DEH-41482

GE Energy
Industrial Solutions

Low Voltage Switchgear
Remote Racking Operator

For AKR Circuit Breakers
Cat. # AKREGRR
115 VAC, 60/50 Hertz

Operation and Maintenance Manual

TABLE OF CONTENTS

Section 1. Introduction

The remote racking operator allows the user to move a drawout circuit breaker between the CONNECT, TEST, and DISCONNECT positions via an electric racking motor and gearbox attached to the front of the breaker. The remote racking operator requires 115Vac, 50/60Hz control power. A control box connected to the operator with a thirty-foot cable permits control from a remote location.

Prior to the initial use of the remote racking operator, a one time modification must be made to each breaker and breaker compartment door.

The remote racking operator is portable and is designed for attachment to the AKR Low Voltage Circuit Breaker in AKD-8 Switchgear. For all AKD-6 applications, contact a GE Distributor.

Section 2. Receiving, Handling and Storage

2-1 Receiving and Handling

Each remote racking operator is carefully inspected and packed for shipment. Immediately upon receipt of the device, an examination should be made for any damage sustained in transit. If damage or rough handling is evident, a damage claim should be filed immediately with the transportation company, and the GE Distributor should be notified.

The device should be removed from the shipping box with sufficient care so that no damage will result from rough handling. "Loose parts" associated with the apparatus may be included in the box. Care should be taken to make certain that these parts are not overlooked. The shipping box will include the remote racking device, two couplers, two mounting brackets, and one mounting plate to be used with AKR 30/50 breakers only.

The bracket for the AKR 30/50 breaker has a long shaft that is welded to it while the bracket for the AKR 30S, 75/100 and 125 breaker has a short shaft welded to it as shown in Figure 1. Remove the two wing nuts and washers that are attached to the motor. Align the two holes in the bracket with the studs on the racking motor. Reattach and tighten the two washers and wing nuts to the motor. Assemble the support plate to the AKR 30/50 bracket only by using the ¼-20 hardware that was supplied and tighten.

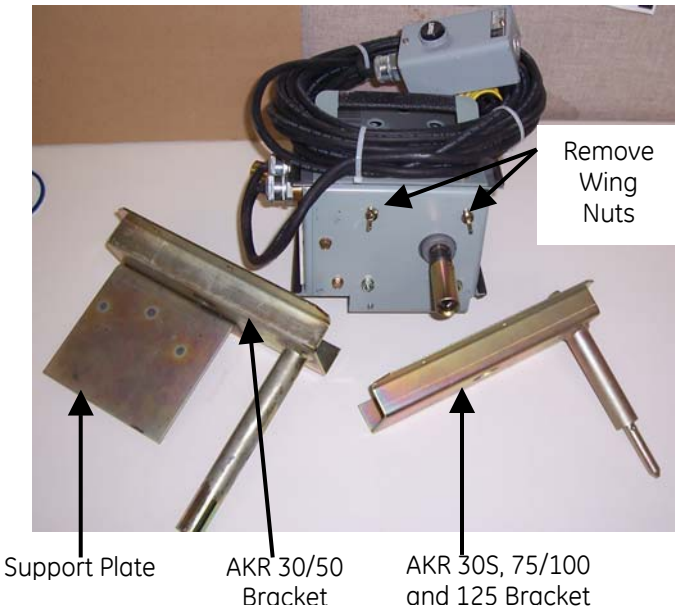


Figure 1
AKR Racking Operator

2-2 Storage

The remote racking operator should be protected against condensation, preferably by storing it in a warm, dry environment at moderate temperatures such as 40 degrees F to 100 degrees F. The storage area should be clean and contain no corrosive gasses.

If the device is stored for any length of time, it should be inspected prior to use to insure its proper mechanical and electrical working condition.

Section 3. Description

3-1 Description of Small Frame Remote Racking Operator – 800A-2000A AKR Breakers

The remote racking operator consists of a drive train, control switches, and attachment brackets. The drive train is made of a gear motor housing (1, Fig. 2), and a square drive coupler (2, Fig. 2), which couples to the breaker drawout mechanism.

Two control switches and a circuit breaker are included with each remote racking operator. The start switch (3, Fig. 2) housed in the hand-held box (4, Fig. 2) controls the power to the motor. Pushing the button closes the switch and in turn supplies power to the motor. This control switch is spring loaded; therefore, continuous pressure on the button is required to keep the motor running. The motor directional toggle switch (5, Fig. 2) is mounted on the motor housing. Two positions are provided, "IN" and "OUT". For racking toward the CONNECT position, the switch should be set to "IN". For racking toward the DISCONNECT position, the switch should be set to "OUT". The circuit breaker (6, Fig. 2) senses the motor stall current when the breaker reaches the end of its travel, which causes the motor to stall. The higher motor stall current trips the circuit breaker to the OFF position and in turn shuts off the power to the motor. The latch rod (7, Fig. 2) is designed to provide the means for attaching the remote racking operator to the front of the Small Frame Breaker. The latch rod (7, Fig. 2) hooks into the breaker mounting clip (8, Fig. 2) for mounting the remote racking operator to the breaker.

Modification to Existing Small Frame Breakers

Before attaching the remote racking operator to the existing AKR 30/50 and AKR 30s breakers, mounting brackets must be added to the breaker. On the AKR 30S breaker, a mounting bracket must be mounted on the right side of the breaker just above the existing racking screw. Refer to page 6 for the installation instructions and kit number.

On the AKR 30/50 breaker, a mounting bracket must be added to the left side of the escutcheon on the breaker frame. Refer to page 7 for the installation instructions and kit number.

Refer to pages 12 and 13 for field modification to existing breaker doors.

ATTACHING / REMOVING DEVICE
Attaching the Remote Racking Operator to the Small Frame AKR circuit breaker.

The circuit breaker must be in the OPEN position before attempting to attach the remote racking operator to the breaker. On the AKR 30/50 breaker, push the trip button and slide the racking screw cover in the breaker escutcheon to the right. Next, slide the remote racking attachment cover on the cubicle door to the left. This will expose an opening in the breaker cubicle door. On the AKR 30S breaker cubicle door, slide either the upper or lower racking screw access cover (located on the upper right corner of the breaker cubicle door) to the left. This will expose two openings in the cubicle door. Position the remote racking operator so that the square drive coupling is aligned with the square shaft of the drawout (racking) mechanism and the ¼ -turn latch rod engages the breaker frame. Push the remote racking operator toward the breaker to engage the square drive coupling with the shaft of the racking mechanism. If the coupling and the shaft are not in alignment, rotate the motor shaft extension on the back of the motor housing in either direction until the square drive aligns with the square racking shaft. When they are in alignment, the remote racking operator

will slide further through the breaker cubicle door. Rotate the ¼ - turn latch rod counter clockwise to lock the remote racking operator to the breaker. Check the latch on the left side of the remote racking operator to make sure it is fully engaged into the breaker front cover (indicated by the label on the latch).

Removing the Remote Racking Operator from the Small Frame AKR Circuit Breaker.

Hold the remote racking operator securely and rotate the latch release (located on the left side of the remote racking operator) clockwise. This should allow the remote racking operator to be pulled from the breaker front cover. The racking screw access covers will close automatically.

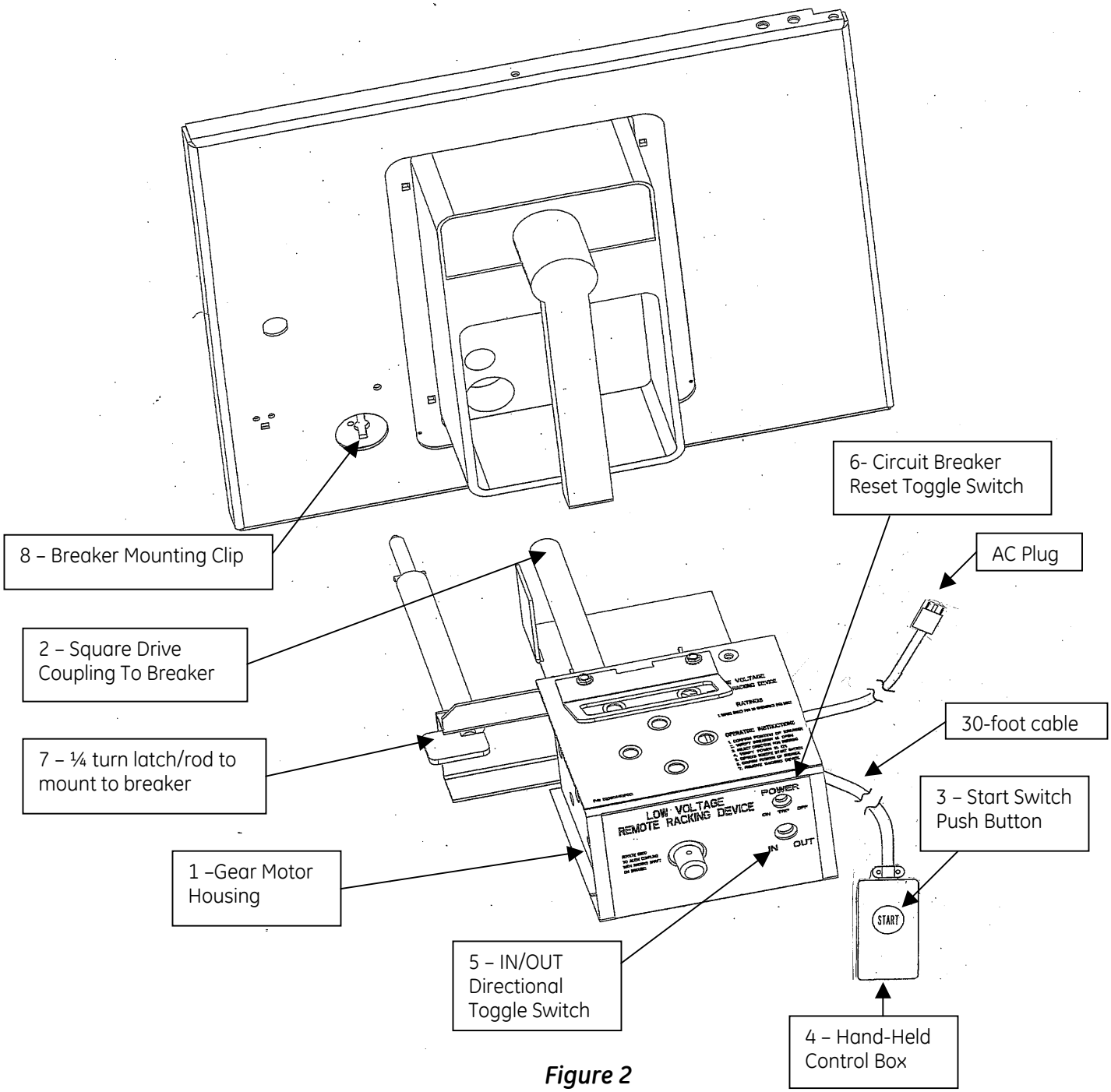


Figure 2

AKR 30/50 Remote Racking Assembly

Installation of the AKR 30S Remote Racker Mounting Bracket Kit – AKR30SEGBRMOD

Locate the (2) 3/8 inch bolts on the right side of the frame under the racking mechanism assembly. Carefully loosen these two bolts in order to slide the remote racking bracket (supplied with kit) behind the lock washer that is on the bolt. See below for location of the bolt heads on the breaker frame. Be careful not to remove these bolts.

Slide the bracket behind the lock washers on to the bolts and then retorque the bolts to 25 – 35 ft.-lbs. Do not over torque. Check to see that the bracket is completely vertical before tightening. If not, this will cause improper alignment of the remote racking shaft. The breaker may now be reinstalled into the cubicle.

The existing racking screw mechanism needs to be inspected for excessive wear and be properly lubricated.

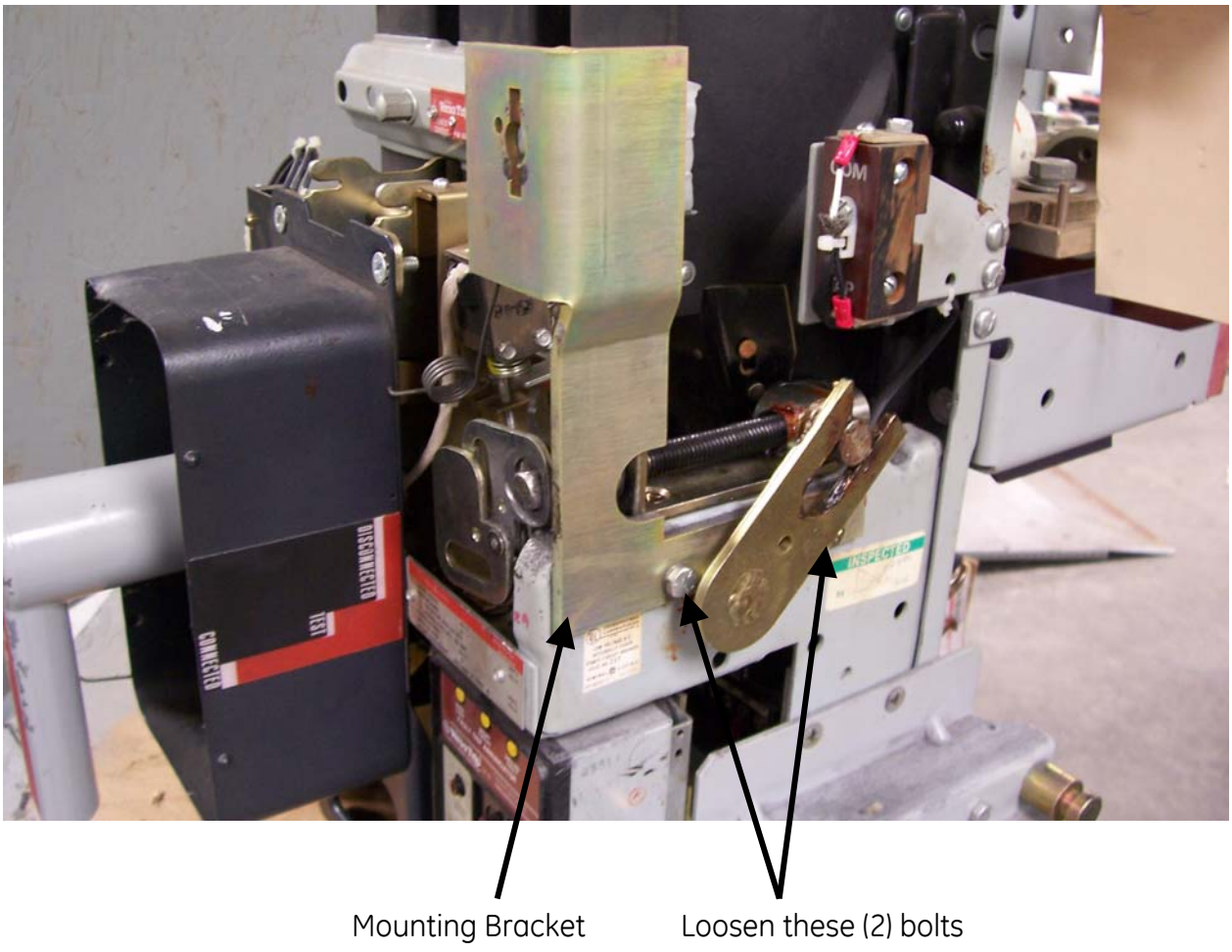


Figure 3

AKR 30S Mounting Bracket Installation

Installation of the AKR 30/50 Remote Racker Mounting Bracket Kit – AKR3050EGBRMOD

When looking at the front of the breaker, locate the (2) mounting holes that are already punched in the frame on the left side of the escutcheon. They are located behind the nameplate on the breaker.

Install the mounting bracket that came with your kit. Align the (2) holes on top of the bracket with the (2) holes on the frame. Install the (2) ¼-20 flat washers, lock washers and bolts through the frame and into the bracket. Torque the bolts to 7 – 10 ft.-lbs. Do not over torque. Make sure that the flat portion of the bracket with the key way is facing outwards. See picture below. After the bracket has been mounted, the breaker is ready to be installed into the cubicle.

The existing racking screw mechanism needs to be inspected for excessive wear and be properly lubricated.

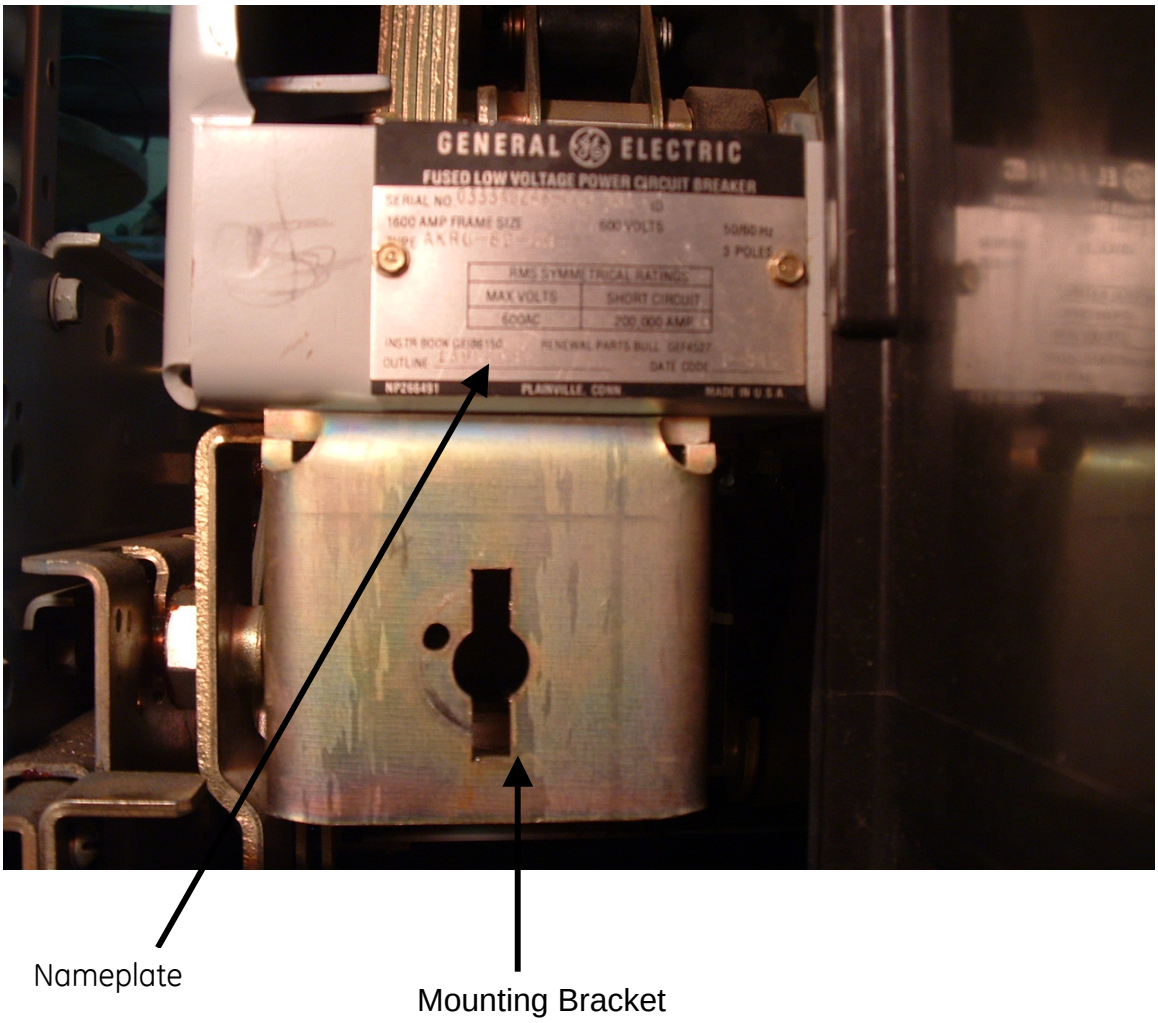


Figure 4

AKR 30/50 Mounting Bracket Installation

3-2 Description of Large Frame Remote Racking Operator – 3200A-5000A AKR Breakers

The remote racking operator consists of a drive train, control switches, and attachment brackets. The drive train is made of a gear motor (1, Fig 5) a square drive socket (2, Fig 5), which couples the breaker.

Two toggle switches and a circuit breaker are included with each remote racking operator. The START switch (3, Fig 5) housed in the hand-held box (4, Fig 5) controls the power to the motor. Pushing the button closes the switch and in turn supplies power to the motor. This control switch is spring loaded; therefore, continuous pressure on the button is required to keep the motor running. The motor directional toggle switch (5, Fig 5) is mounted on the motor housing. Two positions are provided, "IN" and "OUT". For racking toward the CONNECT position, the switch should be set to "IN". For racking toward the DISCONNECT position, the switch should be set to "OUT". The circuit breaker (6, Fig 5) senses the motor stall current when the breaker reaches the end of its travel, which causes the motor to stall. The higher motor stall current trips the circuit breaker to the OFF position and in turn shuts off the power to the motor.

The ¼ turn shaft (7, Fig. 5) is designed to provide the means for attaching the remote racking operator to the front of the Large Frame Breaker. The latch rod (7, Fig. 5) hooks into the breaker connecting bracket for mounting the remote racking operator to the breaker.

ATTACHING / REMOVING DEVICE

Attaching the Remote Racking Operator to the Large Frame AKR Circuit Breaker

The circuit breaker must be in the OPEN position before attempting to attach the remote racking operator to the breaker. Slide either the upper or lower racking screw access cover (located on the upper right corner of the breaker cubicle door) to the left. This will expose two openings in the breaker cubicle door. The upper opening is for the ¼-turn latch rod and the lower opening is for the square drive coupling. Position the remote racking operator so that the square drive coupling and ¼-turn latch rod are aligned with the openings in the breaker cubicle door. Push the remote racking operator toward the breaker so that the square drive coupling engages the square racking shaft and the ¼-turn latch rod engages the breaker frame. If the coupling and the shaft are not in alignment, rotate the motor shaft extension on the back of the motor housing in either direction until the square drive aligns with the square racking shaft. When they are in alignment, the remote racking operator will slide further through the breaker cubicle door. Rotate the ¼-turn latch rod counter-clockwise to lock the remote racking operator to the breaker.

Removing the Remote Racking Operator from the Large Frame AKR circuit breaker

Hold the remote racking operator securely and rotate the ¼-turn latch rod clockwise to release the remote racking operator from the breaker. Pull the remote racking operator away from the breaker cubicle door. The racking screw access covers will close automatically.

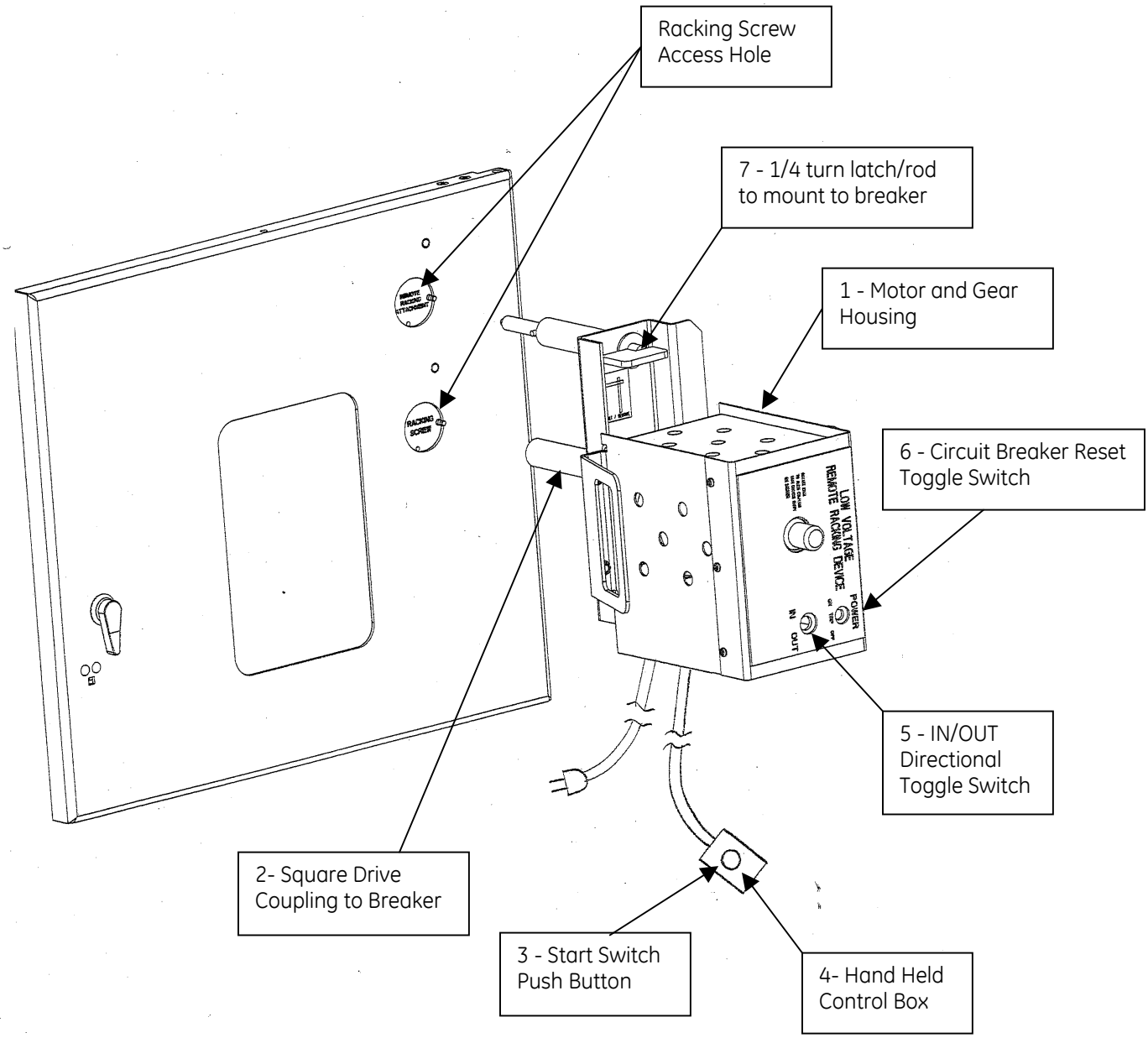
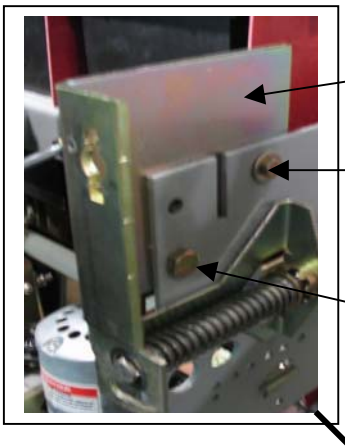


Figure 5

AKR 30S, 75/100 and 125 Remote Racking Assembly

Section 4. Modifications

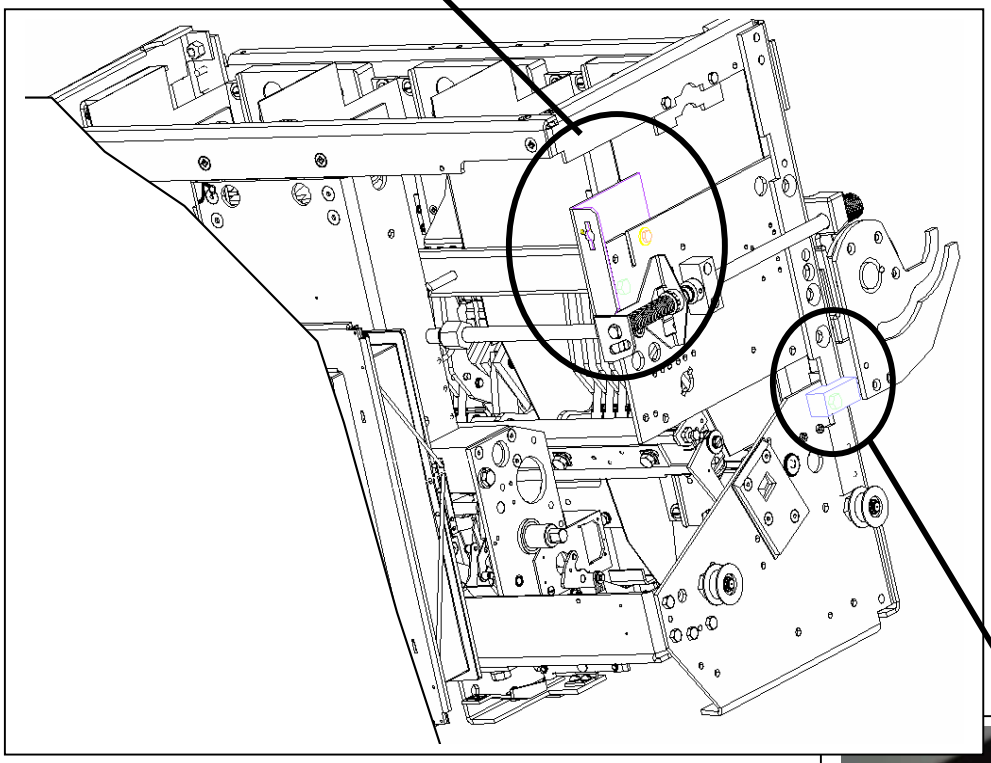
4-1 Converting Large Frame Breaker to work with Remote Racking Operator



Connecting Bracket – Align 1st to existing holes in breaker frame.

¼-20 Bolt, Nut, Lock Washer, Flat Washer – Add ¼ inch hardware to existing hole of bracket and frame in upper position as shown.

3/8-16 Bolt, Nut, Lock Washer, Flat Washer – Add 3/8 inch hardware to existing hole in bracket and breaker frame in lower position as shown.

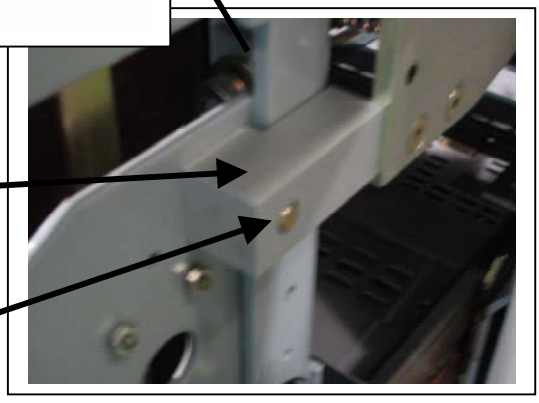


AKR751008EGBRMOD & AKR125EGBRMOD
Modification Kit for AKD-8 AKR 75/100 & 125 Large Frame Breakers

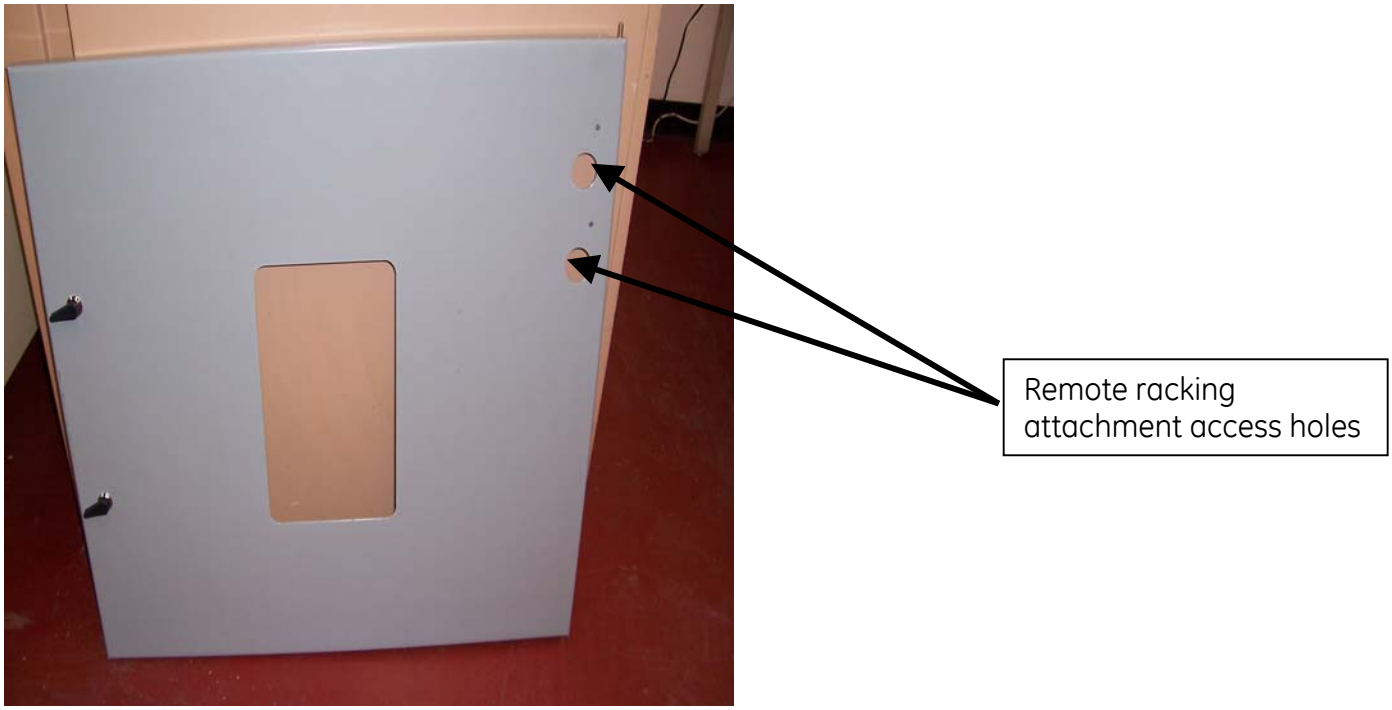
Figure 6

Racking Stop – Align racking stop with existing hole in breaker frame as shown.

3/8-16 Bolt – Add 3/8 inch hardware from inside frame of breaker as shown.



4-2 Changing a Small / Large Frame Breaker Door in AKD 8 Switchgear to work with Remote Racking Operator



AKD-8 Doors

Kit **AKR30S8EG22DR**- 800A AKR 22" Wide Breaker Door

Kit **AKR30S8EG30DR**- 800A AKR 30" Wide Breaker Door

Kit **AKR30S8EG22DRDI**- 800A AKR 22" Wide Breaker Door with Defeatable Interlock

Kit **AKR30S8EG30DRDI**- 800A AKR 30" Wide Breaker Door with Defeatable Interlock

Kit **AKR30508EG22DR**- 800A/1600A AKR 22" Wide Breaker Door

Kit **AKR30508EG30DR**- 800A/1600A AKR 30" Wide Breaker Door

Kit **AKR30508EG22DRDI**- 800A/1600A AKR 22" Wide Breaker Door with Defeatable Interlock

Kit **AKR30508EG30DRDI**- 800A/1600A AKR 30" Wide Breaker Door with Defeatable Interlock

Kit **AKR751008EG30DR**- 3200A/4000A AKR 30" Wide Breaker Door

Kit **AKR751008EG30DRDI**- 3200A/4000A AKR 30" Wide Breaker Door with Defeatable Interlock

Kit **AKR1258EG38DR**- 5000A AKR 38" Wide Breaker Door

Kit **AKR1258EG38DRDI**- 5000A AKR 38" Wide Breaker Door with Defeatable Interlock

4-3 Field Modification to existing Breaker doors.

All existing small and large frame AKR Breaker doors can be modified in the field to accommodate the new AKR remote racking operator. A drilling template kit (CAT# AKREGDRTEMP) can be provided with (5) drilling templates (one for each type of breaker door). The racking flag assemblies (CAT# AKREGDRMOD) can also be ordered for each modified breaker door.

Below is a picture demonstrating how to locate and drill holes in an existing 30S, 75/100 or 125 breaker door. A picture demonstrating how to locate and drill the holes for a 30/50 breaker door is located on the next page.

Refer to page 14 for remote racking flag details.

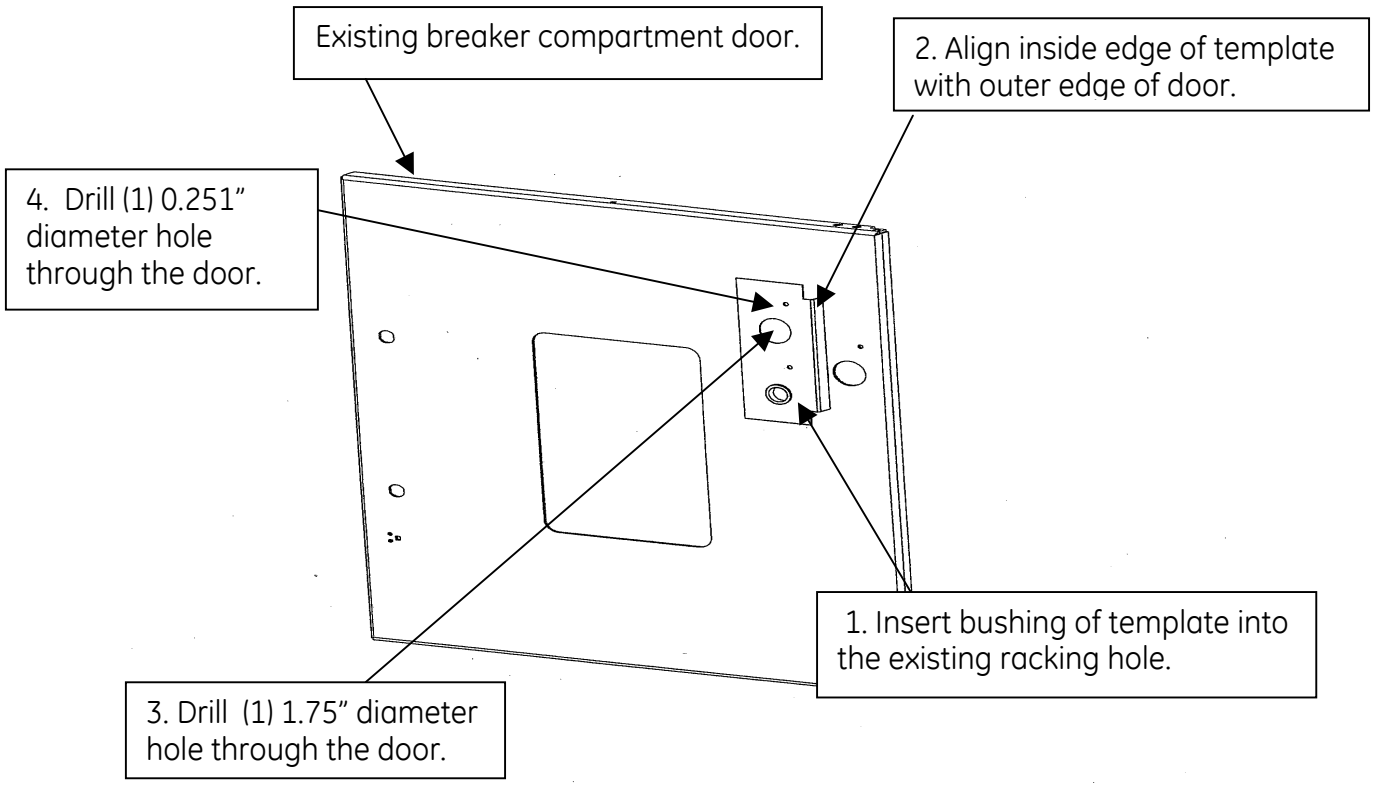


Figure 7

Door drilling template for AKR 30S, 75/100 and 125 doors

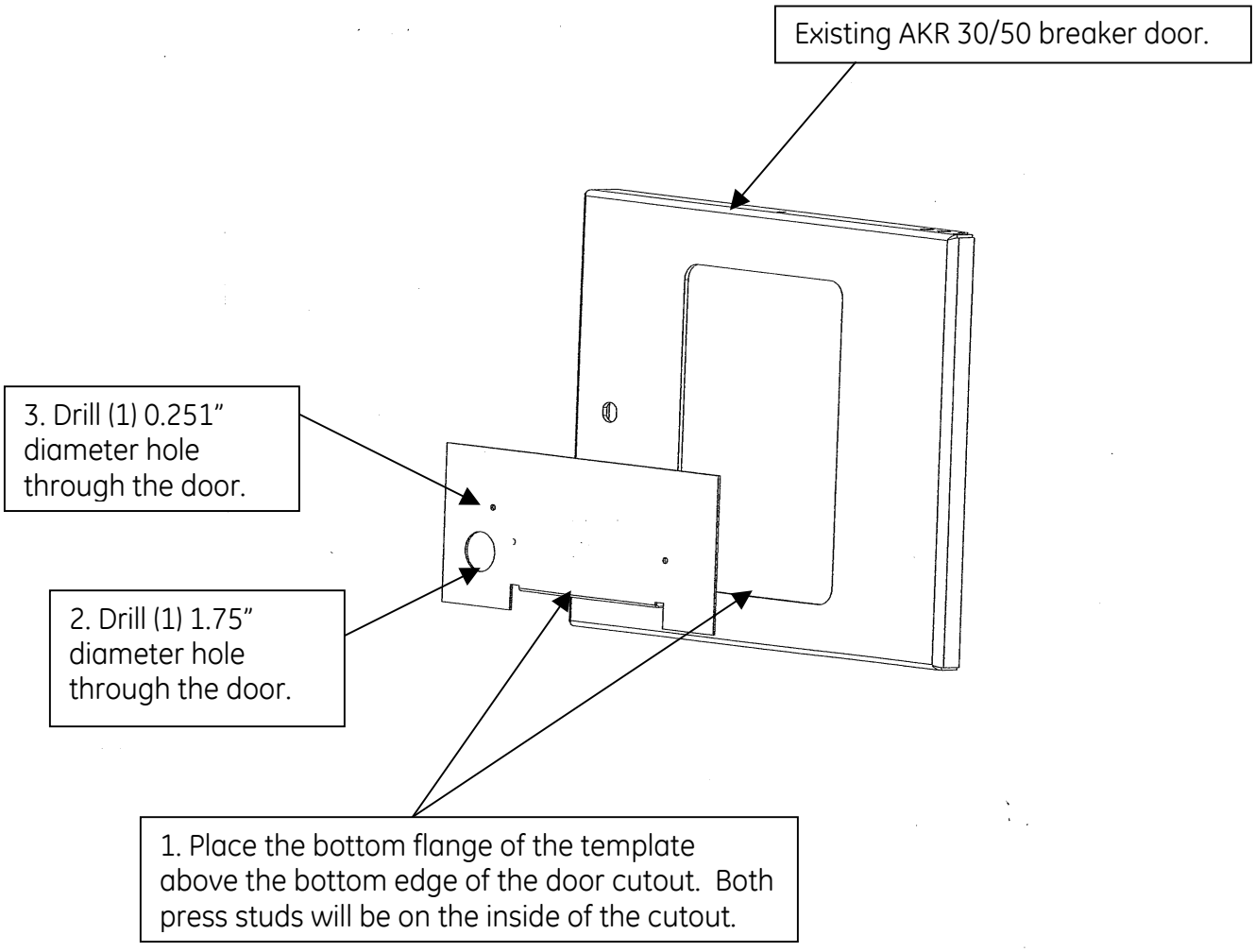


Figure 8

Door drilling template for AKR 30/50 doors.

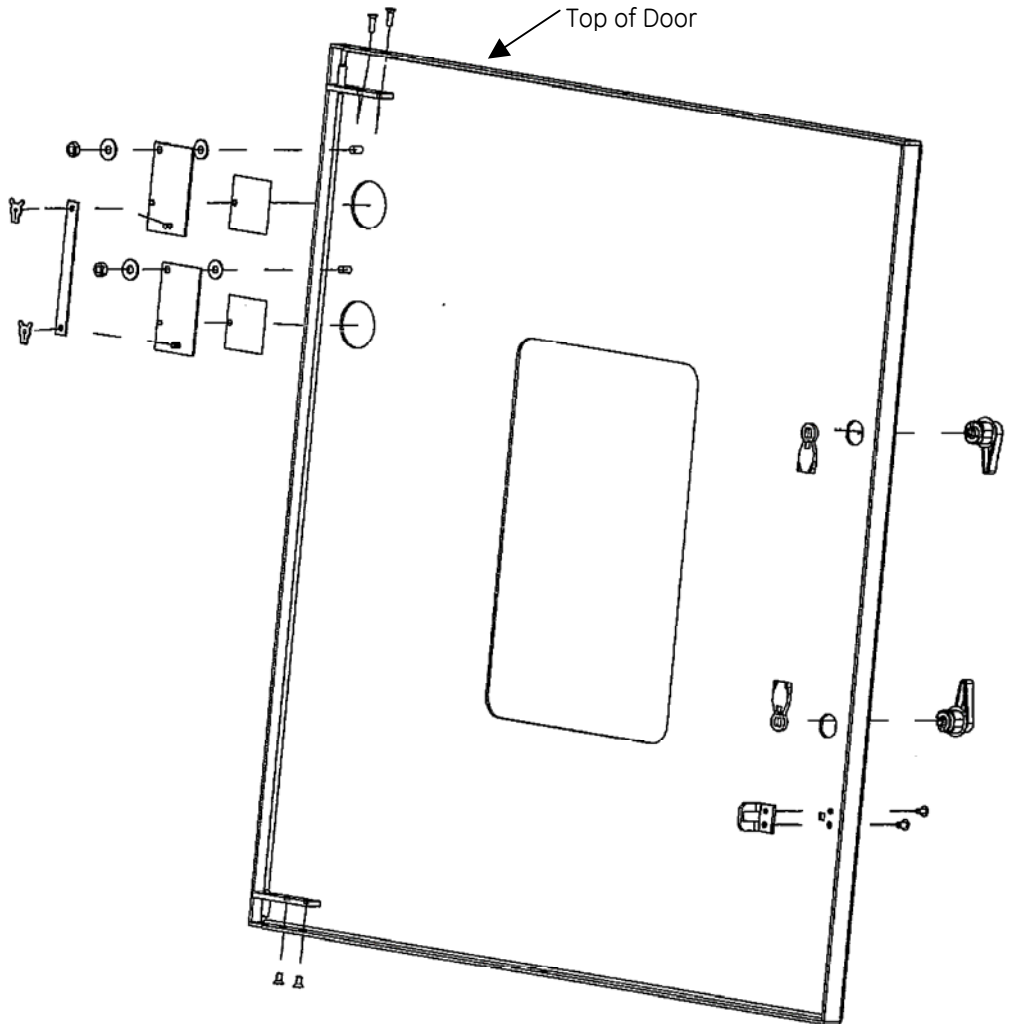


Figure 9

Flag Assembly

Aftermarket Solutions available from GE Energy - Industrial Solutions

WavePro/EntelliGuard (Entellisys) Remote Racker GEK-99986
EntelliGuard G Remote Racker DEH-41467
EntelliGuard TU Trip Unit Conversion Kits DET-722
Power Break II into a Power Break I Retrofit Kit DEH-41502
EntelliGuard G AK/AKR Retrofills Coming soon

These instructions do not purport to cover all details or variations in equipment or 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 the General Electric Company.

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