

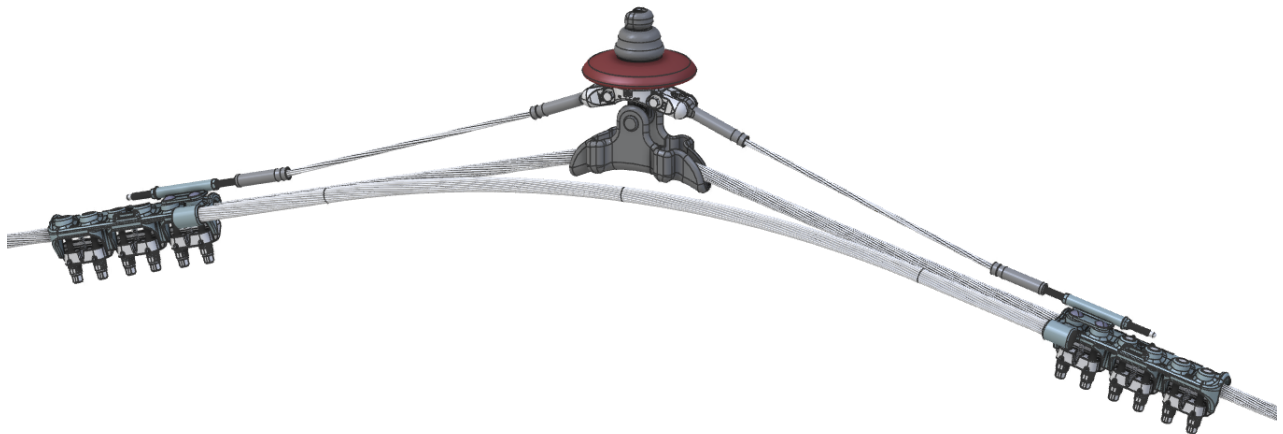
## CSS Suspension Clamp Installation Instruction

### ClampStar® CSS-0883-XXX-BCT

#### Installation of Tangent Suspension Shunt with Mechanical Safety Tether

ClampStar® Ball-Cap Tether units are designed to be installed without the need for hoisting apparatus, come-alongs or other lifting equipment. Their purpose is to restore full mechanical and electrical integrity to suspension systems found with broken strands, conductor abrasion or fretting wear. Suspension systems having line guards or no form of additional conductor protection will utilize shorter ClampStar units without the need for the auxiliary suspension clamp. The illustration below is a typical installation of a CSS-0883-BCT ClampStar® unit.

The ClampStar® Engineered Mechanical Shunt system serves to uprate the current capacity to a level of 250°C continuous conductor operation. The “Ball Cap” serves to provide a mechanical attachment point for the tether cables, which serve to maintain the mechanical integrity of the system should additional degradation of the original conductor occur within the suspension clamp.



ClampStar® BCT units are designed with the intent that they may be installed by two linemen from a single aerial platform. This instruction is written with that in mind.

If this device is unfamiliar to the linemen performing the installation, it is important to learn the nomenclature associated with the various components of the installation. This will assist, not only when reading these instructions, but also for communication during installation.

The following tools are required for the installation:



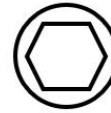
**Tape Measure**



**Impact Driver**

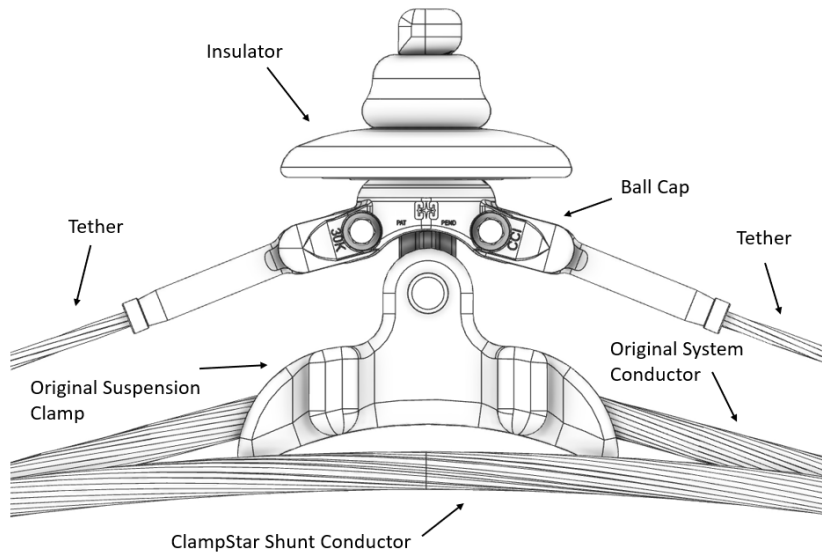


**Wire Brush  
Conductor Preparation**

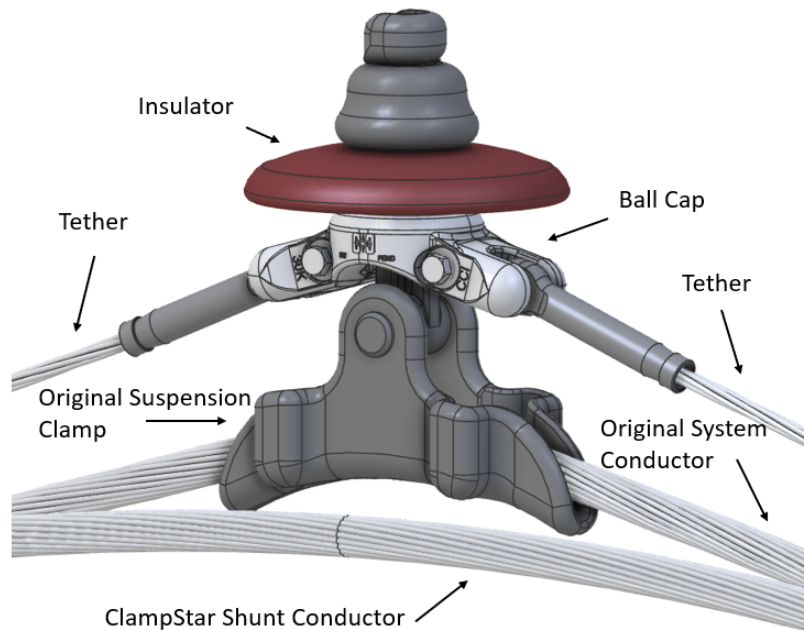


**3/4" Socket  
and Wrench**

The principal components and their arranged positions are identified in the following illustration:



The pictorial illustration below may also be helpful in understanding the intent of the components:



ClampStar® assemblies come individually packaged in sealed plastic bags with their cable grooves factory-loaded with proprietary inhibitor compound. The assembly shall be kept in the sealed container prior to installation to prevent dust/dirt contamination. Additional inhibitor is not required and alternate inhibitor compounds shall not be used.

ClampStar® assemblies are shipped with the keepers open to allow the assembly to be installed without further adjustment. Each keeper is equipped with torque limiting shear nuts. When the small head shears, during installation, further adjustment of the fastener shall not be made.

While these installation instructions for this device apply for both de-energized or energized conductors, it is highly recommended that FIRST, the procedure be practiced in a de-energized environment to ensure understanding and effective implementation of the process to avoid a compromised circumstance that could result in serious injury or loss of life.

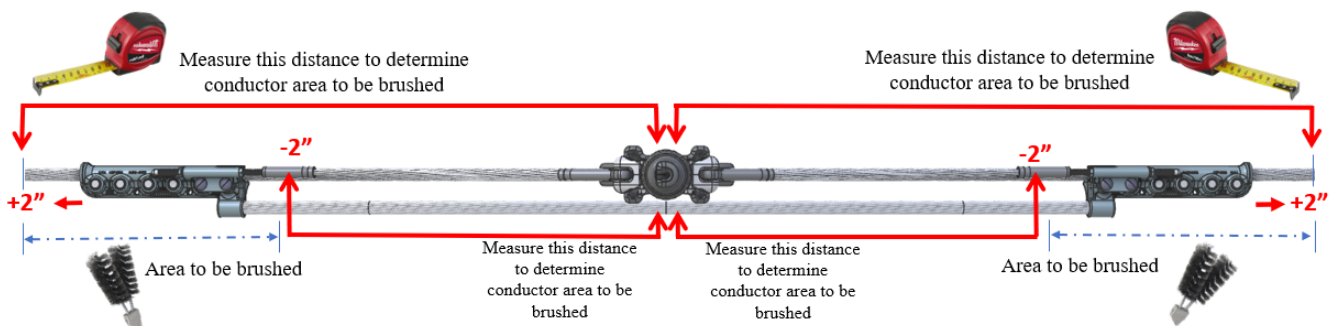
### Preparation

It may be advantageous to separate the ball cap halves and tape them to the ClampStar shunt conductor portion of the unit which connects the two attachment heads.

To preserve the integrity of the inhibitor, to prevent contamination of dirt and dust, the plastic wrap covering the corona heads, and connector bodies, should not be removed until the unit is suspended and the conductor cleaned/brushed.

#### *How to Properly Identify Conductor Area to Be Brushed*

Prior to attaching the ClampStar® unit to the conductor, preferably while on the ground, measure the distance from the bracket end of the tether to 2 inches (51mm) beyond the end of one ClampStar® Body and then measure the distance from the bracket end of the tether to the closest end of the same ClampStar® Body and subtract 2". The measurements will be the same on the other body. Note these measurements and mark the conductor accordingly. Then, using a clean, stainless steel wire brush, brush between the marked locations to prepare for installation.



Dry brushing is all that is necessary, alternative inhibitors shall not be used.

### Landing the ClampStar

The unit may now be lifted into place with one lineman at each end. Simply lift the unit, with the bolts oriented toward the ground, and place each head on the conductor. Snug up one nut – no more than finger tight, as its position will be adjusted later. The purpose is to prevent the head from coming off the conductor. Position the unit adjacent the original suspension clamp, and attach the ball cap using the bolts provided. The unit is now suspended and cannot fall.

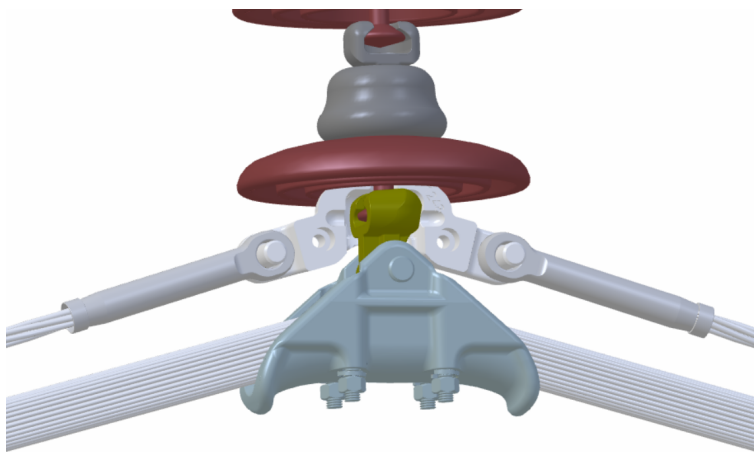
## Installing the Ball Cap Tether Bracket

The “Ball Cap” is designed to encapsulate the Ball/Socket fitting under the insulator. Separate the 2 halves of the Ball Cap tether bracket. Identify the half that contains the 2 pins and install that half first by aligning it on the ball socket with the pins facing the installer. Attach each Safe-T-Link Tether eye to the appropriate pin. Then place the other half of the Ball Cap tether anchor bracket on the ball socket and tighten the 2 bolts to 40-60 lbf/ft



**Ball Cap Tether Anchor Bracket**

An additional picture of the Ball Cap assembly procedure for reference is shown below:



## Final Position

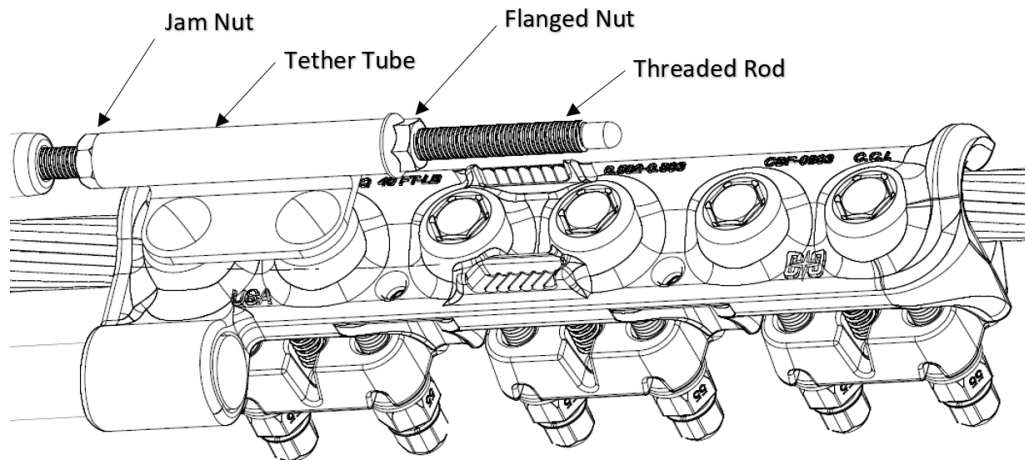
The heads are to be moved outward as far as possible, and centered.

- NOTE: The Tether Adjustment nuts are at each end of the tether tube. It is necessary to assure they are backed off properly. They should have approximately 1” (25mm) of thread engagement. This allows them to accept the threaded rod during the process of tightening the tether, which occurs after tightening the shear nuts on the heads.

Once satisfied with the position, tighten the torque limiting shear nuts on each end. This should be done in a linear fashion, beginning with the inner most nut and continuing toward the span. The nuts should be tightened a number of successions equal to the number of aluminum strands over the steel core of an ACSR conductor. For instance, Hen is a 30/7 conductor, having two layers of aluminum strands. Snug all the nuts up, then go over them again, adding additional torque, and then a second pass, snapping the torque limiting heads off as you progress.

## Tether Adjustment

The Tether Nuts can be tightened with a 3/4" (19mm) wrench, or socket using a power driver – HOWEVER...



**DO NOT OVERTIGHTEN!** It only takes about 15 lbf/ft of torque to put 2000 lbs of tension on the Tether. 1000 to 1500 lbs tension is sufficient for the Tether.

Adjust the tether cables evenly to ensure the ball cap is level, having roughly even tension on each side.

For systems in excess of 138kV system voltage, corona shields are to be installed over the threaded fasteners using the nuts provided.

The finished installation should resemble the illustration on the first page! An additional photo below shows a ClampStar® installed properly.



*The photos above are a CSS-0883-BCT*