

REMOVAL AND REINSTALLATION OF TYPE PSE DEAD-FRONT PAD-MOUNTED SWITCHGEAR ROOF

NOTE: These are general operational procedures for the removal and reinstallation of the roof on dead-front (PSE) pad-mounted switchgear from Federal Pacific.

Consult the factory for specific information, such as the length of gasket material needed and any other specific issues. The factory will require the serial

number of the switchgear unit in order to provide this information.

If you do not understand any portion of this instruction bulletin and need assistance, contact Federal Pacific at 276-466-8200.

Qualified Persons

WARNING

The equipment covered by this publication must be selected for a specific application and it must be operated and maintained by **Qualified Persons** who are thoroughly trained and knowledgeable in the installation, operation, and maintenance of underground power distribution equipment along with the associated hazards that may be involved. This publication is written only for such qualified persons and is not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment. Proper installation is the responsibility of the operating and construction personnel and the utility performing and authorizing the work. Completion of these instructions implies no further warranty by the manufacturer.

A **Qualified Person** is defined in the National Electrical Code (NEC/NFPA-70) as:

One who has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training to recognize and avoid the hazards involved.

The specific electrical safety training requirements to be considered a qualified person are detailed in **NFPA-70E, Article 110.1(D), Employee Training**. Some of the requirements from the 2012 edition are shown in the adjacent column. For the specific detailed training requirements for a Qualified Person make certain to refer to the most recent applicable edition.

These training requirements would include, but are not limited, to the following key points:

- The skills and techniques necessary to distinguish exposed energized parts from other parts of electrical equipment.
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed.
- The proper use of the special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment.
- Tasks performed less often than once per year have additional training requirements.

These instructions are intended only for such qualified persons. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment. Additionally, the recommendations in this instruction bulletin are not intended to supersede or to take the place of established utility safety guidelines and established practices. If there is any question, consult with your foreman or supervisor, as appropriate.

Please refer to OSHA 29 CFR 1910.399 and NFPA 70E Articles 100 and 110.

SAFETY INFORMATION

Understanding Safety-Alert Messages

There are several types of safety-alert messages which may appear throughout this instruction bulletin as well as on labels attached to the pad-mounted switchgear. Familiarize yourself with these types of messages and the importance of the various signal words, as explained below.

DANGER

“DANGER” identifies the most serious and immediate hazards which will likely result in serious personal injury or death if instructions, including recommended precautions, are not followed.

WARNING

“WARNING” identifies hazards or unsafe practices which can result in serious personal injury or death if instructions, including recommended precautions, are not followed.

CAUTION

“CAUTION” identifies hazards or unsafe practices which can result in minor personal injury or product or property damage if instructions, including recommended precautions, are not followed.

NOTICE

“NOTICE” identifies important procedures or requirements that, if not followed, can result in product or property damage if instructions are not followed.

SAFETY PRECAUTION

DANGER

Federal Pacific Fuse Mountings in conjunction with appropriate fuses are designed to protect equipment and to disconnect faulted equipment from the system. The fuses cannot protect personnel from injury or electrocution if contact is made with energized circuits or hardware.

Following Safety Instructions

NOTICE



Thoroughly and carefully read this instruction bulletin before installation of the pad-mounted switchgear, before switching or operating the switches or fuse mountings in this equipment, and before performing any maintenance on the equipment.

If you do not understand any portion of this instruction bulletin and need assistance, contact Federal Pacific at 276-466-8200.

Replacement Instructions & Labels

If you need additional copies of this instruction bulletin, contact Federal Pacific at 276-466-8200.

It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting Federal Pacific.

Recommended Tools and Material

- 9/16” Socket and driver (deep-well socket and electric driver/drill recommended)
- Extension bar for socket driver (12” min, universal joint or wobble attachment recommend)
- Two (2) Pry Bars (“Wonder bar” or equivalent suggested)
- 2” x 4” boards (one or two to slide the roof off).
 - 15kV - 8’ or longer (8’ Std. min.)
 - 25kV - 9’ or longer (10’ Std)

Replacement Gasket Material

(Gasket, 1/2 x 1-1/2 will be needed)

- Quantity (as required, U/M - Ft) Part Number 410100006
- 15kV PSE (4 compartment) 24 ft. (typical, verify with factory for specific amount)
- 25kV PSE (4 compartment) 28 ft. (typical, verify with factory for specific amount)

Touch-up Paint

- Touch-up paint (if needed), supply the switchgear serial number to the factory.

⚠ DANGER

The following procedure must be performed with the unit completely de-energized, grounded, and isolated from voltage in accordance with applicable work practices and safety rules. Any attempt to perform this procedure with the unit energized may result in electrical arc flash that can cause equipment damage, personal injury or death.

Before working on the switchgear, ensure that the switchgear and incoming cables are de-energized, tested for voltage, and grounded in accordance with appropriate users safety and operational procedures.

⚠ CAUTION

Wear appropriate personal protection equipment (PPE), in accordance with applicable users safety and operating procedures, when removing, repositioning, and installing the roof.

1. Open the doors on both sides of the switchgear, using the wind-braces to secure the doors in the open position. (Figure 1)



Figure 1. Dead-front Pad-mounted PSE-9 Switchgear Unit, with doors open and secured with wind-braces.

2. Remove and retain the nuts, clamping plates, and associated hardware used to secure the welded stud-bolts on the underside of the roof to the switchgear enclosure. (See Figure 3)



Figure 2. Preparing to remove roof retaining hardware. Note 9/16" socket on extension bar with wobble attachment and power driver. (Live-front design shown for illustration purposes only.)

- a. 9/16" – a deep-well socket is recommended.
- b. The roof of a dead-front (PSE) unit (Refer to Figure A – "Typical PSE Dead-Front Roof") will typically have 6 attachment points (one in each corner of the four corner of the switchgear, and one at each of the two termination compartment divider walls.)
- c. Retained hardware will be used later when reinstalling the roof.
- d. After the retaining hardware has been removed, close the doors of the switchgear.



Figure 3. PSE clamping bracket in corner of termination compartment.

⚠ CAUTION

NOTE: This is not a "one-person job". When lifting, protect hands. To avoid personal injury, communicate among all the participants that are present the next action to be taken so that each step in the lift process is coordinated and performed simultaneously by all personnel involved.

3. Remove roof (approximately 200 pounds) as follows:

a. Starting inside the cable termination compartments, (in order to protect the exterior finish of the switchgear) use pry-bars to "break" the old gasket free, working along the gasket, using even force in order to avoid deforming the roof or switchgear enclosure. (Figure 4)

i. Pry-bars are likely to be needed.



Figure 4. Using pry bars to "break loose" the roof gasket attachment. Protective measures, such as wrapping the pry-bars with cloth as shown should be used to protect enclosure finish(paint).

ii. To avoid damage to the roof and enclosure, it is best to wrap the pry bars with cloth or to use cardboard or other padding to minimize potential damage to the paint finish



Figure 5. Wood block support installed at corner, initial location.

b. Protect the painted surface from scratches and damage.

c. Beginning at one corner, raise the roof and install support(s). Repeat at each corner. (Figure 4a and 4b)



Figure 6a. The roof is supported on all four corners by blocks.



Figure 6b. Cross-piece runner board(s) is (are) installed to aid in removal of the roof and are normally installed in the direction the roof will be moved.

d. After the roof is raised on all four corners (Figure 6a), place one or two of the long 2 x 4s as cross-piece "runners" in the direction in which the roof is to be moved (Figure 6b).

e. The roof may be left in this partially open position (Figure 7) or completely removed and lowered to the ground (Figure 8), as is appropriate for the tasks to be performed.

NOTE: Never rest the roof on open switchgear doors.

- f. If the roof is removed and lowered to the ground, the roof should be supported to avoid damage to the finish (paint). Using blocks (as shown in Figure 8) will also facilitate lifting the roof when it is to be reinstalled.
4. Remove all gasket material from the top of the switchgear and the underside of the roof.
5. Install new gasket material as described in the *Recommended Tools and Materials* list on page 2, ensuring that a continuous seal will be re-established with the roof when it is repositioned on the enclosure.
6. Install the roof on the switchgear by reversing the process used in step 3.
7. After the roof is in place, reconnect the roof to the switchgear, referring to Figure A. For each stud, install one each:
 - a. The clamping brackets must be positioned across the roof and the enclosure to provide the maximum applied clamping surface.
 - b. The 3/8" flat washer is positioned on the roof stud between the roof and the clamping bracket.
 - c. A 3/8" Belleville washer is installed on the bottom of the clamping bracket, cupped side towards the bracket.
 - d. This assembly is secured to the roof stud with a 3/8" 16 locking (nyloc) steel hex nut (torque to 20 foot-pounds).
8. After the roof has been reinstalled, touch-up any damage to the paint.



Figure 7. PSE roof moved to side to allow work on switchgear.

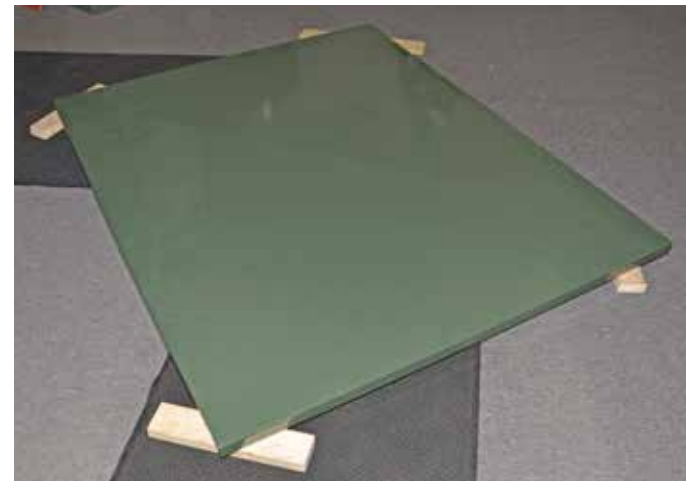
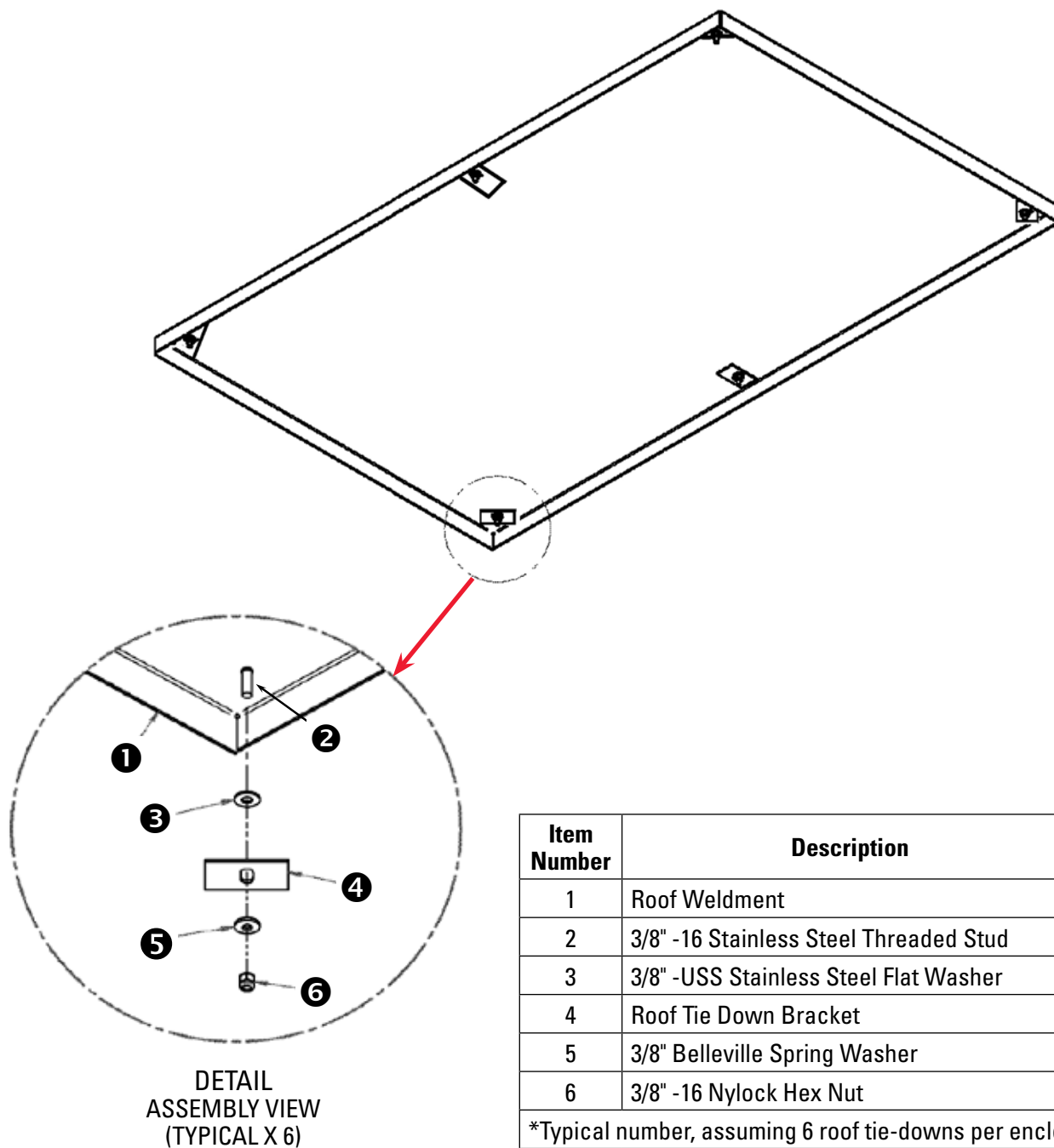


Figure 8. Roof supported on blocks after it is removed and lowered to the ground.

FIGURE A - Typical PSE Dead-Front Roof (viewed from bottom of roof)



Item Number	Description	Quantity
1	Roof Weldment	1
2	3/8" -16 Stainless Steel Threaded Stud	6*
3	3/8" -USS Stainless Steel Flat Washer	6*
4	Roof Tie Down Bracket	6*
5	3/8" Belleville Spring Washer	6*
6	3/8" -16 Nylock Hex Nut	6*

*Typical number, assuming 6 roof tie-downs per enclosure.



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