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**PULSE-190-260 REVISION P01 TO P02 UPGRADE
WORK INSTRUCTION**



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1 Purpose of Document

This document is intended as a guideline for Rigging Lofts to perform an upgrade from Rev. P01 to Rev. P02 on Pulse (PL) canopies sizes 190, 210, 230, 260.

2 Scope

This upgrade involves removing existing line set, removing line tabs at locations 3 and 5 (4 total), opening tail seam, adding reinforcement tape in locations 4 and 6 (4 total), closing tail seam, installing 4 new line tabs and newer revision Line set.

2.1 Required materials and equipment

- P02 line set
- Four new line tabs 4" (10cm) long MIL-T-5038, T3, C1, 3/4", natural (provided with line set)
- Four 7" (17.5cm) long seam reinforcement tapes BRM#6707, 1/2", natural (provided with line set)
- White Nylon E-thread for re-stitching the seams closed
- Silver Nylon E-thread for line tabs and line bartack
- Blue Nylon F-thread for stabilizer attachment
- Single needle or 1/4" gauge double needle sewing machine set up to yield minimal shrinkage and 6 to 10 stitches per inch. Use F-111 or 1.1 oz. 0-3 cfm ripstop nylon fabric to set up machine.
- Bartack machine or zig-zag machine.



2.2 Rework process

NOTE: PD low bulk fabric used for bottom surface and ribs on Pulse canopies is very absorbent. To prevent oil stains on canopy please wipe all your tools and sewing machine surfaces with alcohol before attempting rework. Make sure machine has not been excessively oiled.

1. Remove existing line set from canopy.
2. Remove line tabs in locations #3 and #5.

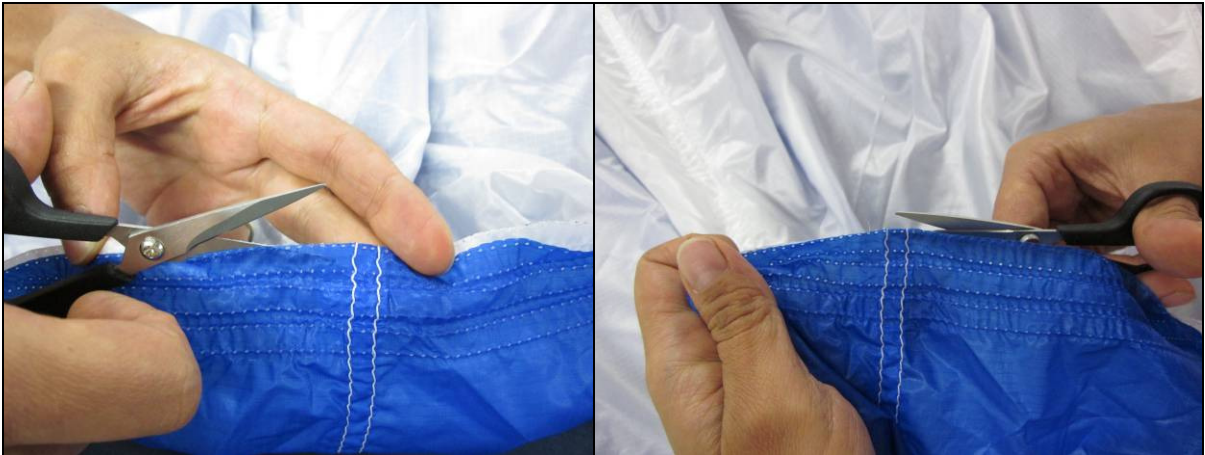


3. Remove tail seam stitching starting approximately 8" (20 cm) away from location #4 and stop 8" (20 cm) after location #6.





4. To gain access to I-Beam seams, carefully separate Top and Bottom skins at locations #4 and #6. Use sharp scissors in the areas where skins were permanently melted together. Do not force skins apart as it will cause snags.



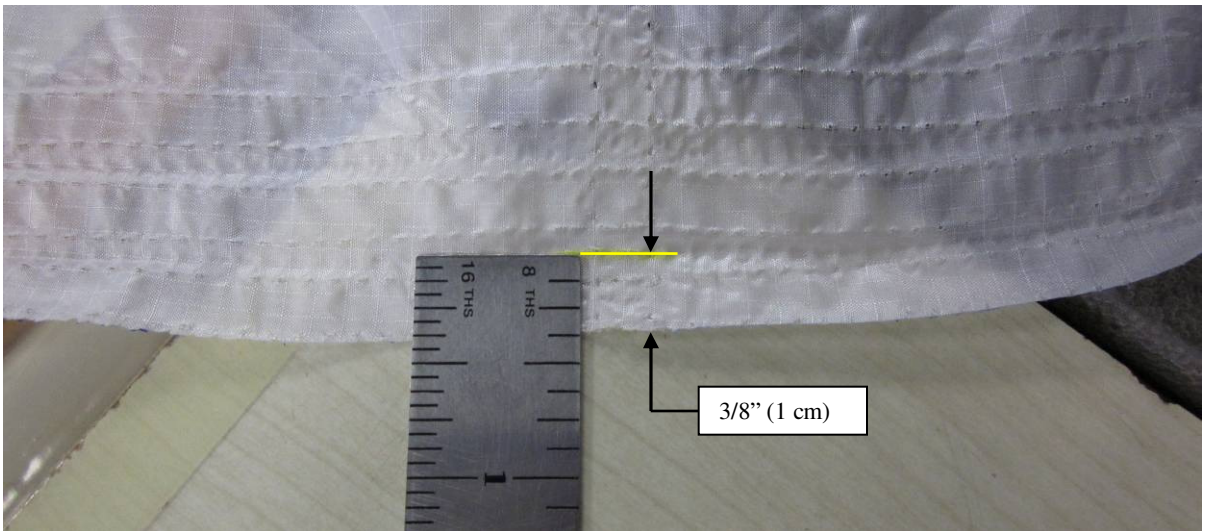
Separated tail seam



5. Open I-Beam seams on bottom skin side only in locations #4 and #6 for about 8" (20 cm) from trailing edge.



6. Mark 3/8" (1cm) from edge on bottom skin.





7. Lay canopy on sewing machine table with bottom skin facing down.
8. Oversew must begin approximately 4" – 6" (10 – 15 cm) away from the end of removed stitches.





9. Follow I-Beam stitches until you reach point to which stitches were removed. Align end of reinforcement tape with 3/8" (1cm) mark made in step 6.

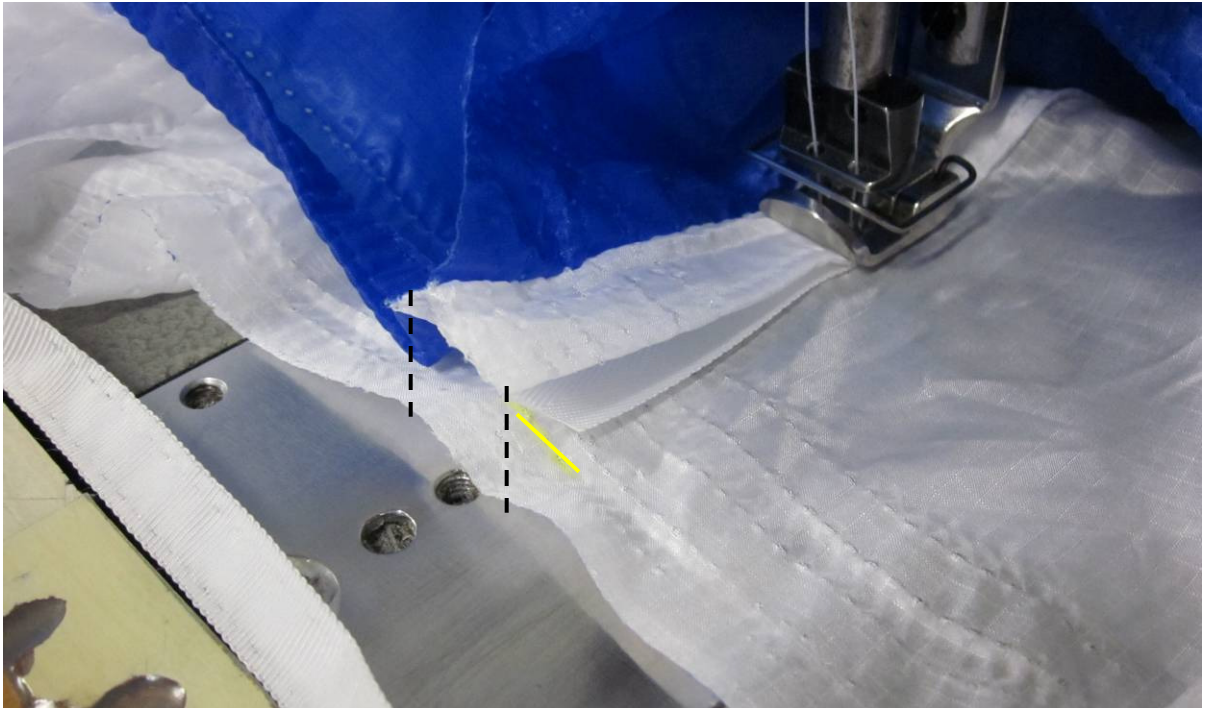


10. Continue sewing with right edge on reinforcement tape aligned with folded edge of rib. Keep 1/8" (3mm) edge distance. Both stitchrows must be on the reinforcement tape. If only single needle machine is available, make first pass (non loaded stitchrow) 1/8" (3mm) from folded edge on rib, follow existing needle marks to make second pass (loaded stitchrow).

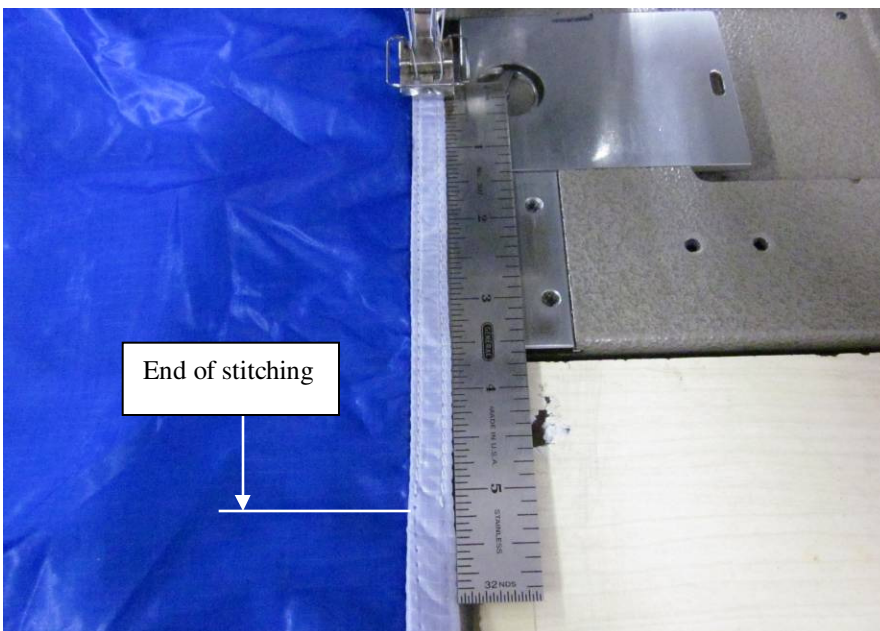




11. Keep bottom skin, rib and reinforcement tape pulled taut to avoid uneven shrinkage and captures. When sewing is complete top skin, bottom skin and rib edges must be even within 1/8" (3mm).



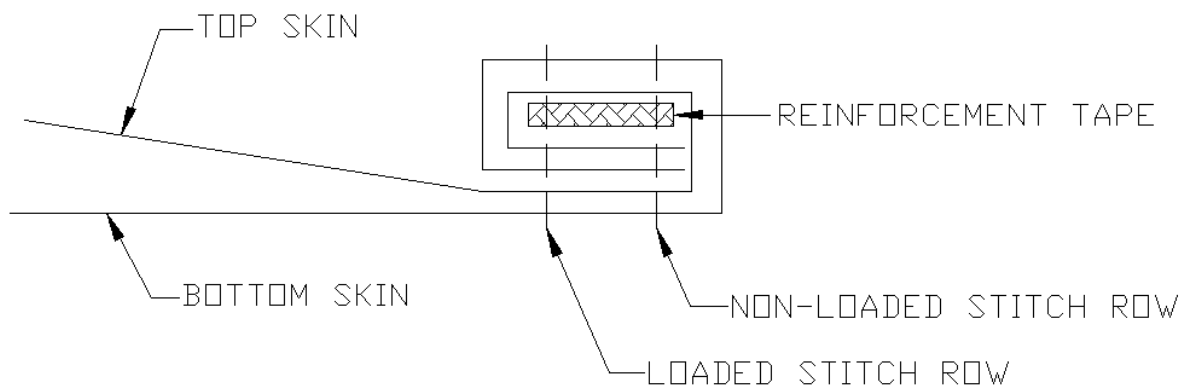
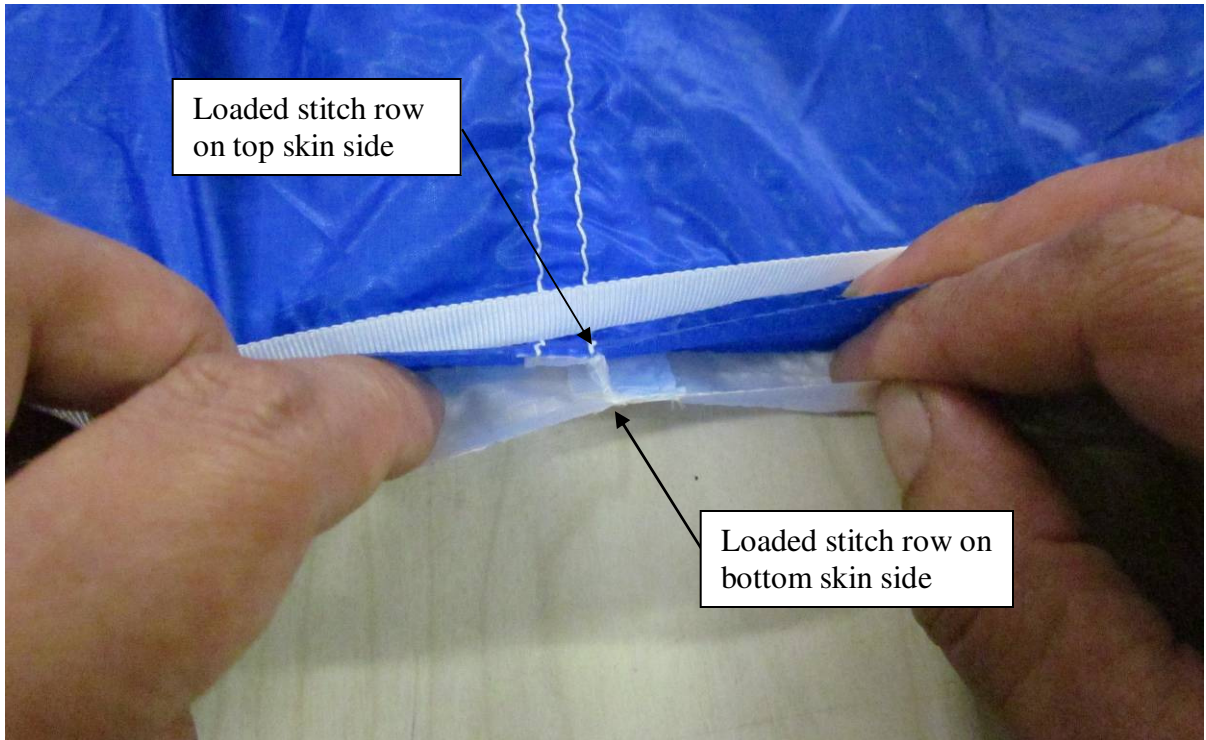
NOTE: Repeat this process for all new line attachment locations.
12. To close tail seam, start with 4"- 6" (10 – 15 cm) oversew.





13. Wrap fabric snug around tail reinforcement tape making sure the bottom seam is turned toward the operator (to prevent from getting caught on presser foot) and sew from seam junction to seam junction, matching the loaded stitchrows of I-Beam seams on both top and bottom skins +/- 1/8" Both tail seam stitchrows must be on the tail seam reinforcement tape. Finish with 4" to 6" (10 – 15 cm) oversew. The tail reinforcement tape must not have any twists.



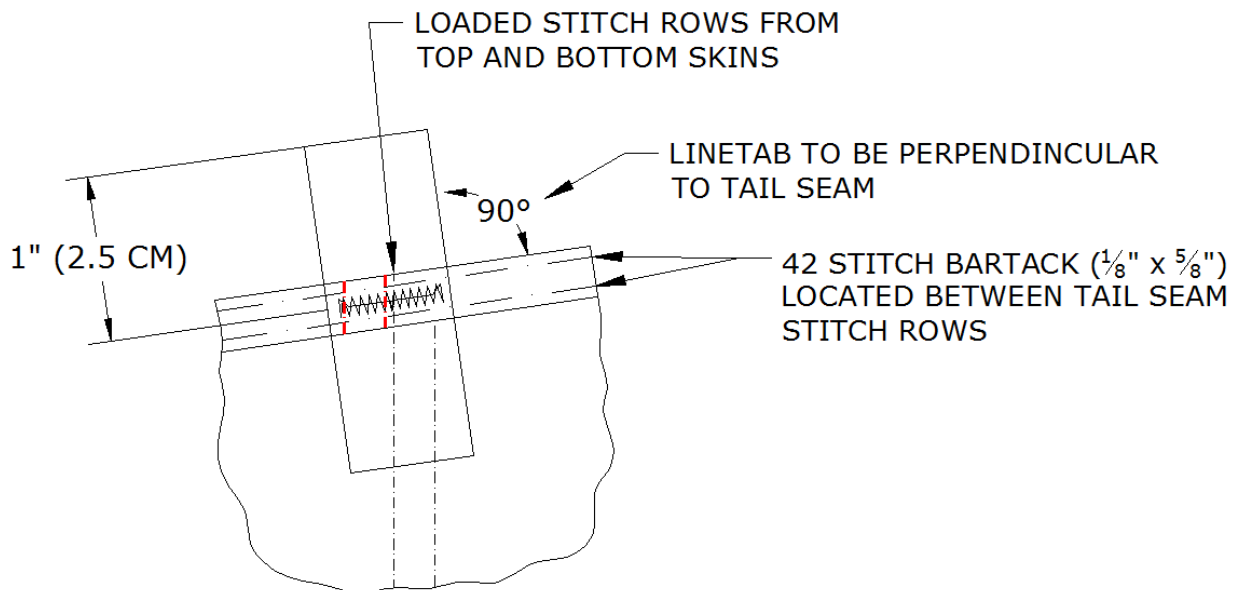


If only single needle machine is available, sew loaded stitchrow first than go back and complete non loaded stitchrow $\frac{1}{4}$ " (6mm) from first pass. Make sure that both stitchrows stay on tail seam reinforcement tape.



14. Install new line tabs at locations #4 and #6. Use four PD supplied line tabs 4" (10cm) long MIL-T-5038, T3, C1, 3/4", natural.

- Fold line tab in half and mark 1" (2.5cm) from folded edge
- Place folded line tab under foot on bartack machine with folded edge away from operator and secure in place
- Insert tail seam between line tab layers and position to meet following requirements : see notes and the drawing below
 - a. Bartacks should be centered between Tail seam stitchrows
 - b. Line tab bartacks must never cross the loaded stitchrow of the tail seam.
 - c. Line tab bartack must catch the loaded stitchrows of both I-Beam seams (seams that connect rib to top skin on one side and to bottom skin on other side)
 - d. Line tab should be perpendicular to tail seam



Bartack stitching must be silver Nylon E-thread.



15. Install new Rev P02 lineset.

16. Hand mark new Rev "P02" on Warning Label. Use non-bleeding, acid-free, waterproof and fade proof marker. We recommend marker manufactured by ZIG Memory System, Millennium, Kuretake Co., LTD, made in Japan; confirms to ASTM D-4236, size MS-08, pure black.

