01.4IB.51808A Vacuum Type Remote Racking Device (51897G29)

for use with PowlVac® STD, CDR, CDS & ND Vacuum Circuit Breakers
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Signal Words

As stated in ANSI Z535.4-2002, § 4.13-4.13.3 the signal word is a word that calls attention to the safety sign and designates a degree or level of hazard seriousness. The signal words for product safety signs are “Danger”, “Warning”, and “Caution”. These 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.

Not stated in ANSI Z535.4-2002, § 4.13-4.13.3 as a signal word but used in this manual is “IMPORTANT”. This is defined as:

IMPORTANT

IMPORTANT indicates a section of the manual covering a non hazardous situation, but one where Powell feels proper attention is warranted.

Qualified Person

For the purposes of this manual, a qualified person, as stated in NFPA 70®, is one familiar with the construction and operation of the equipment and the hazards involved.

In addition to the above qualifications, one must also be:

1) trained and authorized to energize, deenergize, clear, ground, and tag circuits and equipment in accordance with established safety practices.
2) trained in the proper care and use of personal protective equipment (PPE) such as rubber gloves, hard hat, safety glasses or face shields, flash clothing, etc., in accordance with established safety practices.
3) trained in rendering first aid if necessary.
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Ch 1 General Information

⚠️ WARNING

The equipment described in this document may contain high voltages and currents which can cause serious injury or death.

The equipment is designed for use, installation, and maintenance by knowledgeable users of such equipment having experience and training in the field of high voltage electricity. This document and all other documentation shall be fully read, understood, and all warnings and cautions shall be abided by. If there are any discrepancies or questions, the user shall contact Powell immediately at 1.800.480.7273.

⚠️ WARNING

Before any adjustment, servicing, part replacement, or any other act is performed requiring physical contact with the electrical working components or wiring of this equipment, the power supply must be disconnected. Failure to follow this warning may result in injury or death.

NOTICE

The information in this instruction bulletin is not intended to explain all details or variations of the Powell equipment, nor to provide for every possible contingency or hazard to be met in connection with installation, testing, operation, and maintenance of the equipment. For additional information and instructions for particular problems, which are not presented sufficiently for the user's purposes, contact Powell at 1.800.480.7273.
A. **Scope**

The information in this instruction bulletin describes the Vacuum Type Remote Racking Device (51897G29) for the following PowlVac® vacuum circuit breakers:

- 05PV36STD
- 05PV50STD
- 15PV25STD
- 15PV36STD
- 15PV50STD
- 05PV63STD
- 15PV63STD
- 05PV36CDR
- 05PV50CDR
- 15PV25CDR
- 15PV36CDR
- 15PV50CDR
- 05PV63CDR
- 15PV63CDR
- 27PV25CDR
- 05PV36SND
- 05PV50SND
- 38PV40CDS

The illustrations in this document are provided as general information to aid in showing component locations only.

*All illustrations and photos are shown using deenergized equipment.*

**WARNING**

*Be sure to follow the appropriate safety precaution while handling any of the equipment. Failure to do so may result in serious injury or death.*

To the extent required, the products described herein meet the applicable ANSI, IEEE, and NEMA Standards; however, no such assurance is given with respect to local codes and ordinances which may vary greatly.

B. **Purpose**

The information in this instruction bulletin is intended to provide information required to properly operate and maintain the Vacuum Type Remote Racking Devices described in **Ch 1 General Information, A. Scope**.

This instruction bulletin provides:

1. Safety guidelines
2. General descriptions on the operation of the Vacuum Type Remote Racking Device
3. Instructions for installation
4. Illustrations, photographs, and description of the equipment described in **Ch 1 General Information, A. Scope**.

C. **Instruction Bulletins Available Electronically**

For more information visit www.powellind.com. To contact the Powell Service Division call 1.800.480.7273 or 713.944.6900, or email info@powellservice.com.
D. **ASSOCIATED INSTRUCTION BULLETINS**

- 01.4IB.60201A PowlVac® STD 25-50kA Circuit Breaker
- 01.4IB.60301A PowlVac® STD 63kA Circuit Breaker
- 01.4IB.60202 PowlVac® CDR 5-15kV Vacuum Circuit Breaker
- 01.4IB.60302 PowlVac® CDR 63kA Circuit Breaker
- 01.4IB.65020A PowlVac® CDR 27kV-38kV Vacuum Circuit Breaker
- 01.4IB.65200 PowlVac-AR® Arc Resistant Metal-Clad Switchgear 12000-2000A with CDR Circuit Breakers
- 01.4IB.65080A PowlVac 38™ CDS 3000A Vacuum Circuit Breaker
- 01.4IB.65110A PowlVac 38™ CDS 1200-2000A Vacuum Circuit Breaker
- 01.4IB.65201 PowlVac-AR® Arc Resistant Switchgear 38kV, 3000A, 40kA with CDS Circuit Breakers
- 01.4IB.65202 PowlVac 38-AR™ Arc Resistant Switchgear, 38kV, 1200A & 2000A, 40kA, with CDS Circuit Breakers
- 01.4IB.77000B PowlVac-ND® Vacuum Circuit Breaker
- 01.4IB.78000A PowlVac-ND® Metal-Clad Switchgear w/ Vacuum Circuit Breaker
- 01.4IB.51000B PowlVac® Metal-Clad Switchgear with Vacuum Circuit Breaker
- 01.4IB.51200A PowlVac-AR® Arc Resistant Switchgear
Ch 2  Safety

A.  SAFE WORK CONDITION

The information in Section A is quoted from NFPA 70E 2004 - Article 120, 120.1 Establishing an Electrically Safe Work Condition.

120.1 Process of Achieving an Electrically Safe Work Condition

1. Determine all possible sources of electrical supply to the specific equipment. Check applicable up-to-date drawings, diagrams, and identification tags.
2. After properly interrupting the load current, OPEN the disconnecting device(s) for each source.
3. Wherever possible, visually verify that all blades of the disconnecting devices are fully OPEN or that drawout type circuit breakers are withdrawn to the fully disconnected position.
4. Apply lockout/tagout devices in accordance with a documented and established policy.
5. Use an adequately rated voltage detector to test each phase conductor or circuit part to verify they are deenergized. Test each phase conductor or circuit part both phase-to-phase, and phase-to-ground. Before and after each test, determine that the voltage detector is operating satisfactorily.
6. Where the possibility of induced voltages or stored electrical energy exists, ground the phase conductors or circuit parts before touching them. Where it could be reasonably anticipated that the conductors or circuit parts being deenergized could contact other exposed energized conductors or circuit parts, apply ground connecting devices rated for the available fault duty.

B.  SAFETY GUIDELINES

Each user has the responsibility to instruct and supervise all personnel associated with usage, installation, operation, and maintenance of this equipment on all safety procedures. Furthermore, each user has the responsibility of establishing a safety program for each type of equipment encountered.

The safety rules in this instruction bulletin are not intended to be a complete safety program. The rules are intended to cover only some of the important aspects of personnel safety related to Vacuum Type Remote Racking Devices.

C.  GENERAL

1. Only supervised and qualified personnel trained in the usage, installation, operation, and maintenance of the metal-clad switchgear shall be allowed to work on this equipment. It is mandatory that this instruction bulletin, any supplements, and service advisories be studied, understood, and followed.
2. Maintenance programs must be consistent with both customer experience and manufacturer’s recommendations, including service advisories and instruction bulletin(s). A well planned and executed routine maintenance program is essential for reliability and safety.
3. Service conditions and applications shall also be considered in the development of safety programs. Variables include ambient temperature; humidity; actual continuous current; thermal cycling; number of operations; interrupting duty; and any adverse local conditions including excessive dust, ash, corrosive atmosphere, vermin and insect infestations.
D. **Specific**

1. **DO NOT WORK ON AN ENERGIZED CIRCUIT BREAKER.** If work must be performed on a circuit breaker, remove it from service and remove it from the metal-clad switchgear.

2. **DO NOT WORK ON A CIRCUIT BREAKER WITH THE CONTROL CIRCUIT ENERGIZED.**

3. **EXTREME CARE MUST BE EXERCISED TO KEEP ALL PERSONNEL, TOOLS, AND OTHER OBJECTS CLEAR OF MECHANISMS WHICH ARE TO BE OPERATED, DISCHARGED, OR RELEASED.** These circuit breaker's utilize stored energy mechanisms. These mechanisms must be serviced only by skilled and knowledgeable personnel capable of releasing each spring load in a controlled manner.

4. **DO NOT ATTEMPT TO CLOSE THE CIRCUIT BREAKER MANUALLY ON AN ENERGIZED CIRCUIT.**

5. **DO NOT USE AN OPEN CIRCUIT BREAKER AS THE SOLE MEANS OF ISOLATING A HIGH VOLTAGE CIRCUIT.** For complete isolation, the circuit breaker shall be in the disconnected position or shall be withdrawn completely.

6. **ALL COMPONENTS SHALL BE DISCONNECTED BY MEANS OF A VISIBLE BREAK AND SECURELY GROUNDED FOR SAFETY OF PERSONNEL PERFORMING MAINTENANCE OPERATIONS ON THE CIRCUIT BREAKERS.**

7. Interlocks are provided to ensure the proper operating sequences of the circuit breakers and for the safety of the user. If for any reason an interlock does not function as described, do not make any adjustments, modifications, or deform the parts. **DO NOT FORCE THE PARTS INTO POSITION. CONTACT POWELL FOR INSTRUCTIONS.**

E. **Safety Labels**

The equipment described in this document has DANGER, WARNING, CAUTION, and instruction labels attached to various locations. All equipment DANGER, WARNING, CAUTION, and instruction labels shall be observed.

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**NOTICE**

*Warning and Caution labels are located in various places in and on the switchgear and on the circuit breaker. Always observe these warnings and caution labels. Do NOT remove or deface any of these warning/caution labels.*
Ch 3  Equipment Description

A. GENERAL

The PowlVac® Vacuum Type remote Racking Device is an accessory which enables circuit breakers to be racked into and out of switchgear from a distance. The accessory consists of a motor control box (Figure 1, f) and electric racking device assemblies (Figure 1, a, b, c, d, g, & h).

B. MOTOR CONTROL BOX

The motor control box (Figure 2) supplies power and enables the selection of operating modes for the electric racking device. The motor control box has a 50 foot long cord (Figure 1, e) with a plug that is inserted into the electric racking device twist lock power cord receptacle (Figure 6, c). The length of the cord enables the user to move to a remote location from the circuit breaker during the racking in or racking out procedures. The motor control box power supply cord (Figure 1, i) plugs into a 120VAC outlet.

C. ELECTRIC RACKING DEVICE

The electric racking device uses a suction cup (Figure 1, a) to connect to the front of the circuit breaker or breaker cell door. The drive socket (Figure 1, d) engages the circuit breaker racking shaft through the racking shaft shutter or the access hole provided on the compartment door. After the racking device is installed, the motor adjustment knob (Figure 1, g) can be turned to engage the drive socket with the circuit breaker racking shaft. When the racking device is connected to the motor control box and energized, the drive socket operates the circuit breaker racking mechanism during the racking in or racking out procedures.
Figure 1  PowlVac® Remote Racking Device

- **a. Suction Cup**
- **b. Suction Cup Staff**
- **c. Vacuum Tube**
- **d. Drive Socket**
- **e. Control Box Cord**
- **f. Motor Control Box**
- **g. Adjustment Knob**
- **h. Access Hole**
- **i. Power Supply Cord**
Figure 2  Close-Up of Motor Control Box

- a. Electrical Cord
- b. “In” Indicator Light
- c. “Out” Indicator Light
- d. Power Switch
- e. Push Button
- f. In/Out Selector Switch
- g. Handle
Ch 4 Installation

A. Receiving

Upon receipt, remove any shipping material and inspect the electric racking device for damage that may have occurred during shipment. Check the equipment received against the shipping documents to ensure receipt of the complete shipment.

B. Handling

The electric racking device weighs 20 lbs. and the motor control box assembly weighs 5 lbs. The preferred method for moving the electric racking device and motor control box is to place them securely on a hand operated shop cart. When handling the electric racking device, personnel should securely grasp the suction cup shaft (Figure 1, b) during movement and installation to avoid possible personal injury or damage to the electric racking device with hard objects.

C. Storage

The electric racking device and motor control box are accessories that are not normally in continuous service. These accessories should be stored properly so that they will be available when needed. The following precautions must be taken to assure proper storage of the electric racking device and motor control box.

1. DO NOT store the electric racking device and motor control box in the switchgear compartment. Store the device in an upright position on a shelf.

2. The electric racking device and motor control box should be carefully protected against condensation. The device should be stored in a warm, dry room of moderate temperature, such as 40-100°F. Since the electric racking device and motor control box are to be energized during use, they must be kept completely dry to avoid accidental electric shock to personnel and/or damage to the equipment.
3. Store the electric racking device and motor control box in a clean location, free from corrosive gasses or fumes. Particular care should be taken to protect the devices from moisture and cement dust, as this combination has a very corrosive effect on many parts.

4. Apply Rheolube grease on the drive shaft, under the spring, to prevent corrosion and help ensure proper operation.

5. If the electric racking device and motor control box are stored for any length of time, they should be inspected periodically for corrosion and to ensure they are in good mechanical condition.

D. **Testing and Inspection**

1) **Electrical Operation Check**

   To pretest the equipment, insert the 50 foot cord from the box into the racking device locking receptacle. Then insert the motor control box power supply cord into a 120VAC receptacle and operate the box on the racking in and racking out settings while the device is not installed on the circuit breaker or compartment door.

2) **Electric Racking Device Inspection**

   a. Inspect the electric racking device for proper lubrication and signs of wear or damage. If plugs and wiring are damaged, return the equipment to Powell for repair.

   b. Inspect the switchgear compartment to ensure that it is clean and clear of debris that might interfere with circuit breaker racking and travel within the compartment.
Ch 5 Operation

A. General

**WARNING**

Do NOT work on an energized circuit breaker. Follow circuit breaker safety guidelines and operating instructions provided in the specific circuit breaker instruction bulletin.

Attaching and operating the electric racking device can be accomplished by one person. When circuit breaker racking is required, the electric racking device engages the racking shaft through the racking shaft shutter on the front cover or through the access hole on the breaker compartment. The racking device is operated by the motor control box.

When racking in a circuit breaker, move the circuit breaker to the required switchgear location. Push the circuit breaker in to the switchgear compartment until the anti-rollout latch engages the switchgear rollout stop block.

For more information on the circuit breaker handling, see the instruction bulletin for the circuit breaker in use.

B. Operation for Remote Racking Device on PowLVac® Standard (STD) Circuit Breakers

**CAUTION**

Before installing any circuit breaker into a compartment, the user MUST verify that the circuit breaker rating meets the metal-clad switchgear rating.

1) Inserting the Circuit Breaker into One-High/Lower Switchgear Compartment

Follow the steps below to insert the circuit breaker into the switchgear compartment:

**CAUTION**

Prior to inserting the circuit breaker into the circuit breaker compartment, ensure that the control circuits are deenergized.

Prior to inserting the circuit breaker into the circuit breaker compartment, ensure that the circuit breaker is OPEN and the mechanism is discharged.

a. Remove the yellow cover that is placed on the suction cup of the remote racking device.

b. Ensure the secondary disconnect device is connected to the circuit breaker (Figure 4, d).

c. Depress the manual trip button on the circuit breaker and open the racking shaft shutter (Figure 4, b). Using the drive socket on the remote racking device (Figure 4, a) open the racking shaft shutter by pushing it down. There is about a ¼ inch lip where the socket should be placed to push the shaft shutter down. Once the shutter has started moving down the manual trip button can be released (Figure 4, c).

d. Push the remote racking device into the shaft shutter and align the remote racking device with the circuit breaker drive shaft. Turn the red adjustment knob (Figure 6, b) on the back of the remote racking device to achieve alignment. Turn the adjustment knob...
until there is resistance and the socket will be on the circuit breaker racking shaft. If the socket fails to engage/align, this is an indication the door is not opening completely. Check the screw which holds the pull ring and verify it is flush with the bottom of the shutter tab. If the screw is projecting past the bottom of the shutter, add a washer to the screw.

e. Attach the remote racking device to the front cover by pumping the suction cup vacuum tube (Figure 6, a) until the red line on the vacuum tube is no longer visible.

**Note:** The suction cup must be connected to a smooth part of the circuit breaker. The vacuum can NOT be achieved over hardware, holes, edges, etc. Remove dust, dirt, grease, etc. from the contact point on the front cover of the circuit breaker and wipe the suction cup clean. Use the adjustment screws (Figure 19) to place the suction cup on a smooth area of the circuit breaker.

f. Insert the cylindrical plug into the remote racking device outlet (Figure 9). Lock the plug by turning it clockwise.

g. Ensure the motor control box power switch is in the “OFF” position.

h. Plug the device into a 120VAC power source.

i. Turn the power switch to the “ON” position.

j. Move the selector switch (Figure 10) on the push button to the “IN” position.

**Note:** The chrome housing on the push button is actually a switch, and can be moved to either the “IN” or “OUT” positions.

k. Physically move the motor control box to a remote area and operate the electric racking device.

l. To begin racking the circuit breaker into the compartment, depress the push button on the control box (Figure 11).

m. When the push button is depressed, the “IN” indicating light (Figure 2, b) will be energized and illuminated.

n. When the circuit breaker is fully racked in, the remote racking device’s torque limiter will begin to slip and there will be a clear clicking sound along with a vibration of the racking device. At this point, release the racking push button.

O. Unplug the 120VAC source and remove the remote racking device (Figure 12). Pull the tabs on the suction cup to break the suction from the circuit breaker.

2) Removing the Circuit Breaker from the Lower Switchgear Compartment

**CAUTION**

Prior to removing the remote racking motor from the circuit breaker compartment, make sure that the control circuits are deenergized.

**CAUTION**

Prior to removing the circuit breaker from the circuit breaker compartment, ensure that the circuit breaker is OPEN.

**Note:** If the circuit breaker indicator flag states “CLOSED”, close the compartment door and trip the circuit breaker electrically from a remote location.
Follow the steps below to remove the circuit breaker from the switchgear equipment:

a. Remove the yellow cover that is placed on the suction cup of the remote racking device.
b. Ensure the secondary disconnect device is connected to the circuit breaker (Figure 4, d).
c. Depress the manual trip button on the circuit breaker and open the racking shaft shutter (Figure 4, b). Using the drive socket on the remote racking device (Figure 4, a) open the racking shaft shutter by pushing it down. There is about a ¼ inch lip where the socket should be placed to push the shaft shutter down.

d. Attach the remote racking device to the front cover by pumping the suction cup vacuum tube pump (Figure 6, a) until the red line on the vacuum tube is no longer visible.

**Note:** The suction cup must be connected to a smooth part of the circuit breaker. The vacuum can NOT be achieved over hardware, holes, edges, etc. Remove dust, dirt, grease, etc. from the contact point on the front cover of the circuit breaker and wipe the suction cup clean. Use the adjustment screws (Figure 19) to place the suction cup on a smooth area of the circuit breaker.

f. Insert the cylindrical plug into the remote racking device outlet (Figure 9). Lock the plug by turning it clockwise.

g. Ensure the motor control box power switch is in the “OFF” position.
h. Plug the device into a 120VAC power source.
i. Turn the power switch to the “ON” position.
j. Move the selector switch (Figure 10) on the push button to the “OUT” position.

**Note:** The chrome housing on the push button is actually a switch, and can be moved to either the “IN” or “OUT” positions.

k. Physically move the motor control box to a remote area and operate the electric racking device.
l. To begin racking the circuit breaker out of the compartment, depress the push button on the control box (Figure 11).
m. When the push button is depressed, the “OUT” indicating light (Figure 2, c) will be energized and illuminated.

Note: The drive socket can be either removed from the racking device as shown in Figure 3 or can remain in the racking device during this step.

Once the shutter has started moving down the manual trip button can be released (Figure 4, c).

**Note:** The drive socket can be either removed from the racking device as shown in Figure 3 or can remain in the racking device during this step.

d. Push the remote racking device into the shaft shutter and align the remote racking device with the circuit breaker drive shaft. Turn the red adjustment knob (Figure 6, b) on the back of the remote racking device to achieve alignment. Turn the adjustment knob until there is resistance and the socket will be on the circuit breaker racking shaft. If the socket fails to engage/align, this is an indication the door is not opening completely. Check the screw which holds the pull ring and verify it is flush with the bottom of the shutter tab. If the screw is projecting past the bottom of the shutter, add a washer to the screw.

i. Move the selector switch (Figure 10) on the push button to the “OUT” position.

**Note:** The chrome housing on the push button is actually a switch, and can be moved to either the “IN” or “OUT” positions.
n. When the circuit breaker is fully racked out, the remote racking device’s torque limiter will begin to slip and there will be a clear clicking sound along with a vibration of the racking device. At this point, release the racking push button.

o. Unplug the 120VAC source and remove the remote racking device (Figure 12). Pull the tabs on the suction cup to break the suction from the circuit breaker.

3) Inserting the Circuit Breaker into Two-High Switchgear Compartment

⚠️ CAUTION

Before installing any circuit breaker into a compartment, the user MUST verify that the circuit breaker rating meets the metal-clad switchgear rating.

Follow the steps below to insert the circuit breaker into the two-high switchgear compartment:

⚠️ CAUTION

Prior to inserting the circuit breaker into the circuit breaker compartment, ensure that the control circuits are deenergized.

⚠️ CAUTION

Prior to inserting the circuit breaker into the circuit breaker compartment, ensure that the circuit breaker is OPEN and the mechanism is discharged.

⚠️ NOTICE

Due to the weight of the racking device, Powell recommends the drive socket be removed before attaching the racking device to the circuit breaker in the upper compartment of the switchgear.

a. On the side of the remote racking box, there is a square cut-out for accessing the socket. Use a small screw driver or 1/8 inch punch to depress the locking pin and pull the socket assembly out (Figure 3).

Figure 3 Removing Drive Socket

b. Remove the yellow cover that is placed on the suction cup of the remote racking device.

c. Ensure the secondary disconnect device is connected to the circuit breaker (Figure 4, d).

d. Depress the manual trip button (Figure 4, c) on the circuit breaker and open the racking shaft shutter (Figure 4, b). Using the drive socket, (Figure 4, a) open the racking shaft shutter by pushing it down. There is about a 1/4 inch lip where the socket should be placed to push the shaft shutter down. Once the shutter has started down the manual trip button
can be released. If the socket fails to engage/align, this is an indication the door is not opening completely. Check the screw which holds the pull ring and verify it is flush with the bottom of the shutter tab. If the screw is projecting past the bottom of the shutter, add a washer to the screw.

e. Attach the remote racking device to the drive socket and align the remote racking device with the drive socket. Turn the red adjustment knob (Figure 6, b) on the back of the remote racking device to achieve alignment. Turn the adjustment knob until there is resistance and the drive socket is engaged with the remote racking device.

f. Attach the remote racking device to the front cover by pumping the suction cup vacuum tube (Figure 6, a) until the red line on the vacuum tube is no longer visible.

**Note:** The suction cup must be connected to a smooth part of the circuit breaker. The vacuum can NOT be achieved over hardware, holes, edges, etc. Remove dust, dirt, grease, etc. from the contact point on the front cover of the circuit breaker and wipe the suction cup clean. Use the adjustment screws (Figure 19) to place the suction cup on a smooth area of the circuit breaker.

g. Insert the cylindrical plug into the remote racking device outlet (Figure 9). Lock the plug by turning it clockwise.

h. Ensure the motor control box power switch is in the “OFF” position.

i. Plug the device into a 120VAC power source.

j. Turn the power switch to the “ON” position.

k. Move the selector switch (Figure 10) on the push button to the “IN” position.

**Note:** The chrome housing on the push button is actually a switch, and can be moved to either the “IN” or “OUT” positions.

l. Physically move the motor control box to a remote area and operate the electric racking device.

m. To begin racking the circuit breaker into the compartment, depress the push button on the control box (Figure 11).

n. When the push button is depressed, the “IN” indicating light (Figure 2, b) will be energized and illuminated.

o. When the circuit breaker is fully racked in, the remote racking device’s torque limiter will begin to slip and there will be a clear clicking sound along with a vibration of the racking device. At this point, release the racking push button.

p. Unplug the 120VAC source and remove the remote racking device (Figure 12). Pull the tabs on the suction cup to break the suction from the circuit breaker.
4) Removing the Circuit Breaker from the Upper Switchgear Compartment (Two-High Design)

Follow the steps below to remove the circuit breaker from the two-high switchgear compartment:

**CAUTION**

Prior to removing the circuit breaker from the circuit breaker compartment, ensure that the control circuits are deenergized.

**CAUTION**

Prior to removing the circuit breaker from the circuit breaker compartment, ensure that the circuit breaker is OPEN and the mechanism is discharged.

**NOTICE**

Due to the weight of the racking device, Powell recommends the drive socket be removed before attaching the racking device to the circuit breaker in the upper compartment of the switchgear.

a. On the side of the remote racking box, there is a square cut-out for accessing the socket. Use a small screw driver or 1/4 inch punch to depress the locking pin and pull the socket assembly out (Figure 3).
b. Remove the yellow cover that is placed on the suction cup of the remote racking device.
c. Ensure the secondary disconnect device is connected to the circuit breaker (Figure 4, d).
d. Depress the manual trip button (Figure 4, c) on the circuit breaker and open the racking shaft shutter (Figure 4, b). Using the drive socket, (Figure 4, a) open the racking shaft shutter by pushing it down. There is about a 1/4 inch lip where the socket should be placed to push the shaft shutter down. Once the shutter has started down the manual trip button can be released. If the socket fails to engage/align, this is an indication the door is not opening completely. Check the screw which holds the pull ring and verify it is flush with the bottom of the shutter tab. If the screw is projecting past the bottom of the shutter, add a washer to the screw.
e. Attach the remote racking device to the drive socket and align the remote racking device with the drive socket. Turn the red adjustment knob (Figure 6, b) on the back of the remote racking device to achieve alignment. Turn the adjustment knob until there is resistance and the drive socket is engaged with the remote racking device.
f. Attach the remote racking device to the front cover by pumping the suction cup vacuum tube (Figure 6, a) until the red line on the vacuum tube is no longer visible.

**Note:** The suction cup must be connected to a smooth part of the circuit breaker. The vacuum can NOT be achieved over hardware, holes, edges, etc. Remove dust, dirt, grease, etc. from the contact point on the front cover of the circuit breaker and wipe the suction cup clean. Use the adjustment screws (Figure 19) to place the suction cup on a smooth area of the circuit breaker.
Figure 4  Inserting the Drive Socket onto the PowIVac® STD Circuit Breaker

a. Drive Socket  
b. Racking Shaft Shutter  
c. Manual Trip Button  
d. Secondary Disconnect  
   (override shown in this picture)
Figure 5  Installing Remote Racking Device onto Racking Drive Shaft

Figure 6  Engaging Suction Cup Vacuum Tube to Attach Remote Racking Device to STD Circuit Breaker

a. Vacuum Tube Pump
b. Adjustment Knob
c. Power Cord Receptacle
Figure 7  Attaching Remote Racking Device to the STD Circuit Breaker

Figure 8  Remote Racking Device Attached to PowlVac® STD Circuit Breaker

Figure 9  Plugging in the Motor Control Box to the Remote Racking Device on the STD Circuit Breaker

Figure 10  Turning Selector Switch on the Motor Control Box
Figure 11  Activating Remote Racking Device

Figure 12  Removing the Remote Racking Device from the STD Circuit Breaker

Figure 13  Removing the Remote Racking Device from the STD Circuit Breaker (continued)

Figure 14  Accessing Racking Shaft

a. Teardrop Racking Shaft Access Cover
g. Insert the cylindrical plug into the remote racking device outlet (Figure 9). Lock the plug by turning it clockwise.

h. Ensure the motor control box power switch is in the “OFF” position.

i. Plug the device into a 120VAC power source.

j. Turn the power switch to the “ON” position.

k. Move the selector switch (Figure 10) on the push button to the “OUT” position.

Note: The chrome housing on the push button is actually a switch, and can be moved to either the “IN” or “OUT” positions.

l. Physically move the motor control box to a remote area and operate the electric racking device.

m. To begin racking the circuit breaker out of the compartment, depress the push button on the control box (Figure 11).

n. When the push button is depressed, the “OUT” indicating light (Figure 2, c) will be energized and illuminated.

o. When the circuit breaker is fully racked out, the remote racking device’s torque limiter will begin to slip and there will be a clear clicking sound along with a vibration of the racking device. At this point, release the racking push button.

p. Unplug the 120VAC source and remove the remote racking device (Figure 12). Pull the tabs on the suction cup to break the suction from the circuit breaker.

C. Operation for Remote Racking Device on PowlVac® Closed Door Racking (CDR) and Closed Door Standard (CDS) Circuit Breakers

![CAUTION]

**Before installing any circuit breaker into a compartment, the user MUST verify that the circuit breaker rating meets the metal-clad switchgear rating.**

1) Inserting the Circuit Breaker into Lower Switchgear Compartment

![CAUTION]

**Prior to inserting the circuit breaker into the circuit breaker compartment, ensure that the control circuits are deenergized.**

a. Move the circuit breaker to the required switchgear location. Open the compartment door and push the circuit breaker into the compartment until the anti-rollout latch engages the switchgear rollout stop block (Figure 15).

b. Insert the switchgear secondary disconnect device into the circuit breaker secondary disconnect receptacle (Figure 16, a) and close the compartment door.

c. On the compartment door, slide the teardrop shaped racking shaft access cover to the left and up away to access the opening (Figure 14, a).

d. Grasp the electric racking device by the vacuum shaft with the drive socket toward the circuit breaker (Figure 17). Insert the drive socket into the racking shaft access opening until the socket engages the circuit breaker racking shaft. With the drive socket in place...
secure the device to the front cover (Figure 18) by pumping the suction cup vacuum tube until the red line on the vacuum tube is no longer visible.

**Note:** The suction cup must be connected to a smooth part of the circuit breaker. The vacuum can NOT be achieved over hardware, holes, edges, etc. Remove dust, dirt, grease, etc. from the contact point on the front cover of the circuit breaker and wipe the suction cup clean. Use the adjustment screws (Figure 19) to place the suction cup on a smooth area of the circuit breaker.

e. With the racking device installed on the compartment door, turn the motor shaft knob until it engages the drive socket with the circuit breaker racking shaft (Figure 18).
f. Insert the cylindrical plug into the remote racking device outlet (Figure 21). Lock the plug by turning it clockwise.
g. Ensure the motor control box power switch is in the “OFF” position.
h. Plug the device into a 120VAC power source.
i. Turn the power switch to the “ON” position.
j. Move the selector switch (Figure 10) on the push button to the “IN” position.

**Note:** The chrome housing on the push button is actually a switch, and can be moved to either the “IN” or “OUT” positions.

k. Physically move the motor control box to a remote area and operate the electric racking device.
l. To begin racking the circuit breaker into the compartment, depress the push button on the control box (Figure 11).
m. When the push button is depressed, the “IN” indicating light (Figure 2, b) will be energized and illuminated.
n. When the circuit breaker is fully racked in, the remote racking device’s torque limiter will begin to slip and there will be a clear clicking sound along with a vibration of the racking device. At this point, release the racking push button.
o. Unplug the 120VAC source and remove the remote racking device (Figure 12). Pull the tabs on the suction cup to break the suction from the circuit breaker.

2) Removing the Circuit Breaker from the Lower Switchgear Compartment

**CAUTION**
Prior to removing the circuit breaker from the circuit breaker compartment, make sure that the control circuits are deenergized.

**CAUTION**
Prior to removing the circuit breaker from the circuit breaker compartment, ensure that the circuit breaker is OPEN.

**Note:** If the circuit breaker indicator flag states “CLOSED”, close the compartment door and trip the circuit breaker electrically from a remote location.

**Note:** The electric racking device drive socket is installed through the front cover racking shaft access door.
a. Move the electric racking device to the location where the circuit breaker is to be racked out of the compartment.
b. On the compartment door, slide the teardrop shaped racking shaft access cover to the left and up away to access the opening (Figure 14, a).

c. Grasp the electric racking device by the vacuum shaft with the drive socket toward the circuit breaker (Figure 17). Insert the drive socket into the racking shaft access opening until the socket engages the circuit breaker racking shaft. With the drive socket in place secure the device to the front cover (Figure 18) by pumping the suction cup vacuum tube until the red line on the vacuum tube is no longer visible.

**Note:** The suction cup must be connected to a smooth part of the circuit breaker. The vacuum can NOT be achieved over hardware, holes, edges, etc. Remove dust, dirt, grease, etc. from the contact point on the front cover of the circuit breaker and wipe the suction cup clean. Use the adjustment screws (Figure 19) to place the suction cup on a smooth area of the circuit breaker.

d. With the racking device installed on the compartment door, turn the motor shaft knob until it engages the drive socket with the circuit breaker racking shaft (Figure 18).

e. Insert the cylindrical plug into the remote racking device outlet (Figure 21). Lock the plug by turning it clockwise.

f. Ensure the motor control box power switch is in the “OFF” position.

g. Plug the device into a 120VAC power source.

h. Turn the power switch to the “ON” position.

i. Move the selector switch (Figure 10) on the push button to the “OUT” position.

**Note:** The chrome housing on the push button is actually a switch, and can be moved to either the “IN” or “OUT” positions.

j. Physically move the motor control box to a remote area and operate the electric racking device.

k. To begin racking the circuit breaker out of the compartment, depress the push button on the control box (Figure 11).

l. When the push button is depressed, the “OUT” indicating light (Figure 2, c) will be energized and illuminated.

m. When the circuit breaker is fully racked out, the remote racking device’s torque limiter will begin to slip and there will be a clear clicking sound along with a vibration of the racking device. At this point, release the racking push button.

n. Unplug the 120VAC source and remove the remote racking device (Figure 12). Pull the tabs on the suction cup to break the suction from the circuit breaker.
Figure 15  Anti-Rollout Latch

Figure 16  Secondary Disconnect Device

Figure 17  Inserting Racking Device on PowlVac® (CDR) Circuit Breaker

Figure 18  Adjusting Knob on PowlVac® (CDR) Circuit Breaker
Figure 19  Adjusting Screws on Remote Racking Device on PowlVac® (CDR) Circuit Breaker

Figure 20  Remote Racking Device on PowlVac® (CDR) Circuit Breaker

Figure 21  Connecting Power Cord to Remote Racking Device on PowlVac® (CDR) Circuit Breaker

Figure 22  Remote Racking Device on PowlVac® (CDR) in Sideways Position
3) **Inserting the Circuit Breaker into Upper Switchgear Equipment**

Follow the steps below to insert the circuit breaker into the switchgear compartment:

**CAUTION**

Prior to inserting the circuit breaker into the circuit breaker compartment, ensure that the control circuits are deenergized.

**CAUTION**

Prior to inserting the circuit breaker into the circuit breaker compartment, ensure that the circuit breaker is OPEN and the mechanism is discharged.

**Note:** The electric racking device drive socket is installed through the teardrop racking shaft access cover (Figure 14).

**NOTICE**

Due to the weight of the racking device, Powell recommends the drive socket be removed before attaching the racking device to the circuit breaker in the upper compartment of the switchgear.

- a. On the side of the remote racking box, there is a square cut-out for accessing the socket. Use a small screw driver or ¼ inch punch to depress the locking pin and pull the socket assembly out (Figure 3).
- b. Remove the yellow cover that is placed on the suction cup of the remote racking device.
- c. Ensure the secondary disconnect device is connected to the circuit breaker (Figure 4, c).
- d. On the compartment door, slide the teardrop shaped racking shaft access cover to the left and up away to access the opening (Figure 14, a).
- e. Insert the drive socket through the access window attaching it to the racking assembly.
- f. Attach the remote racking device to the drive socket. Turn the red adjustment knob (Figure 6, b) on the back of the remote racking device to achieve alignment.
- g. Attach the remote racking device to the front cover by pumping the suction cup vacuum tube (Figure 6, a) until the red line on the vacuum tube is no longer visible.

**Note:** The suction cup must be connected to a smooth part of the circuit breaker. The vacuum can NOT be achieved over hardware, holes, edges, etc. Remove dust, dirt, grease, etc. from the contact point on the front cover of the circuit breaker and wipe the suction cup clean. Use the adjustment screws (Figure 19) to place the suction cup on a smooth area of the circuit breaker.

- h. Insert the cylindrical plug into the remote racking device outlet (Figure 9). Lock the plug by turning it clockwise.
- i. Ensure the motor control box power switch is in the “OFF” position.
- j. Plug the device into a 120VAC power source.
- k. Turn the power switch to the “ON” position.
- l. Move the selector switch (Figure 10) on the push button to the “IN” position.
**Note:** The chrome housing on the push button is actually a switch, and can be moved to either the “IN” or “OUT” positions.

m. Physically move the motor control box to a remote area and operate the electric racking device.

n. To begin racking the circuit breaker into the compartment, depress the push button on the control box (Figure 11).

o. When the push button is depressed, the “IN” indicating light (Figure 2, b) will be energized and illuminated.

p. When the circuit breaker is fully racked in, the remote racking device’s torque limiter will begin to slip and there will be a clear clicking sound along with a vibration of the racking device. At this point, release the racking push button.

q. Unplug the 120VAC source and remove the remote racking device (Figure 12). Pull the tabs on the suction cup to break the suction from the circuit breaker.

4) Removing the Circuit Breaker from the Upper Switchgear Compartment

**CAUTION**

Prior to removing the remote racking motor from the circuit breaker compartment, make sure that the control circuits are deenergized.

**CAUTION**

Prior to removing the circuit breaker from the circuit breaker compartment, ensure that the circuit breaker is OPEN.

**Note:** If the circuit breaker indicator flag states “CLOSED,” close the compartment door and trip the circuit breaker electrically from a remote location.

**Note:** The electric racking device drive socket is installed through the teardrop racking shaft access cover (Figure 14).

**Notice**

Due to the weight of the racking device, Powell recommends the drive socket be removed before attaching the racking device to the circuit breaker in the upper compartment of the switchgear.

- On the side of the remote racking box, there is a square cut-out for accessing the socket. Use a small screwdriver or ⅛ inch punch to depress the locking pin and pull the socket assembly out (Figure 3).

- Remove the yellow cover that is placed on the suction cup of the remote racking device.

- Ensure the secondary disconnect device is connected to the circuit breaker (Figure 4, d).

- On the compartment door, slide the teardrop shaped racking shaft access cover to the left and up away to access the opening (Figure 14, a).

- Insert the drive socket through the access window attaching it to the racking assembly.

- Attach the remote racking device to the drive socket. Turn the red adjustment knob (Figure 6, b) on the back of the remote racking device to achieve alignment.
g. Attach the remote racking device to the front cover by pumping the suction cup vacuum tube (Figure 6, a) until the red line on the vacuum tube is no longer visible.

**Note:** The suction cup must be connected to a smooth part of the circuit breaker. The vacuum can NOT be achieved over hardware, holes, edges, etc. Remove dust, dirt, grease, etc. from the contact point on the front cover of the circuit breaker and wipe the suction cup clean. Use the adjustment screws (Figure 19) to place the suction cup on a smooth area of the circuit breaker.

h. Insert the cylindrical plug into the remote racking device outlet (Figure 9). Lock the plug by turning it clockwise.

i. Ensure the motor control box power switch is in the “OFF” position.

j. Plug the device into a 120VAC power source.

k. Turn the power switch to the “ON” position.

l. Move the selector switch (Figure 10) on the push button to the “OUT” position.

**Note:** The chrome housing on the push button is actually a switch, and can be moved to either the “IN” or “OUT” positions.

m. Physically move the motor control box to a remote area and operate the electric racking device.

n. To begin racking the circuit breaker out of the compartment, depress the push button on the control box (Figure 11).

o. When the push button is depressed, the “OUT” indicating light (Figure 2, c) will be energized and illuminated.

p. When the circuit breaker is fully racked out, the remote racking device’s torque limiter will begin to slip and there will be a clear clicking sound along with a vibration of the racking device. At this point, release the racking push button.

q. Unplug the 120VAC source and remove the remote racking device (Figure 12). Pull the tabs on the suction cup to break the suction from the circuit breaker.
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Vacuum Type Remote
Racking Device (51897G29)

for use with PowlVac® STD, CDR, ND & CDS
Vacuum Circuit Breakers

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