Inspection of Aerial Facilities

Inspecting Poles

Purpose: Inspect poles and determine their capacity to support loads that will be imposed

Note: Pole inspections shall include adjacent poles

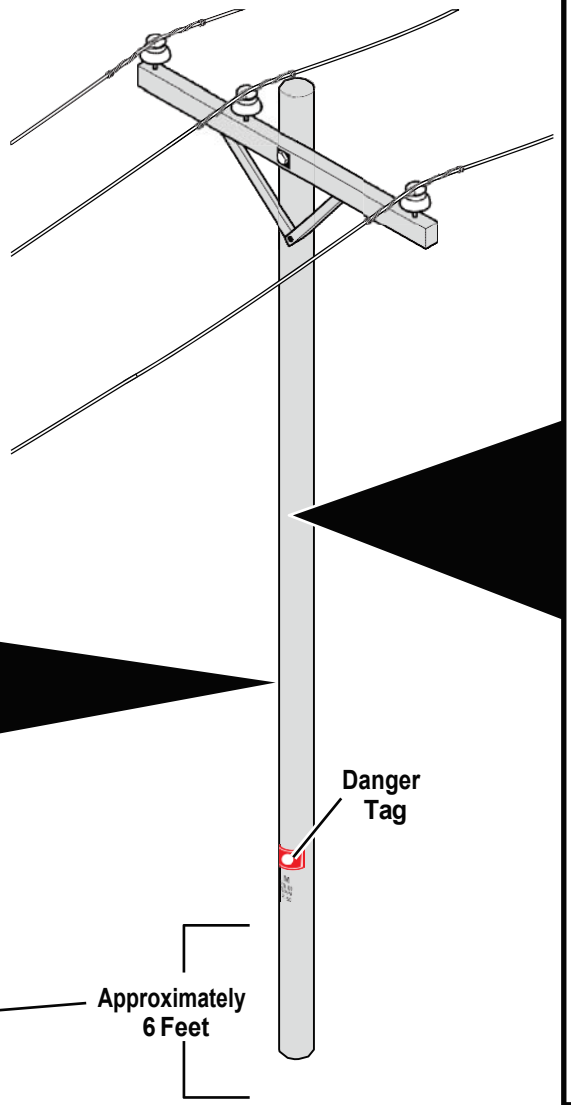
X Danger or Rejection Tags

Reinforceable Reject Poles are marked with a two-inch square plain yellow tag and may be reinforced using the C-TRUSS method

Reject Poles are marked with a two-inch square red tag with a silver arrow

Priority Reject Poles, or "danger" poles, are marked with a two-inch square red tag with a crossed silver circle over a silver arrow

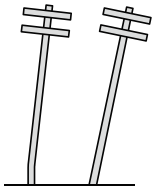
Do not climb a tagged "danger" pole unless using additional support (i.e. pikes, guys, truck's boom etc.)



X General Condition

May indicate rotten or broken pole:

- Buckling
- Odd angles

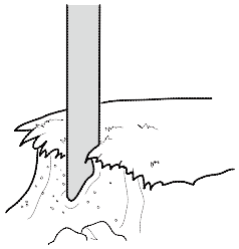


X Soil Conditions

May not support pole:

- Soft
- Wet
- Loose

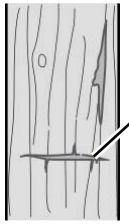
Look for erosion, especially near waterways



X Depth of Setting

Check for sufficient burial:

- Former ground line on pole
- Height of branding

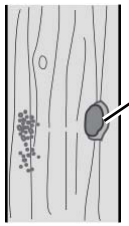


X Cracks

Pole weakening cracks:

- Horizontal
- Perpendicular to wood grain

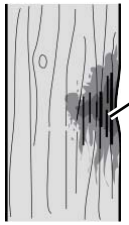
Vertical cracks pose hazard to climber so keep gaffs away



X Holes

Pole weakening holes:

- Hollow spots
- Woodpecker holes
- Infestation of carpenter bees

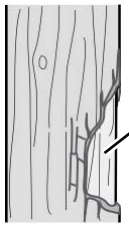


X Burn Marks

Deep burn spots from:

- Transformer failures
- Conductor faults

Pole may not support mechanical stress changes



X Shell Rot and Decay

- Cutout hazard
- Possible indication of:
  - Pole age
  - Internal condition

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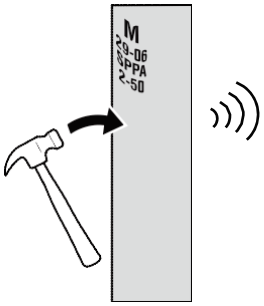
Testing Wood Poles

Purpose: Test poles and determine their capacity to support loads that will be imposed

Note: The following tests taken from *29 CFR 1910.269 (Appendix F)* are recognized as acceptable methods of testing wood poles

1 Hammer Test

Starting near the ground line, rap pole with 3-lb. hammer and repeat rapping around and up pole until height of 6'



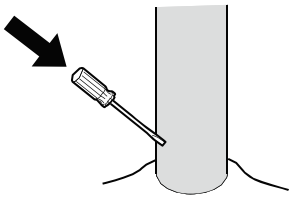
Normal Condition:
- Clear sound
- Hammer rebounds quickly

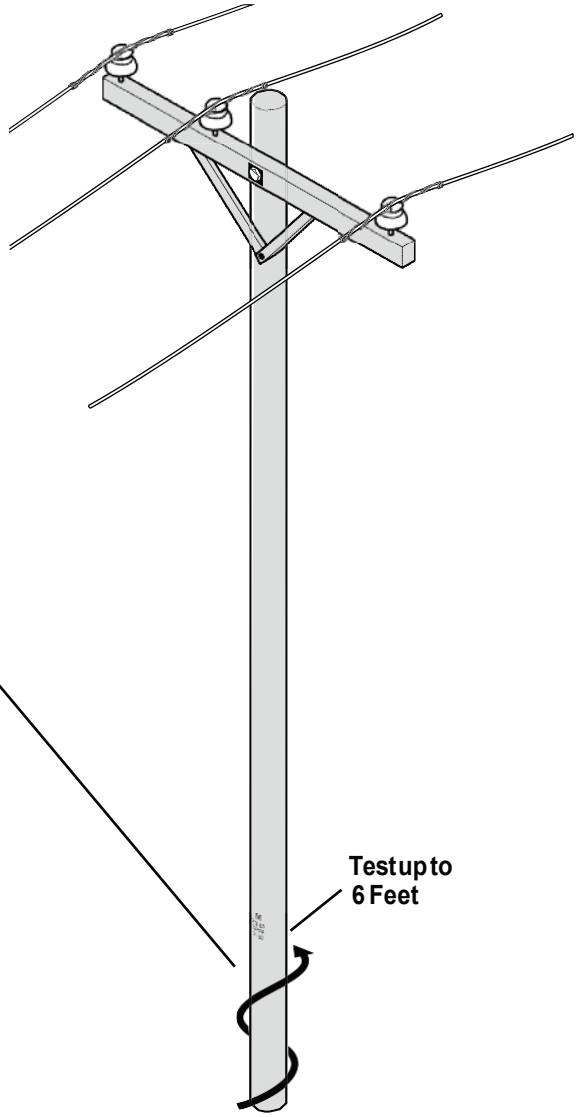
Decay:
- Dull sound
- Hammer rebounds less

2 Probing

Using screwdriver with at least 5" blade, prod pole as close to ground line as possible

Note:
- If substantial decay is found, pole is unsafe





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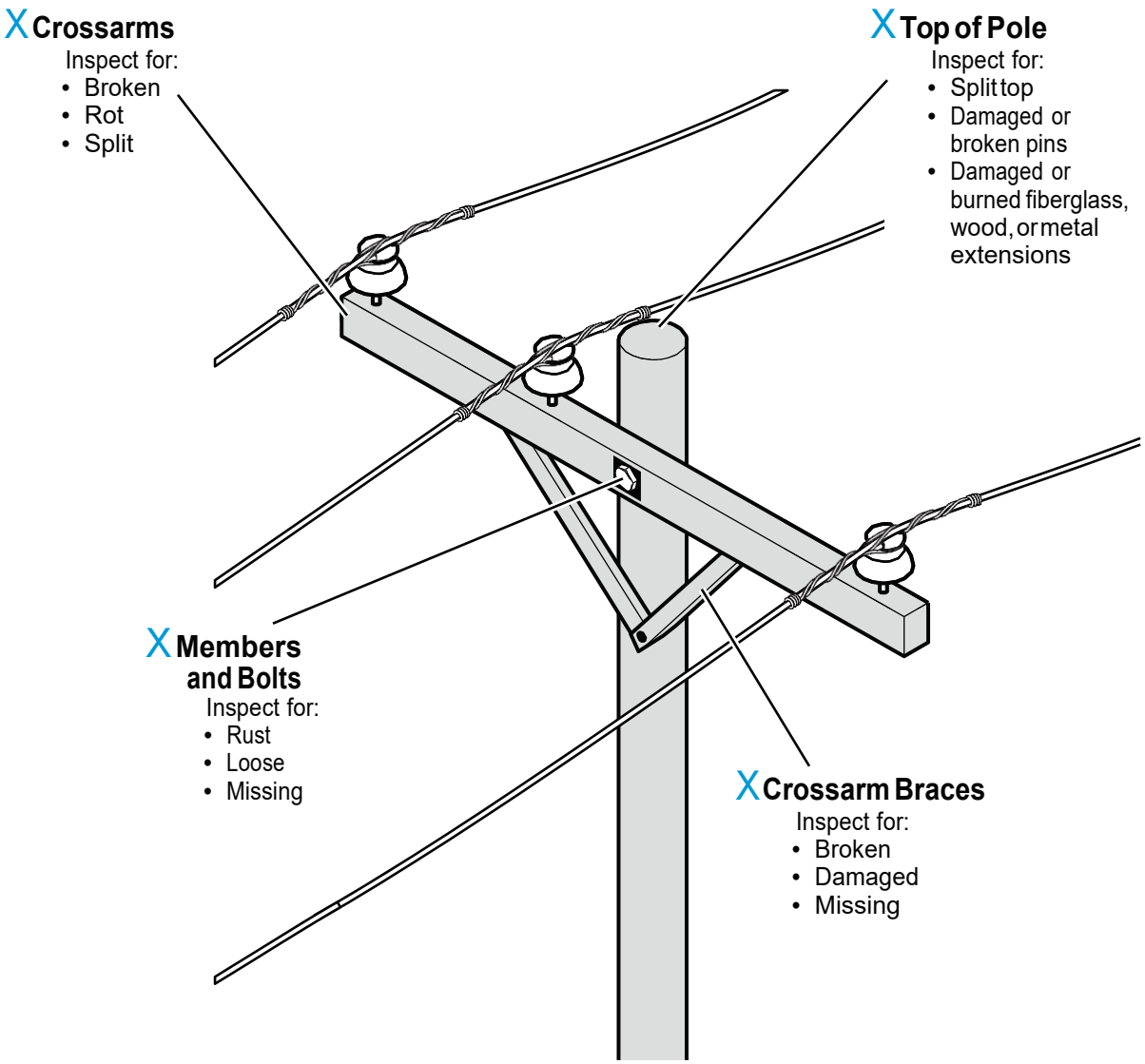
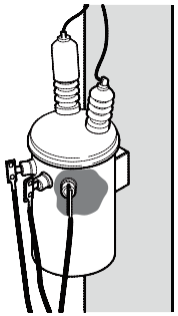
Inspecting Pole Top Assemblies—Transformers, Crossarms and Members

Purpose: Inspect pole top assemblies for damage that would affect job to be done

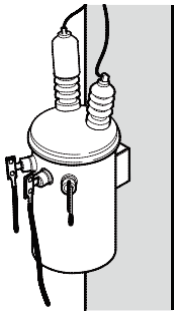
Note: Pole inspections shall include adjacent poles



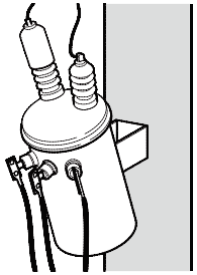
X Transformers



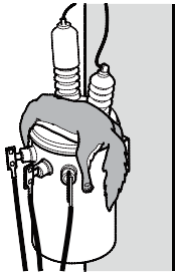
Oil Leaks



Broken Ground Connections



Excessive Leaning



Animal Contact

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Inspecting Pole Top Assemblies—Insulators and Tie Wires

Purpose: Inspect pole top assemblies for damage that would impact job to be done

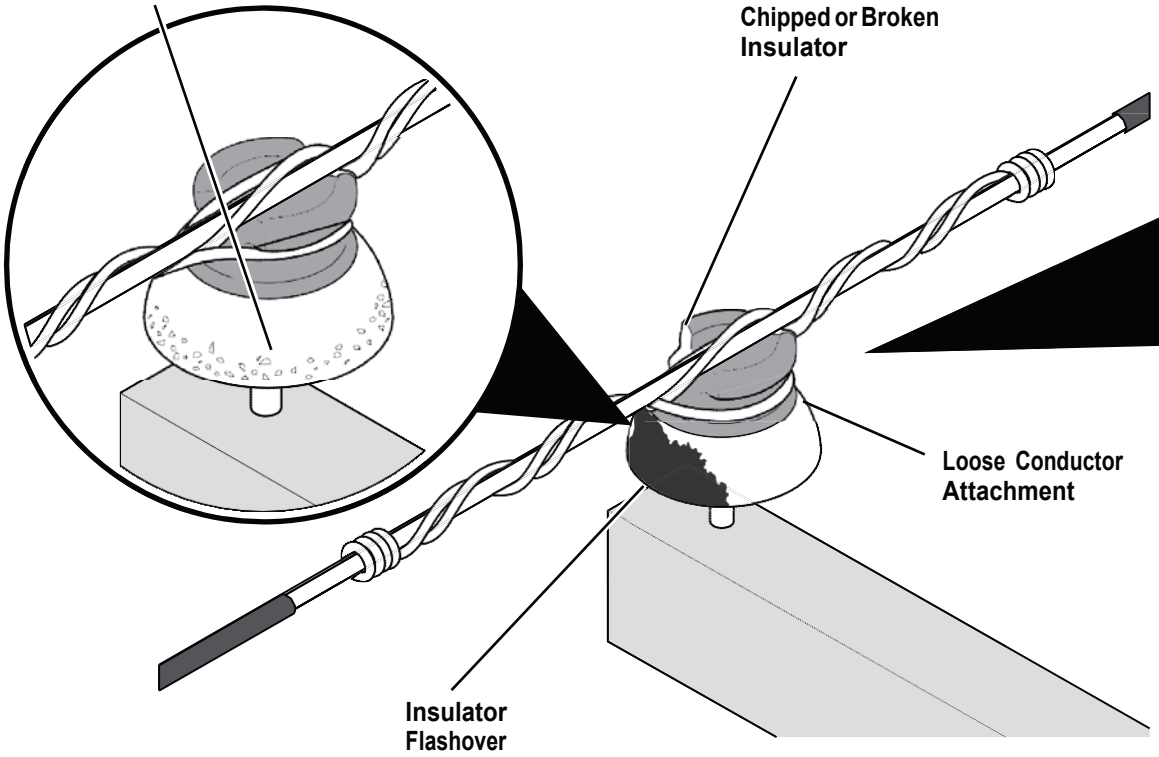
Note: Pole inspections shall include adjacent poles

X Insulators

Contaminated

High contamination locations include:

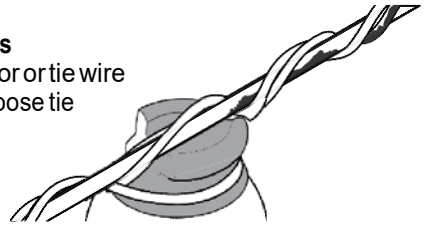
- Quarries
- Industrial areas
- Locations adjacent to:
  - Overpasses
  - Major road intersections



X Tie Wires

Black Deposits

- On conductor or tie wire
- Caused by loose tie



Covered Conductor Tied-in with Bare Tie Wire

Inspect for deterioration in area where the ends of the wire meet conductor

Radio Free Glaze

Caution: Covered conductors shall not be installed on radio free glaze insulators with either a covered or bare tie wire

If covered wire is installed on a radio free glaze insulator, inspect very closely for erosion of the covering

If conductor damage is identified:

- De-energize
- Rebuild to current construction standard

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Inspecting Conductors

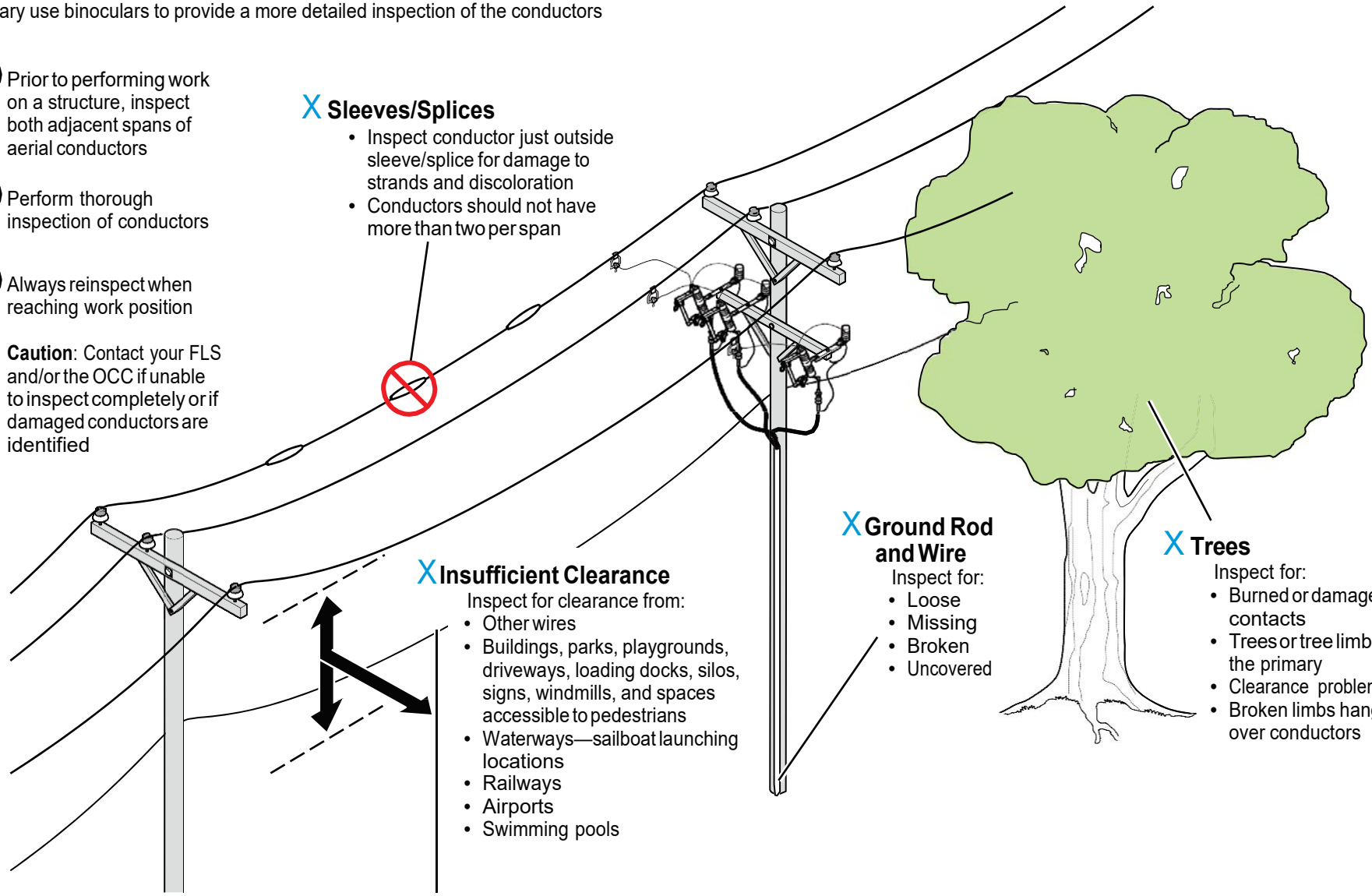
Purpose: Inspect conductors for damage that would affect their integrity

Note: Inspection of conductors may include an evaluation from the ground, aloft from a pole site and along the entire span

If necessary use binoculars to provide a more detailed inspection of the conductors

1. Prior to performing work on a structure, inspect both adjacent spans of aerial conductors
2. Perform thorough inspection of conductors
3. Always reinspect when reaching work position

Caution: Contact your FLS and/or the OCC if unable to inspect completely or if damaged conductors are identified



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Inspecting Conductors, Continued

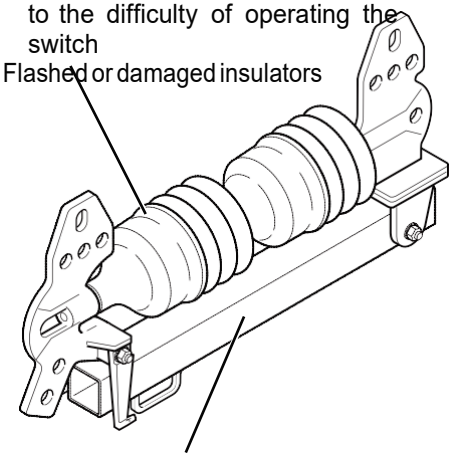
Note: Inspection of conductors may include an evaluation from the ground, aloft from a pole site and along the entire span

If necessary use binoculars to provide a more detailed inspection of the conductors

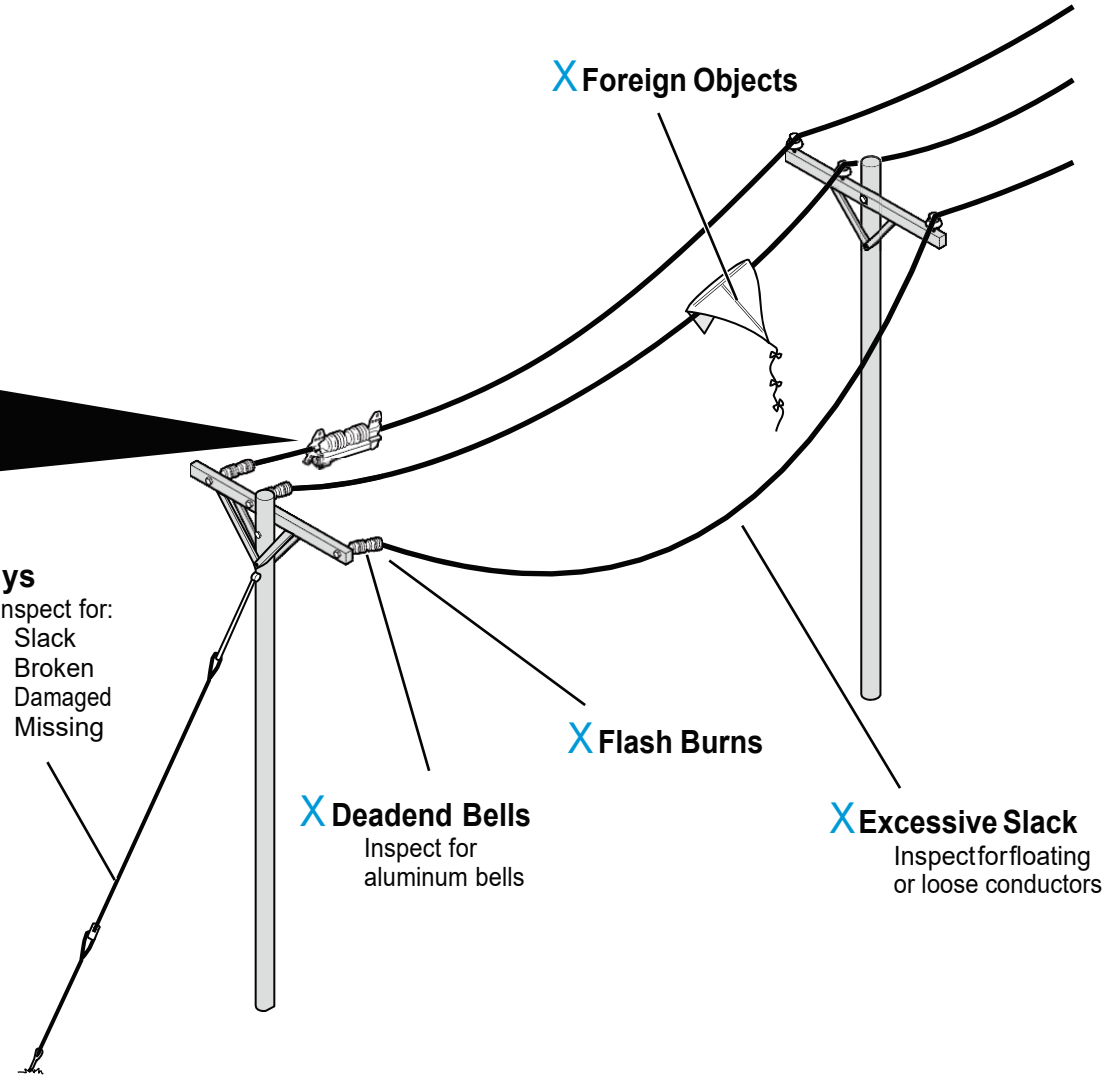
X Pole Mounted LTDs and Hookstick Switches

Inspect for:

- Burned or damaged contacts
- Damaged interrupters or arcing horns
- Worn parts or any evidence of overheating
- Lightening arresters installed and operational where applicable
- Proper ground connections
- Loose hardware
- Insulating section in operating rod of group-operated switches
- Both switch ends are installed on the wire, "free floating," rather than anchored to an insulator at the pole
  - the greater the distance from a pole a switch is installed the more likely conductor roll will contribute to the difficulty of operating the switch
- Flashed or damaged insulators



- Proper blade alignment



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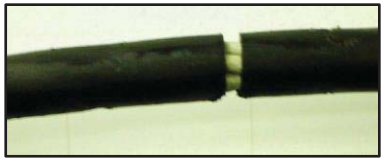
Inspecting Conductors, Continued

Note: Refer to *Standard C7752* and *C7753* for conductor repairs of 34.5kV and less

1 Identify type of damage

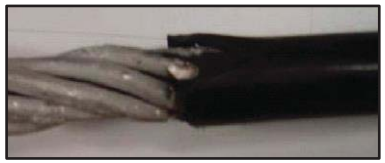
Tracking on Cover
May be indication of damage



Circular Cracks, Missing or Damaged Cover

Broken or Loose Strands

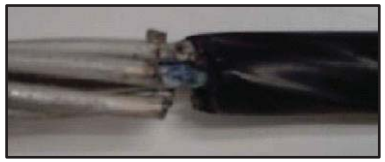
Pitted or Splattered Conductor



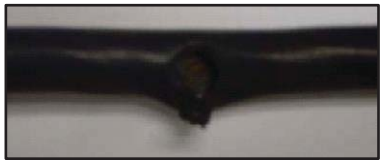
Arcing Damage

Contact Damage

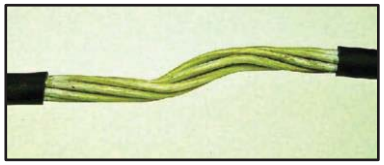
Birdcage with Broken Strands



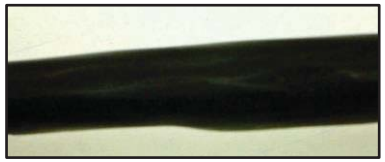
Arcing Damage



Bullet Damage



Severe Bending



Bulges

2 Take appropriate action

May Indicate Damaged Conductors

- Inspect damaged conductors further
- De-energize before repair if more than ½ of strands are damaged

Can Be Repaired in Service

- Inspect damaged conductors further
- De-energize before repair if more than ½ of strands are damaged

Note: Often these types of damages can be repaired in service, unless more than ½ of strands are damaged

Unable to Inspect Conductor Damage

- De-energize before repair

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Inspecting Cutouts

Purpose: Inspect cutouts

Note: Inspection of cutout(s) shall include an inspection from the ground or aloft

If necessary use binoculars to provide a more detailed inspection of the cutout(s)

It is not possible to list all the conditions that may be encountered in field situations. Examine the work, identify the risks, and develop a work plan to mitigate the risks. Utilize your skills, protective devices, rubber goods, jumpers, and equipment to develop a safe plan of execution.

STOP—Focus on all the potential hazards of the site and the task to be performed

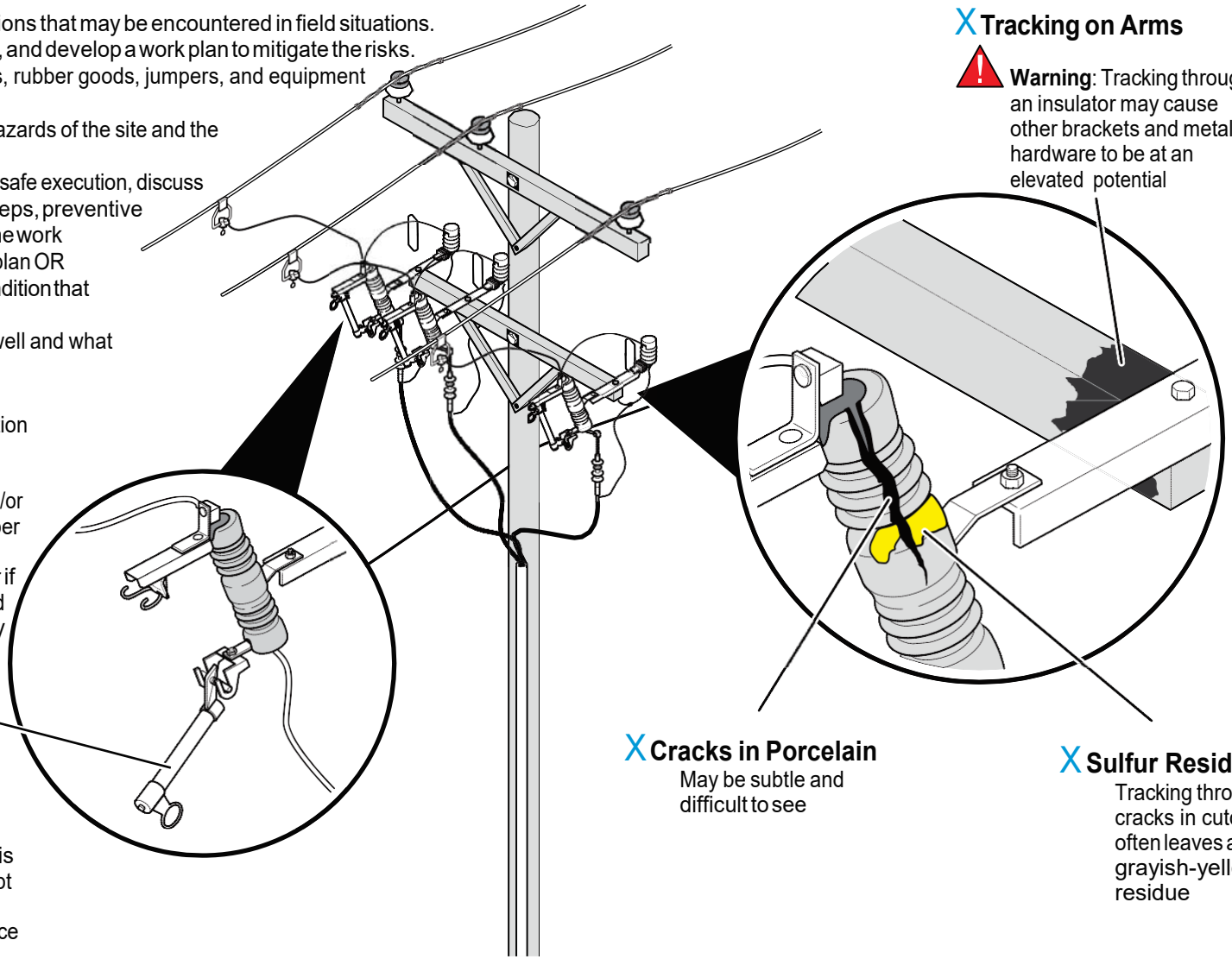
THINK—Consider options to ensure safe execution, discuss how the work will progress, all the steps, preventive measures, and any Hold Points in the work

ACT—Execute the discussed work plan OR notify your FLS of the hazardous condition that cannot be mitigated

REVIEW—Talk through what went well and what could improve

1 Perform thorough inspection of cutouts

Caution: Contact FLS and/or OCC to determine the proper course of action if unable to inspect completely, or if cutouts are damaged, and in an unsafe or potentially unsafe condition



X **Blown Fuse**

X **Burning Cutout**

Warning: If the cutout is burning do NOT attempt to operate and isolate from an upstream device

X **Tracking on Arms**

Warning: Tracking through an insulator may cause other brackets and metal hardware to be at an elevated potential

X **Cracks in Porcelain**

May be subtle and difficult to see

X **Sulfur Residue**

Tracking through cracks in cutout often leaves a grayish-yellow residue

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Replacing Damaged or Defective Cutout

Purpose: Replace cutout

Caution: Do not operate a damaged or defective cutout

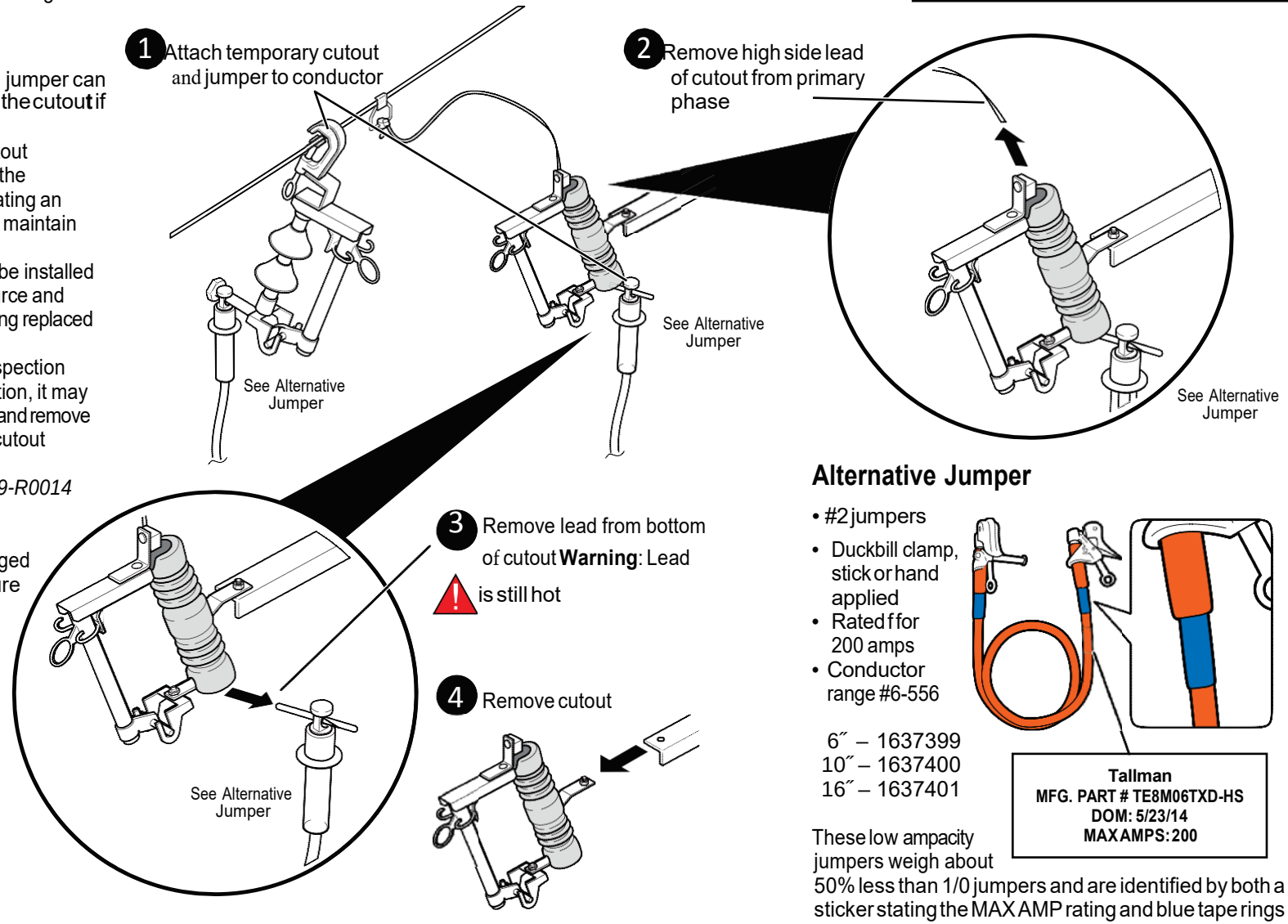
Note: The cutout may be replaced energized if:

- A temporary cutout and jumper can be installed in parallel to the cutout if field conditions permit
- The temporary fused cutout (Cat Id#0001114314) is the approved method of creating an electrical parallel path to maintain fuse protection
- Temporary cutouts must be installed between the primary source and load side of the cutout being replaced

Note: When a thorough inspection reveals a hazardous condition, it may be necessary to de-energize and remove the damaged or defective cutout

Note: Refer to *CM-CE-P059-R0014 Handling Broken Cutouts*

Note: Tag and return damaged or defective cutout for failure analysis



Alternative Jumper

- #2 jumpers
- Duckbill clamp, stick or hand applied
- Rated f for 200 amps
- Conductor range #6-556

6″ – 1637399
10″ – 1637400
16″ – 1637401

Tallman
MFG. PART # TE8M06TXD-HS
DOM: 5/23/14
MAX AMPS: 200

These low ampacity jumpers weigh about 50% less than 1/0 jumpers and are identified by both a sticker stating the MAX AMP rating and blue tape rings on the jumper cable

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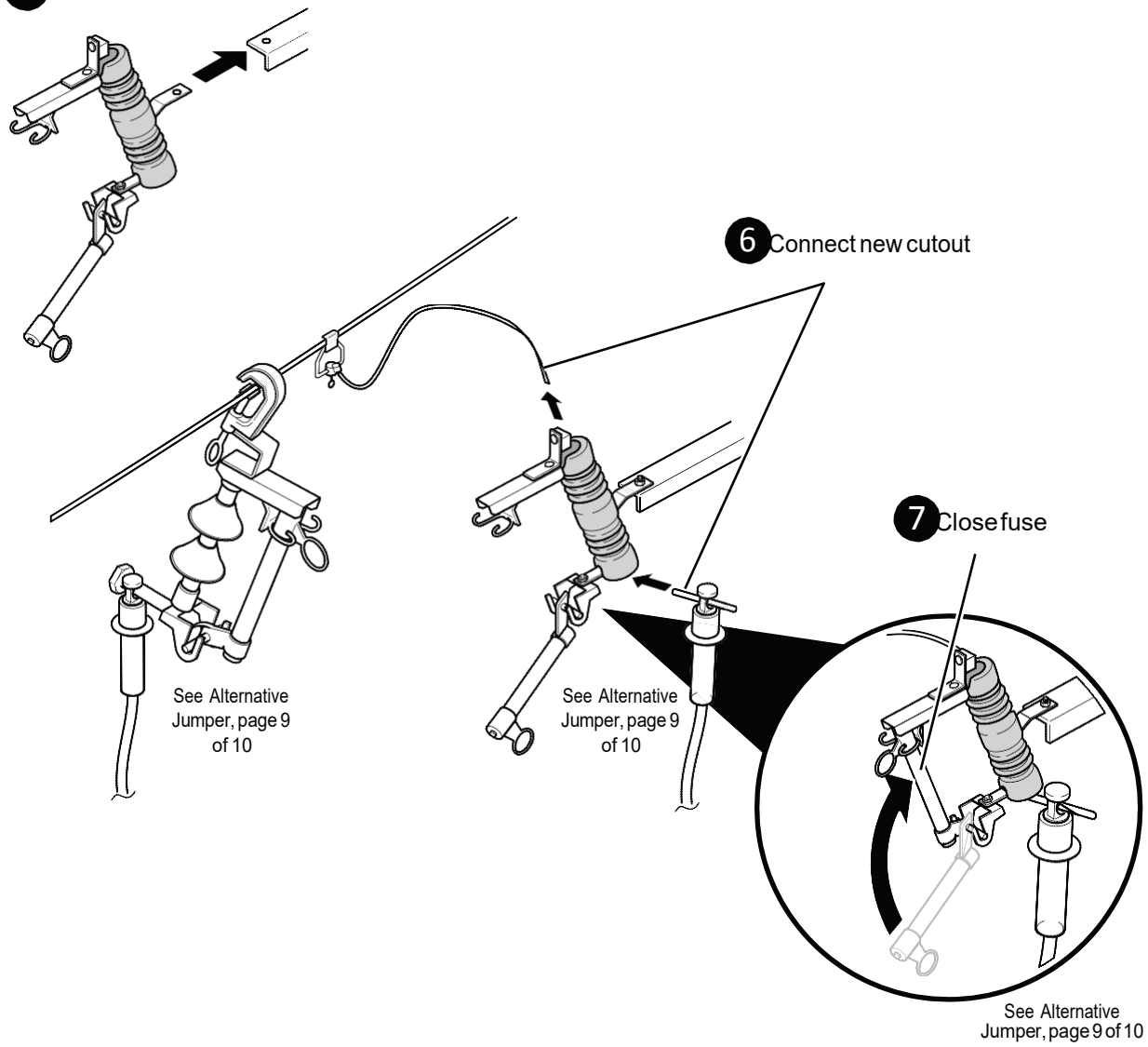
Replacing Damaged or Defective Cutout, Continued

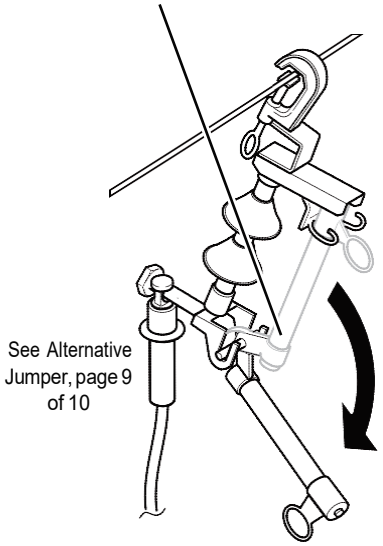
5 Attach new cutout

6 Connect new cutout

7 Close fuse



8 Open temporary cutout



9 Remove jumper

10 Remove temporary cutout

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