

DROGUE CENTERLINE REPLACEMENT WORK INSTRUCTION

54" Centerline P/N's

CPS-032-005-001
CPS-DROGUE-CLINE54-S
CPS-DROSGCL

60" Centerline P/N's

CPS-032-015-003
CPS-DROGUE-CLINE60

72" Centerline P/N's

CPS-032-015-004
CPS-DROGUE-CLINE72

54" Extended Centerline P/N's

CPS-101-356
CPS-101-752

SOV3 drogue centerlines are specially fabricated with Spectra and Vectran. Each new drogue envelope and bridle may vary slightly, and each can stretch after use. CPS cannot supply a finished replacement centerline that is the correct length for all used drogues. The replacement centerline has a finished loop at the envelope end. A rigger must calibrate, finger-trap and sew the lower end to match the particular drogue into which it's installed. Replacement centerlines can be purchased through CPS. Contact your CPS Account Executive. (Do not attempt to fabricate this component yourself.)

Tools Required: Ruler, permanent marker (Green), two (2) calibrated scales, one (1) pull-up cord, hand-tacking needle (large), tack cord (any size), finger-trapping tool, scissors, Bartack machine (any pattern) or zig-zag machine (any throw), E-thread.

Work may be performed by any licensed parachute rigger (military, FAA senior/master or foreign equivalent).

INSPECT EXISTING DROGUE CENTERLINE

Before removing the existing centerline, and assuming you are replacing the centerline before it breaks, make the following observation so that you will understand the work you are preparing to accomplish.

1. Remove the existing drogue bridle from the main deployment bag by opening the #5 Rapide Link. Pull out the white centerline and observe its attachment to the link.



Figure 1. Remove Drogue Bridle from D-Bag

2. Attach the #5 Rapide link to a solid anchor point on your work table.



Figure 2. Anchor the #5 Rapide Link

3. Go to the other end of the drogue and locate the #0 guide grommet at the base of the envelope. Hold the grommet with one hand while pulling on the centerline with the other hand.

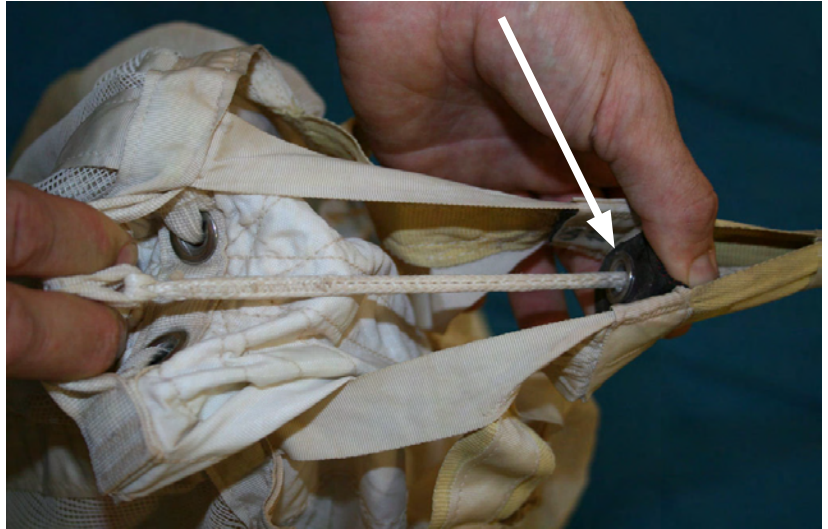


Figure 3. Locate #0 Grommet - Base of Envelope

4. Apply equal tension (approx. 10 lbs) independently to the Kevlar drogue bridle and centerline. The use of two (2) calibrated scales is recommended.

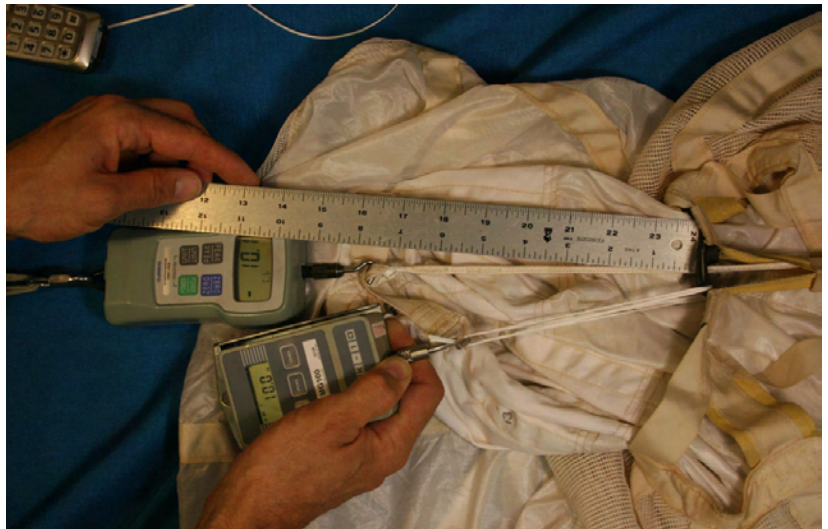


Figure 4. Apply 10 lbs of Tension

5. The centerline (CL) calibration is based on the distance from the #0 grommet to the end of the lark's head knot.



Figure 5. 60" Drogue - 7.5" CL-Calibration

60" Drogue Centerline Replacement is documented below.

Apply the same procedures for other drogue sizes. Be aware of the different calibration dimensions listed below. With the aid of an assistant, follow the instructions below to achieve the same result while installing the replacement centerline.

6. Calibration Dimensions

54" & 72" Drogues: 1 ½ " (+1" -2")

60" Drogues: 7 ½ " (+1" - 2")

54" Extended: 8 ½ " (+1" - 2")

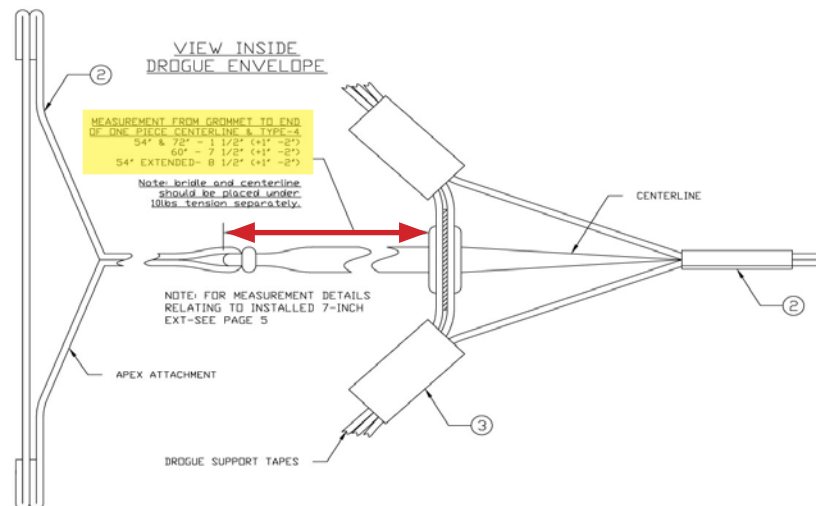


Figure 6. SPECDWG-0090 REV-7.9

7. Loosen the lark's head knot at the base of the envelope as shown.



Figure 7. Loosen Lark's Head Knot

8. Using a pair of scissors, carefully cut the lark's head knot.



Figure 8. Cut the Centerline at Lark's Head

9. Route the replacement centerline into the loop formed by the (1") Type-IV tape.



Figure 9. Route the New Centerline

10. Pass the running end of the replacement centerline through itself, forming a new lark's head knot.



Figure 10. Tie a Lark's Head Knot

11. Tighten the new lark's head knot completely as shown.



Figure 11. Tighten the Lark's Head Knot

12. Connect the old and new centerlines together by installing a temporary hand-tack. This technique is more secure than a knot and is easier to pull through the Kevlar bridle.

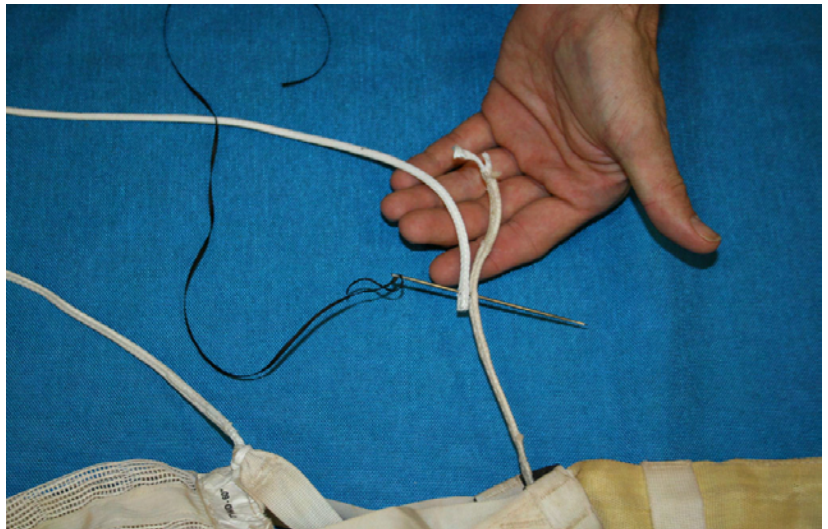


Figure 12. Connect the Old and New Centerline

13. Ensure the leading edge of the new centerline is firmly tacked down with several whip-stitches that encircle both centerlines. Tie a secure knot.



Figure 13. Hand-Tack Completed

14. With the aid of your assistant, pull the new replacement centerline through the Kevlar bridle. The leading edge hand-tack is placed to ensure a smooth pull-through. Go to the opposite end of the drogue bridle and slowly pull out the old centerline.



Figure 14. Pull through the New Centerline

15. Continue to pull the old centerline out until the new one exits the bottom of the Kevlar bridle.



Figure 15. New Centerline Pulled Through

16. Pull the new centerline until the lark's head knot at the drogue-end hits the #0 grommet. Remove the hand-tack and discard the old centerline.

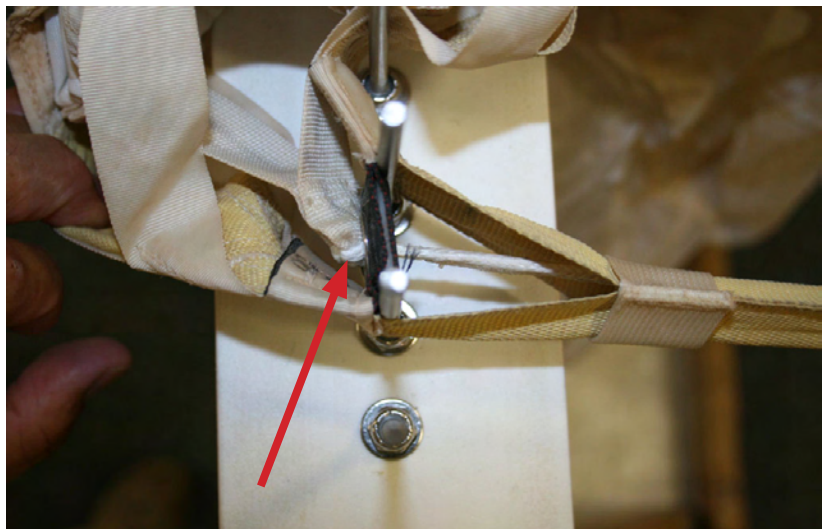


Figure 16. Pull Lark's Head Against Grommet

17. With the aid of your assistant, pull approximately 10 lbs of tension independently on both the Kevlar bridle and centerline. Mark the centerline at the inside end of the link engaged by the Kevlar bridle as shown.

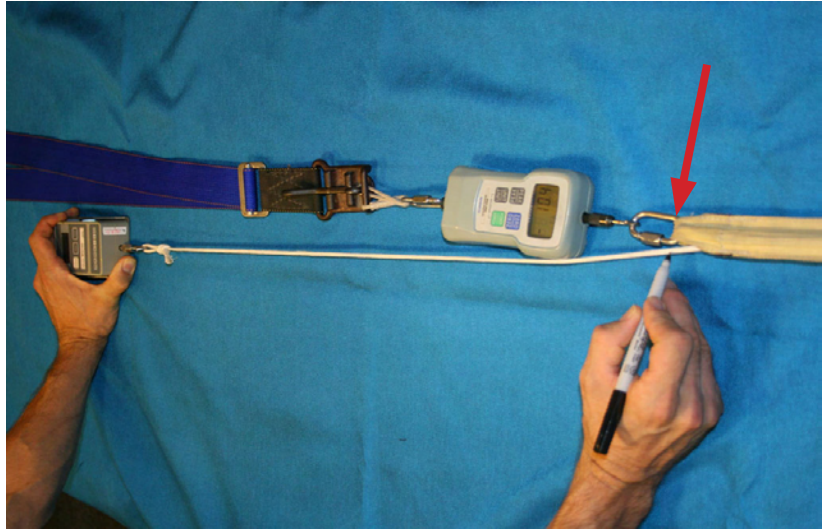


Figure 17. Pull Tension - Mark Centerline at Link

18. The 2nd mark will be 8" from the original mark.

Reminder: This is a 60" drogue model that requires a 7.5" centerline calibration. A half-inch is added to allow for shrinkage.

The 54" & 72" drogues will require a 2" mark at this location.

The 54" drogue with "extended" centerline will require a 9" mark at this location.

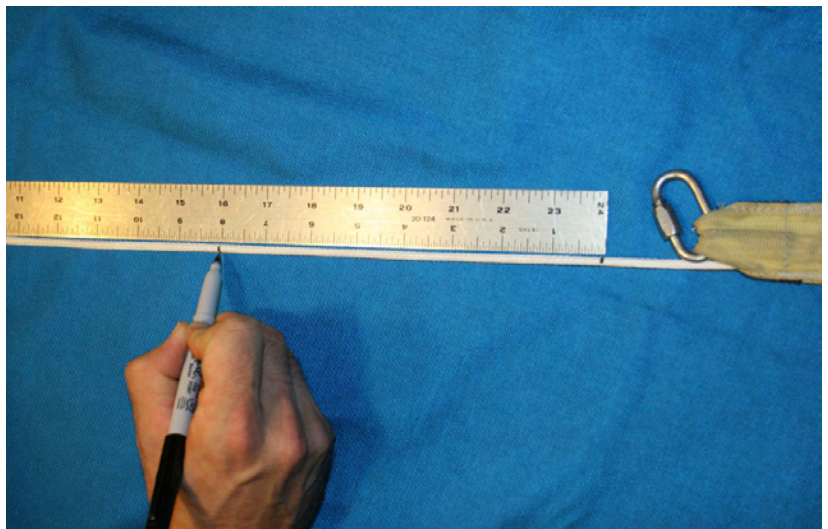


Figure 18. 2nd Mark - 8-Inches Past Original Mark

19. Place two additional marks at 1" and 4" as shown. These marks will facilitate the finger-trapping.

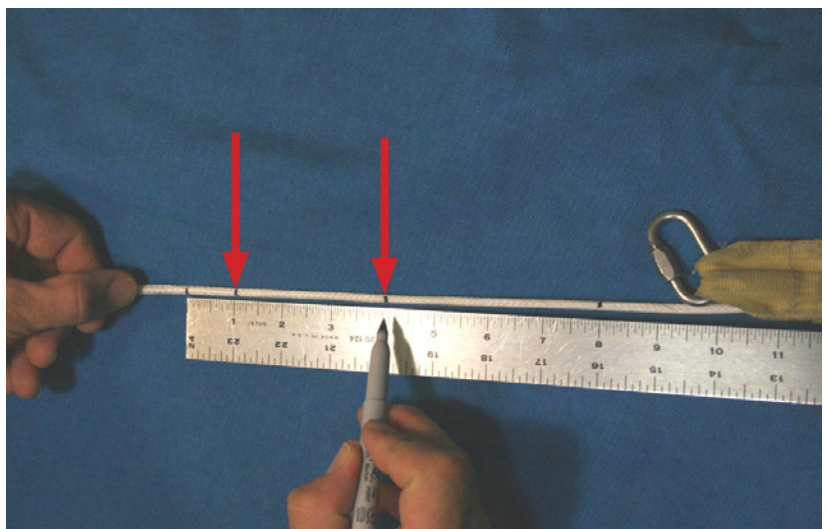


Figure 19. Additional Marks for Finger-Trapping

20. Insert the finger-trapping tool (FTT) at the 4" mark.

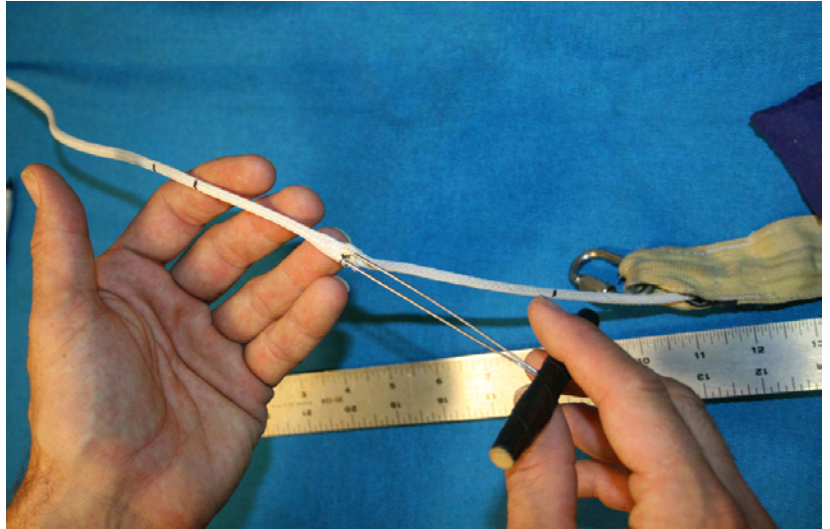


Figure 20. Insert FTT at 4-Inch Mark

21. The end of the FTT should exit the line at the 1" mark.

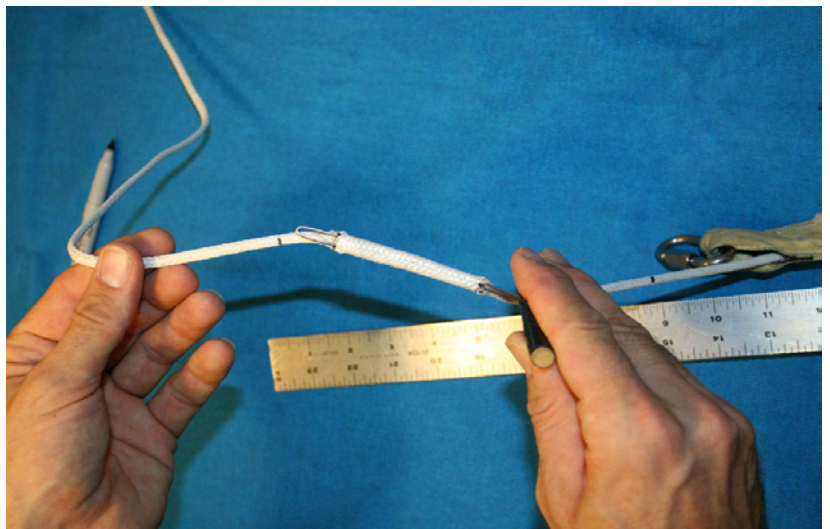


Figure 21. FTT Exits at 1-Inch Mark

22. Insert the running end of the centerline into the end of the FTT.

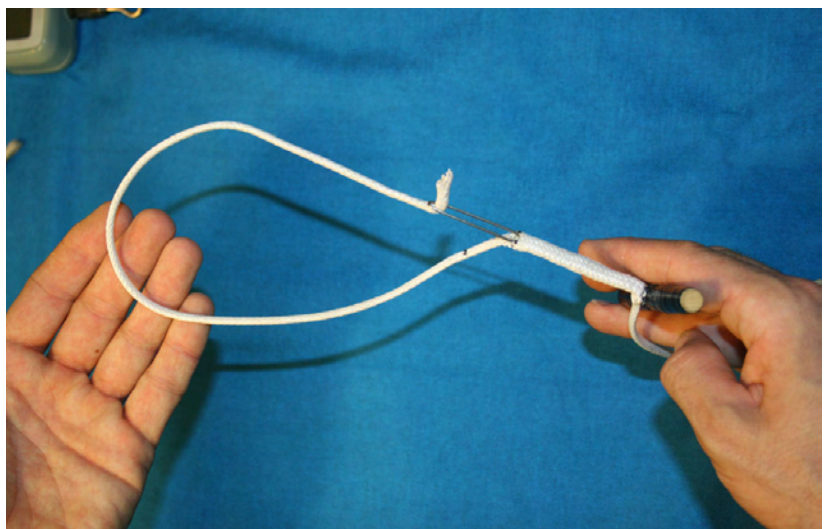


Figure 22. Insert Centerline into FTT

23. Pull through the running end of the centerline as shown, thus creating the finger-trap.

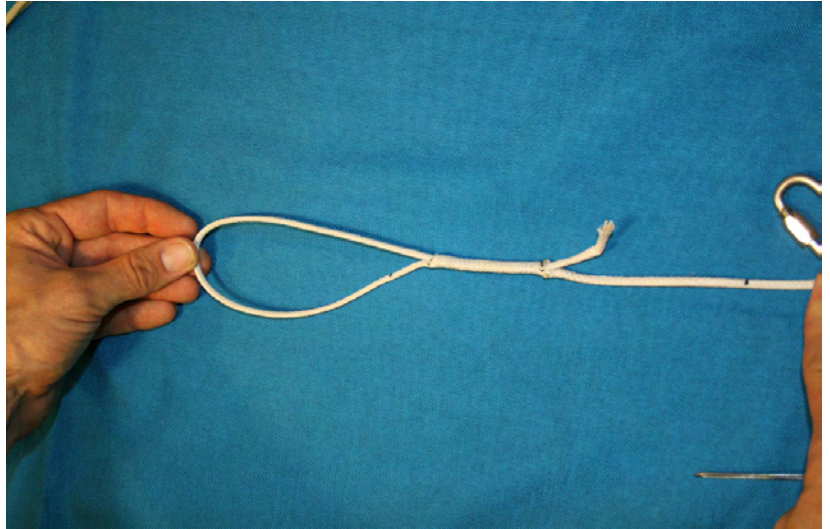


Figure 23. Pull Centerline into Finger-Trap

24. Continue to pull the centerline through the finger-trap until your marks match the photo. The first 1-inch forms the new loop. The next 3.5-inches is the finger-trap area. (This constitutes the 1/2" shrinkage.)

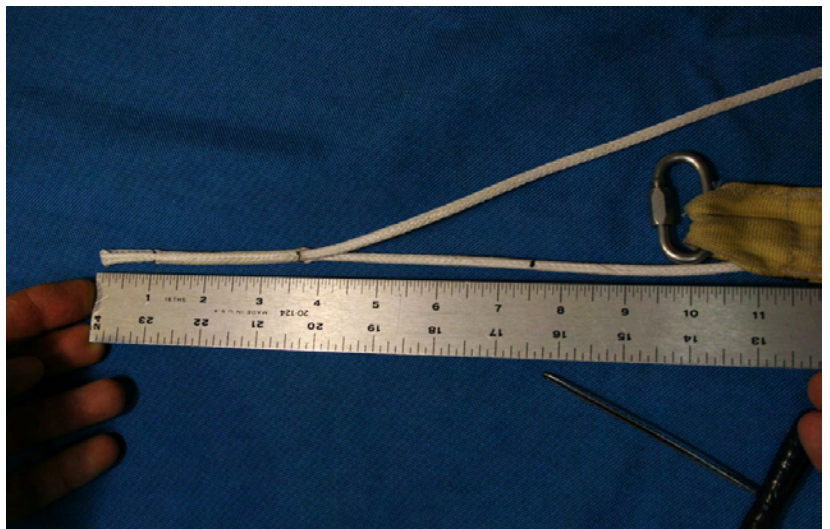


Figure 24. Form a One (1") Inch Loop

25. Install two (2) bartacks as shown. Ensure the bartacks are on the finger-trapped section. A long, double-pass zig-zag is also acceptable.



Figure 25. Install Two (2) Bartacks

26. Trim off the excess centerline. Work the cut end back inside the line.

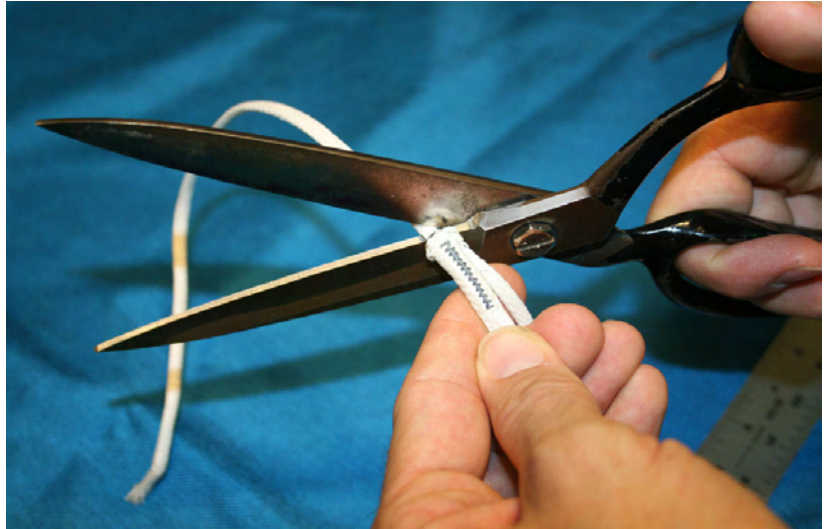


Figure 26. Trim Excess Centerline

27. Lay the finished end against a ruler. From the loop-end to the original mark should be approximately 7.5", which is the centerline calibration for the 60" drogue. A 1/2" of shrinkage is normal due to the finger-trap and bartacks.

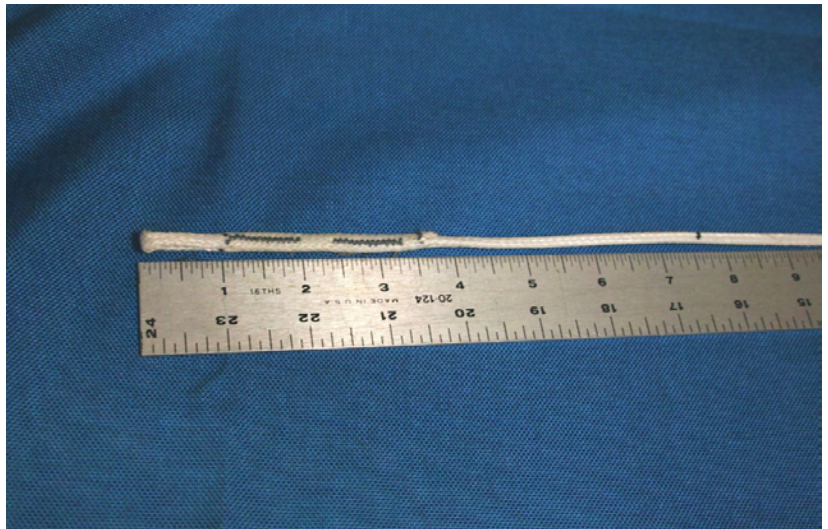


Figure 27. Inspect Finished Centerline

28. Slide the loop-end of the centerline over the #5 Rapide Link.

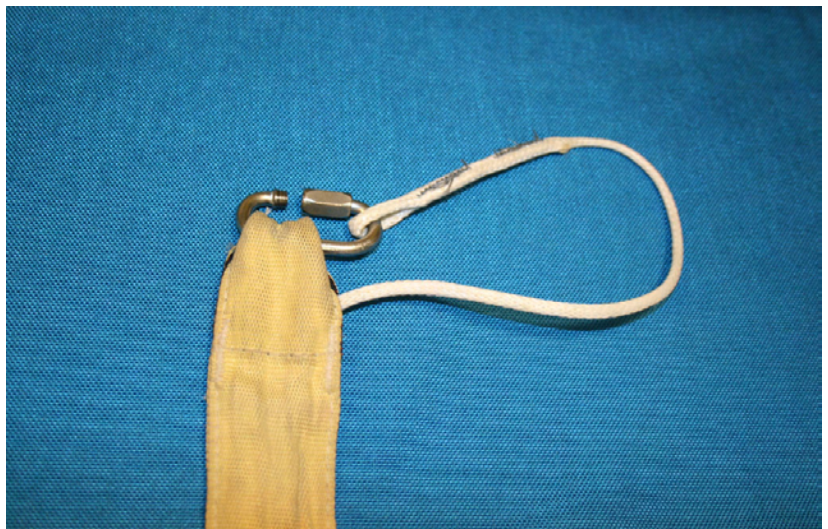


Figure 28. Attach Centerline to Rapide Link

29. With the aid of your assistant, check the centerline calibration at the envelope end of the drogue. Attach independent scales to the outer Kevlar bridle and the centerline. Pull approximately 10 lbs on each. For the 60" drogue, the calibration should be 7.5" (+1" -2" tolerance).

Reference the dimensions listed in Figure-6 for other drogue sizes.

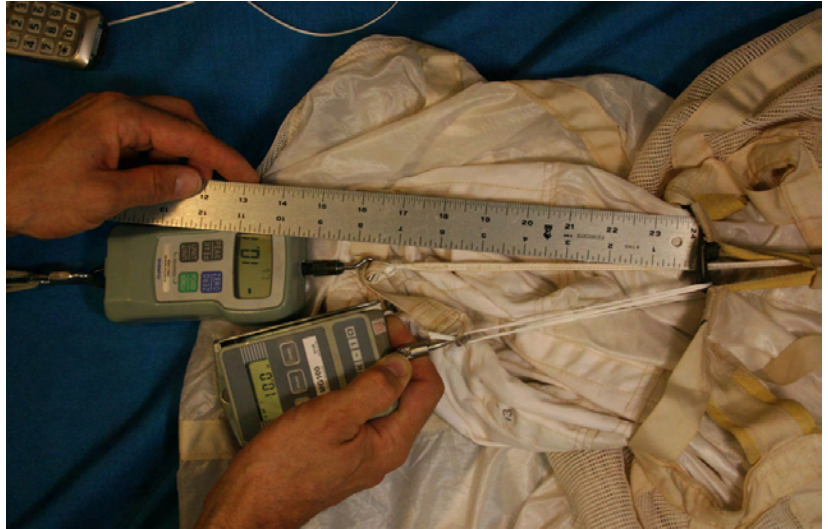


Figure 29. Check Calibration Measurement

30. With the aid of your assistant, hold the disc in place while pulling on the handle on top of the drogue envelope. Set the drogue completely, creating the scrunch below the disc, in preparation for marking the "Green Zone" on the centerline.



Figure 30. Set the Drogue

31. Using a "green" permanent marker, place a mark in the center of the check-window as shown.

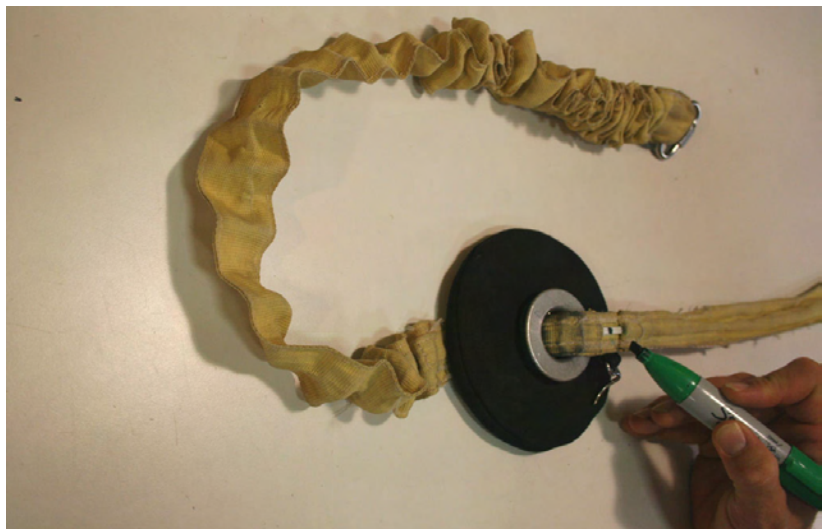


Figure 31. Mark the Centerline

32. Pull the centerline out of the check-window as shown.

The green mark represents the center of the “green zone.”

54” and 60” drogues must have a 6” green zone.

72” drogues must have a 9” green zone.

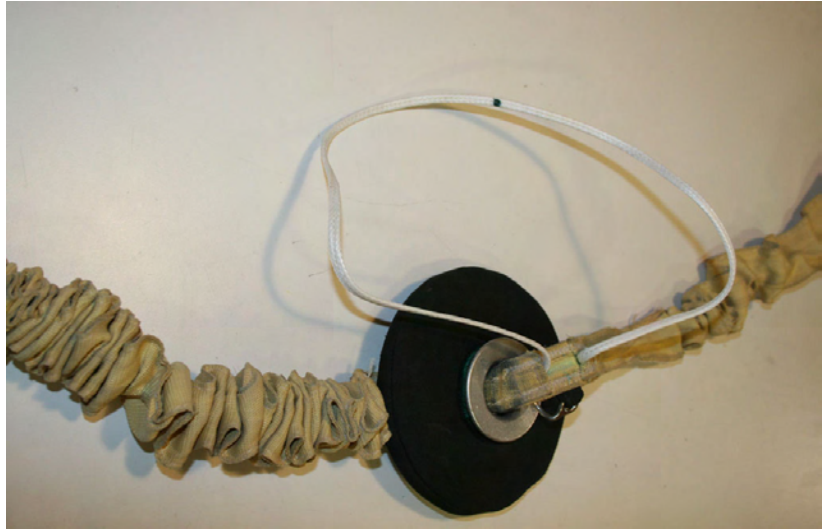


Figure 32. Pull Centerline Out of Check-Window

33. For 54” and 60” drogues, lay the centerline against a ruler, placing the green mark at the 3-inch position as shown.

For 72” drogues, lay the centerline against a ruler, placing the green mark at the 4.5-inch position. (Not Shown)

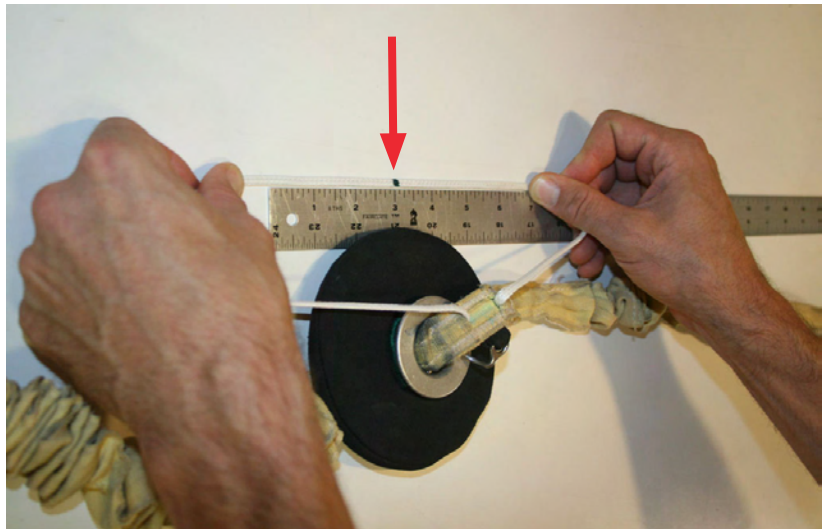


Figure 33. Place Mark at 3-Inches on Ruler

34. For 54” and 60” drogues, make two (2) additional marks at 0-inch and at 6-inches as shown. This forms the “Six-Inch Green Zone.”

For 72” drogues, make two (2) additional marks at 0-inch and at 9-inches. This forms the “Nine-Inch Green Zone.” (Not Shown)

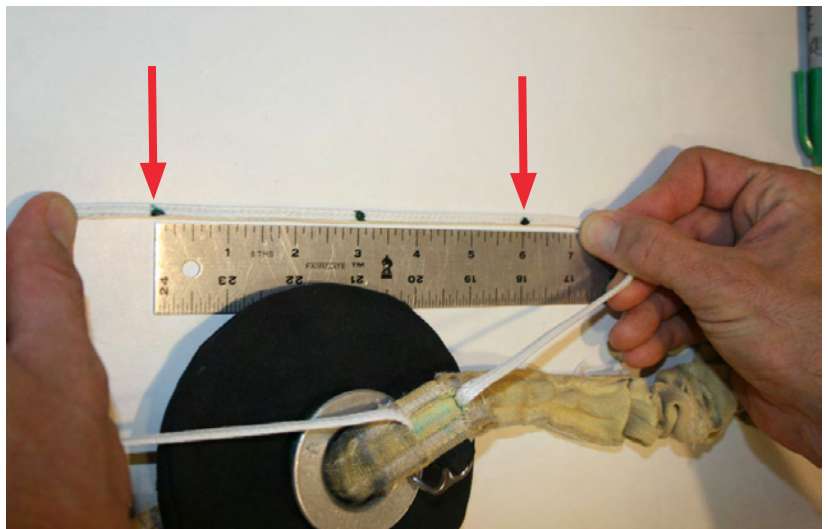


Figure 34. Make two (2) Additional Marks

35. Mark the “Green Zone” completely with the green permanent marker. Ensure the green zone covers the entire circumference of the centerline.

54” and 60” Drogues: 6-Inch Green Zone (as shown)

72” Drogues: 9-Inch Green Zone (Not Shown)



36. Mark the “Green Zone”

37. Feed the centerline back into the Kevlar bridle by pulling both sides of the bridle.

Centerline replacement is now complete. Reattach the #5 Rapide link to the main deployment bag.

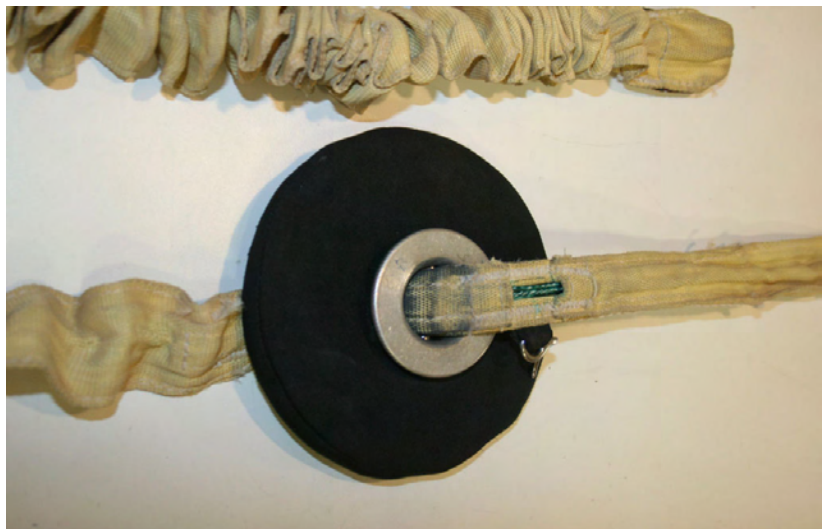


Figure 35. Pull Centerline Back into Outer Bridle

HOW TO SHORTEN THE CENTERLINE

38. If the centerline must be shortened slightly to bring it back into proper tolerance, various knots may be used. The photo shows the standard loop connection.



Figure 36. Standard Connection to Rapide Link

39. Use of a lark's head knot will generally shorten the centerline by 3/4 Inch.



Figure 37. Lark's Head Knot

40. Use of one (1) overhand knot (tied within the single section of line) will generally shorten the centerline by 1-1/8 Inches.



Figure 38. Overhand Knot (Single Line Thickness)

41. Use of a single overhand knot (tied within the finger-trapped section of line) will generally shorten the centerline by 2 Inches.

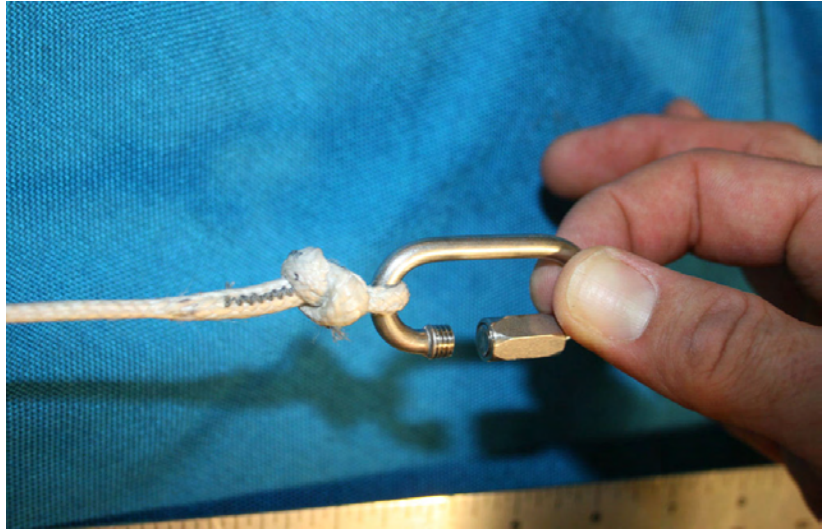


Figure 39. Overhand Knot (Double Line Thickness)

42. Use of two (2) overhand knots (tied side-by-side within the single section of line) will generally shorten the centerline by 2-3/8 Inches.



Figure 40. Two (2) Overhand Knots (Single Thickness)