PowlVac® Electric Racking Device (51899G07)
For Use With The PowlVac®
Standard Circuit Breaker
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**WARNING**

THIS EQUIPMENT 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 ELECTRICAL MANUFACTURING COMPANY IMMEDIATELY AT 1-800-480-7273.

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**WARNING**

BEFORE ANY ADJUSTMENT, SERVICING, PARTS 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 CAUTION MAY RESULT IN INJURY OR DEATH.
I. INTRODUCTION

A. SCOPE

This instruction bulletin describes the following PowlVac® Electric Racking Device:

- Electric Racking Device (Part 51899G07)
- Power Control Switchbox (Part 51895G01)

B. PURPOSE

The content of this document is intended to provide the information and procedures required to properly operate and maintain the electric racking device and power control switchbox listed in Section A. SCOPE.

This instruction bulletin contains the following topics:

1. Guidelines for safety
2. General descriptions of the operation and maintenance of the electric racking device and power control switchbox assemblies
3. Instructions for installation and preparation for use of the electric racking device and power control switchbox assemblies
4. Instructions for part replacement

The illustrations contained in this document are provided as general information to aid in showing component locations. Therefore, the illustrations may not represent the exact construction details of the electric racking device and power control switchbox assemblies.

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 vary greatly.

C. INSTRUCTION BULLETINS AVAILABLE ELECTRONICALLY

Many Powell Electrical Manufacturing Company Instruction Bulletins are available through a link on the Web site, http://www.powellservice.com. For more company information visit http://powellelectric.com. To contact the Powell Apparatus Service Division (PASD) call 1-800-480-7273 or 713-944-6900, or email PASD at info@powellservice.com.

II. SAFETY

Study this instruction bulletin and all other associated documentation before uncrating the electric racking device and power control switchbox assemblies. For circuit breaker safety procedures, see the specific instruction bulletin for the specific type of circuit breaker used.

Each user has the responsibility to design and implement thorough maintenance and safety procedures for each type of equipment used. The user shall train all personnel associated with the equipment on usage, installation, operation, maintenance and safety procedures. All safety procedures must be observed.

A. GENERAL

1. Only supervised and qualified personnel who are trained in the usage, installation, operation, and maintenance of power circuit breakers and the electric racking device shall be allowed to work on this equipment. It is mandatory that this instruction bulletin, any supplements, and service advisories are studied, understood, and followed.
2. Maintenance programs must be consistent with the customer experience and the manufacturer’s recommendations, including information available in service advisories and the instruction bulletin(s). A well-planned and executed routine maintenance program is essential for electric racking device reliability and safety.

3. Service conditions and electric racking device applications shall be considered in the development of maintenance programs. Service conditions include variables such as ambient temperature, humidity, amount of usage, and any adverse local conditions such as excessive dust, and corrosive atmosphere.

B. SPECIFIC

1. DO NOT TRANSPORT OR INSTALL THE ELECTRIC RACKING DEVICE WHILE IT IS ENERGIZED.

2. BEFORE PERFORMING RACKING IN OR RACKING OUT A CIRCUIT BREAKER, ENSURE THE CIRCUIT BREAKER CONTROL CIRCUIT IS NOT ENERGIZED.

3. DO NOT USE AN OPEN CIRCUIT BREAKER AS THE ONLY MEANS OF ISOLATING A HIGH VOLTAGE CIRCUIT. FOR COMPLETE ISOLATION, THE CIRCUIT BREAKER SHALL BE IN THE DISCONNECTED POSITION OR SHALL BE WITHDRAWN COMPLETELY.

4. INTERLOCKS ARE PROVIDED TO ENSURE THE PROPER OPERATING SEQUENCES OF THE CIRCUIT BREAKERS AND FOR THE SAFETY OF THE USER. DURING RACKING IN OR RACKING OUT, 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 ELECTRICAL MANUFACTURING COMPANY FOR INSTRUCTIONS.

C. SAFETY LABELS

Danger, warning, and caution labels are attached to the circuit breaker in various locations. Personnel must observe all DANGER, WARNING, and CAUTION labels while performing electric racking in or racking out of the circuit breaker.

DANGER
BE SURE CIRCUIT BREAKER CONTACTS ARE OPEN AND SPRINGS DISCHARGED BEFORE DOING MAINTENANCE WORK.

WARNING
SECONDARY DISCONNECT MUST BE FULLY ENGAGED PRIOR TO OPERATION
III. EQUIPMENT DESCRIPTION

A. GENERAL DESCRIPTION

The PowlVac® Electric Racking Device is an accessory that enables circuit breakers to be racked into and out of switchgear from a distance. The accessory consists of a motor control switchbox (Figure 1) and an electric racking device (Figure 2) assemblies.

B. MOTOR CONTROL SWITCHBOX

The motor control switchbox (Figure 1) supplies power and enables the selection of operating modes for the electric racking device (Figure 2). The motor control switchbox has a 30’ long cord (Figure 1, d) with a plug that is inserted into the electric racking device twist lock receptacle (Figure 2, e). The length of cord enables the user to move to a distance from the circuit breaker during racking in and racking out procedures. The motor control switchbox power supply cord (Figure 1, c) plugs into a 110VAC outlet.

C. ELECTRIC RACKING DEVICE

The electric racking device (Figure 2 and Figure 3) installs on the circuit breaker front cover (Figure 6, a). The racking device support latch (Figure 2, c) attaches to a lock pin (Figure 6, f) installed on the circuit breaker front cover. The drive socket (Figure 2, a) engages the circuit breaker racking shaft through the racking shaft access door (Figure 6, g) located on the breaker front cover. After the racking device is installed, the motor shaft knob (Figure 3, b) can be turned to engage the drive socket with the circuit breaker racking shaft. When the racking device is connected to the motor control switchbox and energized, the drive socket operates the circuit breaker racking mechanism during racking in and racking out activities.
IV. INSTALLATION

A. RECEIVING

Upon receipt, remove any shipping material and inspect the electric racking device for damage that may have occurred during shipment. Check 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 switch assembly weighs 5 lbs. The preferred method for moving the electric racking device and motor control switch assembly is to place them securely on a hand operated shop cart. When handling the electric racking device, personnel should securely grasp the handle during movement and installation to avoid possible personal injury, or damage to the electric racking device. Do not drop the racking device nor hit it with a hard object.

Ensure the circuit breaker control circuit is not energized before racking in or racking out the circuit breaker from the switchgear.

When racking in a circuit breaker, move the circuit breaker to the required switchgear location. Push the circuit breaker into the switchgear cell (See Figure 5) until the anti-rollout latch engages the switchgear rollout stop block.

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

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.

CAUTION

DO NOT HANDLE OR CARRY THE RACKING DEVICE BY THE POWER CORDS. DAMAGE TO THE POWER CONNECTIONS MAY RESULT AND CAUSE AN ELECTRICAL SHORT. THE POWER CORDS SHOULD BE INSPECTED FOR ANY SIGNS OF DAMAGE BEFORE EACH USE.
C. STORAGE

The electric racking device and power control switchbox 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 switchbox.

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

2. The electric racking device and motor control switchbox should be carefully protected against condensation. It should be stored in a warm, dry room of moderate temperature, such as 40–100°F. Since the electric racking device and motor control switchbox are to be energized during use, they must be kept completely dry to avoid accidental electric shock and/or damage to the equipment.

3. The electric racking device and motor control switchbox should be stored 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 rusting and help ensure proper operation.

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

D. PREPARATION

**CAUTION**

BEFORE PERFORMING CIRCUIT BREAKER RACKING-IN AND RACKING-OUT, REVIEW SPECIFIC CIRCUIT BREAKER INSTRUCTIONS FOR PROPER INSPECTION AND PREPARATION.

1) **Electric Racking Device Support Lock Pin**

**NOTE:** The circuit breaker must be removed from service when the support lock pin is installed.

A support lock pin (Figure 7, b) provides a means to attach the racking device support latch to the circuit breaker front cover. The circuit breaker fastener located on the middle right side of the front cover must be removed so that the support lock pin can be inserted in the fastener hole (Figure 6, f and Figure 7, a). The racking device support latch fastens onto the support lock pin when the racking device is attached to the circuit breaker front cover (Figure 10). The position of the racking device enables the drive socket to engage the circuit breaker racking crank through the access door to perform racking procedures.

To install the lock pin, follow directions accompanying the lock pin order and see Figure 8. For information on ordering the support lock pin for installation on each circuit breaker, see Section VII. RENEWAL PARTS (Part No. 49492P00000630).

2) **Testing and Inspection**

a) **Electrical Operation Check**

To pretest the equipment, insert the 30’ cord from the switchbox into the racking device locking receptacle. Then insert the switchbox power cord into a 110VAC receptacle, and operate the switchbox on the racking in and racking out settings.

b) **Electric Racking Device Inspection**

1. 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 Electrical Manufacturing Company for repair.

2. Inspect the switchgear compartment to ensure that it is clean and clear of debris that might interfere with racking and circuit breaker travel.
Figure 6. Circuit Breaker in the Switchgear Compartment

- a. Circuit Breaker Front Cover
- b. Nameplate
- c. Manual Trip Operator
- d. Circuit Breaker Open/Close Indicator
- e. Manual Close Operator
- f. Cover Bolt to be Replaced with the Device Support Lock Pin
- g. Racking Crank Access Door
- h. Secondary Disconnect Cable
- i. Switchgear Secondary Disconnect Device

Figure 7. Replace Circuit Breaker Front Cover Bolt with a Support Lock Pin

- a. Cover Fastener to be Replaced with the Support Lock Pin
- b. Support Lock Pin

Figure 8. Install the Racking Device Support Lock Pin on the Circuit Breaker Door

- a. Support Lock Pin
- b. Wrench for Installing the Support Lock Pin
V. OPERATION

The instructions in this section are intended to explain procedures for using the electric racking device and the motor control switchbox. For circuit breaker handling and racking in and racking out procedures, review the specific instruction bulletin for the specific circuit breaker in use.

IMPORTANT: Ensure the secondary disconnect cable (Figure 5, h) is not trapped between the electric racking device and the circuit breaker front cover.

6. While holding the racking device handle in the right hand, press the circuit breaker MANUAL TRIP OPERATOR with the left hand (Figure 6, c and Figure 11, a). The circuit breaker racking shaft access door can be opened after the circuit breaker is tripped.

6. Push the access door fully open with the racking device drive socket guard and release the manual trip operator. (Figure 11, b).

7. Insert the drive socket into the crank access opening (Figure 10). Ensure the racking device support latch fits over the support lock pin (Figure 12).

8. Unlock the spring lock on the support latch and place the support latch over the support lock pin (Figure 13).

9. Push down the support latch as far as possible. (Figure 14).

10. With the support latch in place, lock the spring pin lock to hold the electric racking device support latch in place (Figure 15).

NOTE: The racking device should be held securely by the hanger support.

A. INSTALLING AND OPERATING THE ELECTRIC RACKING DEVICE FOR RACKING IN

This section describes procedures for installing and operating the electric racking device for racking IN. Section B describes procedures for installing and operating the electric racking device for racking OUT.

1) Installing the Electric Racking Device for Racking In

1. Ensure the electric racking device support lock pin is installed on the circuit breaker. (See Section IV. INSTALLATION, D. PREPARATION 1) Electric Racking Device Support Lock Pin.)

2. Move the circuit breaker to the required switchgear location. Push the circuit breaker into the switchgear cell (See Figure 5) until the anti-rollout latch engages the switchgear rollout stop block.

3. Insert the switchgear secondary disconnect device (Figure 6, d) into the circuit breaker secondary disconnect receptacle.

4. Insert the plug of the gear motor cord (Figure 2, d) into the electric racking device twist-lock receptacle (Figure 2, e), and turn it 1/4 turn clockwise to lock in the plug. See Figure 9.

5. Grasp the electric racking device by the top handle with the drive socket toward the circuit breaker (Figure 10).

11. Turn the motor shaft knob until it engages the drive socket (Figure 2, a) with the circuit breaker racking shaft (Figure 16).

12. Physically move the motor control switchbox to a safe area to operate the electric racking device.

The electric racking device is positioned and ready to be energized for racking the circuit breaker into the switchgear (Figure 17).

NOTE: See Section, 2). Performing Circuit Breaker Racking In.
Figure 9. Insert the Motor Control Switchbox Cable Plug
   a. Locking Receptacle
   b. Switch Box Power Cord

Figure 10. Approach Circuit Breaker with the Drive Socket Toward the Circuit Breaker Door
   a. Racking Device
   b. Drive Socket
   c. Support Lock Pin
   d. Support Latch

Figure 11. Open the Circuit Breaker Crank Nut Access Door and Insert the Drive Socket
   a. Push to Trip Paddle
   b. Racking Device Drive Socket

Figure 12. Insert the Support Latch Over the Lock Pin

Figure 13. Unlock the Spring Lock Pin on the Support Latch

Figure 14. Push Down the Support Latch
2) Performing Circuit Breaker Racking In

Before racking in a circuit breaker, ensure the electric racking device is installed properly (see Section V. OPERATION, INSTALLING AND OPERATING THE ELECTRIC RACKING DEVICE FOR RACKING IN 1). Installing the Electric Racking Device for Racking In.

1. Plug the motor control switchbox power cord into a 110VAC receptacle.

2. On the motor control switchbox, move the power toggle to the ON position (Figure 18, a).

3. On the motor control switchbox, turn the racking direction selector to IN (Figure 18, d).

4. Depress the black push button on the racking direction selector. The red IN indicator lamp will illuminate (Figure 18, e). The electric racking device begins to rack in the circuit breaker and will vibrate slightly.

5. When racking-in is complete, the electric racking device motor will clutch out. As clutch out occurs, there will be a loud popping noise, and the racking device will vibrate strongly. At this point, release the black push button.

6. On the motor control switchbox, move the power switch to the OFF position.

7. Unplug the motor control switchbox power cord from the 110VAC electric receptacle when the racking in procedures is successfully completed.

NOTE: To uninstall the device, see Section V. OPERATION, D. UNINSTALLING THE ELECTRIC RACKING DEVICE.
B. INSTALLING AND OPERATING THE ELECTRIC RACKING DEVICE FOR RACKING OUT

1) Installing the Electric Racking Device for Racking Out

**CAUTION**

BEFORE INSTALLING THE ELECTRIC RACKING DEVICE, ENSURE THE CIRCUIT BREAKER CONTACTS ARE IN THE OPEN (TRIPPED) CONDITION. THIS SHOULD BE DONE BY REMOTELY SENDING A TRIP SIGNAL TO THE CIRCUIT BREAKER. THE MANUAL TRIP FUNCTION ON THE CIRCUIT BREAKER AND/OR SWITCHGEAR DOOR SHOULD ONLY BE USED IF THE REMOTE ELECTRICAL SIGNAL CANNOT BE USED.

1. Ensure the electric racking device support lock pin is installed on the circuit breaker. (See Section IV. INSTALLATION, D. PREPARATION 1) Electric Racking Device Support Lock Pin.)

2. Remotely open (trip) the circuit breaker if possible. In an emergency, if remote tripping is not available, use the manual trip function on the circuit breaker.

3. Insert the plug of the gear motor cord (Figure 1, d) into the electric racking device twist-lock receptacle (Figure 2, e), and turn it 1/4 turn clockwise to lock in the plug. See Figure 19.

4. Grasp the electric racking device by the top handle with the drive socket toward the circuit breaker (Figure 20).

**IMPORTANT:** Ensure the secondary disconnect cable (Figure 5, h) is not trapped between the electric racking device and the circuit breaker front cover.

5. While holding the racking device handle in the right hand, press the circuit breaker **MANUAL TRIP OPERATOR** with the left hand (Figure 6, c and Figure 21, a). The circuit breaker racking shaft access door can be opened after the circuit breaker is tripped.

6. Push the access door fully open with the racking device drive socket and release the manual trip operator. (Figure 21, b).

7. Insert the drive socket into the crank access opening (Figure 10). Ensure the racking device support latch fits over the support lock pin (Figure 22).

8. Unlock the spring lock on the support latch and place the support latch over the support lock pin (Figure 23).

9. Push down the support latch as far as possible. (Figure 24).

10. With the support latch in place, lock the spring pin lock to hold the electric racking device support latch in place (Figure 25).

**NOTE:** The racking device should be held securely by the support latch on the support lock pin.

11. Turn the motor shaft knob until it engages the drive socket (Figure 2, a) with the circuit breaker racking shaft (Figure 26).

**CAUTION**

TO AVOID DAMAGE TO EQUIPMENT, AND ENSURE PROPER RACKING OPERATION, THE CIRCUIT BREAKER CRANK NUT MUST BE ENGAGED BY THE RACKING SOCKET BEFORE THE ELECTRIC RACKING DEVICE IS OPERATED.

12. Physically move the motor control switchbox to a safe area to operate the electric racking device.

The electric racking device is positioned and ready to be energized for racking the circuit breaker out of the switchgear (Figure 27).

**NOTE:** For racking out procedures, see the next section, 2) Performing Circuit Breaker Racking Out.
Figure 20. Approach the Circuit Breaker with the Drive Socket Toward the Circuit Breaker Door

Figure 21. Open the Circuit Breaker Crank Nut Access Door and Insert the Drive Socket

a. Push to Trip Paddle
b. Racking Device Drive Socket

Figure 22. Insert the Support Latch Over the Lock Pin

Figure 23. Unlock the Spring Lock Pin on the Support Latch

Figure 24. Push Down the Support Latch

Figure 25. Lock the Spring Lock on the Support Latch
2) Performing Circuit Breaker Racking Out

⚠️ CAUTION

DO NOT WORK ON AN ENERGIZED CIRCUIT BREAKER. FOLLOW CIRCUIT BREAKER SAFETY GUIDELINES AND OPERATING INSTRUCTIONS PROVIDED IN THE SPECIFIC CIRCUIT BREAKER INSTRUCTION BULLETIN.

⚠️ CAUTION

THE CIRCUIT BREAKER MUST BE OPENED (TRIPPED) REMOTELY BEFORE PERFORMING RACKING OUT PROCEDURES.

Before racking out, ensure the electric racking device is installed properly (see Section V OPERATION, A. INSTALLING THE ELECTRIC RACKING DEVICE ON THE CIRCUIT BREAKER FRONT COVER.

1. Plug the motor control switchbox power cord into a 110VAC receptacle.

2. On the motor control switchbox, move the power toggle to the **ON** position (Figure 28, a).

---

**Figure 26. Insert the Support Latch Over the Lock Pin**

**Figure 27. Electric Racking Device Installed on the Circuit Breaker**

**Figure 28. Operate Motor Control Switchbox**

- **a.** Power Switch (ON position)
- **b.** Racking IN Indicator Lamp
- **c.** Racking OUT Indicator Lamp
- **d.** Racking Direction Selector
- **e.** Racking Activation Button
3. On the motor control switchbox, turn the racking direction selector to **OUT** (Figure 28, d).

4. Depress the black push button on the racking direction selector and the green **OUT** indicator lamp comes on (Figure 28, c). The electric racking device proceeds to rack out the circuit breaker and will vibrate slightly.

5. When racking-out of the circuit breaker is complete, electric racking device motor will clutch out. As clutch out occurs, there will be a loud popping noise, and the racking device will vibrate strongly. At this point, release the black push button.

6. On the motor control switchbox, move the power toggle to the **OFF** position.

7. Unplug the motor control switchbox power cord from the 110VAC electric outlet when the racking in procedures is successfully completed.

To uninstall the electric racking device, see the next section, D. UNINSTALLING THE ELECTRIC RACKING DEVICE.

### C. UNINSTALLING THE ELECTRIC RACKING DEVICE

1. Ensure the racking device is deenergized by disconnecting the motor control switchbox power cord from the 110VAC receptacle.

2. On the racking device, disengage the support latch pin lock (Figure 3, a and Figure 29) by pulling it away from the latch and turning the pin to the release position.

3. Lift the racking device support latch to release the circuit breaker support lock pin (Figure 30).

4. Pull the electric racking device straight out of the racking access hole for ease of removal. The racking socket should be removed straight out from the access door to avoid damage to the circuit breaker or the racking device (Figure 31).

5. Remove the plug of the motor control switchbox cord from the racking device by twisting it 1/4 turn counterclockwise to unlock it, and removing the plug from the racking device receptacle (Figure 32).

Store the electric racking device and motor control switchbox as described in Section IV. INSTALLATION, A. STORAGE.
VI. MAINTENANCE

A. GENERAL

A regular maintenance schedule should be established to obtain the best service and reliability from the electric racking device.

Actual inspection and maintenance will depend on individual application conditions such as number of racking operations, time between uses, and storage conditions. When the ground and test device has been in storage for an extended period of time, it must be inspected and cleaned before being used. See Section IV. INSTALLATION, C. STORAGE, D. PREPARING THE ELECTRIC RACKING DEVICE FOR USE.

A permanent record of maintenance work and inspections should be kept. The degree of record detail depends on the operating conditions. The record should include the dates and results starting from the date the device is first put into service. Dates and results of inspections and routine maintenance activities should be recorded.

B. INSPECTION AND CLEANING

Inspect the electric racking device for loose or damaged hardware or parts. Tighten any loose hardware, and replace missing or damaged hardware or parts.

When necessary, remove loose dust and dirt from the electric racking device with a vacuum cleaner, a clean, dry cloth, or an industrial type wiper. DO NOT use an air hose to clean the electric racking device. Dirt or grit may be blown into critical parts, including bearings, which will cause excessive wear of the parts.

C. LUBRICATION

Apply Rheolube grease on the drive shaft, under the spring (Figure 2, b), to prevent rusting and help ensure proper operation.

VII. RENEWAL PARTS

A. ORDERING

Should any part require replacement due to wear or damage, order renewal parts from Powell Apparatus Service Division (PASD). (See Table A. Renewal Parts).

When ordering parts, provide the following information from the ground and test device name plate:

- Name of the ultimate user
- Location of the installation
- Type of the device including rated voltage and rated amps
- Serial number of the device
- Description of the part
- Photo of the device with the needed part marked will be helpful in assuring that the proper part is furnished

To order parts, visit the Powell Web site at www.powellservice.com or call 1-800-480-7273.
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