

# Speed D Switchboard

Operation and maintenance manual – English

Revision 1.0

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# Publication information

## Revision history

Revision number	Release date	Change description
1.0	December 2025	Initial release.

## Edition notice

This document is based on information available at the time of its publication. While efforts have been made to ensure accuracy, the information contained herein does not cover all details or variations in hardware and software, nor does it provide for every possible contingency in connection with installation, operation, and maintenance. Features may be described herein that are not present in all hardware and software systems.

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## Applicable standards

**UL891** – Standard for Switchboards

**NFPA 70E** – National Electric Code

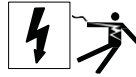
**Symbols used**

Symbol	Description
 The logo consists of the letters 'UL' in a bold, sans-serif font, enclosed within a circle. Below the circle, the word 'LISTED' is written in a smaller, bold, sans-serif font.	Underwriters Laboratories certification mark
 A lowercase letter 'i' inside a circle.	Provides additional information to clarify or simplify a procedure.

# Safety

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



## Hazard labels

<b>⚠ DANGER</b>
<b>DANGER</b> indicates an imminently hazardous situation which, if not avoided, <b>will result in</b> death or serious injury.

<b>⚠ WARNING</b>
<b>WARNING</b> indicates a potentially hazardous situation which, if not avoided, <b>can result in</b> death or serious injury.

<b>⚠ CAUTION</b>
<b>CAUTION</b> indicates a potentially hazardous situation which, if not avoided, <b>can result in</b> minor or moderate injury.

<b>CAUTION</b>
<b>CAUTION</b> , used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, <b>can result in</b> property damage.

**i** Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Maverick Power for any consequences arising out of the use of this material.

## Safety precautions

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power before working on or inside this equipment.
- Always use a properly rated voltage sensing device to confirm the power is off.
- Replace all devices, doors and covers before turning on the power to this equipment.
- Before performing visual inspections, tests, or maintenance on this equipment, disconnect all sources of electric power. Assume all circuits are live until they are completely de-energized, tested, and tagged. Pay particular attention to the design of the power system. Consider all sources of power, including the possibility of backfeeding.
- Handle this equipment carefully and install, operate, and maintain it correctly in order for it to function properly. Neglecting fundamental installation and maintenance requirements may lead to personal injury, as well as damage to electrical equipment or other property.
- Carefully inspect your work area and remove any tools and objects left inside the equipment.
- All instructions in this manual are written with the assumption that the customer has taken these measures before performing maintenance or testing.

**Failure to follow these instructions will result in death or serious injury.**

# Introduction

This bulletin contains instructions for the proper installation, operation, and maintenance of Speed-D™ service and distribution switchboards from Maverick Power. Engineering, installation, and operating staff supervisors must familiarize themselves with this manual and become acquainted with the appearance and characteristics of each piece of equipment mounted or contained in the switchboard.

Retain this bulletin in the instruction material holder for future reference for the applications defined below:

## Service switchboards

Speed-D service switchboards contain a current transformer compartment approved by the Electric Utility Service Equipment Requirements Committee (EUSERC).

Single main disconnect sections contain a circuit breaker main, and may include a distribution panel providing space for branch circuit breakers.

## Service entrance equipment

For switchboards actually installed as service entrance equipment, apply a SERVICE DISCONNECT label on the switchboard front cover near the handle of each circuit breaker, which is a service disconnect.

**Figure 1: Service Disconnect Label**



**i** If a circuit breaker or switch in the switchboard section is marked MAIN, remove the MAIN label and apply the SERVICE DISCONNECT label in its place.

## Underground pull sections

Underground pull sections provide space for transition or termination of underground service cables. Indoor and outdoor units have symmetrical construction which permits installation on either side of the service section switchboard. A side closure plate kit is available for applications where the indoor underground pull section is not attached to the switchboard section.

## Loadside wireway

The 11.5-inch (292 mm) indoor loadside wireway permits top exit of loadside cables from branch circuit breakers. The loadside wireway can be installed on the right or left of the service section switchboard.

## Lug landing kits

Lug landing kits are available for job site installation to terminate utility service cables in the underground pull sections. Each kit includes supports, lug pads, and loadside lugs suitable for aluminum or copper cable. Captive bolts and Keps® nuts are provided to mount the utility's incoming lugs to the lug pad.

A two-lug adaptor kit (SA7PL) also is available for job site installation. This kit provides two 300–800 kcmil single barrel lugs instead of the standard double barrel lug supplied with the switchboard. The kit is for terminating service entrance cables in the current transformer compartment on 600 A and 800 A service sections.

Lug landing kits can be mounted in both indoor and rainproof underground pull sections


## Distribution switchboards

Speed-D distribution switchboards contain distribution panel only, which provides space for branch breakers.

- A plug-on (sub-feed) lug kit or backfed circuit breaker can be used to power the distribution panel.
- These sections can not be used for service entrance equipment.

The distribution sections are available in two types of constructions:

1. Stand-alone
2. Add-on (mounted along side a Speed-D service switchboard containing a single main only.)

 If a backfed circuit breaker is used in this section, place the Section Main label (Figure 2) on the cover adjacent to the backfed circuit breaker.

**Figure 2: Section Main Label**



# Receiving, handling, and storage

## Receiving

Upon receipt, check the packing list against the equipment received to ensure the order and shipment are complete. Also upon receipt, immediately inspect switchboard sections for any damage that may have occurred in transit. If damage is found or suspected, file a claim with the carrier immediately, and notify your local Maverick Power representative.

## Handling

Verify that proper equipment, such as an overhead crane, is available at the installation site to handle the switchboard. This equipment will help avoid injury to personnel and damage to the switchboard.

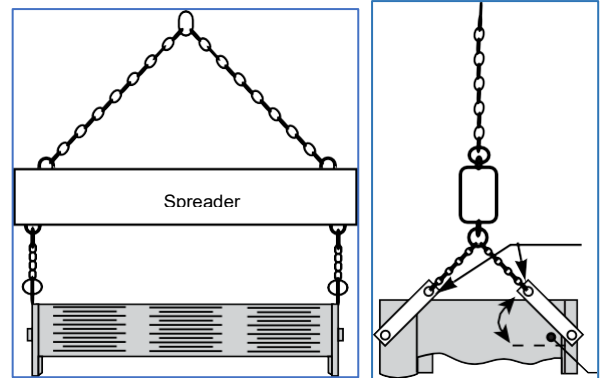
The shipping weight of each shipping section is marked on the packing list. Verify the lifting capacity of the equipment being used to handle the switchboard in accordance with the shipping weight of each shipping section.

## Handling with lifting straps

Maverick Power recommends using an overhead crane, lifting straps, and cables or chains to handle the switchboard.

Maverick Power provides lifting straps as standard equipment for switchboard shipping sections. Instruction labels on each shipping section include drawings and written instructions outlining the proper use of the lifting straps. (See Figure 3.) Use rigid spreaders or a spanner bar to provide vertical lift on the lifting straps. Spreader bars are shipped with rainproof (NEMA 3R) Speed-D switchboards. This will help to avoid damaging the frame or finish

**Figure 3: Lifting with an Overhead Crane, Lifting Straps, and Cables or Chains**



## Rainproof switchboards

To prevent damage to the drip hood and door, use care when handling the section with lifting straps. Remove all of the top caps before rotating lifting straps into lifting position. The warning label in Figure 4 is attached to both the front and rear of the switchboard.

**Figure 4: Warning Instruction Label, Rainproof Switchboards**



## Storage

When storing the switchboard before installation, cover the top and openings of the equipment during the construction period to protect the switchboard from dust and debris.

A switchboard that is not installed and energized immediately should be stored in a clean, dry space with a consistent temperature to prevent condensation. Store the switchboard indoors, if possible. Preferably, it should be stored in a heated building with adequate air circulation and should be protected from dirt, fumes, water, and physical damage. Storing the switchboard outdoors may cause harmful condensation inside the switchboard.

**i** Portable electric heaters approximately 250 watts per vertical section must be installed in both indoor-type and rainproof-type switchboard enclosures for adequate protection during storage.

Before energizing the space heaters, remove all loose packing or flammable materials inside the switchboard. Outdoor switchboards are not weather resistant until completely and properly installed and should be treated exactly the same as indoor switchboards against moisture buildup until after installation.

# Site preparation

Correct installation of Speed-D service and distribution switchboards is essential for proper operation of all switchboard components. Study the associated instruction books and all drawings carefully.

**i** While installing the switchboard, do not use the top of the switchboard as a support for the weight of the installer.

## Location

Find the designated area on the building floor plan where the switchboard will be installed. The location chosen for installation should provide working clearances complying with the NEC. Front-accessible switchboards require field connections including mains, branches, ground bus, and neutral bus, all that are accessible and maintainable from the front. Equipment drawings identify switchboards requiring rear or side access.

If the switchboard has been placed in a wet location or outside of the building, it should be enclosed in an outdoor enclosure or other equipment to prevent moisture or water from entering and accumulating within the enclosure.

## Foundation preparation

The floor or foundation must be strong enough to support the weight of the switchboard without sagging. The surrounding floor area should gently slope toward a drain.

Speed-D service and distribution switchboards are assembled on level floors at the assembly plant. To ensure correct bus bar alignment, confirm that the concrete mounting pad and channels are level side-to-side and front-to-rear within 1/8-inch per square yard (4 mm per square meter). If parallel steel floor channels are imbedded for mounting the switchboard, take extra care to ensure the floor channels are level over their entire length to avoid distortion of the switchboard structure. Each channel should be level with the finished floor.

When pouring the foundation, make provisions for conduits entering the switchboard from below. The bottom view in the equipment drawing in shows the available conduit area for correct layout.

Before pouring the foundation, consider installing additional conduits for future circuits.



## Switchboard preparation

To prepare the switchboard, follow these steps:

1. Remove dirt and debris from the foundation and surrounding area before moving the switchboard into final position.
2. Take each shipping section off its' shipping stringers after the switchboard has been moved to its final installation site.
3. Remove all packing materials.

# Installation

## General installation

Install the switchboard into its final position by leveling progressively each section and bolting the frames together, if separated. Position shipping sections as follows:

1. Maneuver each shipping section into the desired position using the procedures under “Handling” on page 9.
2. Carefully lower the section over the conduit stubs to comply with the “available conduit area” as shown in the bottom view of the equipment drawings. Otherwise, sufficient cable bending space may not be available.
3. Level the shipping section.

## Switchboard sections – Indoor NEMA1

1. Place the switchboard in a clean, dry, well-ventilated area, protected from dirt and water.
2. Position the switchboard with at least 1/2-inch (13 mm) space between it and the adjacent walls.

## Switchboard sections – Outdoor NEMA 3R

Position the switchboard with at least 1-inch (25 mm) space between it and the adjacent walls

## Joining shipping sections

For indoor switchboards refer to the following pages for joining sections to the service section: “Indoor Underground Pull Section (SA26PS)”.

For outdoor switchboards refer to the following pages for joining sections to the service section: “Outdoor Underground Pull Section (SA26PSR)”.

## Anchoring the switchboard

Although the sections are freestanding, a hard bump or shifting movement can result in damage to wire or cable insulation and hubs connected to the section. Each vertical section must be anchored to the floor.

Side channels run the depth of the shipping section. The channels have 0.56-inch (14 mm) diameter holes for fastening the section to the floor. (See Figure 23 on page 32.) To properly anchor the switchboard to the floor, the mounting holes closest to the rear and front of the section must be used. A minimum of 4 bolts/anchors are required with minimum size of 3/8-16-inch.

**i** Anchoring hardware is not furnished with the switchboard.

The equipment specifier/installer determines that the equipment is rigidly supported to its foundation. The engineer of record is responsible for detailing the equipment anchorage requirements. The installer and manufacturers of the anchorage and restraint system are responsible for assuring that the mounting requirements are met. Maverick Power is not responsible for the specification and performance of these anchorage systems.

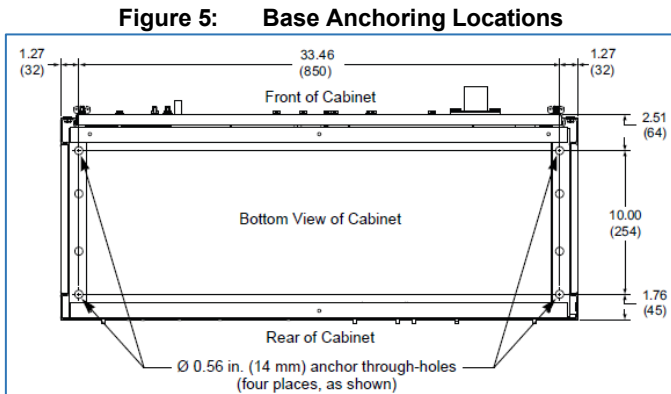
After all switchboard sections are properly joined together and the entire structure is secured to the floor, then install the incoming service conductors and loadside cables.

## Seismic applications

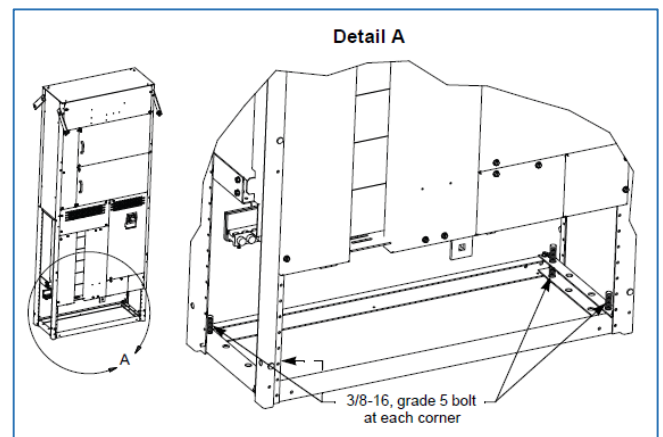
**i** Building code requirements vary by location. Always review the codes and standards relevant to the specific installation site before starting installation.

### Base anchoring

There is a 0.56 in. (14 mm) diameter anchor through-hole in each end of the switchboard base channels (see Figures 5 and 6).

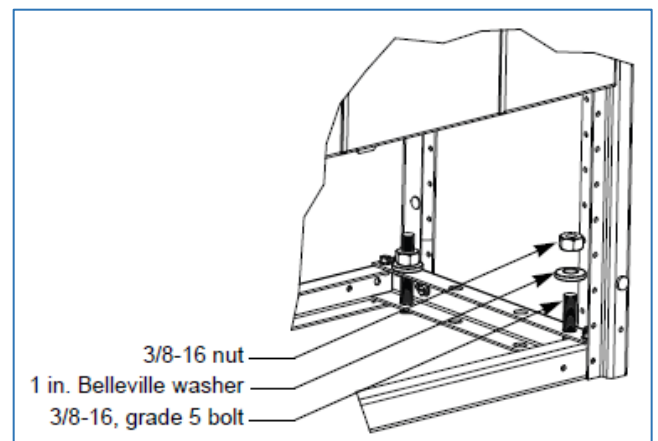


**Figure 6: Base Channel Anchoring Bolts**  
(Covers shown removed for illustration purposes.)



1. Once the switchboard is in place, secure the base channels to each bolt using a one-inch Belleville washer between a 3/8-16 nut and the frame (see Figure 7).
2. Torque each nut to the value recommended by the anchor manufacturer to develop the full strength of the anchor.

**Figure 7: Anchoring Hardware Installed**



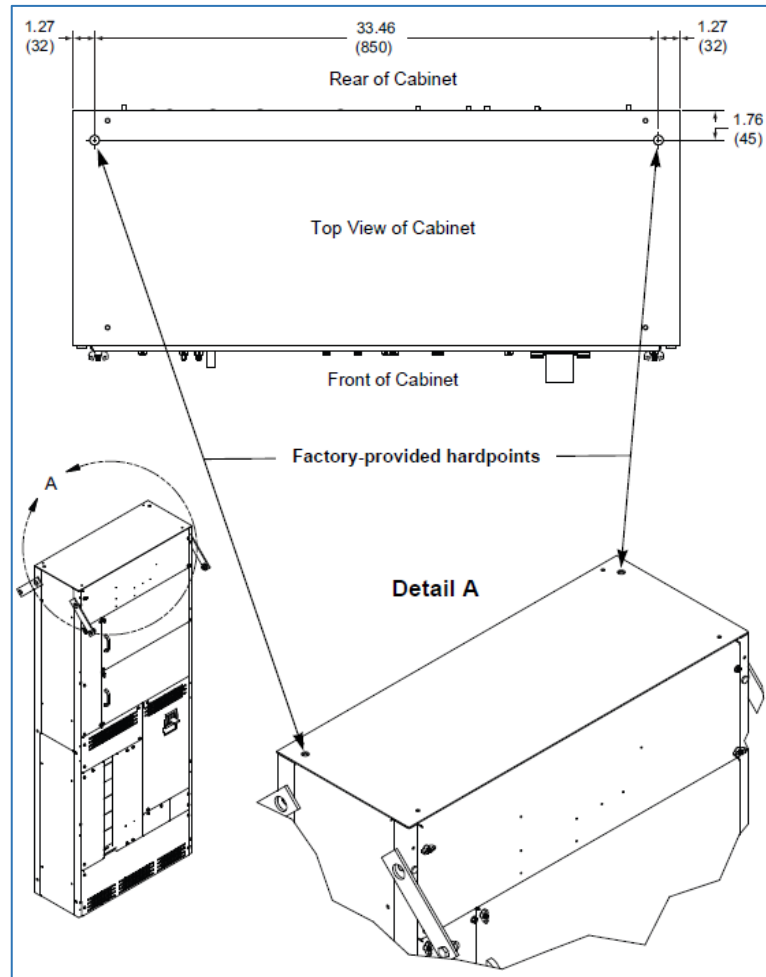
### Top anchoring / restraint

For installation at locations with an  $S_s$  greater than 2.67, (as determined from the current version of the International Building Code), or, where displacement cannot be tolerated at the top of the switchboard during an earthquake, attach top restraints to the two, 3/8-inch diameter equipment hardpoints shown in Figure 8.

**i** By code, it is the responsibility of the building design professional to determine the top restraint methodology for the intended building application.

Maverick Power does not furnish top anchoring hardware with the switchboard.

**Figure 8: Top Anchoring Locations**



After properly joining all switchboard sections and anchoring the entire structure, install the incoming service conductors and loadside cables.

**i** The switchboard enclosure (particularly the top) should not be used to mount exterior equipment.

## Grounding and bonding

**i** A system is “grounded” if it is grounded at any point ahead of the switchboard, whether the grounded conductor (neutral) is carried through to the loads, or not.

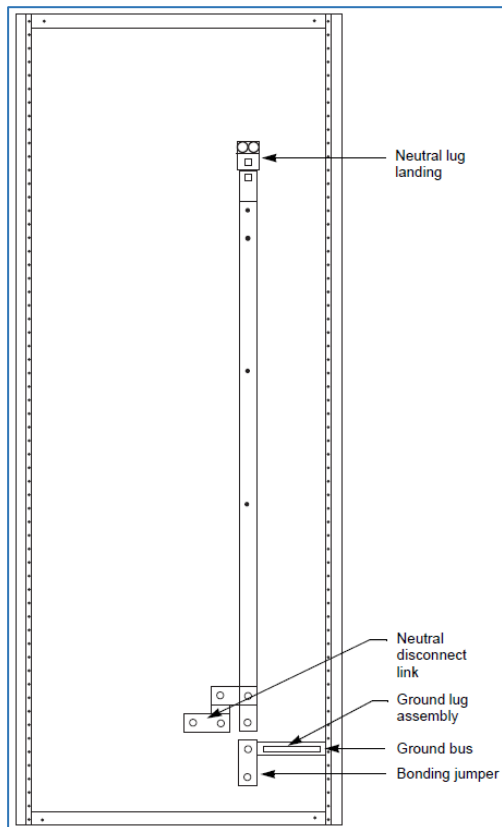
### Service equipment

For solidly grounded systems used as service equipment:

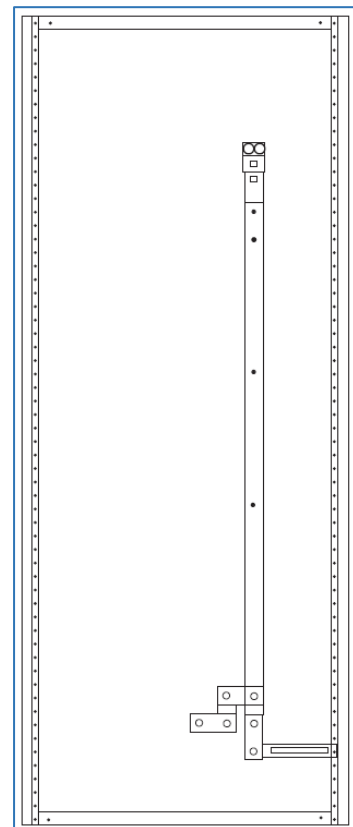
1. Run a grounding electrode conductor (GEC) from the grounding electrode at the installation site to the GEC connector (ground lug) located on the switchboard ground bus (or on the neutral bus, if so indicated on the drawing). (See Figure 9) Select the proper material and size of the GEC to comply with the NEC. Install the GEC as specified in the NEC.
2. When the unit is used as service equipment, the neutral must be bonded to the enclosure. To do so, connect the main bonding jumper from the ground bus assembly to the neutral bus assembly (shipped from the factory disconnected). Figure 9 shows the unbonded position, and Figure 10 shows the bonded position.

**i** Refer to “Multiple Main (Six Subdivision) Service Section” for six subdivision instructions.

**Figure 9: Unbonded Neutral (Front View)**



**Figure 10: Bonded Neutral (Front View)**



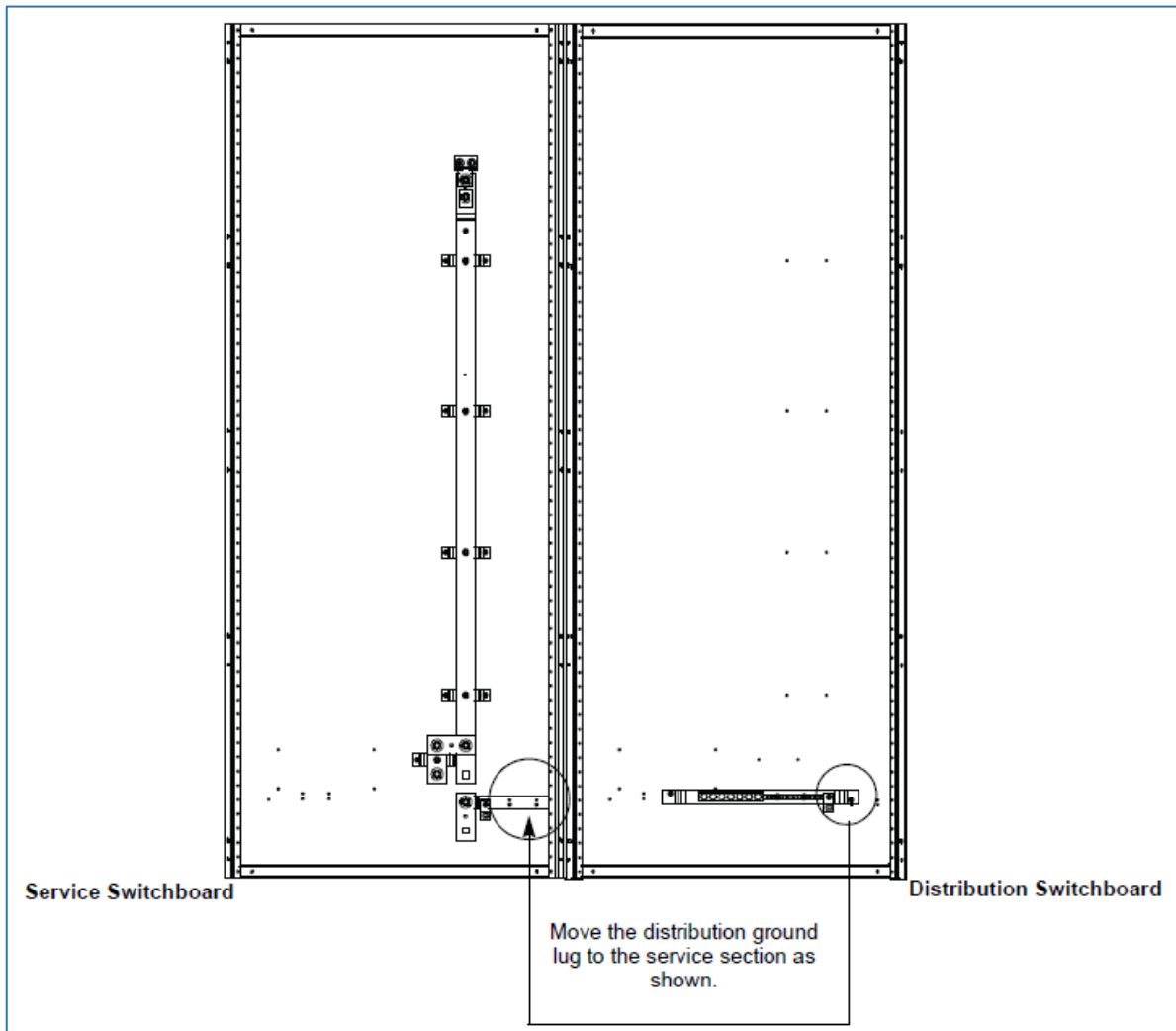
## Distribution equipment

When a distribution section is used as a stand-alone section, use equipment grounding conductors sized according to the NEC to connect the switchboard frame and ground bus to the service ground.

When a distribution section is used as an add-on section to a service section, the single lug located on the distribution section ground bus must be removed and reinstalled on the service section ground bus.

(See Figure 11.) Connect the switchboard frame and the ground bus in the distribution section to the service ground in the service section using equipment grounding conductors sized according to the NEC.

**Figure 11: Grounding of Add-on Distribution Section**



## Indoor underground pull section (SA26PS)

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

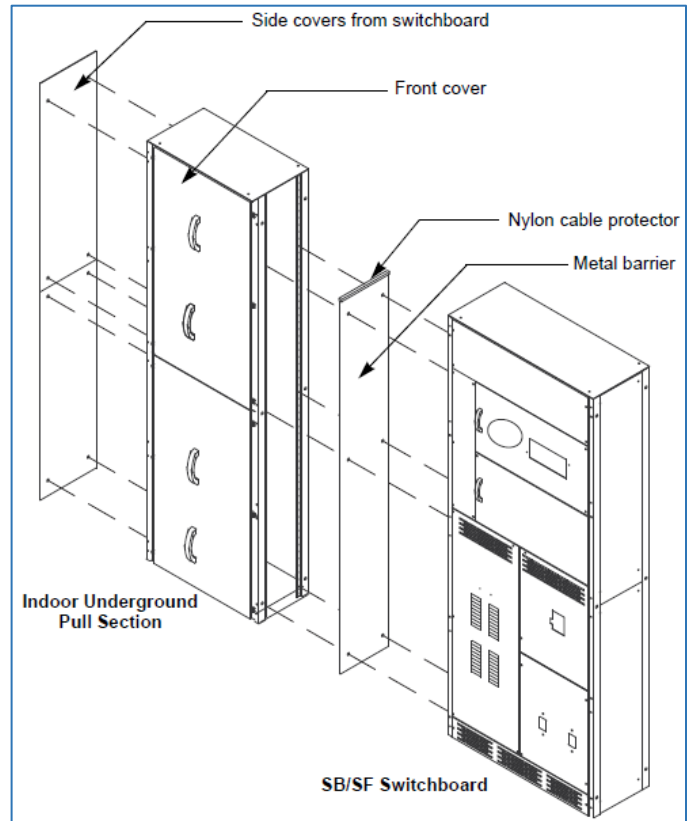
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm the power is off.
- Replace all devices, doors and covers before turning on the power to this equipment.

**Failure to follow these instructions will result in death or serious injury.**

To install the indoor underground pull section, follow these steps;

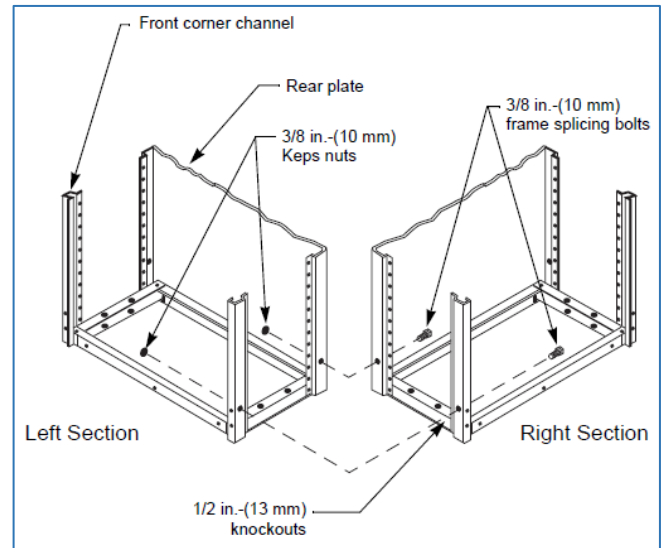
1. Verify that the nylon cable protector is over the exposed steel edge of the pull section barrier . (See Figure 12.).
2. Remove and retain all front covers from the pull section and service section for reuse. (See Figure 12.)
3. Remove and retain the side cover and hardware from the installation side of the service section for reuse.
4. Remove the six 1/2-inch (13 mm) diameter knockouts from the front corner channel and back panels of the pull section and service section sides to be joined.

**Figure 12: Installing Indoor Underground Pull Section SA26PS**



5. Position the pull section next to the service section; install the six 3/8-16 frame splicing bolts and Keps nuts (supplied with pull section). Torque to 250–350 lb-in (28–40 N•m). (See Figure 13)
6. Install the side cover and hardware, retained in Step 3, on the exposed side of the pull section. Install all sealing hardware in the locations as directed in “Sealing Hardware for Indoor Service Switchboards and Underground Pull Sections (SA26PS).
7. Complete all wiring.
8. Replace all front covers removed in Step 2.

**Figure 13: Installing Frame Splicing Hardware**



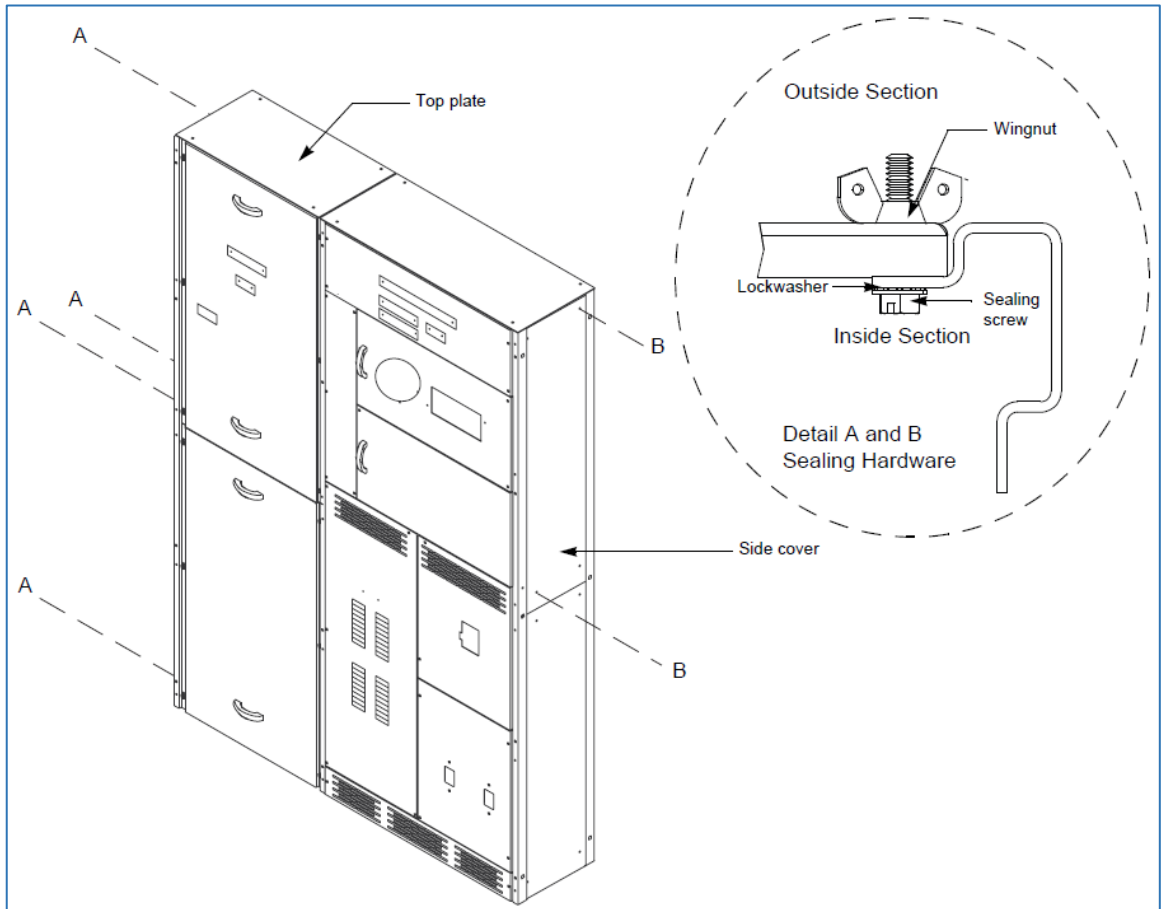
## Sealing hardware for indoor service switchboards and underground pull sections (SA26PS)

Sealing hardware is factory installed in the top plates, front covers/doors and side covers of the pull section and service section. The sealing hardware used to attach the top plates and front covers/doors does not require relocation. The sealing hardware provided for the side covers will require relocation when multiple sections are installed together.

When a pull section and service section are installed together, Figure 14 depicts the installation locations for the sealing hardware, these are locations labeled “A” and “B”.

When a pull section and service section are installed together, only the locations labeled “A”, shown in Figure 14, require sealing hardware be installed

**Figure 14: Installing Sealing Hardware for SB Indoor Switchboard with Underground Pull Section (SA26PS)**



**i** Sealing hardware is always installed in a diagonal pattern in covers required to be sealed

## Lug landing kit (SA8LL)

# ⚠ DANGER

### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

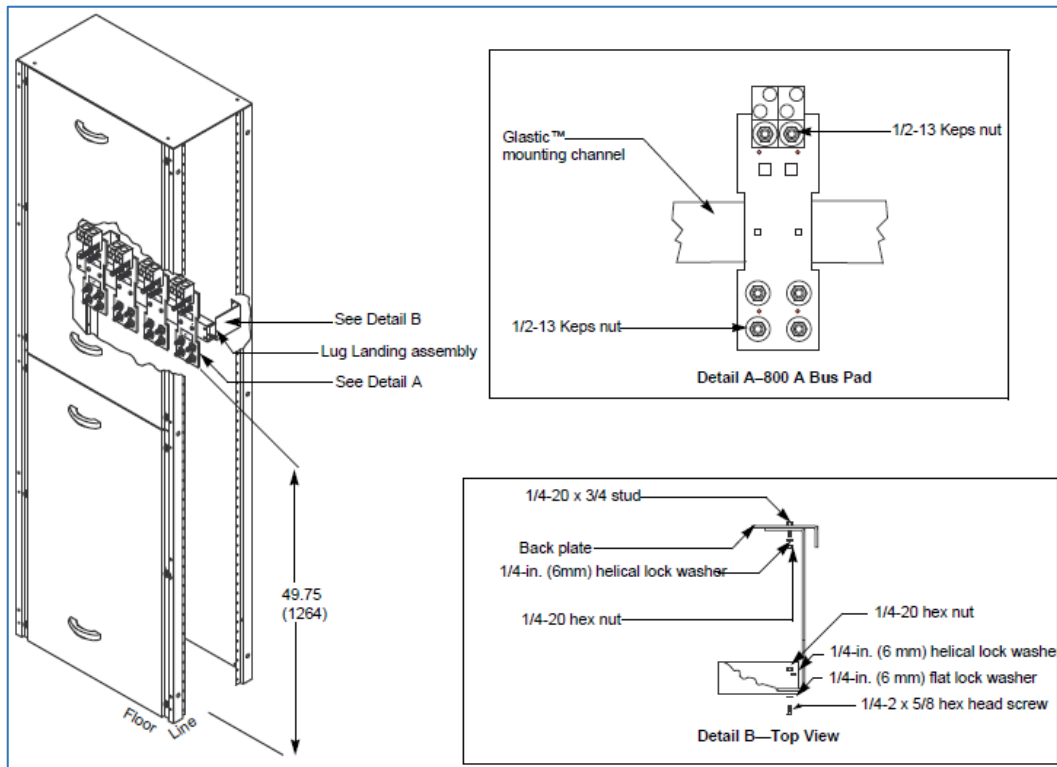
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm the power is off.
- Replace all devices, doors and covers before turning on the power to this equipment.

**Failure to follow these instructions will result in death or serious injury.**

To install the lug landing kit SA8LL follow these steps:

1. Remove the front covers from the underground pull section.
2. Position and fasten the mounting brackets onto the 1/4-20 studs, located on the pull section back plate. (See Figure 15, Detail B)
3. Install the lugs on the lug landing assembly bus pads. (See Figure 15, Detail A)
4. After the lugs are in place, tighten the 1/2-13 Keps nuts to 250–350 lb-in (28–40 N•m).
5. Position and fasten the lug landing assembly onto the mounting brackets. (See Figure 15, Detail B.) Position the lugs in the up position (See Figure 15, Detail A)
6. Replace the front covers.

**Figure 15: Installing Lug Landing Kit SA8LL**



## Outdoor underground pull section (SA26PSR)

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm the power is off.
- Replace all devices, doors and covers before turning on the power to this equipment.

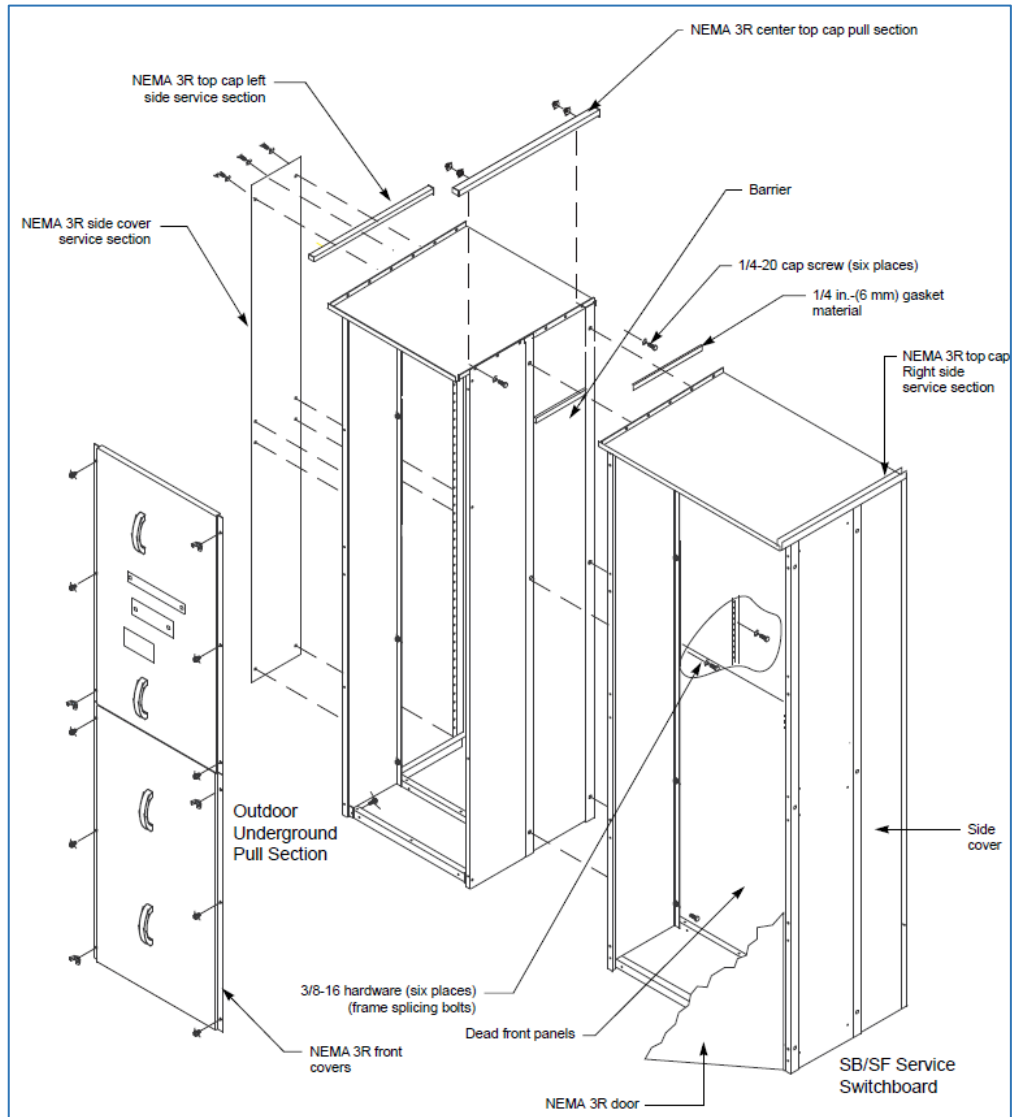
**Failure to follow these instructions will result in death or serious injury.**

To assemble an outdoor underground pull section (SA26PSR), follow these steps:

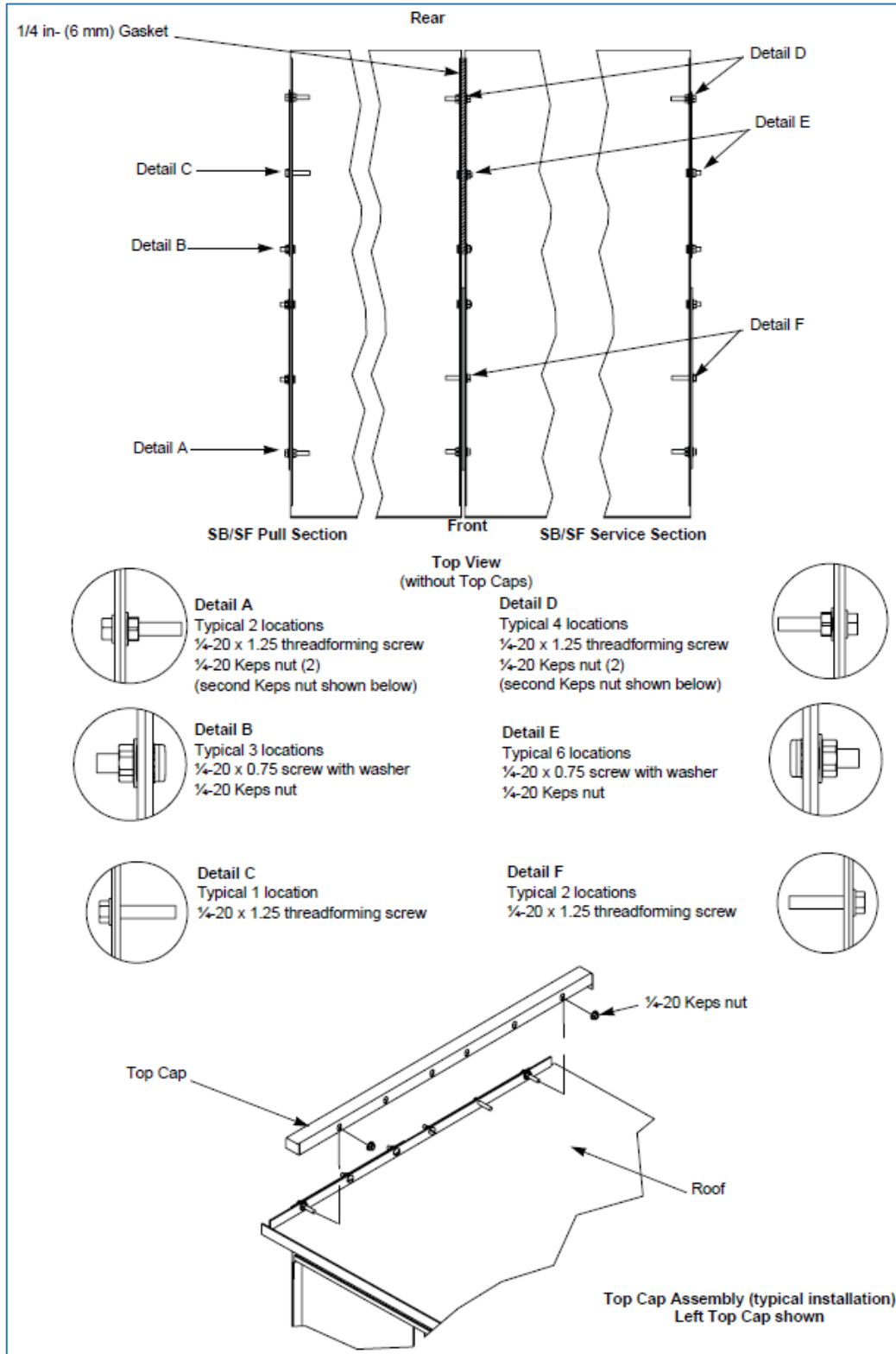
1. Remove all deadfront and NEMA 3R front covers from both sections. (See Figure 17)
  2. Pull sections are pre-assembled with a NEMA 3R top cap located on the right side. NEMA 3R service sections are pre-assembled and installed with left and right 3R top caps.
    - a. Remove the pull section NEMA 3R top cap.
    - b. Remove the service section NEMA 3R top cap from the side of the service section to which the pull section is installed.
    - c. Retain the top caps and mounting hardware for reuse.
  3. Remove and retain the side cover and hardware from the installation side of the service section for reuse.
  4. Remove the six 1/2-inch (13 mm) diameter knockouts from the front corner channel and back panels of the pull section and service section sides to be joined.
  5. Remove the 1/4-inch (6 mm) gasket material located in the pull section plastic data pocket.
    - a. Using the gasket, seal the surface of the service section top cover where the side cover was removed in Step 3.
    - b. Trim excess gasket material as required.
  6. Position the pull section next to the service section.
    - a. Install the six 3/8-16 frame splicing bolts and Keps nuts (supplied with the pull section).
    - b. Torque to 250–350 lb-in (28–40 N•m).
  7. Install the service section side cover and hardware retained in Step 3 on the exposed side of the pull section. Install all sealing hardware in the location as directed in the “Sealing Hardware for Outdoor Service Switchboards and Underground Pull Sections (SA26PSR)”.
- i** Replace all lifting straps on exposed side of sections. Verify the bolt is tight to maintain NEMA 3R integrity.
8. Install the NEMA 3R top cap, removed from the pull section in Step 2, as the center top cap. Refer to Figure 17, and Figure 18, for hardware installation configurations.
  9. Install the NEMA 3R top cap removed from the service section in Step 2 on the exposed side of the pull section.

10. Complete all wiring.
11. Replace all deadfront and NEMA 3R covers removed in Step 1.

**Figure 17: Installing Outdoor Underground Pull Section SA26PSR (Left Side Installation Shown)**



**Figure 18: Outdoor Underground Pull Section NEMA 3R Top Cap Assembly**



## Sealing hardware for outdoor service switchboards and underground pull sections (SA26PSR)

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm the power is off.
- Replace all devices, doors and covers before turning on the power to this equipment.

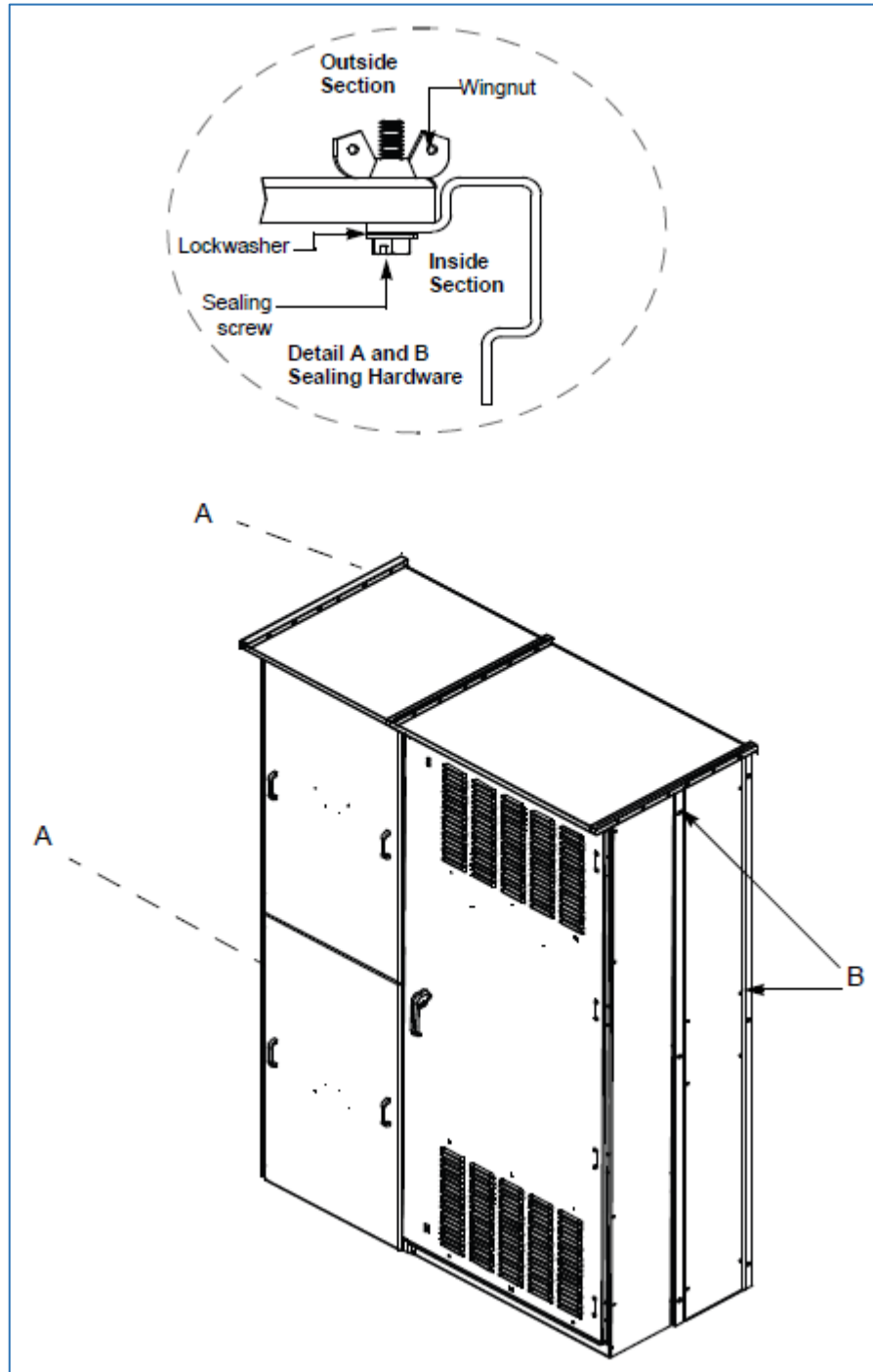
**Failure to follow these instructions will result in death or serious injury.**

Sealing hardware is factory installed in the front covers/doors and side covers of the pull section and service section. The sealing hardware used to attach the front covers and doors does not require relocation. The sealing hardware provided for the side covers will require relocation when multiple sections are installed together.

When a pull section and service section are installed together, Figure 19, depicts the installation locations, labeled “A” and “B” for the sealing hardware.

When a pull section and service section are installed together, only the location labeled “A” shown in Figure 19 require sealing hardware be installed.

Figure 19: Sealing Hardware for Outdoor Underground Pull Section (SA26PSR) and a SB Switchboard



① Sealing hardware is always installed in a diagonal pattern in covers required to be sealed.

## Indoor Loadside Wireway (SA10LW)

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm the power is off.
- Replace all devices, doors and covers before turning on the power to this equipment.

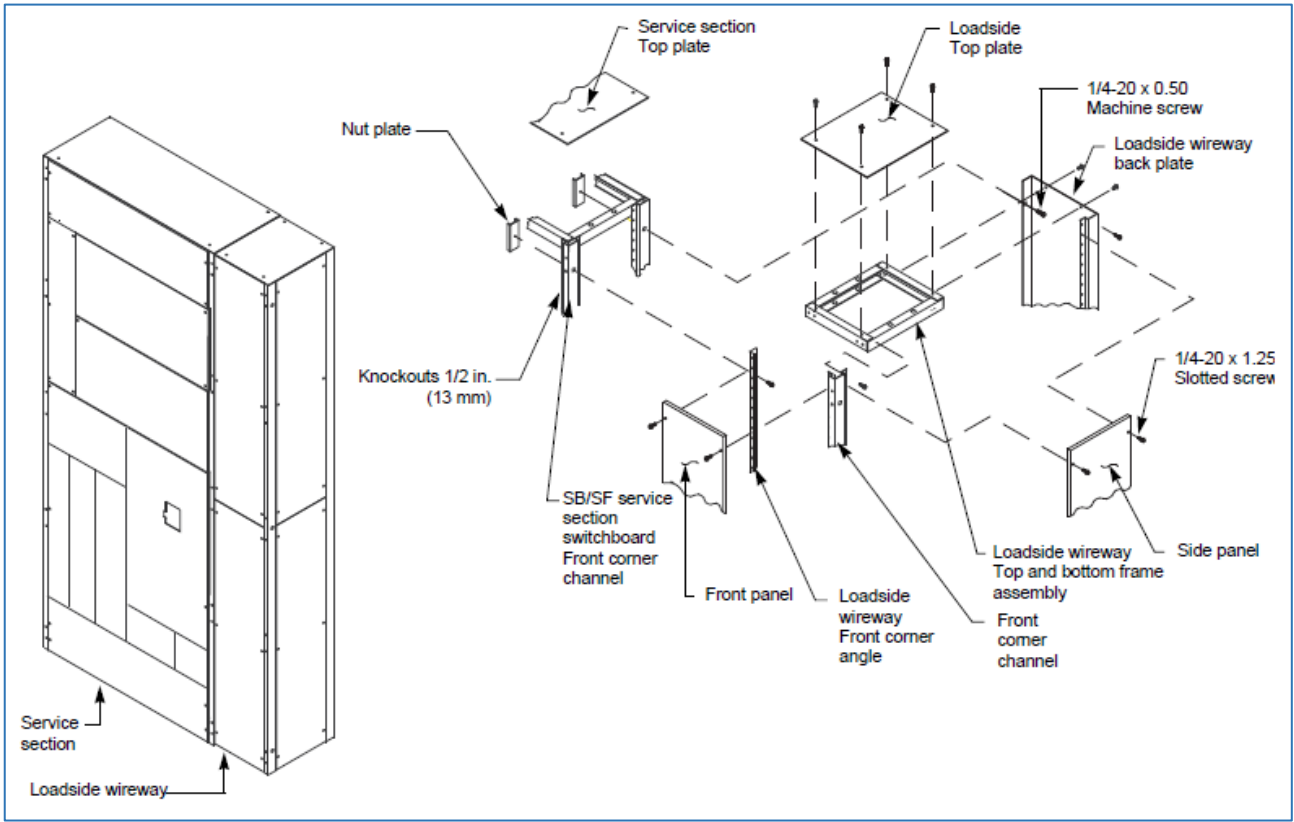
**Failure to follow these instructions will result in death or serious injury.**

To assemble the indoor loadside wireway (Figure 22), follow these steps:

1. The loadside wireway can be located to the right or left of the main service section.
2. Remove the six 1/2-inch (13 mm) diameter knockouts from the front corner channel and back panel of the service section side where the loadside wireway will be installed.
3. Remove and throw away the lower side cover (not shown) from the switchboard next to the loadside wireway to allow cables to exit the switchboard.
4. Use the six retainer nut plates and six 1/4-20 x 0.50 drive screws to connect the back plate and front corner angle of the loadside wireway to the switchboard frame at the section splicing locations.
5. Cut the required conduit holes in the loadside wireway top plate.
6. Install the top plate on the loadside wireway. Use four 1/4-20 x 0.50 drive screws to attach to the top frame assembly.
7. After the loadside cables are installed, attach the front and side panels to the wireway frame and corner channel using 1/4-20 x 0.50 slotted screws.

**i** The loadside wireway is shipped factory-assembled for installation on the right side of the service section. If mounted on the left side, disassemble the wireway and then reassemble for left side mounting. (Figure 22)

**Figure 22: Assembling Indoor Loadside Wireway SA10LW**



## Conduit And Wiring Installation

### Conduit area

1. Locate and terminate all conduit in the switchboard enclosure within the “Recommended Conduit Area” Entry Detail, designated in Figure 23.
2. Install the conduit properly. Use hubs and ring connectors to protect the cables and to prevent condensation on the conduit from entering the switchboard.

**i** If using top entry, do not use the top of the switchboard to support the weight of the conduit. Support the conduit independently.

**i** Under seismic conditions, the top of the switchboard can move in any direction. Any top incoming cables must accommodate this motion.

3. Bond all conduit, stubs, and ring connectors to the switchboard enclosure with approved electrical connections.

### Cable Pulling

Speed-D switchboard components are arranged to give proper cable clearance and bending space for cables entering or exiting the switchboard.

1. Use only cable sizes suitable for a proper fit with the corresponding lugs.

2. Pull the proper number of lineside and loadside cables according to the load served and the NEC.
3. Position the cables inside the switchboard so that they are not subject to physical damage.
4. Maintain the maximum possible bending radii and proper clearance to bus bars and grounded parts. If any cables are lying or bearing on structural members, support them to relieve this condition or place suitable protective material at the bearing point to protect the cable insulation.
5. Be certain to run all phase conductors, including the neutral, through the same opening where cables enter or leave the switchboard, or pass through any metal that has magnetic properties. Otherwise, overheating can result.

### **Cable Terminations**

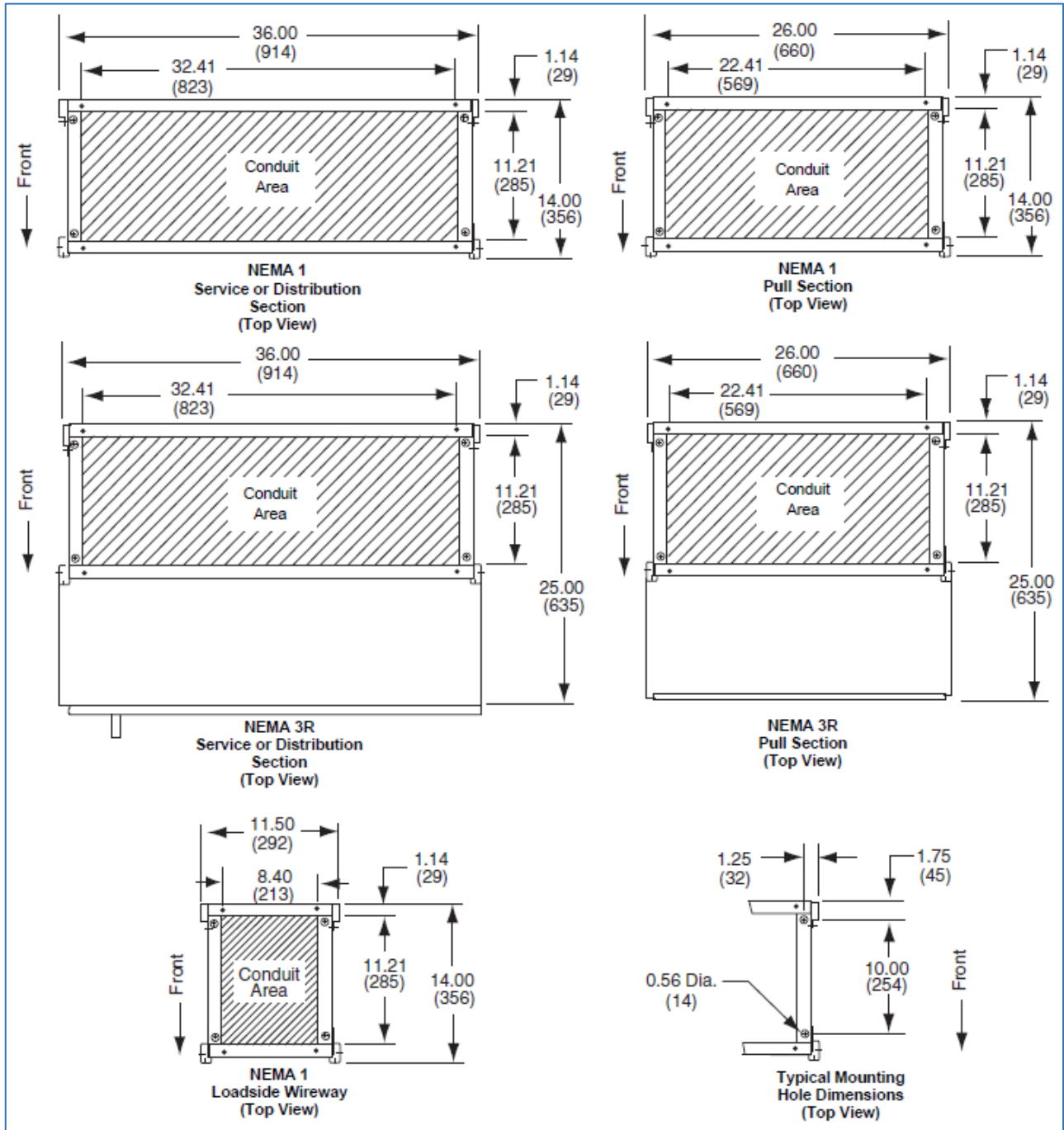
1. Use a proper insulation stripping tool to strip a length of insulation from the end of the cable sufficient to fit into the full length of the lug barrel. Be careful not to nick or ring the strands.
2. Thoroughly clean aluminum cable contact surfaces with a wire brush, or scrub them with an abrasive cloth to remove oxides and foreign matter.
3. Immediately apply an acceptable joint compound to the bare aluminum surfaces.
4. Set screw-type lugs may be furnished as main incoming lugs and are standard on molded case circuit breakers. Torque these lugs to, but do not exceed, the specified values. Torque values for circuit breaker and switch lugs are marked on these units. Torque values for other switchboard lugs are marked on the switchboard.

### **Service Section—Incoming Cables**

1. The incoming lugs will accept copper or aluminum cable up to 600 kcmil.
2. Tighten all wire binding set screws to 450–500 lb-in (51–57 N•m), or 620 lb-in (70 N•m) if indicated on the lug. Refer to the appropriate torque label in the switchboard.

Bottom feed service sections require an underground pull section. The underground pull section can either provide cable bending room to bring the cables up and around to the lugs in the top of the current transformer compartment or can be used with a lug landing kit to terminate the utility cables in the underground pull section. When instructed, brace or cable-lace the conductors.

Figure 23: “Recommended Conduit Area” Entry Detail



## Branch Circuit Breaker Installation/Removal

- ① See the short circuit current rating label in the switchboard for rating information.
- ① Circuit breaker plug-on jaws are factory-set and require no adjustment. Do not remove grease from jaws.

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm the power is off.
- Replace all devices, doors and covers before turning on the power to this equipment.

**Failure to follow these instructions will result in death or serious injury.**

## QO™, QOB, QO-VH, and QOB-VH Circuit Breaker Installation

Space is provided on the NQ distribution panel for mounting QO/QOB circuit breakers. The distribution panel contains 42 single-pole spaces. To install a QO/QOB circuit breaker, follow these steps:

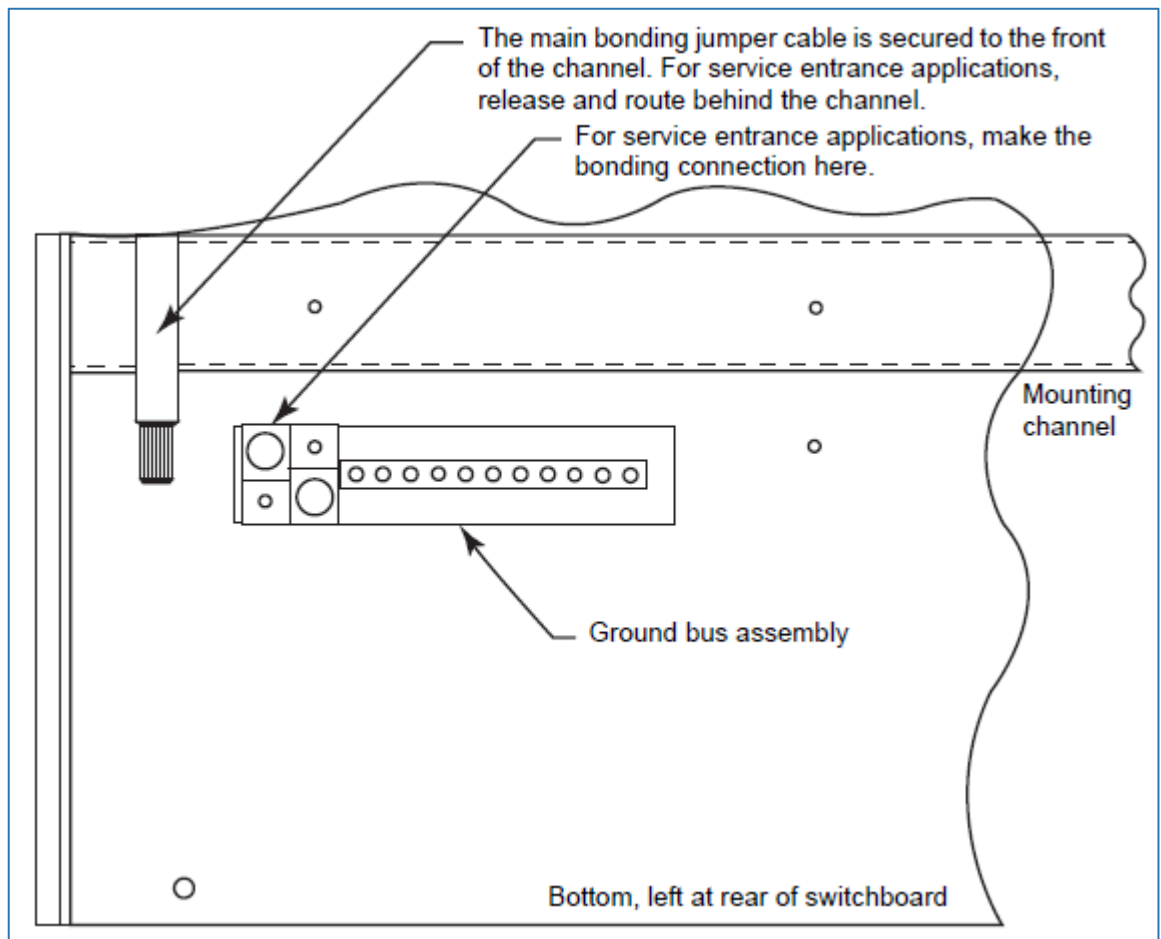
1. Turn off the main disconnect. Always use a properly rated voltage sensing device to confirm power is off.
2. Remove the distribution panel cover.
3. Bolt the QOB circuit breakers onto the connector fingers mounted on the distribution panel. Torque the QOB connector finger screws to  
2. 18–21 lb-in (2.0–2.4 N•m). Ensure that the circuit breakers are in the OFF position before installation.
1. QO circuit breakers simply plug onto the connector fingers mounted on the distribution panel. Ensure that the circuit breakers are in the OFF position before installation.
3. Refer to torque labels on the QO/QOB circuit breakers for loadside lug torque requirements.
4. Remove the filler plates over the circuit breaker locations from the cover over the distribution panel. Any open space that will not be filled with a circuit breaker must be filled with a filler plate (Schneider Electric catalog number QOFP).
5. Replace the distribution panel cover.
6. Turn the main disconnect on.

## Multiple Main (Six Subdivision) Service Section

### Grounding and Bonding

1. Ground the enclosure as specified in the NEC.
2. Bond the neutral to the enclosure when the section is used as a service entrance. To do so, connect the supplied main bonding jumper to the ground bus assembly as shown in Figure 27. The main bonding jumper is shipped from the factory disconnected from the ground bus assembly.
3. Tighten the connection to 340–375 lb-in (38–42 N•m), according to the torque data label.

**Figure 27: Multiple Main Unbonded Neutral**



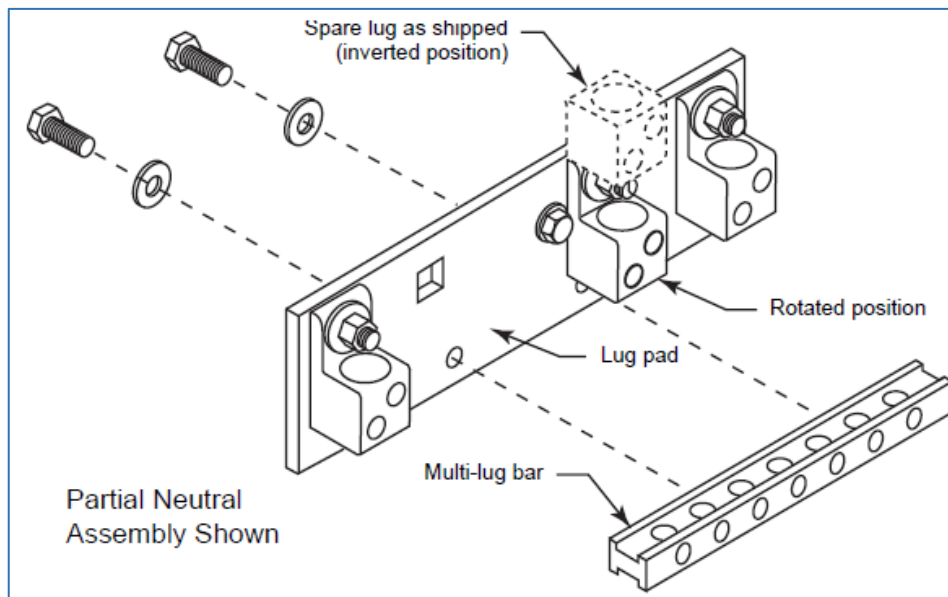
## Neutral

The neutral lug assembly includes a spare 3/0-750 kcmil lug, mounted in an inverted position. If this lug is needed, it must be rotated 180 degrees before use. To rotate, follow these steps:

1. Use an open-end or box-end wrench to remove the two 1/4–20 hex-head screws holding the multi-lug bar in place. The screw heads are located on the back of the 3 x 9-inch (76 x 229 mm) lug pad. Discard the hex-head screws and multi-lug bar.
2. Loosen the 1/2-13 Keps nut holding the inverted lug. Rotate the inverted lug.
3. Refer to the torque label on the switchboard. Retorque the nut to 250–350 lb-in (28–40 N•m).

**i** Speed-D multiple main service section switchboards are suitable for use as service equipment when no more than six subdivision means are provided.

**Figure 28: Multiple Main (Six Subdivision) Neutral Lugs**



## Current and Potential Instrument Transformer Installation

The bus bars in the current transformer compartment are designed for mounting standard bar-type transformers. The drillings meet EUSERC requirements. Current transformers usually are installed by the utility company. Sufficient room is supplied above the current transformer compartment for installation of utility potential transformers. The current transformer compartment is completely sealable for revenue purposes. Window-type current transformers require the use of a bus link kit (Maverick Power catalog number SA10BL).



# Pre-Energizing Check-out Procedure

Before energizing the switchboard, inspect it thoroughly to ensure all components will function and operate properly. Complete each step of the check-out procedure listed below before energizing the switchboard.

1. Check all field-made connections and other accessible bolted connections to ensure that they are secure. If necessary, retorque to the values listed.

## CAUTION

### HAZARD OF EQUIPMENT DAMAGE

- Dents or other switchboard damage could reduce electrical clearances inside the switchboard.
- If reduced clearances are observed or suspected, contact your local Maverick Power representative before energizing the equipment.

**Failure to follow these instructions can result in equipment damage.**

**Connection Torque Values**

Bolt Diameter	Torque Value
1/4 in. (6 mm)	50–75 lb-in (6–8 N•m)
5/16 in. (8 mm)	80–125 lb-in (9–14 N•m)
3/8 in. (10 mm)	175–225 lb-in (20–25 N•m)
1/2 in. (13 mm)	250–350 lb-in (28–40 N•m)

2. Check the switchboard enclosures for any dents or other damage that could reduce electrical clearances inside the switchboard.
3. Remove all foam blocks or other temporary cushioning or retaining material, from the electrical devices.
4. Manually open and close all switches, circuit breakers, and other operating mechanisms, checking for correct alignment and free operation.
5. Factory-installed molded case circuit breakers may have adjustable trip settings which are shipped on the “LO” setting. To provide coordinated operation during a fault, adjust the trip settings as outlined in the respective instruction manual. All poles are adjusted simultaneously by the single setting.



6. Verify that all grounding connections are correctly made.
7. Conduct an electrical insulating resistance test to ensure that the switchboard is free from short circuits and undesirable grounds. With the neutral isolated from the ground and the power switches and circuit breakers open, conduct electrical insulating tests from phase-to-phase, phase-to-ground, phase-to-neutral, and neutral-to-ground. If the resistance reads less than one megohm while testing with the branch circuit devices in the open position, the system may be unsafe and should be investigated. Contact Maverick Power Services at [support@maverickpwr.com](mailto:support@maverickpwr.com) to help correct any problems.
8. After completing the electrical insulation resistance test, reconnect main bonding jumper (if this is a service entrance switchboard).
9. Check all field-installed wiring. Make certain it is clear of all live parts, and when instructed, secured to withstand fault currents.
10. Vacuum to remove any dust, scrap wire, or other debris.
11. Replace all covers; check for any pinched wires, and close doors. Make certain all enclosure parts are aligned properly and securely fastened.

## **CAUTION**

### **HAZARD OF EQUIPMENT DAMAGE**

- Do not use an air hose to blow out the switchboard. The dust may settle inside overcurrent devices, causing overheating and improper operation.
- Hydrocarbon spray propellants and hydrocarbon-based sprays or compounds cause degradation of certain plastics. Before using these products to clean, dry, or lubricate components during installation or maintenance contact your local Maverick Power representative.
- Do not sand or remove the plating on any bus bar, splice bar, or terminal lug. To replace a damaged part, contact Maverick Power Services at [support@maverickpwr.com](mailto:support@maverickpwr.com).

**Failure to follow this instruction can result in equipment damage.**

# Energizing the Switchboard

## **⚠ DANGER**

### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm the power is off.
- Replace all devices, doors and covers before turning on the power to this equipment.
- Follow the checkout procedures described in “Section 6—Pre-Energizing Check-out Procedure”.

**Failure to follow this instruction will result in death or serious injury.**

1. Make sure that qualified electrical personnel are present when equipment is energized for the first time.
2. No load should be on the switchboard when it is energized. Turn off all downstream loads.
3. Energize the switchboard in the following sequence:
  - a. Close all doors and covers.
  - b. Close the main device(s).
  - c. Proceed to each panelboard and other downstream load.
4. After all overcurrent protective devices are closed, turn on all loads (for example, lighting circuits, contactors, heaters, and motors).

# Maintenance

Periodic maintenance on the switchboard includes cleaning, lubrication, and exercising component parts. The interval between maintenance checks can vary depending upon the amount of usage and environmental conditions of each installation. The maximum recommended inspection interval is one year. This definition for periodic maintenance applies throughout this manual, unless otherwise noted.

Always inspect the switchboard after a fault, (Refer to “Section 9—Adverse Circumstances”). Service bulletins for the various disconnecting and overcurrent devices mounted in the switchboard are available through your local Maverick Power representative.

## **⚠ DANGER**

### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm the power is off.
- Replace all devices, doors and covers before turning on the power to this equipment.

**Failure to follow these instructions will result in death or serious injury.**

## **General Inspection and Cleaning**

## **CAUTION**

### **HAZARD OF EQUIPMENT DAMAGE**

- Do not use an air hose to blow out the switchboard. The dust may settle inside relays and overcurrent devices, causing overheating and improper operation.
- Do not allow paint, chemicals, or
- petroleum-based solvents to contact plastics or insulating materials.

**Failure to follow this instruction can result in equipment damage.**

1. Vacuum the switchboard interior to remove any dirt or dust deposits. Wipe all bus bars, insulators, cables, and so forth, with a clean, dry, lint-free cloth.
2. Check the switchboard interior carefully for moisture, condensation build-up, or signs of any previous wetness. Moisture can cause insulation failures and rapid oxidation of current carrying parts. Inspect all conduit entrances and cracks between the enclosure panels for dripping leaks. Condensation in conduits may be a source of

moisture and must not be allowed to drip onto live parts or insulating material. Take the necessary steps to eliminate the moisture and seal off all leaks.

3. Inspect the switchboard for any signs of overheating. Discoloration and flaking of insulation or metal parts are indications of overheating.

**i** If overheating occurs, be sure that all conditions that caused the overheating have been corrected. Loose or contaminated connections can cause overheating.

4. Check for signs of rodent nesting in the switchboard. If required, use a good exterminating technique in the general area of the switchboard.

**i** Do not place or use exterminating substances and chemicals inside the switchboard. Some of these products attract rodents.

5. Carefully inspect all devices for any visibly worn-out, cracked, or missing parts.
6. Manually open and close switches and circuit breakers several times to verify they are working properly.

### **Bus Bar Joints, Lug Terminations, and Insulating Materials**

#### **CAUTION**

##### **HAZARD OF EQUIPMENT DAMAGE**

- Do not sand or remove plating on any bus bar, splice bar, or terminal lug.
- Damage to plating can result in overheating. Replace damaged part. Contact Maverick Power Services at [support@maverickpwr.com](mailto:support@maverickpwr.com).

**Failure to follow this instruction can result in equipment damage.**

1. Bus bar joints are maintenance-free. Do not retighten them after the pre-energizing checkout procedure is complete.
2. Check all bus bar joints and terminal lugs for any pitting, corrosion, or discoloration resulting from high temperatures or subjection to high fault conditions. If any damage has occurred, replace the bus bars or lugs. If cleaning is required, use Lectra-Clean®, made by CRC.
3. Inspect all insulating materials. Before re-energizing the switchboard, replace insulators with any visible damage (such as cracks).

### **General Lubrication Information**

For field maintenance re-lubrication of blade/jaw components in switches

600 V and below, use Square D catalog number SWLUB, BG20 High Performance Synthetic Grease, from Dow Corning. This grease is applicable for the following switches:

- QMB Main and Branch
- QMJ Branch

For bus/plug-on connections use Square D catalog number PJC7201, Electric Joint Compound.

## Circuit Breakers

Square D™ brand circuit breakers are designed and manufactured as totally sealed units requiring minimal periodic maintenance.

Exercise circuit breakers at least once a year to ensure proper operation. For general maintenance:

1. Trip the circuit breaker by pushing the Push-To-Trip or "Open" button located on the face of the circuit breaker. Refer to the appropriate circuit breaker manual for the specific location of this button.
2. Manually open and close the circuit breaker two to three times.

**i** Schneider Electric instruction bulletin 48049-900-0x, Field Testing and Maintenance Guide for Thermal-Magnetic and Micrologic™ Electronic-Trip Molded Case Circuit Breakers, provides more in-depth information. For more information, refer to “Section 11—Reference.

Publications” on page 50 of this bulletin (80244-812-0x) and/or contact your local Schneider Electric representative.

Refer to individual circuit breaker instruction manuals shipped with the switchboard for additional maintenance information, such as changing rating columns or adjustable settings and removing circuit breakers. If an instruction manual is not available, refer to “Section 11—Reference Publications” of this manual and/or contact your local Schneider Electric representative.

# ⚠ DANGER

## HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- If adjusting circuit breaker settings, do not set the long-time trip rating at a higher ampacity than the rating of the bus bar or load cables it supplies; overheating can occur.
- Before energizing the switchboard, fill all unused mounting spaces with blank fillers and/or extensions as listed in Table 2.

**Failure to follow these instructions will result in death or serious injury.**

**Table 2: Blank Fillers and Extensions**


	Height	Catalog No.
<b>Blank Fillers</b>	1.50 in. (38 mm)	HNM1BL
	4.50 in. (114 mm)	HNM4BL
<b>Blank Extensions</b>	1.50 in. (38 mm)	HLW1BL
	4.50 in. (114 mm)	HLW4BL

## CAUTION

### HAZARD OF EQUIPMENT DAMAGE

Do not remove the protective lubricant on the plug-on connectors.

**Failure to follow this instruction can result in equipment damage.**

 If additional lubrication is required, apply a coating of electrical joint compound, catalog number PJC7201, to the plug-on connector's contact surfaces.

## Adverse Circumstances

This section includes, but is not limited to, all electrical components of the switchboard.

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside the equipment.
- Always use a properly rated voltage sensing device to confirm the power is off.
- Replace all devices, doors and covers before turning on the power to this equipment.

**Failure to follow these instructions will result in death or serious injury.**

**i** Before attempting to re-energize the switchboard following a fault, contact Maverick Power Services at [support@maverickpwr.com](mailto:support@maverickpwr.com) , for special instructions.

### **Inspection Following a Short Circuit**

If a short circuit occurs, make a thorough inspection of the entire system and verify that no damage to conductors or insulation has occurred. High mechanical and thermal stresses developed by short circuit currents may damage conductors and insulation. Check the overcurrent protection device that interrupted the short circuit current for possible damage.

Do not open sealed devices, such as molded case circuit breakers. These devices should be replaced if damaged. Before energizing the switchboard, all unused circuit breaker mounting spaces must be filled.

### **Clean-up Following a Short Circuit**

The insulating properties of some organic insulating materials may deteriorate during an electrical arc. If so:

1. Remove any soot or debris.
2. Replace carbon-tracked insulation.

### **Water-Soaked Switchboards**

Do not clean or repair a switchboard that has been exposed to large volumes of water or submerged at any time. Current carrying parts, insulation systems, and electrical components may be damaged beyond repair. Do not energize the switchboard. Contact Maverick Power Services.



## **Water-Sprayed or Splashed Switchboards (Clean Water Only)**

If the switchboard has been sprayed or splashed with small amounts of clean water, make a thorough inspection of the entire system and verify that no damage to conductors or insulation has occurred. Do not open sealed devices such as molded case circuit breakers or fuses. These devices should be replaced if damaged.

### **Inspection and Clean-up of Clean Water Sprayed or Splashed Switchboards**

Follow steps 1 through 8 only if:

- No signs of physical damage to the equipment are present.
- The switchboard has not been submerged or exposed to water for long periods of time.
- The water that has been in contact with the switchboard has not been contaminated with sewage, chemicals, or other substances that can negatively affect the integrity of the electrical equipment.
- The water that has been in contact with the switchboard has not entered any area of the enclosure that may contain wiring installed as intended and located above any live part. Specifically, inspect for water entering through conduits located above live parts.

If any of these conditions have not been met, contact Maverick Power Services at [support@maverickpwr.com](mailto:support@maverickpwr.com).

If ALL of the conditions listed above are true, proceed as follows:

1. Completely de-energize the switchboard. Disconnect and electrically isolate the switchboard so no contact can be made with energized parts. Always use a properly rated voltage sensing device to confirm power is off.
2. Wipe off all moisture from the bus bars, insulators, and insulating material with a clean, dry, lint-free cloth. Do not use cleaning agents or water displacement sprays.
3. Prepare the switchboard for insulation resistance testing by disconnecting all line-side supply connections and all load-side cable connections to isolate the switchboard from the wiring system.
4. Turn all circuit breakers or switches to their ON position. The switchboard must remain completely de-energized.
2. Use a megohmmeter with a capacity of 500–1,000 Vdc and apply voltage from:
  - a. Each phase-to-ground with breaker on.
  - b. Phase-to-phase with breaker on.
3. Record resistance values (see “Section 10—Switchboard Insulation Resistance Chart”).
4. If resistance measurements are less than 0.5 megohm, contact Maverick Power Services at [support@maverickpwr.com](mailto:support@maverickpwr.com) for recommendations.

If resistance measurements are greater than 0.5 megohm, the equipment can be energized using the procedures listed in “Section 7—Energizing the Switchboard”.



