

Safe Work Practices



BREAK-SAFE® Tool	Reference:	SWP-2.05	Revision:
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1.0 OVERVIEW

- 1.1** The BREAK-SAFE® is a jumper clamp that functions like a portable switch. It is designed to operate on overhead distribution lines in conjunction with a mechanical jumper.
- 1.2** The BREAK-SAFE® has three operating functions:
- i. LOAD BREAK
 - ii. LOAD PICKUP
 - iii. CONTINUOUS CURRENT DUTY
- 1.3** The BREAK-SAFE® is available in four models with either a Floating Head or a Duckbill Head:
- i. 15 kV / 300 amp
 - ii. 27 kV / 300 amp
 - iii. 38 kV / 300 amp
 - iv. 46 kV / 200 amp

2.0 MINIMUM APPROACH DISTANCE

- 2.1** In order to keep personnel at a safe distance, the BREAK-SAFE® is operated with an insulated fiberglass hot stick for load break and load pick-up functions.
- 2.2** The Yellow Safety Lock is also operated by a hot stick and helps prevent the tool from an unintended load break or pickup operation.

3.0 SPECIFICATIONS

3.1

MODEL	OPERATIONAL VOLTAGE	RATING*	WEIGHT	CLOSED LENGTH	OPEN LENGTH
USBS-15-1	15 kV	300 AMPS	7 lb 3 oz	24"	28"
USBS-15-2	15 kV	300 AMPS	6 lb 7 oz	28"	32"
USBS-27-1	27 kV	300 AMPS	7 lb 10 oz	28"	33.5"
USBS-27-2	27 kV	300 AMPS	7 lb	32"	37.5"
USBS-38-1	38 kV	300 AMPS	8 lb 6 oz	33"	41"
USBS-38-2	38 kV	300 AMPS	7 lb 12 oz	37"	45"
USBS-46-1	46 kV	200 AMPS	10 lb 3 oz	42.5"	53.5"
USBS-46-2	46 kV	200 AMPS	9 lb 9 oz	46.5"	57.5"
CONDUCTOR SIZES (ALL)	#6 COPPER MIN. up to 954 ACSR (1.1" dia.) MAX.				
DIAMETER (ALL)	2.5"				

*LOAD BREAK, LOAD PICKUP and CONTINUOUS CURRENT DUTY

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4.0 CRITERIA FOR USE (OPTION VS. INSTALLING A CUTOUT)

- 4.1 This is another tool in the Line Worker's toolbox. It is designed to substitute the installation of a cutout.
- 4.2 Broken system neutral on energized primary circuit.
 - i. The BREAK-SAFE® Tool may be used as an option to restore continuity of a broken system neutral to avoid an outage.
- 4.3 Energizing a line with load
- 4.4 Energizing a line with **NO** load:
 - i. If energizing a line over 10 spans or if reduced by visibility, line energization requires the BREAK-SAFE® Tool or a cutout. (If under 10 spans, the line may be energized with a hot stick and hot line clamp, or with a mechanical jumper. The line must be patrolled and within sight).

5.0 MAINTENANCE

- 5.1 Follow the manufacture's recommendations in 2.03 A&B.
- 5.2 A two year maintenance schedule is recommended for all 2nd generation models of the BREAK-SAFE® Load Break & Pick-up Tool. A shorter maintenance schedule is recommended for frequently used tools or tools operated at or near their maximum ratings. Maintenance should be performed by the factory or by trained and certified personnel. The maintenance decal is located near the product decal.

Operational Video: https://www.youtube.com/watch?v=KP9_iFeHKEo

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BREAK-SAFE® Load Break & Pick-up Tool



**USBS-15-1-PS
USBS-15-2-PS
USBS-27-1-PS
USBS-27-2-PS
USBS-38-1-PS
USBS-38-2-PS
USBS-46-1-PS
USBS-46-2-PS**

Available Options:

H - Hard Case S - Soft Case

Second Generation Models Only.
For tools manufactured after
April 2014 and including
the Yellow Safety Lock.

PATENT NO. 6,078,008 *Other Patents Pending*

Operation Manual

B-01031 USBS Manual (12-19-18)

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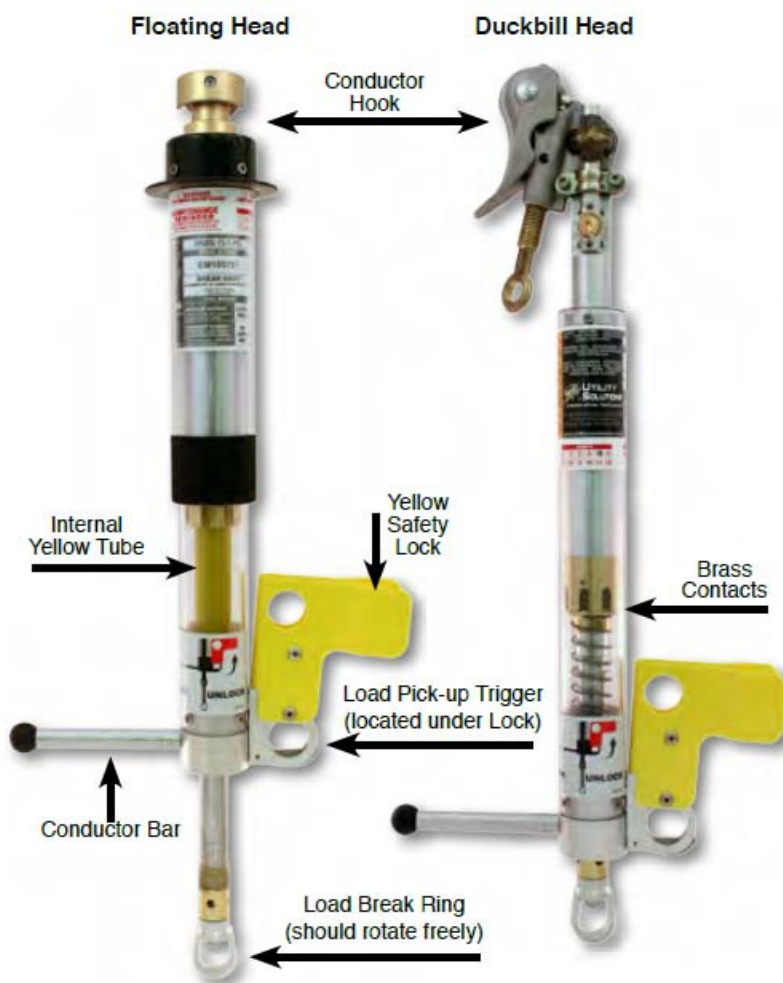
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Components



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Applications

The BREAK-SAFE® is a jumper clamp that functions like a portable switch. It is designed to operate on overhead distribution power lines in conjunction with an appropriately rated and approved jumper cable.

There are three operating functions: load break, load pick-up and continuous current duty. It is intended for temporary connections and should not be used in a permanent capacity.

Floating Head models (USBS-XX-1-PS) are designed to be installed and removed from overhead lines using appropriately rated and approved rubber gloves and personal protective equipment. Duckbill Head models (USBS-XX-2-PS) are designed to be installed and removed from overhead lines using an approved insulated hot stick.

All models require an approved insulated hot stick for the load break and load pick-up operations.

⚠ DANGER ⚠

Contact with high voltage will cause death or grievous personal injury to the operator. Only use this device in conjunction with safe operating practices around energized lines and equipment.

⚠ WARNING ⚠

Carefully read and fully understand this manual prior to operating, maintaining or testing this device. Improper operation, handling or maintenance of this device can result in death, grievous personal injury and or equipment damage.

⚠ WARNING ⚠

Always wear appropriately rated rubber gloves and personal protective gear when utilizing this product to prevent electrocution.

⚠ WARNING ⚠

Follow safe work procedures and practices when utilizing this device. Failure to use this device in a safe manner can result in death, grievous personal injury and or equipment damage.

⚠ WARNING ⚠

These instructions are not intended to replace or be a substitute for proper safety training procedures. Failure to select the proper tool in regards to minimum system requirements can result in death, grievous personal injury and or equipment damage.

Circuit Restrictions

The BREAK-SAFE® should not be used if the maximum voltage and/or amperage rating of the tool can be exceeded. The BREAK-SAFE® is rated by maximum amperage and voltage (kV). The table below details the specific ratings of the various BREAK-SAFE® models.

Model	Maximum System Voltage	Maximum Current Rating	Minimum Conductor Size	Maximum Conductor Size
USBS-15-1-PS	15 kV	300 A	#6 Copper	954 ACSR
USBS-15-2-PS				
USBS-27-1-PS	27 kV			
USBS-27-2-PS				
USBS-38-1-PS				
USBS-38-2-PS				
USBS-46-1-PS	46 kV	200 A		
USBS-46-2-PS				

Table 1

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The BREAK-SAFE® has been tested to the full voltage and amperage rating for nominal power factors of 70%-80% for both load break and load make applications. However, the tool is rated by system voltages. For example, a 15 kV tool on a 15 kV system will usually experience voltages of 15 kV / $\sqrt{3}$ or about 8.6 kV. It is at these actual ($\sqrt{3}$) system voltage levels that the tool is rated for line charging and cable charging applications. The BREAK-SAFE® USBS-15-1-PS and USBS-15-2-PS models have been tested at full 15 kV. This does not mean the tool is rated for phase to ground applications of a 27 kV system. Use a 15 kV BREAK-SAFE® for 15 kV system voltages and below. Use a 27 kV BREAK-SAFE® for 27 kV system voltages and below. Use a 38 kV BREAK-SAFE® for 38 kV system voltages and below. Use a 46 kV BREAK-SAFE® for 46 kV system voltages and below.

The tool is designed to be used on three phase systems, but only on a single phase at a time. Typical three phase applications require three separate tools.

Outlined below are some circuit restrictions known to exist:

- Do not utilize the BREAK-SAFE® tool in situations where ferroresonance can produce over-voltage situations. An example of this involves switching unloaded transformers that are delta-connected three phase and wye-connected three phase with primary neutral ungrounded.
- The tool should never be used in phase-to-phase applications.
- Do not utilize the BREAK-SAFE® to switch unloaded transformers.
- Do not utilize the BREAK-SAFE® to switch capacitor banks.

WARNING

Only trained and qualified personnel should operate, inspect and maintain this equipment.

WARNING

When working with the BREAK-SAFE® always assume the tool is energized at all times. Never consider the tool body as rated insulation.

WARNING

The BREAK-SAFE® is not waterproof. Do not use the BREAK-SAFE® in wet conditions. If inclement weather is expected after installation, cover tool with an approved insulating rubber blanket.

WARNING

The BREAK-SAFE® is NOT a fuse. It should be used in a temporary capacity only.

WARNING

Carefully inspect the tool prior to each use. Damaged components can result in personal injury and or equipment damage.

WARNING

Always remove the BREAK-SAFE® from the circuit, or remove the jumper attached to the conductor bar, after each load break operation. The BREAK-SAFE® is not rated insulation nor is it considered a "visible gap".

Line and Tool Preparation

1. Do not exceed the maximum voltage or amperage rating of the tool (TABLE 1).
2. Insulate the pole and conductor as required by the supervising utility safety practices.
3. Clean the conductor at each location where the BREAK-SAFE® and jumper cable will be attached. Clean and inspect the conductor bar before attaching a jumper cable.
4. If the BREAK-SAFE® is equipped with a duckbill head (USBS-XX-2-PS) ensure that all attachment fasteners are tight and secure.

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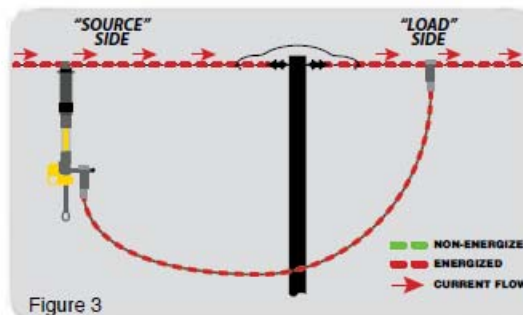
Operation

Prepare the Tool for use

1. Refer to the laminated **Field Inspection Procedure** card before each use.
2. Place the BREAK-SAFE® in the UNLOCK Position (FIGURE 1) by lifting the Yellow Safety Lock to gain access to the Load Break Ring.
3. Pull the Load Break Ring until the tool locks in the open tool position (the internal yellow tube is visible).
4. Lower the Yellow Safety Lock into the LOCK OPEN position (FIGURE 2) to prevent an accidental load pick-up operation.

Install the Tool and Jumper Cable

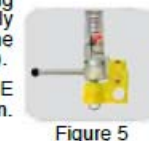
5. Securely attach the BREAK-SAFE® in the LOCK OPEN position to the "SOURCE SIDE" (FIGURE 3) of the circuit using standard utility safety practices and procedures.
6. Securely attach one end of an appropriately rated and approved jumper cable to the "LOAD SIDE" of the circuit (FIGURE 3) using standard utility safety practices and procedures.



7. Securely attach the opposite end of an appropriately rated and approved jumper cable to the Conductor Bar of the BREAK-SAFE® (FIGURE 3).

Perform Load Pick-up Operation

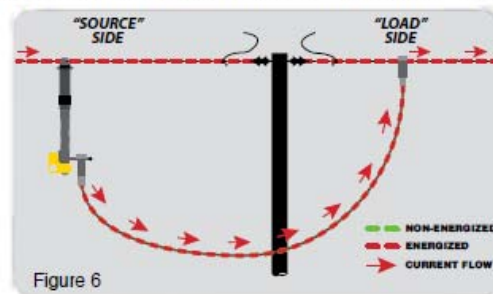
8. Visually check connections and confirm placement of the tool and jumper cable on the circuit before performing the Load Pick-up operation (FIGURE 3).
9. The Load Pick-up operation must be done using an approved insulated hot stick and NEVER by hand.
10. Using an approved insulated hot stick, lift the Yellow Safety Lock into the UNLOCK position (FIGURE 1) to gain access to the Load Pick-up Trigger.
11. Using an approved insulated hot stick, exert a steady downward movement on the Load Pick-up Trigger. The Load Break Ring Assembly will retract forcefully into the Clear Tube Assembly energizing the circuit. Push up on the Load Break Ring with the hot stick to verify the brass contacts are fully seated (FIGURE 4).
12. Immediately lower the Yellow Safety Lock into the LOCK CLOSE position (FIGURE 5) to prevent an accidental load break operation.



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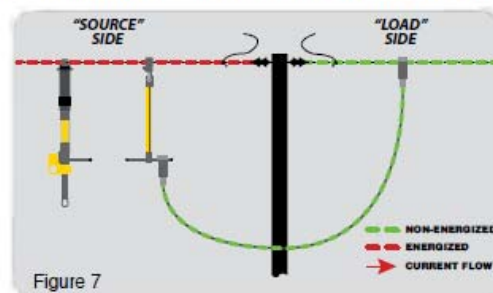
Temporary Circuit Established

A temporary or parallel circuit has now been established. The permanent circuit can be disconnected or cut following standard safety practices and procedures while maintenance or other activities are performed (FIGURE 6). *Note: The BREAK-SAFE® is a temporary device and is not meant for long term use. The BREAK-SAFE® is NOT a fuse.*



Perform Load Break Operation

13. Using an approved insulated hot stick, lift the Yellow Safety Lock into the UNLOCK position (FIGURE 1) to gain access to the Load Break Ring.
14. Using an approved insulated hot stick, push up on the Load Break Ring to verify the tool has been properly reset (FIGURE 4).
15. With one steady motion, pull down firmly on the Load Break Ring using an approved insulated hot stick until the tool locks in the open position. Do not stop or hesitate while pulling.
16. Immediately lower the Yellow Safety Lock into the LOCK OPEN position (FIGURE 2) to prevent an accidental Load Pick-up operation.
17. Verify there is NO VOLTAGE and/or NO AMPERAGE present on the BREAK-SAFE® and the jumper cable.
18. If the SOURCE SIDE circuit is to remain energized while work is done, move the jumper cable to the conductor bar of a Utility Solutions *Jumper-T* (USJT-001/2) or equivalent device (FIGURE 7). This will create a visible gap using rated insulation.



19. To re-energize the temporary circuit, repeat the procedure beginning at step #7.
20. If the temporary circuit will not be re-energized, the BREAK-SAFE® and the jumper cable may be safely removed from the permanent circuit.
21. The BREAK-SAFE® should be stored in the LOCK CLOSE position (FIGURE 5).

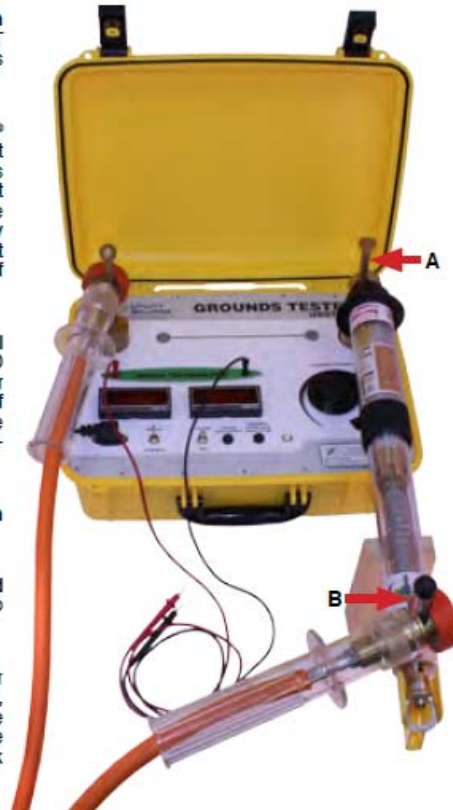
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Resistance Test

An optional Resistance Test may be performed in between scheduled maintenance. This test DOES NOT replace scheduled maintenance or extend the time between scheduled maintenance.

This test is performed using the Utility Solutions USGT-600 Grounds Tester w/ REACH Technology or equivalent device. Refer to the testers' instruction manual for proper set-up procedures.

1. The BREAK-SAFE® should be in the closed position and RESET with the external brass contacts fully seated.
2. Connect the BREAK-SAFE® Conductor Hook to a Current Output Post on the Grounds Tester (A). Position and support the BREAK-SAFE® so the weight of the tool does not apply sideways force on the Current Output post (a small block of wood should suffice).
3. Connect a standard Mechanical Jumper (minimum 6 feet, 1/0 AWG, 300 AMP) to the other Current Output Posts of the Grounds Tester and the conductor bar of the BREAK-SAFE® (B).
4. Put the Grounds Tester in REACH mode.
5. Turn on the Grounds Tester and adjust the Current Control Knob to energize to 300 AMPS.
6. Using the red and black Jumper Leads on the Grounds Tester, measure the voltage on the BREAK-SAFE® between the lower jaw of the Conductor Hook (A) and the Parking Stand (B).
7. Voltage drop should not exceed 0.220 volts. If the voltage displayed exceeds 0.220 volts the tool should be removed from service. Maintenance should be performed by the factory or by trained and certified personnel.



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Periodic Maintenance

A two year maintenance schedule is recommended for all 2nd generation models of the BREAK-SAFE® Load Break & Pick-up Tool. A shorter maintenance schedule is recommended for frequently used tools or tools operated at or near their maximum ratings. Maintenance should be performed by the factory or by trained and certified personnel. The maintenance decal is located near the product decal.

MAINTENANCE REMINDER style decals indicate the date of manufacture or date of last service. Service is recommended 2 years after the date shown.



MAINTENANCE DUE style decals indicate the date of next service. Service is recommended on or before the date shown.



Storage

The BREAK-SAFE® should be stored in a clean, dry place. Damp and/or high humidity environments should be avoided.

The BREAK-SAFE® should be stored in the LOCK CLOSE position (internal yellow tube will not be visible). Utility Solutions recommends storing the BREAK-SAFE® in a soft case (USBS-XX-SOFTCASE) or hard case (USBS-XX-HARDCASE).



Warranty

Utility Solutions warrants the BREAK-SAFE® Load Break & Pick-up Tool for any defects in manufacturing for the period of one year. If the tool is returned within that time period, Utility Solutions will repair or replace the tool free of charge.

<p>Title:</p> <h2 style="margin: 0;">BREAK-SAFE® Tool</h2> <h3 style="margin: 0;">Field Inspection</h3>	Reference:	Revision:
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FIELD INSPECTION PROCEDURE

BREAK-SAFE® Load Break & Pick-up Tool

Follow the steps below before EACH use of the BREAK-SAFE®. This procedure does NOT replace or eliminate the periodic maintenance that is recommended every 2 years.

PATENT NO. 6,078,006 Other Patents Pending

1. VISUAL INSPECTION

Visually inspect the tool. If any of the following are found, remove the tool from the field and perform service:

- Soot or Dirt buildup on components
- Damage to contacts
- Cracks of 1/4" or more on outer tube
- Damaged Load Break Ring. Ring should rotate freely (shaft should NOT rotate)
- Damaged or discolored Yellow Tube
- Damaged Conductor Hook or Duckbill
- Loose Conductor Bar
- Damaged Safety Lock
- Out of Date Maintenance Decal (maintenance recommended every 2 years)

2. CONTINUITY

The Brass Contacts do not carry the load during Load Break operation. The current path will exist inside the tool until the load break mechanism is triggered.

A) With the tool in the CLOSED position, use a voltmeter, confirm continuity exists between the Conductor Bar and the Conductor Hook.

B) Confirm continuity exists while pulling the Load Break Ring toward the open position. Continuity should exist until the load break mechanism is engaged and the tool locks in the open position.

C) Confirm NO continuity exists between the Conductor Bar and the Conductor Hook when the tool is in the fully opened positioned.

3. RESET TOOL

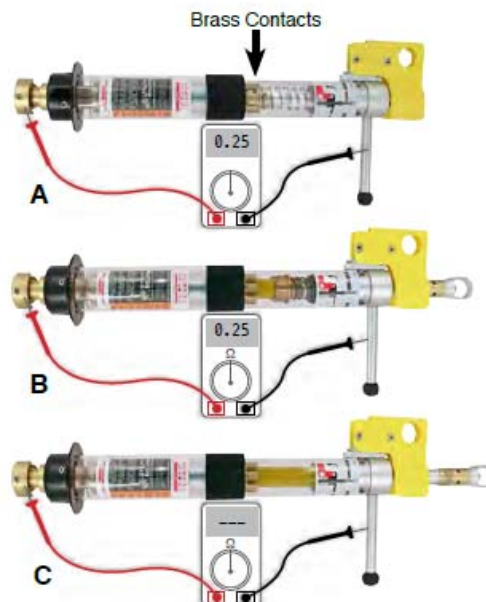
The BREAK-SAFE® will only reset when the Brass Contacts are fully seated.



Exert a steady downward movement on the Load Pick-up Trigger (D). The Load Break Ring Assembly should retract forcefully into the Clear Tube Assembly. The tool should operate firmly and smoothly.

With the tool in the Lock Close position, confirm the Brass Contacts are fully seated (E). The Brass Contacts will fit inside one another so the fingers of the top Brass Contact are touching the lip of the lower Brass Contact.

The Brass Contacts should remain seated with the tool in the CLOSED position (F). Push the Load Break Ring up and into the tool to ensure the Brass Contacts are fully seated. The tool will require service and should NOT be used if the Brass Contacts cannot be fully seated.



E Fully Seated



F

⚠ WARNING ⚠

Carefully read and fully understand the manual prior to operating, maintaining or testing this device. Improper operation, handling or maintenance of this device can result in death, grievous personal injury and or equipment damage.

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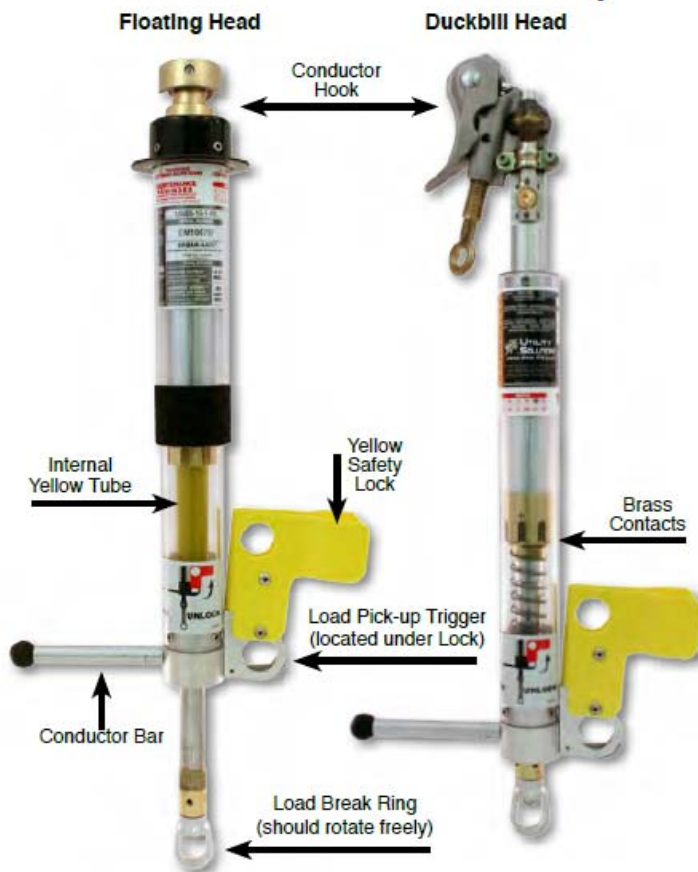
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FIELD INSPECTION PROCEDURE BREAK-SAFE® Load Break & Pick-up Tool



⚠ WARNING ⚠

Always remove the BREAK-SAFE® from the circuit, or remove the jumper attached to the conductor bar, after each load break operation.
The BREAK-SAFE® is not rated insulation nor is it considered a "visible gap".

⚠ DANGER ⚠

The Safety Lock does not RESET the tool. Refer to Inspection Procedure on reverse side and the Operation Manual for complete instructions on properly resetting the BREAK-SAFE®.

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