

# Instruction Bulletin Pad-Mounted Switchgear With Non-Functional Door Latch

## 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.

## Application Note

These instructions apply to pad-mounted switchgear that is equipped with the Federal Pacific auto-latch self-latching mechanisms that may include some non-stainless steel springs and bushings. It does not apply to equipment with any other style of door latch. Door latches utilized after December 2007 include stainless-steel bushings and springs. But these instructions will apply to such vintage units where the penta-head bolt has been broken by applying heavy torque such as by using power tools to turn the bolt.

## Overview

The goal of the processes below is to cause the least damage to the door latches (which may only need lubrication), the striker-pin rails, and, most importantly, the doors and hinges. This being the case, proceed through the steps in the first condition, and then the steps in the second condition, going to a higher numbered step only if the preliminary step(s) have not succeeded in opening the active door (typically the right-hand door with the lockbox and latches).

Condition #1 – The penta-head security bolt is broken off or otherwise non-functional. The first section of this document provides instructions for accessing the latch mechanism to force the latches to release.

Condition #2 – The penta-head security bolt is in place and one or more of the latches are “stuck” and not releasing properly. This has been reported in some pad-mounted switchgear manufactured prior to March 2008 which may (or, prior to October 2007, will) have door latches that do not have the latest stainless-steel components. In harsh environments and where maintenance has not been performed, these older vintage latches may be subject to corrosion that prevents the latches from releasing.

For instructions on installation and operation of Live-Front Pad-Mounted Switchgear refer to IB-1A-110 and for Dead-Front Pad-Mounted Switchgear refer to IB-2A-210.

### **DANGER**

The following maintenance procedures must be performed with the switchgear completely de-energized and isolated from voltage. Any attempt to perform maintenance with the unit energized may result in electrical arc flash that can cause equipment damage, personal injury, or death.

### **DANGER**

In no case should the unit be left unsecured even for a short period of time.

## 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 padmounted 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.

## 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.

## SAFETY PRECAUTION

#### **DANGER**

Federal Pacific Fuse Mountings in conjunction with appropriate fuses are designed to protect cable and 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.

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. Please be prepared to provide the part number of the required label or a good description and location of the label on the enclosure if the part number is not available.

**Condition #1 – The penta-head security bolt is broken off or otherwise non-functional.**

- Step 1 – Ensure that the switchgear is de-energized, tested for voltage, and grounded.
- Step 2 – Drill a 3/8" hole as indicated in Figure 1 at the designated location below the lock box. (Typical location shown - may vary with specific design by serial number. Check with factory for details).

**NOTES:**

- 1) When drilling the door, do not go more than 1/2" deep in order to not damage the latching mechanism. In some cases, the drilling may go through both the thickness of the door and the thickness of the galvanized-steel latch-support angle bracket.
- 2) If a larger hole is drilled, the hardware used to close the hole should be increased in size to ensure a proper fit and closure of the hole.

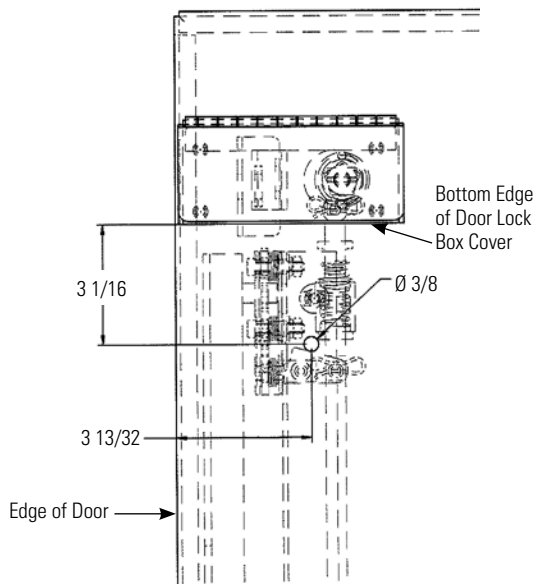


Figure 1. Drawing showing typical recommended drilling location.

Method A – Supply Federal Pacific with the serial number of the switchgear, and Federal Pacific will provide a recommended drilling location, as shown above (example only, may vary).

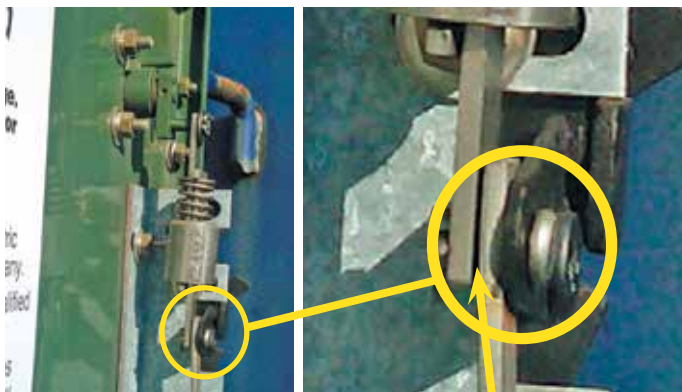


Figure 2a. Latch-bar joint.

Figure 2b. Close-up of latch-bar overlapped joint.

Method B – If another door on the switchgear can be opened, open that door and establish horizontal and vertical locating dimensions to the joint on the latch bar as indicated above.

- Step 3 – Insert a flat-edge screwdriver with blade horizontal through the drilled hole. Position the flat edge of the screwdriver blade under the latch-bar joint and pry up at the latch-bar joint as shown until the latches trip open.

After a vertical movement of approximately 1/4-inch the latches will release and the door will open.



Figure 3a. With the flat edge of the screwdriver horizontal, insert the screwdriver through hole drilled in door.



Figure 3b. Flat edge of screwdriver positioned under latch-bar joint.

If the foregoing procedure did not release the latches, proceed to Condition #2.

- Step 4 – Dress the hole with a small file or emery cloth to remove any burrs or sharp edges and to provide a smooth clean surface for paint.
- Step 5 – Paint the edges of the hole with a rust-inhibiting paint. Allow to dry. Top coat, if desired (allow to dry if applied).
- Step 6 – Put a bead of caulk around the hole, but inside the area of the carriage-bolt head.
- Step 7 – Seal the hole with the 5/16"-18 x 3/4" SS carriage bolt and 3/8" flat SS washer on the outside of the door, and a 3/8" flat SS washer on the inside with a 3/8" SS split lock-washer, and 5/16"-18 brass nut on it - all of which are supplied.
- Step 8 – Paint the head of the carriage bolt to match the cabinet (optional).

**Recommended Parts to Close the Hole in Door**

Quantity	Description	Federal Pacific Part Number
1	5/16" - 18 x 3/4" Carriage Bolt (stainless)	84-0332211
1	5/16" x 18 Hex Nut Brass	82-0142200
1	3/8" Split Lock Washer (stainless)	85-0330500
2	3/8" Flat Washer (stainless)	85-0130400

**Condition #2– The penta-head bolt is in place and the latches are “stuck” and not releasing when turning the penta-head security bolt or after lifting the latch-bar using the drilling method described in Condition #1.**

As previously stated, the goal of the processes below is to get the door open while causing the least damage to the latches (see Figure 4a), (which may only need lubrication), the striker-pin rails, (see Figure 4b), and, most importantly, the doors and hinges. This being the case, proceed sequentially through the steps, that follow so that any damage can be minimized.

This is a case where, if lubricating the existing latches is all that is needed, then the direct and simple approach of lubricating and continuing to use the existing latches should be taken. This will remove the need for adjusting replacement latches and/or striker-pin rails.

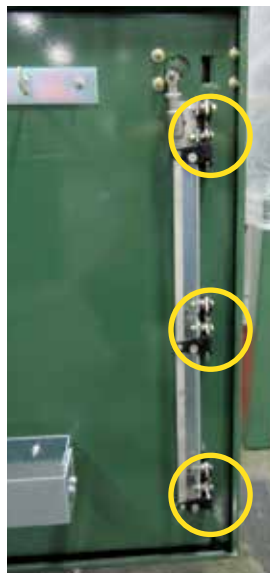
In the case of a one-man trouble crew, or if the need to open the switch is critical, then it may be necessary to move directly to the last step, Step 4, but moving to Step 4 is also more likely to result in damage that will need more significant repair.

**Step 1 - Latches Will Not Release**

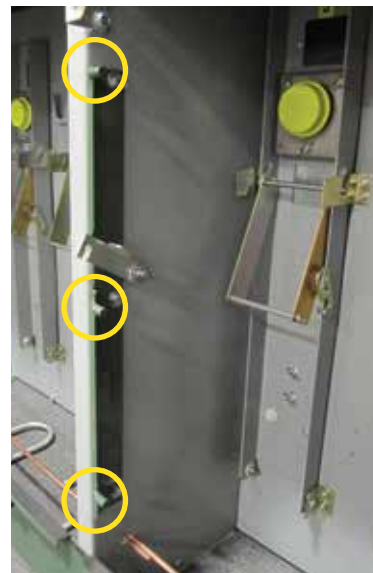
- If the rotation of the penta-head bolt does not release the latch, the first step is to turn the penta-head bolt while gently prying up on the active door at the bottom edge at a location in line with the latch assembly.
- If the penta-head bolt is sheared, use the “drill and screwdriver” method previously described in “Condition #1. Insert the screwdriver to put pressure on the latch bar, while gently prying up on bottom of the active door at a location that is in line with the latch assembly. See Figure 5.
- This procedure is an effort to free and trip the latches without damage to the latch pins on the striker-pin rail or (more importantly) damage to the active door and hinges. See Figures 4a and 4b.
- Spray penetrants and lubricants on the latch assembly.
- If a hole has been drilled in the door, complete Step 4 through Step 8 under Condition #1. Do not leave the unit without completing these steps to provide a protective finish that minimizes the chance for corrosion where the paint has been removed during the drilling procedure.

- If this method is successful, inspect the door, hinges, latch assembly, and striker rails for damage. If any damage is noted, proceed to Step 2 that follows.

**Inspect striker pins and latch assembly for damage and, if necessary, replace as described in Step 2 below.**



Figures 4a. Latch assembly (latches circled).



Figures 4b. Striker-pin rail (latch pins circled).



Figure 5. Gently pry up active door at bottom in line with the latch assembly. The penta-bolt can be used to approximate the correct location.



Figure 6. Prying the edge of the active door while applying tension on the latches.

## Step 2 - If the Striker-Pin Rail and/or Latch Assembly are to be Replaced.

**Note:** It is recommended that the roof be removed to facilitate installation and adjustment of the latch assemblies and the striker-pin rails. Inspection of the striker rail and latches during adjustment is easier with the roof removed and, if necessary, makes it easier to release the latches during the adjustment process.

- a. Before removing the latches or the striker-pin rail, mark the positions of the old latch assembly and striker-pin rail to help with the installation and adjustment of the replacements.
- b. Install replacement auto latch and/or striker-pin rail as needed, using the previously marked positions as guides.
- c. Adjustment is required if all three auto-latches do not fully and simultaneously engage and latch securely to their respective latch-pins.
- d. If adjustments are needed, it usually is best to adjust the striker-pin rail to match with the auto-latches. Start by loosening the striker-pin rail and aligning the latch-pins to the auto-latches vertically, then horizontally.
- e. After achieving successful latching and unlatching of the door, securely tighten the striker-pin rail to the enclosure.

## Step 3 - If the Latches Still Do Not Release - A More Forceful Method.

If the method in Condition #2, Step 1 does not work, then a more forceful prying of the active door is necessary, using the passive door as the fulcrum to support a pry-bar.

- a. While turning the penta-bolt (or using the "screwdriver method" from Condition #1) to get tension on the latch-bar, pry on the door with increasing force as needed. Apply the pressure at the first latch from the top that is not tripping (i.e. - if the top latch is released, pry at the middle latch first).
- b. The goal, once again, is to trip the latches while taking particular care to avoid damage to the doors and hinges. In this case the striker-pin rails may be considered expendable.

— In extreme cases, the active door may be considered to be expendable as well.

- c. After the switchgear door has been forced open, inspect the door, hinges, auto-latch assembly, and striker-pin rails for damage.
- d. Spray penetrants and lubricants on the latch assembly, or remove the latches as appropriate.
- e. If the auto-latch assembly or the striker-pin rail are damaged and require replacement, refer to the procedure described in Step #2.
- f. Change out the active door and hinges if they have been deformed.
- g. If a hole has been drilled in the door, complete Step 4 through Step 8 under Condition #1. Do not leave the unit without completing these steps.

## Step 4 - If the Latches Do Not Release - And Time is of the Essence

In the case where time is of the essence and the restoration crew needs immediate access (especially in the case of a one-person crew, if appropriate), the responder may need to forcefully pry the active door open, using the techniques of Step #3, exerting increasing force until the door is opened.

- a. Spray penetrants and lubricants on the latch assembly, or remove the latches as appropriate, restore service, close and secure the active door via a padlock on the hasp tab on the active door.
- b. The repairs may be deferred to "regular hours" with a repair crew, provided the switchgear can be secured and made safe, according to the Safety and Operational policies of the utility.
- c. If a hole has been drilled in the door, complete Step 4 through Step 8 under Condition #1. Do not leave the unit without completing these steps.

### DANGER

In no case should the unit be left unsecured even for a short period of time.





Every effort is made to ensure that customers receive an up-to-date instruction manual on the use of Federal Pacific products; however, from time to time, modifications to our products may without notice make the information contained herein subject to alteration.

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