

for many years but are currently still in use. Contact with current certificated parachute manufacturers has proven that none currently recognize or accept this type of repair as an approved procedure and do not recommend the use of ripstop tape on any parachute in production. It is highly advised that before affecting any type of repair with the use of ripstop tape on an approved parachute that the manufacturer be contacted for confirmation and the request of an approval document before completing this type of repair.

Figure 7-15 shows a table of square canopy repairs and limitations. These are for reference only. Not all manufacturers recognize the same types of repairs. The information in this table is an excerpted cross-section of allowable repairs. The rigger should consult with the manufacturers to confirm what repairs are allowed on any particular canopy.

Detailed Information on Square Canopy Repairs

Holes or snags smaller than the size of one ripstop box ($\frac{1}{8}$ inch, 3.2 mm) may remain unrepaired as long as no more than one hole exists within any 10-inch (25.4 cm) circle. A maximum of three such holes or snags per cell are allowed.

Ripstop tape is not authorized for use on parachutes. If the damage is enough to warrant a repair, a sewn repair must be performed. Darning is not a means of repairing any parachute currently in production.

Any hole or tear up to 10 inches (25.4 cm) in length may be repaired by a Senior Rigger as long as the closest area of the completed repair is at least 1 inch from the nearest seam and at least 5 inches from the nearest tape or line attachment. These are minor repairs. Any damage or hole larger than 10 inches (25.4 cm) may be repaired by a Master Rigger, in either direction or involving a seam or tape. This is a major repair.

Any damage that requires a repair of an area that is larger than 50 percent of the total area of a cell skin (upper or lower) requires cell skin replacement and should be returned to the manufacturer.

Master riggers may perform repairs that do not involve taking apart any bartacks on the canopy unless they have the correct bartack machine or equivalent. Special bartack patterns are used that are not normally found in the field. In addition, removal and replacement of these stitch patterns usually weakens the fabric to the point that it is necessary to replace or reinforce portions of the panels. This should also be considered in the repairs of load bearing and non load bearing ribs as most have these types of bartack stitches located at the ends.

Before performing a repair, contact with the canopy manufacturer is very important, as some of these repair standards and limitations may vary slightly.

Materials

Certified canopies should only be repaired using certified materials or equivalent. All replacement materials should come from the manufacturer or meet production quality and shelf life standards. Under-strength thread and fabric is frequently found in the field. The only way to be sure the material meets manufacturer standards is to obtain them directly from manufacturer or locate materials recognized by the manufacturer as acceptable for the repair needed.

The following are the repairs found in Section 1, Canopy and Lines:

- Seam re-stitching
- Canopy ripstop tape repair
- Round and square canopy—basic patch
- Round canopy—panel replacement
- Square canopy—partial panel replacement
- Square canopy—rib repair
- Square canopy—pilot chute attachment point repair
- Round canopy—non-continuous line replacement
- Square canopy—main line replacement
- Square canopy—control line replacement
- Square canopy—crossport repair
- Square canopy—trim check and re-trim

Square Canopy Repairs and Limitations		
Type	Limits	
	Certificated	Non-certificated "Recommendations"
Restitching	No limit to length and number over stitch 4 to 6 inches from start.	No limit to length and number over stitch 4 to 6 inches from start.
Ripstop tape	Not allowed.	Not allowed.
Basic patch	Size limit 10 inches, senior rigger.	Size limit 10 inches, senior rigger.
Panel patch	50% cell skin, master rigger. Senior rigger, not allowed.	50% cell skin, master rigger. Senior rigger, not allowed.
Suspension lines	Master rigger, no limit. Senior rigger, not allowed.	Master rigger, no limit. Senior rigger, not allowed.
Line splice	Not allowed.	Not allowed.

Figure 7-15. Table of square canopy repairs and limitations.