Trouble Shooting Guide for problems with drive cables

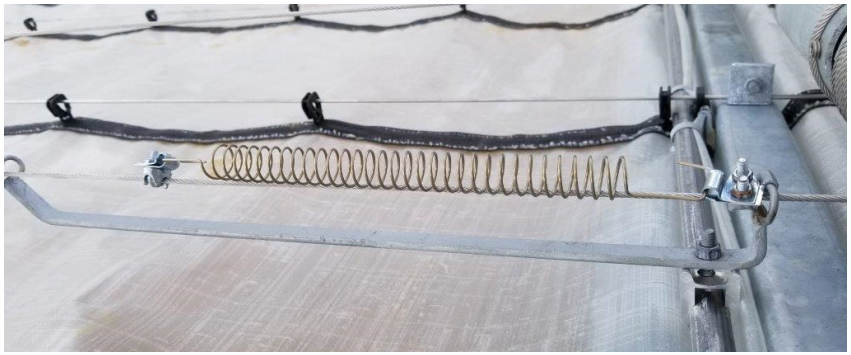
January 26, 2022

The primary causes of drive cable problems

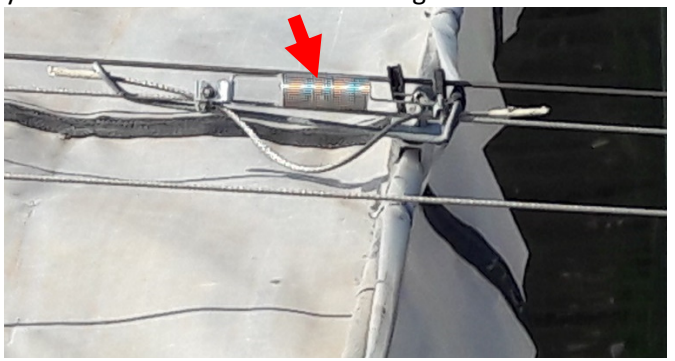
1. Drive cable pretension is too low.
2. Drive cable tension is excessive.
3. Drive cables are not aligned with the drive drums.
4. Drive cables are not aligned with the return pullies.

1. **Drive cable pretension is too low.** Cable pretension is the tension on the drive cable **without** any forces being exerted on the cable due to moving the roof in a retracted or closed position.
    a. When the drive cable pretension is too low, the cable spring will collapse completely when the roof is fully retracted

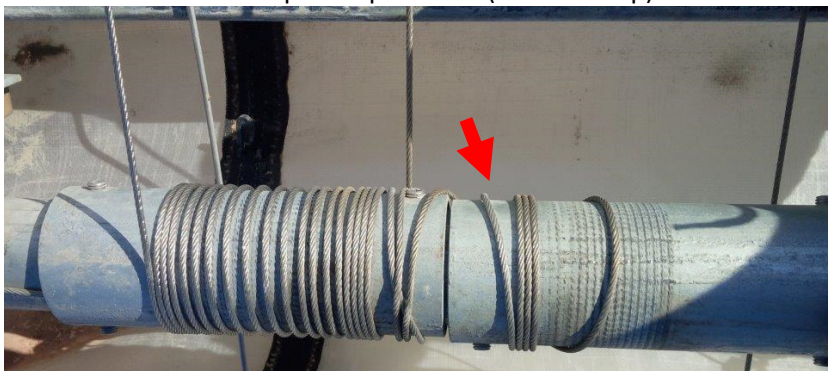
Spring is extended when the roof is closed



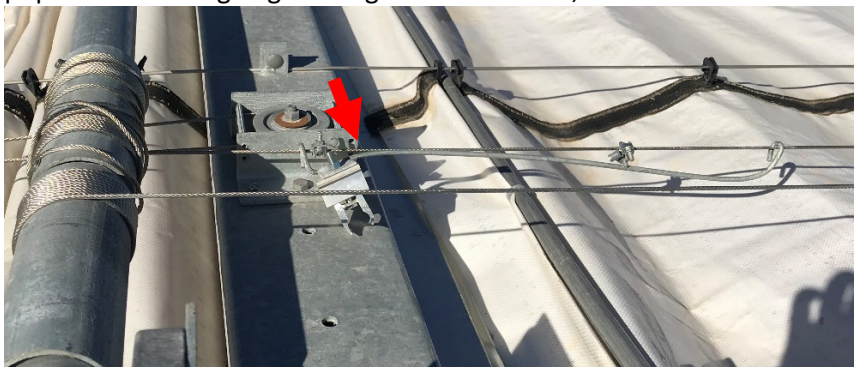
If the cable spring is fully collapsed when the roof is retracted, then there is a high risk of the drive cable to double wrap on the drive drum when the roof closes completely. When the drive cable double wraps, it usually results in the drive cable breaking.



When the cable pretension is too low, then the cable spring can no longer maintain sufficient tension on the lower drive cable causing the lower drive cable to wrap on top of itself (double wrap)



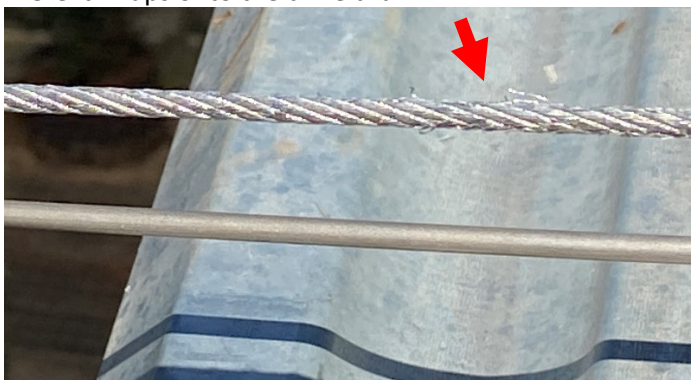
When the drive cable double wraps, it pulls the leading edge too far causing the delay bracket to become damaged, and the tube carrier to pop off the leading edge tubing. In severe cases, the cable will break.



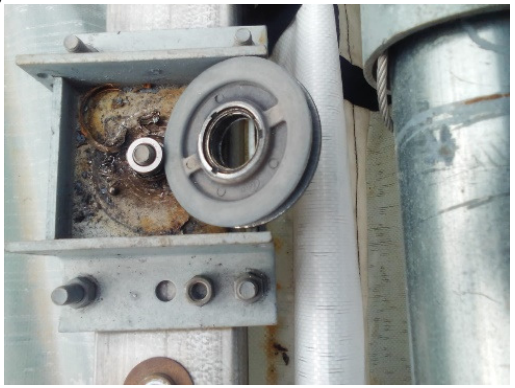
2. Drive cable tension is excessive

a. **<u>Pretension</u>** of the drive cable is too high.

Excessive pretension will cause wearing of the drive cable where it wraps onto the drive drum



Excessive cable pretension will cause premature wear on the return pulley or bearing inside the pulley

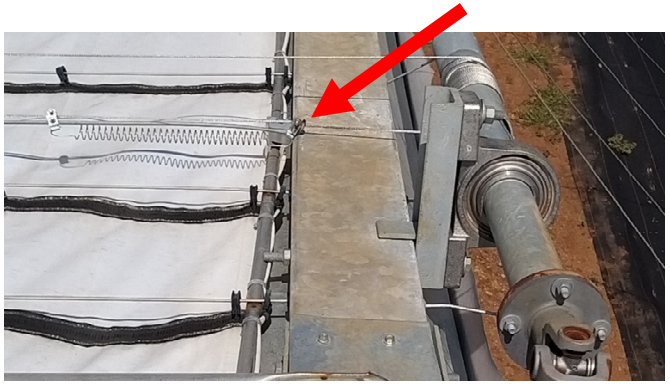


b. Roof is over travelling **causing the drive cable tension to increase beyond the capacity of the cable**

i. The roof limit switches are set incorrectly causing the roof to overtravel where the leading edges are being pulled into the trusses or end members, causing the tension in the lower drive or upper return cable to exceed the allowable maximum tension.

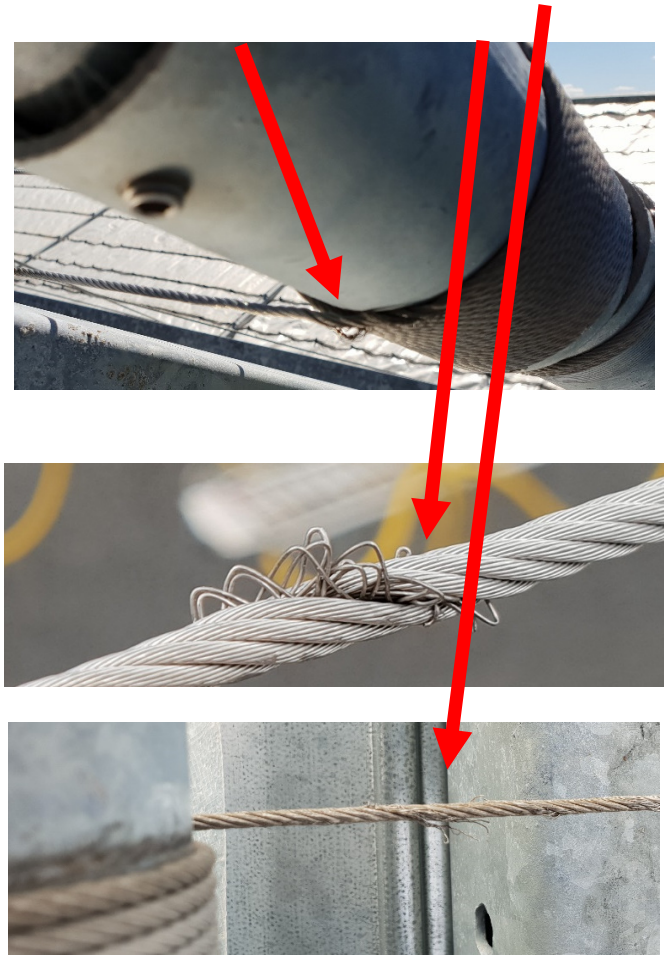
ii. Some delay brackets and/ or tube carriers are incorrectly positioned causing some leading to be pulled into full contact with some trusses or end members.

When the roof is in a fully covered position, if some delay brackets or tube carriers pull the leading edge tubing causing it to make contact with the truss or end member, then the tension in the drive cable between the delay bracket and the drive shaft exceeds the allowable limit causing some strands to break…eventually leading to the drive cable breaking.

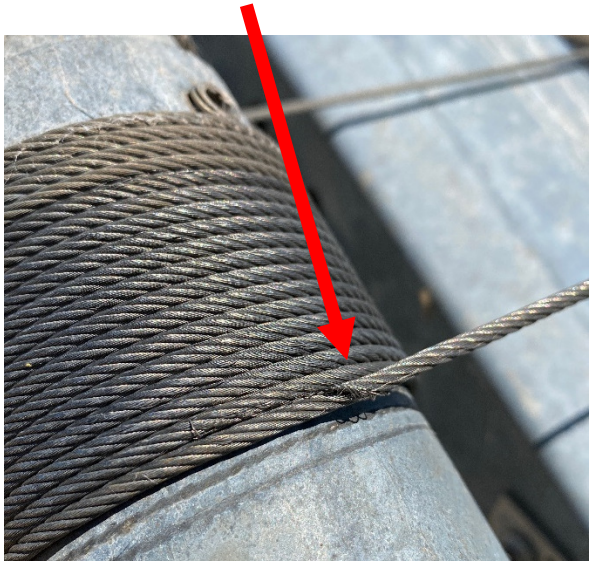


Tube carrier rotates when the leading edge has overtravelled causing cable tension dramatically increase

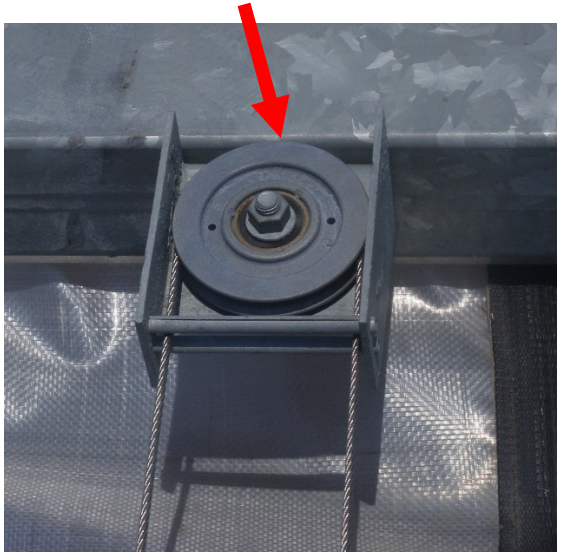
Excessive cable tension causes damage to the cable where it begins to wrap onto the drive drum when the roof is in a fully closed position.



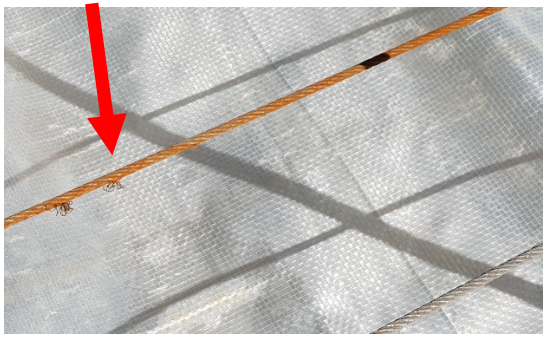
If the roof is over travelling when the roof is **retracted**, then the upper return cable will have excessive tension right where the cable begins to wrap on the drive drum causing cable strands to break.



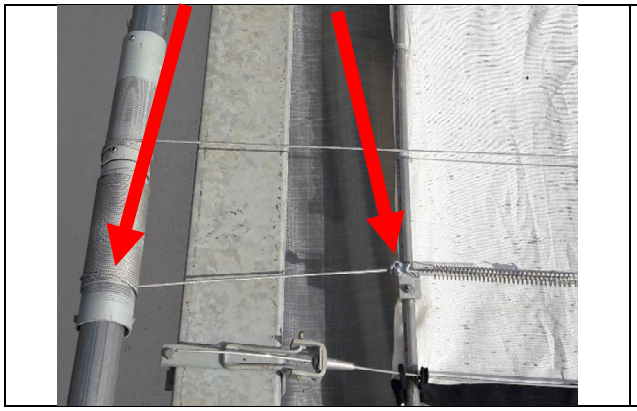
The cable tension will also become excessive where the cable goes around the pulley resulting in cable strands initally breaking with the cable eventaully breaking completely if the excessive tension is not prevented



Broken strands due to excessive tension when the roof is fully retracted. Cables will rust if galvanized cables are used during a repair.



3. **Drive cables double wrapping on the drive drum** due to the delay brackets being secured to the leading edge such that the delay bracket is pulling the drive cable overtop of the cable wraps already on the drum.



4. **Drive cables are not aligned with the return pullies** due to the tube carriers being secured to the leading edge such that the tube carrier is pulling the drive cable on an angle to pulley.

Cable retainer is pulling the return cable against the pulley housing.

Delay bracket is misaligned causing friction between the delay bracket and the drive cable.