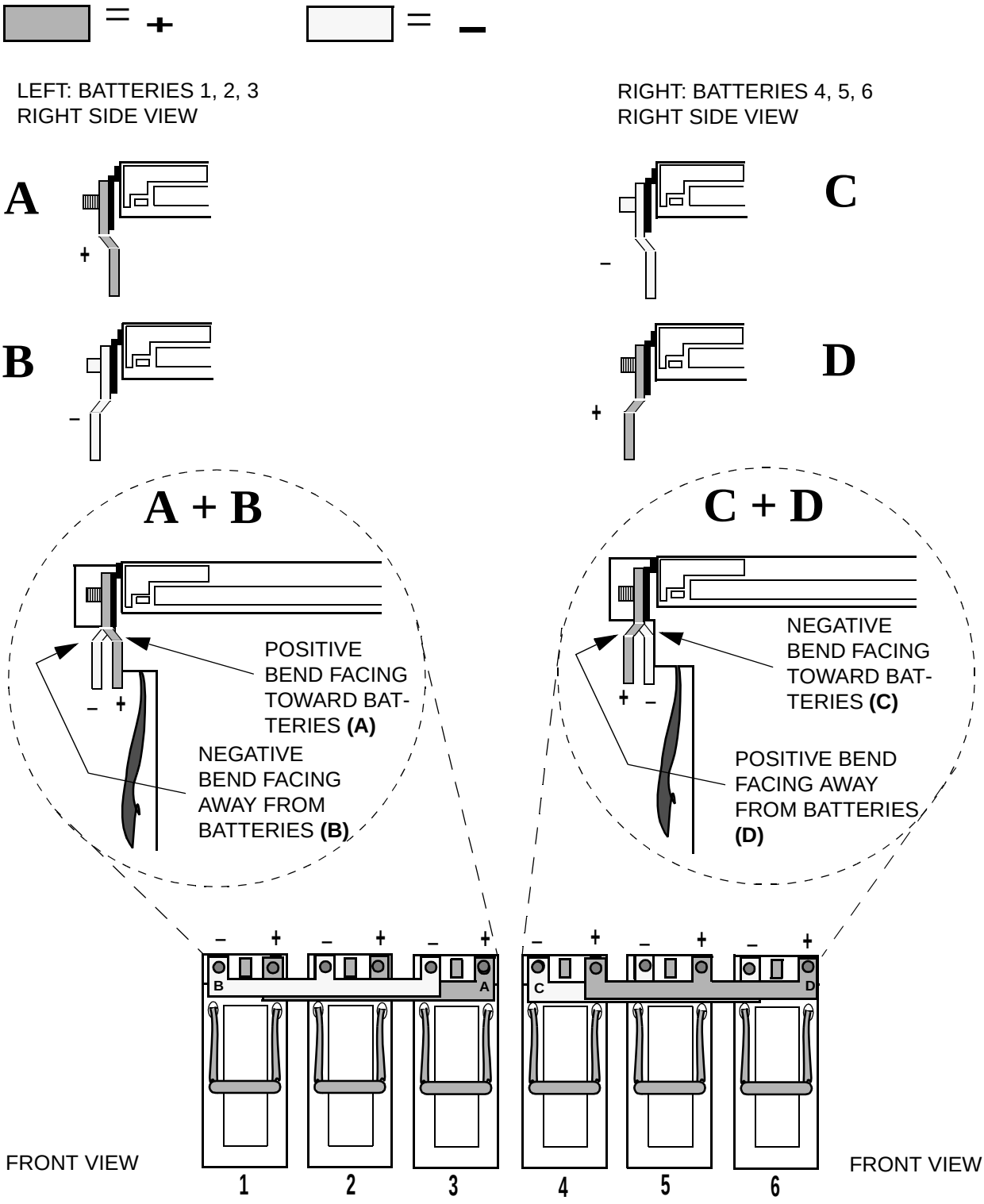
- Place a bus bar (A) on the positive terminals with the bend facing toward the batteries.
- Place a bus bar (B) on the negative terminals with the bend facing away from the batteries.

3 Place bus bars on batteries 4, 5, and 6.

- Place a bus bar (C) on the negative terminals with the bend facing toward the batteries.
- Place a bus bar (D) on the positive terminals with the bend facing away from the batteries.

4 Temporarily secure each bus bar in place with a washer and nut.

5 Repeat Steps 1 through 4 for all remaining battery shelves, if applicable. Refer to the figure below.



Connect the positive battery cables to the batteries

Important! When performing the following steps, for safety reasons, always connect the positive battery cables first and the negative battery cables last (when instructed to do so).

Perform the following steps to connect the positive battery cables to the batteries.

1 Locate the previously mounted battery cable assemblies on the bottom shelf.

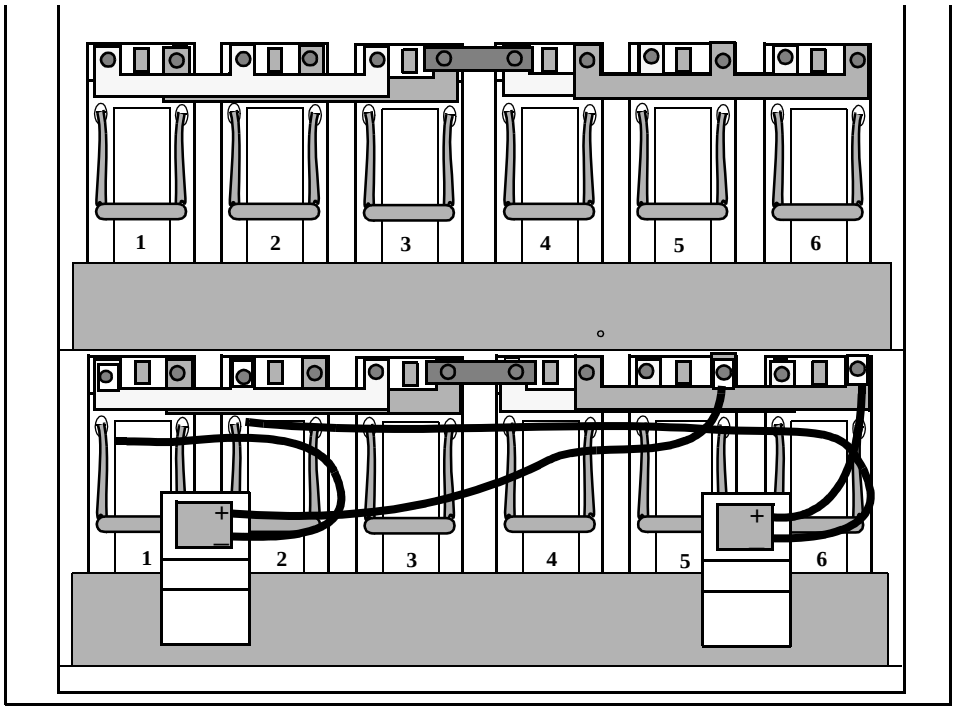
2 Separate two of the battery cables. The positive cables from each of the two battery cable assemblies will be connected to the batteries in the next step.

Important! When performing the next step, note that the two positive battery cables being connected come from two separate battery connectors. Refer to the figure on Page 5-43.

3 Apply antioxidant compound to the two positive (+) terminals of batteries 5 and 6. Refer to the figure on Page 5-43.

4 Connect the two positive (+) battery cables (from separate connectors) to the positive (+) terminals of batteries 5 and 6, using the flat washers, lock washers and nuts.

5 Repeat Steps 2 through 4 for all populated battery shelves. Remember, for safety reasons, to connect the positive battery cables first and the negative battery cables last (when instructed to do so).



6 Do not torque the nuts on the positive battery connections at this time. The nuts on all positive battery connections will be torqued after mounting of the series bus bars in the next procedure.

END OF STEPS

Attach the interconnecting bus bars

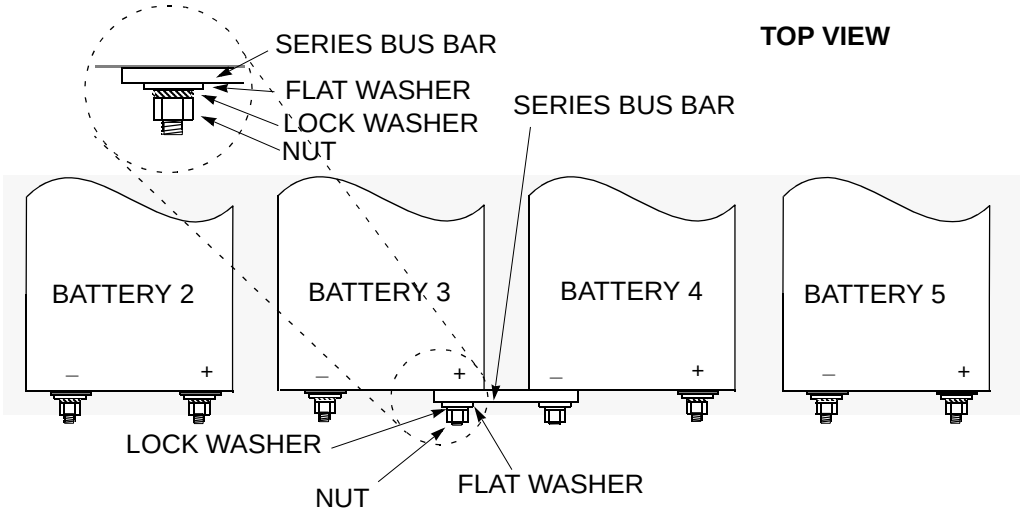
Perform the following steps to connect the interconnecting bus bars. Do the bottom shelf first.

1 Remove the series bus bar from the kit provided with the batteries.

2 Apply antioxidant compound to the interconnecting bus bar, the positive (+) terminal of battery 3, and the negative (-) terminal of battery 4. Refer to the figure below.

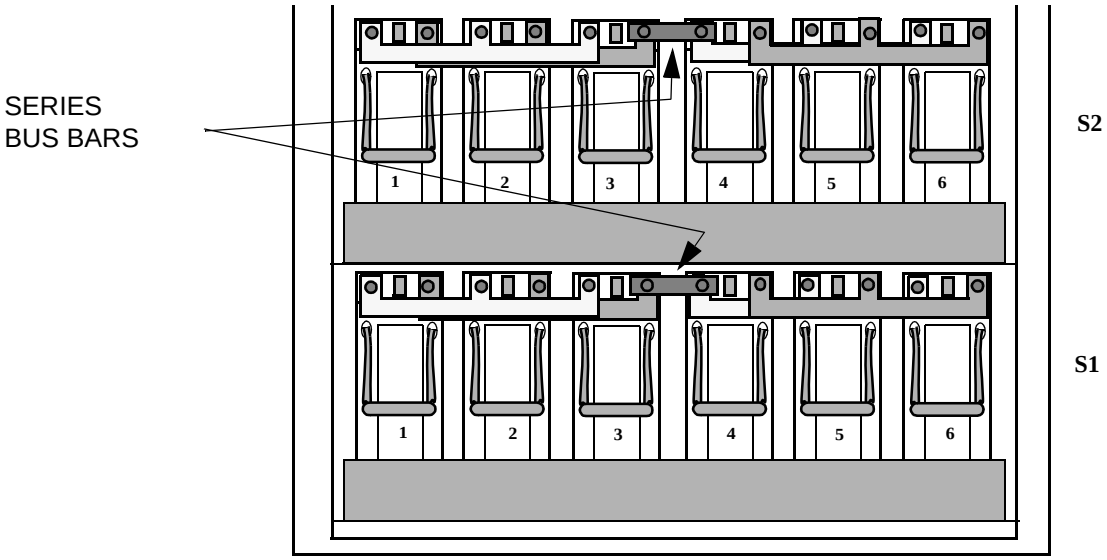
3 Place the interconnecting bus bar between the positive terminal of battery 3 and the negative terminal of battery 4.

4 Connect the interconnecting bus bar using the flat washers, lock washers and nuts. Refer to the figure below for a top view (for mounting order). Refer to the figure on Page 5-45 for a front view.



PARALLEL BUS BARS AND CABLES NOT SHOWN FOR CLARITY

5 Repeat Steps 1 through 4 for the remaining battery shelves, if applicable. Refer to the figure below.



BATTERY CABLES NOT SHOWN FOR CLARITY

6 Torque the following connections using an insulated 10-mm socket and torque wrench set at 62 in.-lb. (7.0 Nm). Do not use the torque specifications provided in Chapter 1.

- All series bus bar connections (+ and -, all shelves)
- All remaining positive battery connections, all shelves
- Negative battery connections on batteries 5 and 6, all shelves

Connect the negative battery cables to the batteries

Perform the following steps to connect the negative battery cables to the batteries.

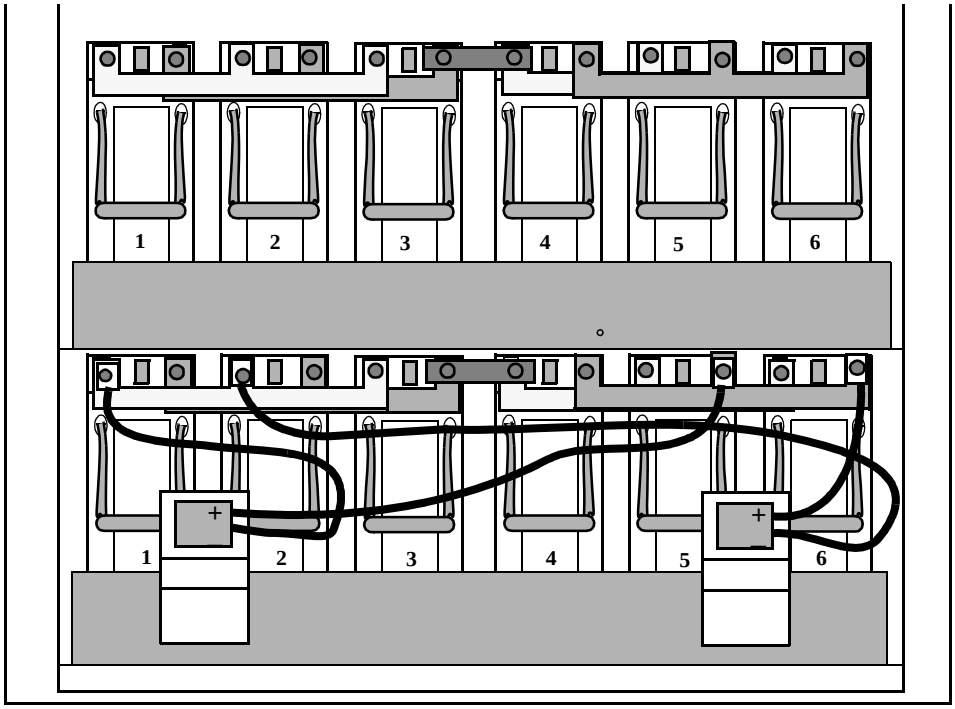
1 Separate two of the battery cables. The negative cables from each of the two battery cables will be connected to the batteries in the next step.

> **Important!** When performing the next step, note that the two negative battery cables being connected come from two separate battery connectors. Refer to the figure on Page 5-47.

2 Apply antioxidant compound to the two negative (-) battery terminals of batteries 1 and 2. Refer to the figure on Page 5-47.

3 Connect the two negative (-) battery cables (from separate connectors) to the negative (-) terminal of batteries 1 and 2, using the flat washers, lock washers and nuts. Refer to the figure on Page 5-47.

4 Repeat Steps 2 and 3 for all remaining battery shelves, if applicable.



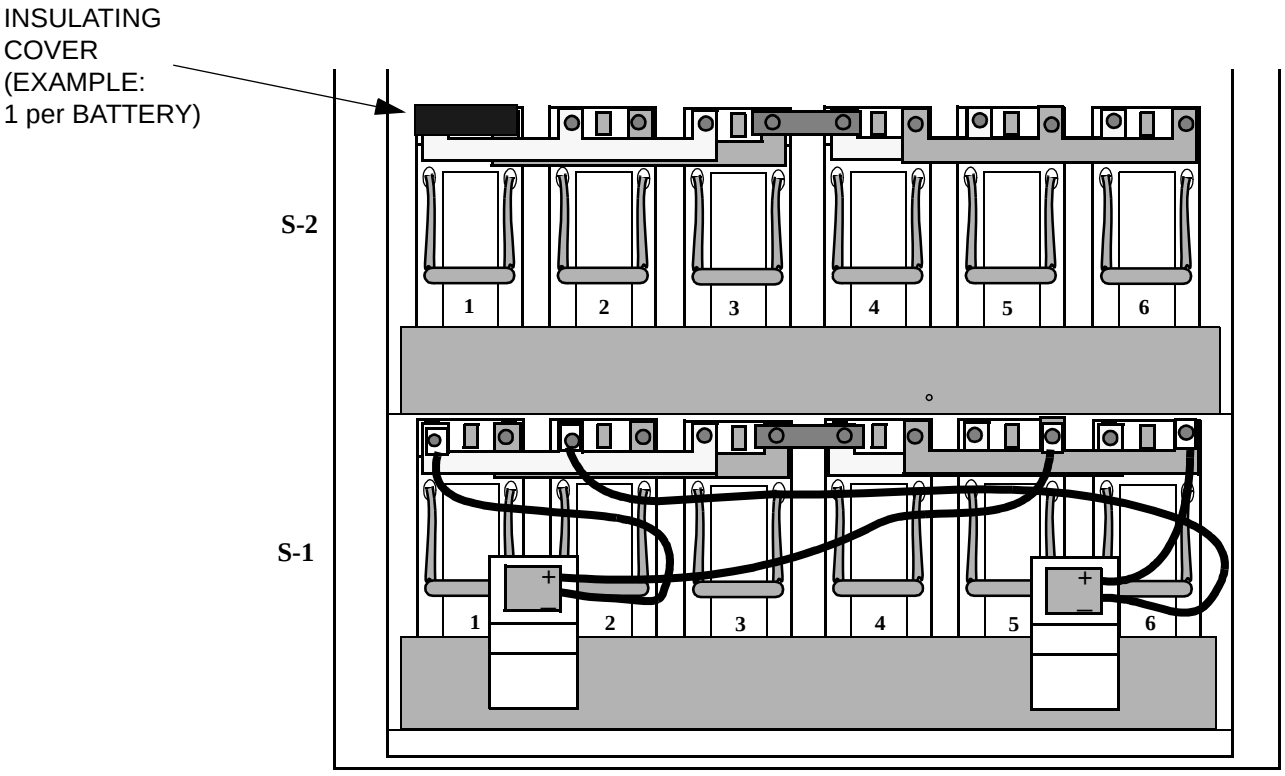
5 Torque all remaining negative connections using an insulated 7/16-inch socket and torque wrench set at 62 in.-lb. (7.0 Nm). Do not use the torque specifications provided in Chapter 1.

END OF STEPS

Install the insulating battery terminal covers

Perform the following steps to install the insulating battery terminal covers.

1 Place all insulating covers on the battery terminals, as shown in the figure below.



Important! Skip to How to route the thermal probe cable(s) and mount the thermal probe(s) in the battery cabinets on Page 5 - 81 to continue the installation.

END OF STEPS

□

How to install 12IR125 type batteries on type 2 battery shelves

Overview

This section provides instructions for the installation and connection of 12IR125 batteries. The instructions are the same for both a first or second battery cabinet, except in the case of thermal probes, where the exceptions are noted. This section contains the following procedures.

Read battery installation procedure overview

Important! In the event that the battery compartment is removed from the primary cabinet because of an upgrade that adds the A6 amplifier shelf (carriers 5 and 6), up to four spare L1 batteries will result. The end user may wish to use these batteries in the battery cabinet, in which case a shelf must be left vacant. Therefore, while performing any task involving a type 1 top battery shelf (shelf 5), it may be desirable to plan on leaving that shelf empty when installing the batteries.

The battery cabinet can contain up to 20 batteries that are wired in a series/parallel configuration which provides 24-volt backup. Two strings (four batteries) can be mounted on each shelf of the battery cabinet. Refer to the figure on Page 5-51.

Prepare the 12IR125 batteries for installation

To prepare the12IR125 batteries, follow all appropriate standard practices for the storage and handling of batteries. Complete the warranty procedures and the following steps.

1 Check and record battery initial voltages.

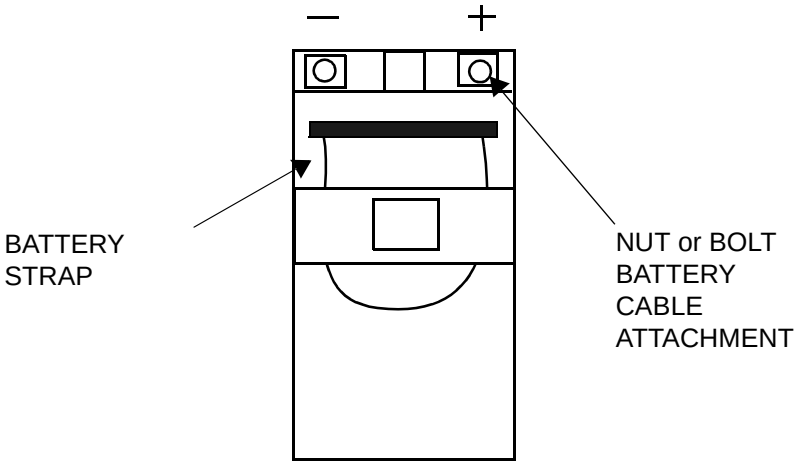
2 Record all battery date codes.

3 Include this information with documentation supplied to the customer.

END OF STEPS

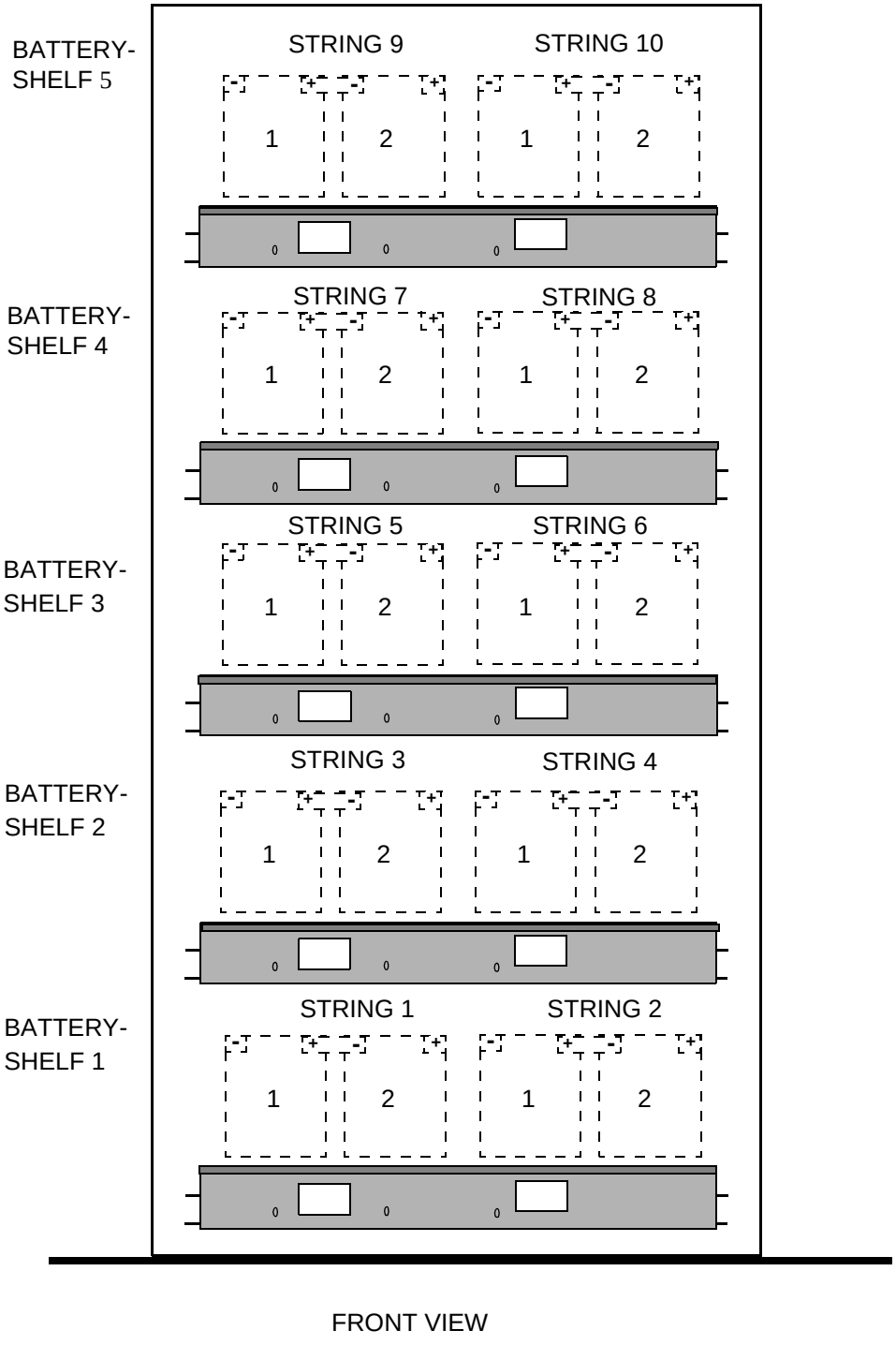
Description of the batteries

The 12IR125 battery terminals are located on one end of the battery. Positive and negative terminals are clearly labeled "+" and "-". Strap handles are permanently attached to the battery. Refer to the example figure below.



Important! To prevent an inadvertent electrical short during battery installation, certain battery types have an insulated cover that is factory-installed over the terminals on the individual batteries. Do not remove this cover until you are preparing to complete each connection.

The figure below illustrates the12IR125 battery string positions and battery numbers in the WNG24-BC battery cabinet.



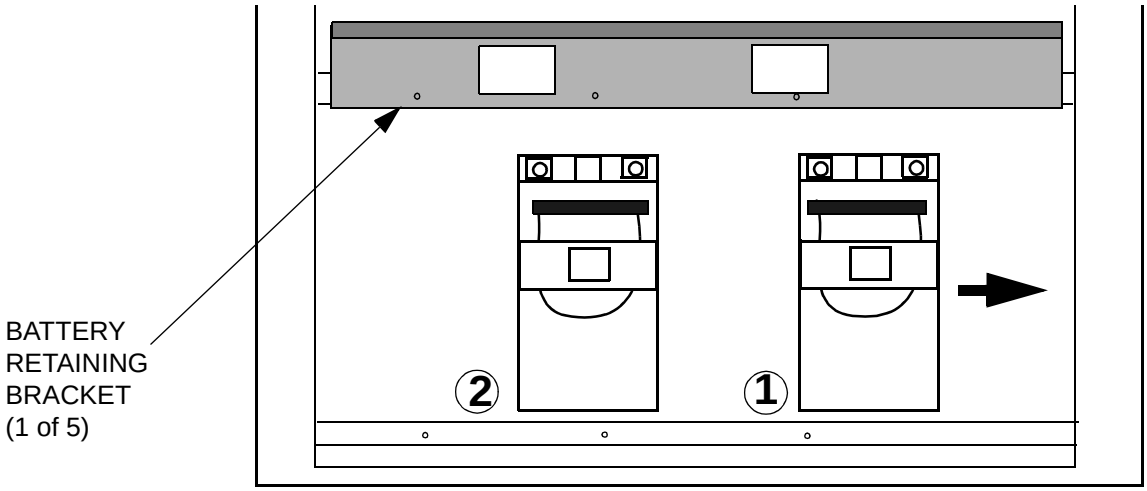
FRONT VIEW

Place the 12IR125 batteries on a shelf

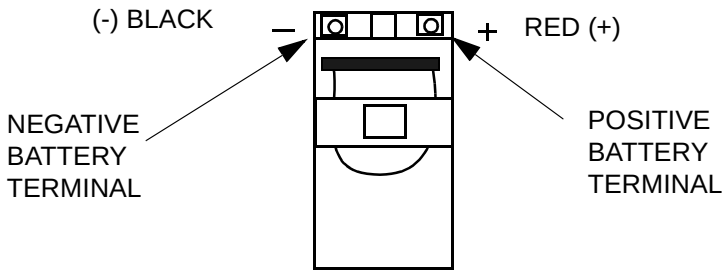
Use the following procedure to place batteries on a shelf, starting with shelf 1 (bottom).

1 Remove the battery retaining brackets that are located on each of the five battery cabinet shelves (if they will be populated with batteries), and carefully lay them aside. Refer to the figure below.

Important! Carefully slide a battery into the center position on the bottom battery shelf (1). Then, slide the battery to the right side of the cabinet shelf. Refer to item 1 in the figure below.



Important! When installed, the battery terminals on the front, narrow end of the battery should face out of the cabinet. The terminals should have a protective cap. Refer to the figure below.



2 Slide another battery into the center of the cabinet shelf. Also, slide this battery to the right side of the shelf. Refer to the figure on Page 5-53, item 2.

3 Slide the remaining the remaining two batteries onto the shelf.

4 Repeat steps 2 through 4 to install batteries on shelves 2 through 5, as applicable.

5 Push all batteries to the rear of the battery shelf.

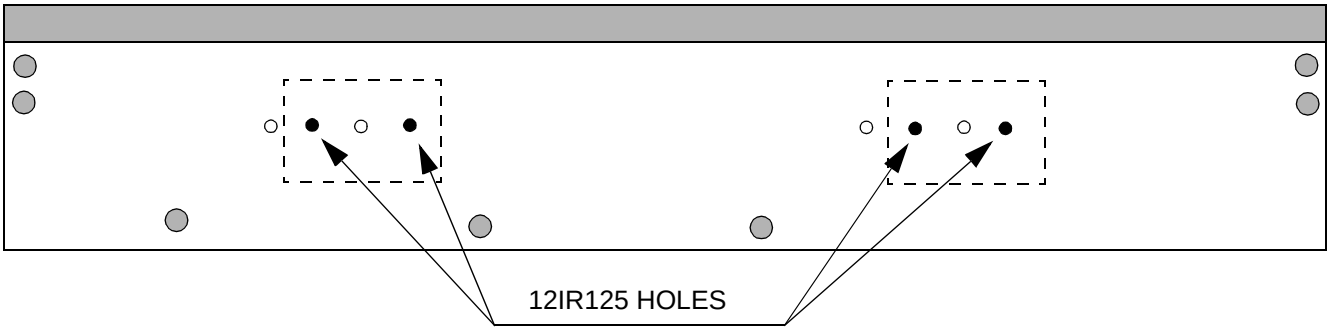
END OF STEPS

Adjust and secure the front battery retaining brackets

Important! When performing the following steps, the battery retaining brackets must be installed as shown in the figure below and the Step 5 figure on Page 5- 56. If the brackets were not shipped installed in the orientation shown, they must be reversed as described in the following steps.

Perform the following steps to correctly install the retaining brackets.

1 Observe the orientation of the battery retaining brackets shown in the figure below. If the battery retaining brackets were not shipped in the orientation shown, they must be reversed, which requires the battery connectors to be moved to the other side of the bracket.

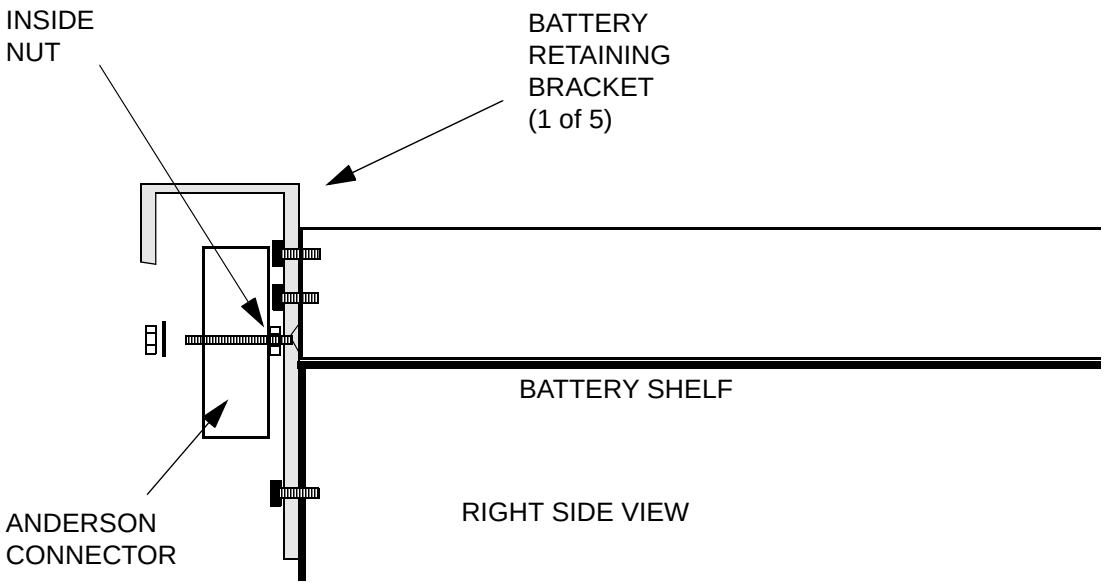


2 If the battery retaining brackets were shipped in the orientation shown, reinstall the brackets as shown in the Step 5 figure on Page 5- 56, and then skip to Connect positive battery cables to all battery strings on Page 5 - 57. If not, proceed to the next step, to reverse the brackets, which requires the battery connectors to be moved to the other side of the bracket.

3 Remove the nuts and washers from each battery connector and remove the connectors from the bracket.

4 Remove the inside nuts, and then the connector mounting bolts from their existing holes in the bracket.

5 Reverse and reinstall the brackets as shown in the figure below.



Important! When performing the next step, note that after the retaining bracket is reversed, the holes counter-sunk on the inside of the bracket will be the correct holes to use. Also note that the correct holes will always be the right-hand set viewed from the front of the correctly installed bracket.

6 Reinstall the connector mounting bolts in the 12IR125 holes. Refer to the figure on Page 5-55.

7 Replace the battery connectors on the brackets, and then reinstall the brackets on the shelf. Refer to the figure above.

END OF STEPS

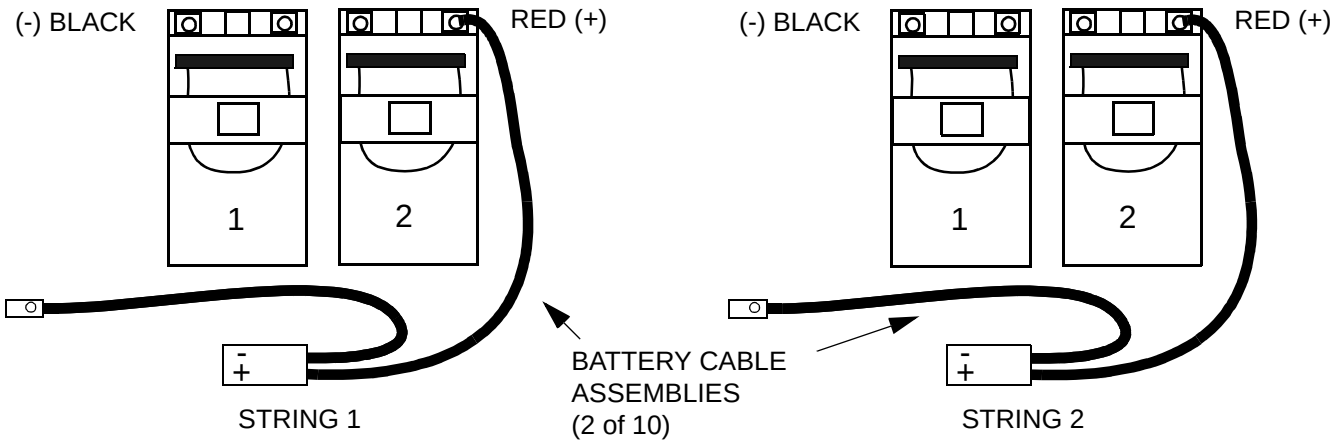
Connect positive battery cables to all battery strings

Important! When performing the following steps, do not connect the negative battery cables. The negative battery cables are not connected until after the interconnecting bus bars have been installed in the next procedure.

Perform the following steps to connect the positive battery cables to all battery strings.

1 Locate the ten battery cable assemblies. Refer to the figure below.

2 Starting with string 2 on the right side of shelf 1, remove the protective cap from the terminals of battery 2. Refer to the figure below.



3 Apply antioxidant compound to the positive (+) terminal of battery 2 of string 2.

4 Connect the positive (+) battery cable to the positive (+) terminal on battery 2 of string 2, using the flat washer, lock washer and nut provided. Refer to the figure on Page 5-60 for a top view of a typical battery cable connection.

5 Torque the positive battery connections using an insulated socket and torque wrench set at 60 in.-lb. (6.8 Nm). Do not use the torque specifications provided in Chapter 1.

6 Repeat steps 1 through 5 for the number 2 battery in all remaining battery strings.

END OF STEPS

Attach interconnecting bus bars to all battery strings

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

1 Starting with string 2 on the right side of shelf 1, remove the protective cap from the terminals of battery 1.

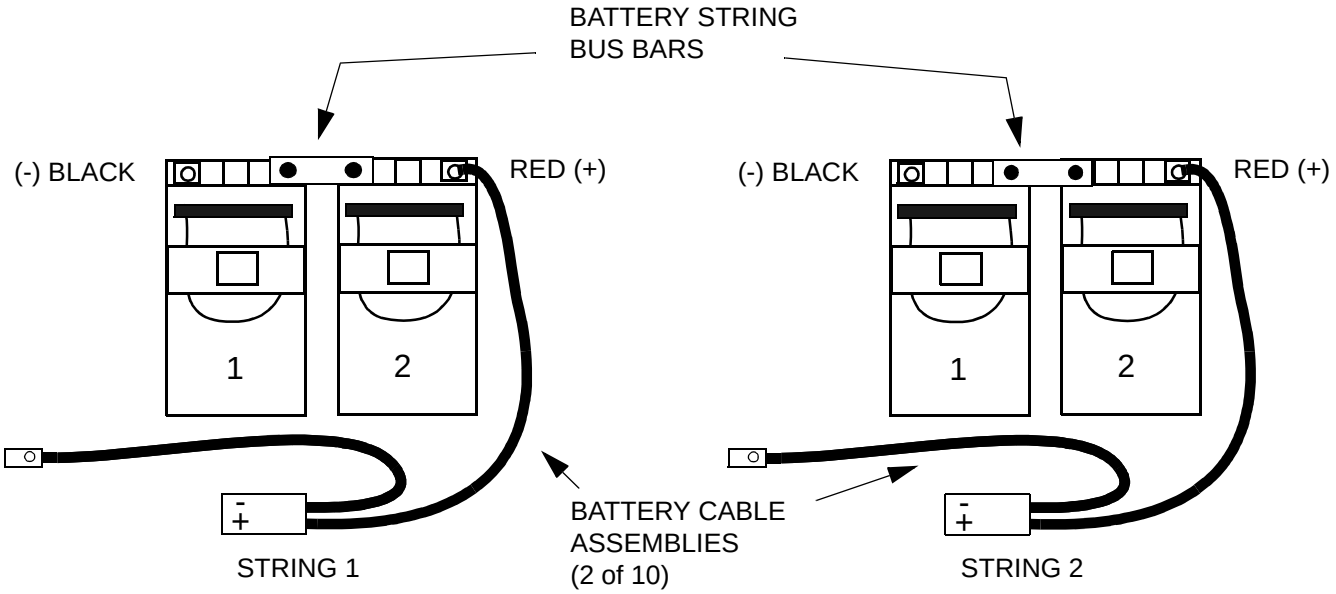
2 Remove the interconnecting bus bar from the kit that is provided with each pair of batteries.

3 Polish the interconnecting bus bar.

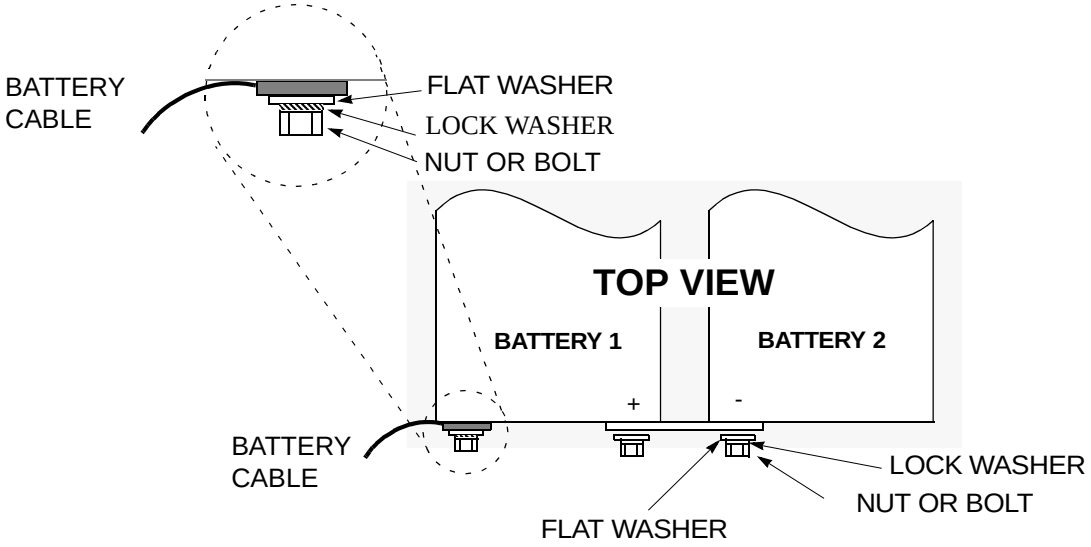
4 Apply antioxidant compound to the interconnecting bus bar.

5 Apply antioxidant compound to the positive (+) terminal of battery 1 and the negative (-) terminal of battery 2 of string 2.

6 On string 2, place an interconnecting bus bar between the positive terminal of the left-hand battery (#1) and the negative terminal of the right-hand battery (#2). Refer to the figure below.



7 Connect the interconnecting bus bar using the flat washer, lock washer and nut provided. Refer to the figure below, which illustrates the interconnecting bus bar installation, including the installation order of the washers.



8 Torque the two bus bar connections using an insulated socket and torque wrench set at 60 in.-lb. (6.8 Nm). Do not use the torque specifications provided in Chapter 1.

9 Repeat steps 1 through 8 for the remaining battery strings.

END OF STEPS

Connect the negative battery cables to all battery strings

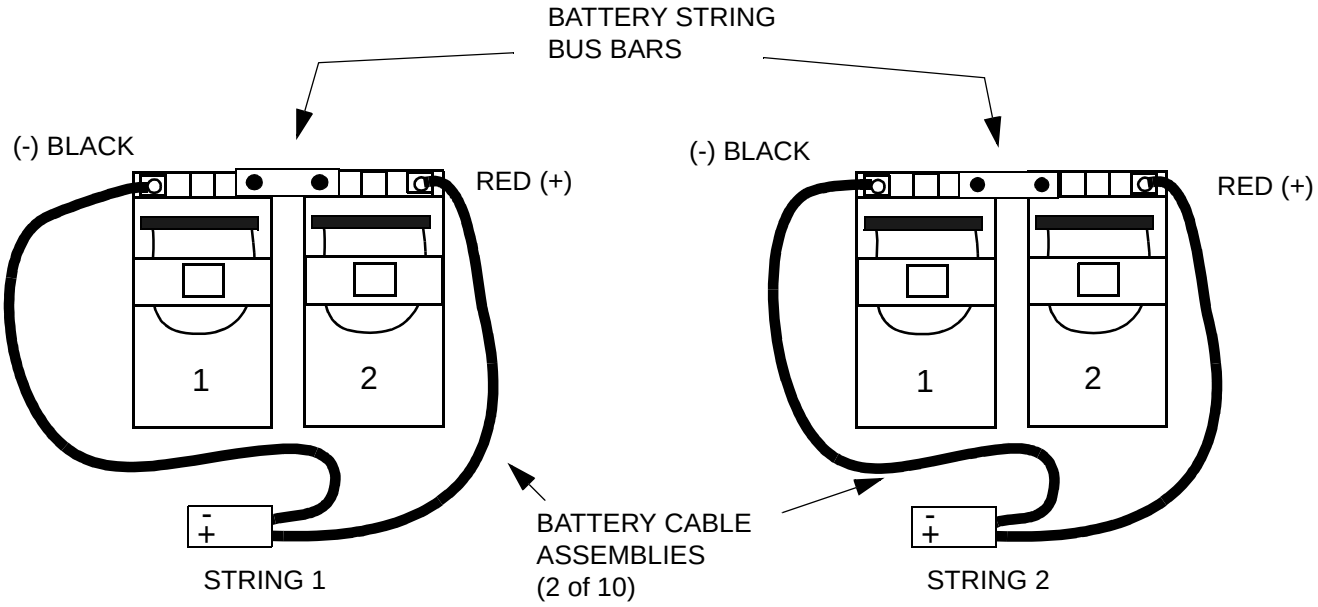
Perform the following steps to connect the negative battery cables to all battery strings. Refer to the Step 4 figure on Page 5- 62

1 Apply antioxidant compound to the negative (-) terminal of battery 1 of string 2.

2 Place the negative (-) battery cable on the negative (-) terminal on battery 1, string 2, using the flat washer, lock washer and nut provided. Refer to the figure on Page 5-60 for a top view of a typical battery cable connection.

3 Repeat steps 1 and 2 for all remaining battery strings.

4 Torque the negative battery connections using an insulated socket and torque wrench set at 60 in.-lb. (6.8 Nm). Do not use the torque specifications provided in Chapter 1.



Important!Skip to How to route the thermal probe cable(s) and mount the thermal probe(s) in the battery cabinets on Page 5 - 81 to continue the installation.

END OF STEPS

How to install C-11 type batteries on type 2 battery shelves

Overview

This section provides the instructions for the installation and connection of the C-11 batteries. The instructions are the same for both a first or second battery cabinet, except in the case of thermal probe cables, where the exceptions are noted.

Read battery installation procedure overview

Important! In the event that the battery compartment is removed from the primary cabinet because of an upgrade that adds the A6 amplifier shelf (carriers 5 and 6), up to four spare L1 batteries will result. The end user may wish to use these batteries in the battery cabinet, in which case a shelf must be left vacant. Therefore, while performing any task involving a type 1 top battery shelf (shelf 5), it may be desirable to plan on leaving that shelf empty when installing the batteries.

The battery cabinet can contain up to 30 batteries that are wired in a series/parallel configuration, which provides 24-volt backup. One string (six batteries) of C-11 batteries can be mounted on each shelf of the battery cabinet. Refer to the figure on Page 5-65.

Prepare the batteries for installation

To prepare the batteries, follow all appropriate standard practices for the storage and handling of batteries. Complete the warranty procedures and the following steps.

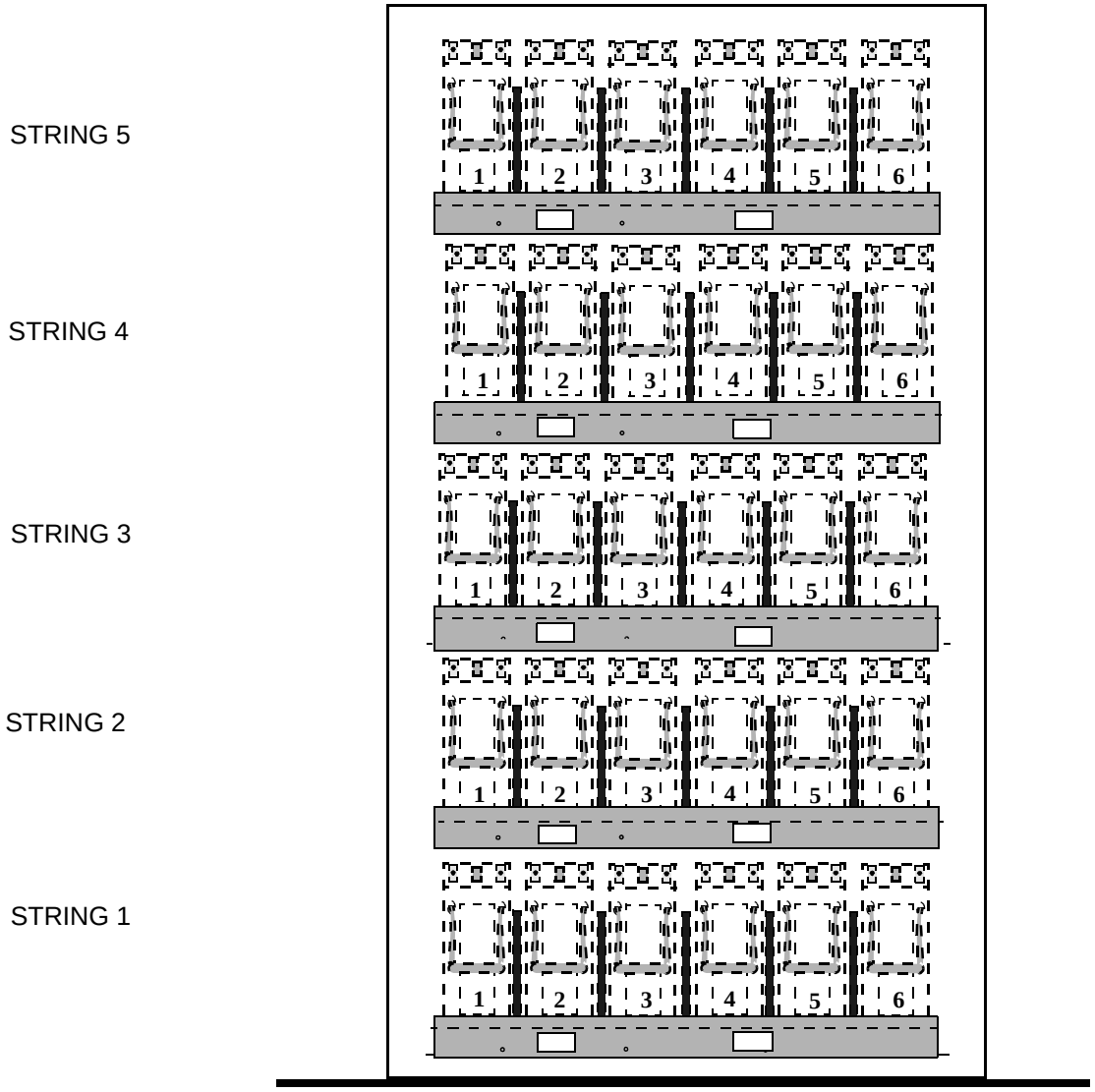
1 Check and record battery initial voltages.

2 Record all battery date codes.

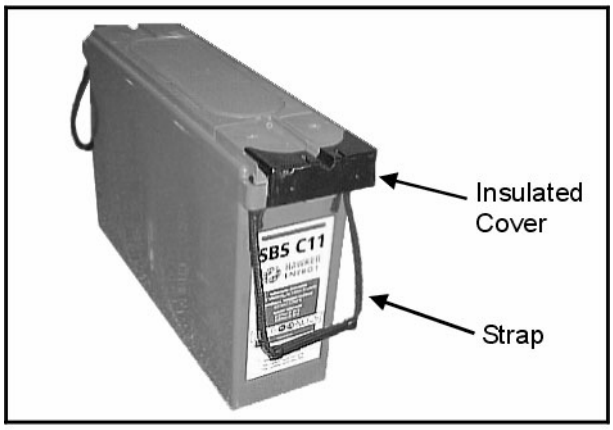
3 Include this information with documentation supplied to the customer.

END OF STEPS

The figure below illustrates the battery string positions and battery numbers for the C-11 batteries in the WNG24-BC battery cabinet.



The battery terminals are located on one end of the battery. Positive and negative terminals are clearly labeled "+" and "-". Strap handles are permanently attached to the battery. Refer to the figure below.



Important! To prevent an inadvertent electrical short during battery installation, an insulated cover is factory-installed over the terminals on the batteries. Do not remove this cover until you are instructed to do so.

The following label is attached to the front of each battery. Refer to the figure below.

CAUTION

The batteries weigh about 66 pounds (30 kg) each. Use care when lifting them.

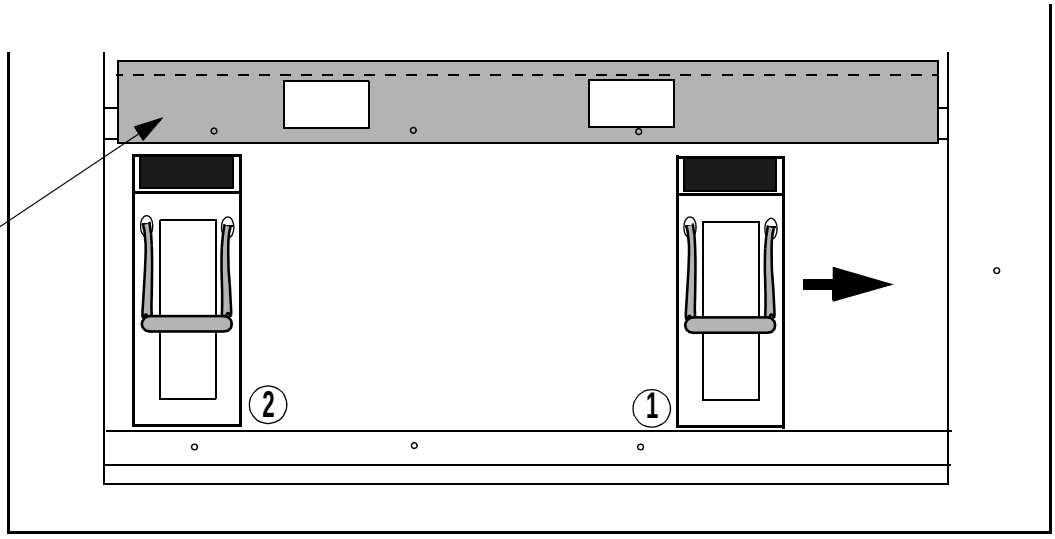
Place the C-11 batteries on a shelf

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

1 Remove the retaining brackets that are located on each of the five battery cabinet shelves (if they will be populated with batteries), and carefully lay them aside. Refer to the figure below.

Important! Before performing the next step, carefully observe the installation of the battery retaining brackets before removing them. Refer to the figure on Page 5-71 for the correct retaining bracket installation for C-11 batteries. If they are not installed properly for C-11 batteries, they must be reversed in the next procedure block. This requires the removal of the battery connectors. It may be easier to remove the battery connectors from the retaining bracket prior to removal of the brackets from the shelves.

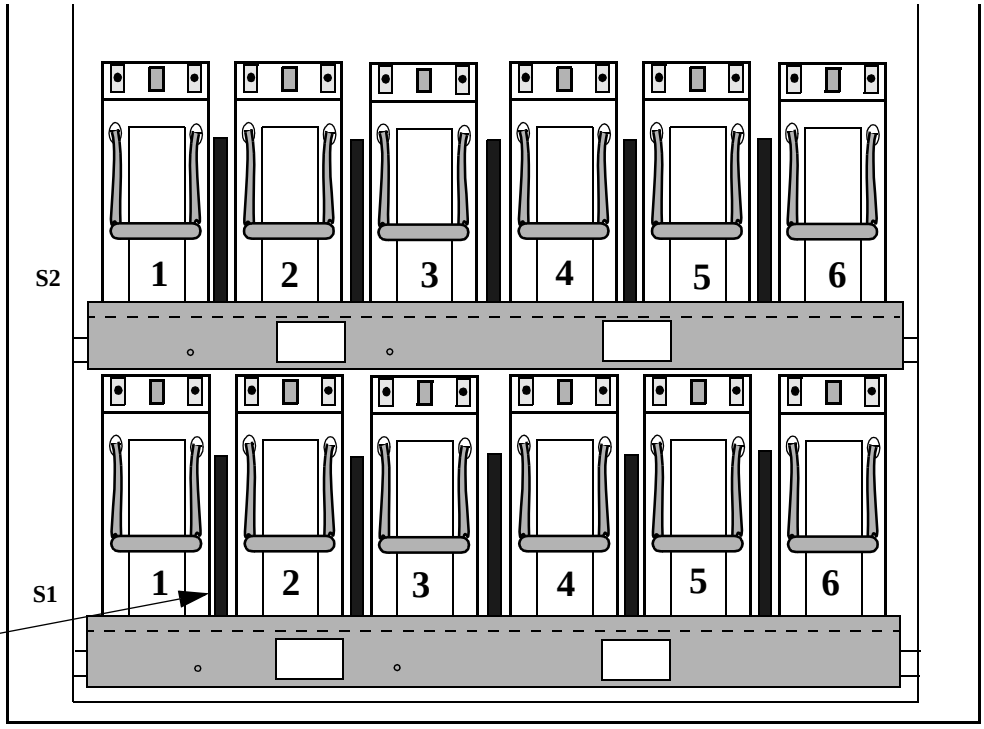
2 Lift and place one battery on the center of the bottom shelf, with the battery terminals facing towards the front. Refer to the figure below.



3 Slide the first battery to the right-most position. Refer to the figure on Page 5-68, item 1.

4 Place the left-most battery, and then the four center batteries. Refer to the figure on Page 5-68, item 2.

5 Install the battery spacers in the locations shown in the figure below (five per shelf).



Important! Note the position numbers of the batteries in the figure above, which will be used for identification purposes when connecting the bus bars, battery cables, and the thermal probes.

6 Repeat steps 1 through 5 for the remaining battery shelves, if applicable.

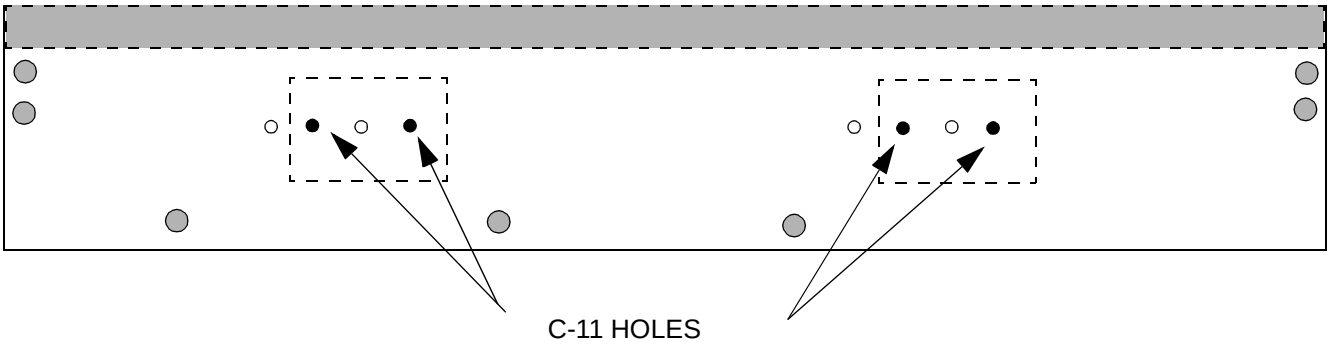
END OF STEPS

Reinstall the battery retaining brackets

Important! When performing the following steps, the battery retaining brackets must be installed as shown in the Step 5 figure on Page 5- 71, for C-11 batteries. If the brackets were not shipped installed in the orientation shown, they must be reversed as described in the following steps.

Perform the following steps to correctly install the retaining brackets.

1 Observe the orientation of the battery retaining brackets shown in the figure below. If the battery retaining brackets were not shipped in the orientation shown, they must be reversed, which requires the battery connectors to be moved to the other side of the bracket. Refer to the figure below and the Step 5 figure on Page 5- 71.



2 If the battery retaining brackets were shipped in the orientation shown, reinstall the brackets as shown in the Step 5 figure on Page 5- 71, and then skip to Place the battery negative and positive bus bars on Page 5 - 72 of this procedure. If not, proceed to the next step.

Important! If the battery retaining brackets were not shipped in the orientation shown, they must be reversed, which requires the battery connectors to be moved to the other side of the brackets.The following steps provide the applicable instructions.

3 Remove the nuts and washers from each battery connector and remove the connectors from the bracket.