

Gauge #	22	20	18	16	14	12	10	8	6	4
2 Wires	10	10	9	8	7 1/2	7	6 1/2	6	5	4
3 Wires	10	10	8 1/2	7	6 1/2	6	5 1/2	5	4	3

Figure 9-131. Recommended number of wire twists per foot.

Spliced Connections in Wire Bundles

Splicing is permitted on wiring as long as it does not affect the reliability and the electromechanical characteristics of the wiring. Splicing of power wires, coaxial cables, multiplex bus, and large-gauge wire must have approved data. Splicing of electrical wire should be kept to a minimum and avoided entirely in locations subject to extreme vibrations. Splicing of individual wires in a group or bundle should have engineering approval, and the splice(s) should be located to allow periodic inspection.

Many types of aircraft splice connector are available for use when splicing individual wires. Use of a self-insulated splice connector is preferred; however, a non-insulated splice connector may be used provided the splice is covered with plastic sleeving that is secured at both ends. Environmentally sealed splices that conform to MIL-T-7928 provide a reliable means of splicing in SWAMP areas. However, a non-insulated splice connector may be used, provided the splice is covered with dual-wall shrink sleeving of a suitable material.

There should be no more than one splice in any one wire segment between any two connectors or other disconnect points. Exceptions include when attaching to the spare pigtail lead of a potted connector, when splicing multiple wires to a single wire, when adjusting wire size to fit connector contact crimp barrel size, and when required to make an approved repair.

Splices in bundles must be staggered to minimize any increase in the size of the bundle, preventing the bundle from fitting into its designated space or causing congestion that adversely affects maintenance. [Figure 9-132]

device, except when attaching to the pigtail spare lead of a potted termination device, to splice multiple wires to a single wire, or to adjust the wire sizes so that they are compatible with the contact crimp barrel sizes.

Bend Radii

The minimum radius of bends in wire groups or bundles must not be less than 10 times the outside diameter of the largest wire or cable, except that at the terminal strips where wires break out at terminations or reverse direction in a bundle. Where the wire is suitably supported, the radius may be three times the diameter of the wire or cable. Where it is not practical to install wiring or cables within the radius requirements, the bend should be enclosed in insulating tubing. The radius for thermocouple wire should be done in accordance with the manufacturer's recommendation and shall be sufficient to avoid excess losses or damage to the cable. Ensure that RF cables (e.g., coaxial and triaxial) are bent at a radius of no less than six times the outside diameter of the cable.

Protection Against Chafing

Wires and wire groups should be protected against chafing or abrasion in those locations where contact with sharp surfaces or other wires would damage the insulation, or chafing could occur against the airframe or other components. Damage to the insulation can cause short circuits, malfunction, or inadvertent operation of equipment.

Protection Against High Temperature

Wiring must be routed away from high-temperature equipment and lines to prevent deterioration of insulation. Wires must be rated so the conductor temperature remains within the wire specification maximum when the ambient temperature and heat rise related to current-carrying capacity are taken into account. The residual heating effects caused by exposure to sunlight when aircraft are parked for extended periods should also be taken into account. Wires, such as those used in fire detection, fire extinguishing, fuel shutoff, and fly-by-wire flight control systems that must operate during and after a fire, must be selected from types that are qualified to provide circuit integrity after exposure to fire for

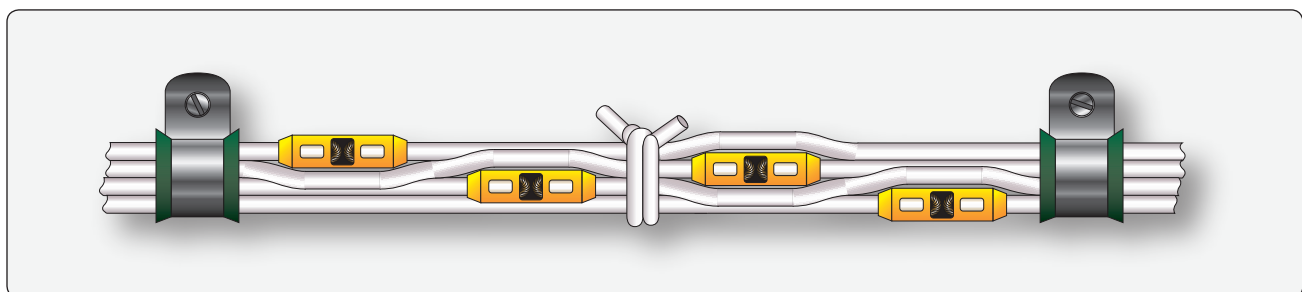


Figure 9-132. Staggered splices in wire bundle.