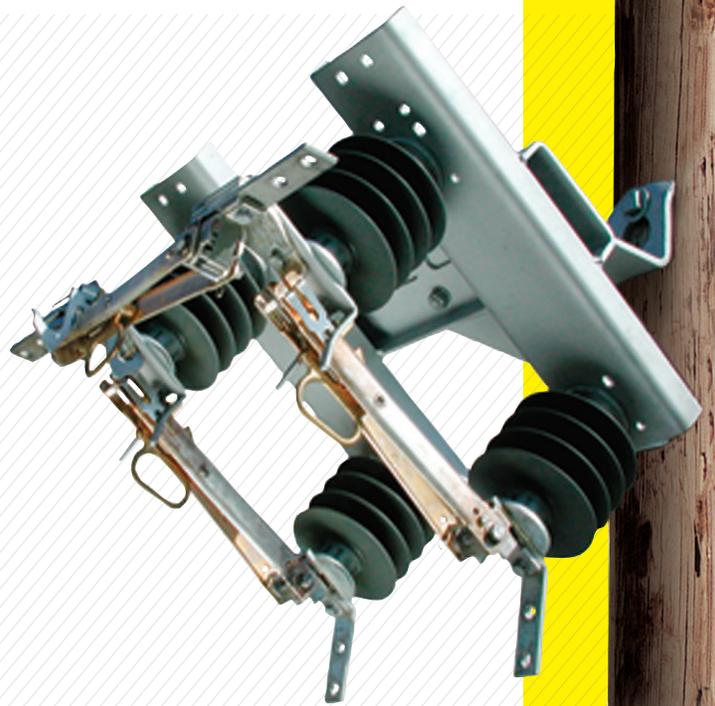


TYPE BP3 3-PULL BY-PASS SWITCH FOR DISTRIBUTION SWITCHING

Installation,
Operation and
Maintenance
Manual



IMPORTANT

Keep this manual readily
available for future reference



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Table of Contents

	<u>PAGE NO.</u>
Warnings	3
Overview	4-6
Receiving & Handling	6
Inspect Packaging	6
Unpack Switch	6
Switch Installation	7-8
Install Switch	7
Structure Application	7
Back Strap Application	7
Pole Mounting Bracket Application	8
Wiring	9
Conductors	9
Connect High Voltage Conductors	9
Operation	10-12
General	10
Closing Switch	10
Opening Switch	11
Maintenance	13



Warnings



DANGER

Electrical equipment contains hazardous voltages and high speed moving parts. Contact with these hazards will cause death, serious personal injury or damage equipment.

Only qualified personnel shall install, operate and maintain this equipment. Always properly ground equipment and lock out electric power (de-energize) before maintenance. Using non-specified/unauthorized parts or components to repair equipment, or tampering with safety devices/systems will result in dangerous conditions which can cause death, severe personal injury or damage to equipment. Take note of and follow all safety instructions contained in this installation, operation and maintenance manual.

IMPORTANT

These installation, operation and maintenance instructions do not claim to cover all details or variations in equipment. Nor do they provide for all possible conditions encountered while installing, operating or maintaining this equipment. If further information is desired or needed to address any particular installation, operation or maintenance problem not covered in this document, contact your authorized factory representative.

The information in this document does not relieve the user from exercising good judgment in selecting equipment for suitability of application. Nor does it relieve the user from using sound practices in installation, operation and maintenance of the equipment purchased.

Note: Because CHANCE has a policy of continuous product improvement, we reserve the right to change design and specifications without notice. Should a conflict arise between the general information in this document and the contents of drawings or supplementary material, or both, the latter shall take precedence.

QUALIFIED PERSON

For the purpose of this manual, a qualified person is:

- (a) familiar with the installation, operation and maintenance of the subject equipment and the hazards involved with its installation, operation and maintenance.
- (b) trained to de-energize, clear, ground, and tag circuits and equipment in accordance with established safety practices.
- (c) trained in the proper care and use of protective equipment such as rubber gloves, hard hat, safety glasses or face shields, flash clothing, etc., in accordance with established utility safety practices.
- (d) trained to render first aid.

SUMMARY

The information in this document does not claim to cover all details or variations in equipment, nor to provide for every possible contingency encountered with installation, operation, or maintenance. Should further information be needed or problems arise that are not covered sufficiently, contact your factory representative.

The contents of this document are not part of, nor do they modify, any prior or existing agreement, commitment or relationship. CHANCE terms and conditions of sale constitute the entire obligation of CHANCE. The warranty in the terms and conditions of sale is the sole warranty of CHANCE. Any statements in this document do not create new warranties or modify any existing warranty.



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Overview

QUALIFIED PERSON

Only qualified trained and competent personnel that understand proper safety procedures must select, install and service this equipment.

Read and understand these instructions before installing, operating or maintaining this equipment.

This guide is not a substitute for adequate training and experience in safety procedures for this type of equipment.

SIGNAL WORDS

The signal words “DANGER”, “WARNING” and “CAUTION” (along with their assigned symbol) throughout this manual indicate the degree of hazard the user may encounter. These symbols and words are defined as:

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

PRODUCT

The products covered by this manual are the BP3 3-Pull overhead by-pass switches for medium voltage electrical distribution switching.

These products are designed for distribution switching only at their rated capacities. They cannot be field modified for capacities other than what was shipped with the units. If a different capacity is desired, contact your supervisor or factory representative

FUNCTION

These products are non-loadbreak disconnect switches designed to provide a means for by-passing, disconnecting and isolating reclosers or similar devices on the electrical distribution system.

GENERAL

The BP3 By-Pass Switch is a single-phase 3-blade, 3-pull, hookstick operated switch. It is used for manually disconnecting a recloser without interrupting normal electrical service. Standard variations are:

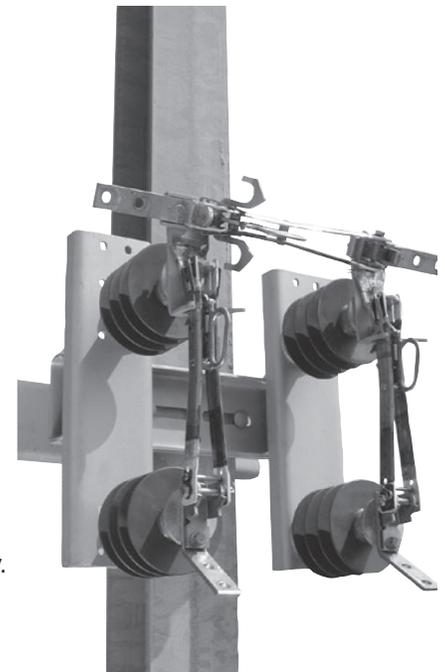
1. Right or left opening by-pass blade operation
2. Switch mounting
3. Terminal connections
4. Loadbreak hooks on disconnect blades.

The BP3 switch has no inherent current making or breaking capacity. The by-pass blade includes a hook for use with a loadbreak tool. The BP3 has no deadending provisions.

SPECIFICATIONS

Select the proper BP3 switch for each installation with consideration to voltage, continuous current, short time current withstand, lightning impulse withstand and variations. If there is concern about the use of this switch as rated, consult your supervisor before installation.

- Nominal voltage ratings of 15.0 kV, 27 kV or 38 kV
- Lightning Impulse peak withstand ratings of 110 kV, 125 kV, 150 kV and 200 kV
- Continuous current rating of 600 or 900A (900A only for units with 200 kV BIL rating)
- Short time current withstand rating: 25 kA Symmetrical, 1 second 65 kA peak



DANGER

Hazardous Voltage

Will cause severe personal injury, death, or property damage.

Only qualified personnel should work on or around this equipment after becoming thoroughly familiar with this document and other publications regarding this equipment.

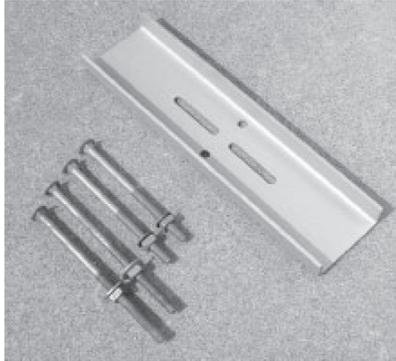
Overview

SWITCH VARIATIONS

1. Right or Left By-Pass Blade Opening

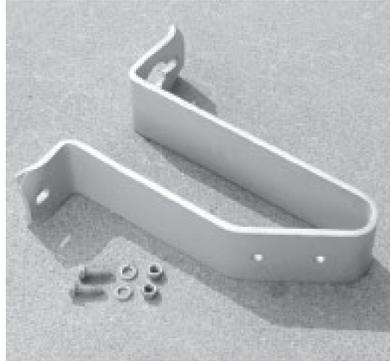
Right or left by-pass blade opening may be specified. A right opening by-pass blade opens to the right of the operator when standing in front of the switch. A left opening by-pass blade opens to the left. Illustrations in this manual show only right by-pass blade opening. Left by-pass blade opening will be opposite as shown but does not change installation or operation procedures.

2. SWITCH MOUNTING (3 variations)



BACK STRAP

Provides a galvanized steel back strap and hardware for vertical structural applications. Mounting hardware supplied consists of two each of ½" diameter by 8" long and 10" long carriage bolts with square nuts and flat washers.



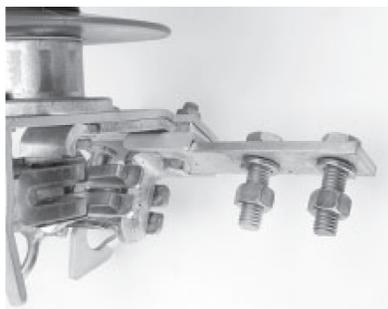
POLE MOUNTING BRACKET

Provides a galvanized steel bracket for wood pole mounting. Hardware is supplied to attach the switch to the bracket. The user supplies the bracket-to-pole hardware. If the utility pole is other than a wood pole, contact your factory representative.

NO MOUNTING BRACKET (STANDARD)

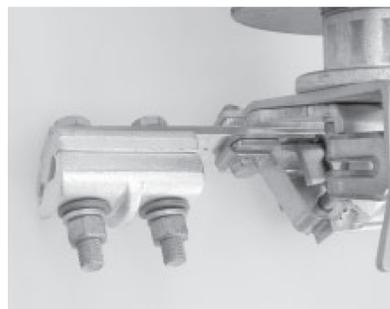
Provides holes and slots in the switch base for direct base to a vertical structure mounting without the use of a back strap or pole mounting bracket. The structure must be drilled to match the base mounting holes or slots. The user supplies the mounting hardware.

3. TERMINAL CONNECTORS (3 variations)



CAPTIVE HARDWARE

Provides ½" diameter by 1¾" long stainless bolt secured into each terminal pad hole. Each bolt is supplied with a hex nut and lock washer. Terminal connectors supplied by the user.



TERMINAL CONNECTORS

Four fortified cadmium plated aluminum parallel groove terminal connectors (ATC1343) with terminal pad mounting hardware are supplied. The connectors accommodate conductor sizes ranging from No 2 solid copper thru 500 MCM copper or aluminum.

NO TERMINAL HARDWARE (STANDARD)

The user supplies the terminal connectors and mounting hardware.

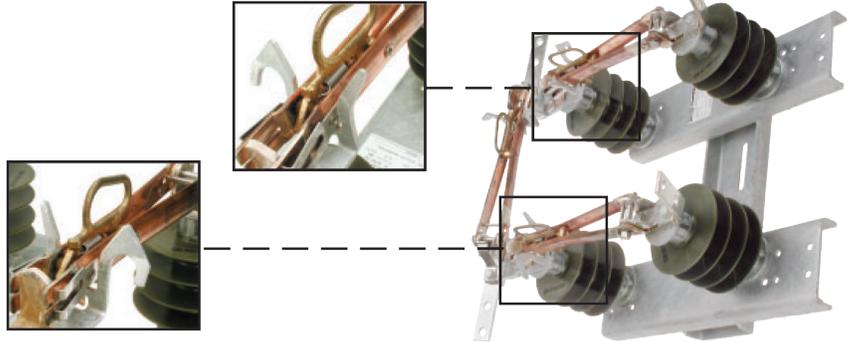


Overview

4. LOADBREAK HOOKS on DISCONNECT BLADES (2 variations)



BLADE GUIDES (STANDARD)
Provides non-loadbreak blade guides on disconnect blades.



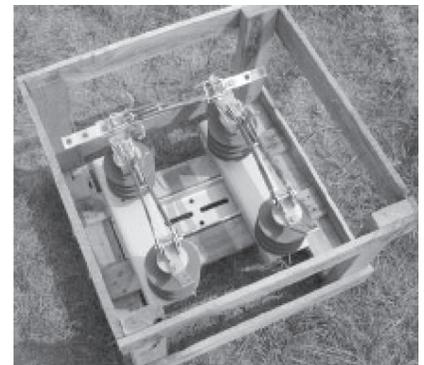
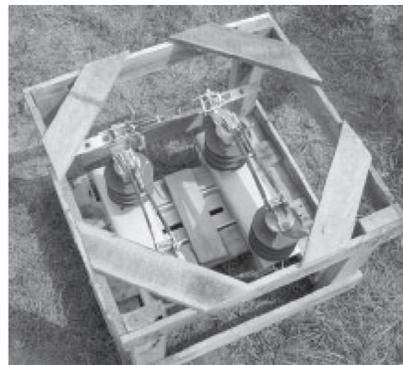
LOADBREAK HOOKS
Provides single-sided loadbreak hooks on disconnect blades.

Receiving & Handling

INSPECT PACKAGING

- Upon receipt, immediately inspect packaging for signs of damage
- Start inspection with the packaging material and proceed to the equipment within
- Look for concealed damage
- If damage is found, note damage on Bill of Lading prior to accepting delivery, if possible

Note: Documentation of visible shipping damage can determine the outcome of any damage claim. Immediately notifying the carrier of concealed damage is essential to resolving or minimizing unsettled claims. Immediately file your claim and notify your factory representative.



INSPECT PACKAGING

- Place shipping crate on stable, level surface near the utility pole
- Remove the four angled top boards from the shipping crate
- Remove any options included
- Remove the clamping board from across the switch base
- Leave switch on its pallet until ready to install
- Compare switch with the photo to be sure all items have been included
- Contact your factory representative if any parts are missing
- If desired, the crate may be turned over and used as a work table to facilitate assembly and slinging of the switch.



Switch Installation

INSTALL SWITCH

The BP3 By-Pass switch is available in three mounting arrangements. It may be obtained with no mounting bracket, with a back strap or with a bracket for wood pole mounting. Select your application from the descriptions below and install the switch accordingly.

STRUCTURED APPLICATION

- Refer to Figure 1
- Determine the switch mounting location on the structure
- Provide a minimum of two $\frac{9}{16}$ " diameter mounting holes in the structure matching the hole or slot patterns as shown in the switch base detail
- Secure lifting sling as shown below

- Using your company's standard practice, hoist the switch into position
- Attach the switch to the structure with $\frac{1}{2}$ " diameter user supplied mounting hardware and torque according to your company standards.

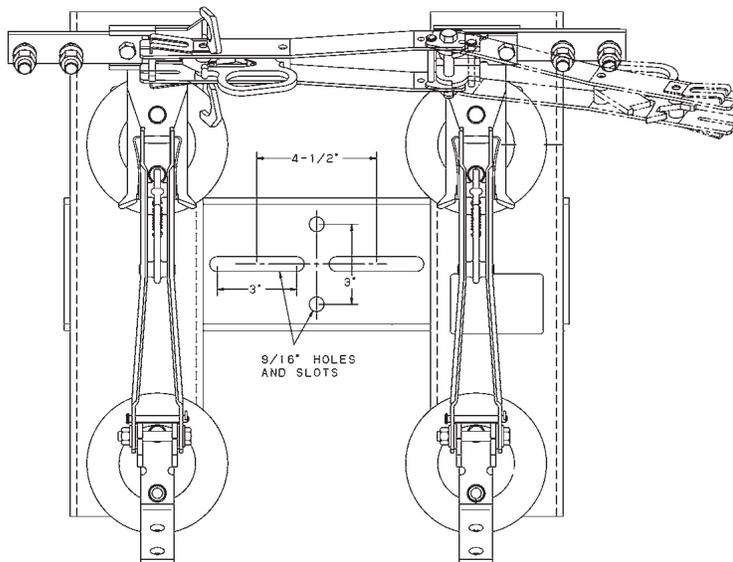
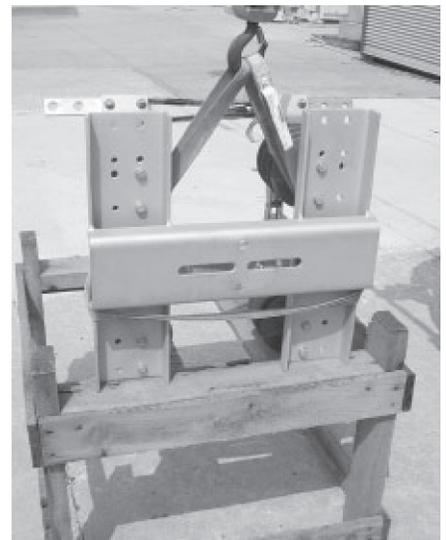


FIGURE 1

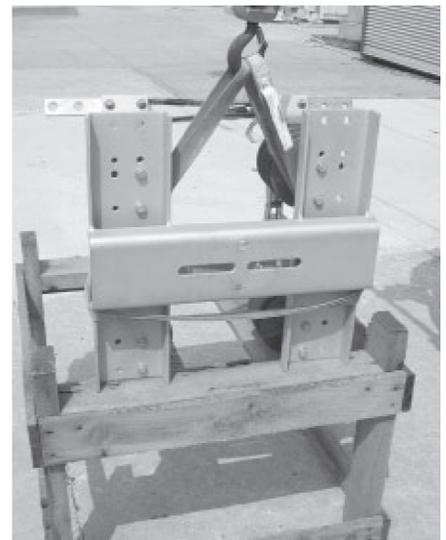


BACK STRAP APPLICATION

- Refer to Figure 2
- The back strap option is supplied with two lengths of mounting bolts, 8 inches and 10 inches in length.



- Secure lifting sling as shown
- Using your company's standard practice, hoist the switch into position
- Attach the switch using the provided back strap and appropriate length bolts.
- Adjust the bolts in the switch base and back strap slots to fit close to the vertical structure.
- Torque mounting hardware nuts to 60 ft-lb.



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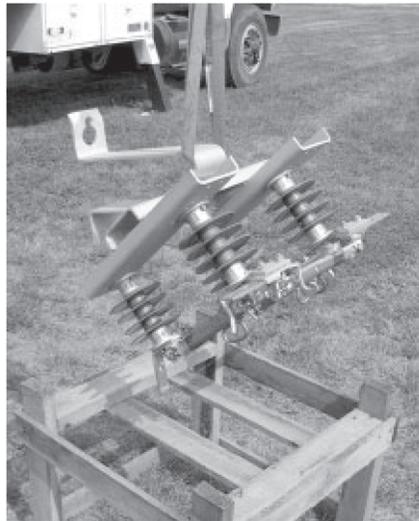
Switch Installation

POLE MOUNTING BRACKET APPLICATIONS

- Determine pole mounting bracket location and drill two $1\frac{1}{16}$ " diameter holes spaced $11\frac{1}{4}$ " apart on the utility pole's centerline.
- Install one user supplied $\frac{5}{8}$ " diameter bolt, washer and nut in the top hole.



- Leave bolt head and washer away from the pole far enough to hang the mounting bracket on the bolt.
- If preferred, the mounting bracket may be installed on the utility pole before the switch is assembled to the mounting bracket, or the mounting bracket may be installed to the switch and then installed on the utility pole. Torque the two supplied $\frac{1}{2}$ " bolts to 60 ft-lb.



- Secure lifting sling as shown
- Using your company's standard practice, hoist the switch into position



- Attach the mounting bracket (with or without the switch) to the utility pole
- Install the lower bolt, washer and nut (user supplied),
- Torque both user-supplied bolts according to your company standards.



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Wiring

CONDUCTORS

- Using your company's standard practices, train the conductors to the switch terminal pads
- Use sufficient conductor length to allow for ease

CONNECT HIGH VOLTAGE CONDUCTORS

- Wire brush mating surface of the switch terminal pads and terminal connectors
- Wire brush connector surfaces where conductors will be secured
- Wire brush conductor surfaces
- Apply a contact sealing paste to the cleaned surfaces (A.B. Chance Z.L.N. or equivalent)
- Assemble connectors, conductors and hardware to the switch terminal pads
- Ensure bolt heads of the terminal connectors are on the insulator side of the terminal pad as shown.
- Torque all supplied hardware to 60 ft-lb.
- Torque user supplied hardware according to your company standards.

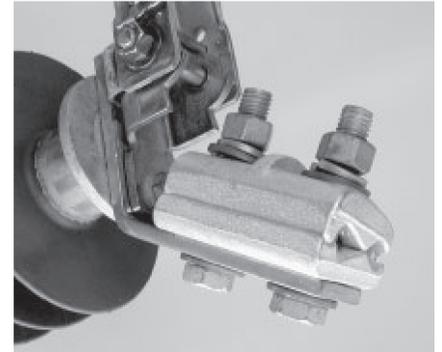
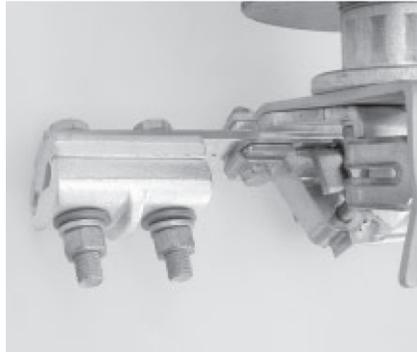


CAUTION

High Voltage Electrical Arc Hazard

May cause property damage.

Install terminal connectors with bolt heads toward the insulator. Failure to do so may compromise the electrical insulation resulting in an electrical arc.



Operation

GENERAL

Operation of the BP3 By-Pass switch is shown in **Figures 4** and **5**. In normal operation, the by-pass blade is open and the two disconnect blades are closed (Figure 4), allowing the recloser to be in the circuit. When isolation of the recloser is required, close the by-pass blade to provide a parallel current path.

Open the disconnect blades (**Figure 5**) to isolate the recloser from the circuit.

- Position yourself below and slightly to the front of the switch's hook stick pull ring
- Position feet and body in a manner that provides good stability and allows for hook stick use without losing a steady footing

- Under ice conditions, be prepared to use greater force to overcome the additional resistance
- Allow a minimum of 24 inches (610 mm) clearance from the bottom of the hook stick to the ground for uninterrupted hookstick travel.

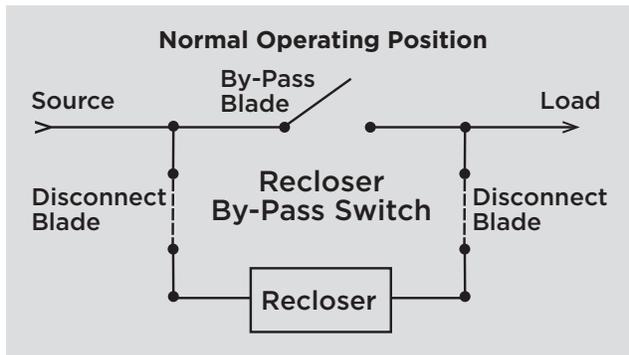


FIGURE 4

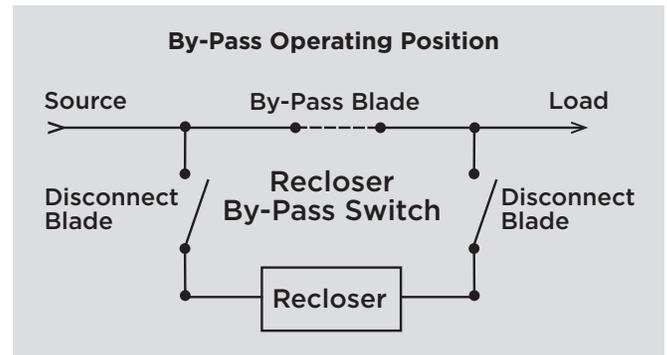


FIGURE 5

CLOSING SWITCH

- To close the BP3 switch, place a hookstick in the pull ring on the blade and rotate the blade to an intermediate position as shown in **Figure 6**.
- Turn head and look away from the switch.
- Quickly, firmly and without hesitation drive the switch to the closed position.
- Carefully remove the hookstick from the pull ring to avoid opening the switch.



FIGURE 6

WARNING

High Voltage Electrical Arc Hazard

Can cause death, severe personal injury or property damage.

Close the by-pass blade before opening either of the two disconnect blades. Failure to do so will result in an electrical arc.

- The BP3 switch is properly closed when the blade hook is fully engaged with the latch portion of the blade stop as shown in **Figure 7**.

- Visually check each switch blade for proper latching.

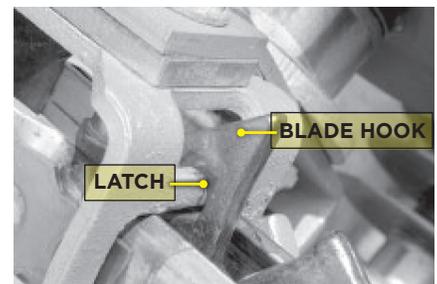


FIGURE 7

Operation

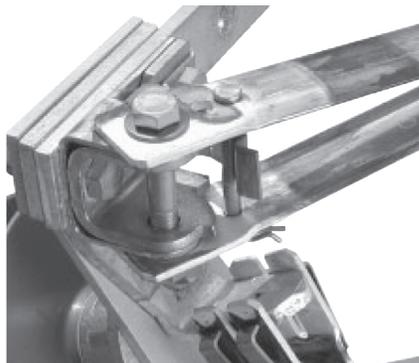
OPENING SWITCH

- To open the BP3 switch, place a hookstick in the pull ring as shown in Figure 8.



FIGURE 8

- Turn head and look away from the switch.
- Quickly, firmly and without hesitation pull down and towards the hinge end of the switch at about a 45° angle.
- Once the switch is open, complete the blade travel to its stop position.
- Carefully remove the hookstick from the pull ring.



- The by-pass blade is equipped with an open blade latch. Visually check that the stop pin has engaged the open blade latch.

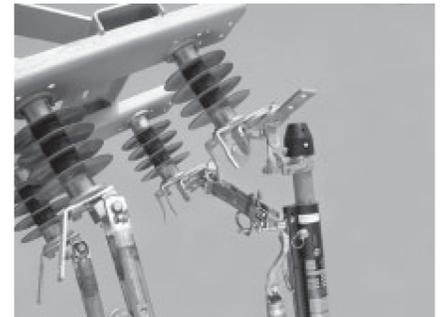
WARNING

High Voltage Electrical Arc Hazard

Opening an energized disconnect switch without a loadbreak tool will create an electrical arc.

Can cause death, severe personal injury or property damage.

Use appropriately rated loadbreak tool to open a switch that is carrying load current.



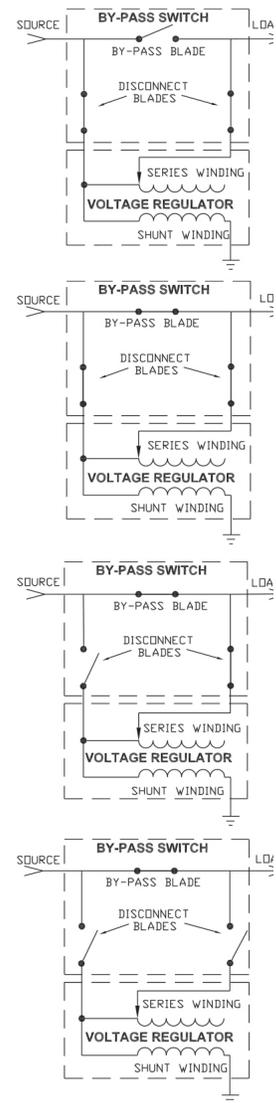
- The by-pass blade of the BP3 switch is also equipped with loadbreak hooks for use with a loadbreak tool.
- To open the by-pass blade of the switch under load, use only an approved loadbreak tool or device designed for use with switches.
- Follow the instructions provided with such tools.



CHANCE

Operation

- Standard BP3 switches have blade guides on the left and right disconnect blades. Open only after by-pass blade has been closed electrically paralleling the disconnect blades.
 - The loadbreak hook option equips the disconnect blades with single sided loadbreak hooks. The loadbreak hooks allow the use of a loadbreak tool for the switching of load, capacitor, line/cable charging and magnetizing currents.
 - To open loadbreak hook equipped disconnect or by-pass blades of an energized by-pass disconnect switch, use only an approved loadbreak tool designed for use with switches.
 - Follow the instructions provided with such tools.
 - When by-passing a voltage regulator, **except three-phase induction regulator**, follow the steps outlined below. For three-phase induction regulators, contact supervisor or factory representative.
1. Set voltage regulator automatic control to manual. Set voltage regulator to its neutral position. Bypass blade is open. Disconnect blades are closed.
 2. Close by-pass blade. The by-pass blade shunts the voltage regulator series winding. Disconnect blades are closed.
 3. Open either disconnect blade to disconnect the voltage regulator series winding. By-pass blade is closed. Voltage regulator shunt winding remains energized through other disconnect blade.
 4. Open remaining disconnect blade using loadbreak tool to interrupt the voltage regulator magnetizing current. By-pass blade is closed. Disconnect blades are open.
 5. Reverse the above sequence of steps to return a voltage regulator to service.



WARNING

High Voltage Electrical Arc Hazard

Opening an energized disconnect switch without a loadbreak tool will create an electrical arc.

Can cause death, severe personal injury or property damage.

Use appropriately rated loadbreak tool to open an energized by-pass switch.

WARNING

High Voltage Electrical Arc Hazard

By-passing a voltage regulator without first setting the regulator to its neutral position and without using a loadbreak tool to open the remaining disconnect blade will create an electrical arc.

Can cause death, severe personal injury or property damage.

Set regulator to its neutral position and use appropriately rated loadbreak tool to open the remaining disconnect blade to by-pass a voltage regulator.



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Maintenance

GENERAL

Prolong the life of the BP3 By-Pass switch with a periodic inspection and maintenance program. Although the switch is designed for long-term exposure in all weather conditions, certain environments may reduce its life without periodic maintenance. Following these minimum inspection and maintenance procedures will help ensure long service life.

Note: It is recommended that all switches go through a maintenance check at least once a year; more frequently if located in a contaminated area

For additional recommendations, refer to ANSI C37.35 "IEEE Guide for the Application, Installation, Operation, And Maintenance of High Voltage Air Disconnect and Load Interrupter Switches."

SWITCH

Operate the switch periodically to clean contact surfaces to keep parts moving freely service life.

- Check for burned or pitted contacts and replace if necessary. Lubricate if necessary with Optimol® grease C600-2870
- Check the hinge bolts for looseness. If loose, clean bolt threads, apply Loctite®-271 and torque to 40-in-lb.
- Inspect all blade rivets for tightness and replace blade assembly if loose.
- Inspect the mounting hardware and tighten according to specifications located in the Installation Section of the manual.

	⚠ DANGER
	<p>Hazardous Voltage</p> <p>Contact with energized lines will result in death, personal injury or property damage.</p> <p>All maintenance work should be performed on de-energized switches. If work must be performed on live lines, follow your company's standard safe operating procedures.</p>

	⚠ WARNING
	<p>Hazardous Voltage</p> <p>Can cause death, severe personal injury.</p> <p>Contact with the switch bases, hardware or crossarm could result in electrical shock. Ground the switch bases and mounting hardware prior to maintenance.</p>

- Replace any damaged or tracked insulators. Clean or replace if heavily contaminated. Consult your factory representative for authorized replacement insulators.

CONDUCTORS

- Be sure all conductors are routed so they do not interfere with switch operation
- Inspect all conductors to be sure terminations are tight and corrosion free
- If necessary, clean and apply contact sealing paste (A.B. Chance Z.L.N. or equivalent) and retighten terminations.



These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to Hubbell Power Systems, Inc.



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For product inquiries, please contact your local sales representative or customer service representative.

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