Installation and Operation

CBS ArcSafe®

Distance Is Safety®

A Group CBS Company

RRS-3 HK(S)

Type HK, 1200-3000A, 75-750MVA

Includes 5HK, 7.5HK, 15HK

Not compatible with 1000MVA

Distance is Safety®

WHAT STANDS BETWEEN YOU AND ARC-FLASH DANGER? WE DO.

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Rev. 10/11/2017

More Products by CBS ArcSafe®

RRS-1 – *Universal Remote Racking System (Rotary)*

The CBS ArcSafe® RRS-1 is a universal remote racking system capable of remotely installing and removing rotary style draw out circuit breakers without requiring any modification to the existing switchgear. Operation of the simple to use RRS-1 is quite intuitive and requires only minimal setup. When used properly, the RRS-1 allows technicians to remain outside of the arc flash boundary during the potentially dangerous racking operation.

RRS-2 – *Universal Remote Racking System (Non-Rotary)*

The CBS ArcSafe® RRS-2 is a universal remote racking system capable of remotely installing and removing non-rotary style draw out circuit breakers without requiring any modification to the existing switchgear. Operation of the simple to use RRS-2 is quite intuitive and requires only minimal setup. When used properly, the RRS-2 allows technicians to remain outside of the arc flash boundary during the potentially hazardous racking operation.

RRS-3 – *Application Specific Remote Racking System (Rotary And Non-Rotary)*

The CBS ArcSafe® RRS-3 product line is made up of various application specific remote breaker racking devices. Each standalone system allows service personnel to remotely install and remove a particular type of circuit breaker safely while stationed safely outside of the arc flash boundary during the potentially dangerous operation. The lightweight and compact design of the RRS-3 systems makes them ideal for hard to access areas where space is at a premium.

RRS-4 – *PLC Based Universal Remote Racking System (Rotary)*

The CBS ArcSafe® RRS-4 universal remote racking system is an updated PLC based version of the best selling RRS-1. The dual mode, source programmable, PLC based control system offers two different operating modes to choose from based on user preference or the application. The RRS-4 is capable of remotely installing and removing rotary style draw out circuit breakers without requiring any modification to the existing switchgear, allowing users to remain outside of the arc flash boundary during the potentially hazardous racking operation.

RSA – *Remote Switch Actuator*

The CBS ArcSafe® Remote Switch Actuator (RSA) product line is made up of various application specific remote operating devices. These products allow service personnel to remotely perform all aspects of an operation for a particular type of electrical equipment from outside the arc flash boundary – reducing or eliminating the possibility of serious injury or death resulting from an arc flash.

RSO – *Remote Switch Operator*

During a remote operation, the CBS ArcSafe® RSO functions as both the power supply and user interface for the device being remotely operated by the user. When paired with an applicable CBS ArcSafe® device, this portable standalone system allows service personnel to remotely perform a racking or switching procedure from outside the arc flash boundary – reducing or eliminating the possibility of injury or death resulting from an arc flash

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About the User's Guide

This user's guide describes the functions and features of the CBS ArcSafe® Single Application Remote Racking System (RRS-3). This technical document is intended to act as a simplified reference for users of the equipment; allowing for safe, quick, and efficient use of the RRS-3 features.

DANGER!

This is a red hazard alert warning box; red hazard alert boxes contain information pointing out potential hazards to personnel and equipment.

ATTENTION!

This is a green information box; green information boxes are used to place emphasis on valuable information the user will want to pay particular attention to.

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DANGER!

Ensure that personnel using this equipment are adequately trained in the operation of the switchgear they are planning to work with; that they are correctly stationed outside the arc flash boundary; and that they comply with all applicable Federal, State, Local, and In-house safety regulations and procedures. Attention should be given to distance, angle, and personal protective equipment (PPE).

DANGER!

Ensure that switchgear is properly maintained and in good working order before using the RRS-3 on your switchgear. Contact your local group CBS service provider at www.gcbs.com to assist in proper care and maintenance for your switchgear.

1 Installation

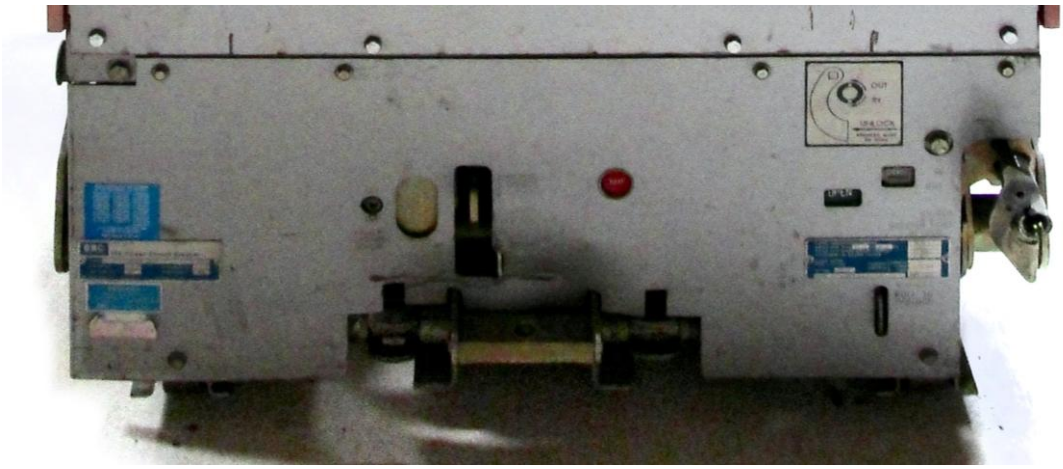
DANGER!

Ensure that the equipment to be remotely operated matches the equipment shown and described on the cover page. If the equipment does not match, please contact CBS ArcSafe® for more information regarding remote operating applications for the equipment in question.

ATTENTION!

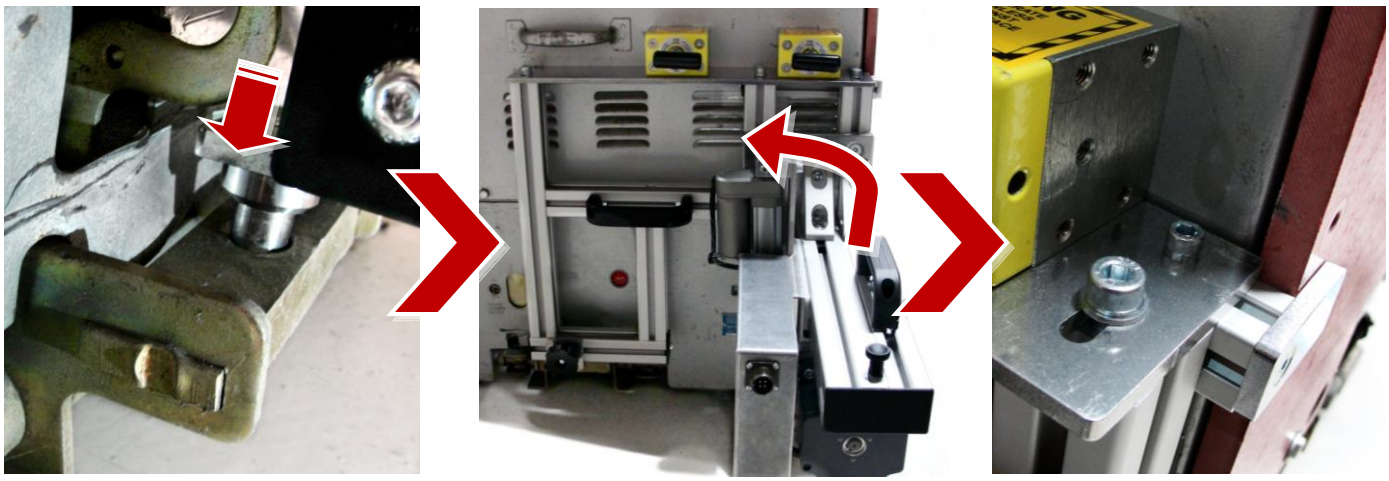
The location of certain items such as mimic bus, stickers, and/or placards may interfere with the installation of the remote operating equipment. These items may need to be removed or repositioned for proper installation.

1. Ensure that the breaker is free from any obstruction that may interfere with the proper installation of the RRS-3.



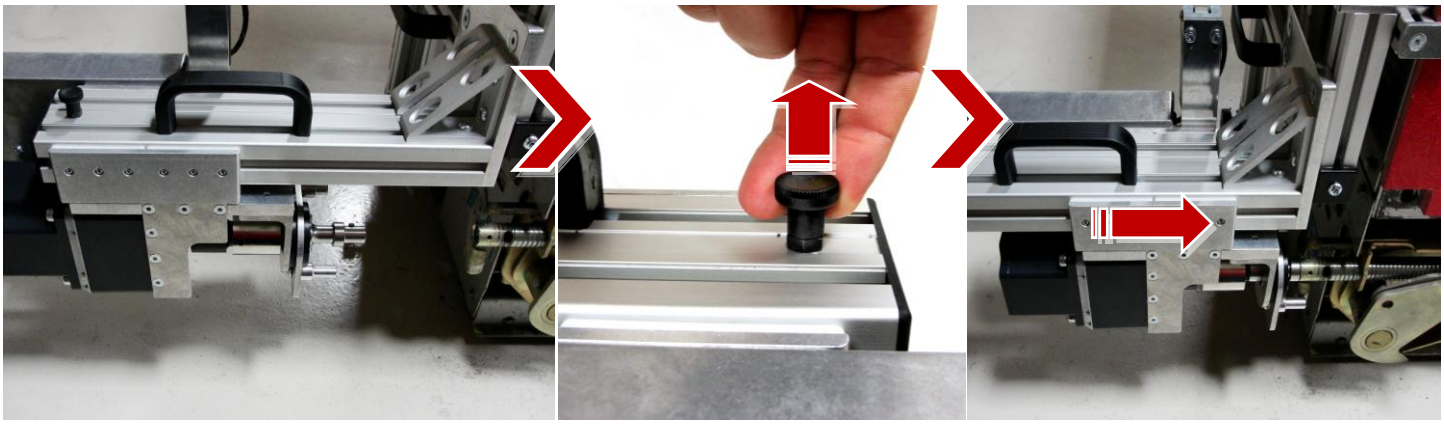
2. Ensure that the torque limiter on the RRS-3 is set correctly to allow proper operation. See section 3.1 Torque Limiter in this manual for more details

3. Insert the lower locator with the black adjustment knob into the turning dolly bracket on the front of the breaker, then roll the RRS-3 counter-clockwise until the right-side locator comes to rest on the right side of the breaker.



4. Secure the RRS-3 to the breaker by turning the handles of the twist magnets 180 degrees clockwise.

5. Pull the rear lock pin up while holding the drive assembly of the RRS-3, and then gently allow the drive assembly to slide forward to mate with the racking screw. Rotate the racking adapter by hand as necessary to ensute that the tooling fully engages the racking mechanism.



The RRS-3 is now ready for operation

2 Operation

ATTENTION!

Please ensure that all cables are clear of moving parts. Failure to do so may result in damage to cables and/or actuator.

ATTENTION!

Please ensure that the batteries to the RSO-IV are fully charged or that the unit is plugged into AC power.

For detailed instructions on the operation of the RSO-IV please see the RSO-IV Manual.

1. Ensure that the RRS-3 is properly installed. See the Installation section of this manual for detailed instructions.

2. Connect the cable from the RSO-IV to the motor control box on the RRS-3

3. Turn the power switch on the RSO-IV to the ON position.

4. Program the settings for the RRS-3 into the RSO-IV. These settings can be found on the placard on the RRS-3. For more information on programming the RSO-IV please refer to the RSO-IV Technical Manual.

5. Exit the arc flash boundary.

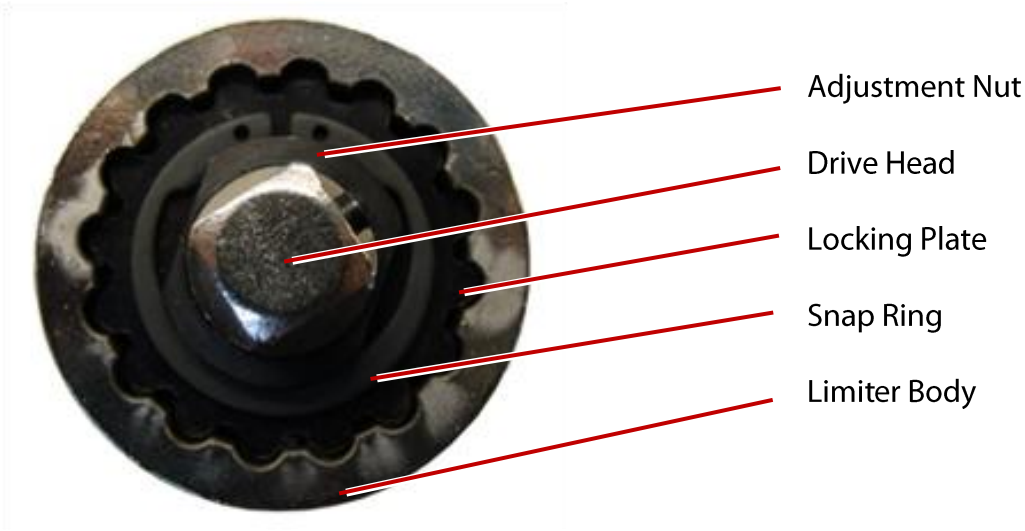
6. To rack the breaker out:
   a. Press and hold the INTERLOCK button on the RSO-IV control panel or remote pendant.
   b. Press and release the REMOVE button.
   c. After 1-2 seconds of racking, release the Interlock Button.
   d. The breaker will stop automatically in Test position. To continue racking out, repeat steps a-c above until it stops in the Removed position.

7. To rack the breaker in:
   a. Press and hold the INTERLOCK button on the RSO-IV control panel or remote pendant.
   b. Press and release the INSTALL button.
   c. After 1-2 seconds of racking, release the Interlock Button.
   d. The breaker will stop automatically in Test position. To continue racking out, repeat steps a-c above until it stops in the Installed position.

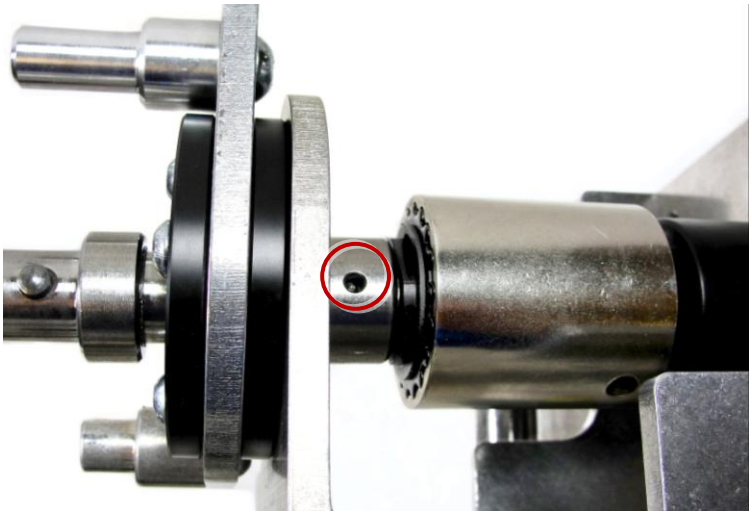
3 Adjustments

3.1 Torque Limiter

The torque limiter is designed as the primary safety system to reduce the possibility of damaging the circuit breaker racking mechanism with the RRS-3. The torque limiter attaches to the drive coupling and mates with the racking tool. The torque limiter is set from the factory for your particular breaker, so only adjust as needed for your specific situation. *Note: A ½ inch drive torque wrench will be required to perform this adjustment.*



1. First, remove the racking tool adapter from the RRS-3 by pushing in the locking pin at the base of the tooling shown below. The racking adapter can then be fitted to a standard ½ inch drive torque wrench.



2. On the de-energized and OPEN test breaker, extract the breaker's racking handle, and fit the racking adapter to the handle as shown in the Installation section of this manual.

3. To determine the proper torque required to rack the breaker, first rack the breaker out, measuring the maximum amount of torque needed. Record this value.

ATTENTION!

When the breaker reaches either the test or disconnected position the torque will rise as various interlocks and mechanical limits engage. Do NOT apply any torque to the racking mechanism greater than that seen during the racking process.

4. Next, reset the torque wrench (if needed) and proceed to rack the breaker in, again measuring the maximum torque applied. Record this value.

ATTENTION!

As you begin racking the breaker onto the stabs the torque should raise, and then almost immediately after the breaker is on the stabs the torque will lower and then spike as you hit the racking limits. This spike is the breaker starting to be racked in too far. DO NOT continue to rack in the breaker at this point. The maximum amount of force the breaker needs to rack will be found as breaker has gone onto the stabs

DANGER!

As breakers age and/or do not see regular maintenance the torque needed to rack a breaker may increase. However, large increases of torque needed to rack a breaker including amounts over 10% of the average torque may indicate breaker problems, which could lead to an arc flash.

If the RRS does not seem to have enough torque, first double check that the breaker is operating properly before racking out by hand.

5. Take the the higher of the two recorded values and multiply by 1.1. This adds an additional 10% margin of error for the torque limiter. This new value is the setting for the torque limiter.

6. Next, Attach the torque wrench to the spring loaded drive head (Various different socket adapters may be necessary depending on the drive size of the torque wrench) and use the torque wrench to determine the present setting of the torque limiter. The torque limiter body will need to be held still during this operation.

7. Remove the snap ring and locking plate from the torque limiter.

8. Adjust the nut clockwise to increase torque, and counter-clockwise to decrease torque.

9. Obtain a new torque reading with the torque wrench to verify the new torque setting. Repeat steps 8-9 until the torque value determined in step 5 is reached.

10. Replace the locking plate and snap ring onto the torque limiter.

DANGER!

Inaccurate setting of the torque limiter may result in excessive slip during racking operations or, if over-tightened, the remote rack placing excessive torque on the breaker racking mechanism; possibly leading to equipment damage.

3.2 Leveling Adjustment

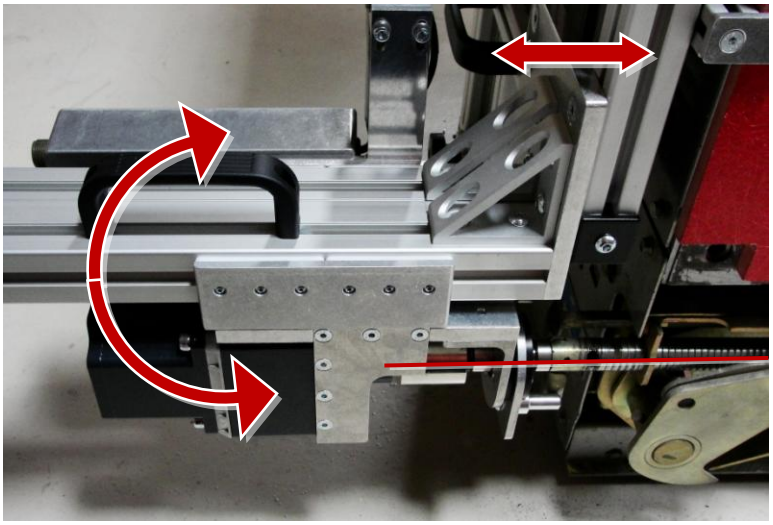
This RRS-3 may occasionally require leveling to be sure that the racking tool is in proper alignment with the racking mechanism on the breaker.

1. Loosen the three bolts the RRS-3 to the magnet plate, as indicated below.

2. Install the RRS-3 as described in the Installation section of this manual.
3. Slide the upper part of the RRS-3 in or out as required to level the device with the racking mechanism. The drive motor and tool should be directly in line with the racking screw.

ATTENTION!

If the RRS-3 is not in proper alignment with the racking screw, it may cause the RRS-3 to bind during operation, causing improper racking behavior. Always be sure that the RRS-3 is properly leveled with the racking mechanism prior to operation.



4. Slide the frame in or out as required to ensure that the racking mechanism is fully engaged.
5. Re-tighten the bolts.

3.3 Lower Locator Adjustment

The locators in the RRS-3 can be adjusted to achieve a better fit on a particular piece of equipment.

1. Install the RRS-3 as described in the Installation section of this manual.
2. Turn the black knob on the lower locator counter-clockwise to loosen it, and then slide it left or right, until the RRS-3 drive assembly is properly aligned with the racking mechanism on the breaker.

3. Slide the frame in or out as required to ensure that the racking mechanism is fully engaged by the RRS-3 drive mechanism, as described in the installation.
4. Re-tighten the bolts.

3.4 Upper Locator Adjustment

The locators in the RRS-3 can be adjusted to achieve a better fit on a particular piece of equipment.

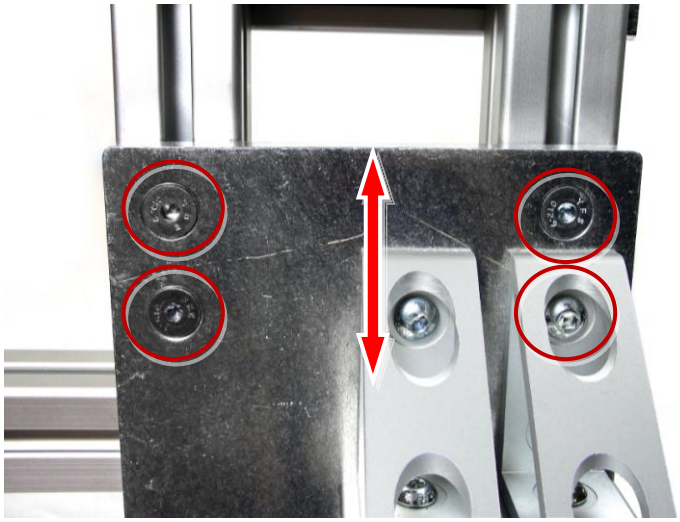
1. Install the RRS-3 as described in the Installation section of this manual.
2. Loosen the two bolts holding the upper locator in place, as shown, and then slide it left or right, until the RRS-3 drive assembly is properly aligned with the racking mechanism on the breaker, and the locator is flush with the side of the breaker, as described in the Installation section.

3. Re-tighten the bolts after adjustment.

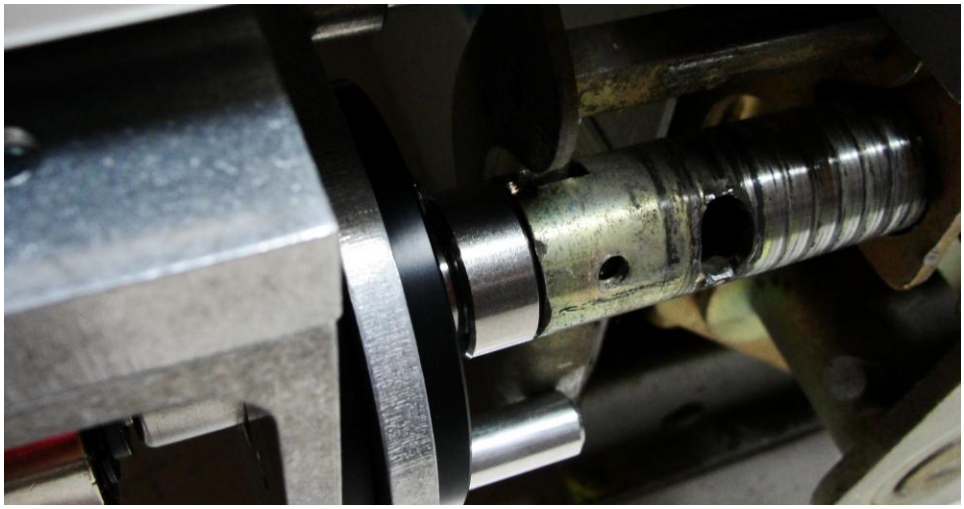
3.5 Motor Height Adjustment

The height of the drive motor on the RRS-3 can be adjusted to achieve proper alignment with the breaker racking mechanism. To adjust the motor:

1. Loosen the four bolts securing the motor in place, as indicated below.



2. Slide the motor up or down to achieve proper alignment with theracking mechanism of the breaker. Ensure that the drive motor and tool on the RRS-3 mates properly with the racking mechanism on the breaker.



3. Re-tighten the bolts when adjustment is complete.

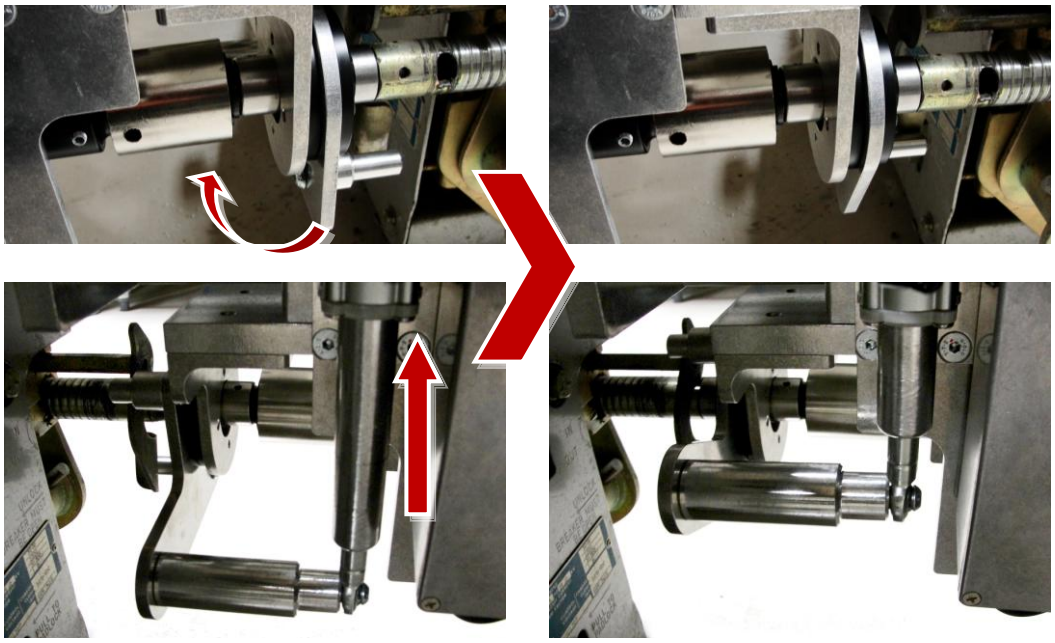
3.6 Interlock Defeat Travel Adjustment

The amount of travel for the interlock defeat mechanism can be adjusted to accommodate equipment differences.

1. Loosen the two bolts on the interlock actuator, as shown below.

2. Install the RRS-3 on the breaker, as described in the Installation section.

3. Use the RSO-IV to operate the interlock defeat mechanism. Match the interlock defeat travel to the actual interlock travel by sliding the interlock defeat actuator up to increase the amount of rotation, or slide the interlock defeat actuator down to decrease the amount of rotation.



Interlock Disengaged *Interlock Engaged*

4. Re-test the interlock defeat with the RSO-IV, and continue adjusting as necessary until the travel is properly matched.

5. Re-tighten the bolts on the interlock defeat actuator.

Notes

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