

# TYPE PSI/II PAD-MOUNTED SWITCHGEAR 15kV • 25kV • 35kV INSTRUCTIONS FOR REMOVAL AND REINSTALLATION OF ROOF

**NOTE:** These are general operational procedures for the removal and reinstallation of the roof of Federal Pacific Live-Front Type PSI/II Pad-Mounted Switchgear.

Consult the factory to obtain the necessary gasket material or for any specific information needed.

The factory will require the serial number of the switchgear unit in order to provide the appropriate material and 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 110.2(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, 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) or functional equivalent.
- Extension bar for socket driver (12" min, universal joint or wobble attachment recommend) or functional equivalent.
- Two (2) Pry Bars ("Wonder bar" or equivalent suggested)
- Corner Supports (Qty 4) - 2" x 4" board sections, approximately 12" length.
- 2" x 4" "runner" boards (Qty 2) - to allow lateral movement of the roof.
  - 15kV - 8' or longer (8' Std. min.)
  - 25kV - 9" or longer (10' Std)

### Touch-up Paint

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

### Replacement Gasket Material (may not be needed)

- 90° "bubble gasket" (8 x 4" each = 32") U/M Ft  
Part # 1011-06 (Qty 3)
- Neoprene Gasket, Left Hand, Self-Adhesive – U/M Each  
Part # A34-9620-01 (Qty. 4)
- Neoprene Gasket, Right-Hand, Self-Adhesive – U/M - Each  
Part # A34-9620-02 (Qty 4)

**⚠ 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 and secure the doors in accordance with the instructions furnished with the switchgear (Publication IB-1A-110) (See Figure 1)

**⚠ CAUTION**

Do not use power tools to operate the security bolt.



Figure 1. Live-front Pad-mounted PSI/II-9 Switchgear Unit, with doors open and secured with door keepers.

2. The roof of a Type PSI/II Live-Front unit will typically have four (4) attachment points (one in each corner).



Figure 2. Preparing to remove roof retaining hardware. Note 9/16" socket on extension bar with wobble attachment and power driver.

- a. In units built September 2004 or later, a gusset with a bolt hole is provided in each corner. A welded stud in the roof is attached to the switchgear enclosure at each of these gusset plate. Refer to Figure A on page 6 - "Typical PSI/II Live-Front Roof".
  - b. Units built prior to September 2004 use a clamping plate in each corner (instead of a gusset plate) to secure the roof to the switchgear enclosure. Refer to Figure B on page 7.
3. Using the 9/16" deep-well socket and extension bar (or equivalents), remove and retain the internal nuts and associated hardware used to secure the roof at the corners to the switchgear enclosure. Figure 2.
    - a. Retained hardware will be used later when reinstalling the roof.
  4. After the retaining hardware has been removed, reposition and store the door keeper, and close the doors of the switchgear.

**⚠ CAUTION**

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

**⚠ NOTICE**

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

5. Remove the roof (approximately 200 pounds) as follows:
- a. Ensure that the painted surfaces are protected from scratches and damage by wrapping the pry bars with a padding material.
  - b. Using the pry bars, with protective padding, "break" the gasket on the enclosure top flange free of the roof by working the pry bar along the gap between the roof and the enclosure and pushing the roof up to gain further separation. Use even force in order to avoid deforming the roof or switchgear enclosure. See Figure 3.
  - c. After "breaking" the gasket free, begin at one corner and raise the roof sufficiently to install a support block. Repeat the process at each corner. Refer to Figures 4a and Figure 4b.
  - d. After the roof is raised on all four corners (Figure 5a), position two long 2x4s on the enclosure flanges across the unit as runners in the direction in which the roof is to be moved, typically parallel to the doors. Space the runners about two feet apart.
  - e. After the roof is supported by the two runner boards, the corner blocks should be removed prior to sliding the roof.

 **CAUTION**

When raising or sliding the roof, avoid positioning fingers in the gap between the roof and the enclosure. Designate one person to give the commands so that all movement is coordinated among the service personnel.

 **NOTICE**

Never rest the roof on the open switchgear doors.

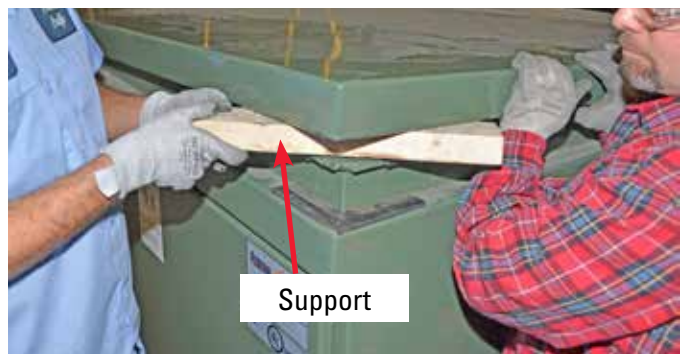
- f. The roof may be left in this partially open position or completely removed and lowered to the ground, as is appropriate for the tasks to be performed.
- g. If the roof is to be lowered to the ground, follow established safe work practices for handling loads of approximately 200 pounds.
- h. If the roof is removed and lowered to the ground, the roof should be supported to avoid damage to the finish (paint) or introduction of contamination on the underside of the roof. Using blocks to support the roof (as shown in Figure 6) will also facilitate lifting the roof when it is to be reinstalled.



*Figure 3. 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).*

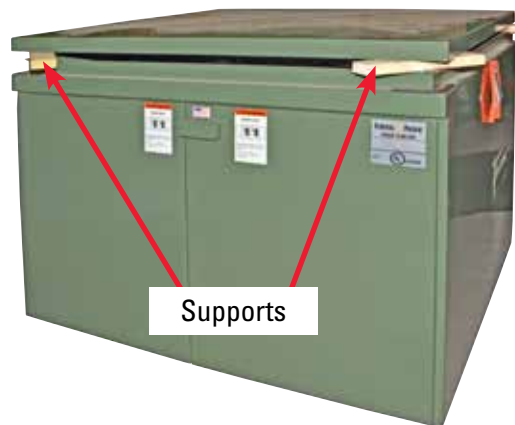


*Figure 4a. Wood block support installed at corner, initial location.*

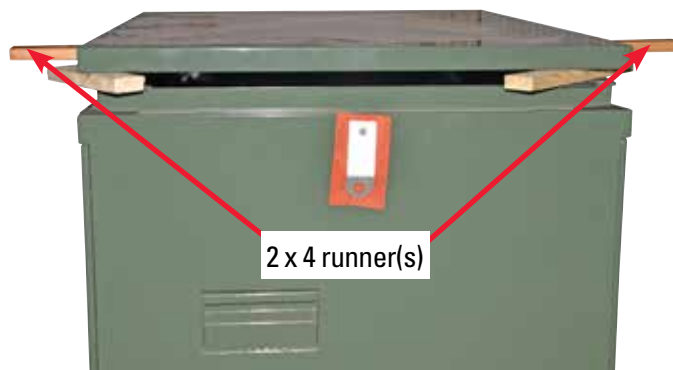


*Figure 4b. Wood support block moved to upper location.*

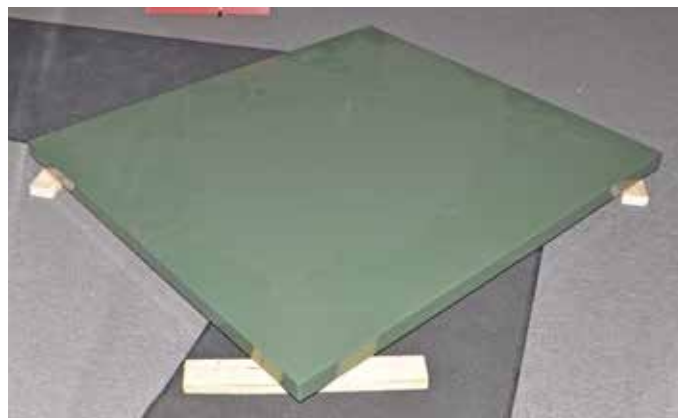
6. Remove any damaged gasket material from the top flange of the switchgear and the underside of the roof.
7. Install, as required, new gasket material (described in the Recommended Tools and Materials list on page 2).
8. Install the roof on the switchgear by reversing the process used in step 5.
  - a. Take care to align the roof squared with the enclosure and avoid damage to the finish (paint) on either surface.
9. After the roof is in place, positioned squarely on the enclosure with the roof studs positioned in the holes of the corner gussets, reconnect the roof to the switchgear. For each stud, install one each:
  - a. 3/8" stainless steel flat washer
  - b. 3/8-16 elastic locking ("nyloc") steel hex nut (torque to 20 foot-pounds). Do not re-use the old "nyloc" nuts.
  - c. Clamping brackets were used on live-front units manufactured prior to September 2004. (Refer to Figure B, page 7.) In such cases, the following procedure applies:
    - i. The clamping brackets must be positioned across the roof and the enclosure to provide the maximum applied clamping surface.
    - ii. The 3/8" flat washer is installed on the bottom of the clamping bracket.
    - iii. This assembly is secured to the roof stud with a 3/8-16 locking (nyloc) steel hex nut (torque to 20 foot-pounds).
10. After the roof has been reinstalled, touch-up any damage to the paint.



**Figure 5a. The roof is supported on all four corners by blocks.**

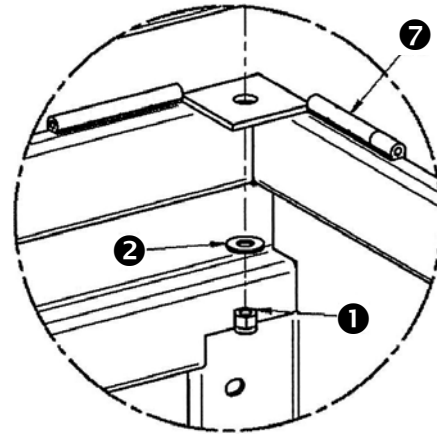
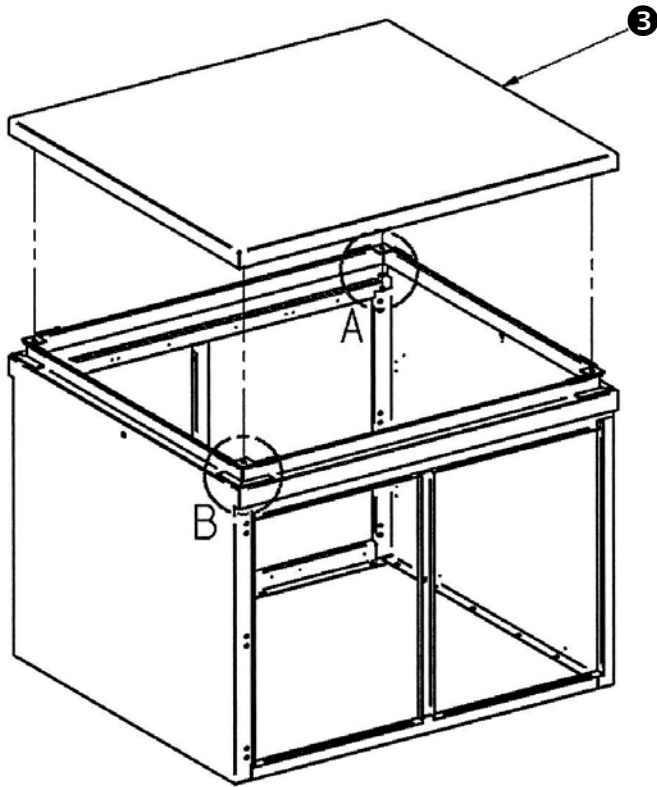


**Figure 5b. 2x4 runner boards are installed to aid in removal of the roof and are normally installed in the direction the roof will be moved.**



**Figure 6. Roof supported on blocks after it is removed and lowered to the ground.**

**FIGURE A - Typical PSI/II Live-Front Roof (September 2004 or Newer)**

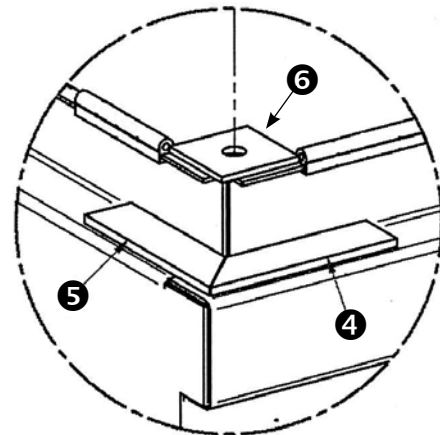


**DETAIL A**

**TYPICAL INSIDE CORNER VIEW**

- NUT AND WASHER ATTACH TO WELDED STUDS ON ROOF THROUGH GUSSET PLATE ON ENCLOSURE

- 90° BUBBLE GASKET IS GIVEN AS A TOTAL "INCH" QUANTITY. EACH OF 8 SECTIONS IS 4 INCHES.



**DETAIL B**

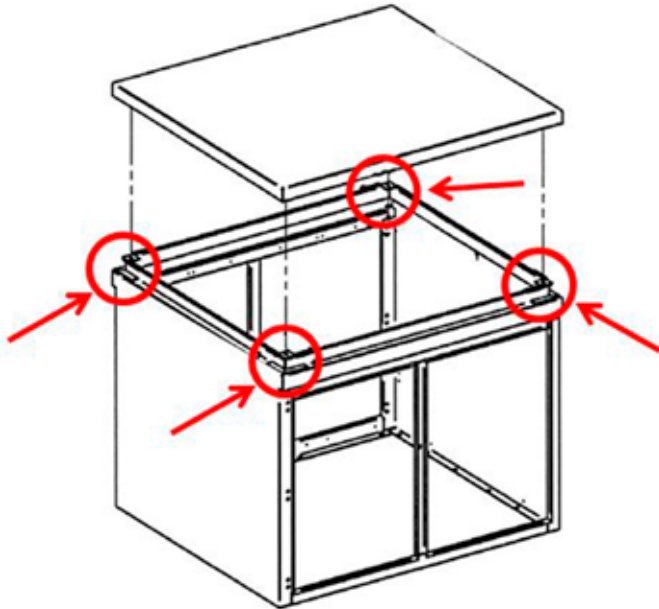
**TYPICAL OUTSIDE CORNER VIEW**

- NEOPRENE SELF-ADHESIVE GASKET ATTACHES FLAT ON TOP OF THE ENCLOSURE AND FLUSH AGAINST INSIDE FLANGE SURFACE

Item Number	Description	Quantity
1	3/8" - 16 Nylock Hex Nut	4*
2	3/8" USS Stainless Steel Flat Washer	4*
3	Roof Weldment	1
4	Neoprene Gasket, left-hand, self adhesive	4*
5	Neoprene Gasket, right-hand, self adhesive	4*
6	Gusset Plate (welded to enclosure)	4*
7	90 degree "Bubble Gasket" - 4" sections	8*

\*Typical number, assuming 4 roof tie-downs per enclosure.

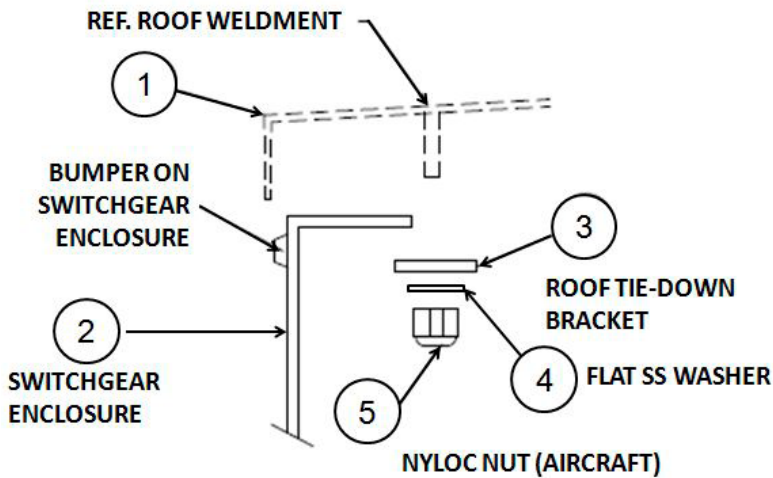
**FIGURE B - Typical PSI/II Live-Front Roof (Manufactured prior to September 2004)**



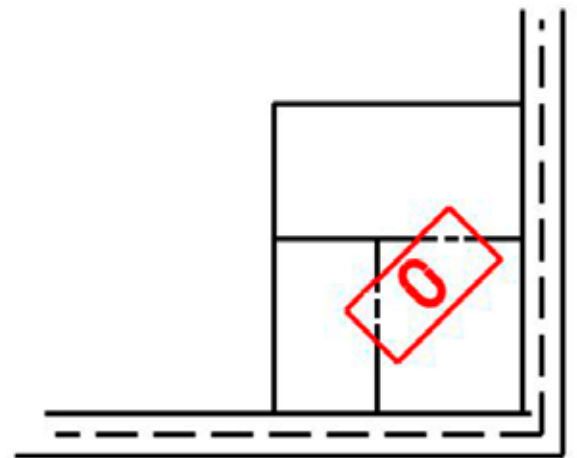
**DETAIL A - Locations of roof tie-down brackets**

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

\*Typical number, assuming 4 roof tie-downs per enclosure.



**DETAIL B - Roof to unit connection**



**DETAIL C - Close-up showing orientation of roof tie-down bracket**

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