AFL's Repair Accessories for Damaged Stranded Aluminum Conductors

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Damaged aluminum conductor stranding yields line loss through the transmission system. AFL has two methods of repairing transmission conductors when some of the aluminum stranding has been impaired or severed (**Figure 1**). The type of repair accessory used depends on the number of strands damaged, operating temperature of the conductor, and the tooling desired to install the assembly. Compression repair sleeves require a die set and hydraulic press, while repair rods installation is completed by wrapping a rod set around the damaged conductor.

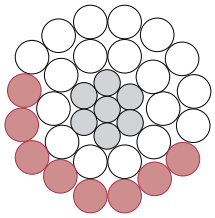
AFL offers the Quick Compress® RS series and Standard Compression 5200 series for conductors operating at or below 100°C and the 5200HT series repair sleeve assemblies for conductors operating at elevated temperatures at or below 250°C. The AFL AAR Rods series can be applied to standard operating temperature and elevated temperature stranded aluminum conductors. Both options are discussed below.

Figure 1—Damaged conductor stranding

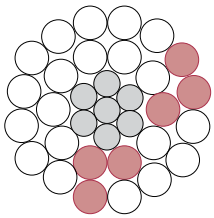
Figure 2—Repair Rods

Repair Rods (armor rod set) will restore the conductor to 100% of its rated strength when the total number of broken/damaged aluminum strands is less than or equal to half the number of outer strands in the conductor (**Figure 2**). The steel core must still be intact.

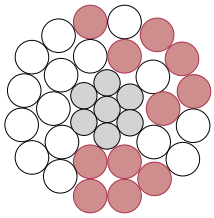
- For example, Hawk ACSS 26/7 has 16 outer layer strands. Therefore, repair rods will work per above if 8 or less than any of the 26 aluminum strands are broken/damaged. Application examples are shown below – damaged/broken stranding is shown in red.



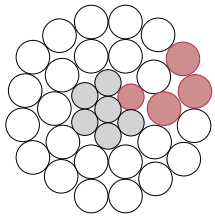
Rods are suitable
8 AL strands are damaged or broken



Rods are suitable
6 AL strands are damaged or broken



Rods are <u>not</u> suitable
11 AL strands are damaged or broken



Rods are <u>not</u> suitable
a steel core strand is damaged or broken

Compression Repair Sleeves will restore the conductor to 95% of its rated strength when 1/3 or less of the total aluminum strands are broken/damaged (**Figure 3**). The steel core must still be intact.

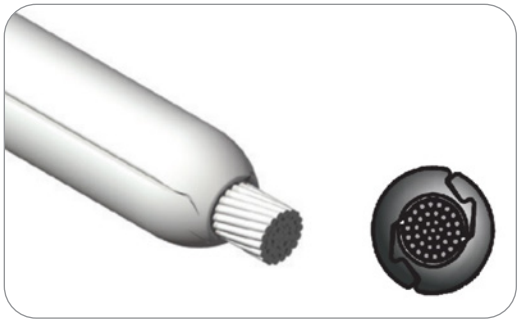
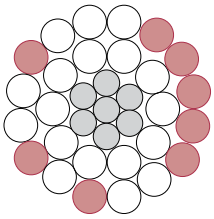
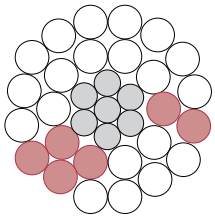


Figure 3—Repair Sleeve Assembly

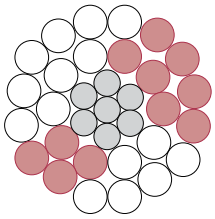
- For example, Hawk ACSS 26/7 has 26 aluminum strands. Therefore, compression repair sleeves will work per above if 8 or less than any of the 26 aluminum strands are broken/damaged. Application examples are shown below – damaged/broken stranding is shown in red.



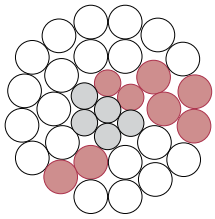
Repair Sleeves are suitable
8 AL strands are damaged or broken



Repair Sleeves are suitable
6 AL strands are damaged or broken



Repair Sleeves are <u>not</u> suitable
11 AL strands are damaged or broken



Repair Sleeves are <u>not</u> suitable
2 steel core strands are damaged or broken

Repair Rods and Compression Repair Sleeves are applicable only when the above detailed number of aluminum strands are damaged or broken. When more conductor strands are damaged, or a steel core strand is impaired, an AFL full-tension compression cutout/replacement splice or dead end must be used to restore the span to full strength. Full-tension compression accessories require more time to install, so if the damage is minimal, the repair options discussed above are advantageous. Contact AFL for more information on this type of full-tension replacement compression assembly.

AFL has over 100 years of experience in the design and application of conductor accessories, and superior knowledge through years of technical support to provide in-depth assistance on a large variety of conductor applications. When stranded aluminum conductor damage occurs, AFL offers multiple options to quickly restore the conductor's strength and conductivity. Repair rods require no additional tools while compression sleeves do. Each option will restore the conductor's strength so that it may remain in operation for years to come.

Detailed information is found in the AFL Transmission and Distribution catalog. For additional support, contact AFL's Accessories technical line at (800) 866-7385.