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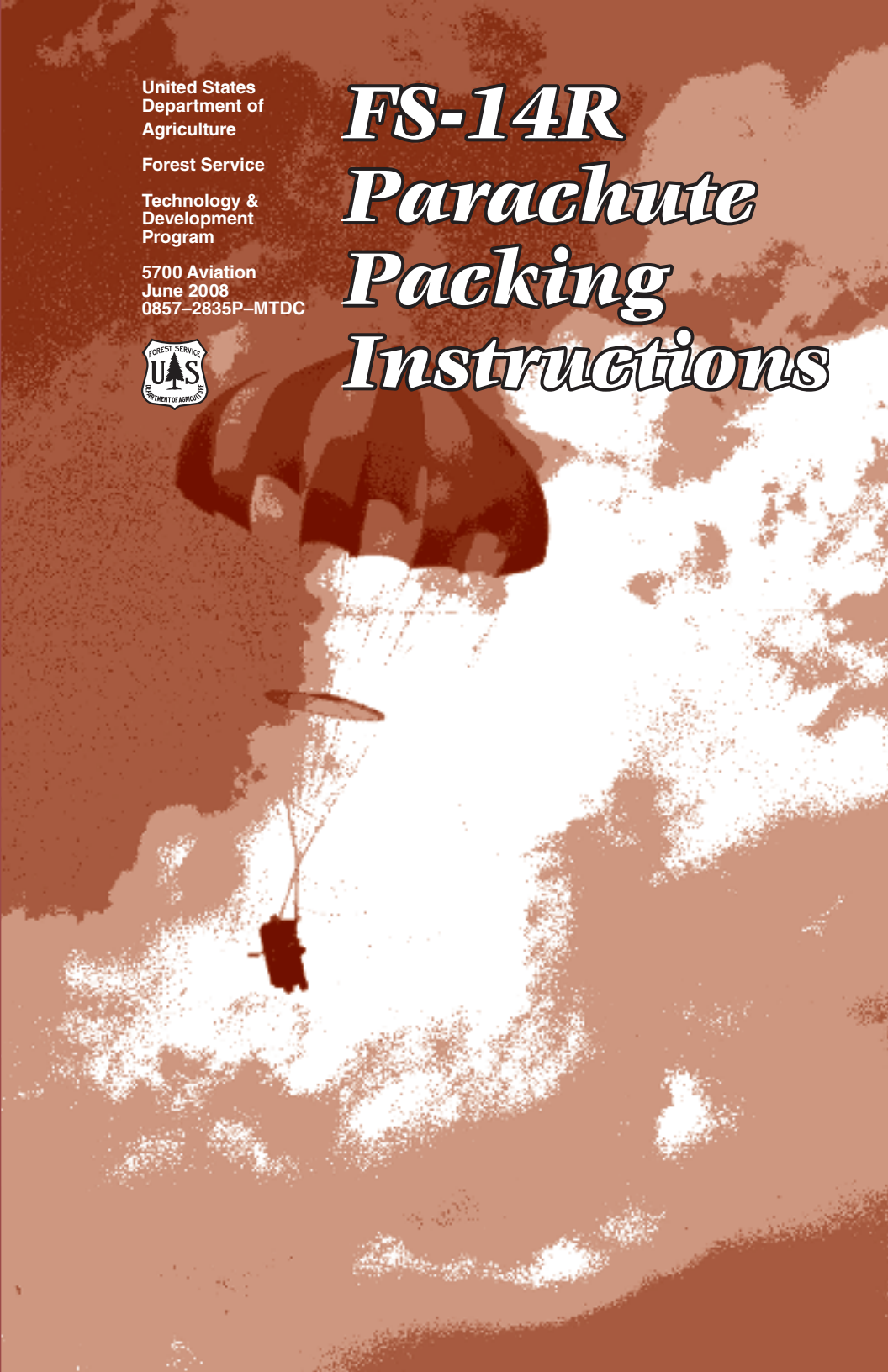
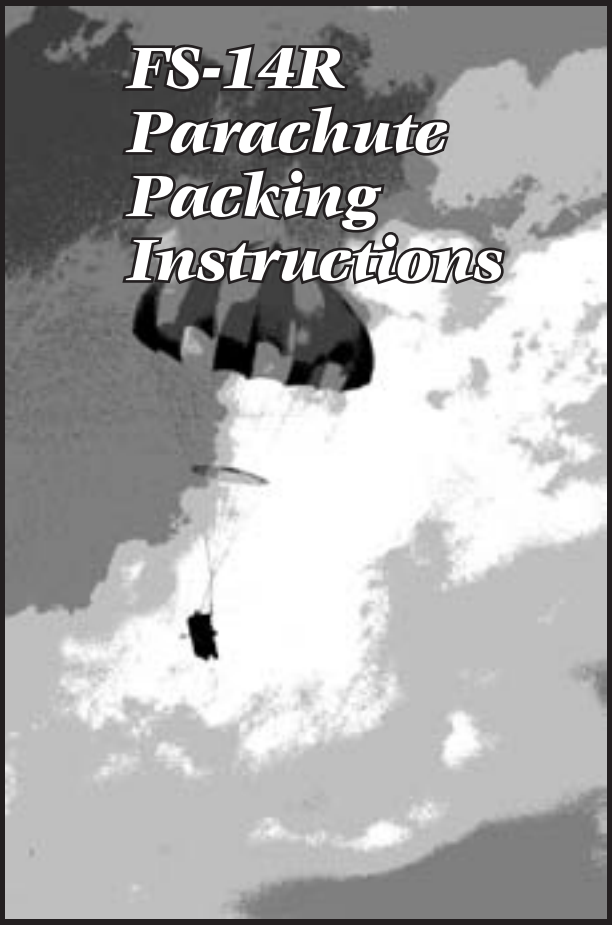
FS-14R Parachute Packing Instructions





FS-14R Parachute Packing Instructions

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Technology & Development Program • Missoula, MT

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System

Before you begin to assemble the FS-14R reserve parachute, make sure you have these components available (figure 1):

Pilot chute
✔ Bridle cord
✔ Canopy
✔ Container
✔ Rubberbands
✔ Ripcord handle
✔ Soft cones
✔ Risers
✔ Safety pins with lanyards (two each)
✔ Tube Stoes

Figure 1—Components of the FS-14R parachute.

To begin assembling:

1. Attach the pilot chute to the bridle with three 42-stitch bar tacks.
2. Install the soft cones into the soft cone pocket on the pilot chute.
3. Attach the risers and cross tie to the connector links.
4. Attach the canopy system to the container.

Important Notes

- Do not let the suspension lines touch the Velcro hook on the container. The hook may snag and damage suspension lines.

- During winter storage when the reserve is not in use, do not leave the parachute packed with the pilot chute compressed. The pilot chute spring will take a set if it remains compressed for months at a time. About 5 inches of spring travel could be lost.

- Inspect the soft cones before rigging the parachute to ensure that they are not frayed or weakened. Replace the soft cones as necessary.

- Use only 1¼-inch rubberbands for all suspension line stows. These rubberbands are available from:

  Para-Gear Equipment Co. Inc.
  3839 West Oakton St.
  Skokie, IL 60076–3438
  Phone: 800–323–0437
  Web site: *http://www.paragear.com*

- Use only Micro-line T88-MTS Tube Stoes for diaper-locking stows. These Tube Stoes are available from:

  Sky Systems USA Inc.
  1407 Flightline Blvd.
  Unit 13
  Deland, FL 32724
  Phone: 386-734-6001
  Web site: *http://www.skysystemsusa.com*

Assembly and Layout

All directions (right, left, top, and bottom) are referenced from a jumper wearing the parachute lying face down, head toward the canopy.

1. When attaching the pilot chute to the bridle cord, route the bridle webbing through the openings in the mesh on the bottom of the pilot chute. Lay the hot-cut end of the bridle cord on the reference mark on the webbing about 8 inches from the hot-cut end of the bridle webbing. Secure the end of the webbing to the bridle with three 42-stitch bar tacks, ¾-inch wide. The bar tacks should be centered on the webbing (figure 2).

Figure 2—Bridle attachment to the pilot chute.

2. Straighten the apex and vent. Equalize the vent lines and make sure that the pilot chute bridle is centered on the vent lines. Recheck the vent hem alignment, then tie a 15-inch piece of 80-pound cotton break tape around the vent lines 4 to 6 inches from the top. Pull this knot as tight as possible without breaking the tape. Make the tie one turn (single) and tie it off with a surgeon's knot and a locking knot (figure 3).

This break tie serves to keep the pilot chute bridle centered on the apex lines and ***MUST BE INSTALLED. THE PARACHUTE HAS NOT BEEN TESTED WITHOUT THE BREAK TIE INSTALLED.***

Figure 3—Pilot chute bridle attachment to the apex of the canopy and break tape tie on vent lines.

3. Place the canopy on the packing table with the stamp panel between lines 1 and 20 on top. In proper layout, lines 1 and 20 run clear from the skirt, through the slider to the inside of the connector links. Lines 10 and 11 run to the outside of the connector links (figure 4). Position the diaper between the table and the canopy.

4. Attach the risers and the cross tie to the connector links. The riser snaps should face down. The cross tie should connect the two inside edges of the connector links with no twists (figure 5).

Figure 4—Four-line check.

Figure 5—Riser and cross tie attachment to the connector links.

5. Connect the reserve safety pins to the reserve snaps, using either red or green Type IIA Mil–C-5040 suspension cord. Finger trap two loops into the cord. Route one loop through the attachment bar of the reserve snap and one loop through the rubber grommet in the center of the safety pin. Secure both loops with either a 28- or 42-stitch bar tack (figure 6).

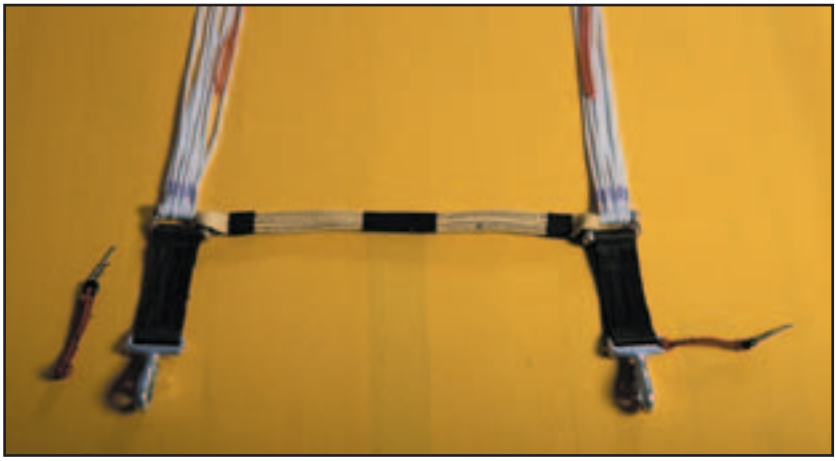

Figure 6—Safety pin attachment to the reserve snaps.

6. Tack the steering loops to lines 3 and 18 with red safety tie thread. This step will ensure clean deployment (figure 7).

Figure 7—Steering loops tacked to suspension lines 3 and 18.

Compressing the Pilot Chute

1. Insert the soft cone loops into the soft cone pocket. Secure the soft cone pocket with a double turn of red safety seal thread. Secure the thread with a surgeon's knot and locking knot (figure 8).

Figure 8—Insert the soft cone loops into the pilot chute.

2. Bring as much excess material as possible to the top of the pilot chute before compressing the spring (figure 9).

3. Compress the spring and lock the pilot chute by inserting the pilot chute locking rod through the packing tab grommet, running it across the top of the pilot chute and through the packing tab grommet on the other side.

4. Make the pilot chute clean and compact by stuffing excess pilot chute material around the pilot chute spring. Run two pullup cords through the soft cone loops (figure 10).

Figure 9—Compress the pilot chute.

Figure 10—Compressed pilot chute with locking rod and pullup cords.

Flaking and Folding the Canopy

1. Before flaking the canopy, do a four-line check to ensure that all lines are clear. Move the slider down the suspension lines halfway between the canopy skirt and risers. Straighten the apex to ensure that the canopy skirt is even (figure 11).

Figure 11—Four-line check.

2. Beginning with line 11, flake the canopy in the normal manner. When flaking is complete, the stamp panel gore 20, with mesh, will be on the top left side, and gore 10 will be on the bottom right side (figure 12).

Figure 12—Canopy layout after flaking.

3. Follow line 20 down to the corresponding grommet on the slider. Grab the top of the slider and pull it as far into the air channel of the canopy as possible (figure 13). The grommets of the slider should be just below the skirt where the suspension lines are attached (figure 14).

Figure 13—Insert the slider into the flaked canopy.

4. After inserting the slider into the main canopy, flake each gore of the slider into the corresponding folds of the canopy (figures 15 and 16).

5. Place a shot bag over the line groups just below the edge of the slider.

Figure 14—Slider grommet position on the radial tape.

Figure 15—Flaking the slider into the canopy skirt.

Figure 16—Canopy layout with flaked slider inside the canopy.

6. Fold the skirt 90 degrees so that the skirt edge is parallel to the radial tapes (figure 17).

7. Long-fold the canopy four times. Always fold the right side, then the left side. The first two folds should be the same width, with each fold overlapping the center by 2 to 3 inches (figures 18 and 19). The third and fourth folds should also overlap the center slightly (figures 20 and 21).

Figure 17—Fold the skirt 90 degrees.

Figure 18—First long fold.

Figure 19—Second long fold.

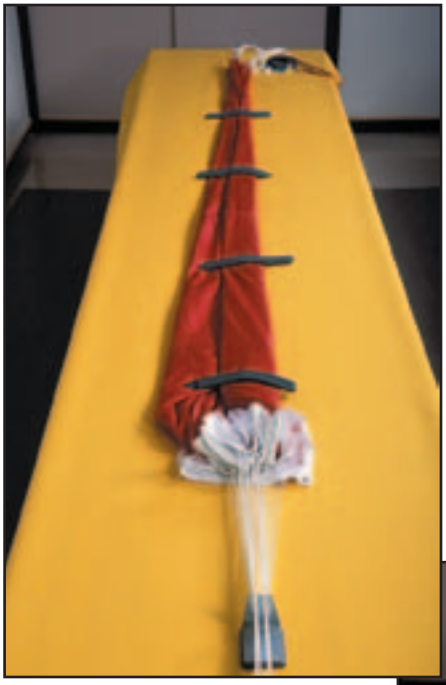

Figure 20—Third long fold.

Figure 21—Fourth long fold.

Closing the Diaper

1. Release the risers from the tensioning device. Place a shot bag on top of the risers to prevent them from twisting and to keep nominal tension on the lines (figure 22).

Figure 22—A shot bag is placed on the risers for tension.

2. Fold the right side of the slider skirt up 90 degrees so it is parallel to the radial seams. Fold the left side of the slider skirt over so it is parallel to the bottom of the diaper. This will more evenly distribute the bulk of the slider skirt (figure 23).

3. Bring both line groups up over the skirt (figure 24).

Figure 23—Folding method for the slider skirt.

Figure 24—Bring both line groups over the skirt.

4. Wrap the diaper around the canopy and suspension lines. Route the Tube Stoes on the left side of the diaper through the diaper grommets (figure 25).

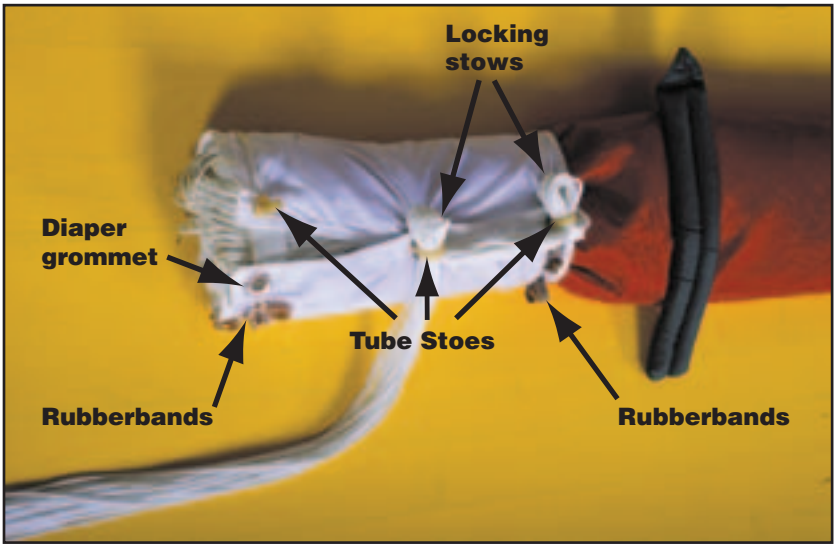

Figure 25—Route the Tube Stoes through the diaper grommets to secure the locking stows.

5. Close the diaper by making locking stows through the three Tube Stoes. Work from the top of the diaper down. Use 1-inch bights on the locking stows, ***single***-wrapping the Tube Stoes (figure 26).

6. Make the first line stow after completing the locking stows. Secure the line stow with a ***single***-wrap of the rubberband (figure 27).

Figure 26—Both line groups in the three locking stows.

Figure 27—First stow after the locking stows.

7. Stow the remaining suspension lines on the diaper in 1-inch bights ***single***-wrapped with rubberbands. Leave 10 to 15 inches of suspension lines unstowed for placement in the container (figure 28).

Figure 28—Complete the line stows on the diaper.

Attaching the Canopy to the Container

1. Install the riser snaps in the snap retainers on the container (figure 29).

2. Place the cross tie in a 'U' shape in the container to distribute its bulk (figure 30).

Figure 29—Insert the risers into the container.

Figure 30—Cross tie placement in the container.

Stowing the Canopy in the Container

1. All directions (right, left, top, and bottom) are referenced from a jumper wearing the parachute lying face down, head toward the canopy. When you are done stowing the canopy and closing the container, the pack should look like figure 31.

2. Place the skirt of the canopy and slider in the bottom left-hand corner of the container with the diaper locking stows on top. Position the remainder of the line stows so they face the inside of the container (figure 32).

Figure 31—Packed FS-14R parachute and container.

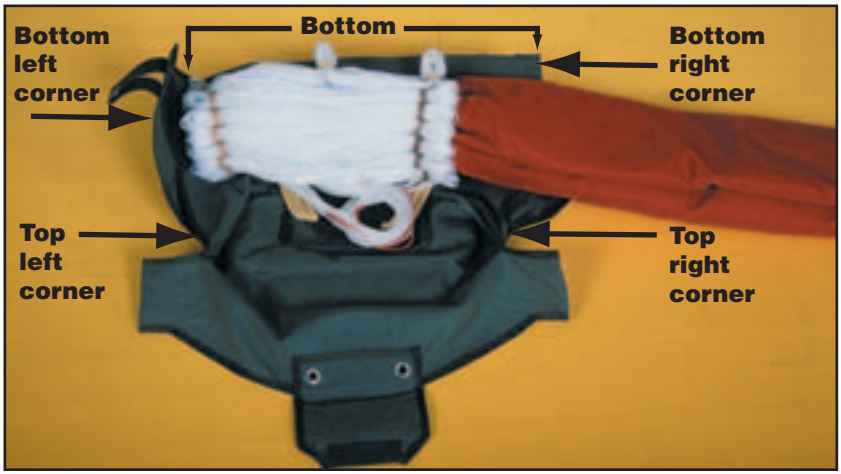

Figure 32—Position the skirt in the bottom left corner of the container.

3. Make one S-fold in front of the line stows filling the bottom corners of the container evenly (figure 33).

4. Make a second S-fold from left to right in front of the first fold, filling both the top left and right corners (figure 34).

Figure 33—The first S-fold fills the bottom corners.

Figure 34— The second S-fold fills the top left and right corners.

5. Fold the remainder of the canopy in flat accordion folds across the top of all the previous folds. Make the first flat accordion fold from the top right corner to the bottom left corner of the container (figure 35a). Alternate the folds so they evenly fill both the top and bottom corners of each side of the container (figure 35b).

Figure 35a—Make the first flat accordion fold from the top right corner to the bottom left corner of the container.

Figure 35b—Flat accordion folds on top of all previous folds.

6. Fold the apex under the last fold far enough to cover all of the vent lines (figure 36).

Figure 36—Fold the apex under the last fold to cover all vent lines.

7. S-fold the pilot chute bridle on the center of the top fold. Take care to ensure the bridle is not twisted (figure 37).

8. Place the chute on top of the pilot chute bridle with the soft cones parallel to the grommets on the container's top and bottom flaps (figure 38).

9. Route the left pullup cord through the left grommet on the bottom container flap. Repeat with the right pullup cord. Lock the soft cones with temporary pins (figure 39).

Figure 37—S-fold the pilot chute bridle on the center of the top fold.

Figure 38—The pilot chute shown on top of the bridle and canopy.

Figure 39—Route the pullup cords through bottom flap grommets.

10. Route the left pullup cord through the left grommet of the top container flap and lock the soft cone with a temporary pin. Repeat with the right pullup cord (figure 40).

Figure 40—Route the pullup cords through top flap grommets.

11. Remove the pilot chute locking rod (figure 41).

12. Route the left pullup cord through the grommet on the left side flap and lock the soft cone with a temporary pin. Repeat the procedure with the right pullup cord (figure 42).

13. Pull the left pullup cord. Remove the left temporary pin from the soft cone. Insert the left curved ripcord pin of the ripcord handle into the soft cone. Pull the right pullup cord. Remove the right temporary pin from the soft cone. Insert the right curved ripcord pin of the ripcord handle into the soft cone. Match the Velcro on the handle with the corresponding Velcro on the container (figure 43).

Figure 41—Remove the pilot chute locking rod.

Figure 42—Close the side flaps.

Figure 43—Insert the curved ripcord pins on the ripcord handle.

14. Rotate the pullup cords under the curved ripcord pins. Slowly remove the cords from the soft cone loops, taking care to avoid friction burns that will damage the soft cones (figure 44).

Figure 44—Rotate the pullup cords under the curved ripcord pins, then remove them.

15. Dress the container with a packing paddle. Fill out the packing data card and install the reserve knife in the pocket on top of the container. Check to see that both safety pins are attached to the reserve snaps (figure 45).

Figure 45—The reserve container after final dressing.

16. Install the safety seal (figure 46).

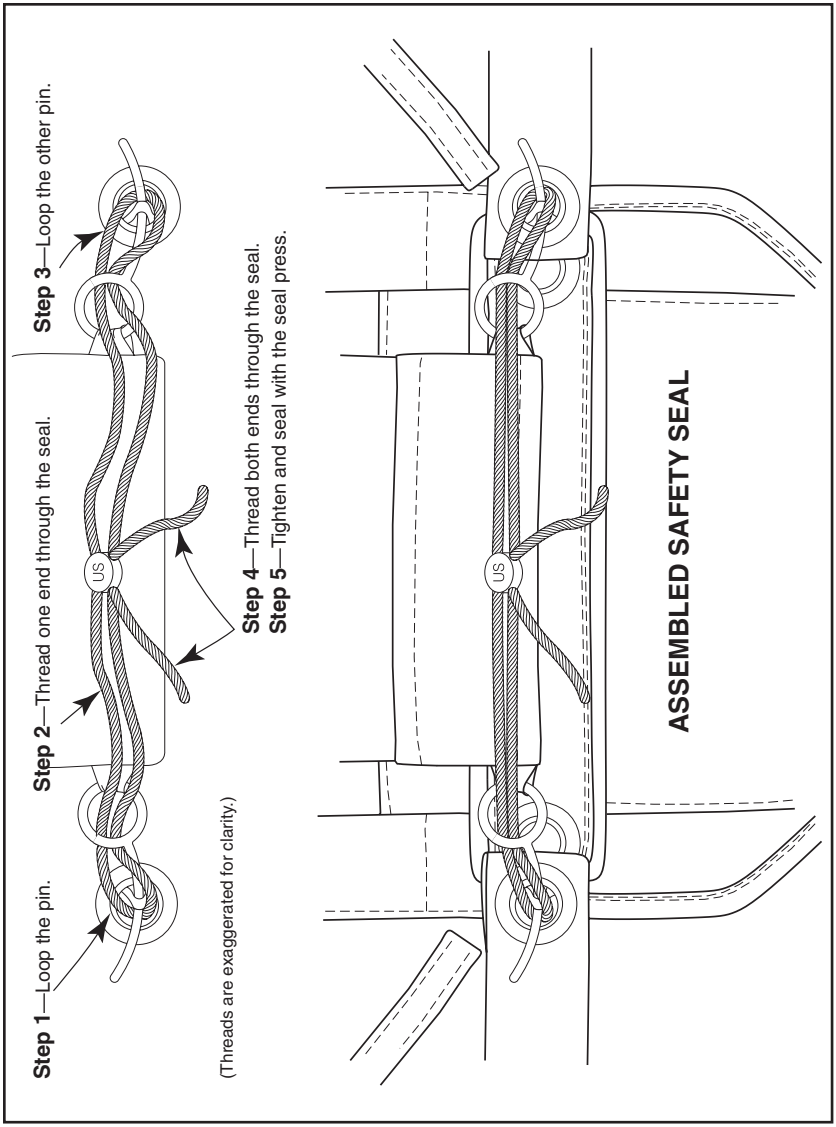

Figure 46—Installing the safety seal.

Notes

Kovalicky, John. 2008. FS-14R parachute packing instructions. Tech. Rep. 0857–2835P–MTDC. Missoula, MT: U.S. Department of Agriculture, Forest Service, Missoula Technology and Development Center. 34 p.

This report provides instructions for packing the FS-14R reserve parachute used by Forest Service smokejumpers and includes color photographs describing each step. It replaces “FS-14R Parachute Packing Instructions” (0257–2814–MTDC).

Keywords: guide, manual, photographs, reserve, smokejumping

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