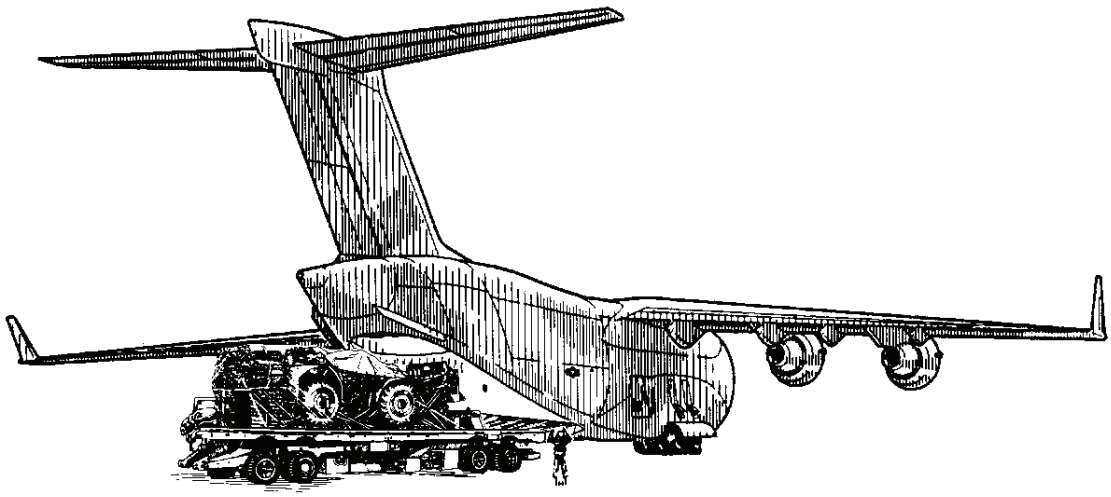
TM 4-48.04 (FM 4-20.142)
MCRP 4-11.3P
NAVSEA SS400-AD-MMO-010
TO 13C7-51-21

Airdrop of Supplies and Equipment: Rigging Loads for Special Operations

August 2012



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Headquarters, Department of the Army
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Technical Manual (TM)
No. 4-48.04 (FM 4-20.142)
Marine Corps Reference Publication
No. 4-11.3P
Naval Sea Command
No. SS400-AD-MMO-010
Technical Order
No. 13C7-51-21

Headquarters
Department of the Army
United States Marine Corps
Department of the Navy
Department of the Air Force
Washington, DC, 6 August 2012

AIRDROP OF SUPPLIES AND EQUIPMENT: RIGGING LOADS FOR SPECIAL OPERATIONS

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***This publication supersedes FM 4-20.142/MCRP 4-11.3P/NAVSEA SS400-AD-MMO-010/TO 13C7-51-21, dated 19 September 2007.**

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Preface

SCOPE

This manual tells and shows how to rig the following airdrop loads for special operations:

- Four different High Speed Low Level Aerial Delivery System (HSLLADS) container loads rigged for airdrop from the MC-130 aircraft.
- Two different inflated Combat Rubber-Raiding Crafts (CRRC) rigged on a Combat Expendable Platform (CEP) for low-velocity airdrop from a C-130 or C-17 aircraft.
- The Rigging Alternate Method Zodiac (RAMZ) is rigged in an A-22 container for low-velocity airdrop from a C-130 or C-17 aircraft.
- The Naval Special Warfare Rigid Inflatable Boat (NSWRIB) is rigged for low-velocity airdrop on a specially designed platform from a C-130 or C-17 aircraft.
- Two different Advanced Rescue Crafts (ARC) rigged on a combat expendable platform (CEP) for low velocity airdrop from a C-130 or C-17 aircraft.
- The Wind Supported Aerial Delivery System (WSADS) Snow Goose is a low-cost, reusable, fully autonomous, Unmanned Aerial Vehicle (UAV) that can be used to carry out a variety of missions at otherwise inaccessible locations for low velocity airdrop from a C-130 or C-17 aircraft.

USER INFORMATION

This publication applies to the Active Army, the Army National Guard (ARNG)/Army National Guard of the United States (ARNGUS), and the United States Army Reserve (USAR), the U.S. Air Force, Air National Guard (ANG), and Air Force Reserve Command (AFRC).

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Introduction

DESCRIPTION OF ITEMS

The descriptions of the items rigged in this manual are given below:

- **High Speed Low Level Aerial Delivery System (HSLLADS):** The HSLLADS container is an adjustable container made of an A-21 cargo cover and other airdrop items. The dimensions and weight capacity of the container is determined by the load being airdropped.
- **Zodiac F470U Combat Rubber Raiding Craft (CRRC):** The inflated Zodiac 470U boat is airdropped singly or in pairs. Each boat is 75 inches wide, 22 inches high, 185 inches long and may be airdropped utilizing a roll-up floor or hard deck. A single boat weighs approximately 322 pounds.
- **Zodiac F470U Combat Rubber Raiding Craft rigged in an A-22 Container or Rigging Alternate Method Zodiac (RAMZ):** The boat is rigged in an A-22 container rigged for low-velocity airdrop over water. The boat is deflated and rigged for rapid inflation and deployment once in the water.
- **Naval Special Warfare Rigid Inflatable Boat (NSWRIB):** The NSWRIB is 108 inches wide, 100 inches high and 432 inches long. The boat rigged on its platform can weigh a maximum of 20,640 pounds.
- **Advanced Rescue Craft (ARC):** The ARC is rigged on a 48- x 87-inch combat expendable platform for low-velocity airdrop. The load can be rigged with or without a 20-man life raft and a rescue board, a rucksack, and an aid bag. The ARC is 70 inches high, 48 inches wide and 111 inches long. The ARC is 1,140 pounds when rigged.
- **Snow Goose:** The Wind Supported Aerial Delivery System (WSADS) Snow Goose is a low-cost, reusable, fully autonomous, unmanned aerial vehicle (UAV) that can be used to carry out a variety of missions at otherwise inaccessible locations. It is quickly configurable for air or ground launch deployable missions.

SPECIAL CONSIDERATIONS

CAUTION

Only ammunition listed in FM 4-20.153/MCRP 4-11.3B/TO 13C7-18-41 may be airdropped. Only ammunition and supplies approved for high velocity or HSLLADS airdrop may be airdropped by HSLLADS. When a dangerous material is being rigged, the container must be marked, labeled and comply with AFMAN 24-204(I)/TM 38-250/NAVSUP PUB 505/MC0 P4030.19I/DLAI 4145.3. A copy of this manual must be available to the joint airdrop inspectors during the before and after loading inspections.

HSLLADS Container. The following items apply to the HSLLADS container:

- A multiple drop of four HSLLADS containers may be airdropped on one pass provided the total weight of the load does not exceed 2,200 pounds.
- The type XXVI nylon webbing used to secure multiple HSLLADS loads will be furnished by the US Army.
- HSLLADS containers are airdropped from the MC-130 aircraft only.

Note. For Air Force use only. A HSLLADS container weighing at least 250 pounds may be airdropped for continuance training purposes only, provided the 35 pounds per square foot minimum is maintained. For unilateral training loads honeycomb is not required.

Boats and Parachutists. The following items apply to boats and parachutists:

- At no time will the total number of static lines on the anchor line cable for personnel and cargo exceed 20.
- The total rigged weight of rubber raiding craft loads on CEP must be a minimum of 2,100 pounds. Sandbags or other ballast may be added to the platform for this purpose.

Joint Airdrop Inspection Record Checklists. Joint Airdrop Inspection Record Checklists are provided for local reproduction in Appendix A. Use the checklists for joint airdrop inspections with DD Form 1748-1, *Joint Airdrop Inspection Record (Containers)*, as follows:

- Fill in the heading of DD Form 1748-1.
- Cross out blocks 12 and 13.
- Write in "See Attached Checklist" in block 16 remarks.
- Make three copies of the checklist and attach them to DD Form 1748-1.
- Use the checklist, as required.
- Sign DD Form 1748-1.
- Keep each checklist together as a complete record.

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Chapter 1

Rigging High Speed Low Level Aerial Delivery System (HSLLADS) Container Loads

SECTION I-RIGGING THE CONTAINER

DESCRIPTION OF LOAD

1-1. The HSLLADS container (Figure 1-1) is an adjustable container made of an A-21 (nylon) cargo cover and other airdrop items. The assembled items are rigged to ensure that the container will withstand the shock of the parachute opening when airdropped at high speeds.

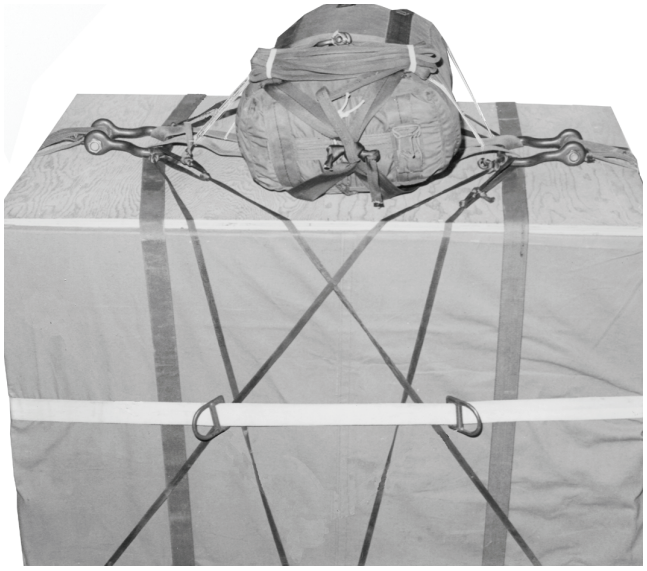


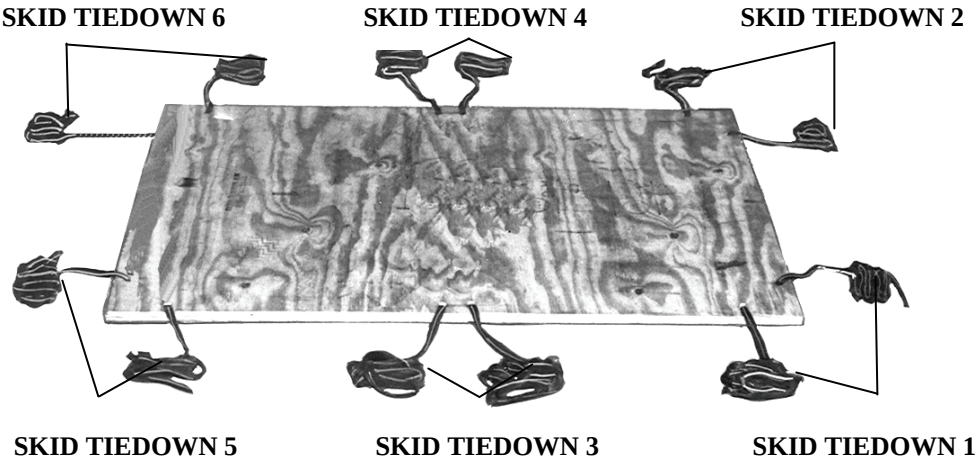
Figure 1-1. High Speed Low Level Aerial Delivery System (HSLLADS)

PREPARING CONTAINER

1-2. Dimensions of the load base in these procedures are typical. The size of the load base may change to fit other supply loads. Prepare the load base and HSLLADS container as shown in Figures 1-2 and 1-3.

CAUTION

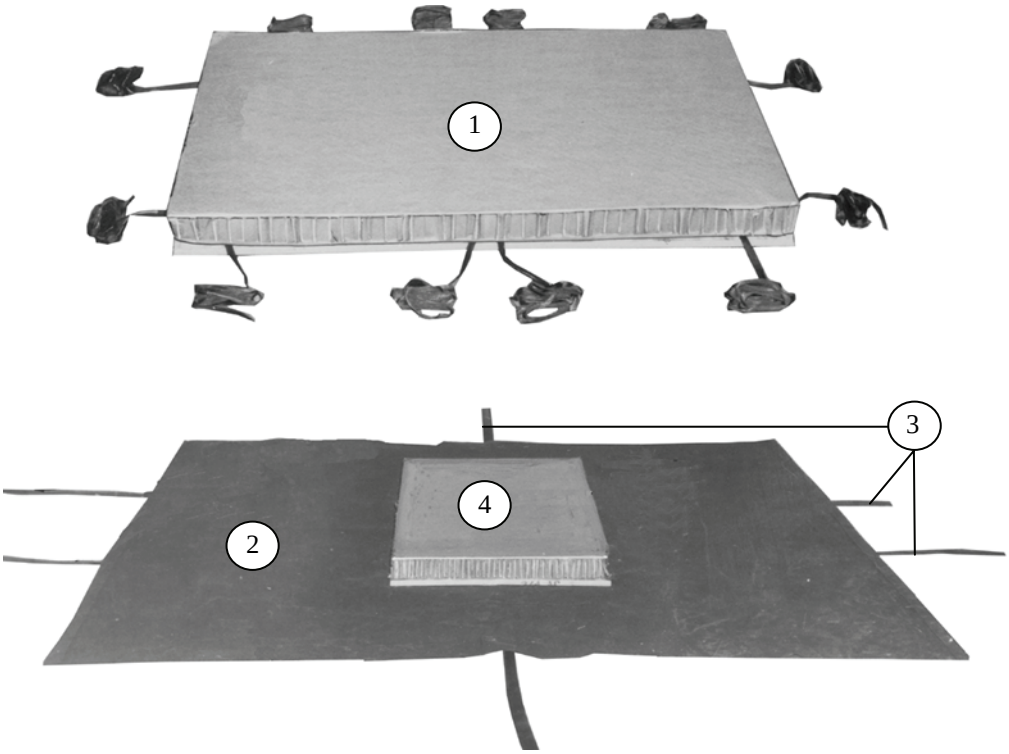
When a container is rigged for delivery from Air Force aircraft, the rigged weight divided by the largest surface area (measured in square feet) must be a minimum of 35 pounds per square foot.



1. Drill 1/2-inch diameter holes 4 inches from each corner and 1 inch from the edge of a 3/4- by 30- by 48-inch piece of plywood.
2. Center two additional 1/2-inch diameter holes on each 48 inch side of the skid 4 inches from each other and 1 inch from the edge.
3. Thread a 12-foot length of 1/2-inch tubular nylon webbing through each pair of holes in the skid. (Doubled, type III nylon cord may be used).

Note. Denoted skid tiedown numbers are referred to in Figure 1-7.

Figure 1-2. Skid Prepared



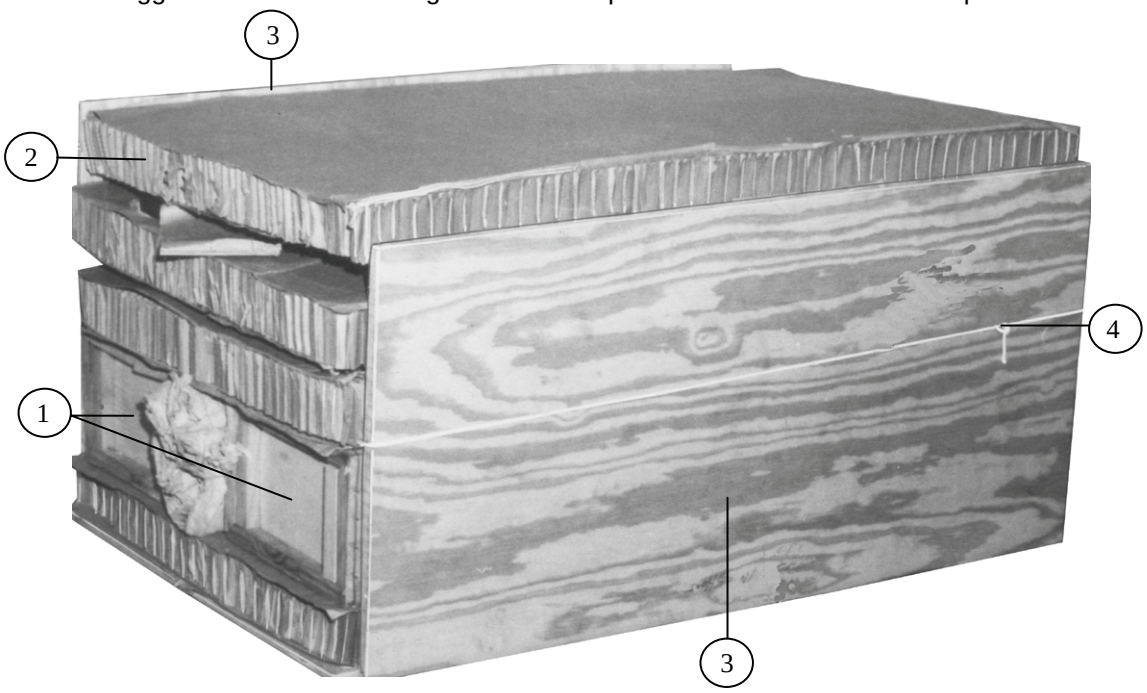
1. Center a 30- by 48-inch piece of honeycomb on the skid.
2. Thread three 12- foot lengths of type X nylon webbing through the keepers on the A-21 cargo cover.
3. Place the cover, with the webbing down, on top of the honeycomb and skid.
4. Center another 3/4- by 30- by 48-inch piece of plywood and a 30- by 48-inch piece of honeycomb on top of the cargo cover. This is the load base.

Figure 1-3. A-21 Honeycomb, Container Cover and Load Base Placed on Skid

LOADING CONTAINER

1-3. Place the items to be airdropped on the honeycomb in the manner shown in Figure 1-4. Place the durable or heavy items on the bottom and the lighter or more fragile items on the middle or top layers. Use the cellulose wadding, felt or honeycomb to cushion the rigged items. Use honeycomb to level and square the load before closing the container.

Note. The rigged container must weigh at least 250 pounds but no more than 600 pounds.



(1) Place the items to be airdropped on the load base.

Note. Only items that have been tested and approved for high-velocity or HSLLADS airdrop may be loaded in this container.

(2) Square the load using the necessary honeycomb pieces.

(3) Place a 3/4-inch piece of plywood cut to fit on each side of the load.

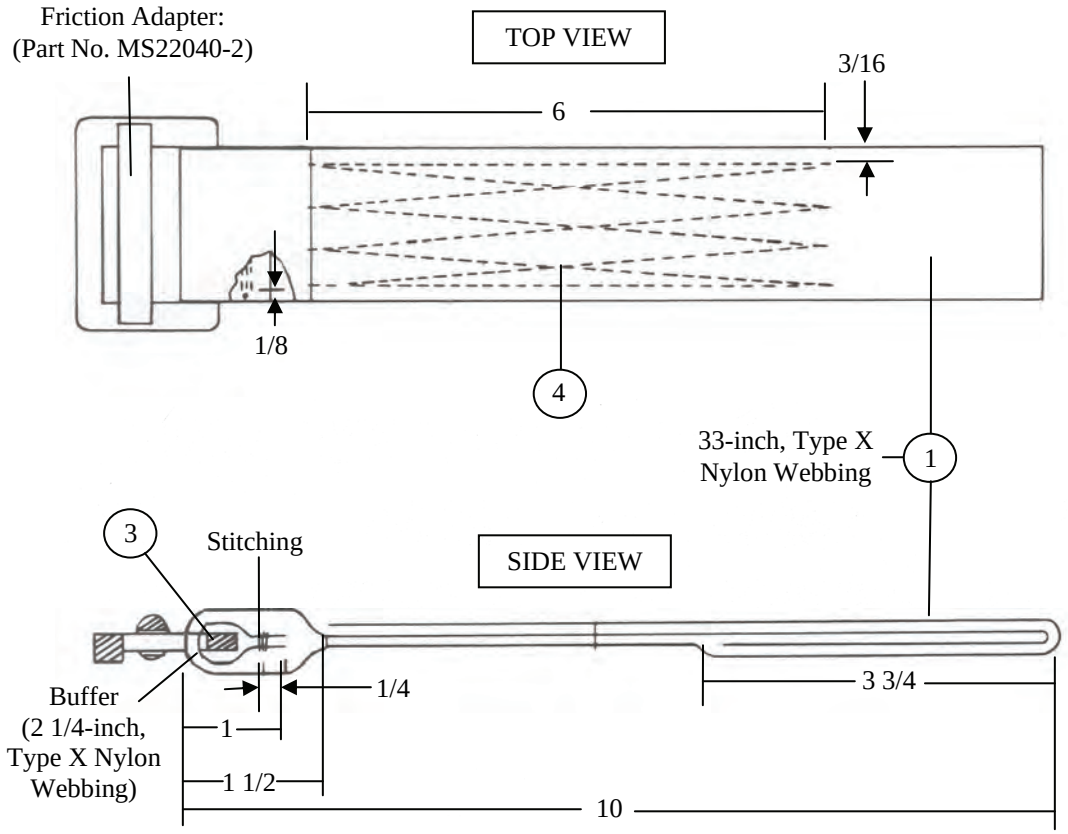
(4) Tie the plywood in place with type III nylon cord.

Figure 1-4. Load Positioned on Load Base with Sideboards in Place

CONSTRUCTING CONTAINER STRAPS

1-4. Construct two container straps as shown in Figure 1-5.

Note. 1. Sewing should be five to seven stitches per inch.
2. All dimensions given are in inches.
3. This drawing is not to scale.

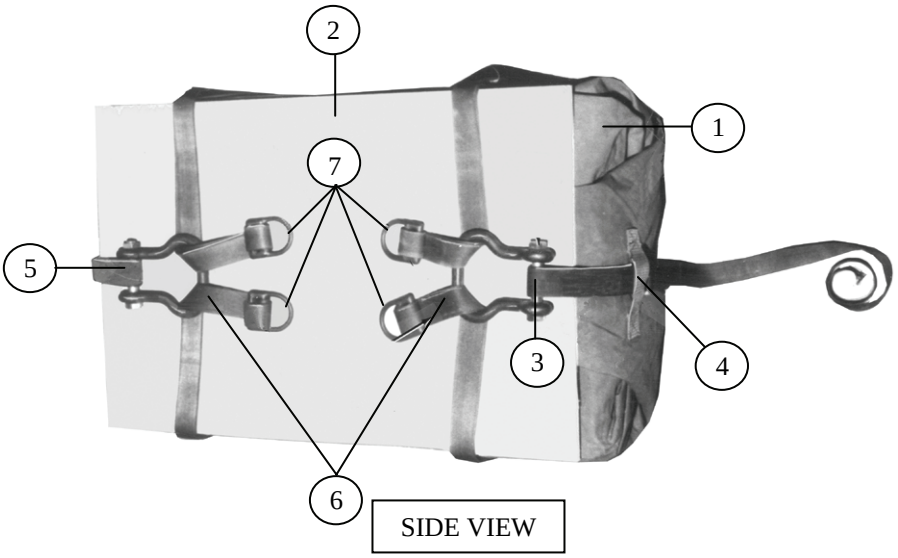


1. Cut a 33-inch and a 2 1/4-inch length of type X nylon webbing.
2. Sear both ends of the webbing (not shown).
3. Sew a friction adapter and buffer in one end and a loop in the other end.
4. Use number 3 or 5 cord and sew the 6-inch, four-point WW stitch.

Figure 1-5. HSLLADS Container Strap Prepared

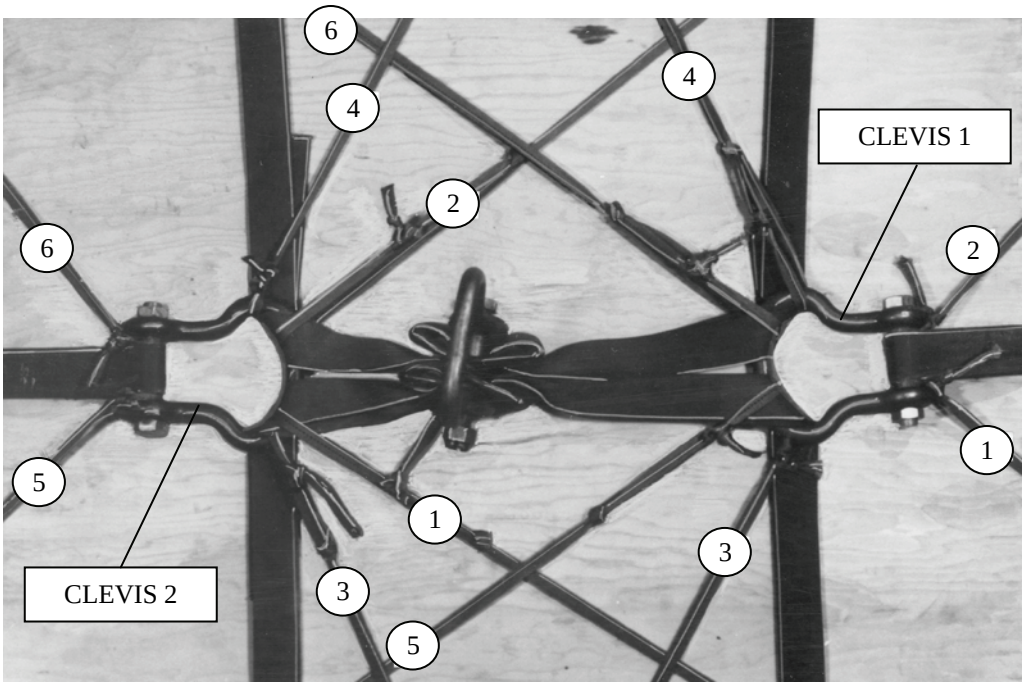
CLOSING CONTAINER AND STOWING PARACHUTE

1-5. Close the container and secure the skid as shown in Figures 1-6 and 1-7. Attach and restrain a 22-foot cargo extraction parachute to the load as shown in Figures 1-8 and 1-9. If a 22-foot cargo extraction parachute is not available, use a 28-foot cargo extraction parachute.



1. Close the cargo cover, and fold under the excess material.
2. Place a 3/4-inch piece of plywood, cut to fit, on top of the load.
3. Fit the loop end of a container strap on the bolt of a cargo suspension clevis.
4. Pass the free end of a 12-foot, type X nylon webbing strap (attached to the A-21 container cover) through the container strap's friction adapter.
5. Attach the second container strap to the other end of the 12-foot, type X nylon webbing strap and then bolt the second cargo suspension clevis in the same manner as in steps 3 and 4.
6. Run the remaining type X nylon webbing straps around the container. Pass the ends of the straps under and up through the cargo suspension clevises.
7. Place a D-ring on each end of the type X nylon webbing straps.

Figure 1-6. HSLLADS Container Closed



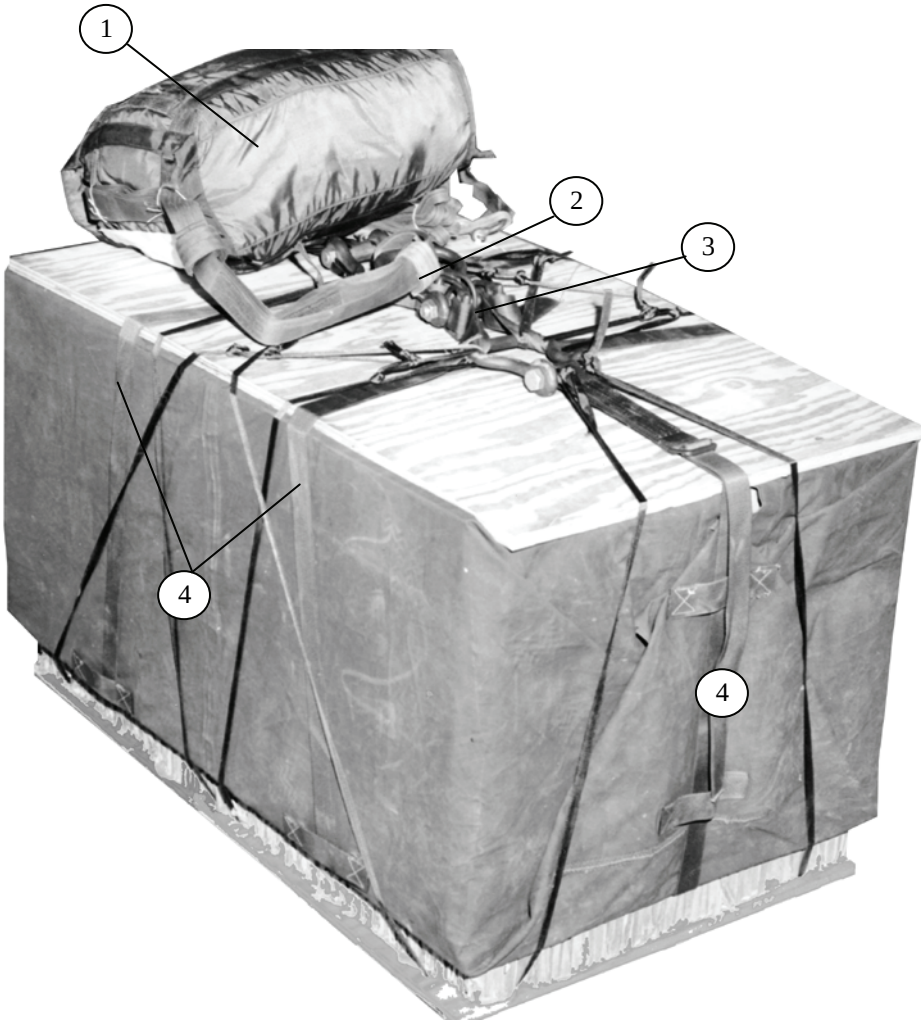
Steps:

1. Tie an end of the 12-foot length of 1/2-inch tubular nylon (positioned on the skid in Figure 1-1) to each clevis indicated below under the first tie column using three half-hitch knots and one overhand knot.

2. Form a loop an appropriate distance from the end of each piece of 1/2-inch tubular nylon for the second tie. Pass the free end through the clevis indicated below in the second tie column and back through the loop. Pull the 1/2-inch tubular nylon tight, and tie it with three half-hitch knots and one overhand knot.

	First Tie	***Second Tie***
1	Clevis 1	Clevis 2
2	Clevis 1	Clevis 2
3	Clevis 1	Clevis 2
4	Clevis 2	Clevis 1
5	Clevis 2	Clevis 1
6	Clevis 2	Clevis 1

Figure 1-7. Skid Tied to the Container

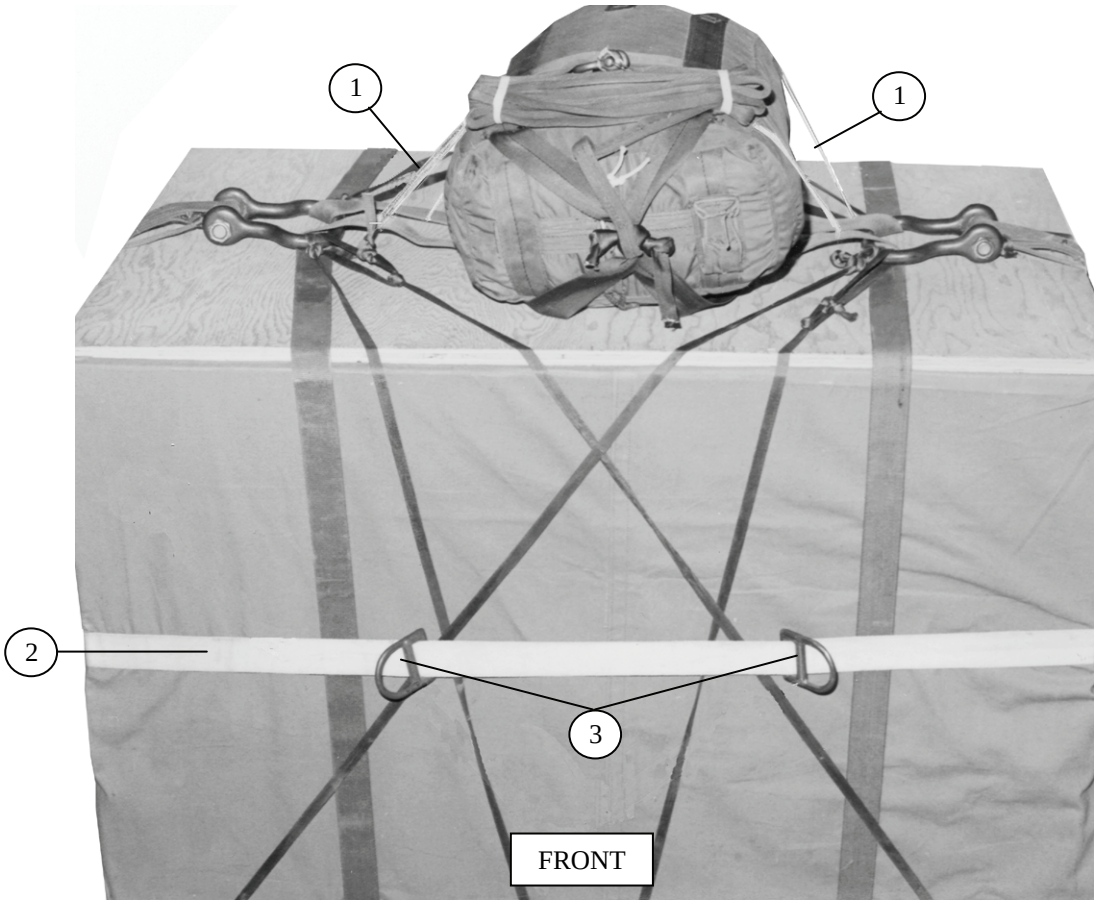


1. Prepare and pack a 22- or 28-foot cargo extraction parachute according to TM 10-1670-277-23&P (28ft) or TM-1670-279-23&P (22-ft).
2. Place the adapter web of the cargo extraction parachute on a cargo suspension clevis.
3. Place four D-rings on the bolt of the cargo suspension clevis that has the adapter web attached.
4. Tighten all straps. Fold any excess webbing, and tape it or tie it with 80-pound cotton webbing.

Figure 1-8. Parachute Prepared

CAUTION

The load band must be as tight as possible to prevent it from stretching when it is attached to the release system.



1. Be sure the parachute is installed so that the apex faces forward in the aircraft. Restrain the parachute to the load with a tie of one turn of single, type I, ¼-inch cotton webbing from each of the four cluster attaching loops to the straps on the container.
2. Use a 15-foot tiedown strap or a length of type XXVI, nylon webbing with two D-rings attached as a load band around the rigged HSLLADS container at the estimated vertical center of balance.
3. Place the two D-rings on the front of the load. Secure the tiedown strap with a D-ring and a load binder.

Figure 1-9. Parachute Restrained and Load Band Installed

EQUIPMENT REQUIRED

1-6. The equipment needed to prepare and rig the HSLLADS container is listed in Table 1-1.

Table 1-1. Equipment Required for Rigging a HSLLADS Container

National Stock Number	*Item*	*Quantity*
4030-00-678-8562	Clevis, 3/4-inch medium	3
4030-00-360-0304	Clevis, small	3
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-360-0321	Cover, canvas, type A-21 bag	1
8135-00-664-6958	Cushioning material (Cellulose wadding)	As required
5365-00-937-0147	D-ring, 10,000- lb	6
8305-00-958-3685	Felt, 1/2-inch	As required
1670-00-753-3928	Pad, energy-dissipating, honeycomb	As required
	Parachute, cargo extraction:	
1670-00-687-5458	22-ft. or	1
1670-00-262-1797	28-ft. with deployment-bag	1
5530-00-618-8073	Plywood, 3/4-inch	As required
1670-00-136-9820	Static line, cargo parachute with universal static line	1
No NSN	Strap, container assembly (fabricated locally)	2
1670-00-937-0271	* Tie-down assembly, 15-ft.	1
	Webbing:	
8305-00-268-2411	Cotton, type I, 1/4-inch	As required
8305-00-082-5752	Nylon, tubular, 1/2-inch	As required
8305-00-268-2455	Nylon, tubular, 1-inch	As required
8305-00-261-8585	Nylon, type VIII	As required
8305-00-261-8584	Nylon, type X	12 yd.
* When the following item is not available, the following items are required:		
1670-00-937-0272	Binder, load, 10,000-lb.	1
1670-00-937-0147	D-ring	2
8305-00-206-9219	Webbing, nylon, type XXVI	15-ft.

SECTION II-MODIFYING AND PACKING THE 22-FOOT AND 28-FOOT CARGO EXTRACTION PARACHUTES

MODIFYING CARGO EXTRACTION PARACHUTE DEPLOYMENT BAG

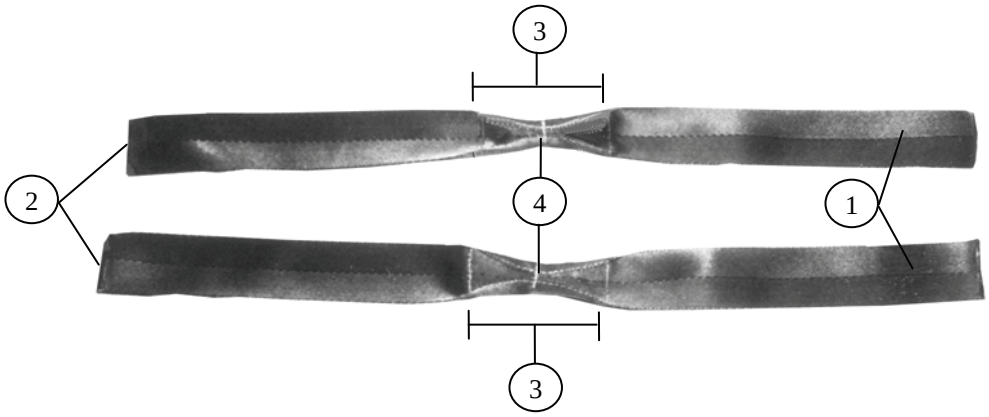
1-7. Remove the pendulum line, safety cords, deployment bag bridle loop, and V-rings from the deployment bag as shown in Figure 1-10. Construct two bridle straps as shown in Figure 1-11. Attach the bridle straps to the deployment bag as shown in Figure 1-12.

Note. 1. If the 28-foot cargo extraction parachute is to be used, the deployment bag must be used. Prepare the bag as you would for the 22-foot cargo extraction parachute.
2. Do not remove the slot reinforcement.



1. Cut the V-rings off the deployment bag.
2. Cut the safety cords off the bag.
3. Cut the bridle loop strap from the deployment bag.

Figure 1-10. Deployment Bag Modified



1. Cut two 24-inch lengths of treated, type VIII nylon webbing.
2. Sear the cut ends.
3. Form a 4-inch roll in the center of each strap.
4. Stitch around the roll and across the center of the roll with ticket 3 nylon cord.

Figure 1-11. Bridle Straps Formed

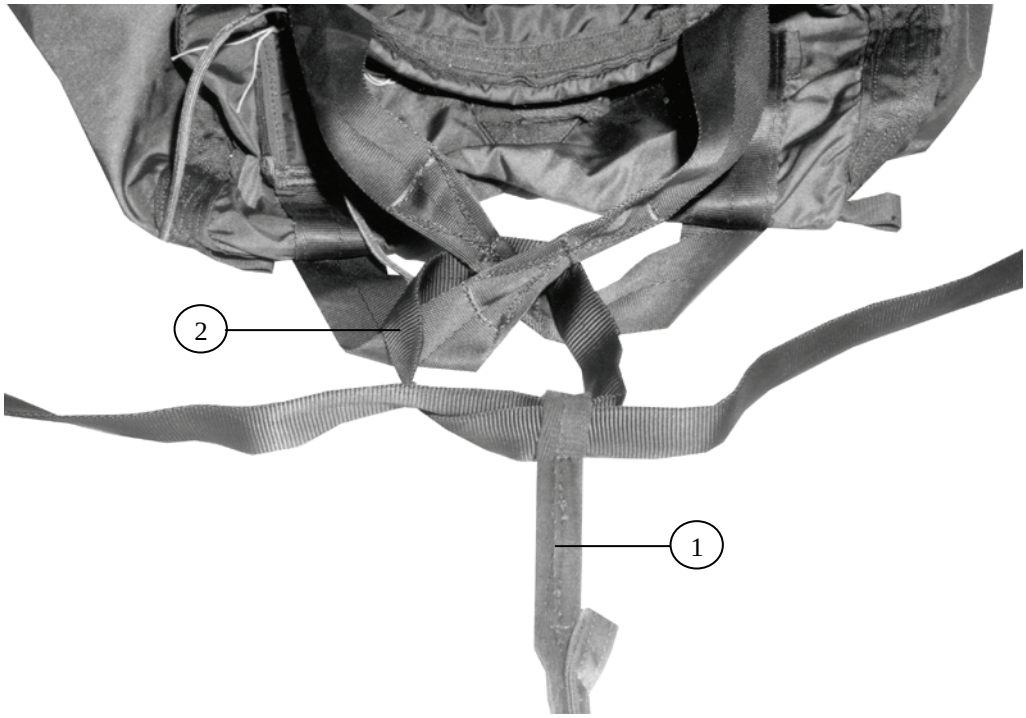


1. Sew one end of a bridle strap to a main strap (on each side of the bag) with a 5-inch four-point WW stitch formation. Use ticket 3 nylon cord.
2. Cross the bridle straps diagonally over the end of the bag. Sew the free end of each bridle strap to the main strap on the other side of the bag with a 5-inch four-point WW stitch formation.

Figure 1-12. Bridle Straps Attached to the 22-Foot Cargo Extraction Parachute Deployment Bag

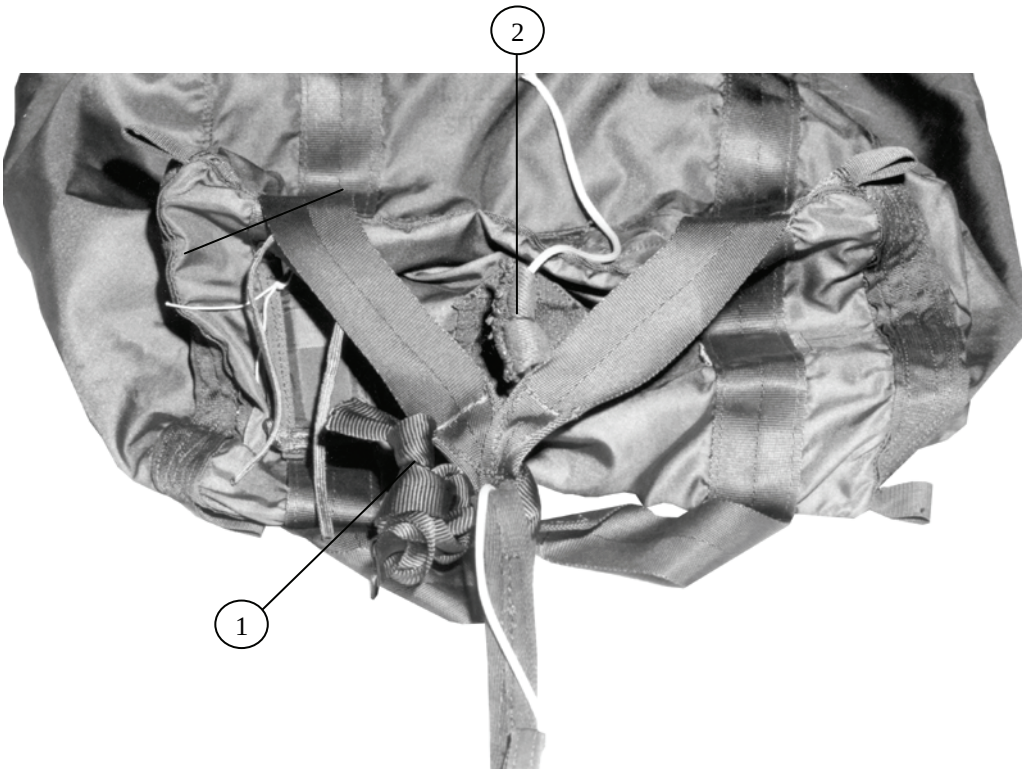
ATTACHING STATIC LINE AND BRIDLE LOOP BREAKCORD

1-8. Using the G-14/Universal Static Line (USL) cargo parachute static line, attach the static line to the bag bridle straps with a length of 1-inch tubular nylon webbing as shown in Figure 1-13. Make the bridle loop break cord tie as shown in Figure 1-14. Stow the static line as shown in Figure 1-15.



1. Use G-14 cargo parachute static line or USL.
2. Pass a length of 1-inch tubular nylon webbing through the static line break cord attaching loop and around the crossed bridle straps to make a two-ply tie.

Figure 1-13. Static Line Positioned



1. Secure the 1-inch tubular nylon webbing with a surgeon's knot, locking knot, and an overhand knot in the running ends.
2. Pass a length of coreless type III nylon cord through the parachute bridle loop and through the static line break cord attaching loop.
3. Tie the coreless type III, nylon cord using a surgeon’s knot and locking knot with an overhand knot in the running end (not shown).

Figure 1-14. Static Line Attached and Bridle Loop Break Cord Placed and Tied

STOWING SUSPENSION LINES

1-9. Use ticket number 8/7, cotton thread instead of retainer bands to stow the suspension lines. Attach the thread to the suspension line retaining straps by making a loop around the straps. Place the suspension line stow between both ends of a length of ticket number 8/7, cotton thread. Secure the ends with a surgeon's knot and a locking knot.

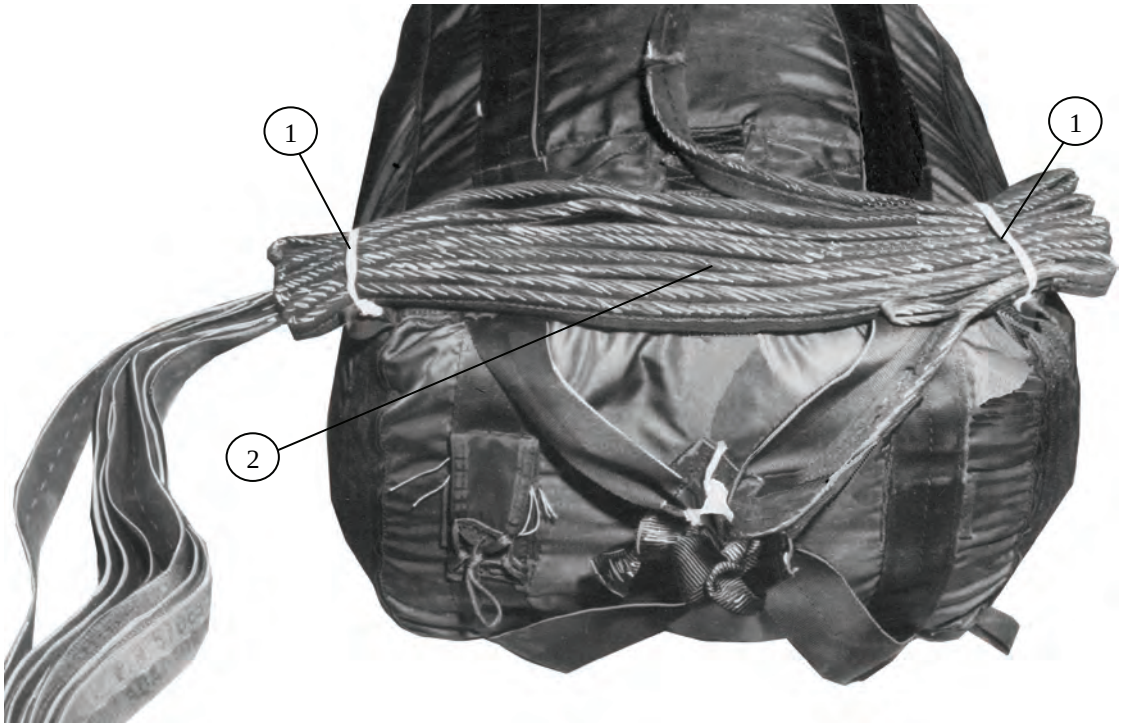
PACKING PARACHUTE

1-10. Pack the 22-foot cargo extraction parachute according to the procedures in TM 10-1670-279-23&P/ TO 13C5-27-2/NAVAIR 13-1-28. If using the 28-foot cargo extraction parachute, pack the parachute according to the procedures in TM 10-1670-277-23&P/TO 13C5-28-2/NAVAIR 13-1-30.

Note. Make the bag-closing tie using one turn single, type I, ¼-inch cotton webbing.

STOWING STATIC LINE

1-11. Stow the static line as shown in Figure 1-15.



1. Attach a retainer band to each of the two cluster attaching loops nearest the static line.
2. S-fold the static line, and secure it with the installed retainer bands.

Figure 1-15. Break Cord Tie Made and Static Line Stowed

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Chapter 2

Rigging Combat Rubber Raiding Craft

SECTION I-RIGGING SINGLE ZODIAC F470U BOAT

DESCRIPTION OF LOAD

2-1. The description of the load rigged in this section is given below.

- **Inflated zodiac F470U rubber raiding craft.** This boat is rigged on a 75- by 144-inch combat expendable platform (CEP) with one G-12E cargo parachute. The weight of the boat is 250 pounds. When inflated, the boat is 75 inches wide, 185 inches long and 22 inches high. One or two 35-horsepower outboard engines that weigh 136 pounds each power the boat shown or one 55 horsepower engine that weighs 215 pounds with a full fuel tank, six paddles weighing a total of 24 pounds and two sets of air pumps with hoses are parts of each boat's equipment.

Note. A 40-horsepower engine is the largest that may be used on this boat when the boat is equipped with the accordion floor. An engine as large as 65-horsepower may be used on this boat without the accordion floor.

- **Accompanying load.** An accompanying load weighing at least 650 pounds but no more than 1,170 pounds must be dropped with the boat.

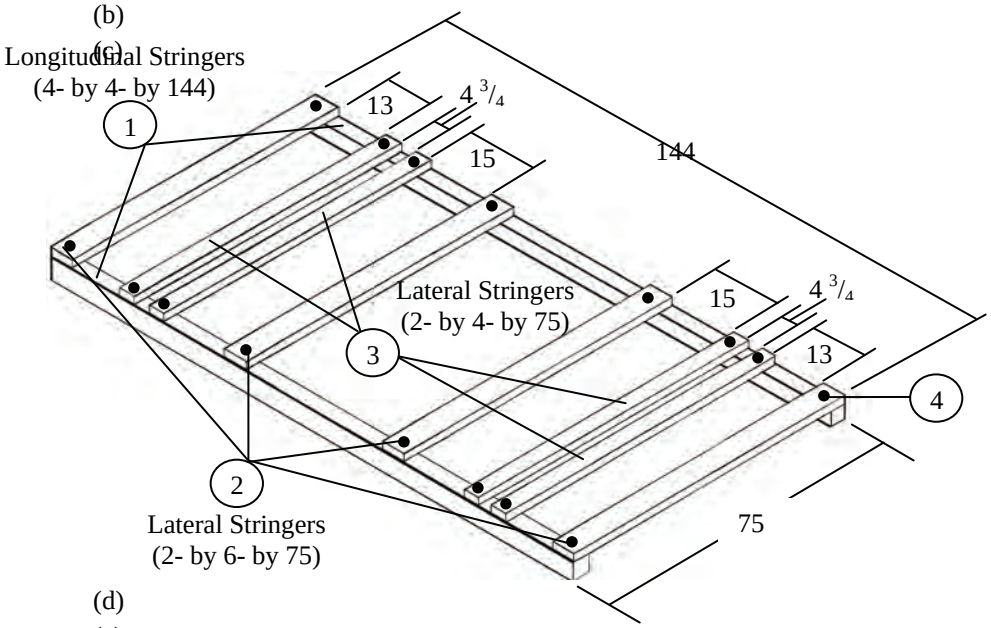
PREPARING THE PLATFORM

2-2. Build a new CEP, or recondition a used one, using the procedures shown in Figures 2-1 through 2-4 and as described below. This platform is used for all the loads in this chapter.

- **New platform.** When no used CEP is available, build a new platform for this load as shown in Figures 2-1 through 2-4. Salt-treated lumber is recommended for the platform frame.
- **Used platform.** When a used CEP is available, inspect and recondition it as described below.
- **Inspecting for damaged or missing parts.** Check the platform to see that all parts are present. Inspect each part carefully for damage. When the following conditions exist, the platform is not suitable for use until it is repaired:
  - Any part is missing.
  - A stringer or spacer block is broken, cracked, split, or severely gouged.
  - A plywood panel is cracked or gouged through at least one ply for a width of 2 inches or more.
  - A plywood panel is gouged for a length of 12 inches or more.
- **Inspecting parts, screws or nails.** Check the entire platform for loose stringers, spacer blocks, and plywood panels. Also, check for loose, missing, damaged, or protruding screws, bolts or nails. These defects may be corrected as follows:
  - Nail loose parts that are undamaged. Do not nail in original holes or in the grain line used before. Use screws when possible.
  - Replace loose, damaged, or missing nails, screws, and bolts. Reset or remove and replace protruding nails, screws, and bolts.

Notes. 1. All dimensions shown are in inches.
2. Drawing is not to scale.

(a)
(b)
(c)



(d)
(e)
(f)
(g)
(h)

(1) Mark, cut and layout two 4- by 4- by 144-inch pieces of treated lumber to be used as longitudinal stringers. Place them 75 inches apart on a level surface with the crowns of the stringers down.

(2) Mark, cut and layout four 2- by 6- by 75-inch pieces of treated lumber to be used as lateral stringers across the longitudinal stringers, placing one at each end and the other two at the center as shown.

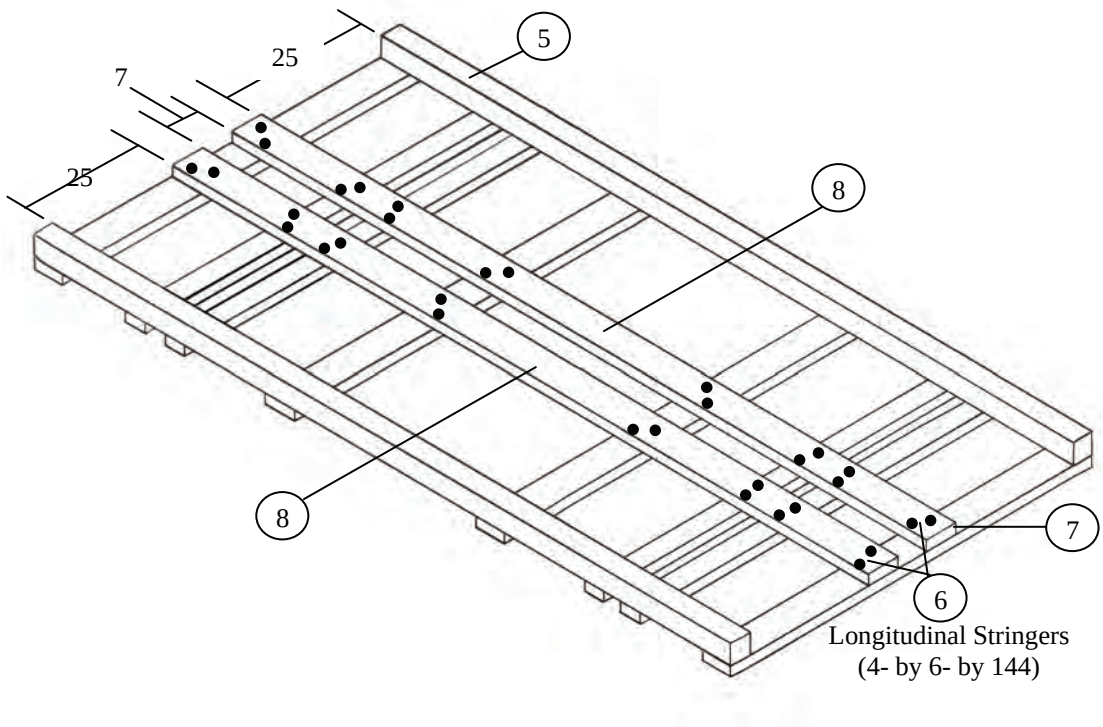
(3) Mark, cut and layout the four 2- by 4- by 75-inch pieces of treated lumber to be used as lateral stringer across the longitudinal stringers, placing the two stringers next to each 2- by 6- by 75-inch end stringer as shown.

(4) Using the measurements shown, measure and mark reference lines and position the eight lateral stringers in place. Apply waterproof construction adhesive to each lap joint. Square the platform frame and tack the lateral stringers to the longitudinal stringers using 16d nails. Place each nail 3 inches inboard of each lateral stringer.

Note. CEPs built before June 2006 that were used with the Type IV connector link will be used until exhausted.

Figure 2-1. Platform Frame Built

Notes. 1. All dimensions shown are in inches.
2. Drawing is not to scale.

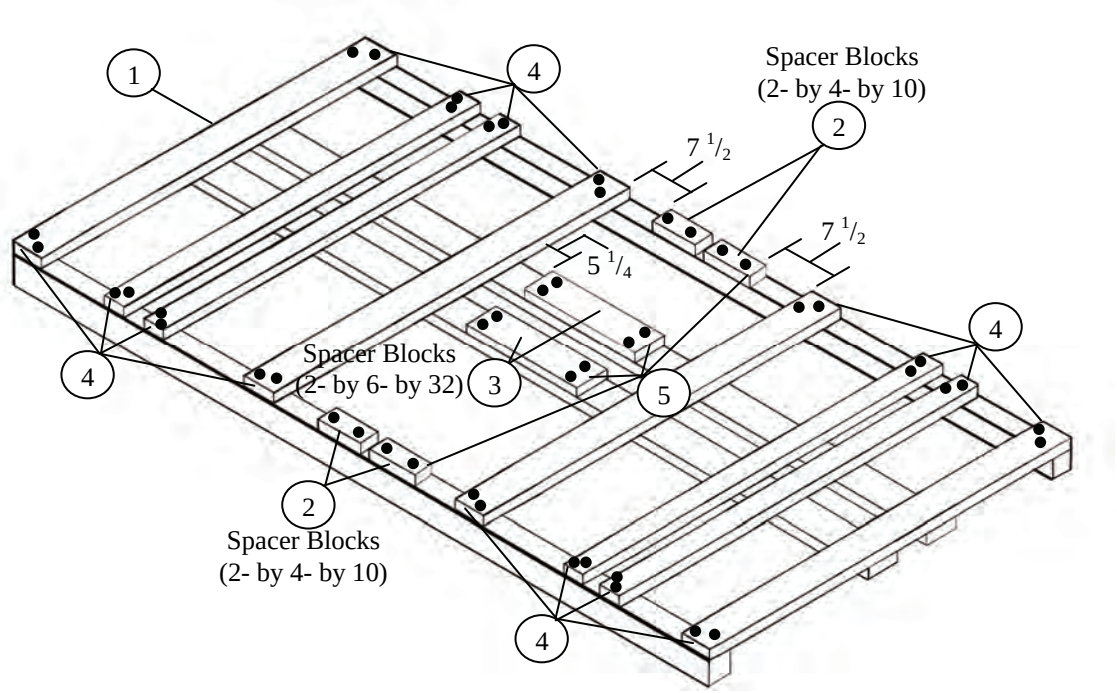


1. Turn the frame over and square the frame.
2. Mark, cut and place two 2- by 6- by 144-inch pieces of treated lumber to be used as longitudinal stringers on the frame. Assemble and position the inboard side of each stringer 3½ inches from the center of the frame's width as shown. This will create a 7 inch space between the two inboard longitudinal stringers.
3. Ensure the platform is still square and mark reference lines for the inboard longitudinal stringer placement across each lateral stringer. Apply waterproof construction adhesive to each lap joint and tack the longitudinal stringers to the outboard lateral stringers using one 8d nail placed 2 inches inboard from each end.
4. Drill two diagonally spaced $^{3}/_{16}$-inch diameter pilot holes, 2½ inches deep at each lateral stringer intersection of the two inboard longitudinal stringers. Install a 2½-inch screw into each pilot hole.

Note. Ensure the screw heads are tightened flush with the surface of the longitudinal stringers.

Figure 2-1. Platform Frame Built (continued)

Notes. 1. All dimensions shown are in inches.
2. Drawing is not to scale.



(1) Turn the platform over so the lateral stringers are facing up and ensure the frame is square.

(2) Apply waterproof construction adhesive to one side of each spacer block. Adhere the four 2- by 4- by- 10-inch spacer blocks to the outboard longitudinal stringers as shown, maintaining 7 ½ inches between the lateral stringers and stringer blocks.

(3) Center and adhere the two 2- by 6- by 32-inch spacer blocks on the inboard longitudinal stringers.

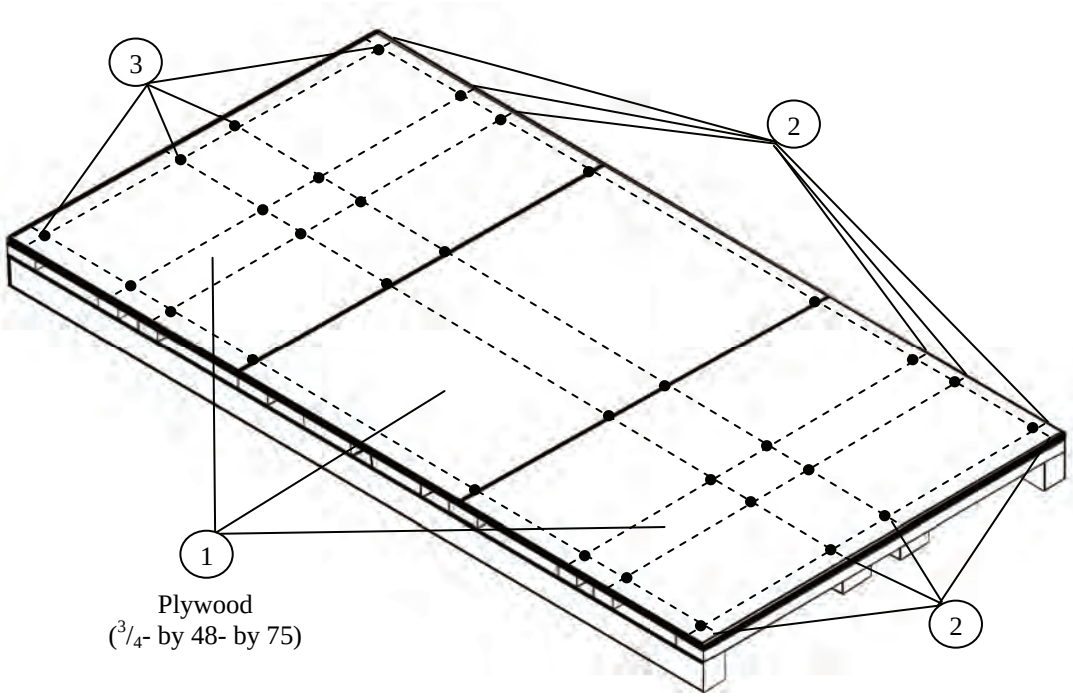
(4) Drill two diagonally spaced $^{3}/_{16}$-inch diameter pilot holes, 4 inches deep, 1 1/2-inches from the ends of the lateral stringer. Install a 4-inch screw into each pilot hole. Ensure the screw heads are tightened flush with the surface.

Note. Do not position the pilot holes on the extreme corners of the frame where the corners will be cut-off later.

(5) Drill a $^{3}/_{16}$-inch diameter pilot hole, 2 1/2 inches deep, and 1 1/2 inches from the end of each spacer block. Drill one hole in each end of the four outboard spacer blocks and two holes at each end of both inboard spacer blocks. Install a 2 1/2-inch screw into each pilot hole. Ensure the screw heads are tightened flush with the surface.

Figure 2-2. Spacer Blocks Attached to Frame

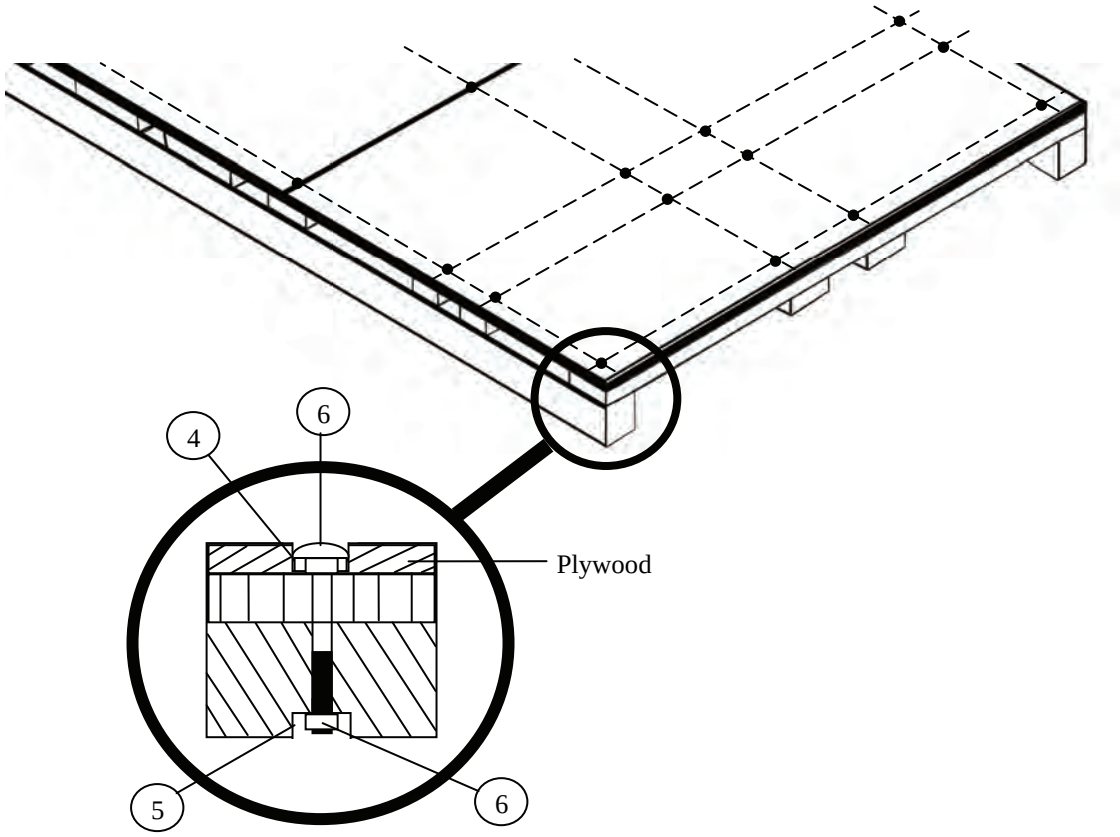
Notes. 1. All dimensions shown are in inches.
2. Drawing is not to scale.



1. Apply waterproof construction adhesive to each lateral stringer and spacer block. Mark, cut and layout three ¾- by 48- by 75-inch sheets of plywood across the platform frame, positioning the plywood flush with the frame's edges. Nail each plywood sheet to the platform frame using one 8d nail placed 2 inches in from the corner of each plywood sheet.
2. Using a chalk line, locate and mark the centerline of each lateral stringer across the plywood as shown. Repeat for the four longitudinal stringers.
3. At the reference line intersection, drill a $^{3}/_{8}$-inch diameter hole through the plywood and framing.

Figure 2-3. Plywood Attached to Frame

Notes. 1. All dimensions shown are in inches.
2. Drawing is not to scale.



(4) Using a $^{7}/_{8}$-inch countersink bit, countersink a ¼-inch hole in each $^{3}/_{8}$-inch diameter hole prepared in Step 3.

(5) Turn the platform over. Using a 1-inch diameter countersink bit, countersink a ¾-inch hole in each outboard $^{3}/_{8}$-inch diameter hole prepared in step 4. Additionally, countersink a ¾-inch hole in each inboard $^{3}/_{8}$-inch diameter hole prepared in step 4.

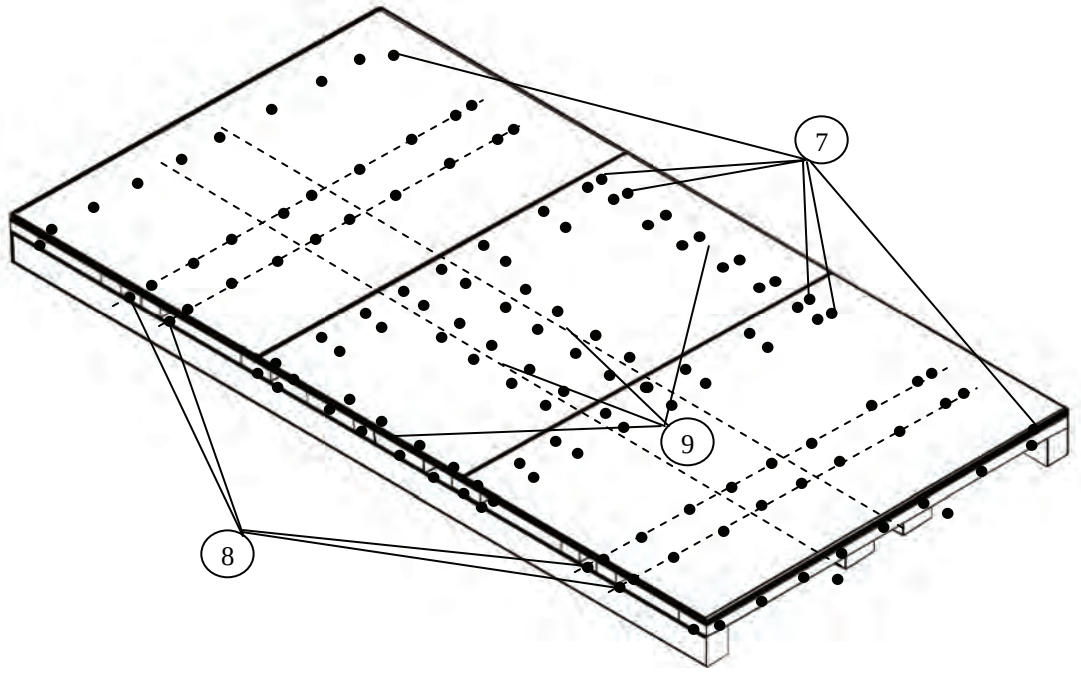
Note. Do not countersink holes too deep or the platform will be structurally weakened.

(6) From the plywood side, insert 6-inch carriage bolts into each outboard longitudinal stringer hole and 4-inch carriage bolts into each inboard longitudinal stringer hole. Tap the bolt heads into place. Install a washer and nut to the outboard bolts only and tighten until the top of the bolt head is flush with the plywood surface.

Note. The washers and nuts will be installed onto the inboard carriage bolts when the platform is turned over.

Figure 2-3. Plywood Attached to Frame (continued)

Notes. 1. All dimensions shown are in inches.
2. Drawing is not to scale.



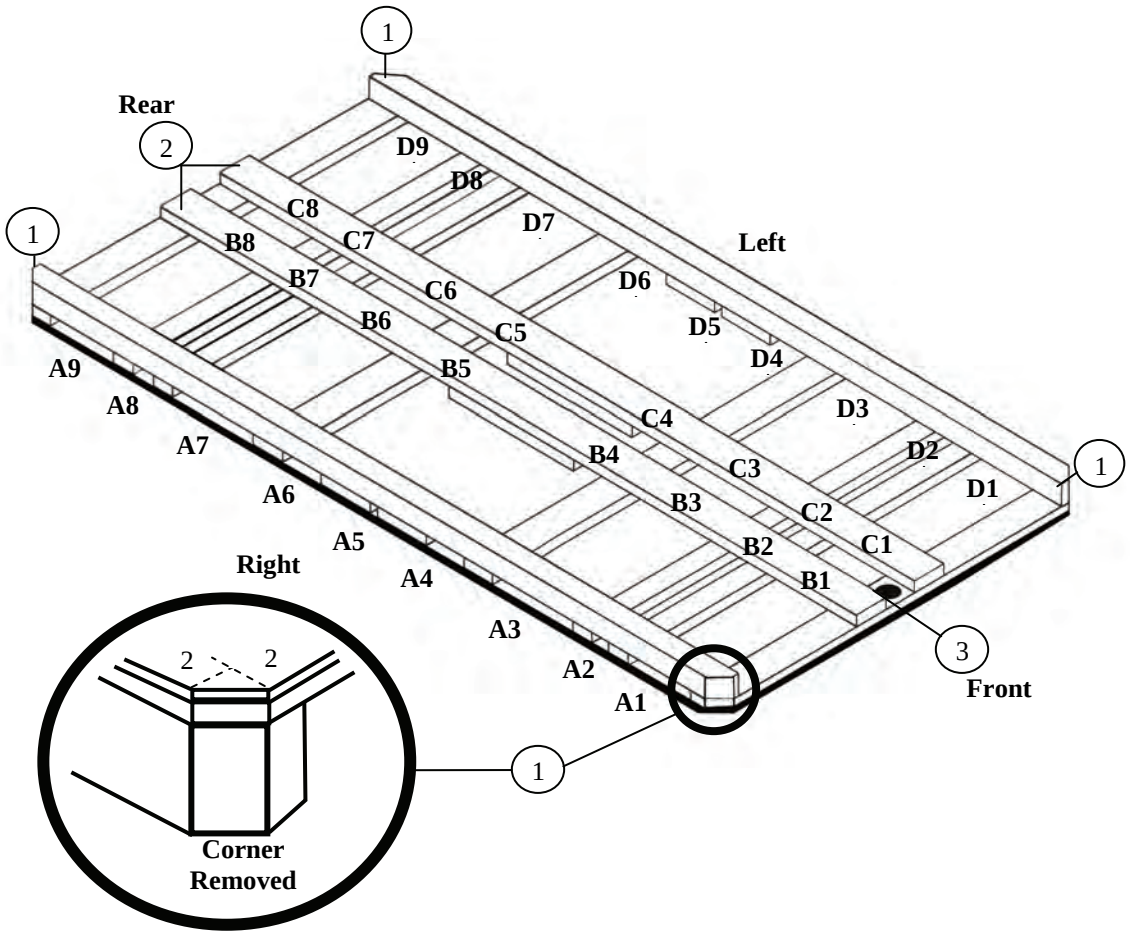
(7) Starting 4½ inches inboard from the sides and 1 inch in from each end of the platform, drill a 2-inch deep pilot hole using a $^{3}/_{16}$-inch bit at 6-inch intervals. Repeat for the plywood edges that are flush together across the lateral stringers. Install a 2-inch screw into each pilot hole and tighten flush with the surface.

(8) Using the inboard lateral stringer chalk lines previously prepared as a guide, drill $^{3}/_{16}$-inch diameter pilot holes across the platform at each lateral stringer. Start 4 1/2-inches inboard from the platform side at 6-inch intervals. Install a 2-inch screw into each pilot hole and tighten flush with the surface.

(9) Drill additional pilot holes 1 inch inboard from the ends of each inboard lateral stringer, 1 inch inboard from each platform edge and at 6 inch intervals into the spacer blocks. Install a 2-inch screw into each pilot hole and tighten flush with the surface.

Figure 2-3. Plywood Attached to Frame (continued)

Notes. 1. All dimensions shown are in inches.
2. Drawing is not to scale.



1. Mark a 2-inch square on each corner of the platform. Draw a diagonal line across each square as a reference line and saw off each corner with a circular saw to start the cut, and a handsaw to finish through the cut thickness.
2. Turn the platform right side up, install washers and nuts to the inboard carriage bolts, and tighten until the top of the bolt head is flush with the plywood surface.
3. Drill a 2-inch hole, 3 inches and centered through the front lateral stringer and plywood as shown.

Note. Inspect the platform. Make sure there are no protruding screws, nails or bolts on the bottom of the platform.

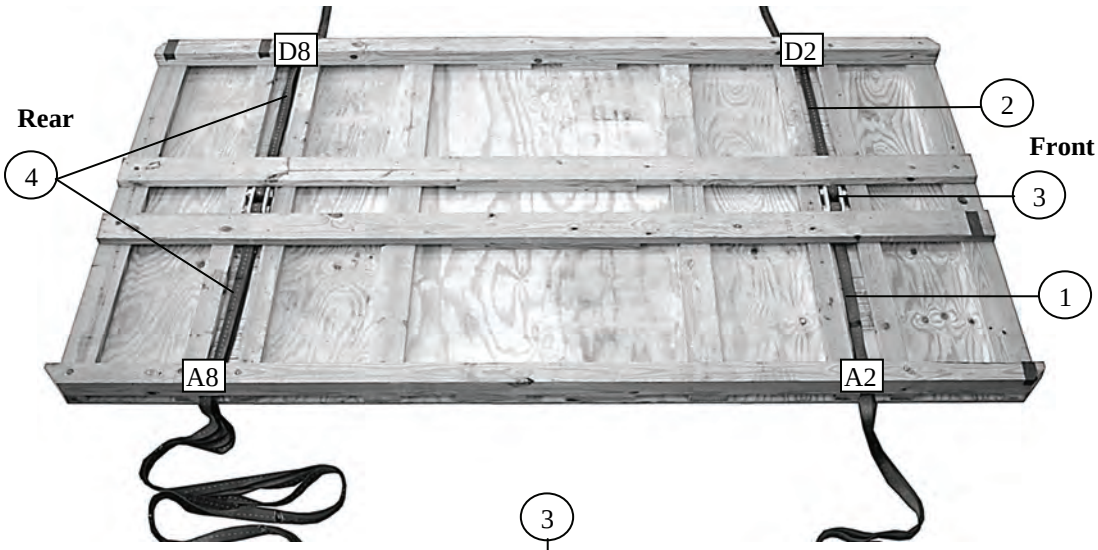
4. Label the tiedown spaces on each longitudinal stringer as shown above.

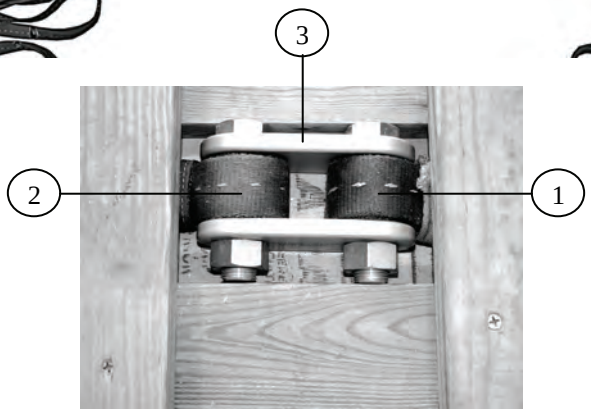
Figure 2-4. Corners Cut Off, Bolts Installed and Tiedown Spaces Numbered

INSTALLING SUSPENSION SLINGS

2-3. Install four 16-foot (2-loop), type XXVI nylon webbing slings as suspension slings on the platform. Use two 3¾-inch two-point link assemblies or two type IV link assemblies with covers to finish installing the suspension slings. Installation is shown in Figure 2-5.

Note. The two-point link cannot be installed on platforms manufactured before June 2006.





1. Run a 16-foot (2-loop), type XXVI sling from the right side of the platform through tiedown space A2.
2. Run a 16-foot (2-loop), type XXVI sling from the left side of the platform through tiedown space D2.
3. Join the two slings together between the center longitudinal stringers using a 3¾-inch two-point link (shown) or a type IV link assembly. Place the link on the floor between the longitudinal stringers.

Note. If using the type IV, place a link cover around the type IV link and secure.

4. Repeat steps 1, 2 and 3 to install the rear slings through tiedown spaces A8 and D8.

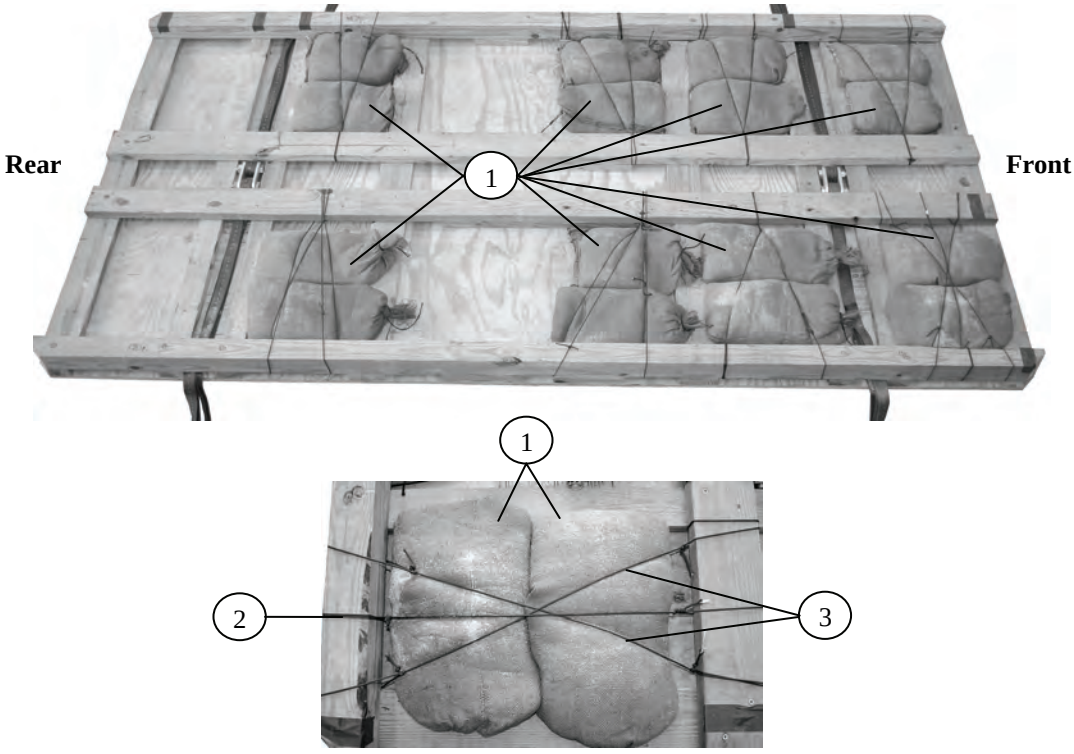
Figure 2-5. Suspension Slings Installed on Platform

STOWING SANDBAGS

2-4. Fill 16 sandbags with 35 pounds of sand or gravel in each bag. Stow the sandbags in the platform recesses as shown in Figure 2-6.

CAUTION

Ensure that all sandbags are securely tied to the platform recess to prevent them from separating from the load during the extraction deployment sequence.



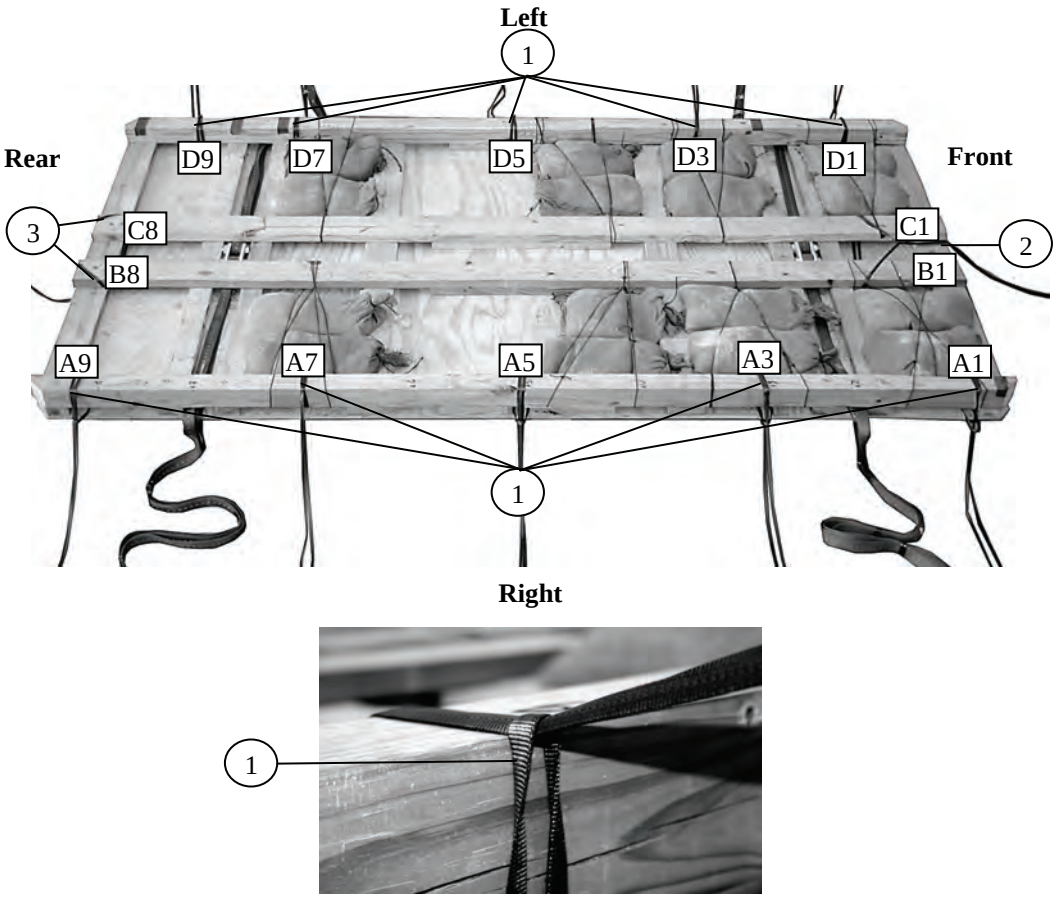
1. Lay two sandbags in each platform recess as shown.
2. Tie a length of type III nylon cord across both sandbags and to the appropriate tie down spaces.
3. Form an X over each pair of sandbags using type III nylon cord and tie the cord to the appropriate tie down spaces.

Note. For training drops, use less sand or remove the sandbags before de-rigging the boat.

Figure 2-6. Sandbags Stowed on Platform

ATTACHING LASHINGS TO THE PLATFORM

2-5. Using ten 18-foot and two 26-foot lengths of 1/2-inch tubular nylon webbing, attach the lashings to the CEP as shown in Figure 2-7.

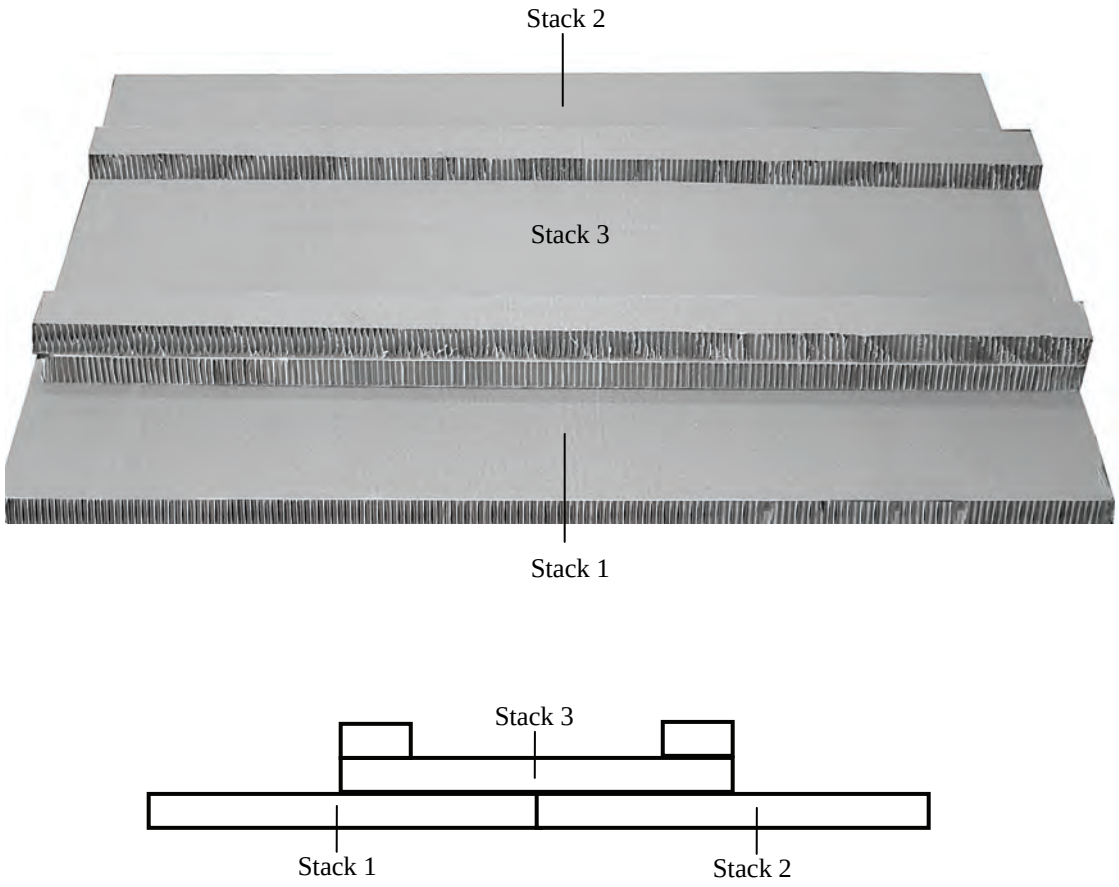


1. Girth-hitch the 18-foot lengths of 1/2-inch tubular nylon webbing through tiedown spaces A1, A3, A5, A7 and A9 on the right outboard longitudinal stringer and through tiedown spaces D1, D3, D5, D7 and D9 on the left outboard longitudinal stringer.
2. Pass one of the 26-foot lengths of 1/2-inch tubular nylon webbing through tiedown spaces B1 and C1. Even the ends and make an overhand knot about 18 inches from the tiedown spaces.
3. Pass one end of the other 26-foot length of 1/2-inch tubular nylon webbing through tiedown spaces B8 and C8. Even the ends and make an overhand knot about 18 inches from the tiedown space.

Figure 2-7. Boat Lashings Attached

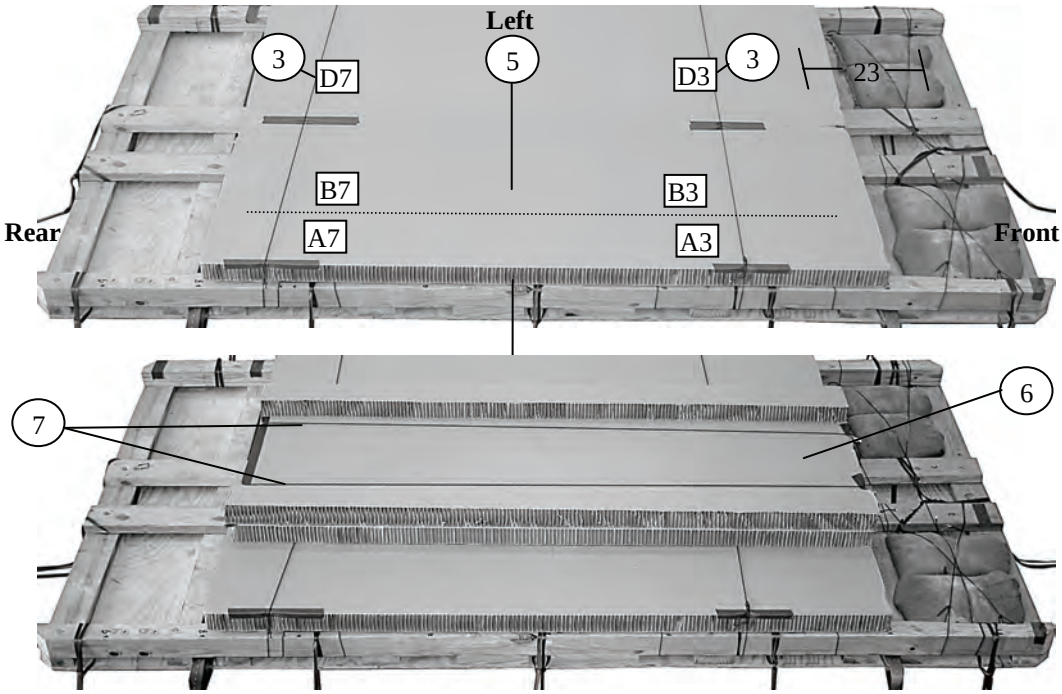
BUILDING, PLACING, AND SECURING HONEYCOMB STACKS

2-6. Build the honeycomb stacks as shown in Figure 2-8. Place and secure the honeycomb stacks as shown in Figure 2-9.



Stack Number	*Pieces*	*Width (Inches)*	*Length (Inches)*	*Instructions*
1	1	36	96	
2	1	36	96	
3	1	36	96	
	2	5	96	Glue a 5- by 96-inch piece of honeycomb flush with each outside edge of the full sheet of honeycomb.

Figure 2-8. Honeycomb Stacks Built



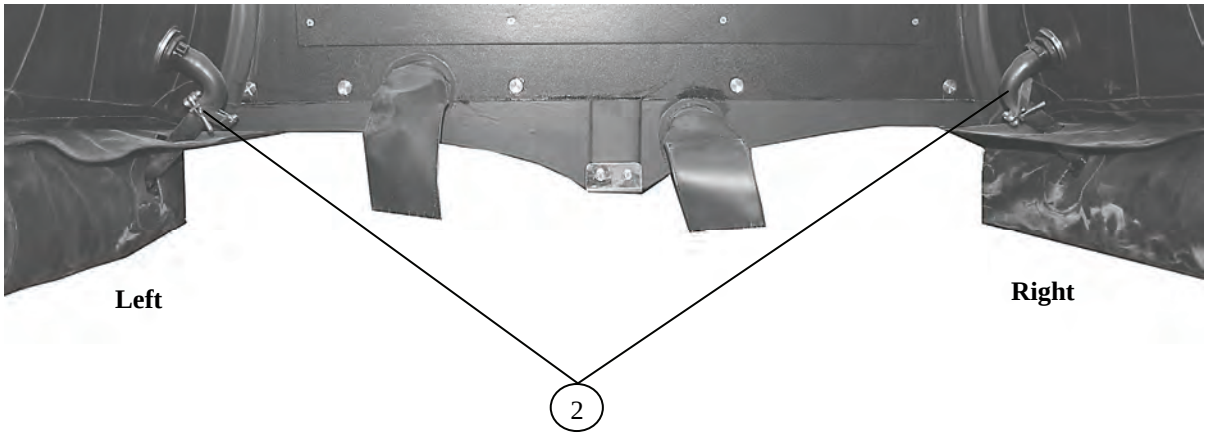
Note. To prevent damage to the honeycomb, tape the edges where the type III nylon cord passes.

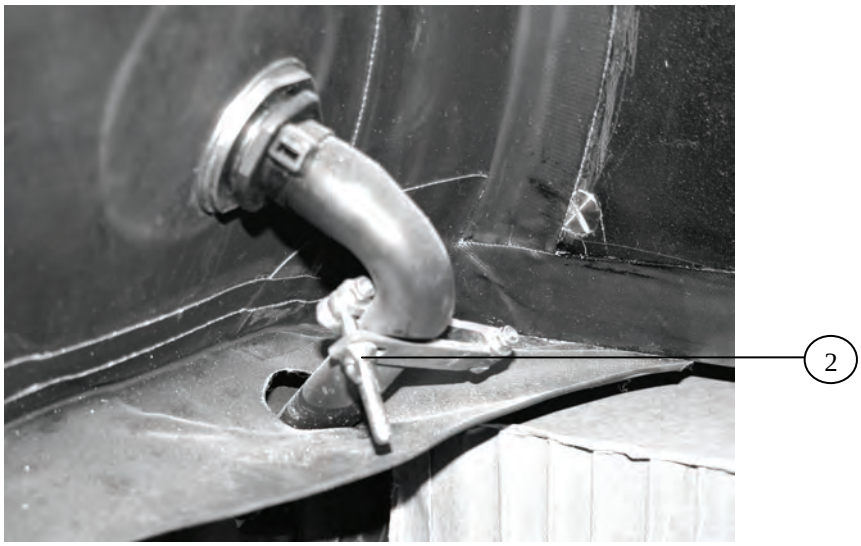
1. Pass a length of type III nylon cord through tiedown spaces A3 and B3 (not shown).
2. Pass a length of type III nylon cord through tiedown spaces A7 and B7 (not shown).
3. Pass a length of type III nylon cord through tiedown spaces C3 and D3 (on the left side of the platform) and another length through tie down spaces C6 and D7.
4. Lay a 36- by 96-inch piece of honeycomb on the right side of the platform 23 inches from the front of the platform. Tie the honeycomb in place with the type III nylon cord placed in Steps 1 and 2 (not shown).
5. Lay a 36- by 96-inch piece of honeycomb on the left side of the platform 23 inches from the front of the platform. Tie the honeycomb in place with the type III nylon cord placed in Step 3.
6. Center and glue stack 3 over stacks 1 and 2 flush with the front and rear of the honeycomb.
7. Tie stack 3 to the inboard longitudinal stringers of the platform with lengths of type III nylon cord.

Figure 2-9. Honeycomb Placed and Secured

PREPARING BOAT

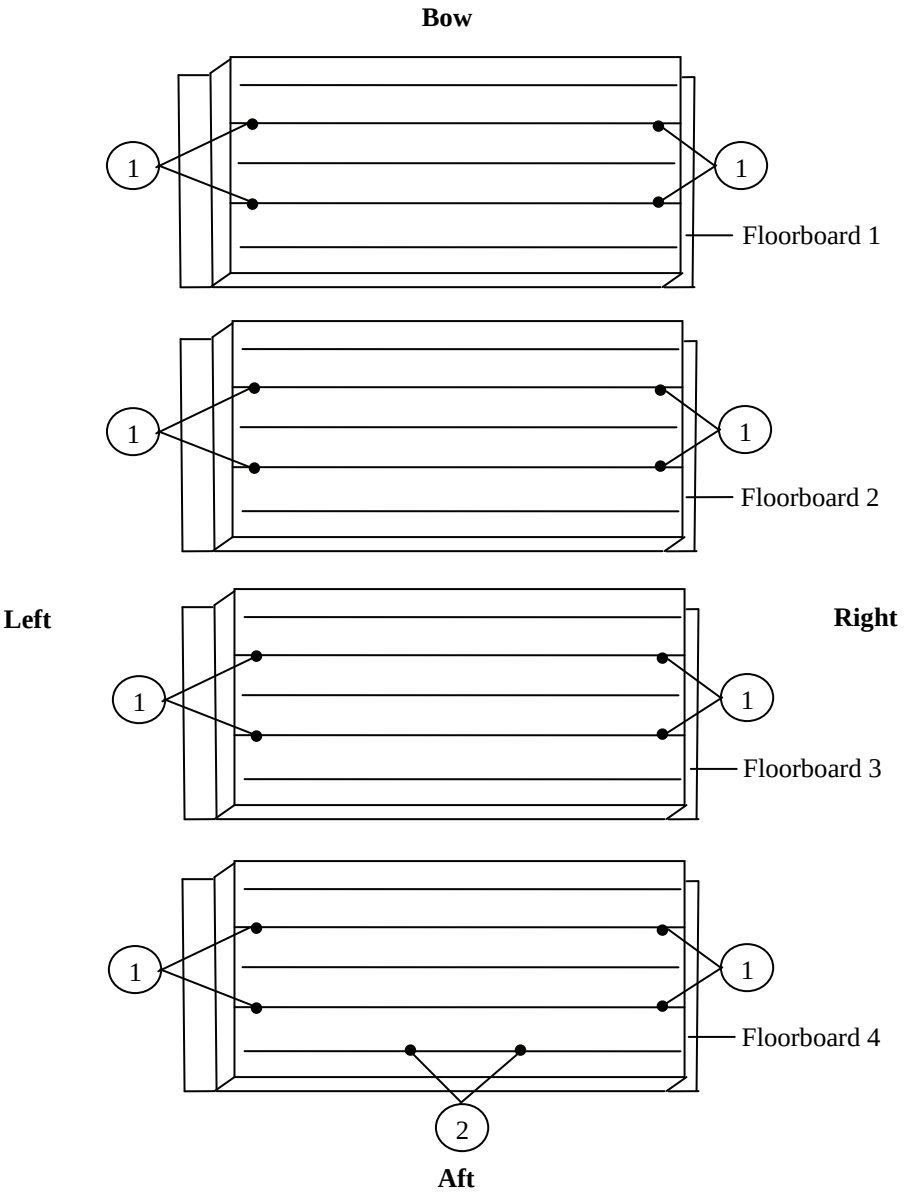
2-7. Inflate the boat except the keel. If the keel is inflated, let the air out. Install the hose clips as shown in Figure 2-10. Prepare boats with a hard deck (aluminum floorboards) as shown in Figure 2-11. Prepare boats with a roll-up floor as shown in Figure 2-12. Prepare and position honeycomb in both boats as shown in Figure 2-13.





1. Remove the hose clips from the stowage pockets behind the transom on the left and right sides of the boat (not shown).
2. Place the hose clips around the hoses connecting the upper and lower tubes, and tighten the hose clips with the wing nuts provided.

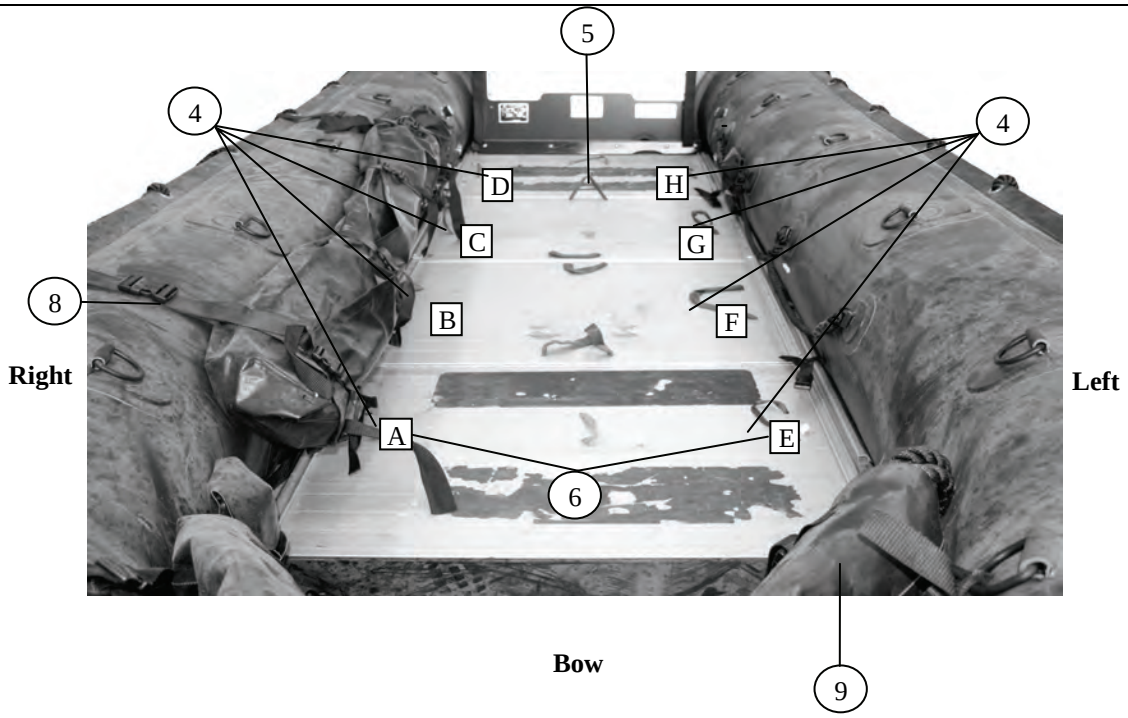
Figure 2-10. Hose Clips Installed



1. Drill two 1/2-inch holes in both sides of each floor panel.
2. Drill two additional holes in the rear floor panel centered near the aft edge.
3. Run a 4-foot length of 1/2-inch or 1-inch tubular nylon webbing through both holes prepared in Step 1. Tie the ends of the nylon webbing together with a square knot and an overhand knot in the running ends on the bottom of the platform (not shown).

Note. Additional floorboard holes may be drilled to accommodate the accompanying load.

Figure 2-11. Boat Prepared with Hard Deck (Aluminum Floorboards)



4 Run a 6-foot length of 1/2-inch or 1-inch tubular nylon webbing through the two holes prepared in Step 2. Secure as in Step 3.

5 Install the floor panels, and inflate the boat.

Note. Additional ties may be added to panels to accommodate the accompanying load.

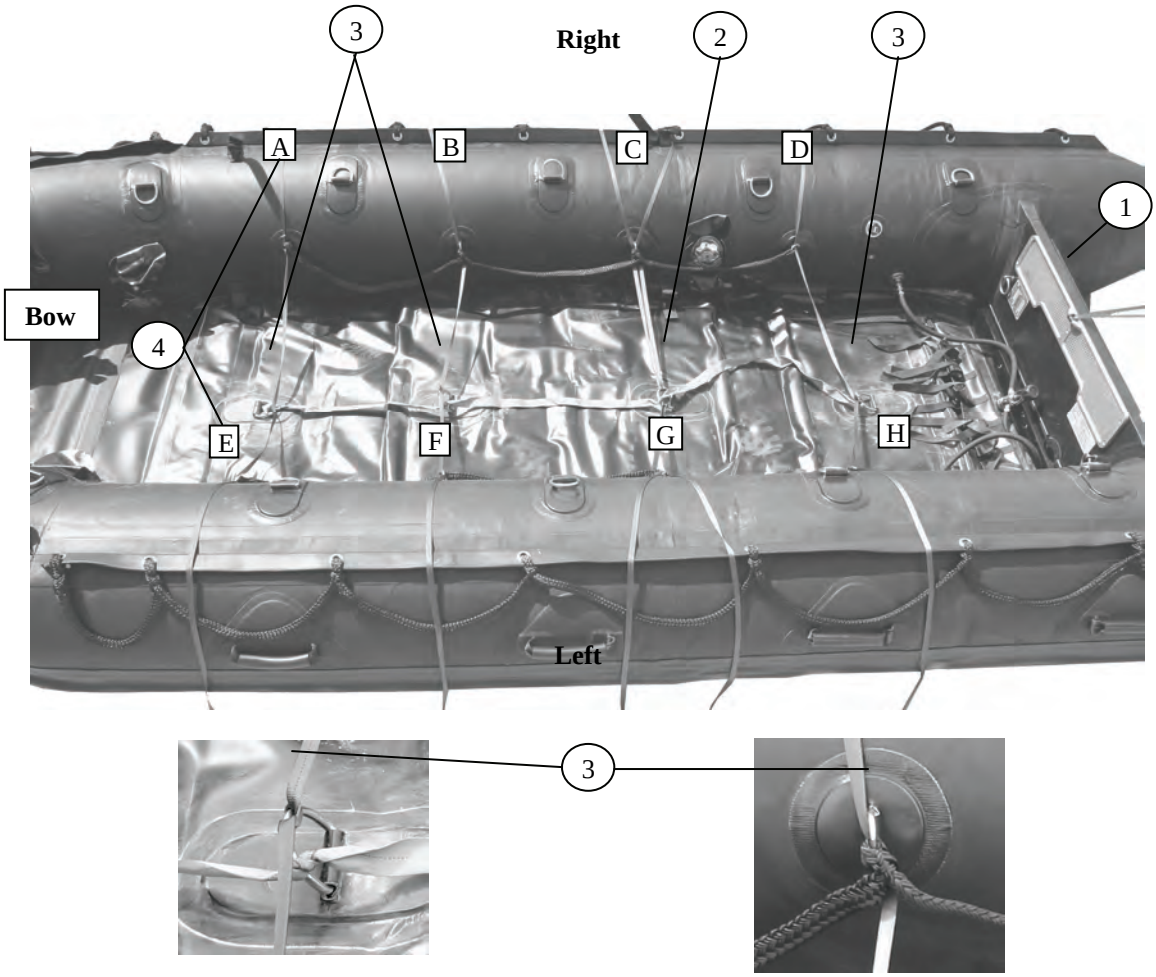
6 Start at the bow of the boat and name the in-boat tiedowns on the right side A, B, C, and D. Name the in-boat tiedowns on the left side E, F, G, and H.

7 Tie chemical lights to the bow of the boat and to the center side carrying handles with type I, 1/4-inch cotton webbing if dictated by mission requirements (not shown).

8 Using type III nylon cord, tie the paddles to the side of the boat in the holders provided.

9 Stow an air pump and air hose in each of the pockets provided in the right front and left rear of the boat.

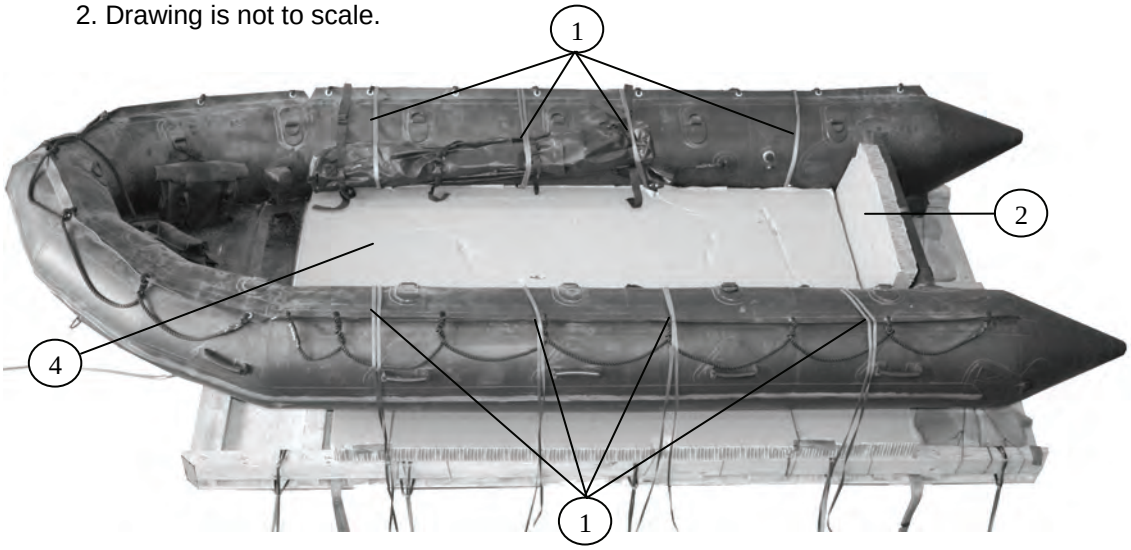
Figure 2-11. Boat Prepared with Hard Deck (Aluminum Floorboards) (continued)

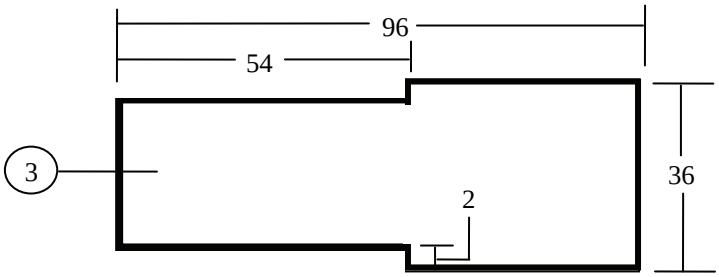


1. Girth hitch a 14-foot length of 1/2-inch tubular nylon webbing to the bracket on the inboard side of the transom.
2. Girth hitch two 14-foot lengths of 1/2-inch tubular nylon webbing to the second in-floor D-ring from the rear of the boat. Pass the running ends through the nearest safety rope D-ring and over the side.
3. Girth hitch one 14-foot length of 1/2-inch tubular nylon webbing to each of the three remaining in-floor D-rings. Pass each running end through the nearest safety rope D-ring and over the side.
4. Start at the bow of the boat and name the in-boat tiedowns on the right side A, B, C, and D. Name the in-boat tiedowns on the left side E, F, G, and H.

Figure 2-12. Boat Prepared with Roll-up Floor

Notes. 1. All dimensions given are in inches.
2. Drawing is not to scale.





Note. The procedures in Step 1 are only used on boats with hard deck (aluminum floorboards).

1. Pass a 13-foot length of 1/2-inch tubular nylon webbing through each in-boat tiedown positioned in Steps 4 and 5 of Figure 2-11. Even the ends, and tie in place with a girth hitch. Lay the lengths outside the boat.

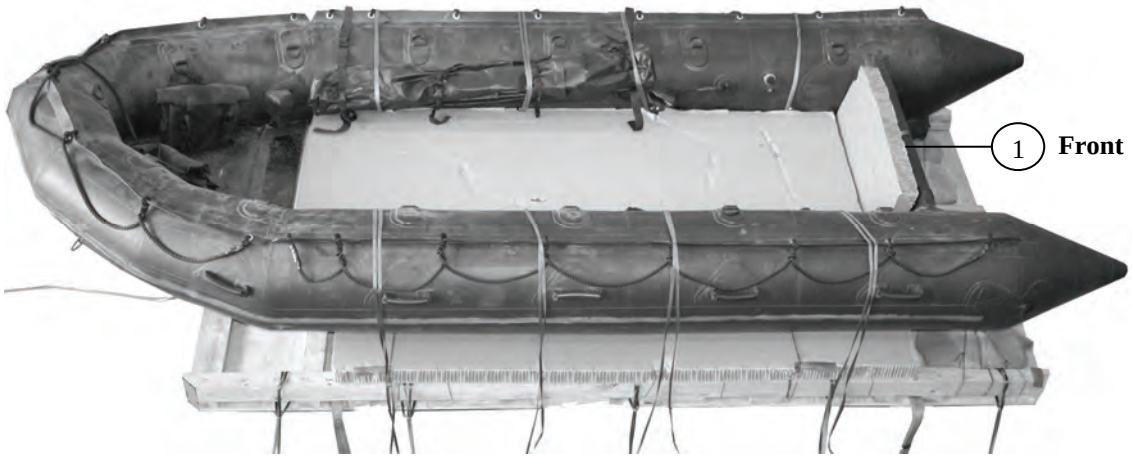
Note. Boats with or without hard deck (aluminum floorboards) will be prepared as shown in Steps 2, 3, and 4.

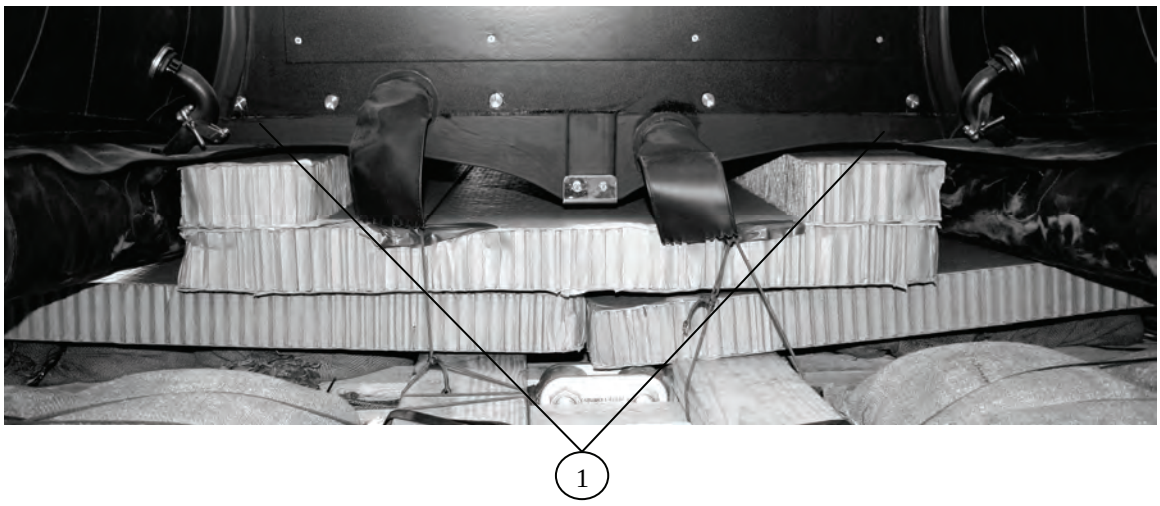
2. Set a 13- by 36-inch piece of honeycomb against the transom.
3. Make 2- by 54-inch cutout on each side, starting from the same end, of a 36- by 96-inch piece of honeycomb.
4. Place the honeycomb on the floor of the boat with the cutouts against the paddles.

Figure 2-13. Honeycomb Prepared and Positioned

POSITIONING BOAT

2-8. Center the boat on the platform with the transom even with the front edge of the honeycomb as shown in Figure 2-14.





(1) Set the boat on the platform with transom even with front edge of the honeycomb.

Figure 2-14. Boat Positioned

PREPARING, PLACING, AND SECURING ACCOMPANYING LOAD

2-9. Prepare the Johnson Enforcer or Bombardier outboard engine and fuel tanks as shown in Figure 2-15. Prepare the three tiedown rings as shown in Figure 2-16. Place the engines, fuel tanks, and load as shown in Figure 2-17. Secure the tiedown rings as shown in Figure 2-18. Secure the engines, fuel tanks, and load as shown in Figure 2-19.



(1) Wrap the lower unit of the outboard engine with cellulose wadding and tape in place.

(2) Tie a 6- by 12-inch piece of honeycomb to the lower unit of the outboard engine using type III nylon cord. Tape edges of honeycomb with cloth backed adhesive tape to prevent cutting by the type III nylon cord.

(3) Lay a 6- by 6-inch piece of honeycomb on the engine. Fold the operating handle onto the honeycomb and tie in place with type III nylon cord Wrap the handle with cellulose wadding and tape in place (not shown).

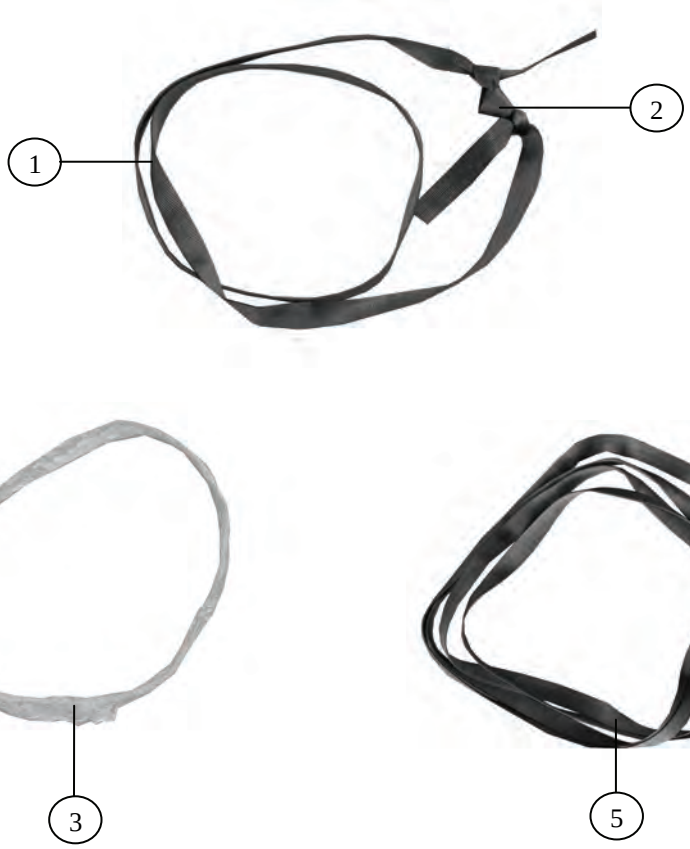
(4) Tie the engine cover in place with two lengths of type III nylon cord (not shown). Wrap the housing with cellulose wadding and tape in place.

Note. Put only five gallons of fuel in each container if collapsible plastic containers are used. Force out all air before closing them. Pad between plastic tanks and engine or other equipment with 1/2-inch felt (not shown).

(5) Make sure the fuel tank is at least 1/2 full but no more than 3/4 full (not shown).

Note. If using a metal fuel tank pad with several layers of cellulose wadding, do not cover the handle and tape the wadding in place.

Figure 2-15. Johnson Enforcer or Bombardier Outboard Engine and Fuel Tank Prepared

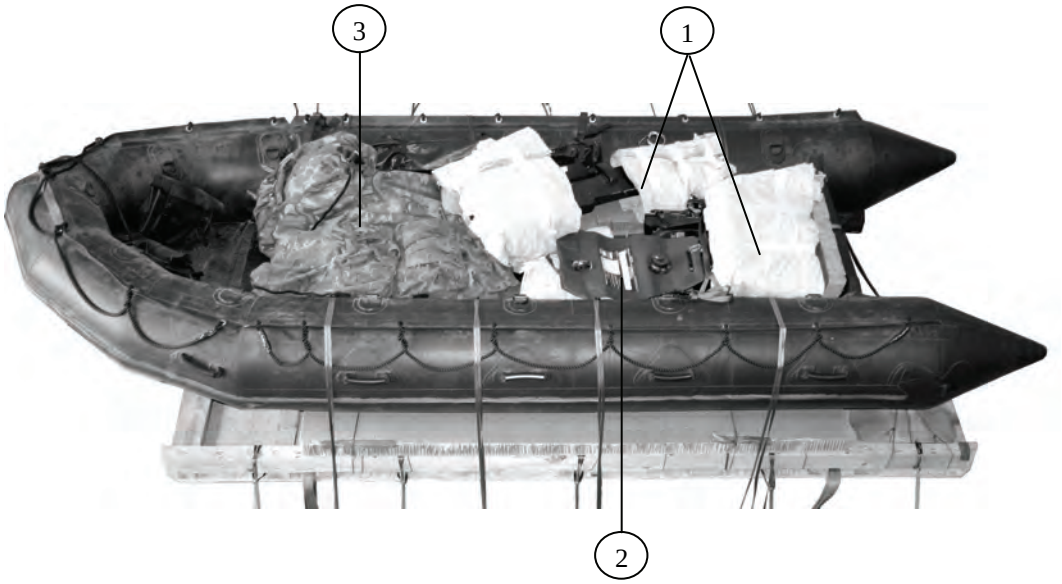


1. Use a 60-inch length of 1-inch nylon webbing to make a two-ply tiedown ring 10 inches in diameter.
2. Tie the ends of the webbing together with a square knot, and tie an overhand knot in each free end.
3. Wrap the nylon webbing using 2-inch adhesive tape.
4. Repeat steps 1 through 3 to form a second tiedown ring (not shown).
5. Use a 120-inch length of 1-inch tubular nylon webbing to make a four-ply tiedown ring 10 inches in diameter. Tie the nylon as in Step 2. Wrap as in Step 3.

Figure 2-16. Tiedown Rings Formed

CAUTION

An accompanying load weighing at least 650 pounds but no more than 1,170 pounds must be dropped with a single Zodiac F470U boat. Safety the engine to a convenient point in the boat with a length of 1/2-inch or 1-inch tubular nylon webbing.



(1) Lay the outboard engine, operating handle facing up, in the rear of the boat. Place the top of the engine 3 inches from the transom.

Note. If placing a second engine, prepare as in Figure 2-15 and place as shown above.

(2) Set the fuel tank beside the lower unit.

Note. Up to four collapsible tanks may be rigged in each boat.

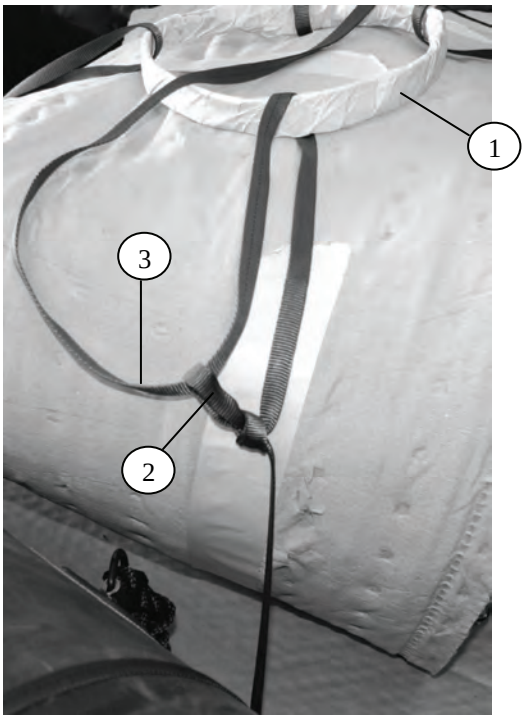
(3) Lay the rucksacks in the boat. Tie the frames together using type III nylon cord.

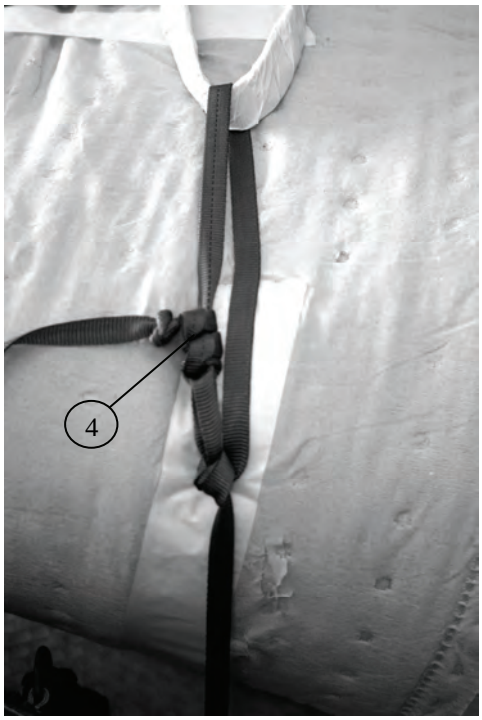
(4) Place the weapons between the two rows of rucksacks. Tie them to a convenient D-ring on the boat with two lengths of type III nylon cord (not shown).

Figure 2-17. Engines, Fuel Tanks and Accompanying Load Placed

Note. Use the following procedures when securing the tiedown ring in boats with a roll-up floor.

Secured Using Roll-up Floor





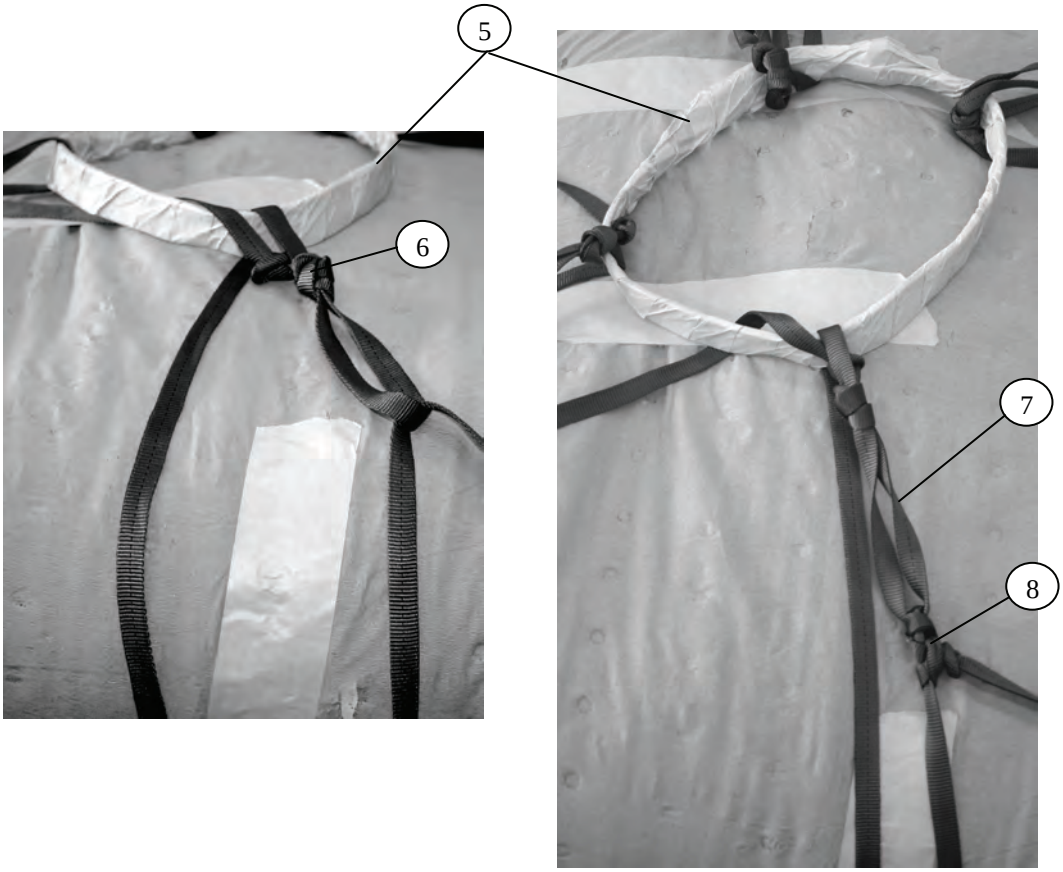
1. Place a two-ply tiedown ring over the accompanying load as described.
2. Tie a loop in the standing end of the 1/2-inch tubular nylon webbing. Tie an overhand knot in the running end.
3. Pass the running end of the 1/2-inch tubular nylon through the tiedown ring.
4. Pass the running end of the 1/2-inch tubular nylon through the loop made in Step 2. Pull it tight and tie with three alternating half hitch knots. Tie an overhand knot in the running end.

Note. The purpose of this method of tying is to allow the lashings to slide easily off the tiedown ring once cut.

Figure 2-18. Tiedown Rings Secured

Note. Use the following procedures when securing the tiedown ring in boats with a hard deck (aluminum floorboards).

Secured Using Hard Deck Floor



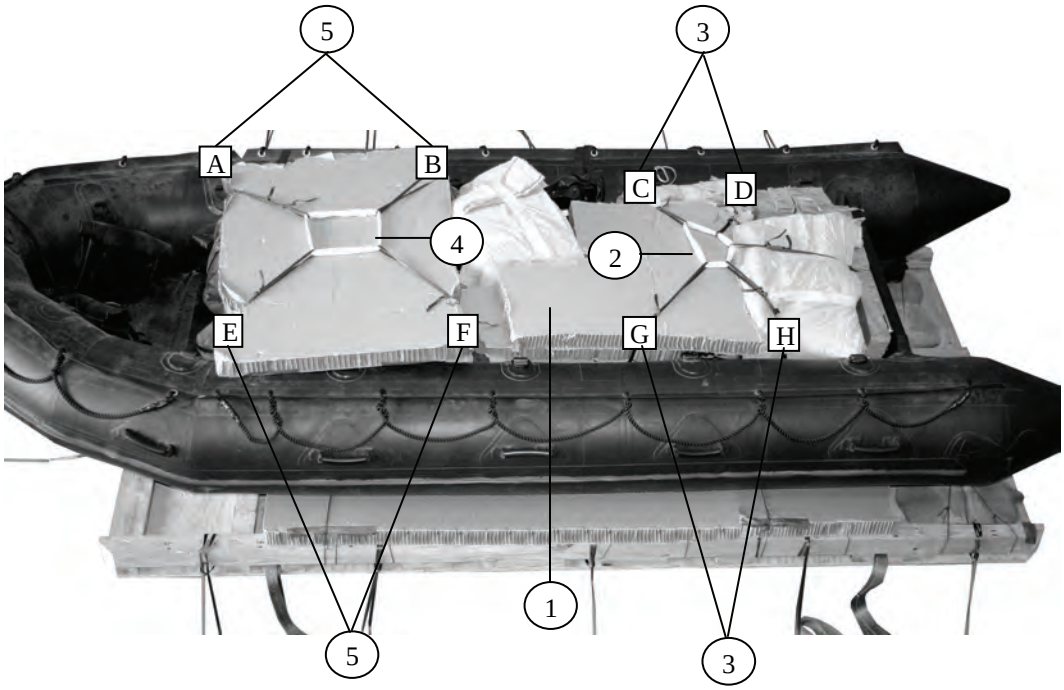
5 Place a two-ply tiedown ring over the accompanying load as described.

6 Tie a loop in one end of the 1/2-inch tubular nylon webbing. Tie an overhand knot in the running end.

7 Pass the loop end through the tiedown ring.

8 Pass the opposite end of the 1/2-inch tubular nylon through the loop made in Step 6, pull it tight and tie with three alternating half hitch knots. Tie an overhand knot in the running end.

Figure 2-18. Tiedown Rings Secured (continued)



(1) Cut and place honeycomb over the accompanying load as shown.

Note. Honeycomb placement over the accompanying load is optional.

(2) Center a two-ply tiedown ring (Figure 2-16) on the middle unit of the outboard engine.

Note. Keep the two-ply, 10-inch tiedown ring centered over the middle unit of the outboard engine. Use the procedures in Figure 2-18 to secure the in-boat tiedowns, depending on the type of floor used in the boat.

(3) Pass one tie from in-boat tiedowns C, D, G, and H on both sides of the boat and from the tiedown on the transom through the tiedown ring. Tie each tie to the loop made in one of the running ends. Secure them to the ring as shown in Figure 2-18 accordingly.

Note. Route the ties on the transom through the handle on the fuel tank. Secure the fuel tank to a convenient D-ring with type III nylon cord.

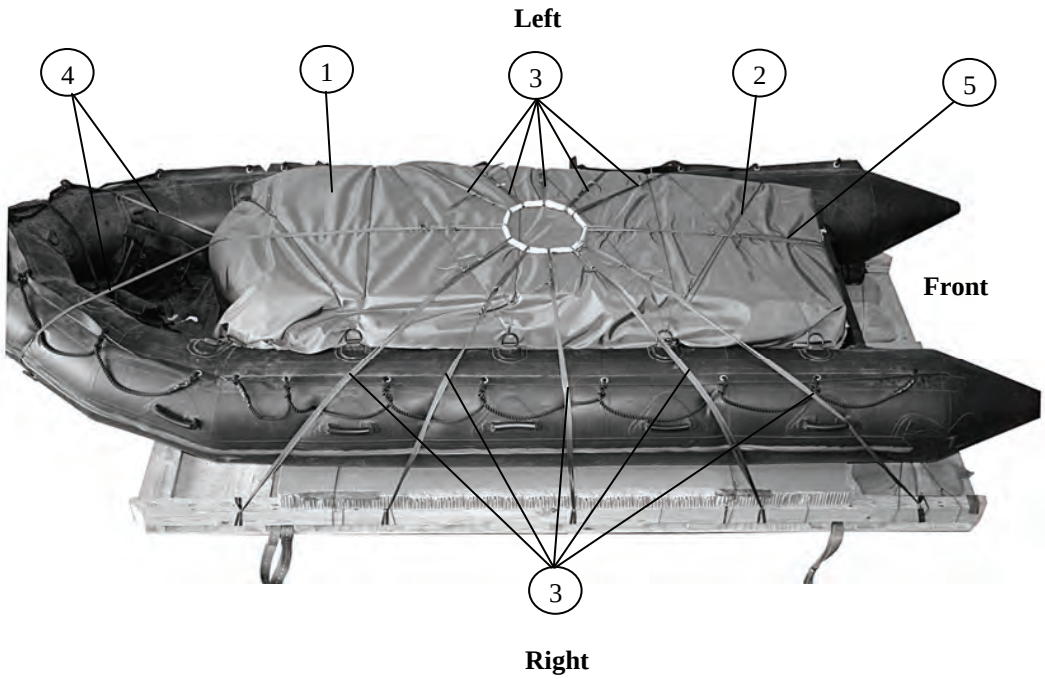
(4) Center a two-ply tiedown ring on the rucksacks.

(5) Use in-boat tiedowns A, B, E, and F to restrain the load as described in Step 3 above.

Figure 2-19. Engines, Fuel Tanks and Accompanying Load Secured

INSTALLING LOAD COVER AND LASHING BOAT

2-10. Place a 5- by 10-foot piece of cotton duck or nylon cover over the accompanying load and lash the boat to the platform as shown in Figure 2-20.

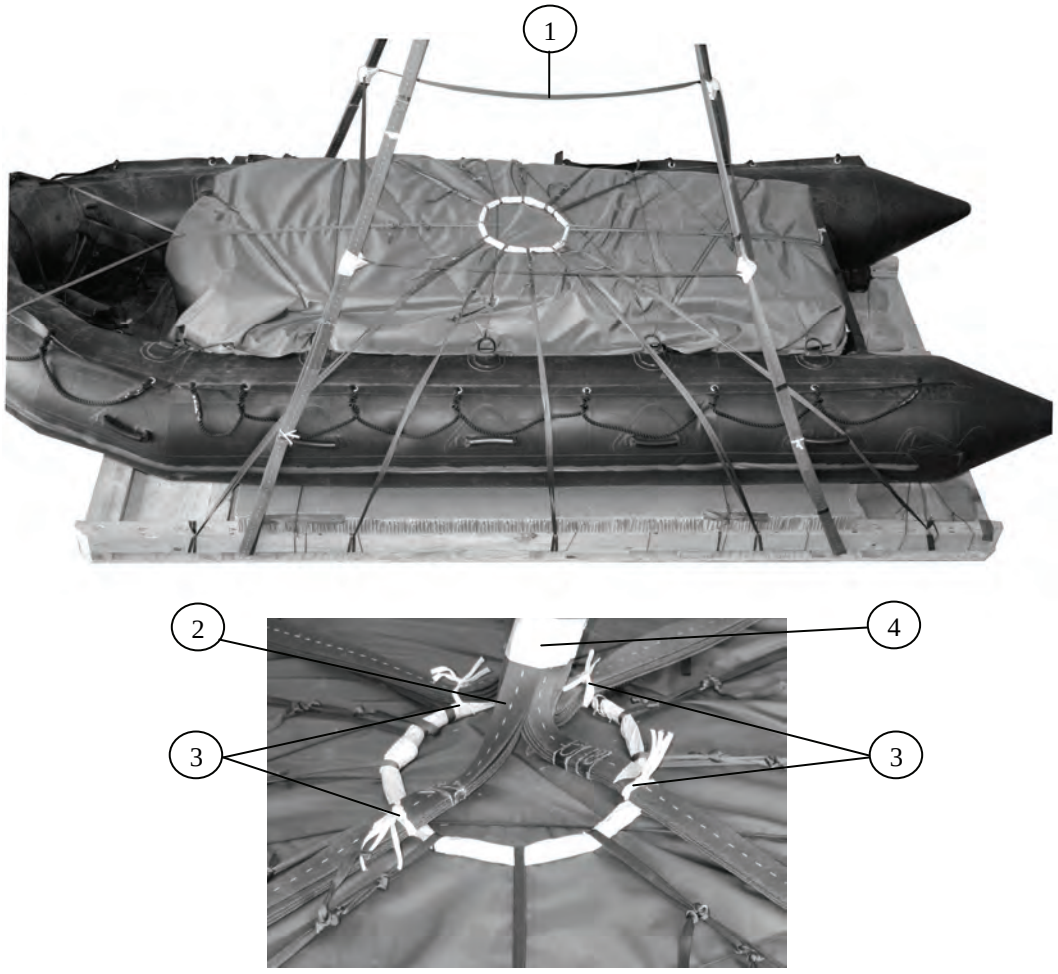


1. Place a 5- by 10-foot piece of cotton duck or nylon cover over the accompanying load. Push the edges of the cloth down between the load and the side of the boat.
2. Tie the cloth in place with type III nylon cord using the D-rings on the sides of the boat.
3. Tie all the 18-foot lashings to the four-ply, 10-inch tiedown ring as described in Figure 2-16, Steps 1 through 5.
4. Pass one end of the rear lashing around each side of the bow. Tie the ends together with an overhand knot. Tie the remainder of the lashing to the four-ply, 10-inch tiedown ring as described in Figure 2-18, Steps 5 through 8.
5. Use the intermediate loop tie to tie each end of the front lashing to the four-ply, 10-inch tiedown ring as described in Figure 2-18, Steps 5 through 8.

Figure 2-20. Cover Placed, Secured and Load Lashed to Platform

SAFETY TIEING SUSPENSION SLINGS

2-11. Safety the suspension slings as shown in Figure 2-21.



1. Raise the suspension slings and install deadman's tie according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.
2. Lower the suspension slings until they touch the tie down ring.
3. Tie each sling to the tiedown ring with two lengths of 80-pound, 1/4-inch cotton webbing.
4. Tape the slings together at the tiedown ring and at 2-foot intervals with two turns of paper masking tape.

Figure 2-21. Suspension Slings Safety Tied

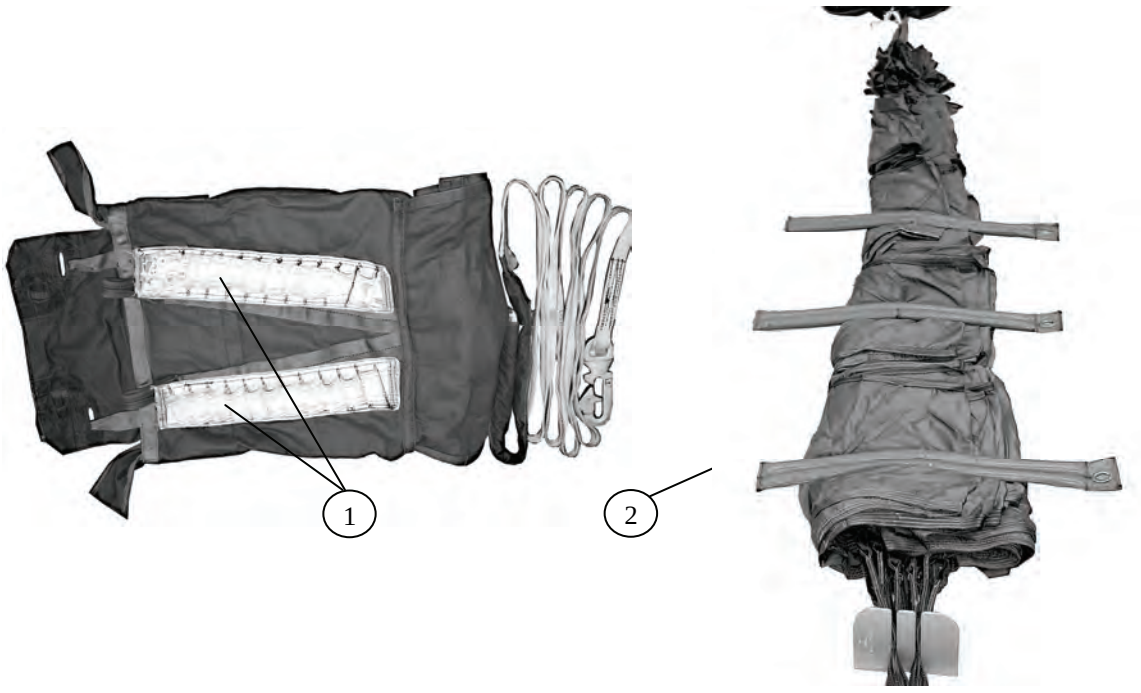
STOWING PARACHUTE

2-12. A 15-foot cargo extraction parachute is used to deploy the G-12 cargo parachute after the load is pushed from the aircraft. When used as a deployment parachute for this load, the 15-foot cargo extraction parachute is packed in a T-10 deployment bag.

Note. If the standard 15-foot parachute deployment bag is attached to the parachute, remove the bag at the bag retaining line.

- **Packing the 15-foot extraction parachute.** Use the following items to pack the 15-foot cargo extraction parachute in a T-10 deployment bag for use with this load as shown in Figures 2-22 through 2-26:
  - One T-10 deployment bag with universal static line.
  - Retainer bands as required.
  - Type I, 1/4-inch cotton webbing.
  - Ticket number 5, 8/4 cotton thread.
  - One large cargo suspension clevis.

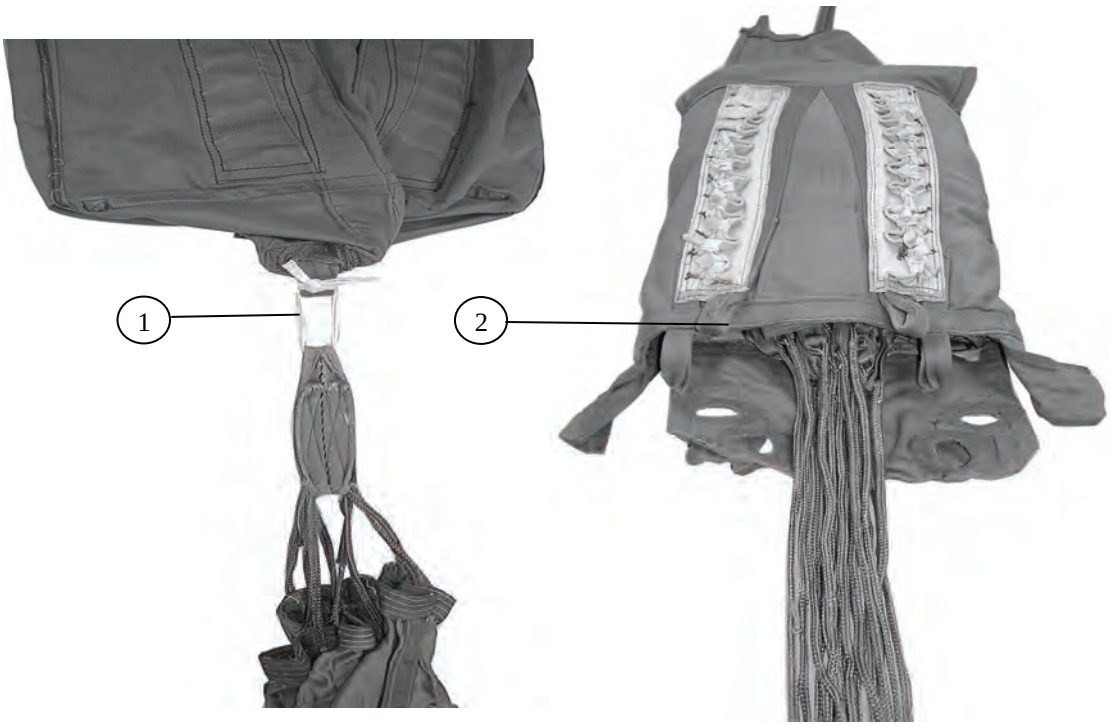
  In addition, for a parachute with a 36-inch adapter web, use one 9-foot (3-loop), type XXVI nylon sling and one two-point connector link.



(1) Attach retainer bands to the first eight stow loops on each side of the T-10 deployment bag.

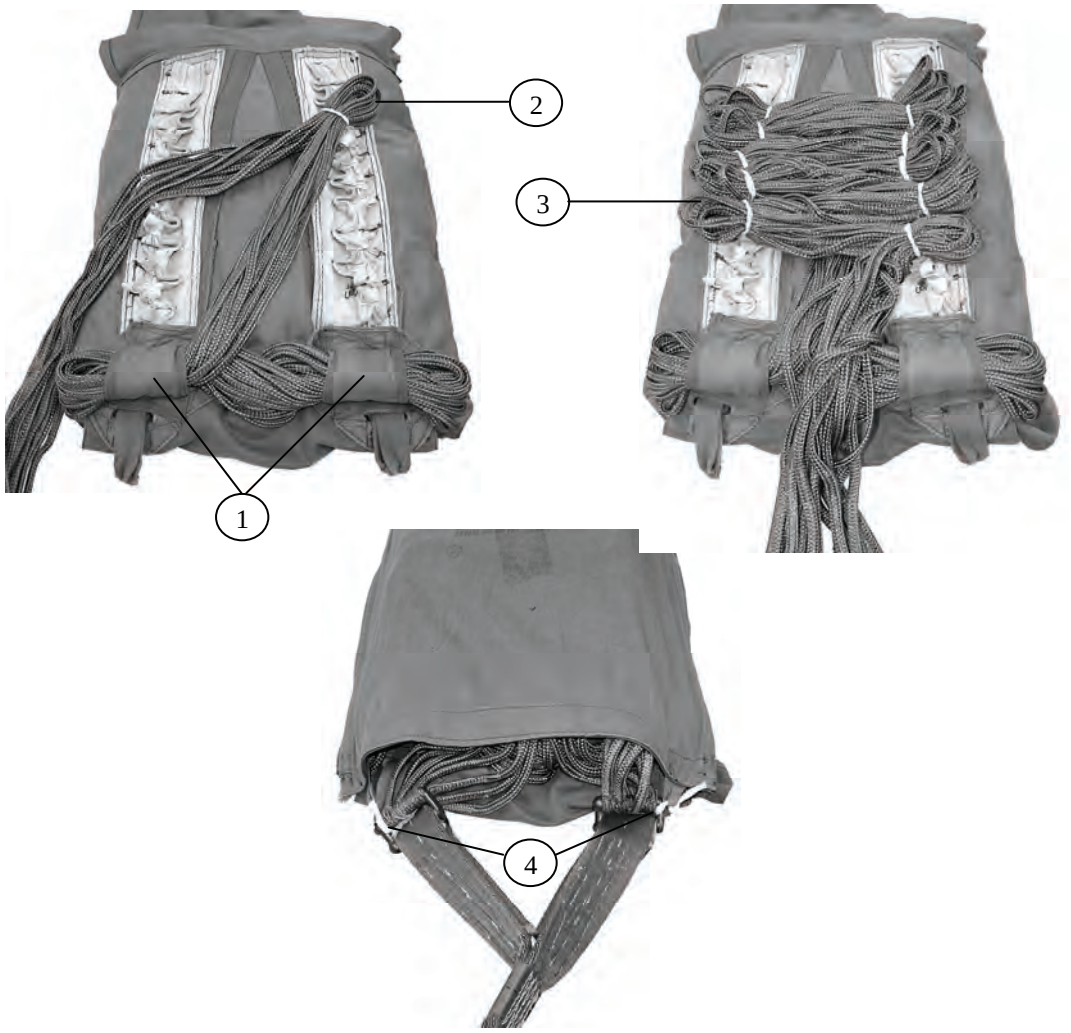
(2) Flat fold and long fold the canopy according to TM 10-1670-278-23&P/TO 13C5-26-2/NAVAIR 13-1-27/TM 01109C-23&P/1.

Figure 2-22. 15-Foot Extraction Parachute Stowed



1. Pass two lengths of type I, 1/4-inch cotton webbing through the bridle loop of the deployment bag to form a 3-inch loop. Cross the ends of the webbing over the bridle attaching loop. Tie them with a surgeon's knot and locking knot.
2. S-fold the canopy into the deployment bag, starting at the upper right corner of the bag.

Figure 2-23. Deployment Bag Attached and Canopy Stowed



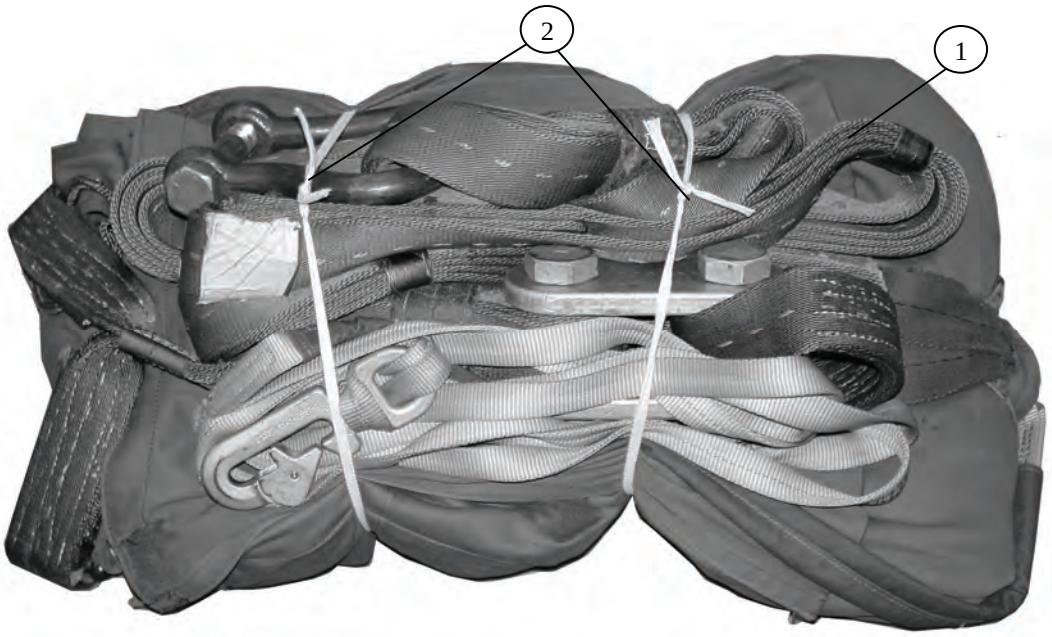
1. Make the locking stows as shown above and according to TM 10-1670-293-23&P/TO 14D1-2-467-2/TM 01136C-23&P/2.
2. Make the first suspension line stow with the upper right retainer band.
3. Continue stowing the lines from side to side.
4. Pass a length of type I, 1/4-inch cotton webbing through the right side connector link, the connector link loops, and the suspension line protector flap loop. Tie it with a surgeon's knot and locking knot. Repeat the procedures on the left side.

Figure 2-24. Locking Stows and Suspension Line Stows Made and Connector Links Tied



1. Attach a two-point, 3 3/4-inch link assembly to a 36-inch adapter web.
2. Attach a 9-foot (3-loop), type XXVI nylon sling to the two point 3 3/4-inch link assembly.
3. Bolt a cargo suspension clevis or a two-point, 3 3/4-inch link assembly to the free end of the sling (shown).

Figure 2-25. Deployment Line Installed on 36-inch Adapter Web

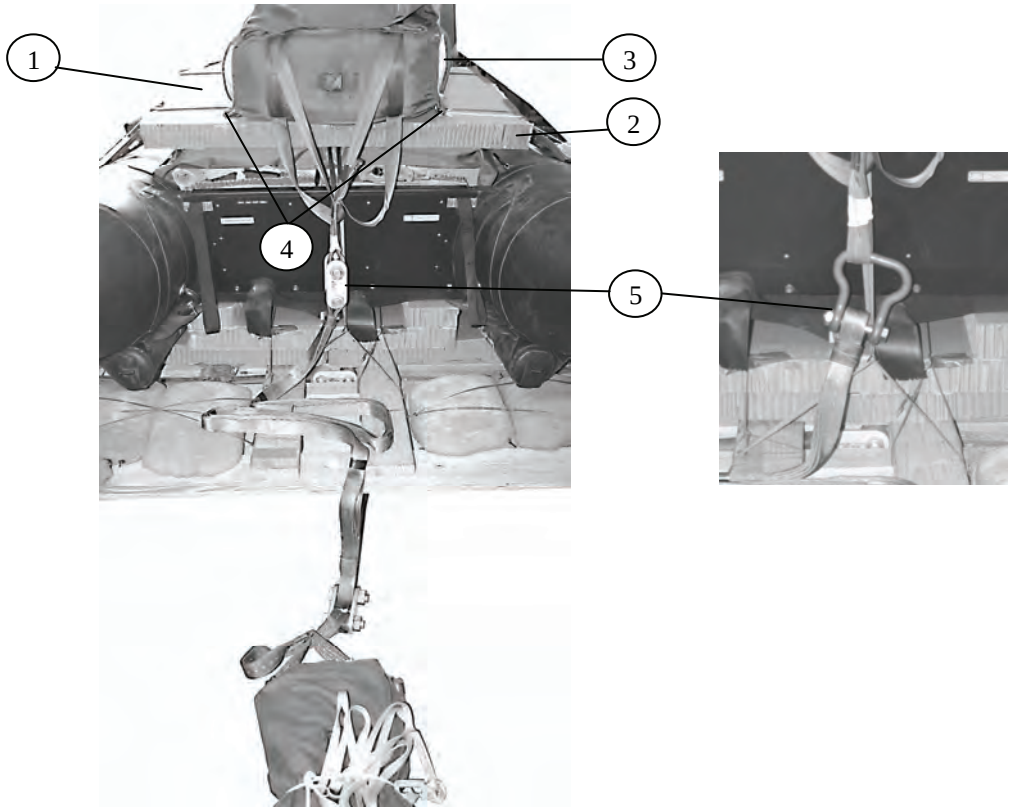


1. S-fold the deployment line and the universal static line. Place them on top of the deployment bag.
2. Secure the deployment line and the universal static line in place with two lengths of type I, 1/4-inch cotton webbing wrapped around the lines and the bag.

Figure 2-26. Cargo Extraction Parachute Packed in a T-10 Deployment Bag

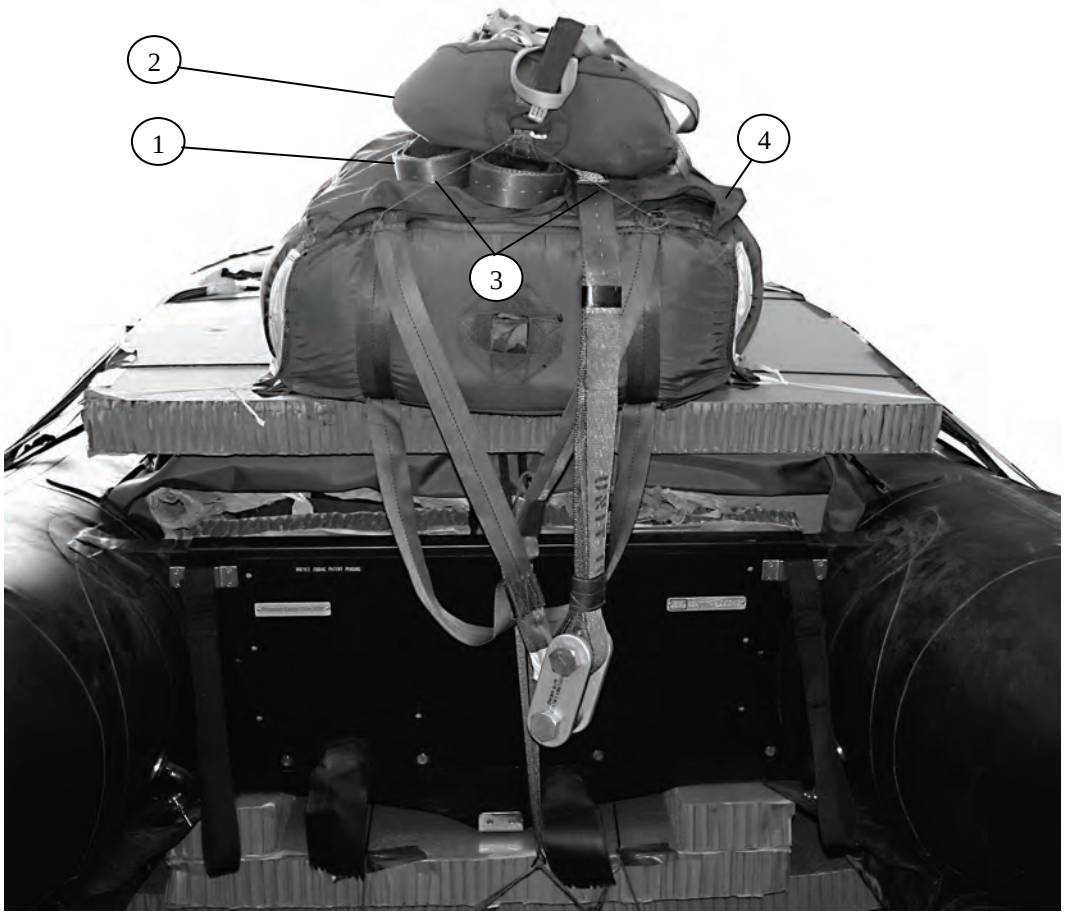
STOWING THE G-12 CARGO PARACHUTE AND 15-FOOT CARGO EXTRACTION PARACHUTE

2-13. Prepare and stow one G-12 cargo parachute as shown in Figure 2-27. Stow the 15-foot cargo extraction parachute as shown in Figure 2-28.



1. Lay a 36- by 55-inch piece of honeycomb on the top front of the accompanying load. Extend it 1-inch past the transom.
2. Bend the honeycomb over the load towards the sides of the boat. Tie it to convenient places with type III nylon cord. Use tape under the cord to prevent it from cutting the honeycomb. (not shown)
3. Set a G-12 cargo parachute on top of the honeycomb with the bridle toward the front of the platform.
4. Tie each corner of the parachute to the platform with one length of type I, 1/4-inch cotton webbing.
5. Attach the 9-foot sling from the 15-foot cargo extraction parachute to the G-12 cargo parachute deployment bag with a cargo suspension clevis (medium) or a two-point, 3 3/4-inch link assembly.

Figure 2-27. G-12 Cargo Parachute Positioned on Load and 15-foot Cargo Extraction Parachute Attached

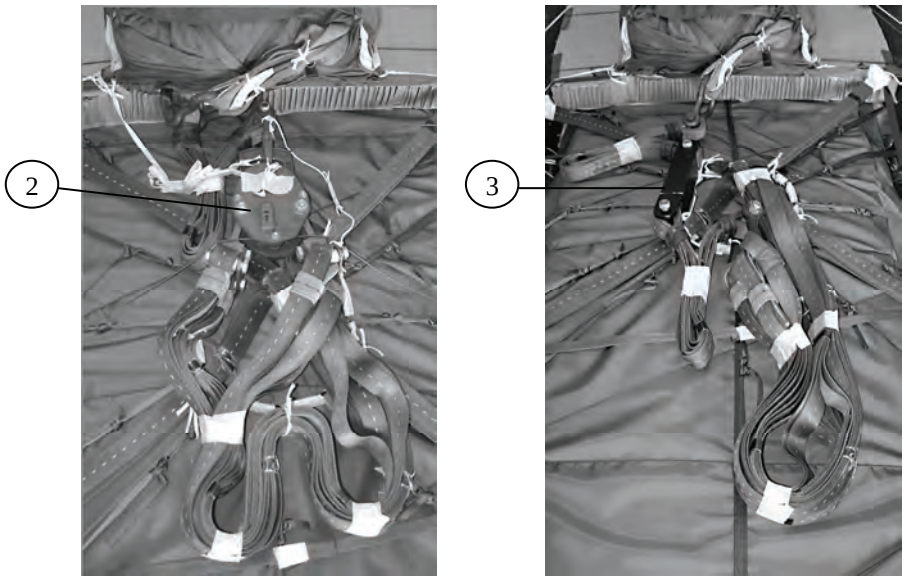


1. Lay the 9-foot sling of the cargo extraction parachute on top of the G-12 cargo parachute.
2. Place the 15-foot cargo extraction parachute on top of the 9-foot sling.
3. Tie the extraction parachute to the G-12 cargo parachute with four lengths of ticket number 5, 8/4 cotton thread.
4. Attach rubber retainer bands to the riser retaining loops on the G-12 cargo parachute. Fold the static line, and hold the folds in place with the retainer bands.

Figure 2-28. Cargo Extraction Parachute Placed on Load

INSTALLING PARACHUTE RELEASE

2-14. Use the M-1 or the automatic cargo parachute release on this load as shown in Figure 2-29 and according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.



(1) Perform the pre-drop activation test to insure the automatic cargo parachute release is fully functional and ready to use according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

(2) Prepare, install, and safety the M-1 cargo parachute release according to FM 4-20.102/ MCRP 4-11.3J NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

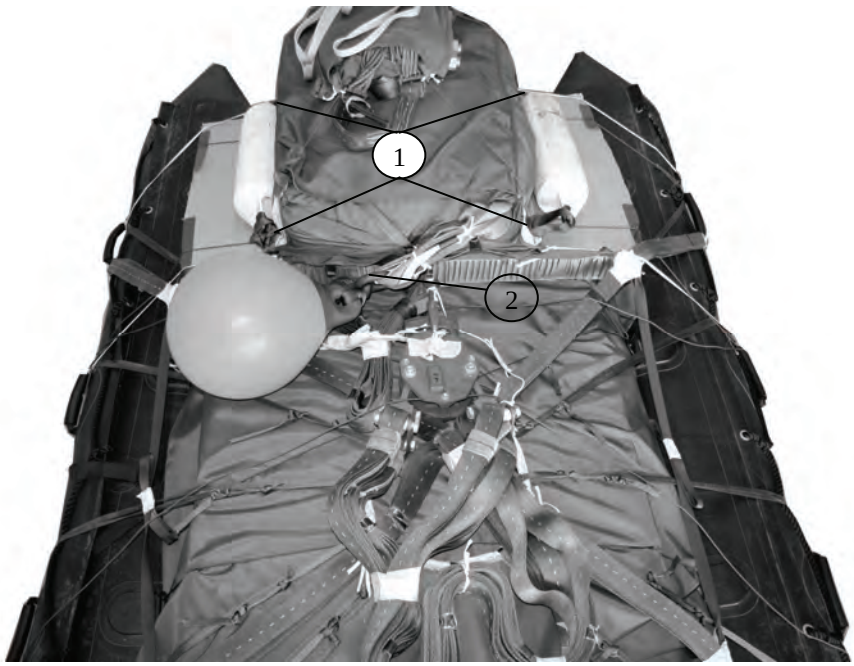
(3) Prepare, install, and safety the automatic cargo parachute release according to FM 4-20.102 /MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

Note. When using the automatic cargo parachute release, install a 25-foot drag line from the G-12 deployment bag to the main body of the automatic cargo parachute release.

Figure 2-29. Cargo Parachute Release Installed

INSTALLING FLOTATION DEVICE

2-15. Use flotation devices on training loads to help recover the parachute and parachute deployment bag. Install the flotation devices as shown in Figure 2-30. Recommended flotation devices include dock bumpers, life preservers, diving buoys, and two 12- by 12-inch pieces of honeycomb taped with waterproof tape.



1. Tie one flotation device to the G-12 cargo parachute deployment bag clustering attaching straps with 1-inch tubular nylon.
2. Tie one flotation device to the clevis between the cargo parachute and the parachute release assembly with a length of 1-inch tubular nylon webbing.

Figure 2-30. Flotation Devices Tied to Load

MARKING RIGGED LOAD

2-16. Mark the rigged load according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 2-31. If the accompanying load varies from the one shown, the weight, height, and CB must be recomputed.



Weight: Load shown.....2,470 pounds
Height .....60 inches
Width .....75 inches
Length .....189 inches
Overhang: Front.....16 inches
Rear .....29 inches
CB (from front edge of platform) .....60 inches

Figure 2-31. F470 Combat Rubber Raiding Craft Fully Rigged

EQUIPMENT REQUIRED

2-17. The equipment needed to prepare and rig this load is listed in Table 2-1. Additional items may be listed with the load description.

Table 2-1. Equipment Required for Rigging the Combat Rubber Raiding Craft for Low-Velocity Airdrop

National Stock Number	*Item*	*Quantity*
8105-00-285-4744	Bag, sand	16
1670-00-568-0323	Band, rubber, parachute	As required
No NSN	Bolt, carriage, 3/8-in dia, 7-in long, with washer and nut (add eight for training)	8
No NSN	Bolt, carriage, 3/8-in dia, 5-in long with washer and nut	4
1670-01-064-4928	Centerline (G-12E, 57 feet)	
4030-00-090-5354	Clevis assembly, large, 1-in., shackle	2
		1
4030-00-678-8560	Clevis, shackle, 3/8 inch diameter	1
8305-00-242-3593	Cloth, cotton duck, 60 inches	4 yd
4020-00-240-2146	Cord, nylon, type III, 550 lb	As required
1670-00-360-0328	Cover, clevis, large	1
8135-00-664-6958	Cushioning material, cellulose wadding	As required
1670-01-476-3131	Deployment bag, w/o static line	1
5306-00-435-8994	Deployment bag, parachute (G-12)	2
1670-00-039-5073	Link assembly, two-point, 3 3/4”	2
1670-00-487-6077	Link assembly connector, type IV	
	Lumber: (Platform)	4
5510-00-220-6146	2- by 4- by 10-in	4
	2- by 4- by 75-in	2
	2- by 6- by 30-in	4
	2- by 6- by 75in	2
5510-00-220-6148	2- by 6- by 144-in	2
5510-00-220-6274	4- by 4- by 144-in	
	Nail, steel, wire, common:	As required
5315-00-010-4657	6d	As required
5315-00-010-4659	8d	As required
5315-00-164-5121	20d	
1670-00-753-3928	Pad, energy-dissipating, honeycomb,	4 sheets
	3- by 36- by 96-in	(1)
	6- by 6-in	(1)
	6- by 12-in	(1)
	7- by 17-in	(2)
	7- by 28-in	(2)
	7- by 36-in	(1)
	36- by 55-in	(3)
	36- by 96-in	

Table 2-1. Equipment Required for Rigging the Combat Rubber Raiding Craft for Low-Velocity Airdrop (continued)

National Stock Number	*Item*	*Quantity*
1670-00-788-8666	Parachute, G-12	1
1670-01-063-3715	Parachute Cargo 15-ft Extraction	1
5530-00-128-4981	Plywood, 3/4- by 48- by 75-in	3
	Release, cargo, airdrop:	
1670-01-097-8816	M-1, cargo parachute release	1
1670-01-337-4366	Automatic cargo parachute release	1
	Sling, cargo, airdrop:	
1670-01-062-6301	3-foot (2 loop), type XXVI	2
1670-01-062-6304	9-foot (2 loop), type XXVI	1
1670-01-062-6302	16-foot (2 loop), type XXVI	4
1670-01-063-7761	20-foot (2-loop), type XXVI	1
7510-00-266-5016	Tape, adhesive, pressure sensitive, 2-in, OD	As required
8125-00-074-5124	Tape, adhesive, cloth backed, type IV, 2-in	As required
8310-00-917-3945	Thread, cotton, 8/7 (ticket 5)	As required
8305-00-268-2411	Webbing, textile (cotton, type I, Nat, 1/4-in, 80lb.)	As required
8305-00-262-2455 (GRN) 8305-00-082-5752 (WHT)	Webbing, textile nylon, tubular 1/2-in, OD	As required
8305-00-268-2455	Webbing, textile nylon, tubular, 1-in	As required

SECTION II-RIGGING DOUBLE ZODIAC F470U BOAT

DESCRIPTION OF LOAD

2-18. The description of the load rigged in this section is given below.

- **Inflated Zodiac F470 rubber raiding craft.** This boat is rigged in tandem on a 75- by 144-inch combat expendable platform (CEP) with a G-12E cargo parachute. Tandem loads require two parachutes. The boats weigh 250 pounds each. When inflated, each boat is 75 inches wide, 185 inches long, and 22 inches high. One or two 35-horsepower outboard engines that weigh 136 pounds each power the boat shown or one 55-horsepower engine that weighs 215 pounds with a full fuel tank. Six paddles weighing a total of 24 pounds and two sets of air pumps with hoses are part of each boat's equipment.

Note. A 40-horsepower engine is the largest that may be used on this boat when the boat is equipped with the accordion floor. An engine as large as 65-horsepower may be used on this boat with a solid floor.

- **Accompanying load.** An accompanying load weighing at least 650 pounds but no more than 1,170 pounds must be dropped with the boat.

PREPARING THE PLATFORM

2-19. Build a new CEP, or inspect and repair a used platform, using the procedures shown in Figures 2-1 through 2-4 and as described in paragraph 2-2.

INSTALLING SUSPENSION SLINGS AND STOWING SANDBAGS

2-20. Install four suspension slings on the platform according to paragraph 2-3 and Figure 2-5. Stow sandbags on the platform according to paragraph 2-4 and Figure 2-6.

PLACING AND SECURING HONEYCOMB STACKS

2-21. Build, place, and secure the honeycomb stacks as shown in Figures 2-8 and 2-9.

PREPARING BOATS

2-22. Inflate the boats except the keel. If the keel is inflated, let the air out. Install the hose clips as shown in Figure 2-10. Prepare the boats as shown in Figures 2-10 through 2-12.

POSITIONING FIRST BOAT

2-23. Position the first boat as shown in Figure 2-14.

PREPARING AND STOWING ACCOMPANYING LOAD

2-24. Prepare and stow the outboard engines, fuel tanks, paddles, all boat accessories, and accompanying load as described in paragraph 2-9 and Figures 2-15 through 2-17.

LEVELING, COVERING, AND LASHING FIRST BOAT AND ACCOMPANYING LOAD

2-25. Level the load on the first boat, position the load cover, and lash the boat to the platform as described below, and shown in Figure 2-32.

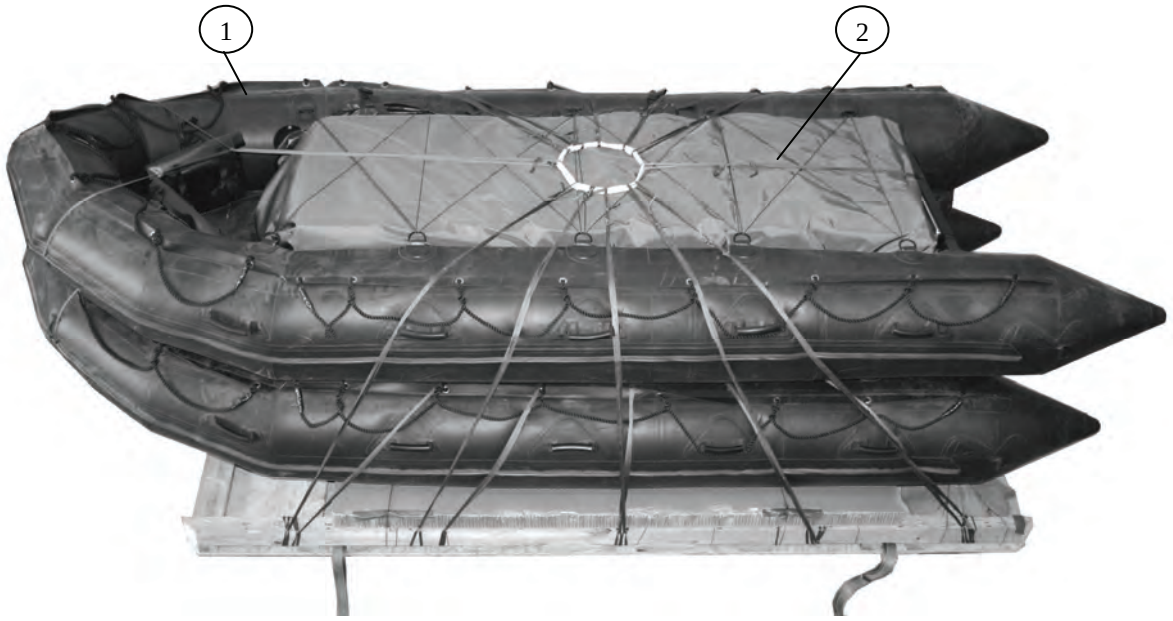
- Use honeycomb pieces to level the load to the top of the engine. If collapsible fuel tanks are used, fit honeycomb around them by standing the honeycomb on edge for support.
- Place a 30- by 90-inch piece of honeycomb on top of the leveled load.
- Cover the load as shown in Figure 2-20.
- Lash the boat to the platform as shown in Figures 2-18, 2-20, and 2-32.



Figure 2-32. Load Covered, Tied in Place and Boat Lashed to Platform

PLACING AND LOADING SECOND BOAT

2-26. Prepare, place, load, and cover the second Zodiac F470U boat as shown in Figure 2-33.



1. Inflate the second boat except the keel (not shown). Prepare it according to Figures 2-10 through 2-12.
2. Prepare, stow, and cover third engine, fuel tanks, and load items according to Figures 2-15 through 2-20.

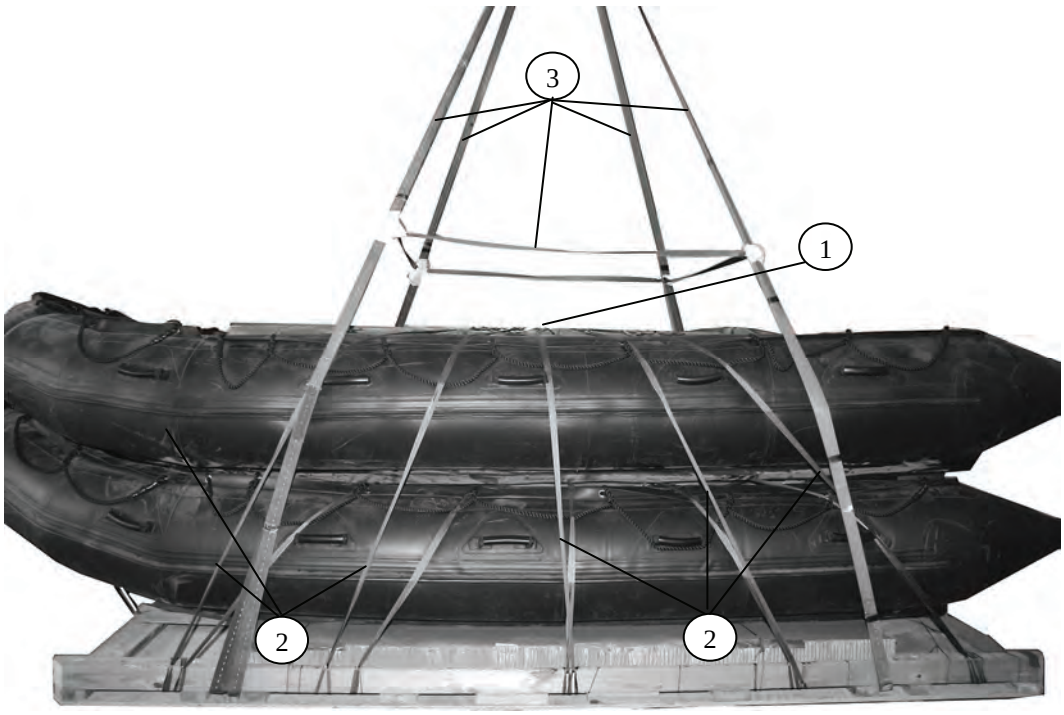
Figure 2-33. Second Boat Prepared, Placed and Covered

LASHING SECOND BOAT TO PLATFORM

2-27. Lash the second boat to the platform as shown in Figures 2-33 and 2-34.

SAFETY TIEING SUSPENSION SLINGS

2-28. Make a deadman's tie, and safety the suspension slings according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figures 2-21 and 2-34.



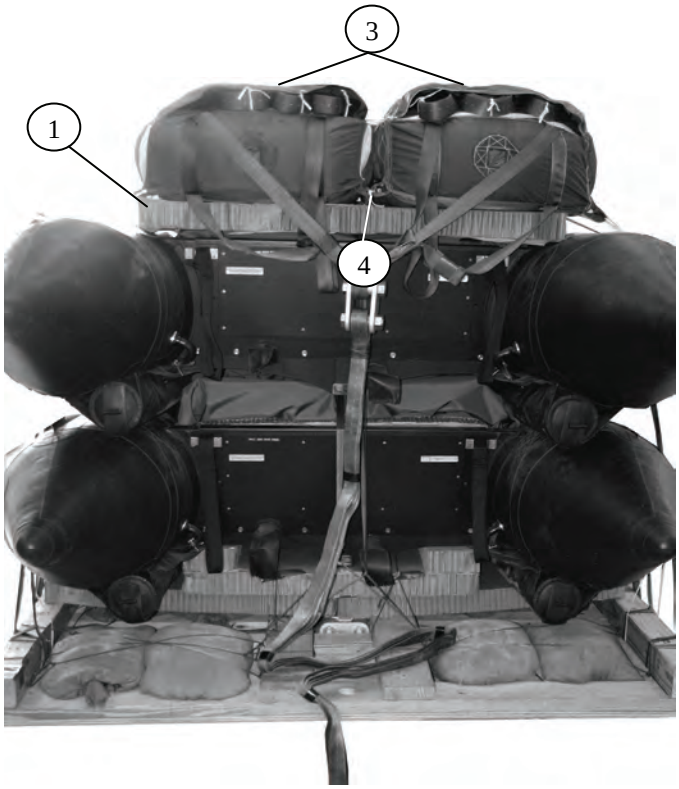
1. Center the four-ply tiedown ring over the load cover of the second boat.
2. Position the lashings and tie them to the tiedown ring as shown in Figures 2-18 through 2-20.
3. Raise the suspension slings, and make the deadman's tie, using 1/2-inch double or 1-inch tubular nylon webbing according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5, using 1/2-inch double or 1-inch tubular nylon webbing.
4. Lower the slings and tie them to the tiedown ring as shown in Figure 2-21.

Figure 2-34. Boat Lashed and Suspension Slings Safety Tied

STOWING PARACHUTES

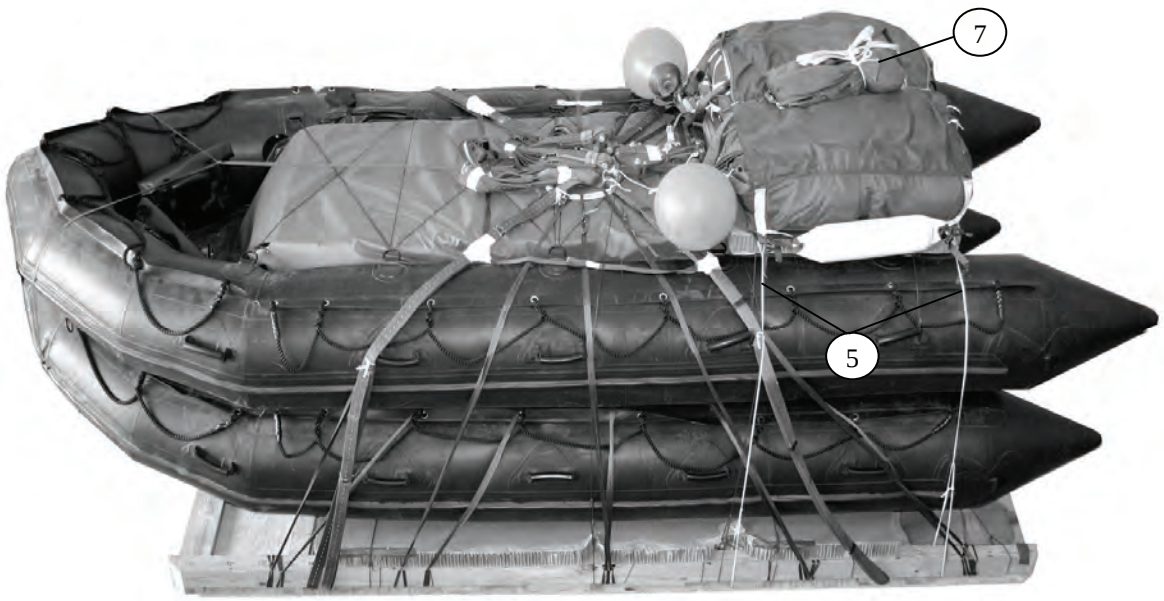
2-29. Stow parachutes as described below.

- Lay a 36- by 55-inch piece of honeycomb across the load cover of the second boat as shown in Figure 2-35.
- Prepare and pack the 15-foot cargo extraction parachute as described in paragraph 2-12.
- Prepare two G-12 cargo parachutes. Stow them on front of the load according to FM 4-20.102/ MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.



1. Lay a 36- by 55-inch piece of honeycomb across the load cover of the second boat extending 1-inch past the transom.
2. Bend the honeycomb over the load. Tape the edges of the honeycomb (not shown).
3. Set two G-12 cargo parachutes on the honeycomb with the riser extension compartment up and the bridle toward the front of the platform.
4. Cluster the parachutes together with single lengths of type I, 1/4-inch cotton webbing.

Figure 2-35. Parachutes Stowed



5 Secure the parachutes to convenient points on the load with four lengths of type I, 1/4-inch cotton webbing.

6 Attach the deployment line (9-foot, type XXVI nylon webbing sling) from the packed 15-foot extraction parachute to the G-12 bridles with a two-point link assembly or a medium clevis (not shown).

7 Center the 15-foot cargo extraction parachute on top of the G-12 cargo parachutes. Safety it in place with ticket number 5, 8/4 cotton thread.

8 S-fold the slack in the deployment line, and tape the folds. Secure the clustering clevis to the riser extension tiedown loops with a double length of type I, 1/4-inch cotton webbing (not shown).

9 Remove the left secondary bag closing tie from both G-12 parachutes (not shown).

Figure 2-35. Parachutes Stowed (continued)

INSTALLING PARACHUTE RELEASE

2-30. Use either one M-1 release or two automatic cargo parachute releases according to FM 4-20.102 /MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

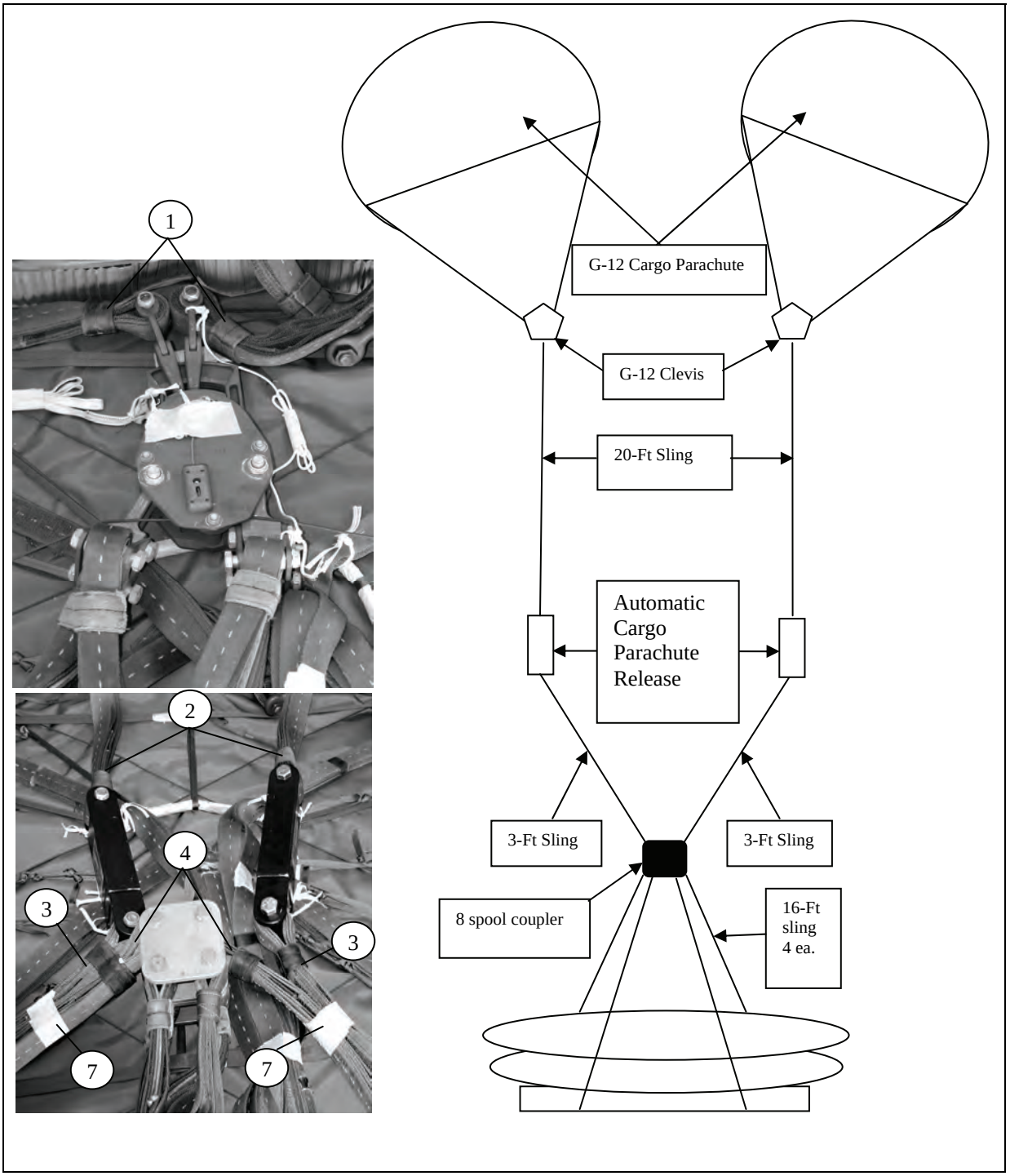


Figure 2-36. M-1 and Automatic Cargo Parachute Release Installed

1. Attach the riser extensions on the G-12 parachutes to the two parachute connectors on the M-1 release. Safety the release to convenient points on the platform with type III nylon cord.
2. Attach 20-foot type XXVI nylon webbing, riser extensions to the main body of the hydraulic cargo release.
3. Attach a 3-foot sling to the release fitting shackle (lower body).
4. Attach opposite ends of the 20-foot riser extension to the large clevis.
5. Secure both releases to the donut using a single turn type I, 1/4-inch cotton webbing on both ends of each release (not shown).
6. Secure the 8 spool load coupler or large clevis to the donut using one turn type I, 1/4-inch cotton webbing (not shown).
7. Tape excess webbing of 3-foot sling with masking tape.
8. Secure cherry buoy to the main body of the hydraulic cargo release with 1-inch tubular nylon webbing (not shown).

Figure 2-36. M-1 and Automatic Cargo Parachute Release Installed (continued)

EQUIPMENT REQUIRED

2-31. In addition to the items listed in Table 2-1, use one additional G-12 cargo parachute, four 36- by 96-inch pieces of honeycomb, two 5- by 96-inch pieces of honeycomb, two 30- by 90-inch pieces of honeycomb, one 13- by 36-inch piece of honeycomb, and one eight spool coupler and another automatic cargo parachute release and another 20-foot (2-loop), type XXVI sling.

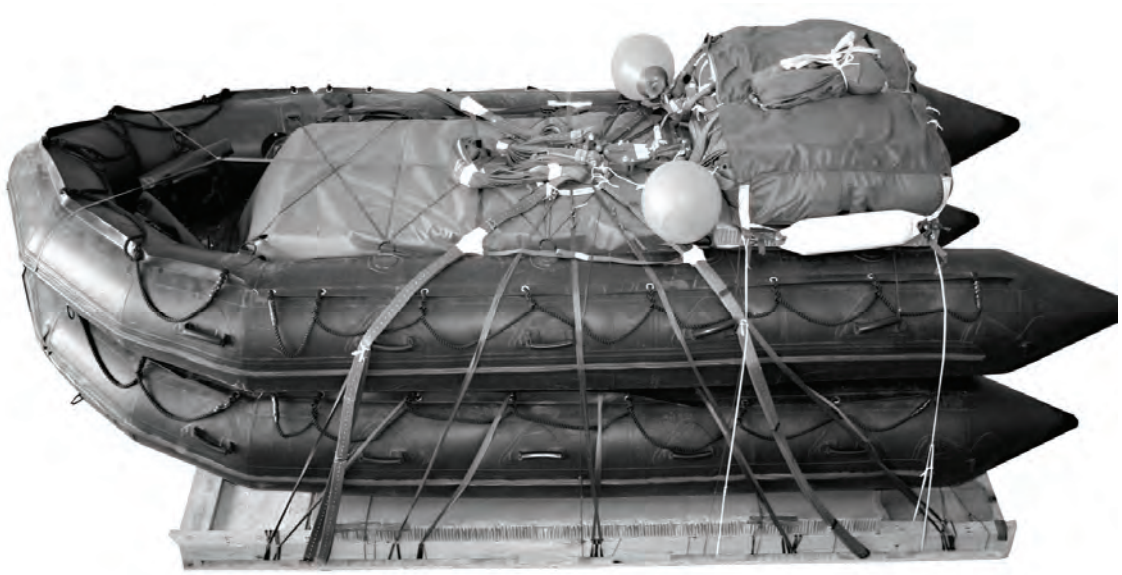
MARKING RIGGED LOAD

2-32. Mark the rigged load according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 2-37. If the accompanying load varies from the one shown, the weight, height, and CB must be recomputed.

CAUTION:

Make the final rigger inspection required by FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves the rigging site.

***Note*.** Remove the plastic and tape from the fuel pump and filter and reattach them before using the MARS engine. Inflate the keel before using the boat.



Weight: (maximum suspended weight) ..... 3500 pounds
Height .....86 inches
Width.....75 inches
Length.....189 inches
Overhang: Front.....16 inches
Rear .....29 inches
CB (from front edge of platform).....60 inches

Figure 2-37. Double Zodiac F470U Fully Rigged

Chapter 3

Rigging Zodiac F470U Boat in A-22 Cargo Bag

DESCRIPTION OF LOAD

3-1. The description of the load rigged in this section is given below.

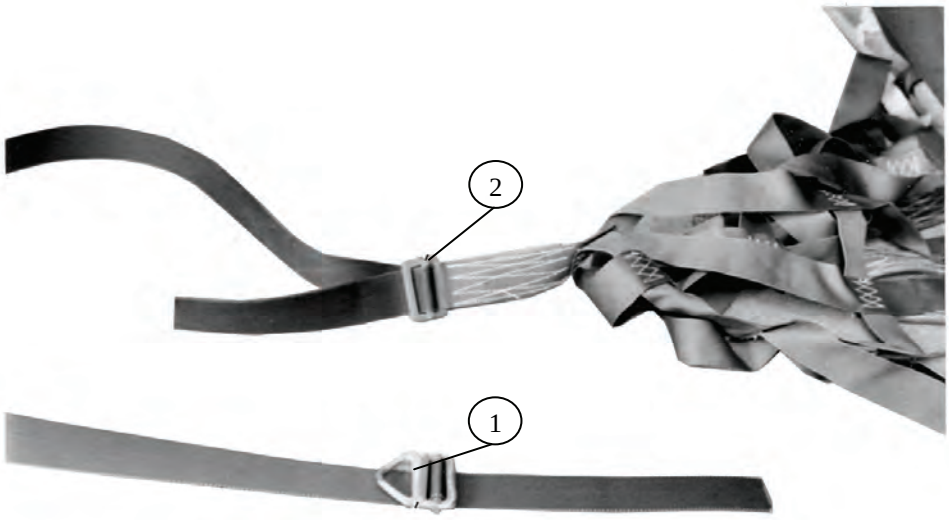
- The Zodiac F470U Combat Rubber Raiding Craft (CRRC) is described in this chapter. This boat is rigged in an adapted A-22 cargo bag on a 48- by 48-inch skid board for low-velocity airdrop over water. The boat is rigged with the 35-horsepower Marine Amphibious Reconnaissance Submersible (MARS) engine installed on the boat transom. This boat is designed for rapid inflation and deployment of the boat. The load shown weighs 600 pounds.
- The accompanying load is limited to equipment that can be stowed on both sides of the engine box and secured within the A-22 cargo bag. No accompanying load is shown.

CAUTION

This load differs from other rubber boat loads. Strict adherence to rigging procedures is critical.

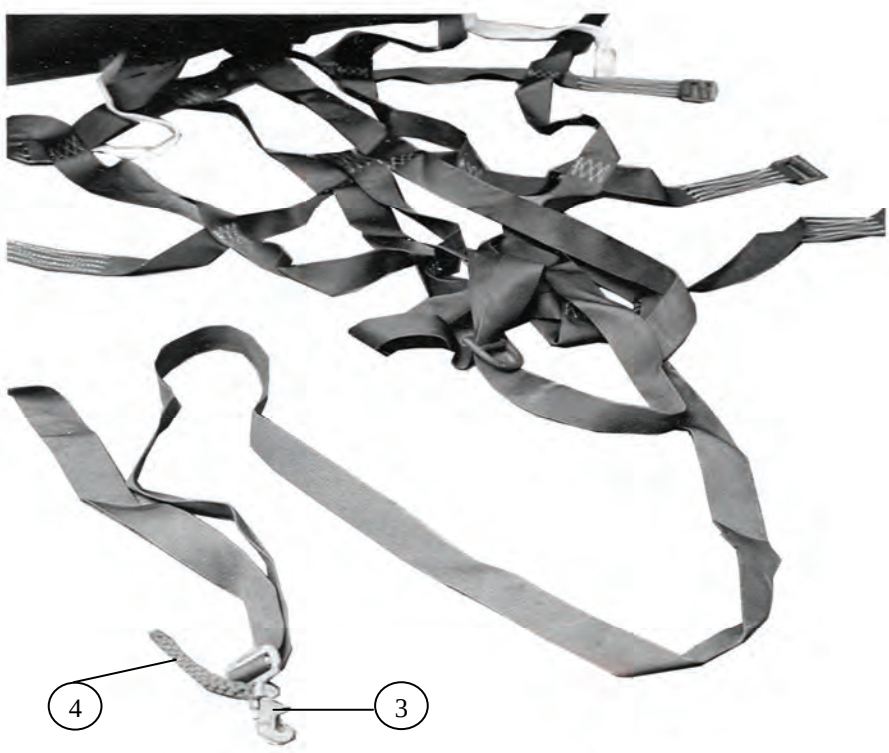
ADAPTING A-22 CARGO BAG

3-2. Adapt the long and short tiedown straps on the sling assembly of the A-22 cargo bag as shown in Figure 3-1.



1. Install a V-ring to one end of a 36-inch length of type VIII nylon webbing. Prepare a second assembly in the same way.
2. Thread the free end of each length of type VIII nylon webbing through the quick fit adapter on the long tiedown strap. Repeat for the short tiedown strap.

Figure 3-1. Sling Assembly Adapted



(3) Install a parachute harness snap to each of the remaining long and short tiedown straps on the sling assembly. Install the parachute harness snap so that it will open inward when the A-22 container is closed.

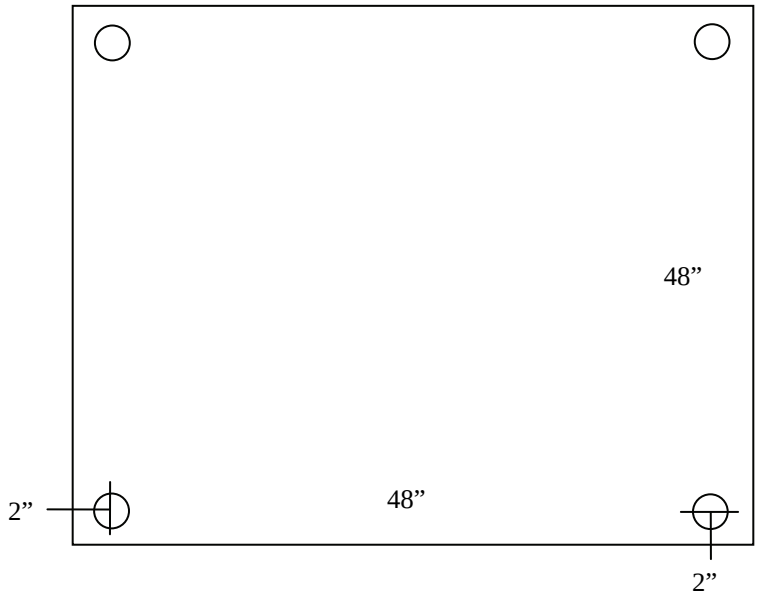
(4) Make a pull handle for each parachute harness ejector snap.

Figure 3-1. Sling Assembly Adapted (continued)

CONSTRUCTING ENGINE PROTECTION BOX

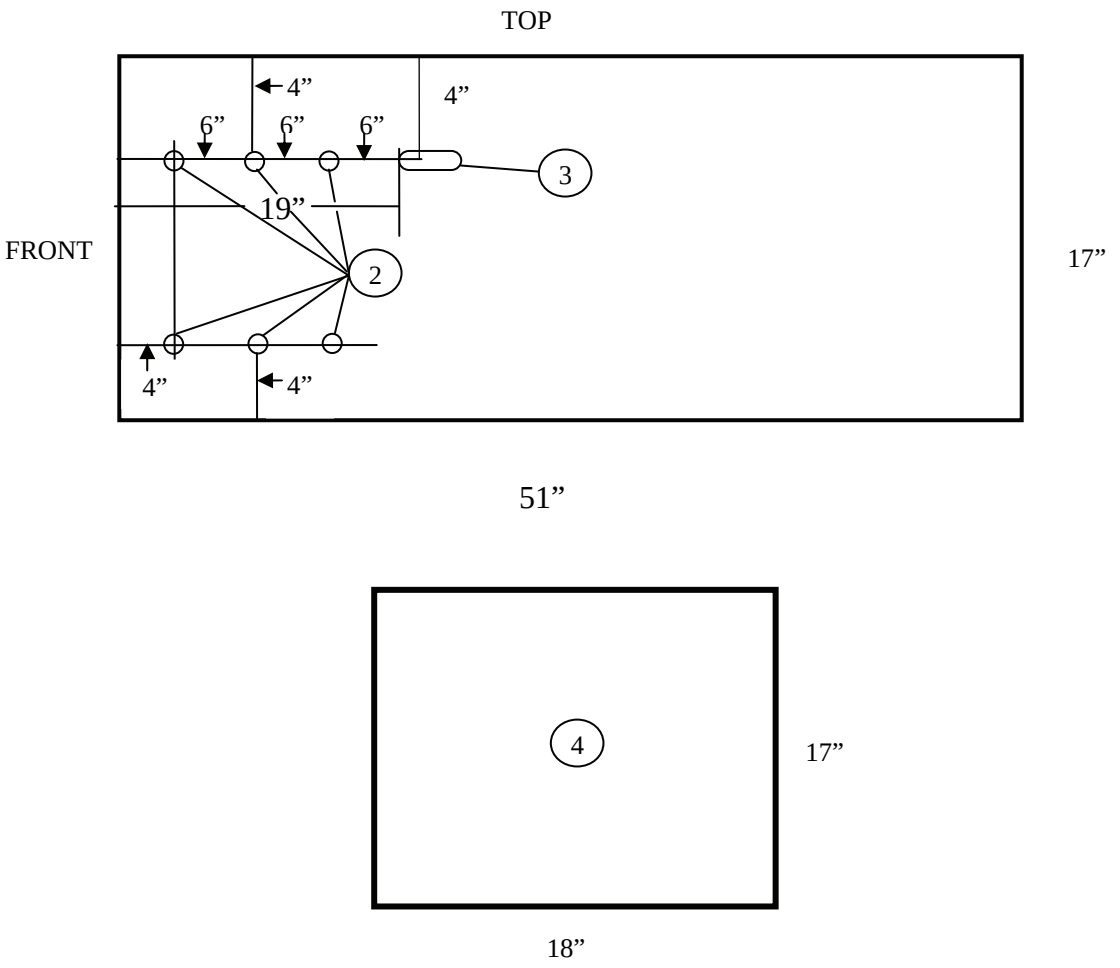
3-3. Construct the engine protection box as shown in Figure 3-2. If the engine protection box is to be recovered and reused, construct the box of oiled marine-grade plywood and aluminum braces. For one-time use, standard plywood and nails may be used.

Note. This drawing is not to scale.



(1) Drill 1/2-inch holes as shown in a 3/4- by 48- by 48-inch piece of plywood. This piece will be the bottom.

Figure 3-2. Engine Protection Box Constructed

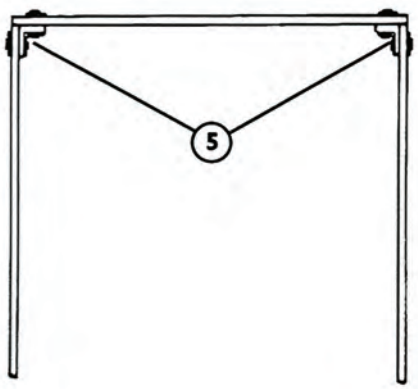


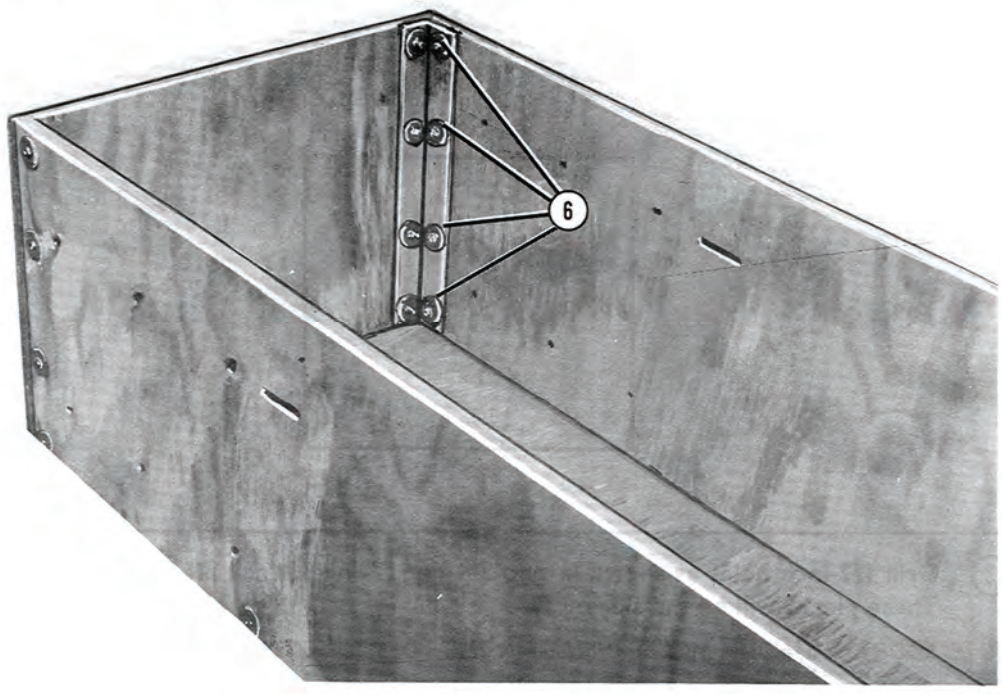
2 Drill 1/2-inch holes as shown in two 3/4- by 17- by 51-inch pieces of plywood. These pieces will be used as the sides.

3 Cut a 2- by 1/2-inch slot in each side 19 inches from the front edge and 4 inches from the top.

4 Cut two 3/4- by 17- by 18-inch pieces of honeycomb to be used as the ends.

Figure 3-2. Engine Protection Box Constructed (continued)



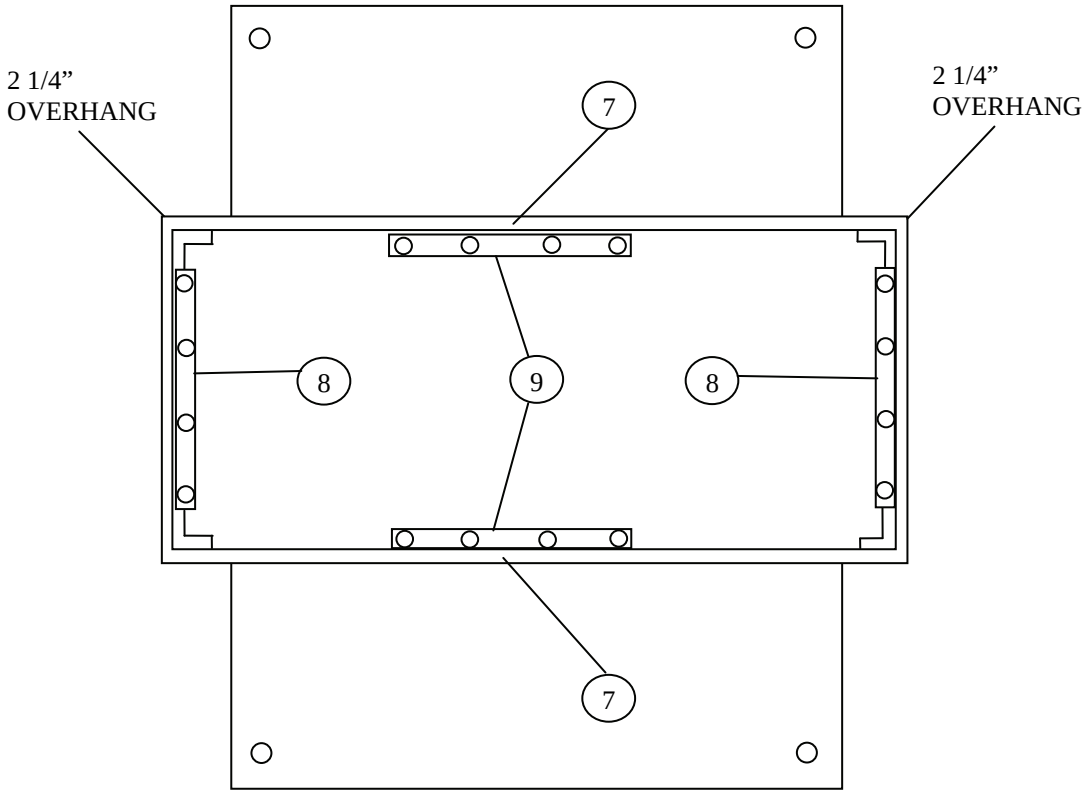


(5) Join the ends and the sides of the box with a 17-inch length of angled aluminum. Fit the ends of the box to the outside edges of the sides.

(6) Drill four holes (one at each end of the brace and two evenly spaced between the end holes). Install bolts and nuts using 1 1/2-inch diameter fender washers under each bolt and each nut.

Figure 3-2. Engine Protection Box Constructed (continued)

Note. This drawing is not to scale.

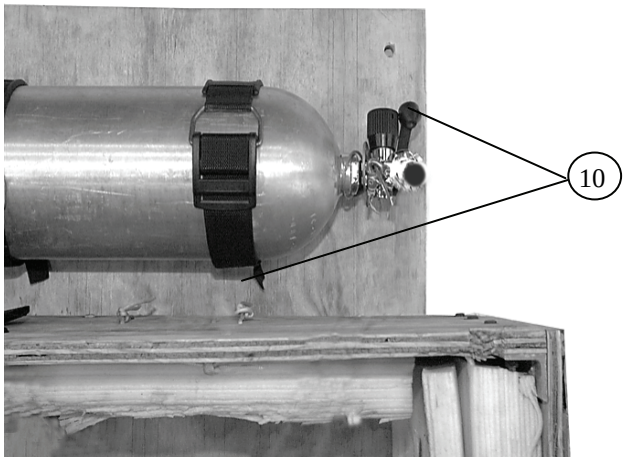


7 Center the sides of the box over the bottom so that the ends overhang the bottom 1 1/2 inches at the front and rear.

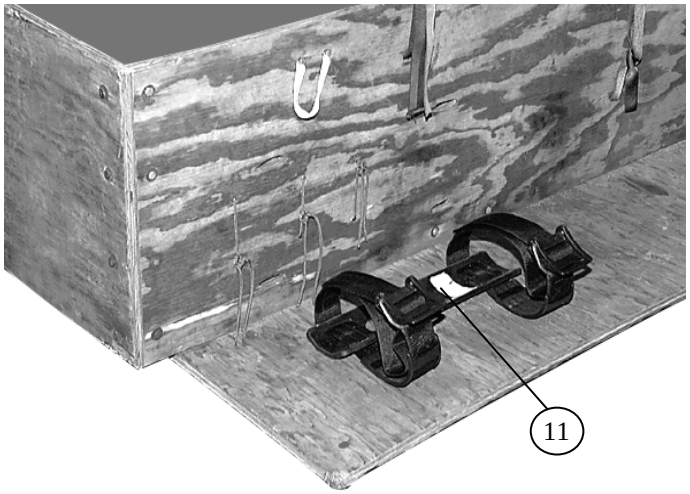
8 Join each end of the box to the bottom with a 14-inch length of angled aluminum. Drill holes and install fasteners and washers as in step 6. Note that the total overhang at each end for a 51-inch box is 2 1/4 inches.

9 Join each side of the box to the bottom with a 20-inch length of angled aluminum centered along each side. Drill holes and install fasteners and washers as in step 6.

Figure 3-2. Engine Protection Box Constructed (continued)



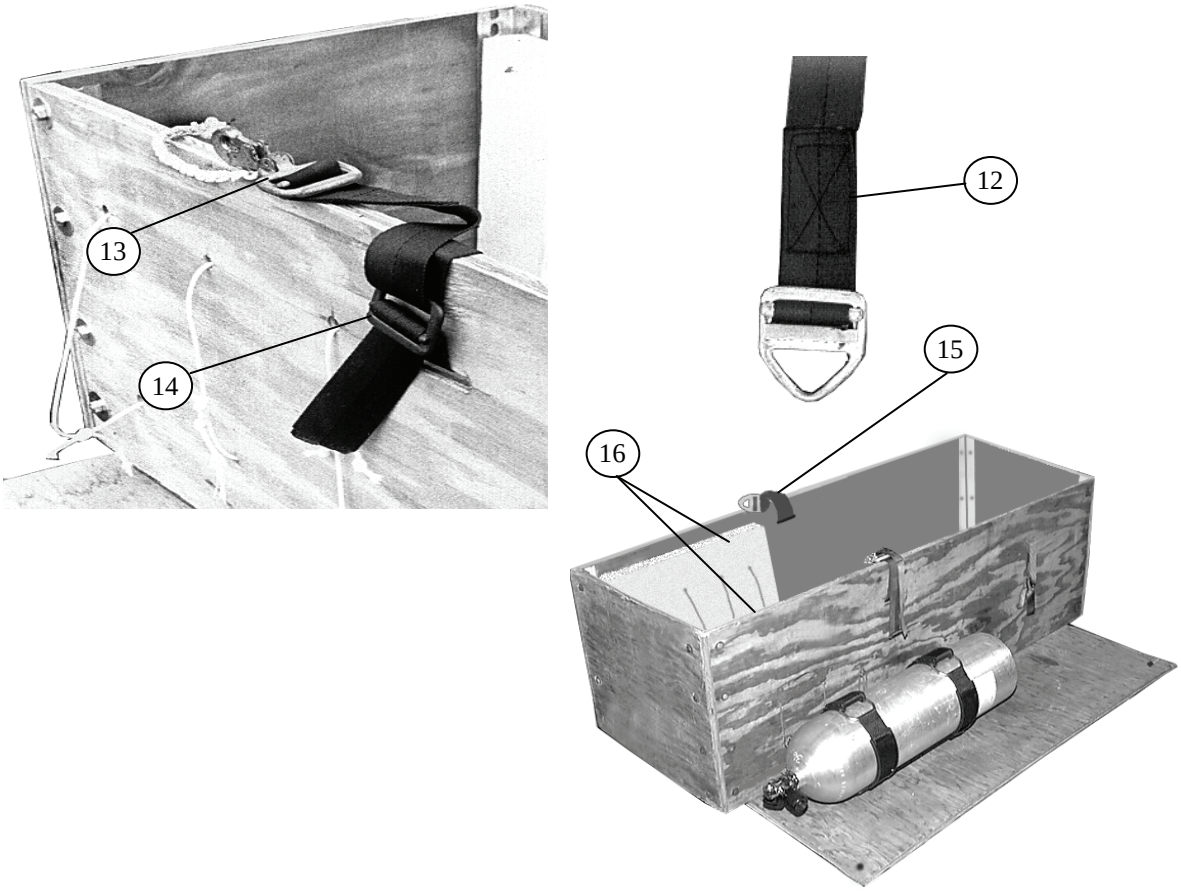




(10) Fill a Self Contained Underwater Breathing Apparatus (SCUBA) cylinder with compressed air at 3000 pounds per square inch (psi), and position the cylinder in its mounting plate. Place the cylinder on the left side of the box base so that the cylinder is 1-inch from the box side, and the cylinder valve flush with the front edge of the base. A carbon fiber apparatus (SCUBA) cylinder with compressed air at 4500 psi may also be used.

(11) Remove the cylinder. Using the mounting plate as a template, drill holes through the box base. Install the mounting plate using the bolts provided.

Figure 3-2. Engine Protection Box Constructed (continued)



(12) Sew a V-ring to a 30-inch length of type VIII nylon webbing.

(13) Attach a parachute harness strap to another 30-inch length of type VIII nylon webbing using the friction adapter on the snap. Make a pull handle for the snap as shown in step 4 of Figure 3-1.

(14) With the snap opening facing the inside of the box, attach the strap with the parachute harness snap to the slot on the left side of the box using a friction adapter.

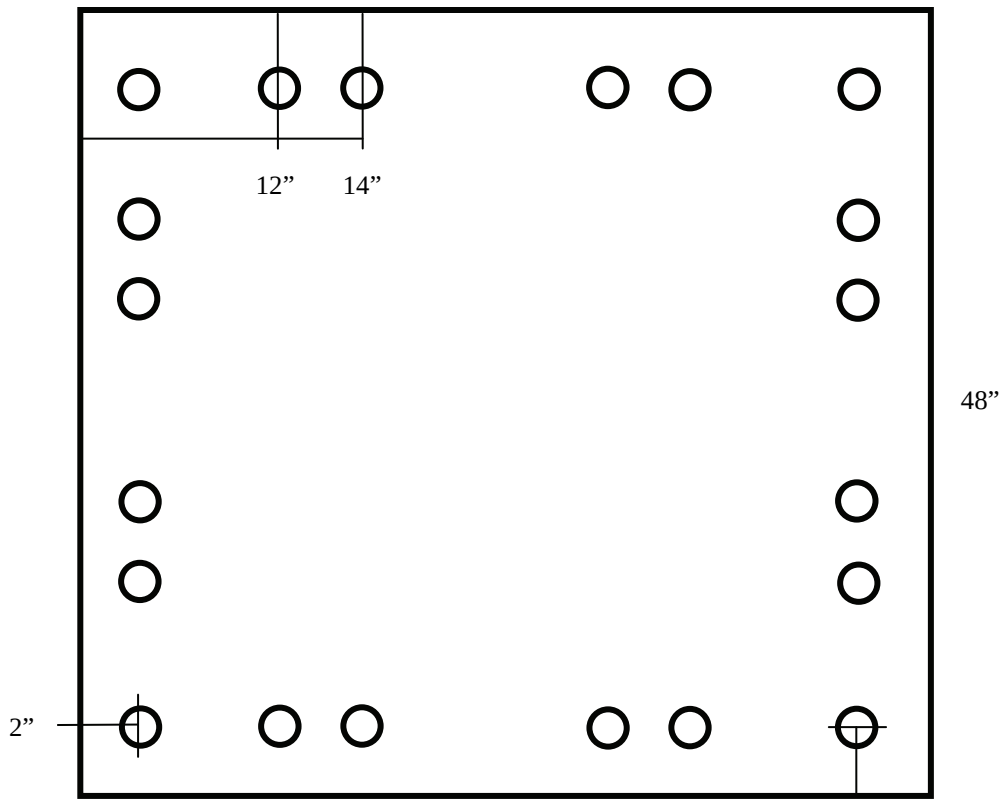
(15) Attach the strap with the V-ring to the slot on the right side of the box with a friction adapter.

(16) Place one 13- by 17-inch piece of foam padding in each front side of the box. Secure them with type III nylon cord tied through the holes in the sides of the box.

Figure 3-2. Engine Protection Box Constructed (continued)

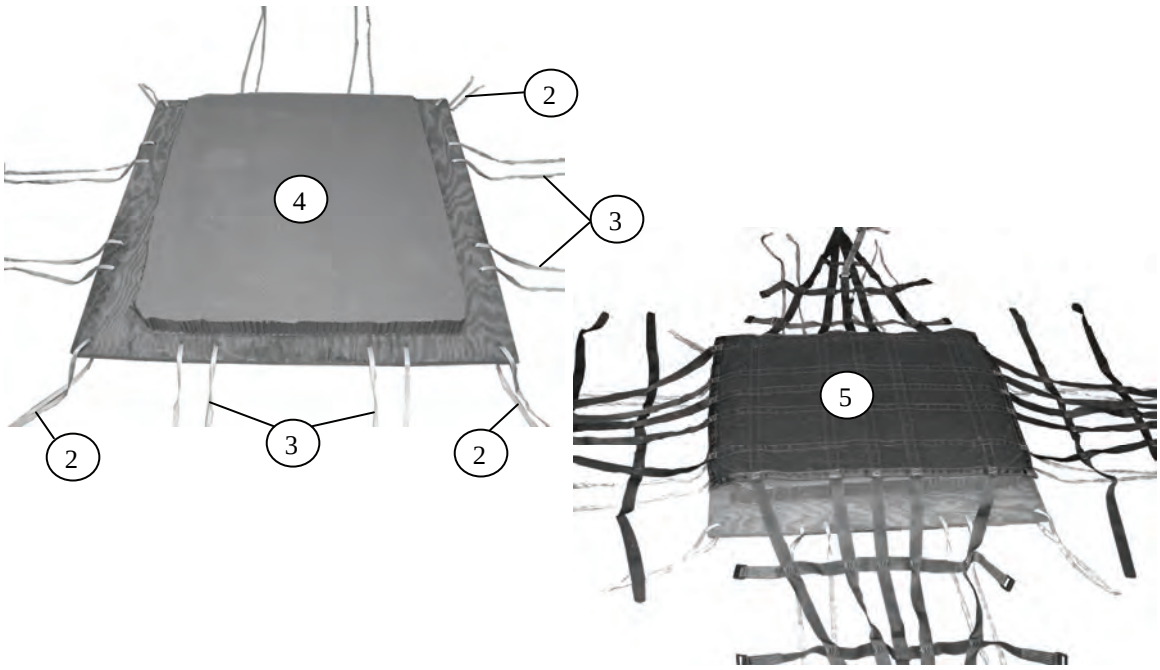
PREPARING SKID AND A-22 CARGO BAG AND PLACING ENGINE BOX

3-4. Prepare the skid board and A-22 cargo bag assembly as shown in Figures 3-3 and 3-4. Place the engine box as shown in Figure 3-5.



1 Drill 1/2-inch holes in skid board according to Figure 3-2, step 1.

Figure 3-3. A-22 Skid Board Prepared



2 Place the skid board on dunnage to allow lifting by forklift (not shown).

3 Center a 24-inch length of 1/2-inch tubular nylon webbing through each corner hole.

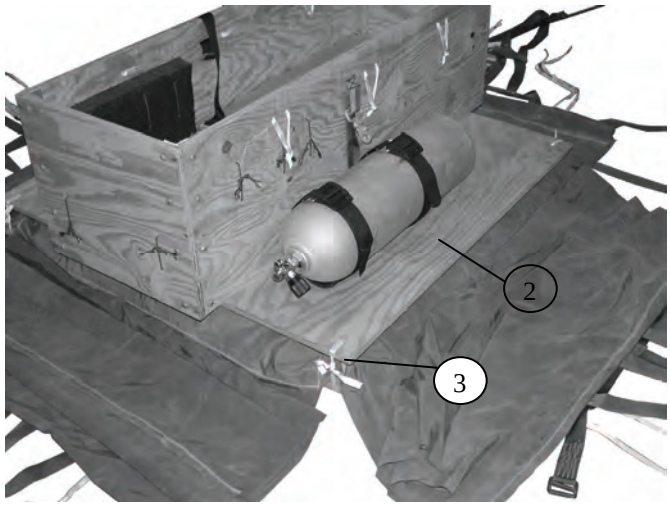
4 Pass a length of 1/2-inch tubular nylon webbing through each pair of holes in the sides of the skid board.

5 Center a 36- by 42-inch piece of honeycomb on the skid board as shown.

6 Center the scuff pad of the A-22 sling assembly over the honeycomb and skid board.

Figure 3-4. Skid Board and A-22 Cargo Bag Prepared





1. Center the A-22 cover assembly over the scuff pad. Tuck the slings and cover flaps around skid board to allow working space.
2. Center the base of the engine box over the skid board and A-22 cargo bag.
3. Tie the corners of the skid board to the corners of the engine box using the lengths of 1/2-inch tubular nylon webbing placed in step 3 of Figure 3-4.

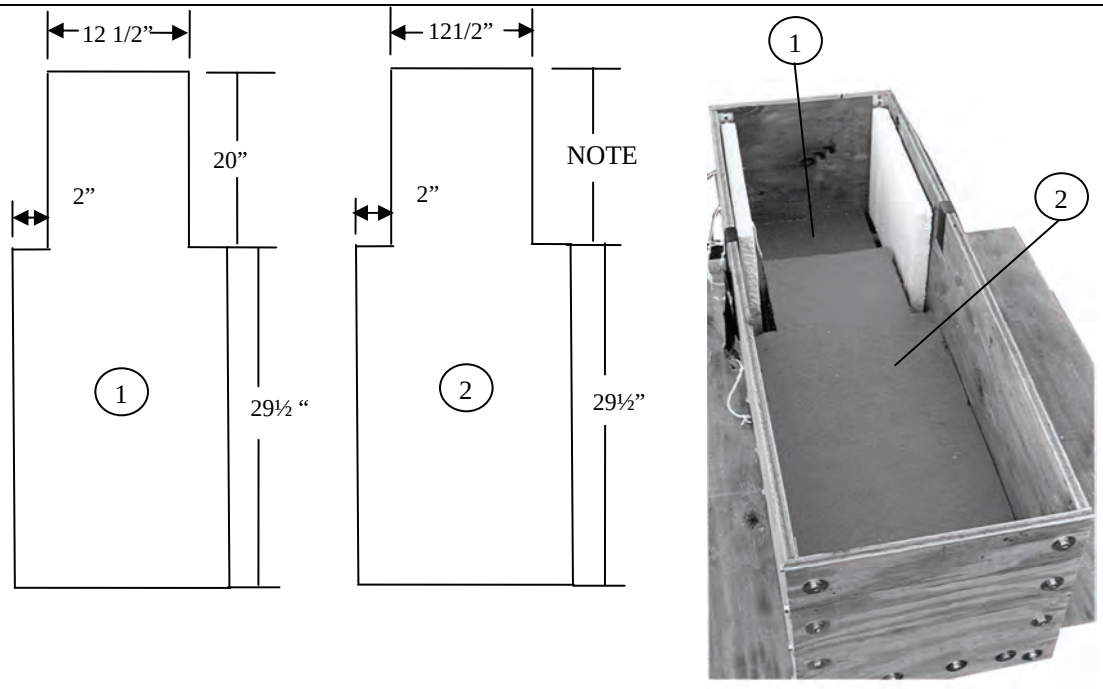
Figure 3-5. Engine Box Placed

PREPARING ENGINE AND SECURING ENGINE IN BOX

3-5. Prepare a 35-horsepower MARS submersible engine and secure it in the engine box as described below:

- Prepare the engine with the assistance of a boat operator as described below.
  - Place the shift lever in the NEUTRAL position.
  - Open the throttle fully.
  - Place the dewatering valve in the OUT position.
  - Coat the ignition components with moisture-resistant sealer.
- Place the engine in the engine box, pad it with honeycomb, and secure it as shown in Figure 3-6.

Note. This drawing is not to scale.

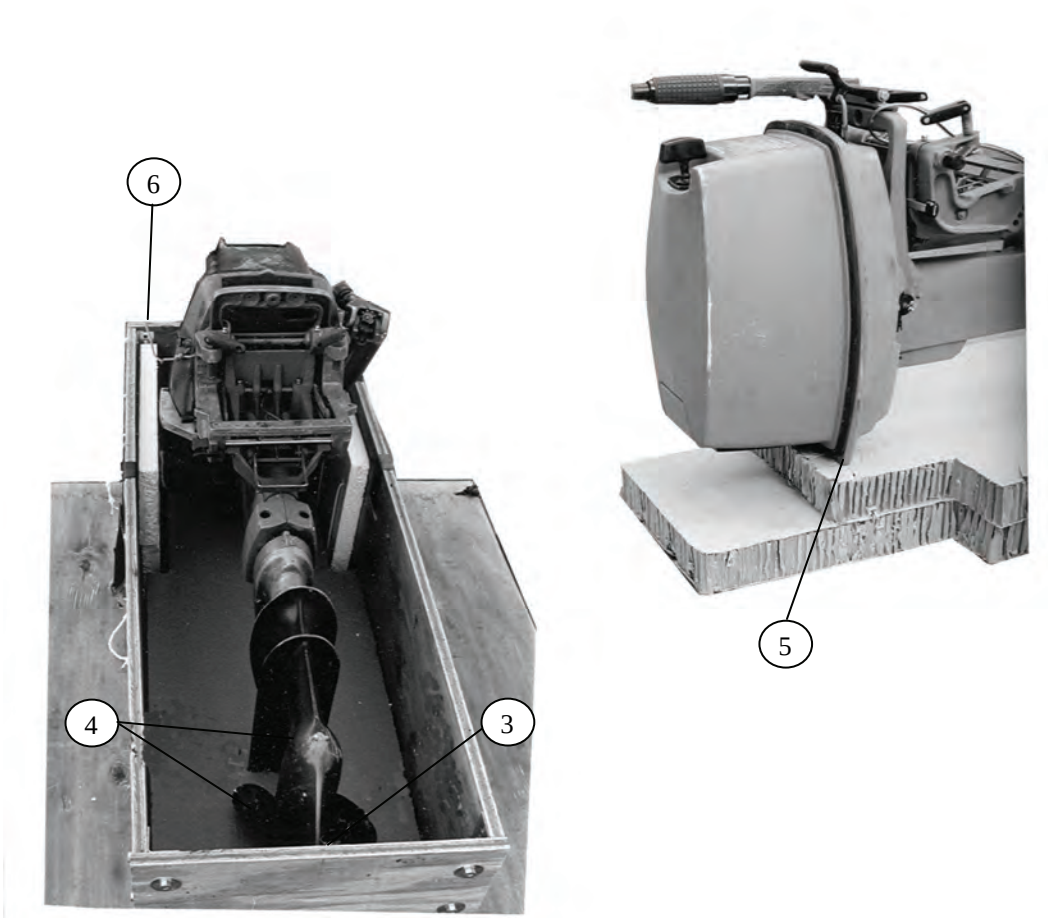


Note. This length will vary with the model of the engine used. See Step 5 for proper alignment.

(1) Cut a piece of honeycomb as shown. Place it in the bottom of the engine box.

(2) Cut the second piece of honeycomb as shown. Place it in the box, aligning the rear edge with the rear edge of the first piece.

Figure 3-6. Engine Secured in Box



3 Place the engine in the box with the skeg touching the rear of the box.

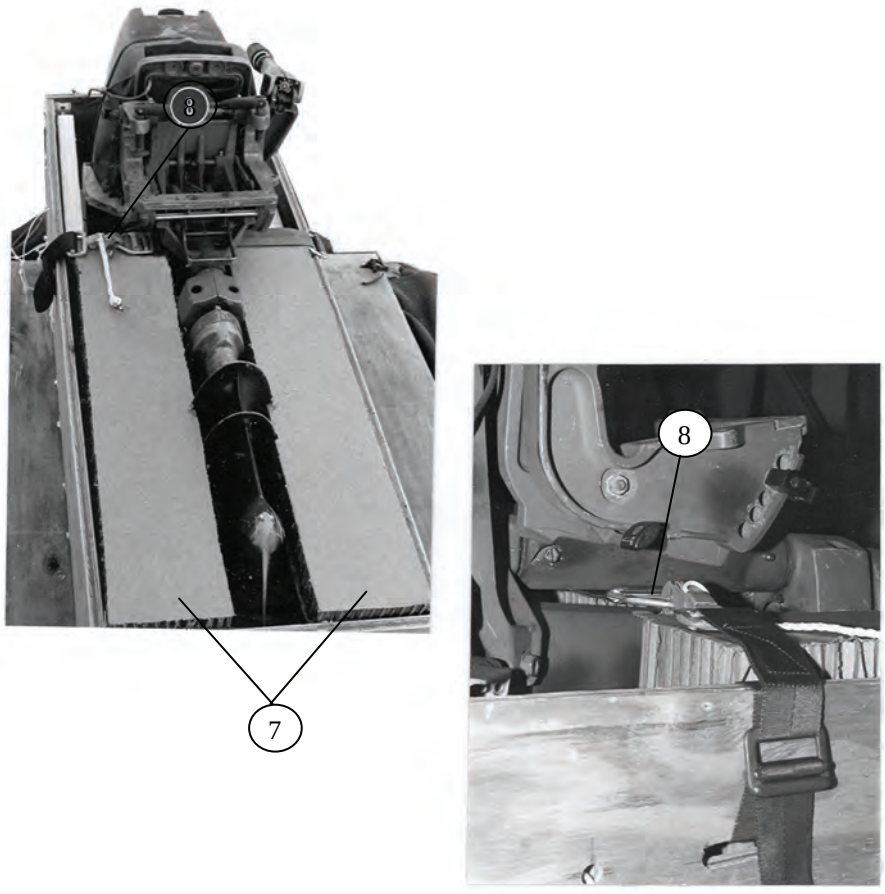
4 Push the propeller and the anti-ventilation plate down into the honeycomb.

5 Make sure the metal ledge below the engine cover rests on the honeycomb as shown. (The box is NOT shown here for visual purposes.)

Note. Make sure the engine cover does not rest on the honeycomb.

6 Leave the engine retention cable outside the box.

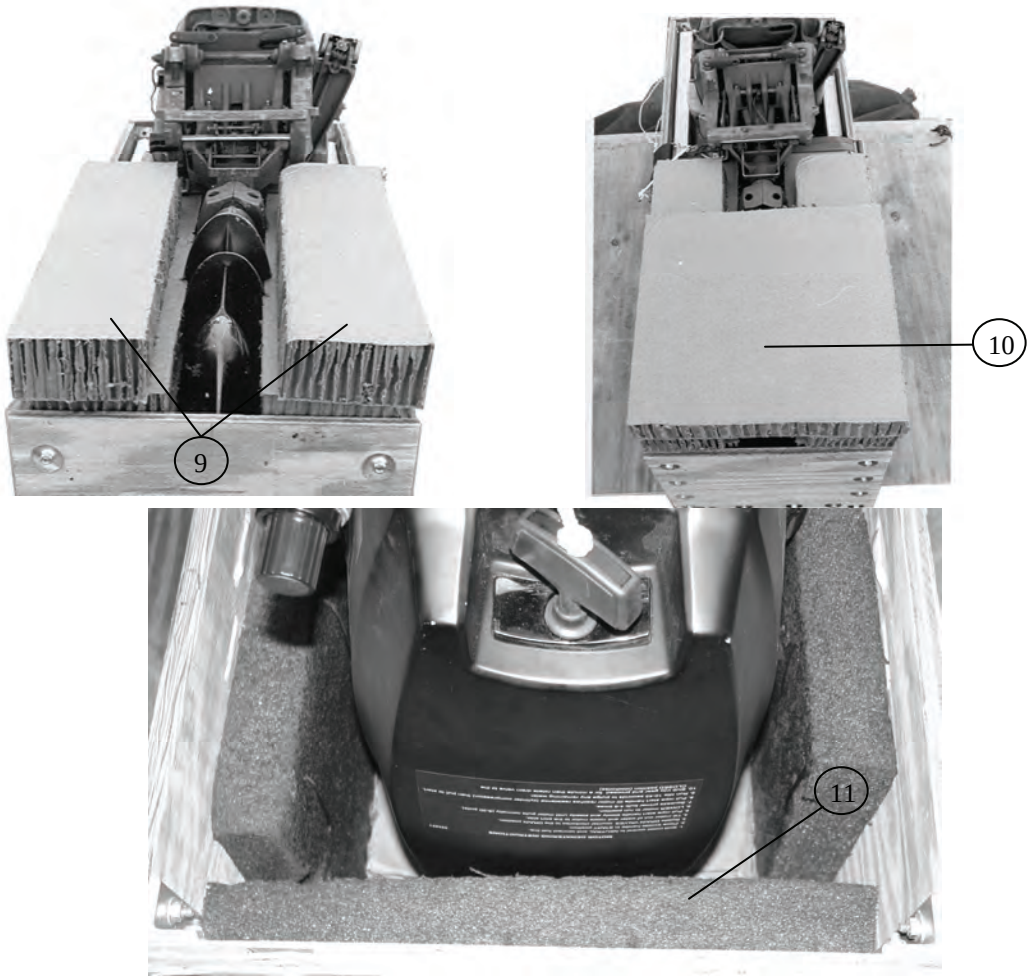
Figure 3-6. Engine Secured in Box (continued)



7 Place four 6- by 30-inch pieces of honeycomb in the box on each side of the lower engine shaft.

8 Fasten the engine restraint strap snugly over the engine. Pass the strap between the engine mounting bracket and drive shaft housing.

Figure 3-6. Engine Secured in Box (continued)



(9) Place a layer of 6- by 26-inch honeycomb on each side of the engine, flush with the rear corners of the box.

(10) Place an 18- by 18-inch piece of honeycomb flush over the rear of the box.

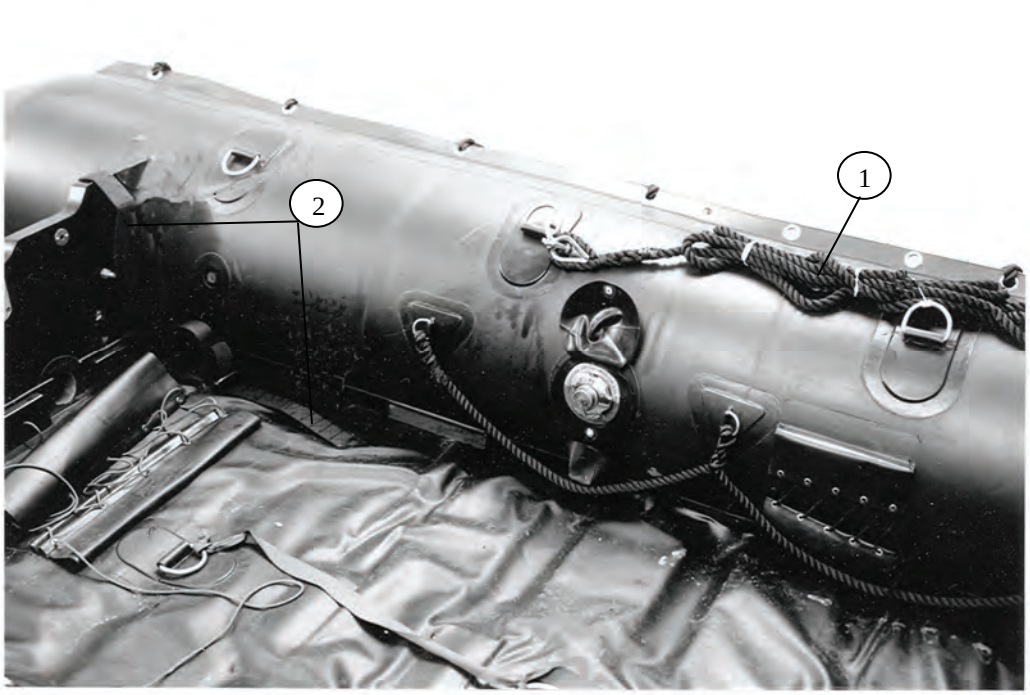
(11) If the short-shaft engine is being rigged, place a piece of honeycomb or a piece of 2-inch thick styrofoam between the top of the engine and the front end of the engine box.

Figure 3-6. Engine Secured in Box (continued)

PREPARING BOAT AND INFLATION SYSTEM

3-6. Prepare the F470U boat and the inflation system as described below:

- Make a pressure check on the boat in accordance with the manufacturer's manual.
- Make sure the bow line is less than 12 feet long.
- Stow any tools, spare engine parts, foot pump, and hose in the bow storage pouches. Attach chemical lights (not red) to the zipper pulls if mission requirements dictate.
- Prepare the boat as shown in Figure 3-7.
- Prepare the inflation system as shown in Figure 3-8.



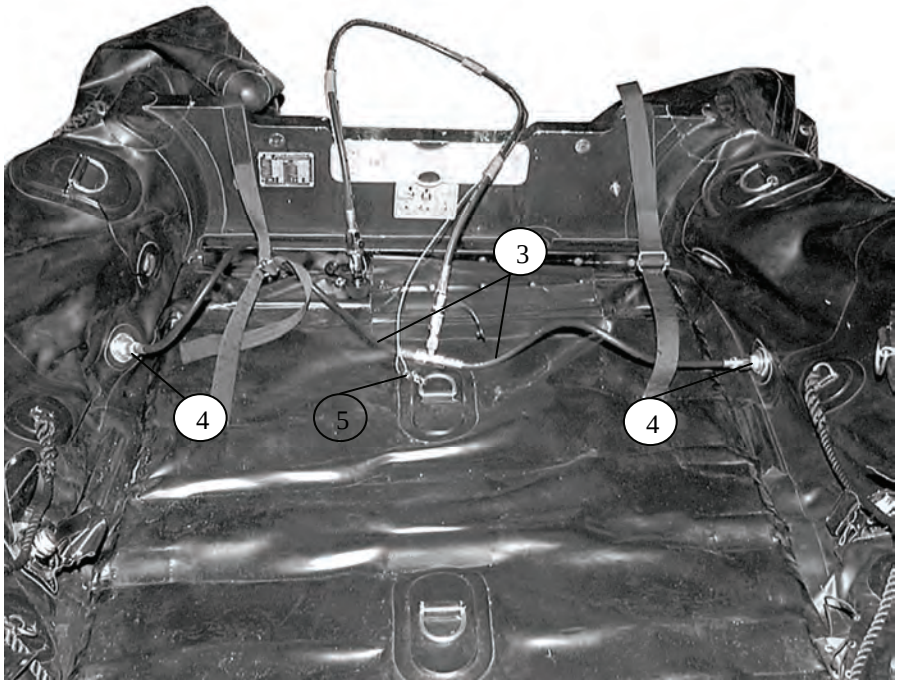
1. S-fold all loose boat lines. Secure the folds to adjacent rings with retainer bands.
2. Loosen the transom straps.

Figure 3-7. Boat Prepared



1. Make sure all four valves are set in the center of the inflation (red) position.
2. Remove the isolator clamps from the shock absorption tubes. Store them in the pouch provided.

Figure 3-8. Inflation System Prepared

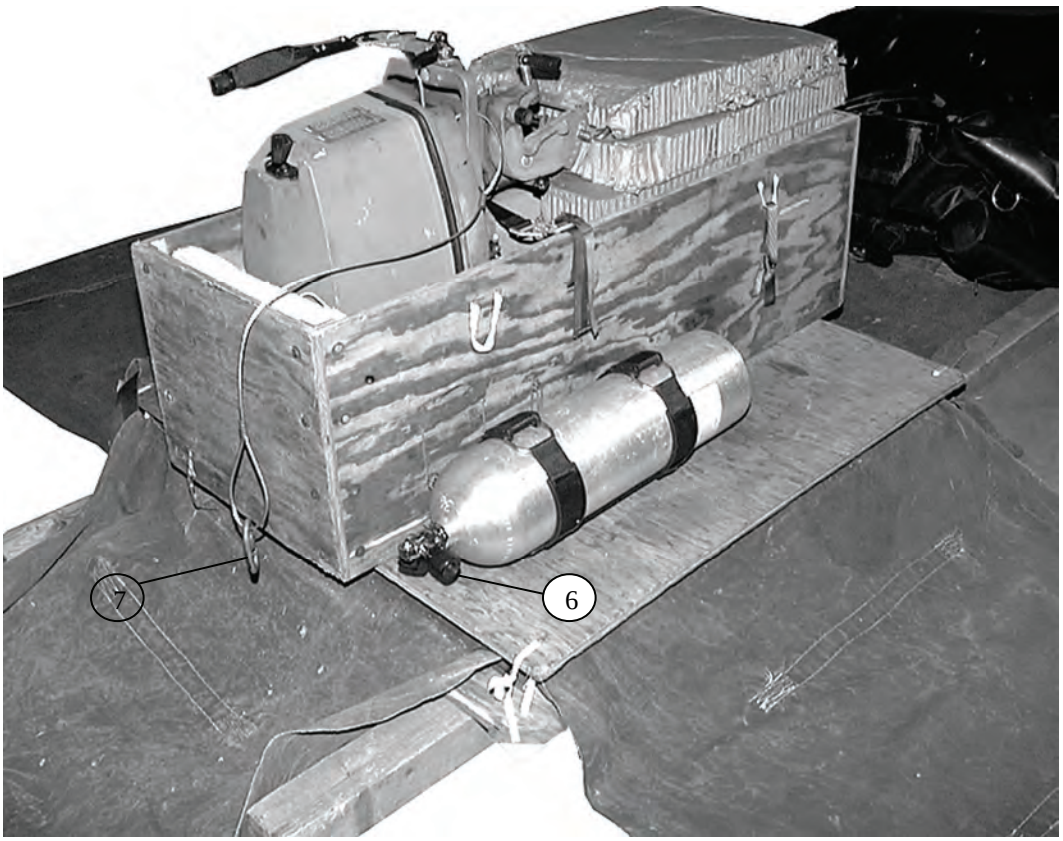


3 Connect the two Zodiac high-pressure inflation hoses to the Zodiac tee tube.

4 Connect the Zodiac high-pressure inflation hoses to the buoyancy tubes.

5 Connect the safety lanyard to the aft center D-ring with a small clevis.

Figure 3-8. Inflation System Prepared (continued)



(6) Make sure the cylinder is placed and secured in its holder, exactly as shown, and that the hand wheel faces away from the box wall.

(7) Place a carabiner or small clevis on the engine securing cable.

Figure 3-8. Inflation System Prepared (continued)

COLLAPSING AND FOLDING BOAT, COMPLETING INFLATION SYSTEM CONNECTION AND LOADING FUEL TANKS

3-7. Collapse the boat, attach it to the engine, and connect the inflation hoses to the cylinder as shown in Figure 3-9. Fold the boat over the engine box as shown in Figure 3-10. Stow the fuel tanks and make the final folds as shown in Figures 3-11 and 3-12.

CAUTION

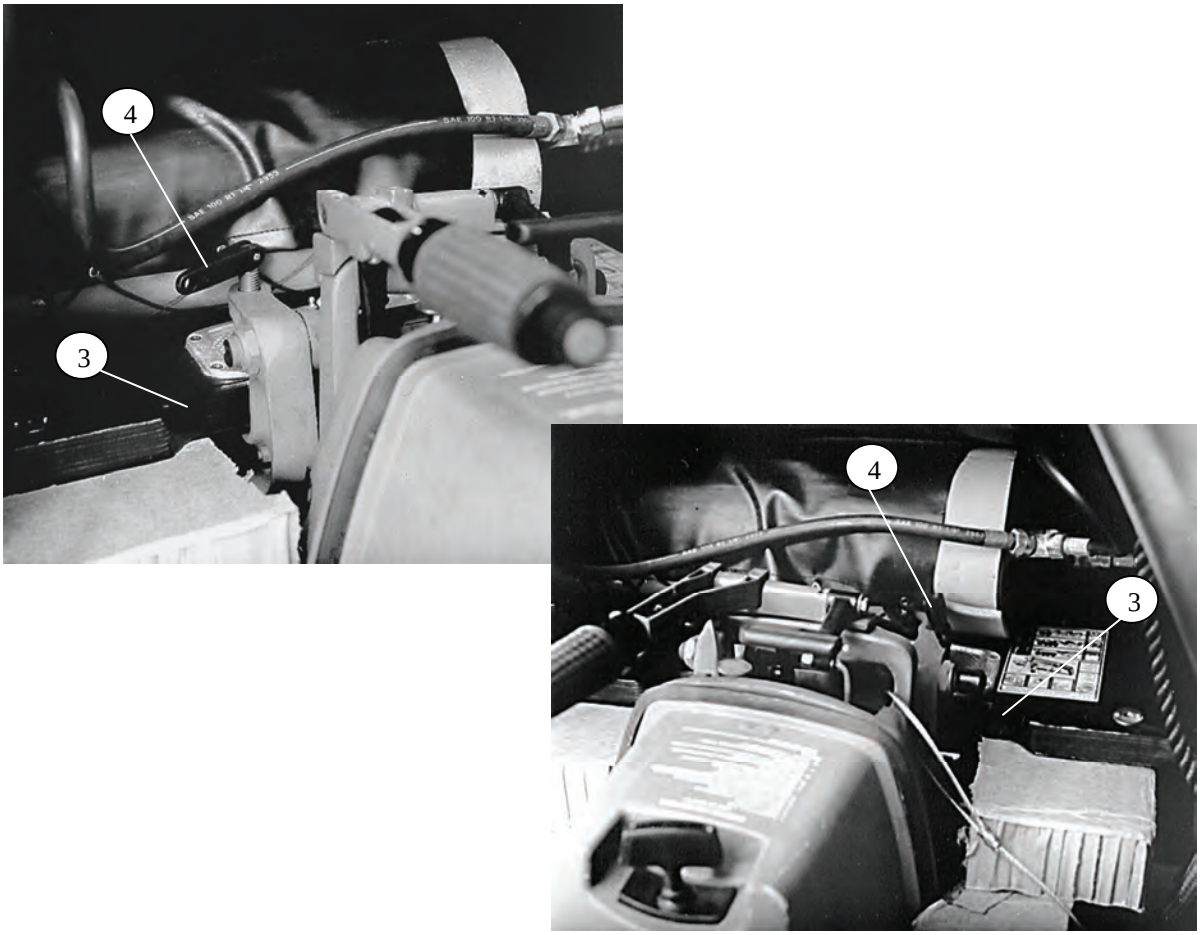
Make sure the isolator clamps are removed from the shock absorption tubes and stowed. Also make sure all inflation valves are closed and in the center of the inflation (red) position.



(1) Use an industrial strength vacuum cleaner to extract the air out of the buoyancy tubes and the keel chamber of the boat (not shown).

(2) Fold the side tubes in toward the center. The bottom seams of the buoyancy tubes will lie along the edge of the deflated boat. The left and right tubes will touch as they are folded toward the center of the boat.

Figure 3-9. Boat Collapsed and Attached to Engine, Final Inflation System Connection Made

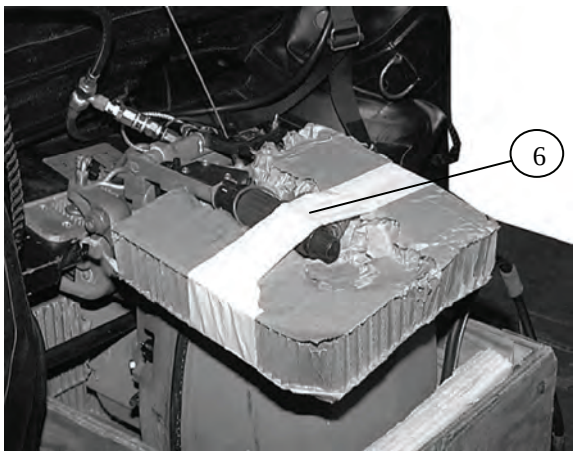


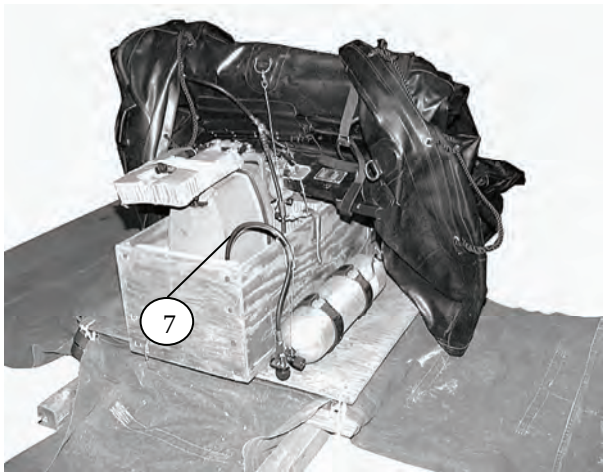
3 Open the mounting clips on the engine. Lift the transom of the boat with the help of an assistant and slide the transom into the engine mounting clamps. Crush the surrounding honeycomb, if necessary.

4 Make sure the clips are aligned with the metal engine mounting pads on the transom. Tighten the engine mounting clamps.

5 Attach the engine safety cable to the ring provided on the transom using a small clevis, or the locking carabiner installed in Figure 3-8, Step 7 (not shown).

Figure 3-9. Boat Collapsed and Attached to Engine, Final Inflation System Connection Made (continued)

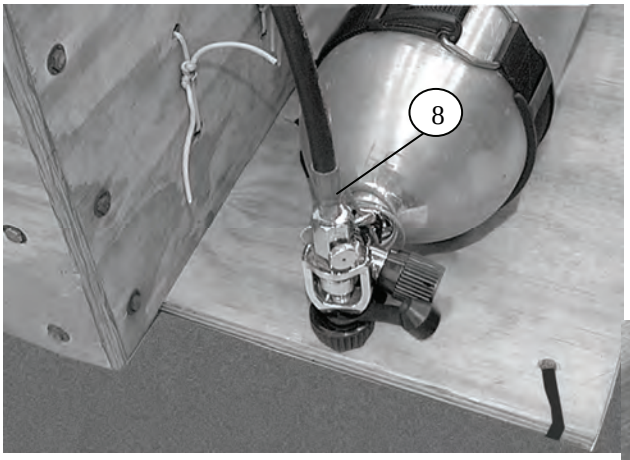


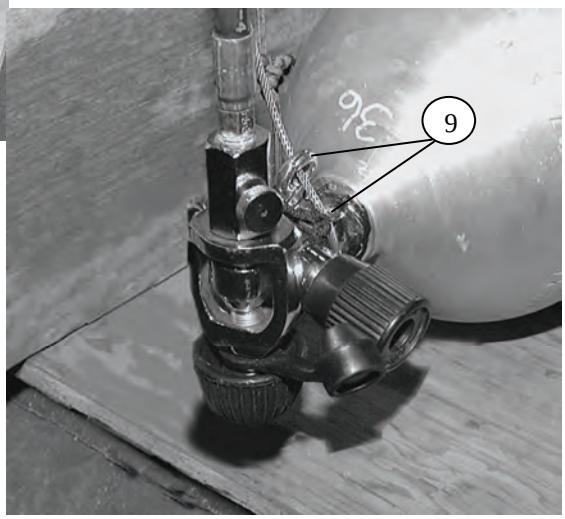


6 Center the motor control handle in a 12- by 12-inch piece of honeycomb. Crush the honeycomb to allow the handle to lay in it. Secure the honeycomb to the handle with two turns of masking tape.

7 Route the main inflation hose down into the box on the left side. Allow a smooth turn of the hose out of the box to where it joins the cylinder valve.

Figure 3-9. Boat Collapsed and Attached to Engine, Final Inflation System Connection Made (continued)





8 Connect the inflation tube to its connector.

9 Route the lanyard through the ring, and attach it to its connector.

Figure 3-9. Boat Collapsed and Attached to Engine, Final Inflation System Connection Made (continued)



(1) Fold the boat up onto the box so that the second floor D-ring is nearly even with the front edge of the box. Make sure the floor slats lie flat and the inflation system connections are intact.

Note. Any equipment, such as rucksacks, may be stowed at this stage along the sides of the box. Do not exceed the dimensions of this space or the capacity of the cargo parachutes. Use the pre-positioned Type III nylon cord to secure the equipment.

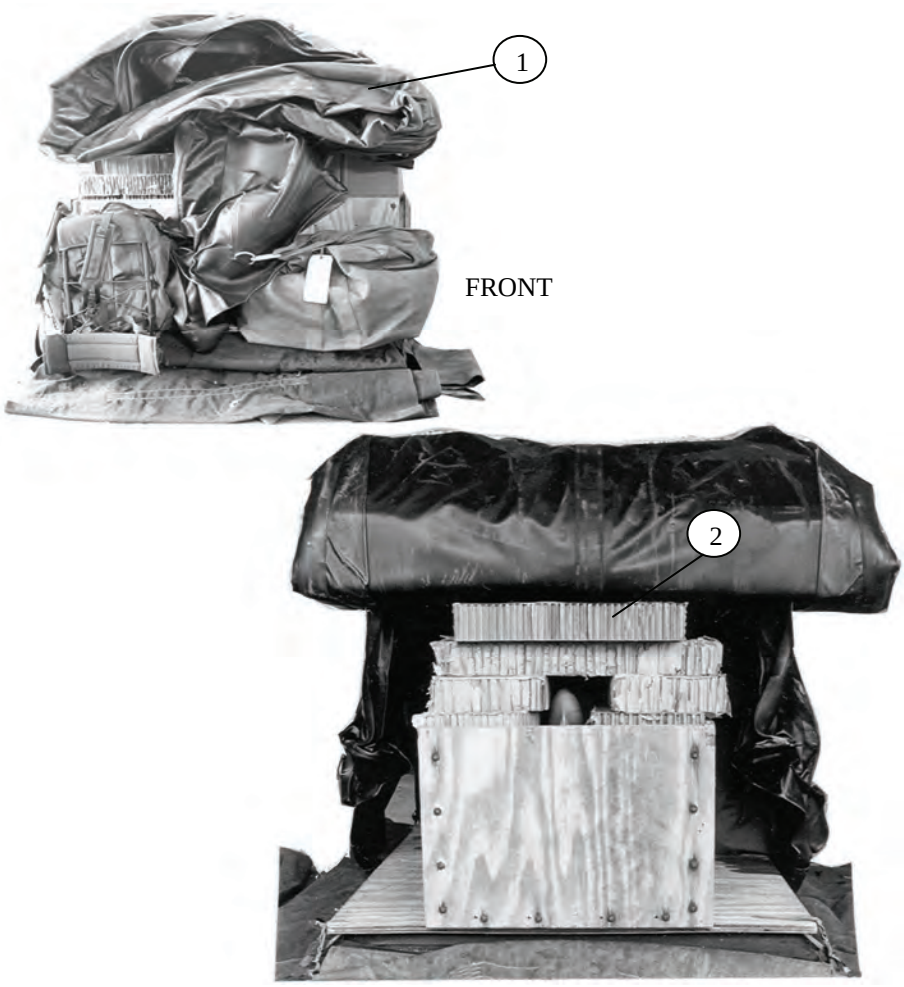
Figure 3-10. Boat Folded over Engine Box



Note. Use 6-, 9-, or 18-gallon plastic collapsible fuel tanks. Use no more than four tanks.

1. S-fold and tie the fuel lines on the tanks.
2. Place the tanks in aviator kit bags, no more than two 6- or 9-gallon tanks per bag. Set the bag on the shelf outside the engine box. Secure the bag to the engine box or to the tow rings on the boat.

Figure 3-11. Fuel Tanks Stowed

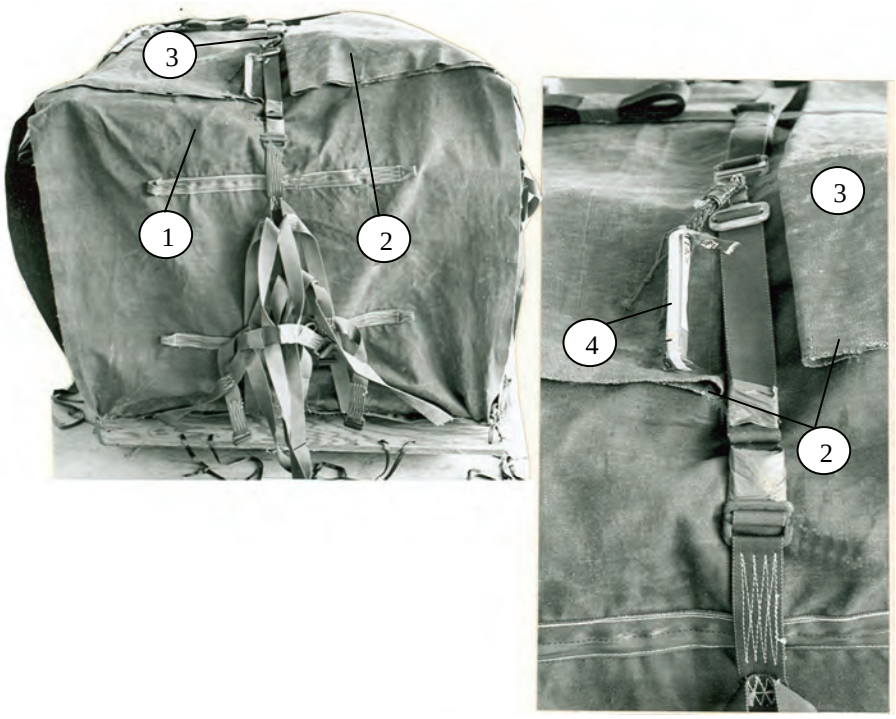


1. Fold the bow of the boat to the front as far as the front edge of the engine box.
2. Support the boat at the rear with a 26- by 16-inch piece of honeycomb.
3. Fold all lifelines under the boat (not shown).

Figure 3-12. Fuel Tanks Stowed and Final Folds Made

SECURING A-22 CARGO BAG

3-8. Secure the A-22 cargo bag as shown in Figure 3-13.



1. Fold the front and rear A-22 cover flaps up. Fold the excess of each flap under itself so that the two flaps just touch.
2. Fold the left and right flaps up in the same way as in step 1 above.
3. Fasten the front-to-rear long and short tiedown straps using the modifications installed in Figure 3-1. Position the fasteners so that they close on the front of the load (the engine end of the boat).
4. Tie a chemical light to the parachute harness snap.

Figure 3-13. Cargo Bag Secured

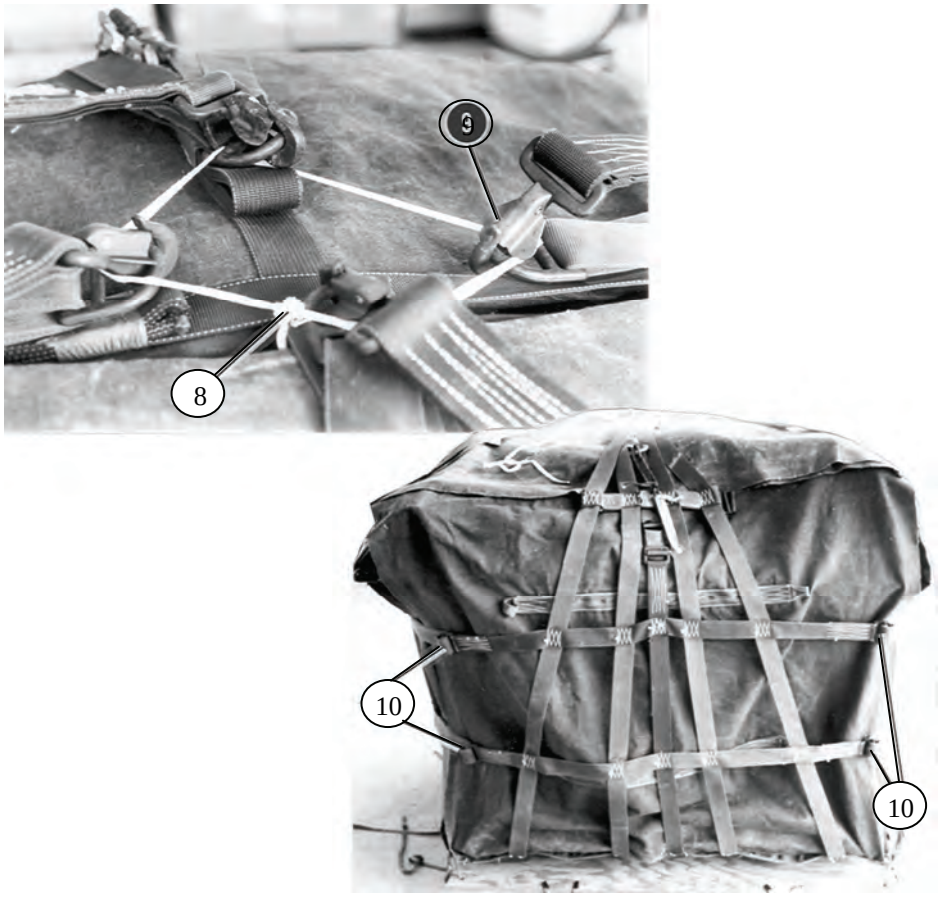


5 Fasten the left to right, long and short tiedown straps using the modifications installed in Figure 3-1. Position the fasteners so that they close on the top left side of the load.

6 Tie a chemical light to the parachute harness snap.

7 Fold and tape any excess webbing.

Figure 3-13. A-22 Cargo Bag Secured (continued)



8 Bring all four support web assemblies to the top of the load. Tie all four together through the D-rings as shown using a length of Type I, ¼-inch cotton webbing tied in a square knot.

9 Install the adapter webs so that the connector snaps face inward.

10 Close the lower and middle lateral connector snaps loosely so that the bag flaps are held securely. Do ***NOT*** allow the lateral straps to touch the boat. Do not fasten the upper lateral straps. Fold them inward, and tape them to the support web assembly.

Figure 3-13. Cargo Bag Secured (continued)



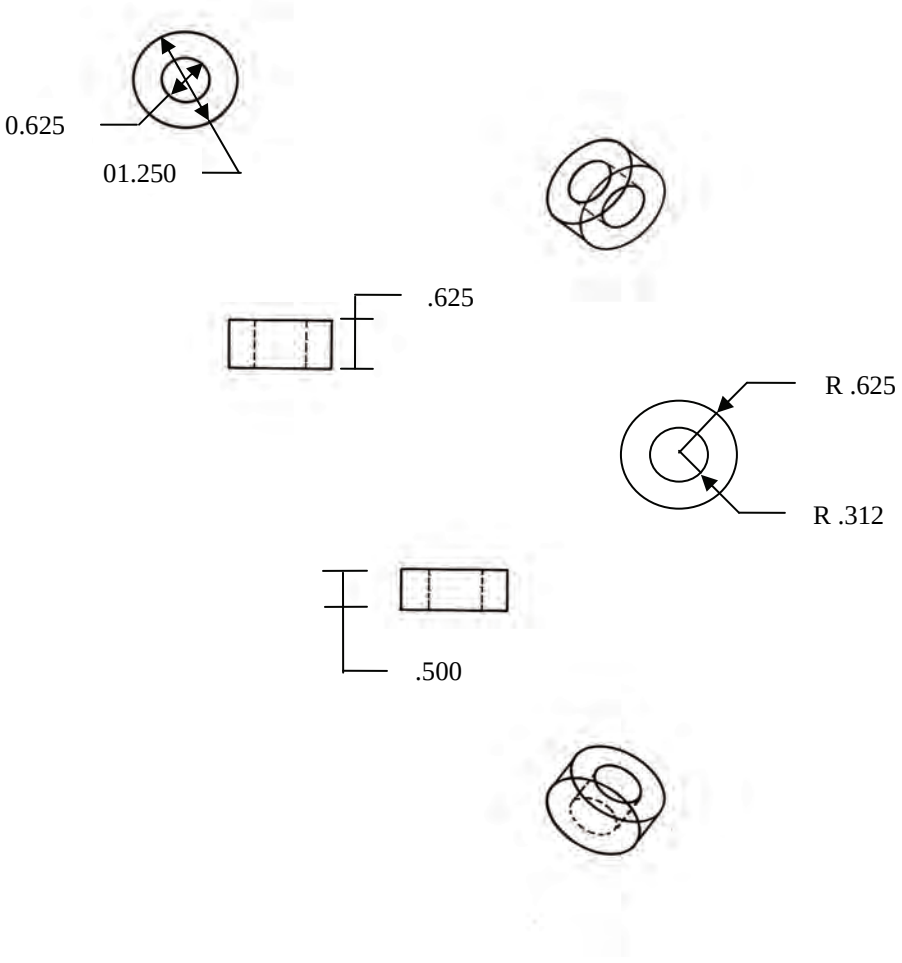
(11) Tie the skid board to the A-22 sling assembly where the lower lateral straps join the support webs as shown using ½-inch tubular nylon webbing and according to FM 4-20.103/MCRP 4-11.3C/TO 13C7-1-11.

Figure 3-13. A-22 Cargo Bag Secured (continued)

MODIFYING TYPE IV LINK ASSEMBLY FOR USE WITH HYDRAULIC RELEASE

3-9. Modify the type IV link assembly as shown in Figures 3-14 through 3-17, if the hydraulic release is used on this load.

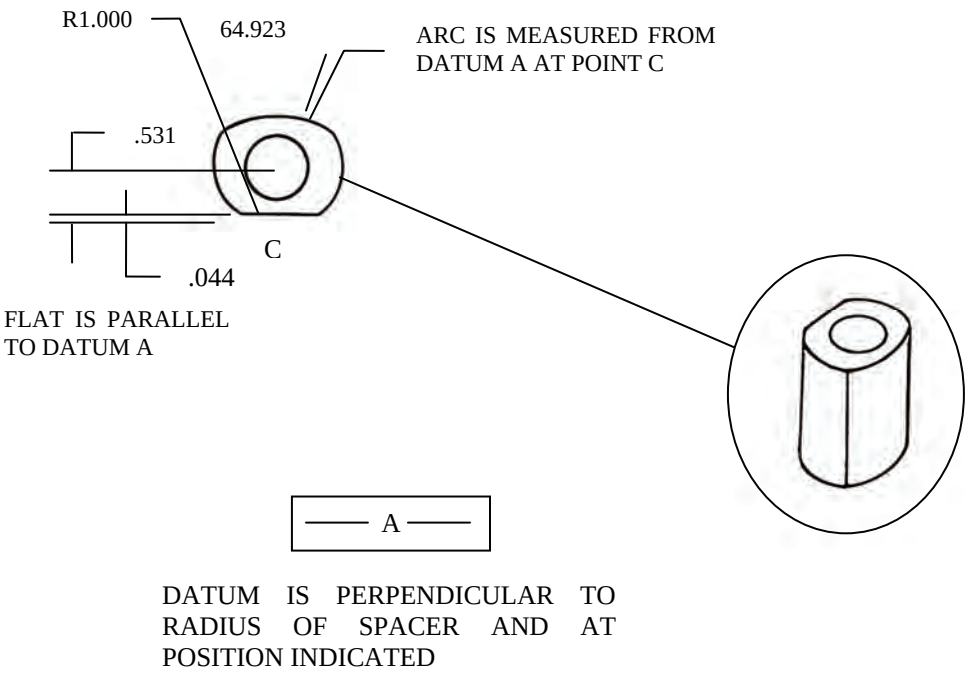
Note. These drawings are not drawn to scale.



(1) Cut one spacer to the thickness shown above.

Figure 3-14. Spacer Modified for Release End of Link

Note. These drawings are not drawn to scale.

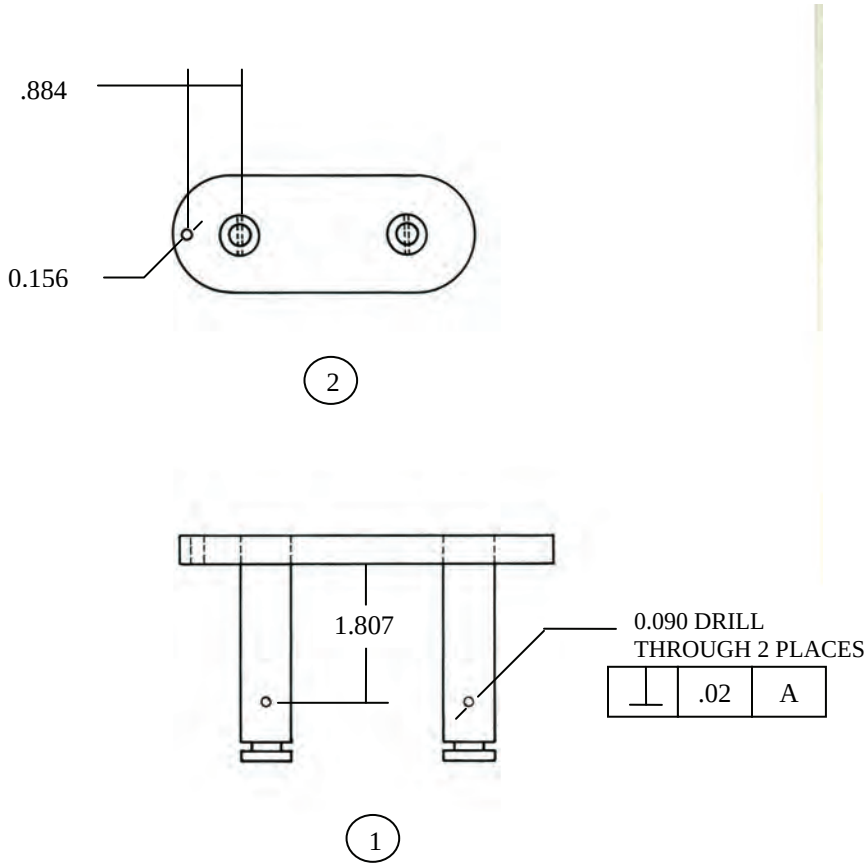


(1) Mill the other spacer to the specifications shown so that the D-rings on the A-22 adapter webs fit over the spacer.

Figure 3-15. Spacer Modified for Load End of Link

Note. These drawings are not drawn to scale.

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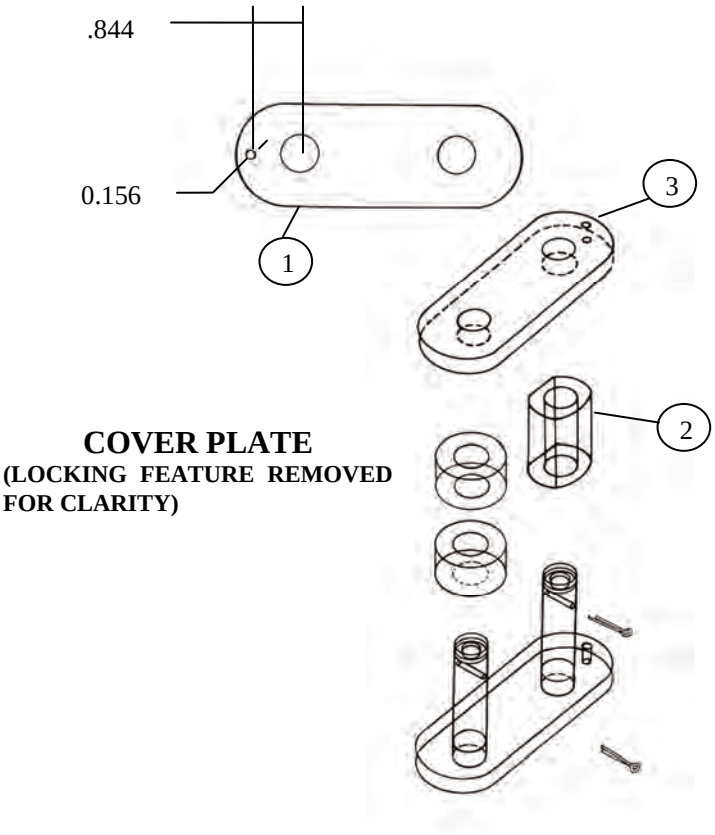


1 Drill holes as shown in both sleeve pins of the link assembly.

2 Drill a hole in one end of the link assembly body as shown.

Figure 3-16. Link Assembly Body Modified

Note. These drawings are not drawn to scale.



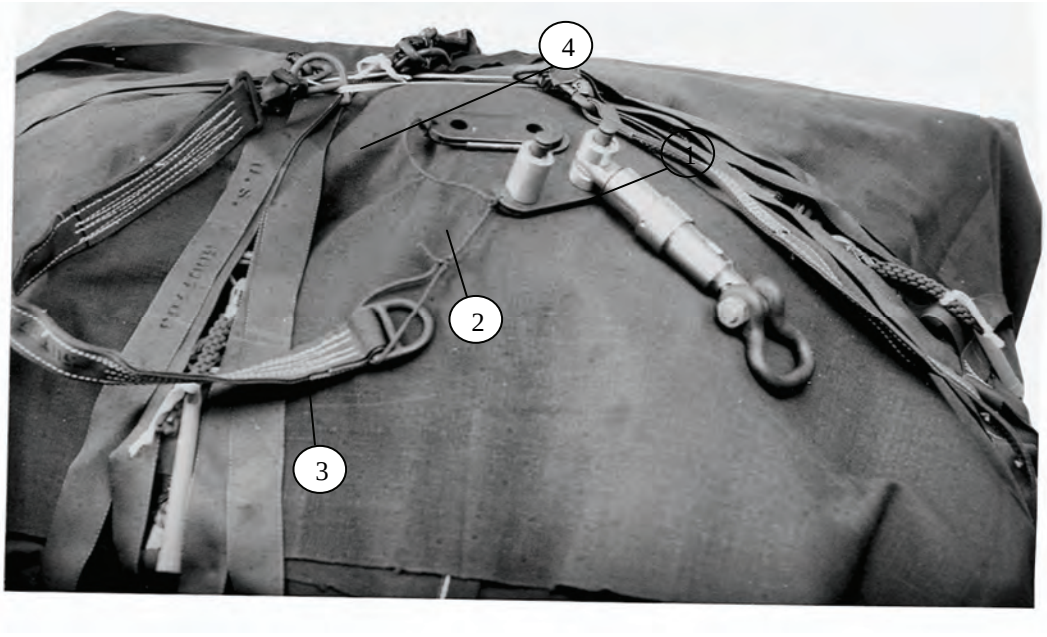
1. Drill a hole as shown in the closure end of the side plate.
2. Place the milled single spacer on the same end of the link assembly body as the drilled hole.
3. Assemble the link as shown. Place the side plate on the link assembly with the drilled hole at the same end as the milled spacer.

Figure 3-17. Side Plate Modified and Link Assembled

INSTALLING PARACHUTE RELEASE AND PARACHUTES

3-10. Install the automatic cargo parachute release as shown in Figure 3-18. Install two T-10 parachutes modified for cargo use as shown in Figures 3-19 through 3-21.

Note. Army units are not authorized to use the automatic cargo parachute release and must use the M-1 cargo parachute release. If parachutes other than the T-10 parachute are used, finish rigging the load according to FM 4-20.103/MCRP 4-11.3C/TO 13C7-1-11.



Note. Install the cargo release with the hydraulic cylinder section attached to the cargo slings and the release bolt to the 120-inch parachute risers.

1. Install the automatic cargo parachute release to the split spacer side of the modified type IV connector link as described in paragraph 3-9.
2. Pass a suitable length of type III nylon cord through the hole in the baseplate of the type IV connector link, leaving 18 inches.
3. Pass the 18-inch end through the fabric loop in the front adapter web. Tie a loop as shown with a bowline knot with an overhand in the running end.
4. Tie the free end of the type III nylon cord to the drilled hole in the type IV link cover.

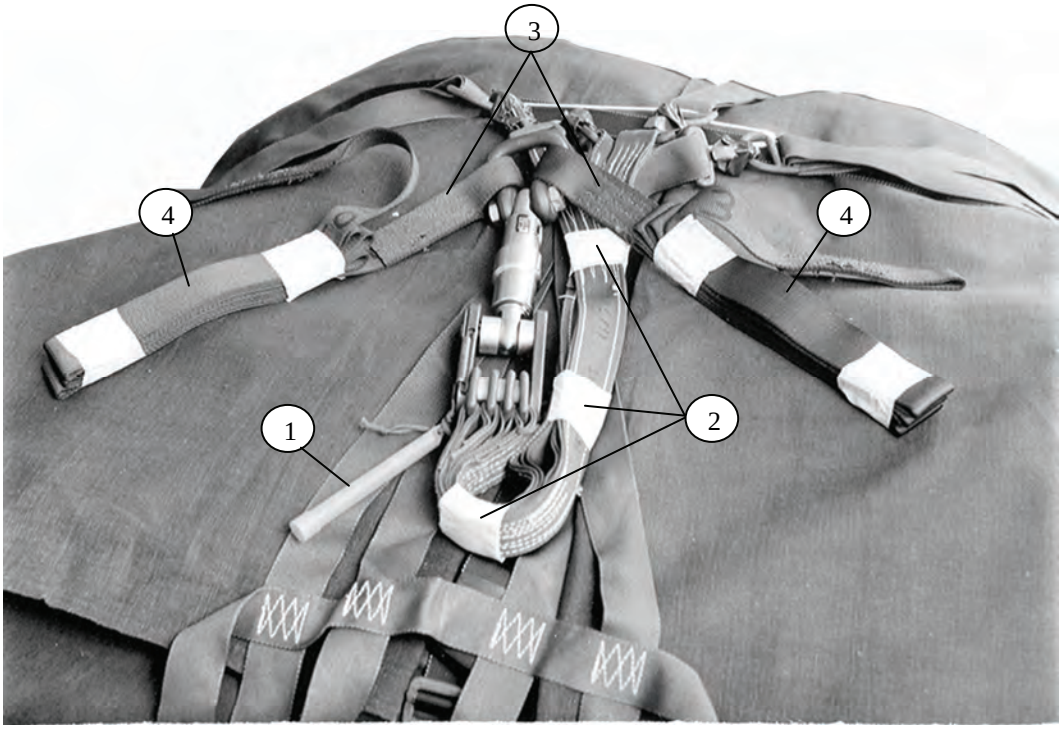
Figure 3-18. Release Installed



5 Place the D-rings of the adapter webs on the milled spacer of the type IV connector link in the following order: front, left, rear, right (clockwise or counterclockwise beginning with the front).

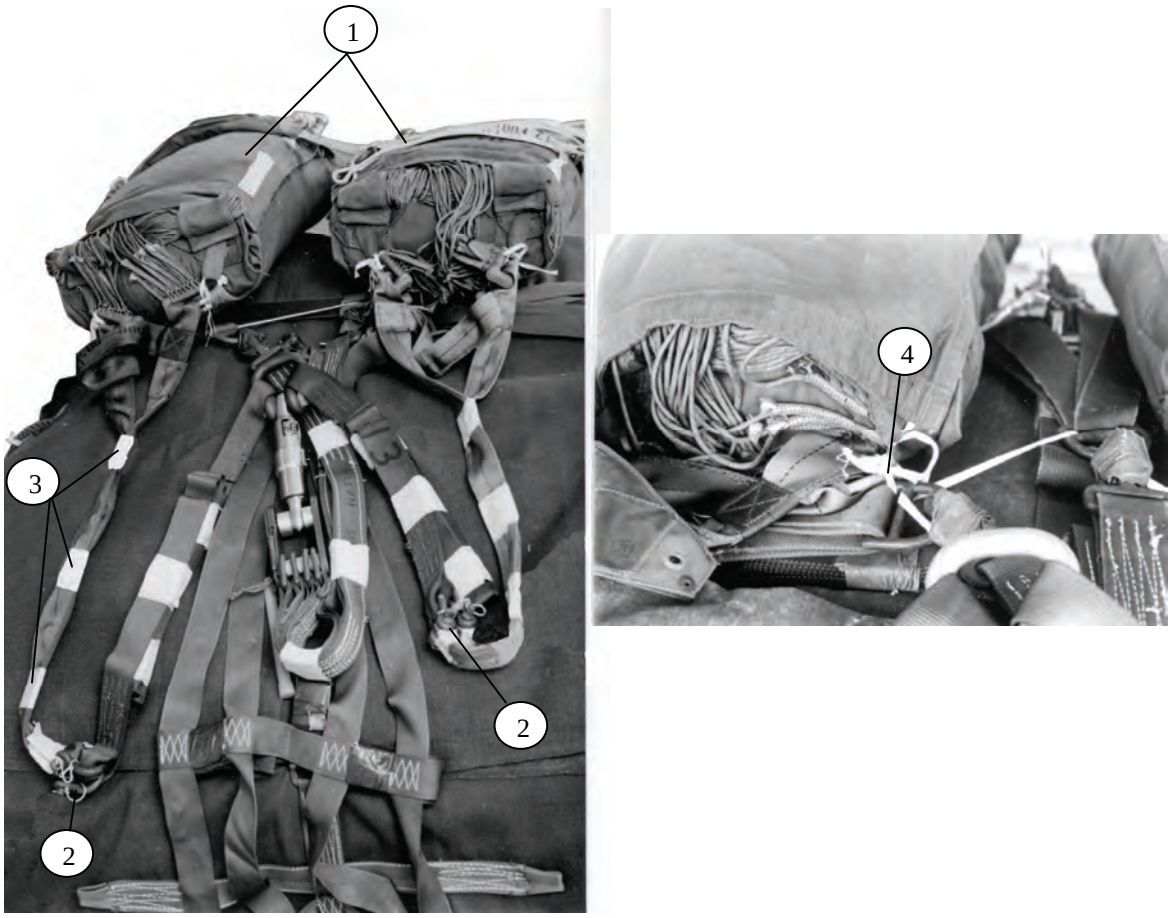
6 Install the cover plate on the type IV connector link, facing the drilled hole away from the release. Raise the adapter webs and make sure there are no twists in them.

Figure 3-18. Release Installed (continued)



1. Tie a chemical light to the type IV connector link with type I, 1/4-inch cotton webbing.
2. Tape the adapter webs together in three places with paper masking tape.
3. Attach two 120-inch connector straps to the bell portion of a small suspension clevis. Bolt the clevis to the release.
4. S-fold the riser extensions into 1-foot folds. Tape the folds in two places with paper masking tape.

Figure 3-19. Small Clevis and 120-inch Connector Straps Installed



1. Install two T-10 parachutes modified for cargo on the front of the load.
2. Place both of the riser clevises in the loop of the riser extension. Secure the clevis pins and make sure the clevis pins remain in the loops of the parachute risers.
3. Tape the risers of each parachute individually in three places with two turns paper masking tape, just behind the clevises, in the center and 6 inches from the H-bar.
4. Tie the inside L-bar connector links on each parachute to the rectangular holes in the nearest support web D-rings with type I, ¼-inch cotton webbing.

Figure 3-20. Riser Extensions and Parachutes Installed



(1) Pass a single length of type I, 1/4-inch cotton webbing through the support web at the second lateral strap. Tie each end to the break cord attaching strap on each parachute deployment bag.

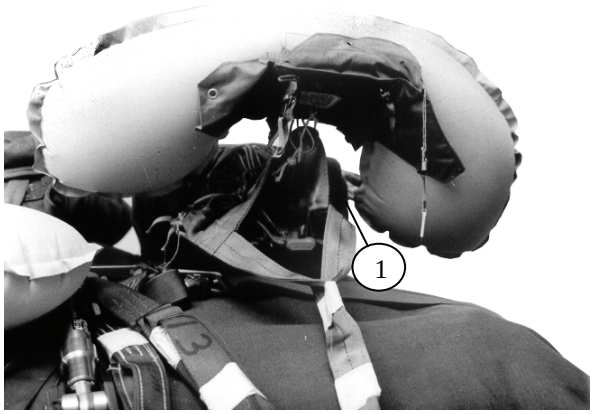
Note. A strobe light is shown at center. Local operating procedure or mission requirements may dictate use of special lighting.

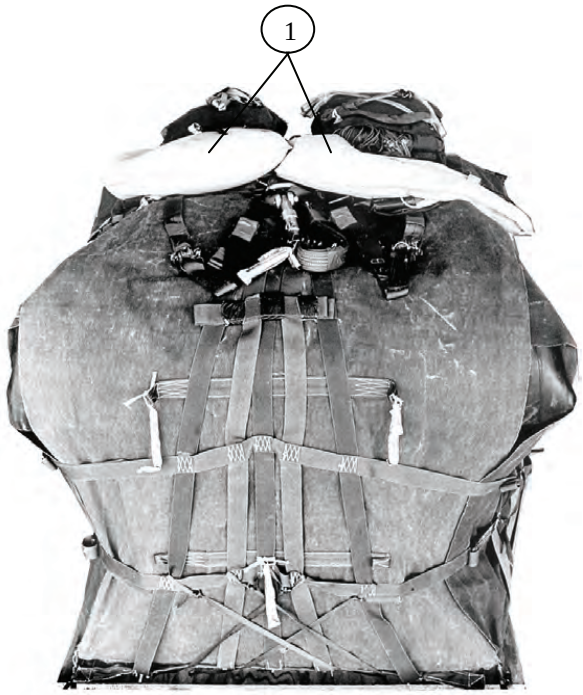
Figure 3-21. Parachutes Installed

INSTALLING FLOTATION DEVICES AND CHEMICAL LIGHTS (OPTIONAL)

3-11. Install flotation devices to aid in the recovery of parachutes for training drops as shown in Figure 3-22. Install chemical lights for night operations as shown in Figure 3-23.

Note. Flotation devices and chemical lights may not be required for operational drops.





(1) Tie a flotation device to the H-bar of the riser harness of each parachute with type III nylon cord.

Figure 3-22. Flotation Devices Installed



(1) Tie chemical lights to the support webs on all sides of the load. An inverted V pattern is shown. Unit standing operating procedures (SOP) will dictate the use of chemical lights.

Figure 3-23. Chemical Lights Installed for Night Operations

MARKING RIGGED LOAD

3-12. Mark the rigged load according to FM 4-20.103/MCRP 4-11.3C/TO 13C7-1-11 and as shown in Figure 3-24.

CAUTION

Make the final rigger inspection required by FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves the rigging site.



Note. The load shown includes 10 gallons of fuel and no additional equipment.

Weight: Load shown	600 pounds
Maximum load allowed with two T-10 cargo parachutes	900 pounds
Height	56 inches
Width	51 inches
Length	51 inches

Figure 3-24. Zodiac F470U Boat Rigged in A-22 Bag for Low Velocity Airdrop

EQUIPMENT REQUIRED

3-13. The equipment required to rig the F470U boat in the A-22 cargo bag is listed in Table 3-1.

Table 3-1. Equipment Required for Rigging F470U Boat in A-22 Cargo Bag

National Stock Number	*Item*	*Quantity*
7125-00-577-5858	Aluminum, angle, 90 degrees	As required
1670-00-587-3421	Bag, cargo, A-22	1
1670-00-568-0323	Band, rubber, parachute	As required
Local purchase	Bolt, 1/4- by 1 1/2- in, galvanized	136
No NSN	Charging yoke, SCUBA, w/dust cap	1
4030-00-360-0304	Clevis, suspension, 5/8-in (small)	1
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
No NSN	Cylinder, SCUBA, compressed air	1
No NSN	Disconnect, 1/4-in, stainless steel male, NPT	1
No NSN	Disconnect, 1/4-in, stainless steel male, NPT, w/safety detent	1
	Flotation device,	
4220-00-059-6061	LPU 3/P or	2
4220-00-657-2197	B7	2
8135-01-005-8974	Foam	2 sheets
5330-01-363-2634	Gasket, paper	4
No NSN	Hose, Zodiac, high pressure inflation	2
No NSN	Hose, rubber, 1/4-in diam, 60-in length, high pressure, 3000 psig, ….w/male and female threaded ends	1
No NSN	Lanyard, safety, braided stainless steel, w/clips	1
	Light, chemical, wand,	
6260-01-074-4229	Green	As required
6260-01-178-5559	Red	As required
1670-00-783-5988	Link assembly, type IV	1
No NSN	Mounting plate, single, SCUBA	1
Local purchase	Nut, hexagonal, 1/4-in, galvanized	136
1670-00-753-3928	Pad, energy-dissipating, honeycomb	2 sheets
1670-01-247-7151	Parachute, T-10B (modified for cargo)	2
5530-00-128-4981	Plywood, 3/4-in:	
	17- by 18-in	2
	17- by 51-in	2
	48- by 48-in	2
1670-01-310-2875	Release, automatic cargo parachute,	1
5340-00-875-1861	Snap, parachute harness	3
1670-00-925-7843	Static line, personnel, (T-10/Universal Static Line)	1
1670-00-738-5879	Strap, connector, extraction, 120-in	2
	Tape:	
7510-00-266-6710	Masking, 2-in	As required
7510-00-266-5016	PSA, cloth-backed, adhesive, 2-in	As required
4730-01-364-6035	Tube, tee, Zodiac	1
No NSN	Valve, SCUBA	1
1670-00-986-1139	V-ring, assembly	3
Local purchase	Washer, fender, 1 1/2-in, galvanized	272

Table 3-1. Equipment Required for Rigging F470U Boat in A-22 Cargo Bag (continued)

National Stock Number	*Item*	*Quantity*
	Webbing:	
8305-00-268-2411	Cotton, type I, 1/4-in	As required
8305-00-082-5753	Nylon, tubular, 1/2-in	As required
8305-00-263-3591	Nylon, type VIII	As required

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Chapter 4

Rigging the Naval Special Warfare Rigid Inflatable Boat (NSW RIB) for Low-Velocity Airdrop

DESCRIPTION OF LOAD

4-1. The NSW RIB is a high-speed boat designed to be airdropped, and quickly recovered. It is rigged on a 21-foot Maritime Aerial Delivery System (MADS) platform. The platform separates from the boat during deployment, and drops with its own G-12 parachute. The platform is easily recoverable and reusable. The load requires four G-11 cargo parachutes. A water activated release system, with the M-2 release as a back-up, ensures separation of the parachutes when the boat strikes the surface of the water. The maximum rigged load weight is 20,640 pounds, including an accompanying load that can vary according to the mission. The boat is 100 inches high, 108 inches wide and 432 inches long.

CAUTION

This load differs greatly from conventional airdrop loads. Strict adherence to these procedures is critical.

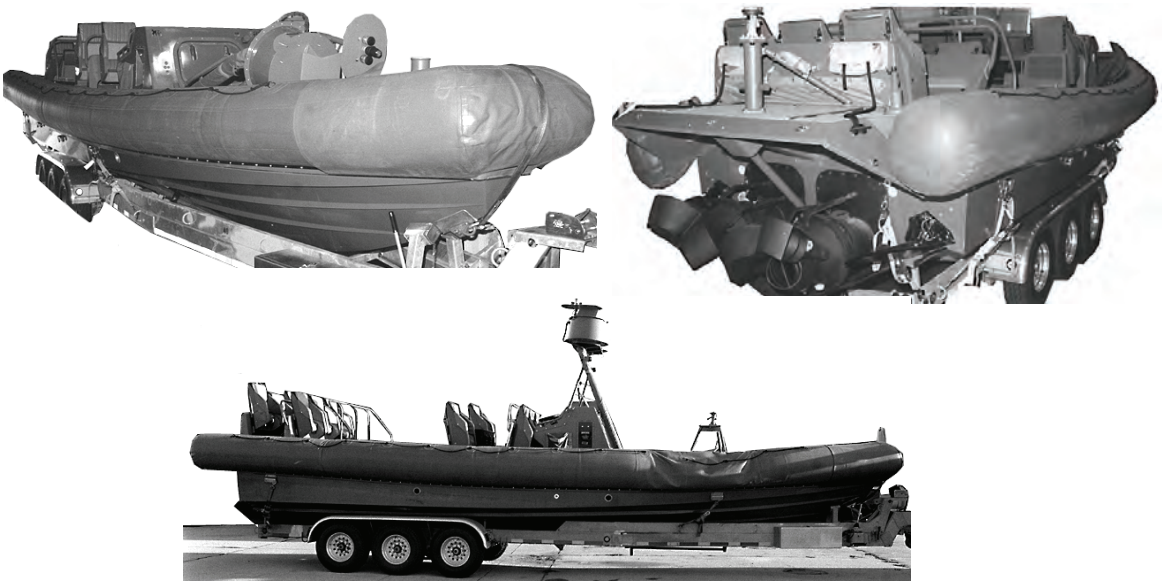


Figure 4-1. NSW RIB on its Trailer

PREPARING PLATFORM

4-2. Prepare a 21-foot MADS platform as shown in Figure 4-2.

- Prepare and inspect the 21-foot MADS platform as explained in the manufacturer's manual.
- Install the emergency restraint clevises to the front of the platform as shown in Figure 4-3.
- Install and test the platform release pulley assembly as shown in Figure 4-4.
- Install the platform recovery parachute as shown in Figure 4-5.

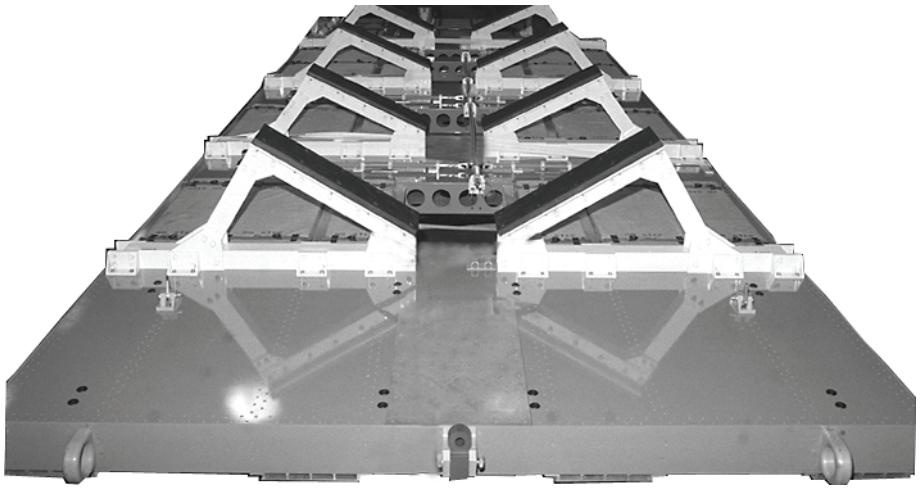
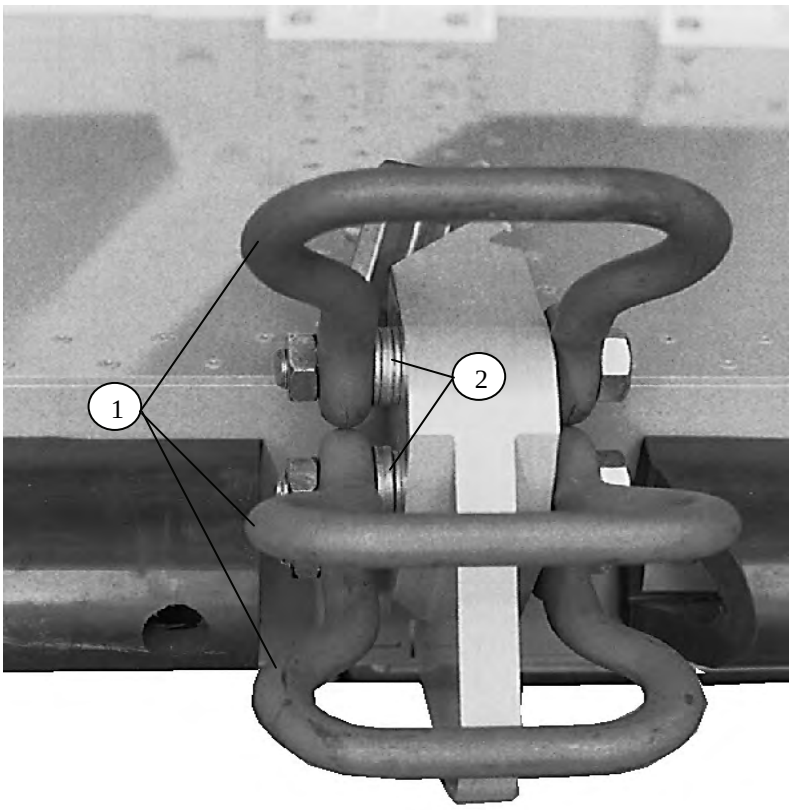
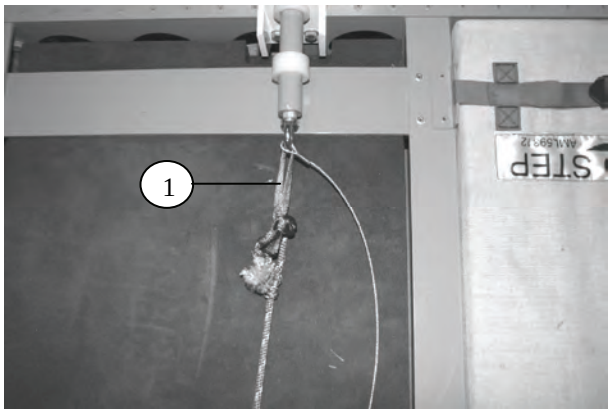


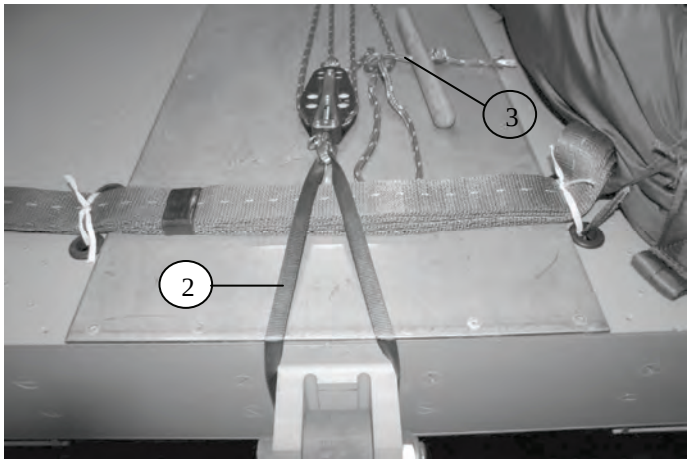
Figure 4-2. 21-Foot MADS Platform Prepared



1. Install a medium clevis assembly to each of the three holes in the links at the front of the platform.
2. Add washers to ensure a snug fit. Tighten the nuts just enough to allow the clevises to stay in the positions shown.

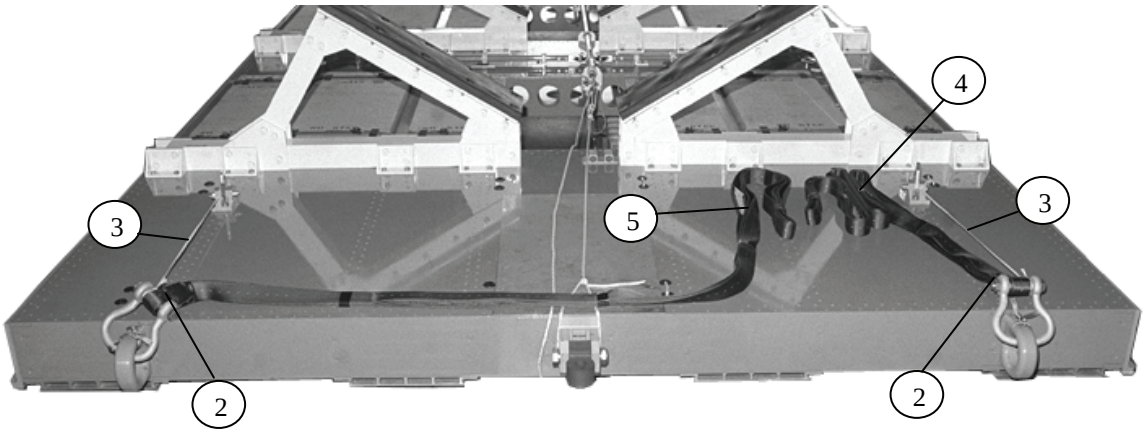
Figure 4-3. Emergency Restraint Clevises Installed

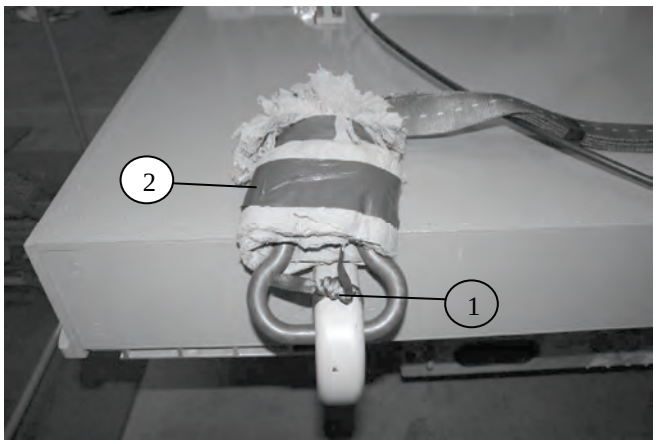




1. Secure the pulley assembly to the end ring of the push rod with a loop of 1/2-inch tubular nylon cord tied with a square knot.
2. Tie the running end to the extraction bracket with 1/2-inch tubular nylon.
3. Pull on the free end of the cord to ensure that the push rod can be pulled fully against its spring.

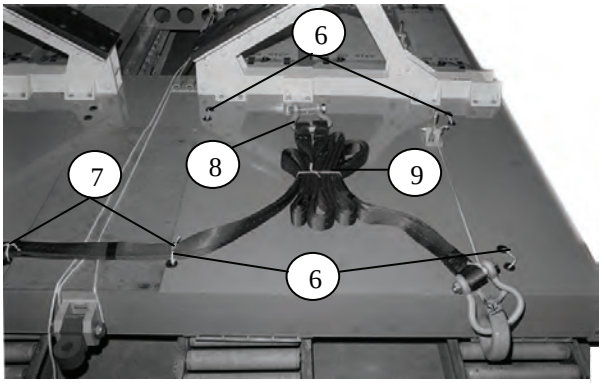
Figure 4-4. Platform Release Pulley Assembly Installed

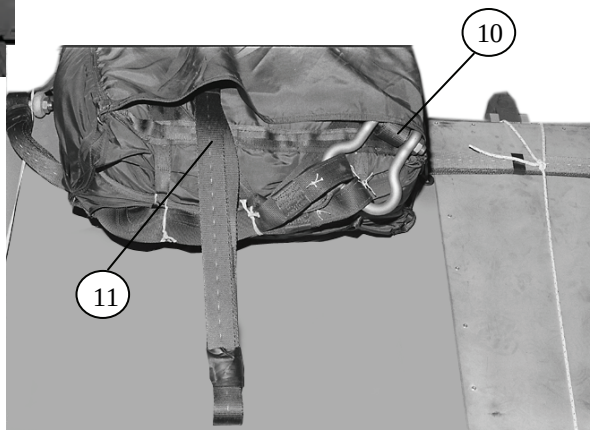




1. Center a length of 1/2-inch tubular nylon webbing with a girth hitch in the bell of a medium clevis. Bring the ends of the webbing over the top of the suspension point and secure tightly with a surgeon's knot and locking knot, with overhand knots in the running ends. Repeat for the other side of the platform.
2. Install a 9-foot, 2-loop, type XXVI nylon sling on the bolt of each medium clevis. Wrench-tighten the nuts. Pad each clevis with cellulose wadding and tape in place.
3. Secure each clevis in an upright position with a length of type I, 1/4-inch cotton webbing tied to a convenient point on the platform.
4. Pass the right sling up to a point centered between the four pairs of deck holes on the right side of the platform. S-fold the sling as shown.
5. Pass the left suspension sling across the rear between the pairs of deck holes, and up to meet the right sling. S-fold the left sling in the same way.

Figure 4-5. Platform Recovery Parachute and Slings Installed





(6) Pass an 18-inch length of 1/2-inch tubular nylon webbing through each pair of deck holes to the right of the extraction bracket. Tie with a square knot, with overhand knots in the running ends. Rotate the knots to the underside of the platform, and tape the nylon webbing.

(7) Tie the left suspension sling to each of the two pairs of deck holes with a single turn of type I, 1/4-inch cotton webbing.

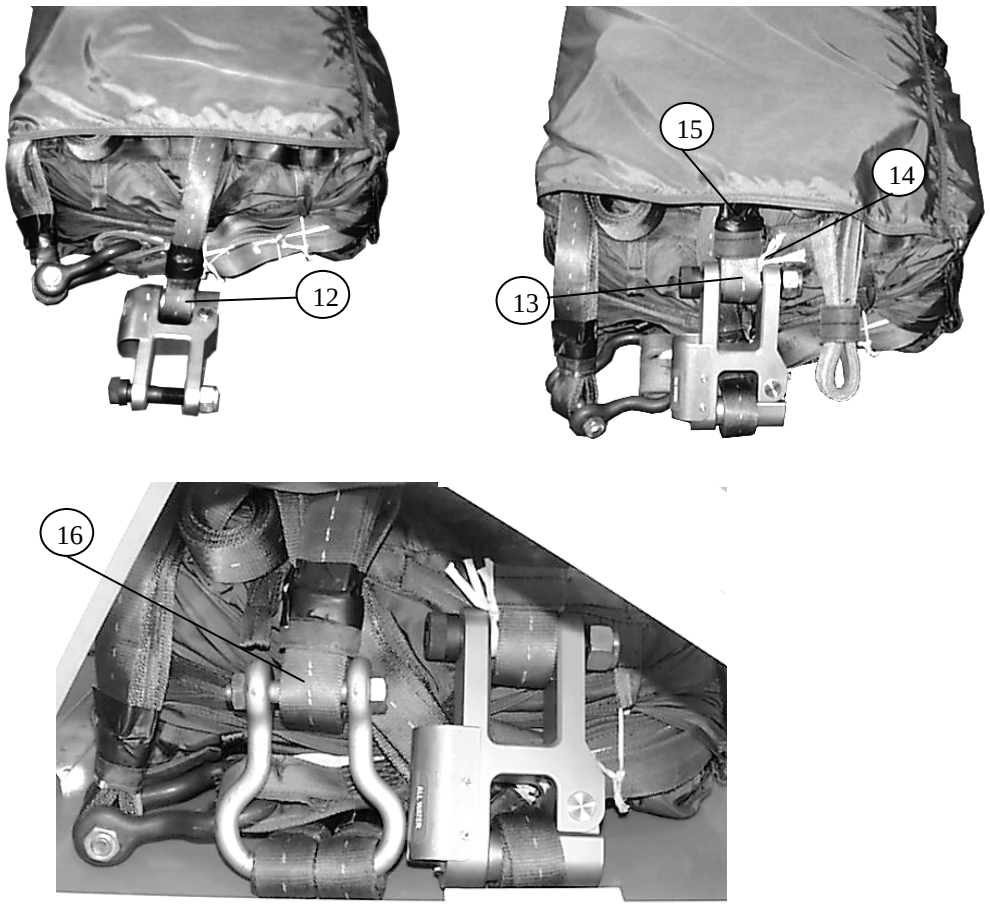
(8) Place the free ends of both slings in the bell of a medium clevis, and place the clevis against the base of the right rear stanchion.

(9) Tie the folds of the two slings together with a length of type I, 1/4-inch cotton webbing.

(10) Remove the tripled cotton webbing bag closing tie from the G-12-clevis. Install a 20-foot, 2-loop, type XXVI riser extension on the bolt of the G-12 clevis.

(11) Stow the riser extension in the G-12E bag according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

Figure 4-5. Platform Recovery Parachute and Slings Installed (continued)



(12) Inspect a water-activated parachute release (WAPR) according to the manufacturer's instructions. Attach the discharge end of the WAPR to the riser extension.

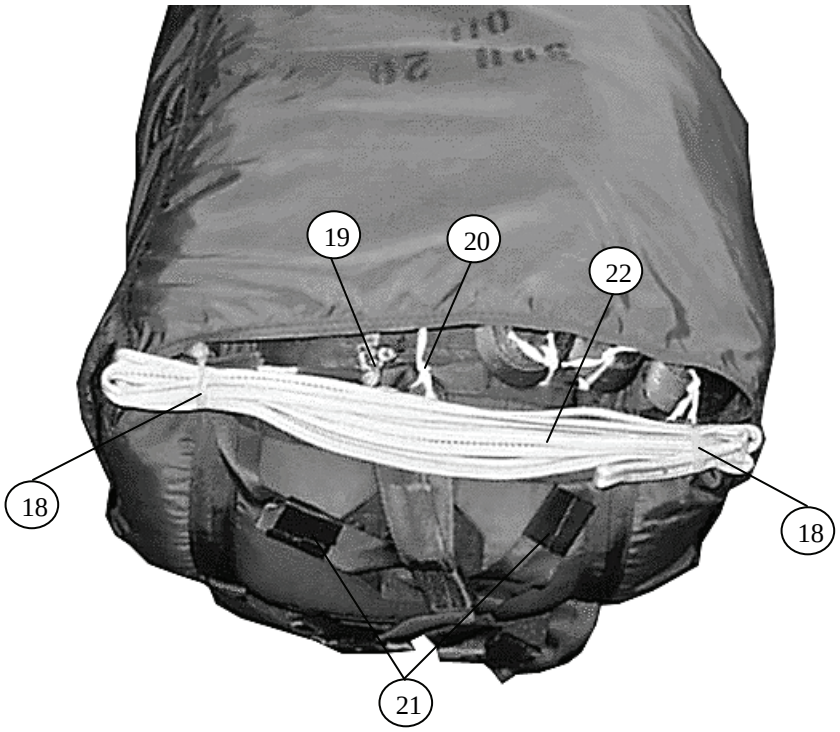
(13) Attach a 3-foot, 2-loop, type XXVI nylon sling to the stationary bolt of the WAPR.

(14) Safety the bolt of the WAPR to the G-12 bag stow bar with one turn single type I, 1/4-inch cotton webbing.

(15) Fold the 3-foot sling in half and secure it with paper masking tape (not shown). Place the sling under the G-12 riser extension flap.

(16) Turn the parachute so that the WAPR faces the front of the platform. Connect the free end of the 3-foot sling installed in step 13 to the clevis at the end of the platform suspension slings.

Figure 4-5. Platform Recovery Parachute and Slings Installed (continued)



17 Remove the universal static line snap hook from a T-10 universal static line (not shown).

18 Girth hitch two retainer bands to each end of the riser extension stow bar.

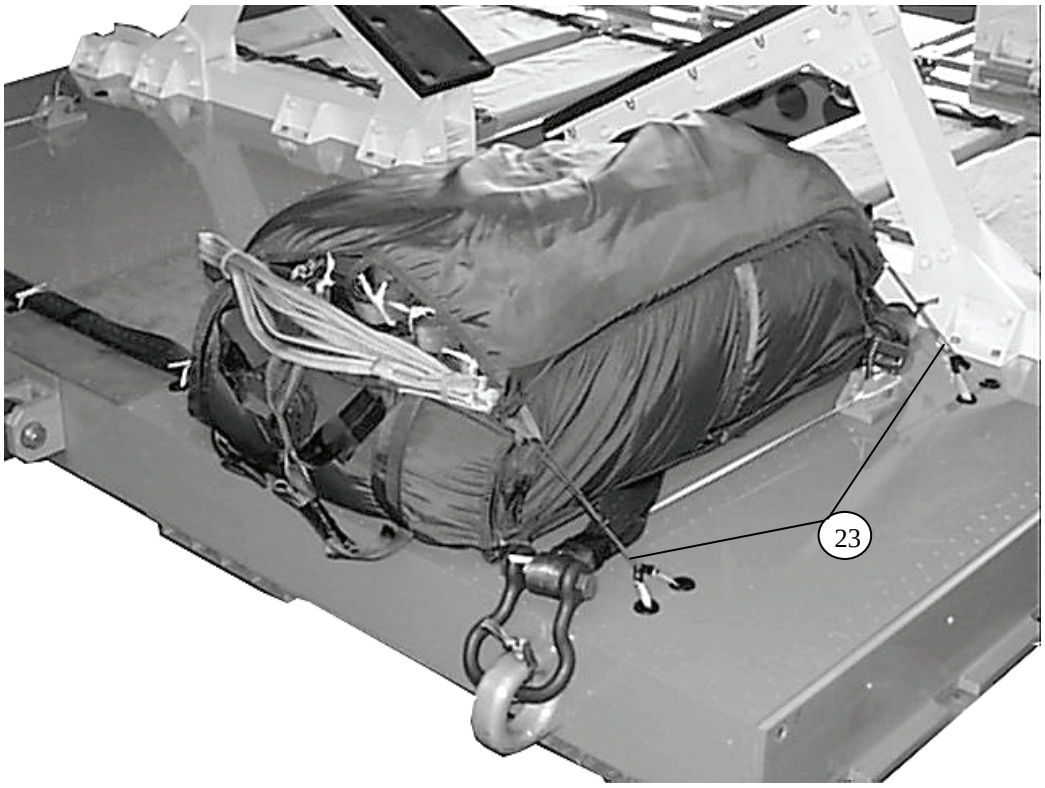
19 Girth hitch the universal static line to the bridle loop of the G-12 cargo parachute.

20 Safety the bridle loop to the riser extension stow bar with one turn single of type I, 1/4-inch cotton webbing.

21 S-fold the excess bridle assembly and secure it with tape.

22 S-fold the universal static line across the rear of the parachute, securing it with the retainer bands installed in step 18. Wrap the retainer bands twice around the static line.

Figure 4-5. Platform Recovery Parachute and Slings Installed (continued)

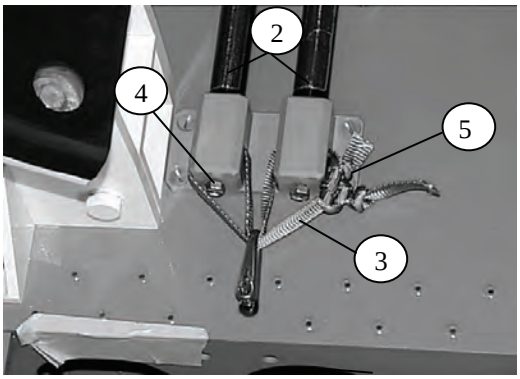


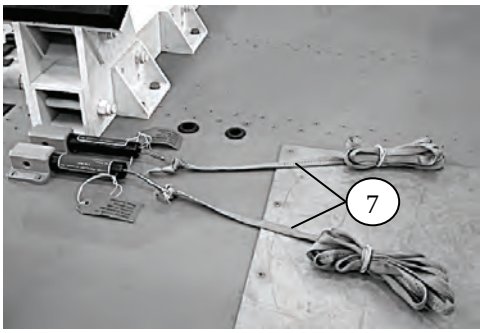
(23) Place the G-12 parachute over the suspension slings, and align with the rear edge of the platform and the center deck holes as shown. Tie the corners of the G-12 deployment bag to the ties placed in step 6 with type III nylon cord with the core threads removed.

Figure 4-5. Platform Recovery Parachute and Slings Installed (continued)

INSTALLING THE PLATFORM RELEASE SYSTEM

4-3. Install the components of the platform release system as shown in Figures 4-6 and 4-7.

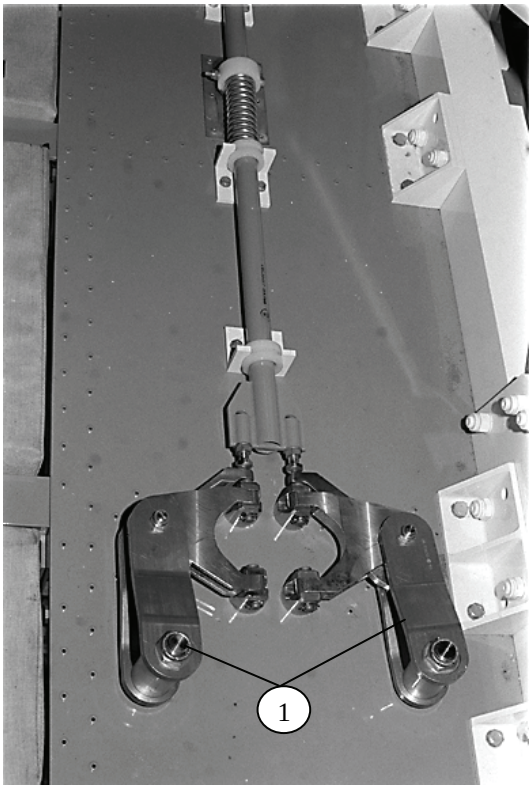


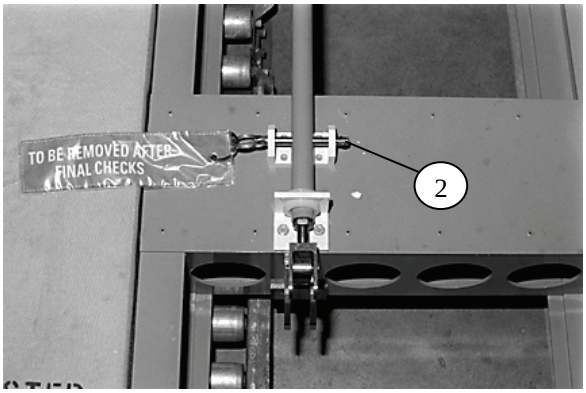


Note. This knot must be on the left forward end of the cutter brackets.

1. Put tension on the central push rod using the pulley assembly. Insert the T-pin through the push rod holes when the holes are aligned with the pin bracket. Connect the drawbar cable to the bolt end of the halyard shackle (Not shown).
2. Install two M-21 reefing line cutters in the cutter brackets. Ensure that the screws on the sides of the cutters are facing the deck of the platform. Ensure the cotter pins can be removed from the cutters once they are installed.
3. Route a length of 1/2-inch tubular nylon as follows:
   - Through the left cutter bracket.
   - Through the bell end of the locking halyard shackle.
   - Through the inside of the left cutter bracket, and out through the left side.
   - Through right cutter bracket.
   - Back through the bell end of the locking halyard shackle, and up to the other free end of the tie.
4. Tighten the screws in the bottom ends of the cutter brackets.
5. Secure the running ends tightly with a surgeon's knot and locking knot, with an overhand knot in the running ends.
6. Disconnect the cable from the halyard shackle. Replace the shackle pin (not shown).
7. Install a 10-foot length of ½-inch tubular nylon webbing to each M-21 cutter arming cable with three alternating half hitches and overhand knots in the running ends. S-fold the excess and secure temporarily with retainer bands.
8. Remove tension on the central push rod using the pulley assembly. Ensure the T-pin is removed (not shown).

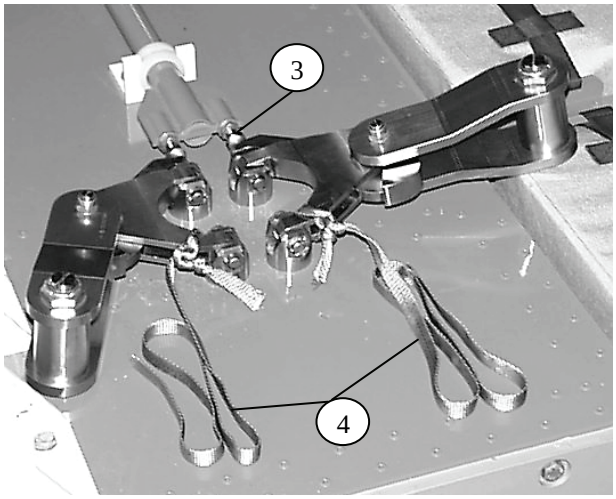
Figure 4-6. Cutters Installed

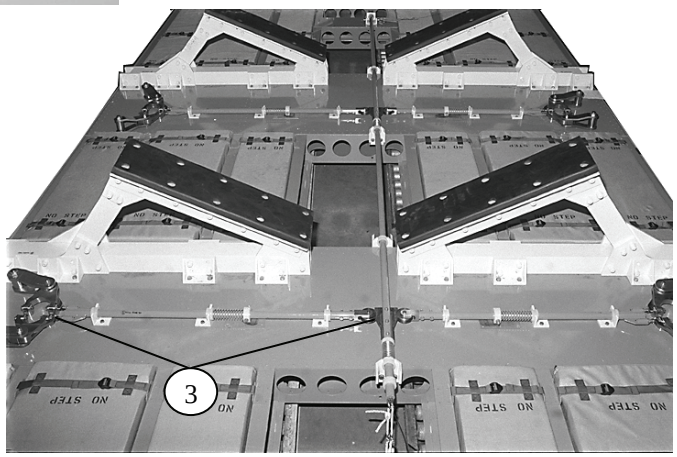




1. Place a tiedown shackle in each scissor release unit. Make sure the large nuts face the edge of the platform, and are facing up. Make sure the scissor units are closed around the shackles.
2. Put tension on the central push rod with the lanyard attached to the pulley assembly. Insert the T-pin through the push rod holes when the holes are aligned with the pin bracket.

Figure 4-7. Scissor Release Units Prepared and Tested





(3) Check all eight scissor release units to make sure they are held in place by the lateral rods. When the central push rod is under tension and held by the pin, the cams engage the lateral push rods to close the scissor releases.

(4) Tie a 60-inch length of ½-inch tubular nylon webbing to the outside leg of each scissor release unit with three alternating half hitches and overhand knots in the running ends.

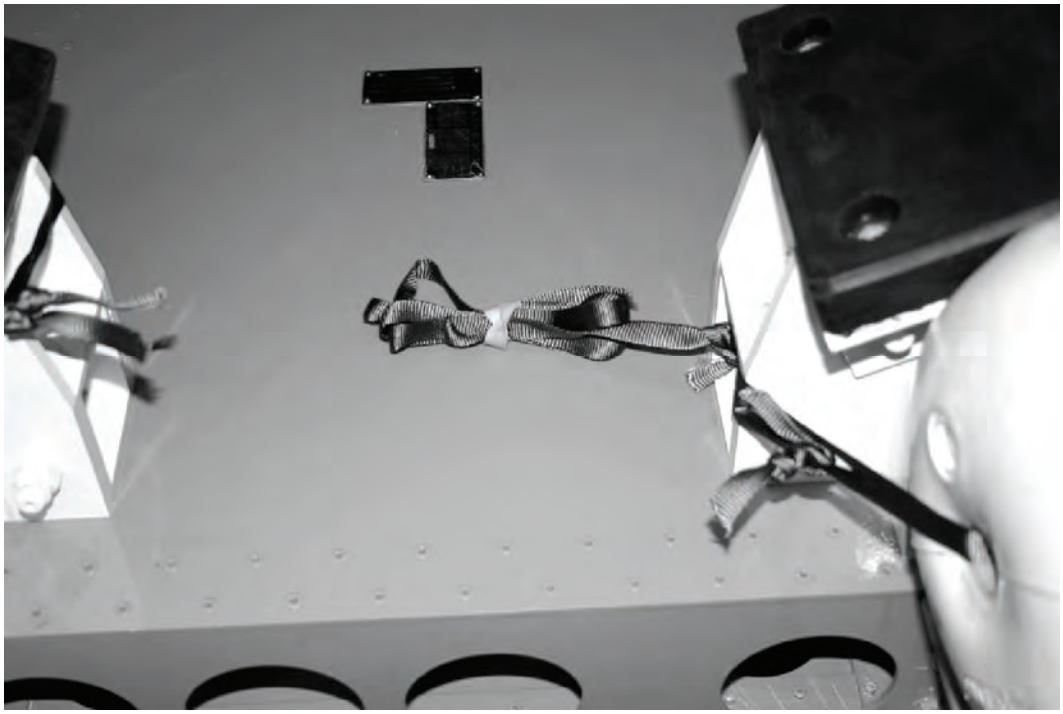
(5) Test the scissor release system as follows:

- One person removes the T-pin at the front end of the push rod while another person keeps the lanyard attached to the pulley under tension.
- A third person holds the nylon lines attached to each pair of shackles. Release the tension from the pulley, and be sure all eight shackles release from the scissor release units as they are pulled by the lines (not shown).

Figure 4-7. Scissor Release Units Prepared and Tested (continued)

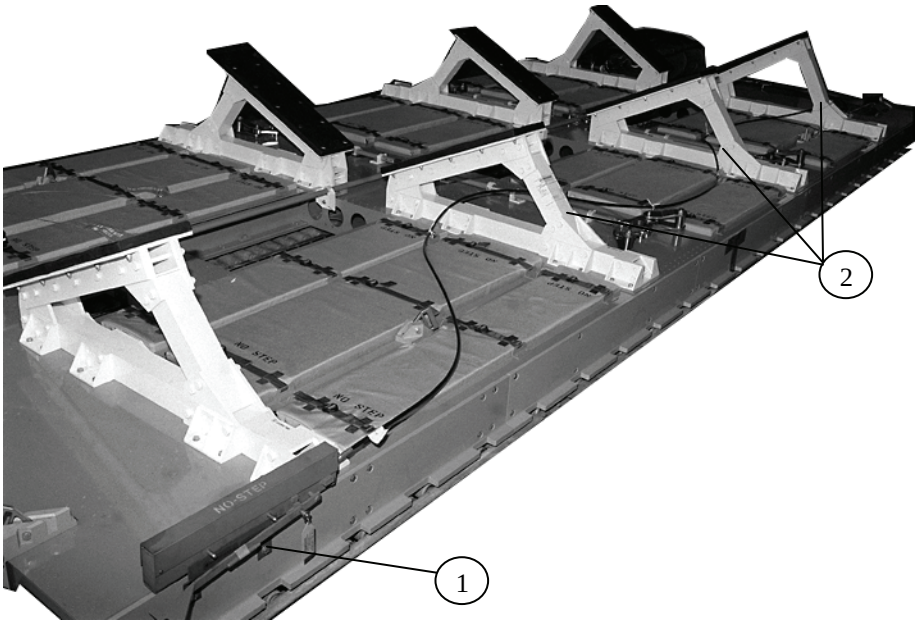
INSTALLING EXTRACTION FORCE TRANSFER COUPLING (EFTC)

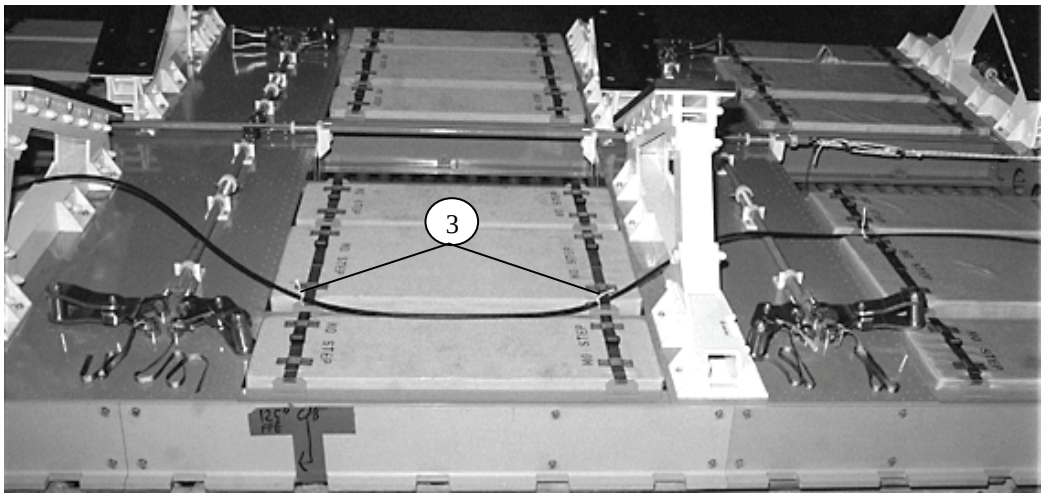
4-4. Install the drop arm retaining line as shown in Figure 4-8. Inspect and prepare the EFTC and a 24-foot cable in accordance with FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-9.



(1) Tie a 60-inch length of 1/2-inch tubular nylon webbing to the front right cradle bar with three alternating half hitches and overhand knots in the running ends. S-fold the excess and secure it temporarily with a rubber retainer band.

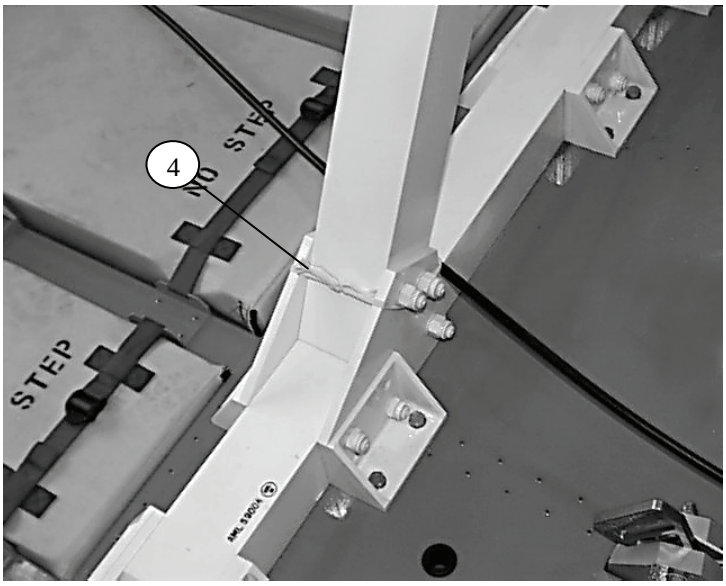
Figure 4-8. Drop Arm Retaining Line Installed

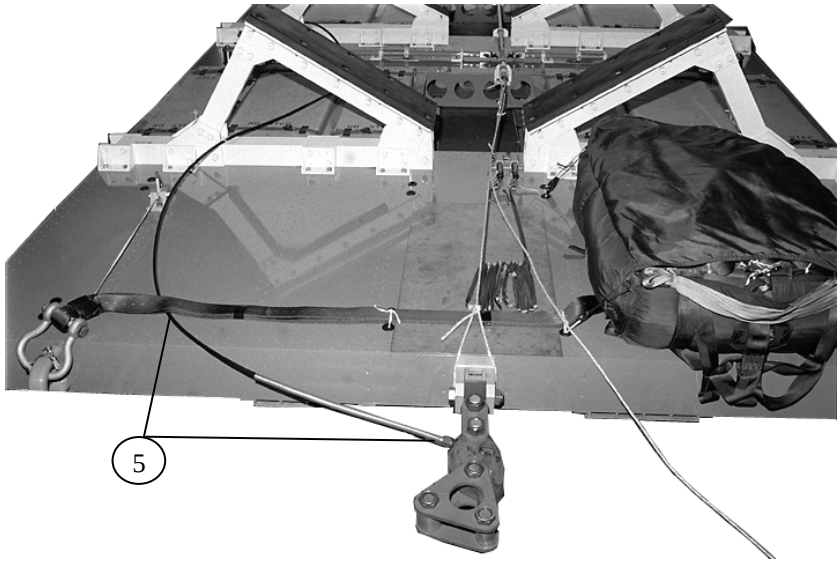




1. Mount the actuator in the bracket provided and install a 24-foot EFTC cable to the actuator.
2. Route the cable through left stanchions 2, 3, and 4. Be sure that the cable does not contact any spring or push rod end in the push rod system.
3. Safety the cable to the flotation device securing brackets whenever possible.

Figure 4-9. EFTC Installed





4 Tie the cable to the left rear stanchion arm with type I, 1/4-inch cotton webbing.

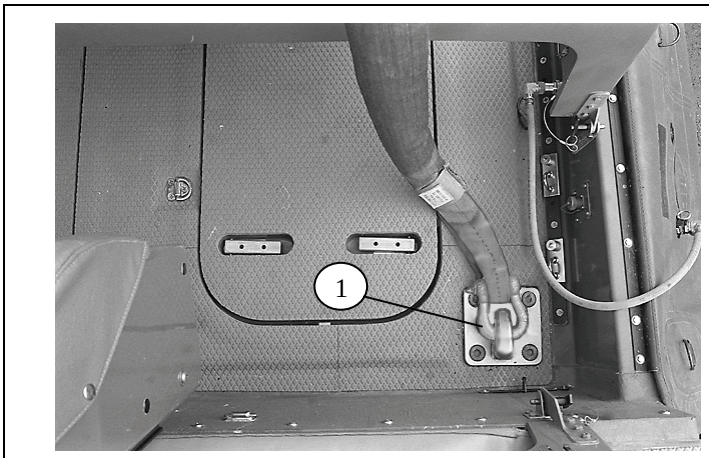
5 Install the EFTC latch assembly. Be sure the cable is routed under the suspension sling before connecting it to the latch assembly.

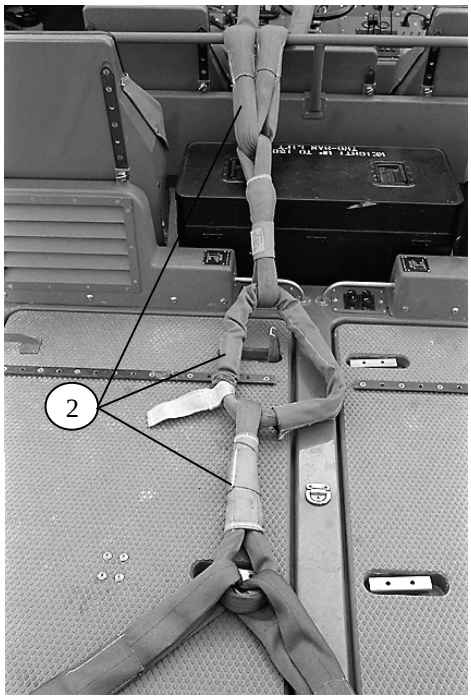
Note. Replace any cable that has been used for a water drop.

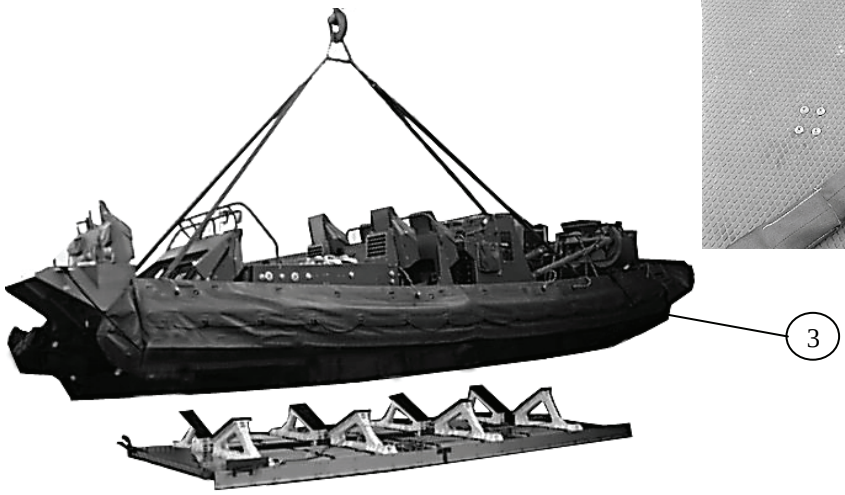
Figure 4-9. EFTC Installed (continued)

LIFTING AND POSITIONING BOAT

4-5. Use the lift kit provided with the boat (four long slings, three short loops, and clevises, instructions) to place the boat onto the cradles as shown in Figure 4-10. Be sure that the Airdrop Boat Preparation Checklist has been completed and signed before proceeding with the preparation of the boat.

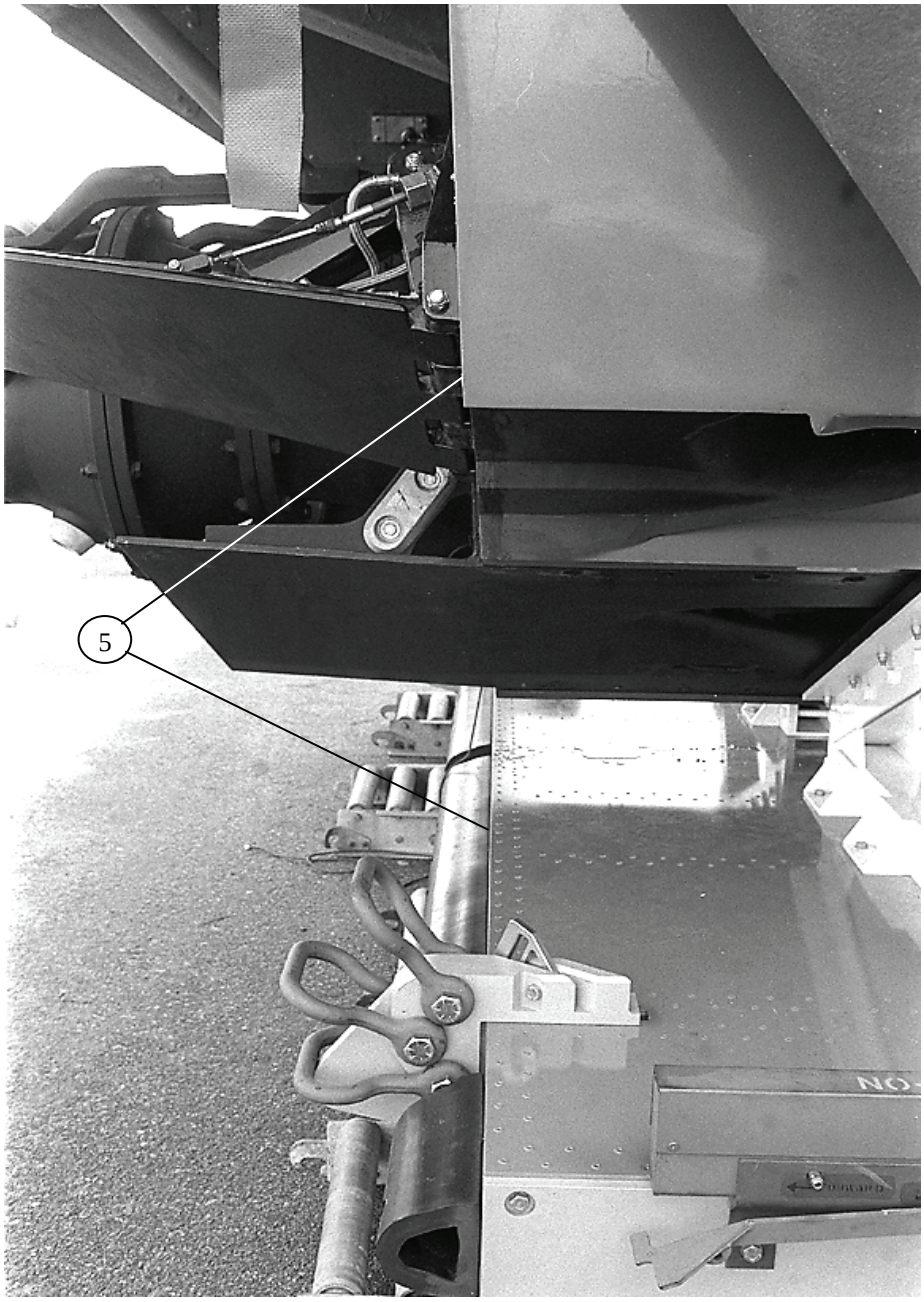






1. Attach a sling to each lifting provision with a screw-pin clevis, ensuring that the pins are facing inboard to outboard.
2. Assemble the lift kit according to the manufacturer's instructions.
3. Position the boat with the bow facing the rear of the platform.
4. Remove the lifting slings and shackles after positioning the boat (not shown).

Figure 4-10. Boat Lifted and Placed on Platform

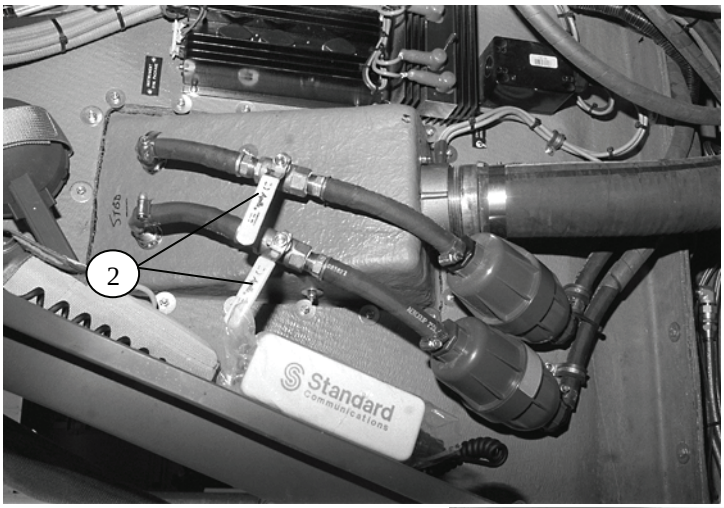


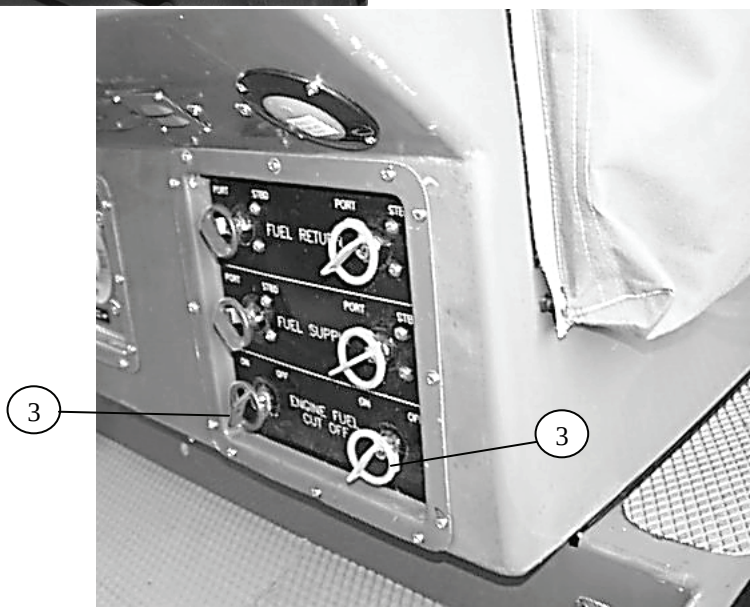
(5) Align the rear edge of the transom with the front edge of the platform, disregarding the rubber bumpers.

Figure 4-10. Boat Lifted and Placed on Platform (continued)

PREPARING BOAT

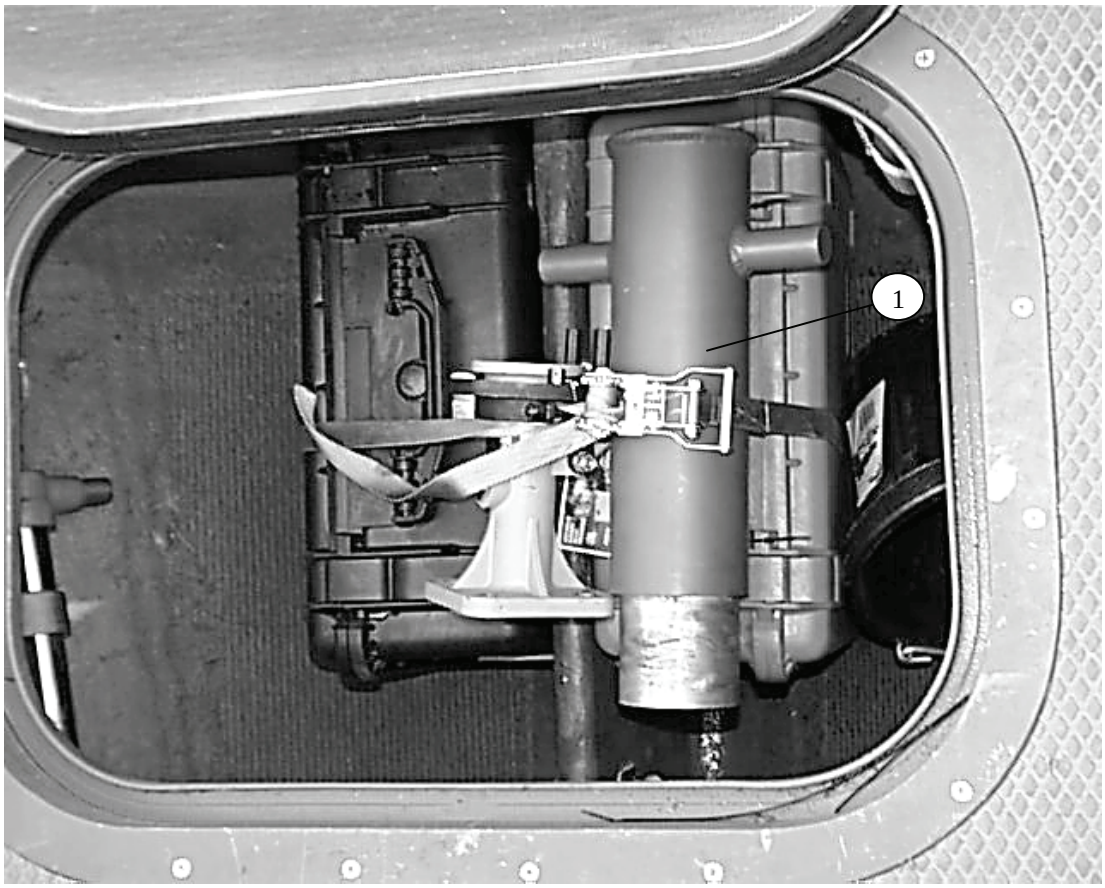
4-6. Prepare the boat as shown in Figures 4-11 through 4-16.





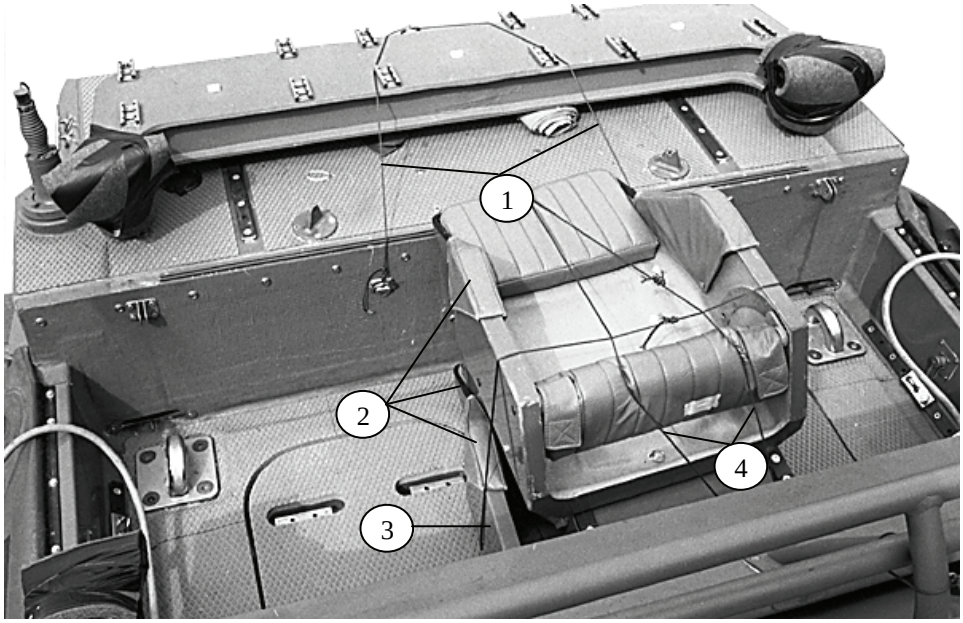
1. Make sure the fuel tanks have no more than 68 gallons (75%) of fuel each (not shown).
2. Close the four fuel vent shut-off valves (two port, two starboard) inside the control access hatch.
3. Turn the fuel shut-off valves (the two valves at the bottom) to the “OFF” position.

Figure 4-11. Fuel System Prepared



(1) Remove the forward tow post. Stow and secure it in a convenient location.

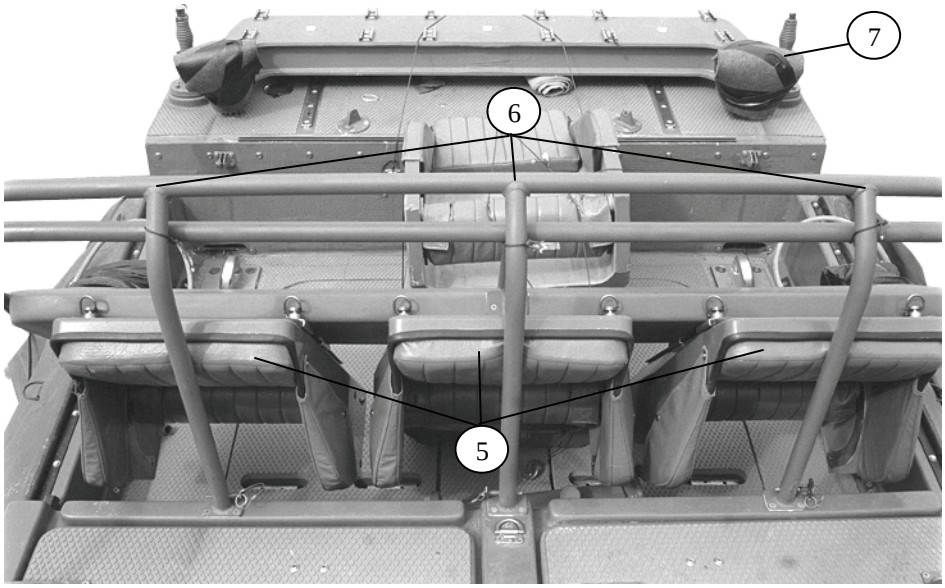
Figure 4-12. Boat Equipment Stowed in Hatch

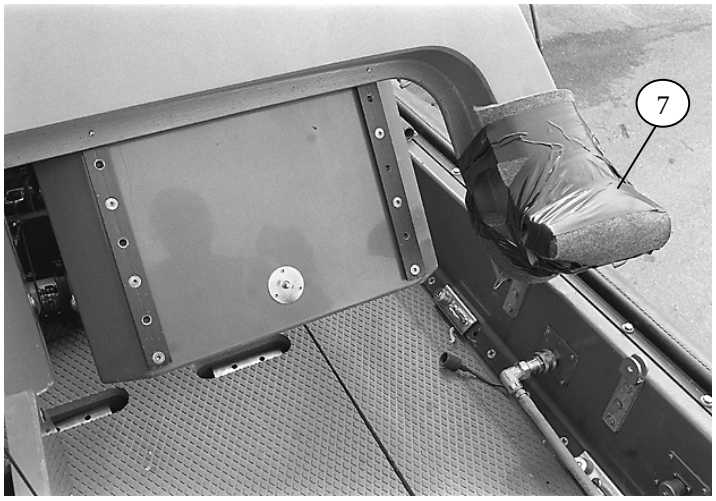


Note. When the fourth row of bolster seats is removed for missions not needing them, steps 1 through 4 may be omitted.

1. Remove the bolster seats from row 4. Remove the life ring and stow it in hold 2. Fold the row 4 bolster frame back on the rolled and tied splash guard. Secure the bolster frame with a length of type III nylon cord through the left and right deck rings on the swimmer deck, and through the center deck ring at the back of the swimmer deck.
2. Center one seat on the floor face up. Place a second seat squarely over the first face down. Place the third seat over the second face up.
3. Tie all three seats together with a length of type III nylon cord.
4. Run a length of type III nylon cord through the deck ring under the third bolster seat row, up through the handle of seat two, over the top seat, and to the top center deck ring on the swimmer deck. Tie both running ends on top of the seats.

Figure 4-13. Bolster Seats Stowed



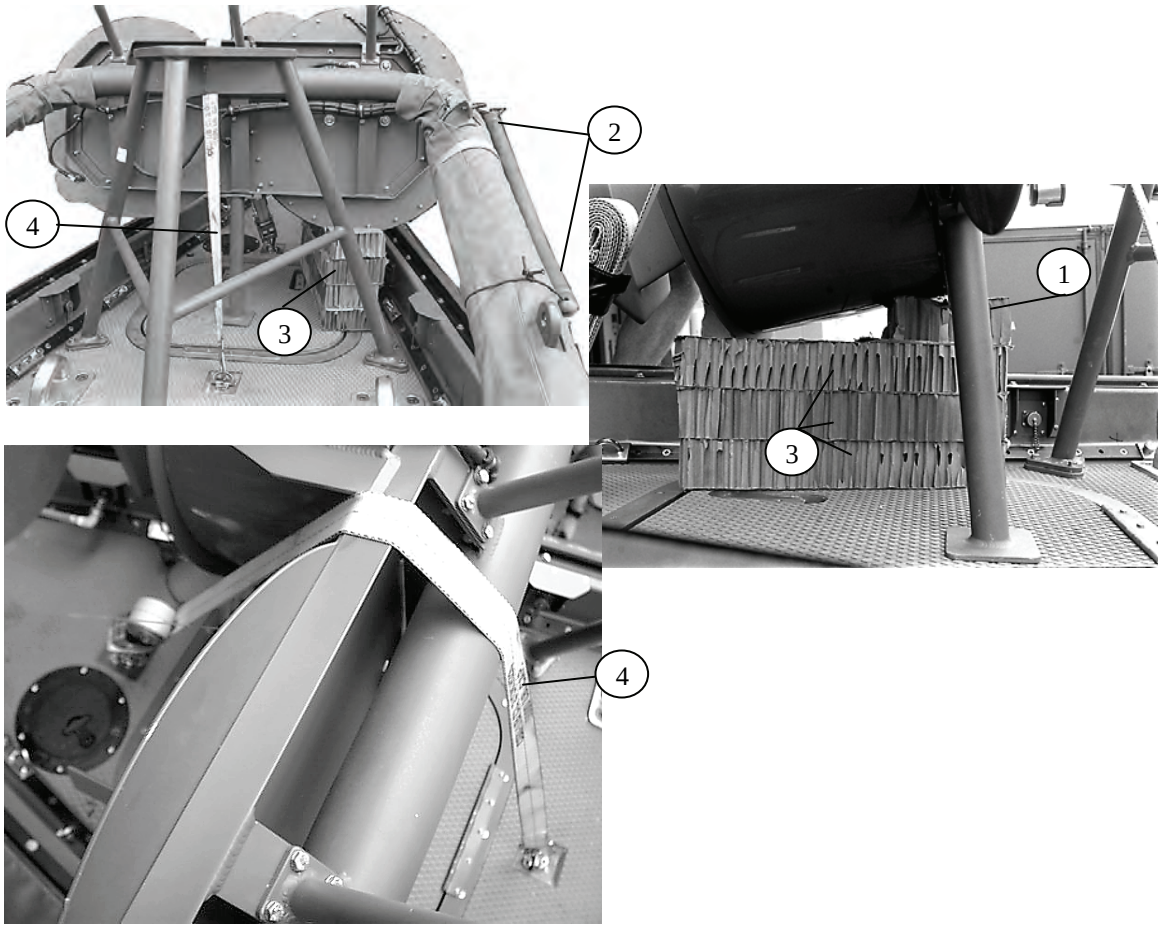


(5) Lower all the bolster seats in rows 1, 2, and 3 to their lowest position. Fold row 3 bolster seat frame all the way forward.

(6) Tie the frame to the handrail in three places with type III nylon cord.

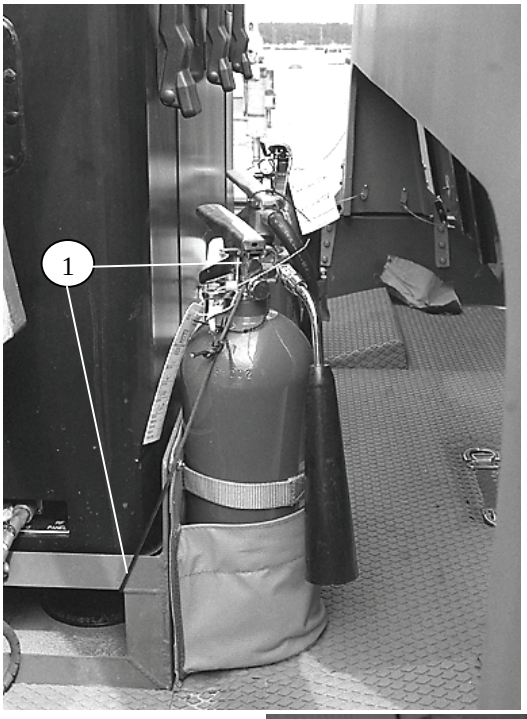
(7) Pad each corner of row 5 and 4 bolster frames with cellulose wadding and tape in place.

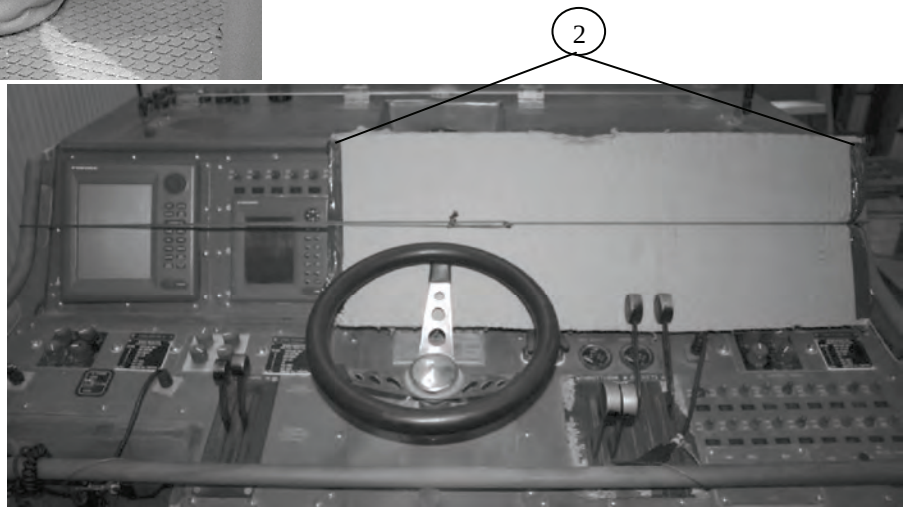
Figure 4-13. Bolster Seats Stowed (continued)



1. Unbolt the supports for the radar arch and fold the arch forward so that it rests on its support post.
2. Secure the support arms to the radar arch with type III nylon cord tied through the bolt holes of the arms.
3. Glue three 20- by 6-inch pieces and one 6- by 6-inch piece of honeycomb together as shown. Center the honeycomb under the radar unit. The radar unit should be supported by both the support post and the honeycomb.
4. Attach a length of 1/2-inch tubular nylon webbing to each of the center deck rings forming a 3/4-inch loop. Secure the radar arch with a CGU-1B tiedown assembly to the 1/2-inch tubular nylon, attaching the ratchet end to the front ring. Route the tiedown assembly over the radar unit as shown.

Figure 4-14. Radar Arch Folded and Secured



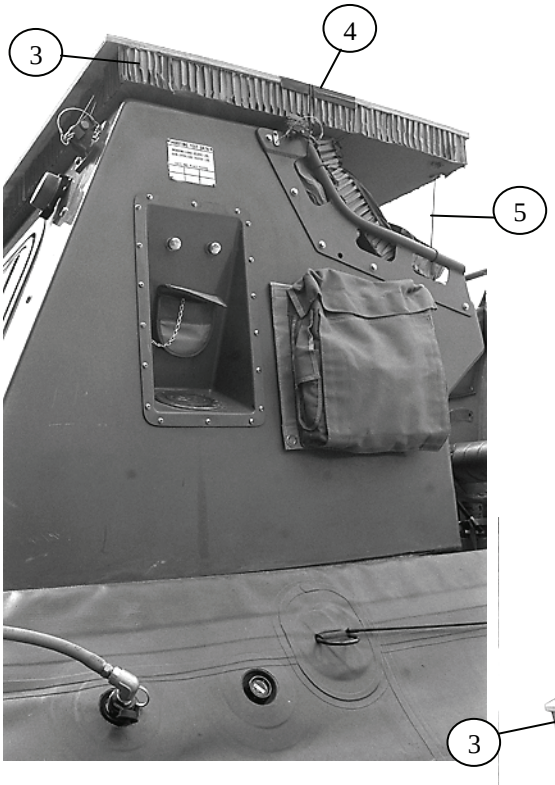


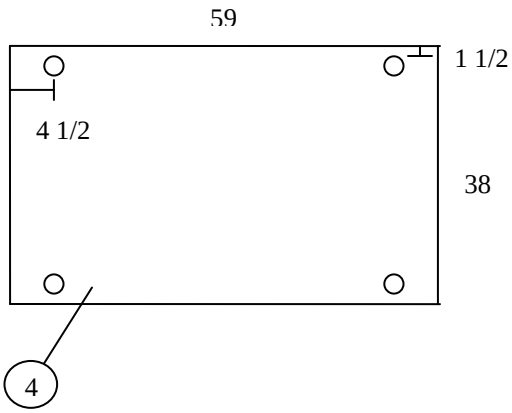
1 Secure the three fire extinguishers behind the driver's compartment with type III nylon cord. Route the cord under the storage box and through the holes on the necks of the fire extinguishers.

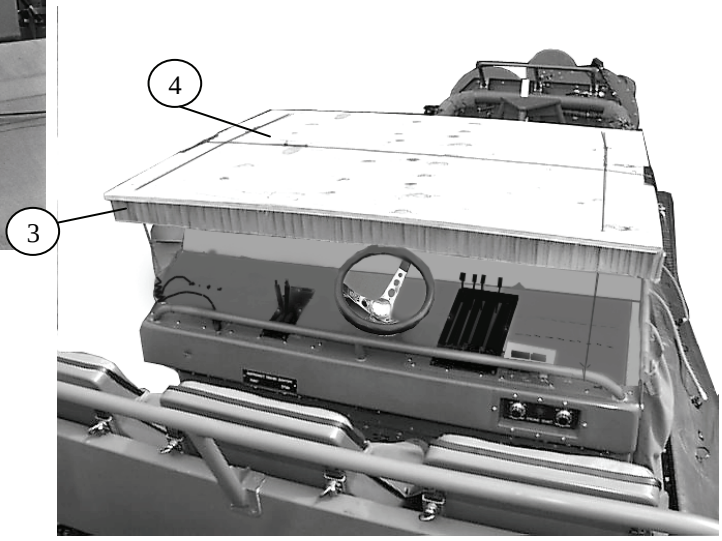
2 Tie two 12- by 36-inch pieces of honeycomb to the instrument panel. Ensure that the honeycomb is flush with the starboard side handrail, making sure the GPS and radar screens are accessible. Tape the edges of the honeycomb and tie it to the handrail with type III nylon cord.

Figure 4-15. Console Prepared

Note. This drawing is not to scale and all dimensions are in inches.





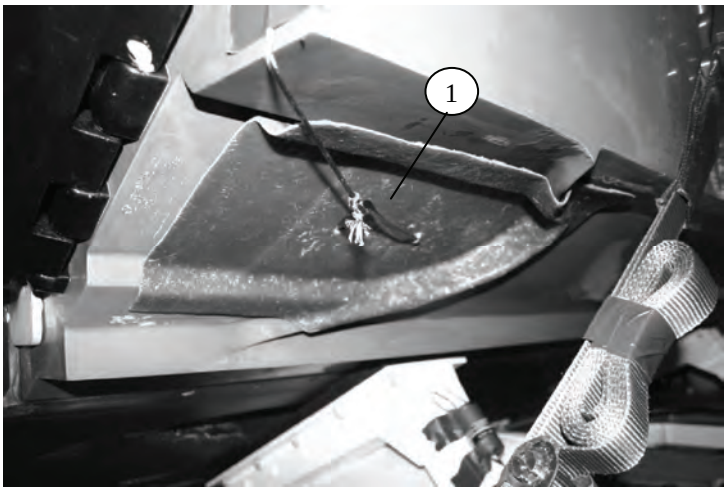


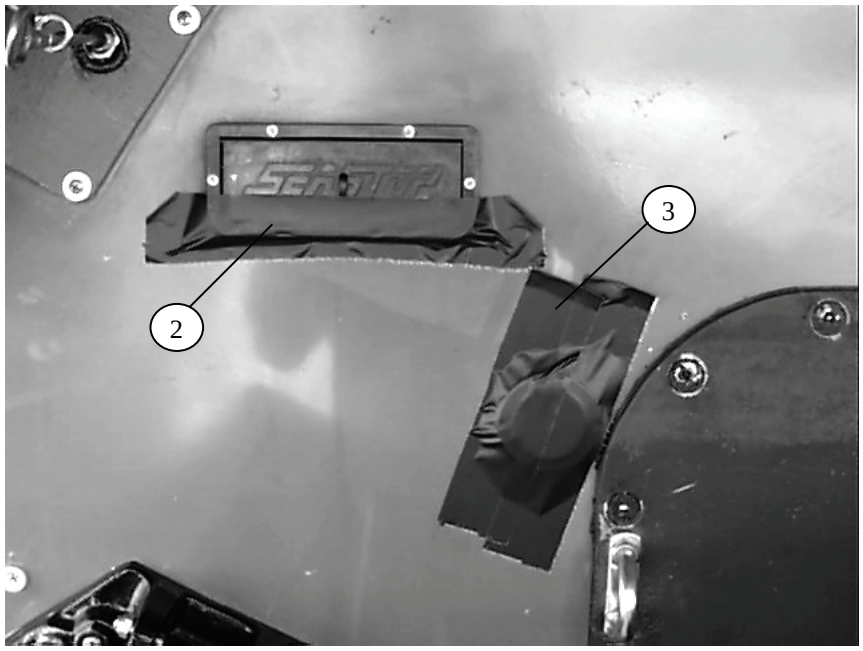
3 Place a 36- by 59-inch piece of honeycomb over the folded windshield. Crush and cut to ensure that it completely covers the windshield surface. Ensure that the edge of the honeycomb and plywood is flush with the front of the console.

4 Drill 1/2-inch holes in a 1/2- by 38- by 59-inch piece of plywood as shown. Center and glue the plywood over the honeycomb placed in step 3 above. Center a type III nylon cord tie over the center of the plywood from the left to the right handrail.

5 Secure the plywood on each side to the console handrails, through the side holes in the plywood and to the push-pull pins.

Figure 4-15. Console Prepared (continued)



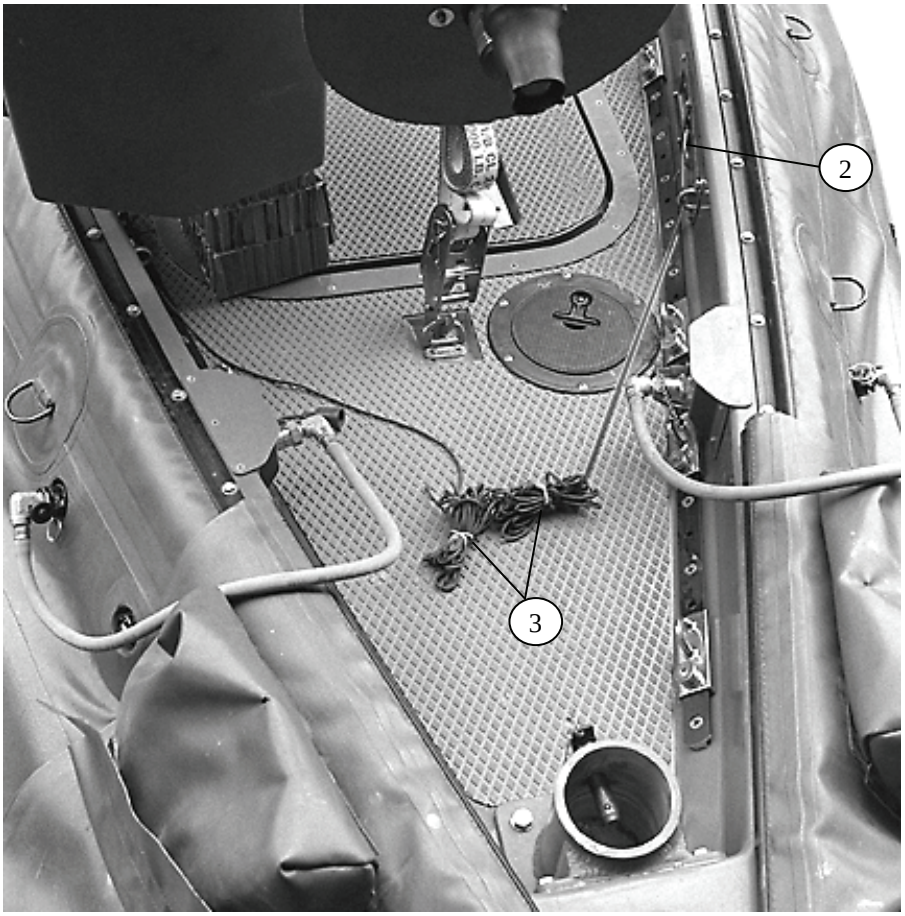


1. Make a handle for each exhaust port cover with ½-inch tubular nylon. Tie a length of type III nylon cord to the handle and to the grommet on the aft sponson cover. Attach several pieces of interlocking velcro to the exhaust covers and attach the exhaust port covers in place.
2. Tape the bottom edge of the deck drainage flap on each side of the transom.
3. Tape the bilge pump overboard discharge holes on each side of the transom.

Figure 4-16. Discharge Holes, Drainage Flaps, and Exhaust Port Covers Secured

PREPARING THE SPONSON INFLATION SYSTEM

4-7. Prepare the sponson inflation system as shown in Figure 4-17.

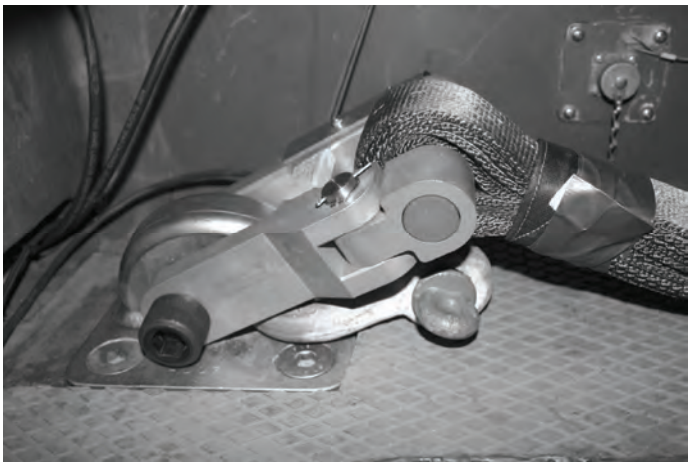


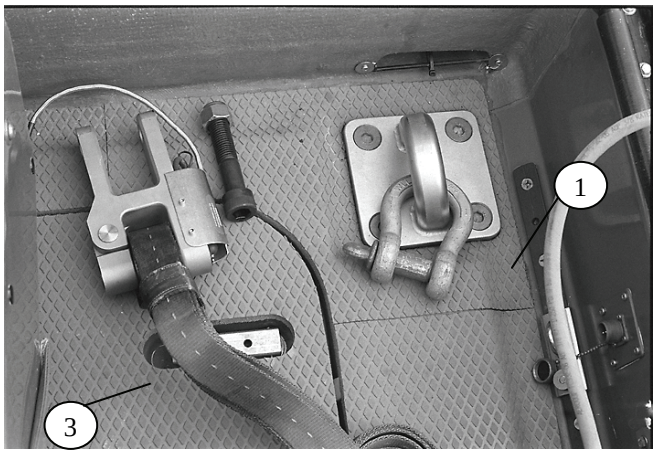
1. Make sure the hose connections for the sponson inflation system are tight (not shown).
2. Remove the core threads from two 6-foot lengths of type III nylon cord. Pass one end of the cord through the tiedown ring and tie it to the sponson activation cable ring. Repeat for the other side of the boat.
3. Fold the excess cord and secure with retainer bands in the middle of the deck.

Figure 4-17. Sponson Inflation System Connected

INSTALLING THE WATER ACTIVATED PARACHUTE RELEASE

4-8. Install the four water-activated parachute releases as shown in Figure 4-18.



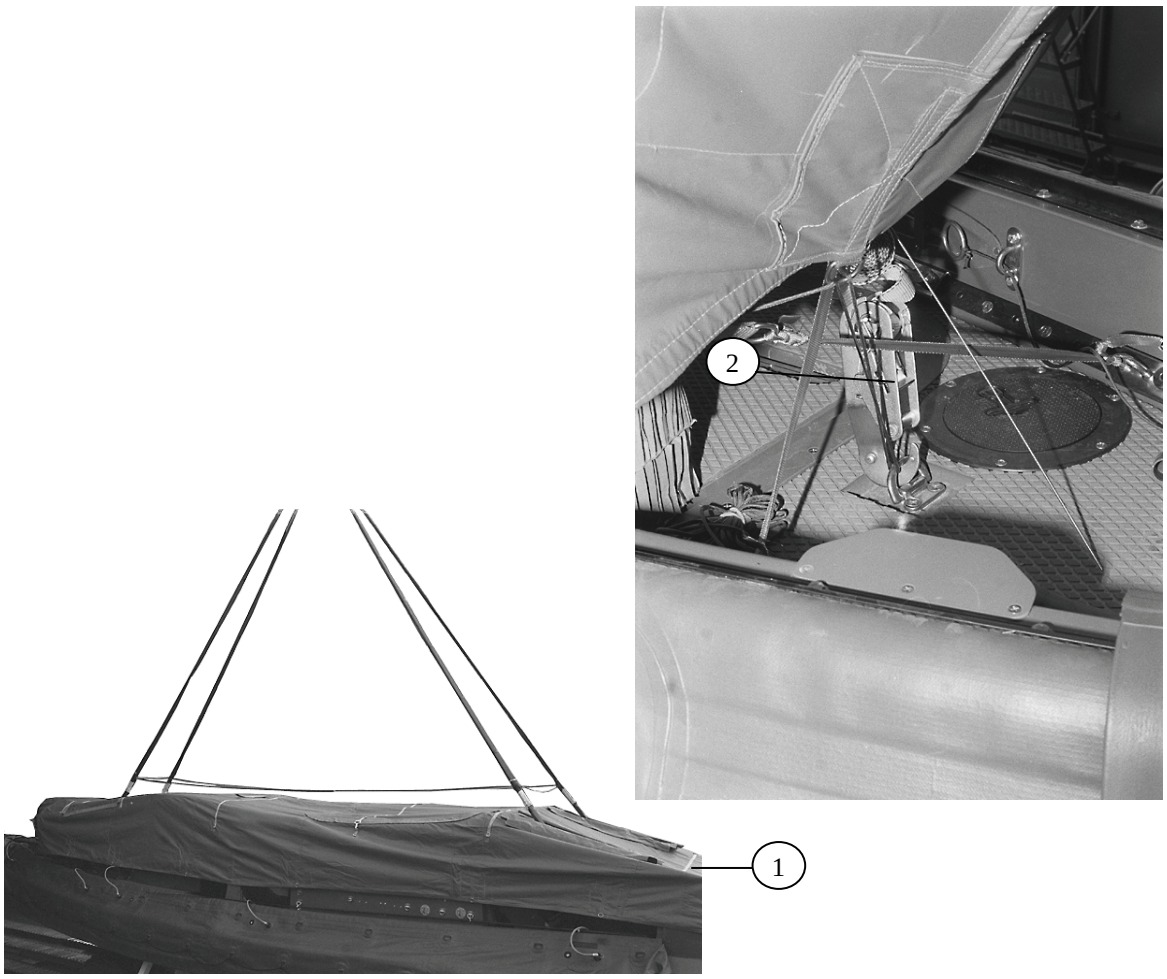


1. Place a shackle from the lift kit onto each suspension point, with the pin facing inboard to outboard as shown. These must be used for lifting the load, not for suspension (not shown).
2. Attach a 20-foot, 4-loop, type XXVI nylon sling to the discharge end of each WAPR (not shown).
3. Attach the WAPR to the suspension point, with the red dust cap facing inboard. Be sure that the bolt faces inboard to outboard. Tighten the bolt wrench tight.
4. Attach the three remaining suspension slings as in steps 1 through 3 above (not shown).

Figure 4-18. Water-Activated Parachute Releases Installed

INSTALLING THE BOAT COVER, SPONSON, TIES, AND SPONSON COVERS

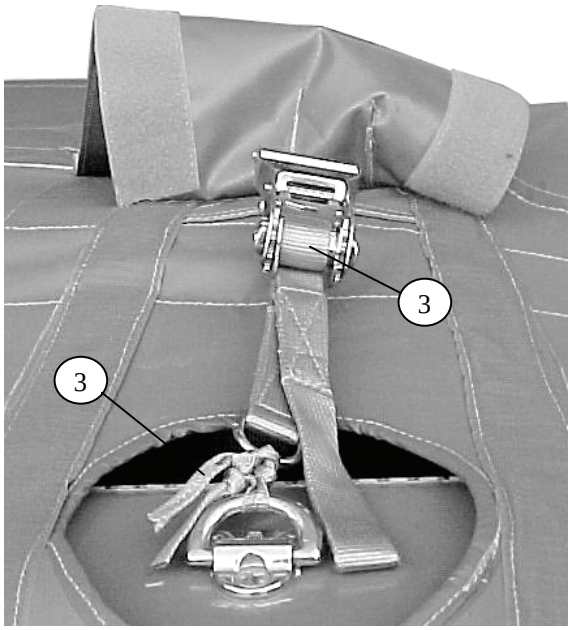
4-9. Install the boat cover as shown in Figure 4-19. Make the sponson ties as shown in Figure 4-20. Install the aft sponson covers as shown in Figure 4-21.

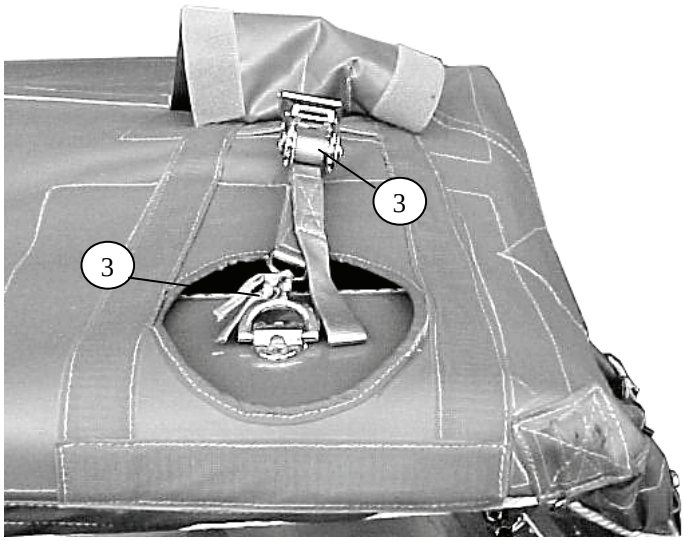


(1) Install the cover provided with the boat in a fore-to-aft direction. Pull the suspension slings through the holes provided and raise them temporarily.

(2) Tie a loop of ½-inch tubular nylon to each sail car tie-down in the forward cockpit. Attach a ratchet strap provided at the front of the cover to each loop, each strap attaching to the loop on the opposite side. Tighten the ratchet straps just enough so that tension on the cover is not placed on the lights and antennas on top of the radar arch.

Figure 4-19. Boat Cover Installed

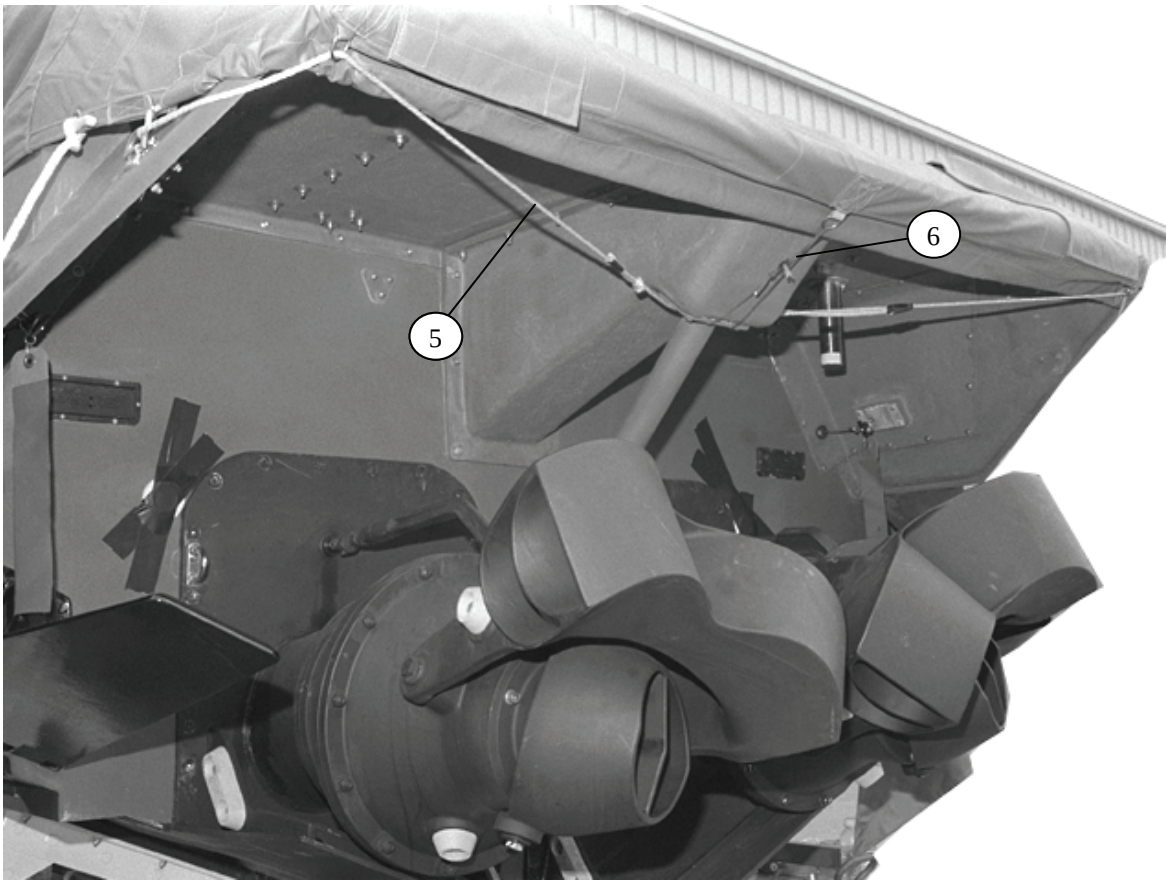




(3) Secure the cover to the bustle of the boat through the two ports in the cover. Secure the end of each ratchet strap to the folding padeye with a loop of 1/2-inch tubular nylon webbing.

(4) Adjust the ratchets to place tension on the cover (not shown).

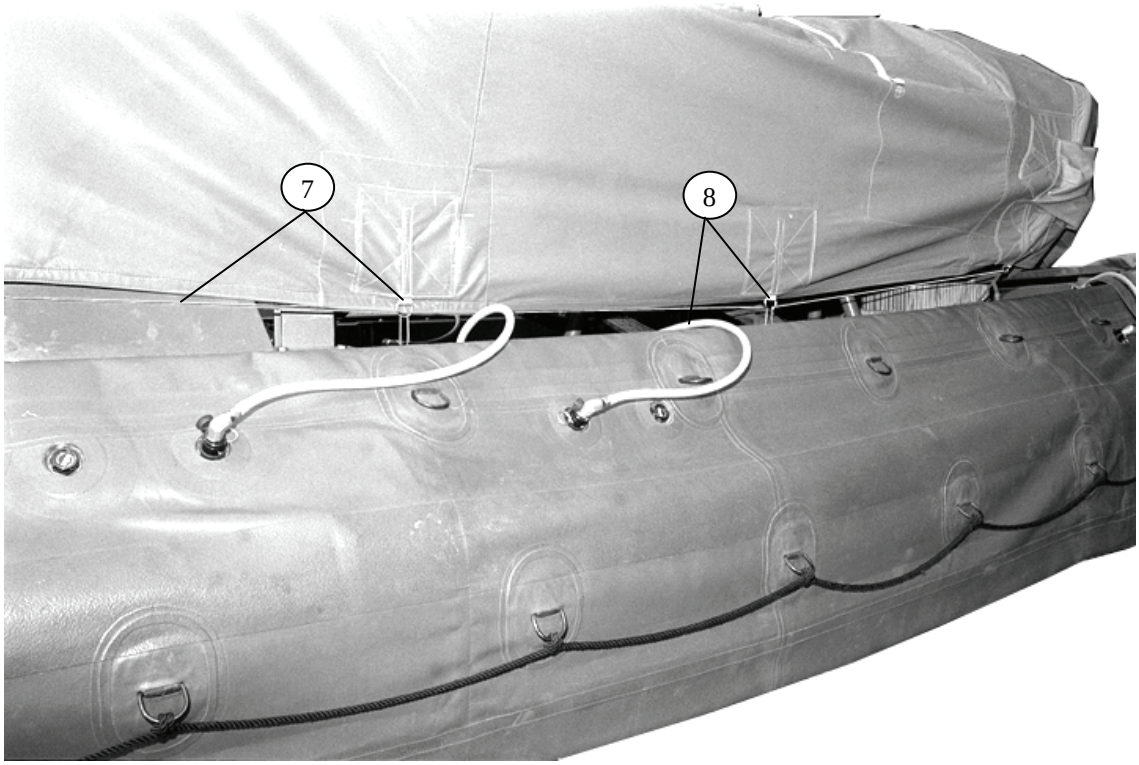
Figure 4-19. Boat Cover Installed (continued)



5 Run a length of 1/2-inch tubular nylon through the D-rings on both sides of the bustle, and tie off, making a three-finger loop. Route the bolt rope through the loops of 1/2-inch tubular nylon and tighten the bolt rope along the edges of the cover on both sides of the boat. Be sure that the cover extends below the edges of the bustle. Form a loop in each running end of the bolt rope.

6 Route a length of type III nylon cord through the looped ends of the bolt rope, around the swim platform support bar, and through the center grommet on the boat cover, forming a continuous loop. Tie off with a cinch knot.

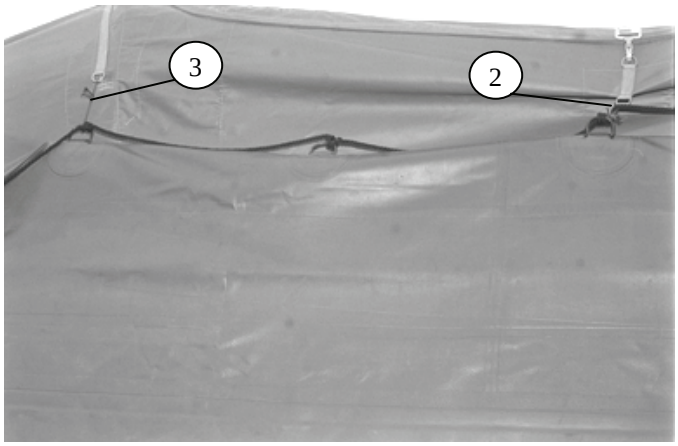
Figure 4-19. Boat Cover Installed (continued)



(7) Cut a length of type III nylon cord long enough to encircle the entire boat cover. Beginning at the left rear sail car, route the cord up through the sewn D-ring on the cover, over through the next sewn D-ring, down through the tie-down ring or sail car, and up through the same sewn cover D-ring.

(8) Repeat this pattern all around the cover, pull the cord taut and tie it off to the right rear sail car.

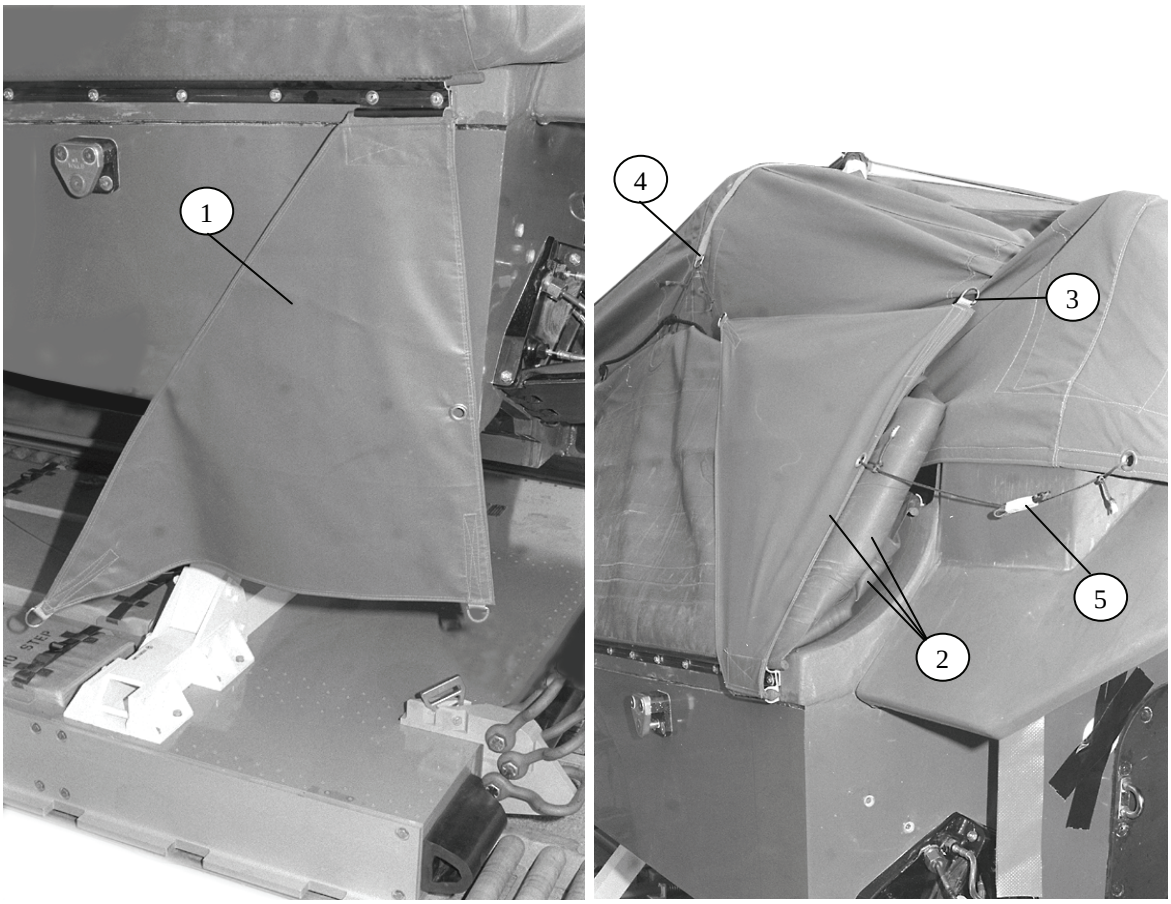
Figure 4-19. Boat Cover Installed (continued)





1. Cut fourteen 6-foot lengths of type III nylon cord. Remove the core threads (not shown).
2. Starting at the rear of the boat, route a length of type III nylon cord down through the sewn D-ring on the boat cover, and through the sewn D-ring on the sponson. Have assistants support the weight of the sponson while tying the cord around both D-rings.
3. Repeat step 2 with the next D-ring on the boat cover. Ensure that you only make a tie to every other D-ring on the sponson.
4. Repeat steps 2 and 3 on the other side.

Figure 4-20. Sponsons Tied

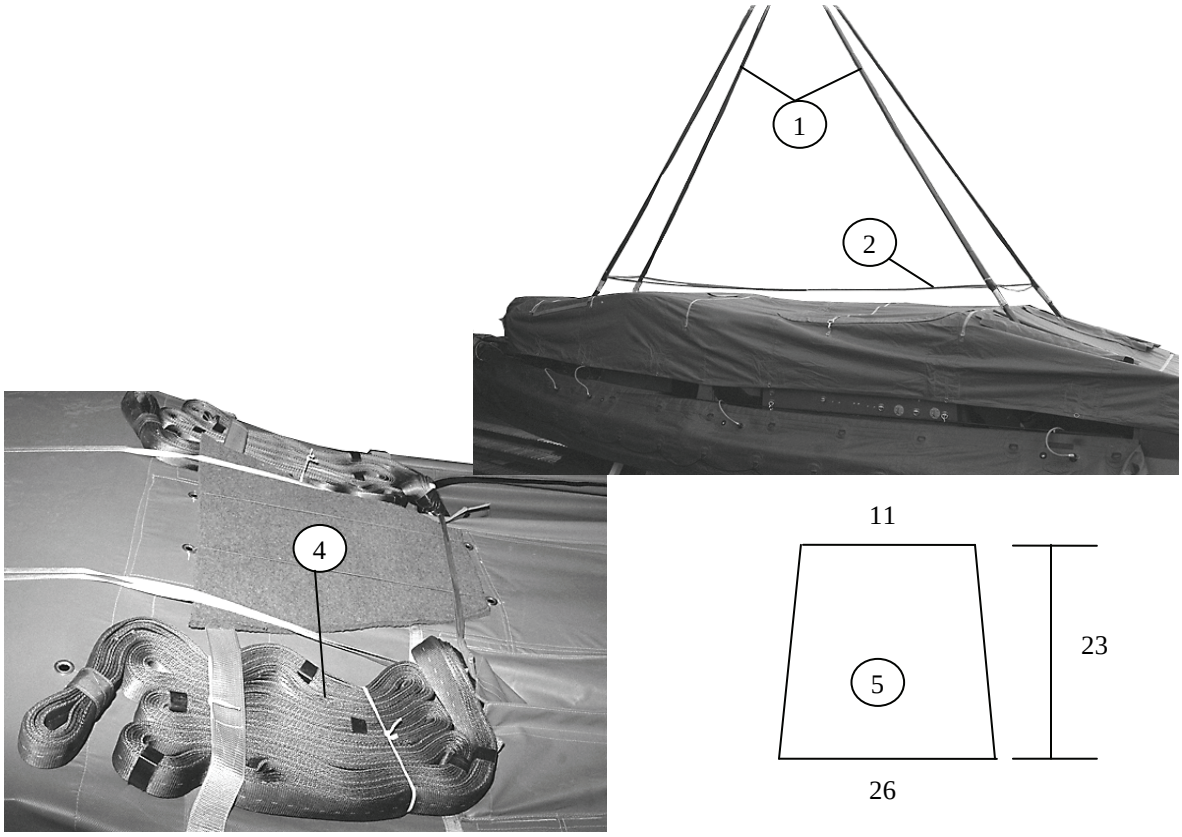


1. Slide the small end of the aft sponson covers into the slots provided.
2. Fold the rear of the sponson inward, and raise the sponson cover over the fold.
3. Pass a 36-inch length of type III nylon cord with the core threads removed through the D-ring on the right angle corner of the sponson cover, and through the rear sewn D-ring on the boat cover. Tie the running ends together.
4. Pass a 48-inch length of type III nylon cord with the core threads removed through the D-ring on the front corner of the sponson cover, and through the second sewn D-ring on the boat cover. Tie the running ends together.
5. Tie one end of a 60-inch length of type III nylon cord to the center grommet on the sponson cover, and the other end to the last grommet on the boat cover. S-fold the excess cord and tape the folds with masking tape (not shown).

Figure 4-21. Aft Sponson Covers Tied

PREPARING SUSPENSION SLINGS

4-10. Raise and safety the suspension slings as shown in Figure 4-22.

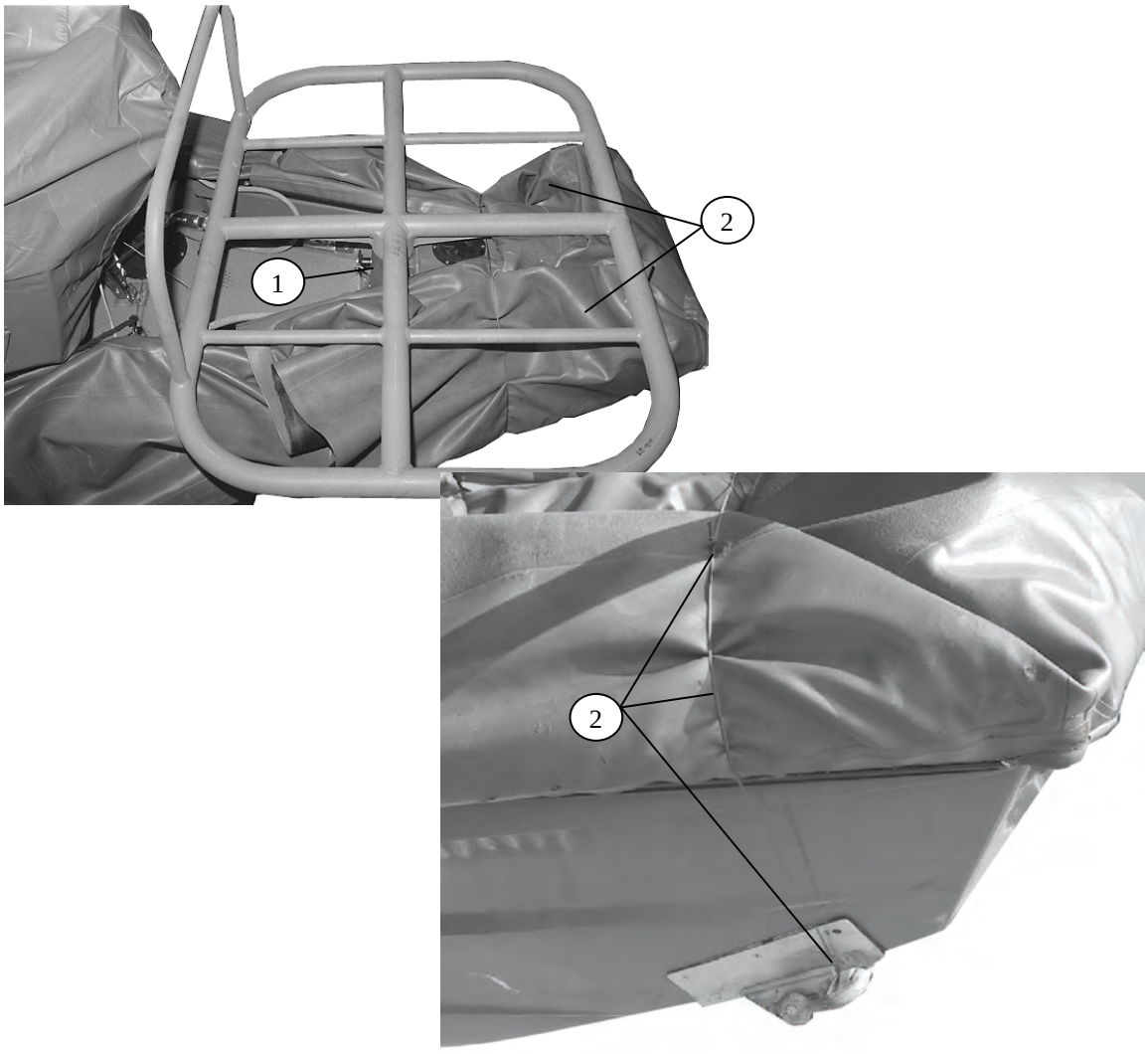


1. Raise the suspension slings, allowing no twists in them.
2. Make the deadman's tie in accordance with FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.
3. Lower the slings. Route the suspension slings from the front of the platform through the center hook-and-pile suspension sling straps on the boat cover (not shown).
4. S-fold the rear suspension slings over the open hook-and-loop fasteners just ahead of the sling exit port on the cover. Tie the folds in two places (top and bottom) with type I, 1/4-inch cotton webbing. Secure the hook portion of the fasteners over the slings.
5. Cut a piece of 1/2-inch felt as shown. Place the felt on the boat cover, narrow end to the rear, and under the deadman's tie. Tie the felt in place through the grommets in the cover with type III nylon cord, knotted under the cover.

Figure 4-22. Suspension Slings Safetied and Stowed

INSTALLING PARACHUTE STOWAGE PLATFORM

4-11. Tie the front sponsons, and install the parachute stowage platform as shown in Figure 4-23.

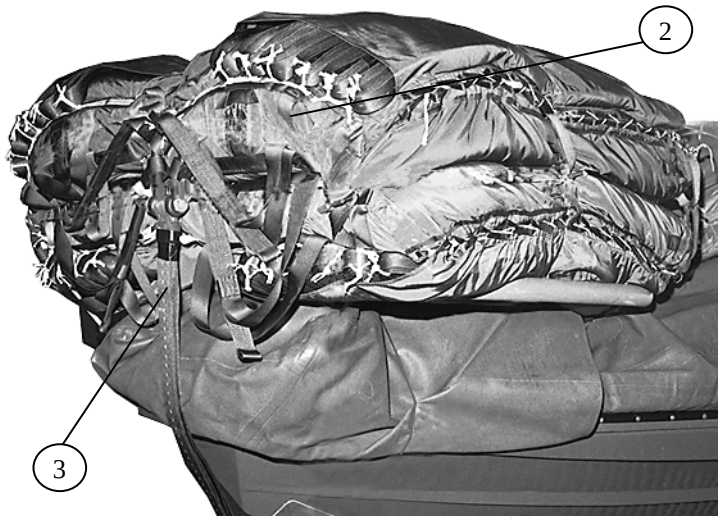


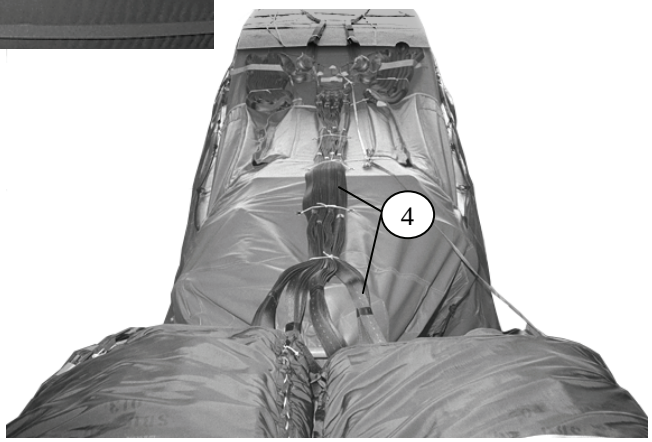
1. Insert the post of the parachute stowage platform into the king post base. Use the push-pull pin for the king post base to secure the stowage platform in place.
2. Fold the bow sponson tube under the stowage platform, folding the front flap first, then the two sides. Tie a length of type III nylon cord with the core threads removed around the sponsons, the hull of the boat, and through the towing shackle. Ensure that the tie is routed aft of the forward tow post mount.

Figure 4-23. Front Sponsons Folded and Parachute Stowage Platform Installed

INSTALLING CARGO PARACHUTES

4-12. Install four G-11 cargo parachutes according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-24.





(3) Attach and stow a 60-foot, 3 loop, type XXVI riser extension to each of the four G-11B cargo parachutes according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 (not shown).

(4) Cluster the parachutes on the parachute storage platform.

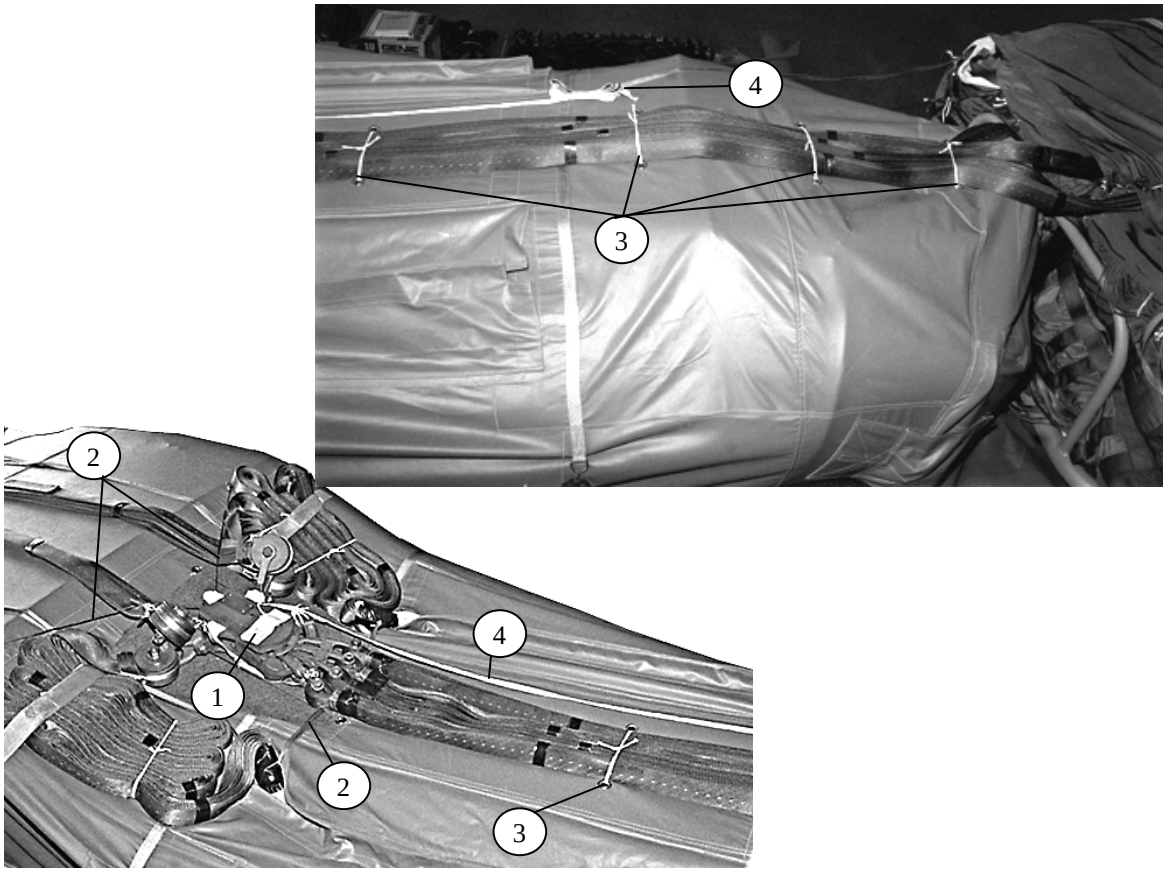
(5) Attach a 16-foot, 2 loop, type XXVI deployment line to the deployment clevis.

(6) Pull enough of the riser extensions from each parachute to reach the release.

Figure 4-24. Cargo Parachutes Installed

INSTALLING M-2 CARGO PARACHUTE RELEASE

4-13. Prepare and install an M-2 cargo parachute release according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5, and as shown in Figure 4-25.

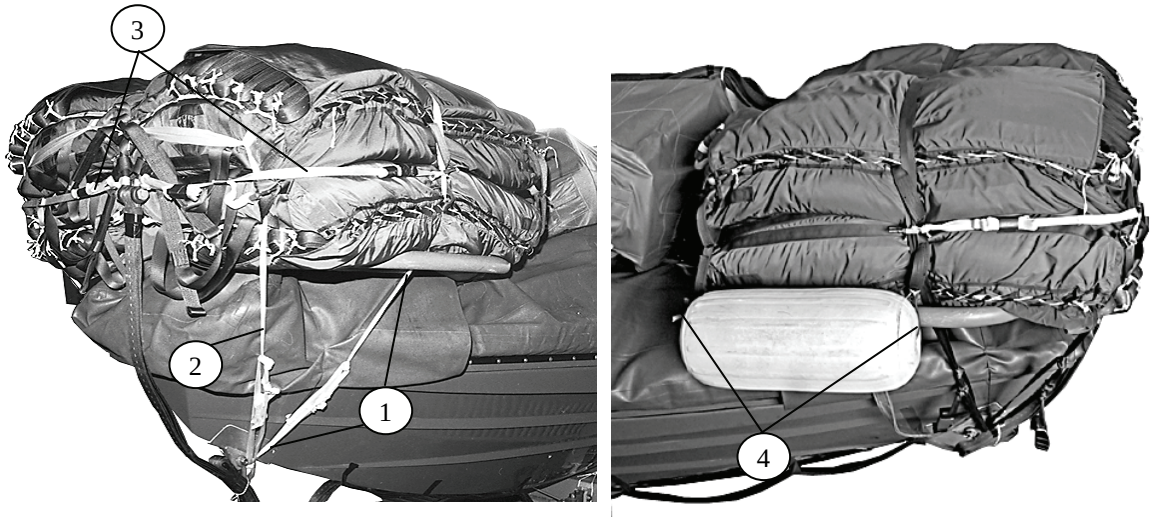


1. Center an M-2 cargo parachute release on the felt as shown. Attach the riser extensions and suspension slings according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.
2. Safety tie the release at the top and bottom with type III nylon cord through the grommets provided in the cover. Tie the type III nylon cord to the radar arch or other convenient points on the boat.
3. Safety the riser extensions in four places with type I, ¼-inch cotton webbing tied one turn single through the grommets in the cover.
4. Make a 20-foot arming wire lanyard for this load. Prepare the lanyard according to TM 1670-296-20&P.

Figure 4-25. M-2 Cargo Parachute Release Installed

INSTALLING PARACHUTE RESTRAINTS

4-14. Restrain the cargo parachute according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-26.

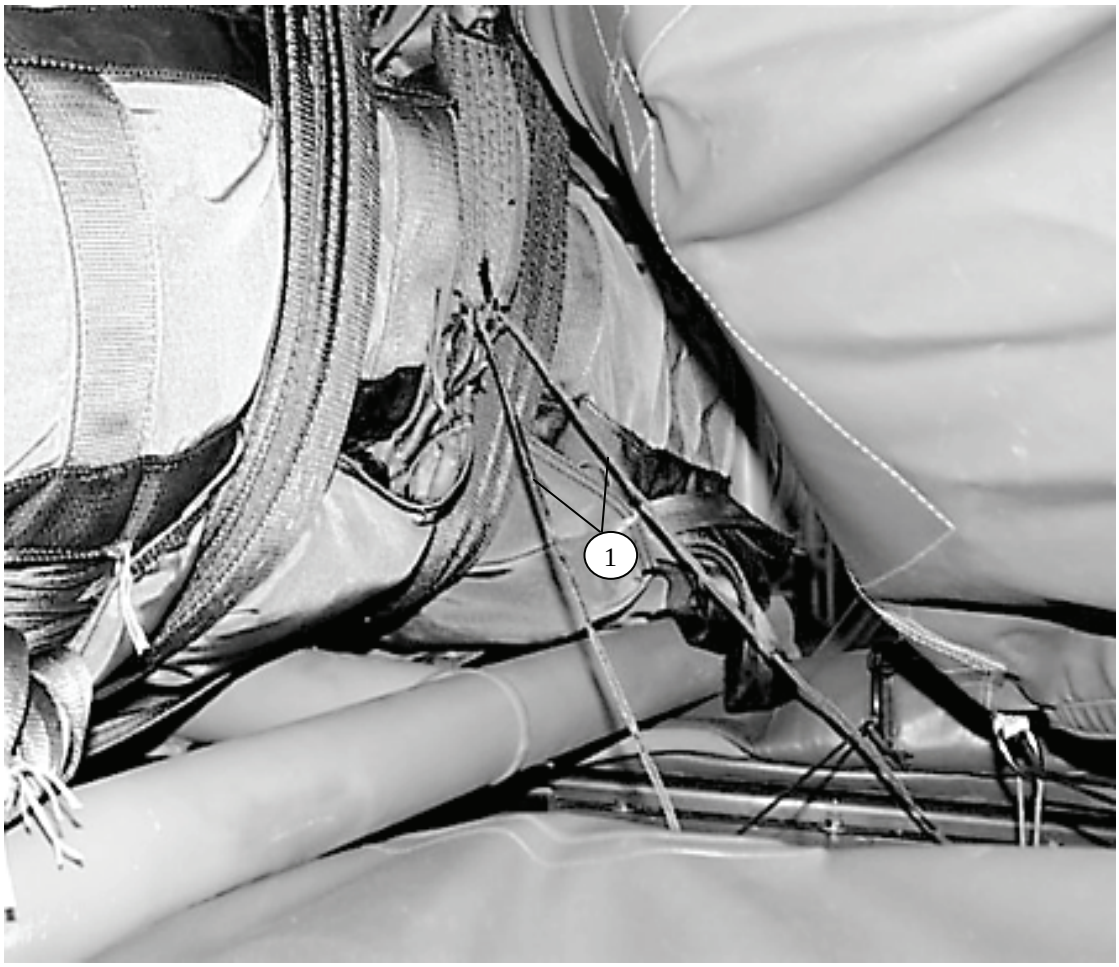


1. Route the center parachute restraint strap down inside the outer bars and behind (aft) the horizontal bars of the parachute stowage platform. Route both sides through the towing shackle. Tightening both sides simultaneously, tie with a trucker's hitch, secured with three alternating half hitches and an overhand knot in the running end. S-fold any excess and secure with tape.
2. Route the rear parachute restraint strap down the outside of the outer bars of the parachute stowage platform. Route both sides through the towing shackle. Tightening both sides simultaneously, tie with a trucker's hitch, secured with three alternating half hitches and an overhand knot in the running end. S-fold any excess and secure with tape.
3. Install two multi-cut release straps according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.
4. Tie a flotation device to the carrying handles of the lower deployment bag on each side with 1/2-inch tubular nylon webbing.

Figure 4-26. Cargo Parachutes Restrained

INSTALLING SPONSON ACTIVATION LANYARD

4-15. Install the sponson activation lanyard as shown in Figure 4-27.

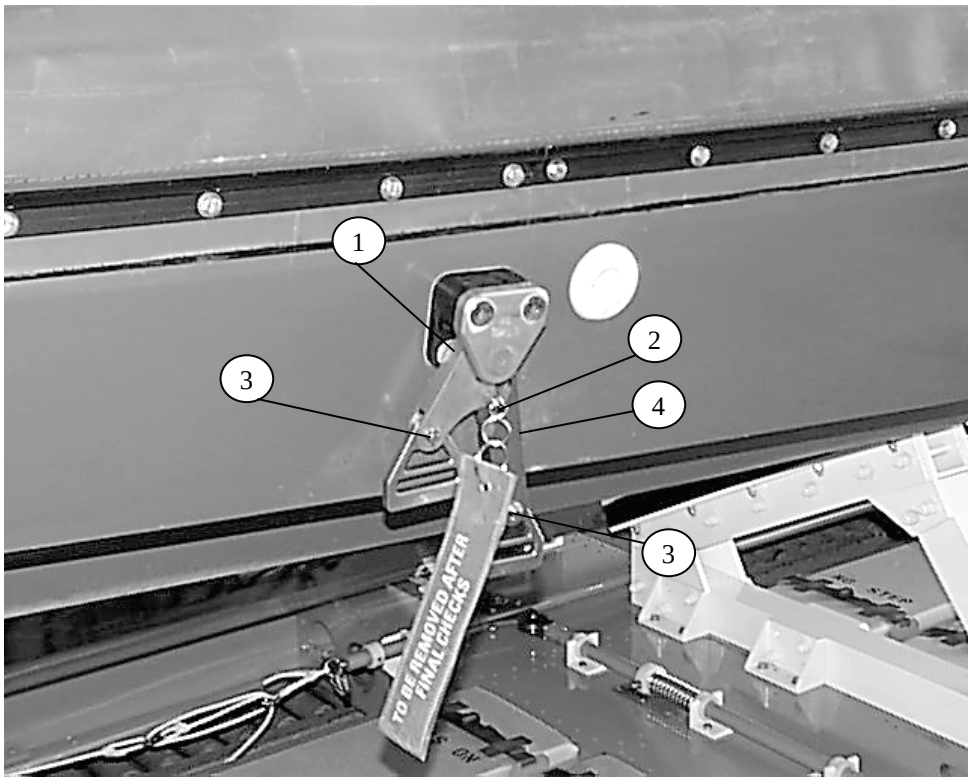


1 Pass the sponson inflation lanyards installed in Figure 4-17 over all items and route through the bottom center carrying handle of the G-11 parachute. Remove the slack between the sponson activation cable ring and the G-11 carrying handles, but do not pull taut. Tie each lanyard to the bottom carrying handle of the G-11 cargo parachute with three alternating half hitches and an overhand knot in the running end. Cut off any excess.

Figure 4-27. Sponson Activation Lanyard Installed

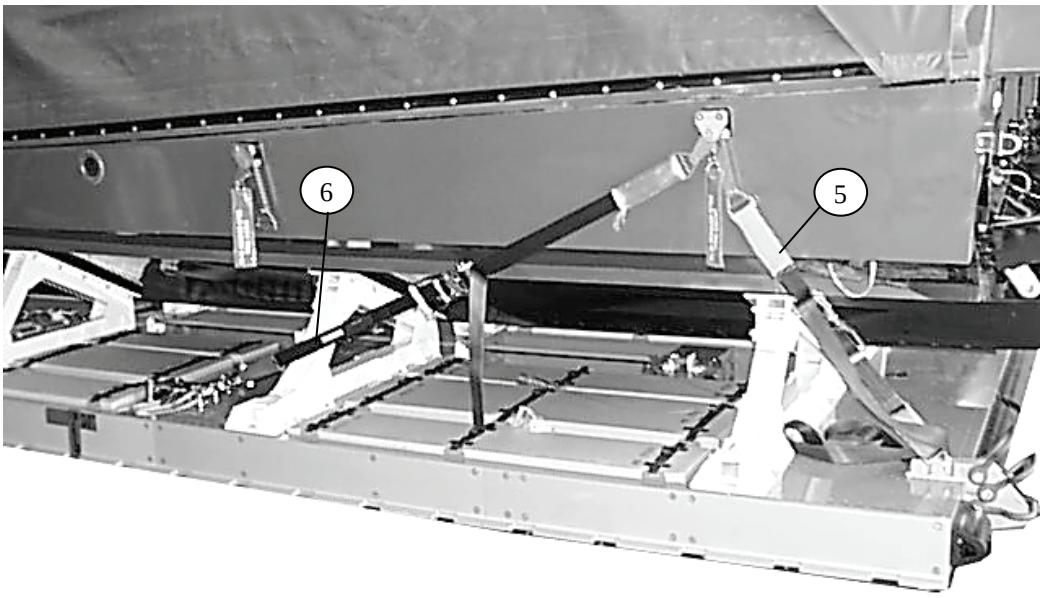
PREPARING AND TESTING THE NSW RIB RESTRAINT SYSTEM

4-16. Prepare the restraint system as shown in Figure 4-28. Prepare the restraint system for test fire as shown in Figure 4-29. Test fire the system as shown in Figure 4-30.



1. Install a release caliper assembly on each of the boat restraint provisions (four on each side).
2. Make sure the long arm faces the stem of the boat.
3. Make sure the cotter pin on each arm faces outward.
4. Secure each caliper assembly in place with the pin provided.

Figure 4-28. Restraint System Prepared

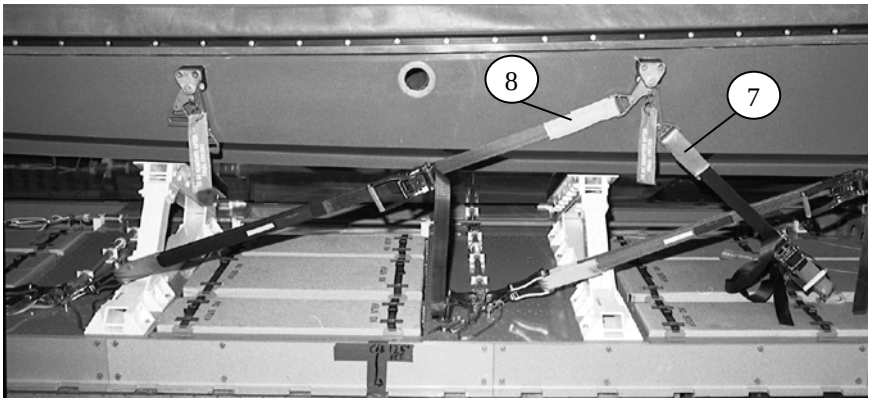


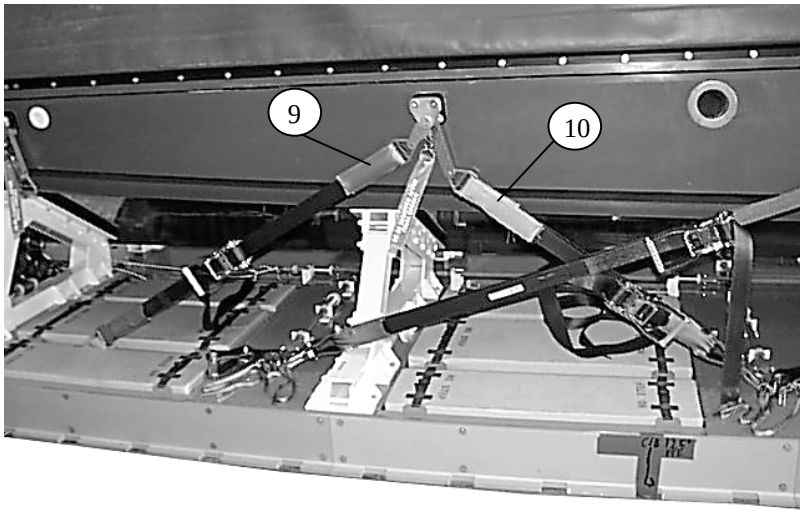
(5) With the ratchet handle facing outboard, pass a lashing through the link on the emergency aft restraint bracket, and up through the long arm of the caliper release unit. Connect the lashing at the ratchet.

(6) From outboard, pass the free end of the second lashing through the large diameter pin of the 1/2-inch shackle fitted to the scissor release unit. Pass the free end upward and inboard through the short arm of the caliper release unit. Connect the lashing at the ratchet.

Note. Allow no twists in these lashings. Be sure that the protective sleeves on the lashings are positioned to protect them from metal contact. Do not tighten the lashings until all are installed.

Figure 4-28. Restraint System Prepared (continued)





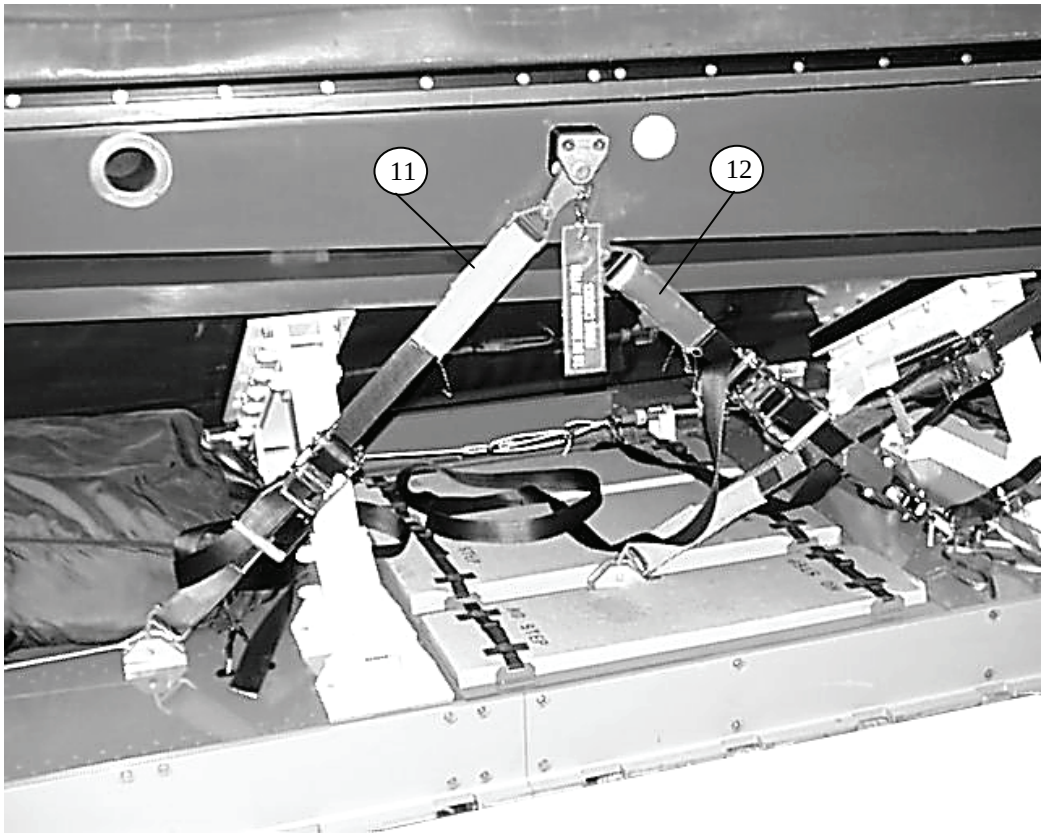
(7) With the ratchet handle facing outward, pass a lashing through the link between the first and second row of flotation devices, and up through the long arm of the caliper release unit. Connect the lashing at the ratchet.

(8) From outboard, pass the free end of another lashing through the large diameter pin of the 1/2-inch shackle fitted to the second scissor release unit. Pass the free end upward and inboard through the short arm of the caliper release unit. Connect the lashing at the ratchet.

(9) With the ratchet handle facing outward, pass a lashing through the link between the first and second row of flotation devices, and up through the short arm of the caliper release units. Connect the lashing at the ratchet.

(10) From outboard, pass the free end of another lashing through the large-diameter pin of the 1/2-inch shackle fitted to the first scissor release unit. Pass the free end upward and inboard through the long arm of the caliper release unit. Connect the lashing at the ratchet.

Figure 4-28. Restraint System Prepared (continued)



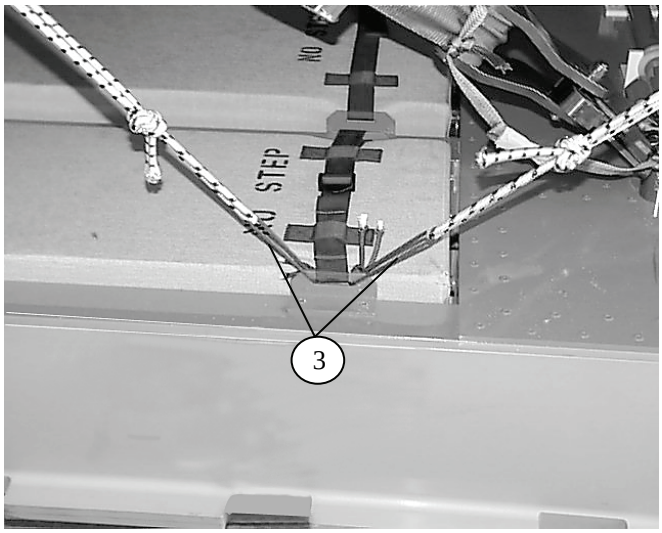
(11) With the ratchet handle facing outward, pass a lashing through the rearmost link, and up through the short arm of the caliper release unit. Connect the lashing at the ratchet.

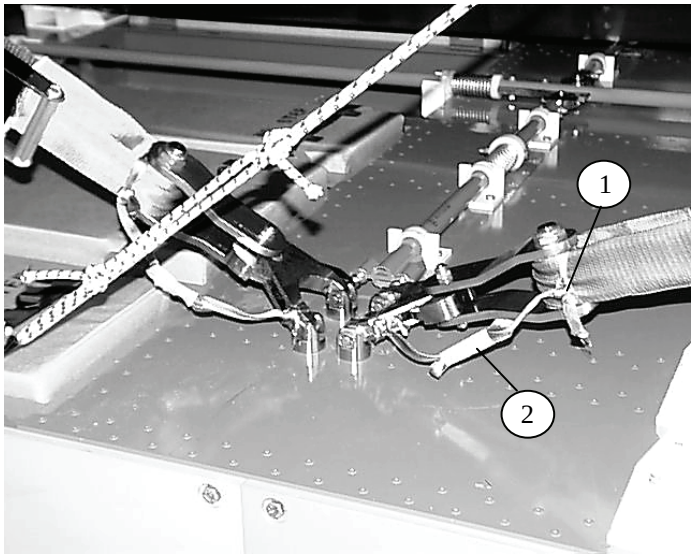
(12) From outboard, pass the free end of another lashing through the large-diameter pin of the 1/2-inch shackle fitted to the second scissor release unit. Pass the free end upward and inboard through the long arm of the caliper release unit. Connect the lashing at the ratchet.

(13) Repeat steps 1 through 12 for the other side of the boat.

Note. Starting at the stern, tighten the lashings simultaneously on the port and starboard sides. Tighten no more than hand tight. Proper tension is applied to a pair of lashings attached to each caliper release assembly when the pin can be withdrawn and re-inserted easily. Do not secure excess lashing until test-firing is completed.

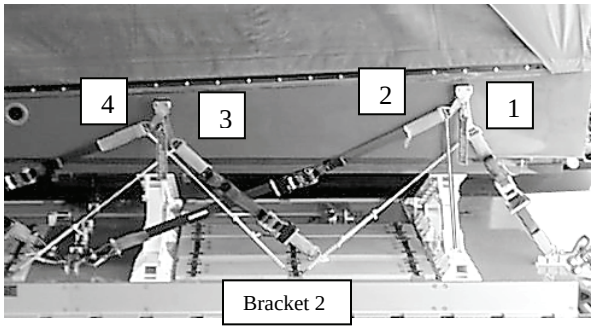
Figure 4-28. Restraint System Prepared (continued)

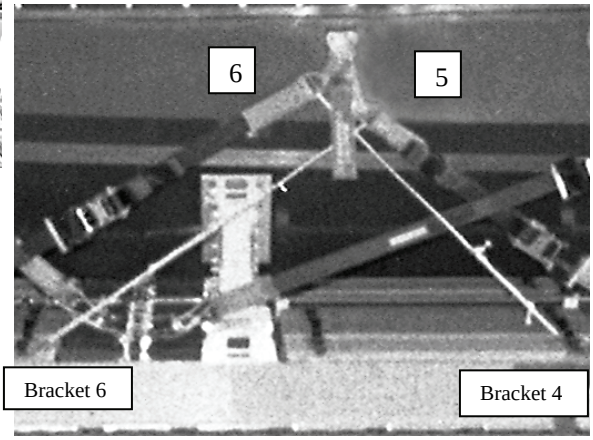


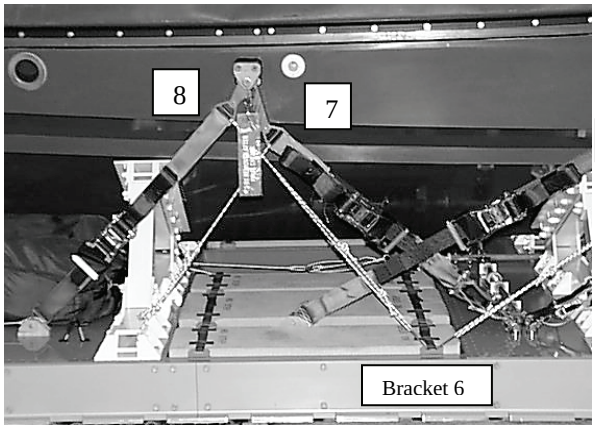


1. Tie the running ends of the 1/2-inch tubular nylon webbing placed in Figure 4-7, step 4 to each lashing, just above the shackle, making sure that 17 inches of nylon remains from knot to knot.
2. S-fold and tape the excess.
3. Cut twelve 24-inch lengths of type III nylon cord. Locate flotation device securing brackets 2, 4, and 6 (counting from the front of the platform). Tie two 2-inch loops of cord in each bracket, on either side of the flotation device retaining strap. Be sure the knots are on the inboard side of the brackets. Tie overhand knots in each running end, and trim the excess.

Figure 4-29. Restraint System Prepared for Test-Fire



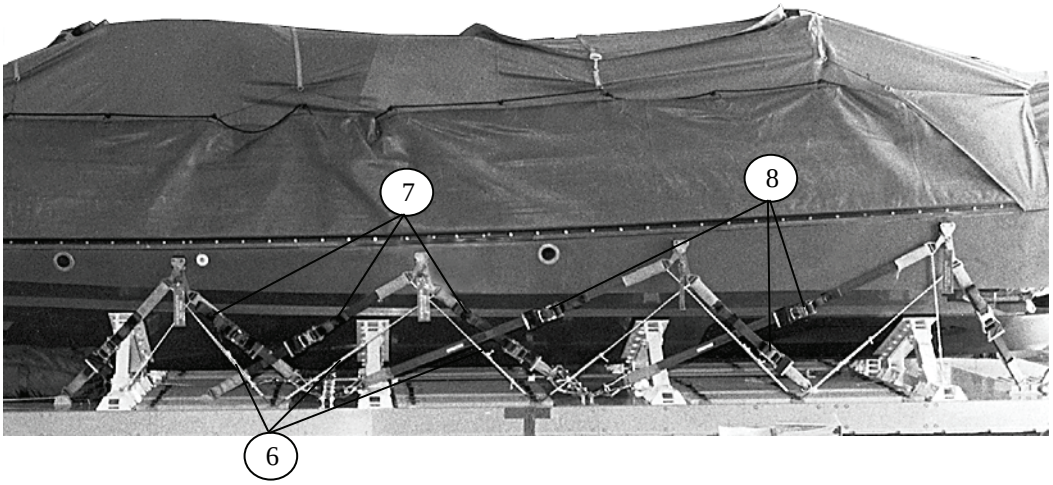




(4) The lashing provision at the end of each of the 16 caliper release legs will have a length of shock cord tied to a specific point on the platform with a trucker's hitch. Tie the knot so that it can easily be retied between tests. Number the lashing points on each side from 1 through 8, beginning at the front of the platform. See the chart below for the specific points on the platform to which each cord is tied.

Lashing Provision Number	Tie-down Point on Platform
1	First loop on bracket 2
2	Bolt at base of first stanchion
3	First loop on bracket 4
4	Second loop on bracket 2
5	First loop on bracket 6
6	Second loop on bracket 4
7	Bolt at base of fourth stanchion
8	Second loop on bracket 6

Figure 4-29. Restraint System Prepared for Test-Fire (continued)

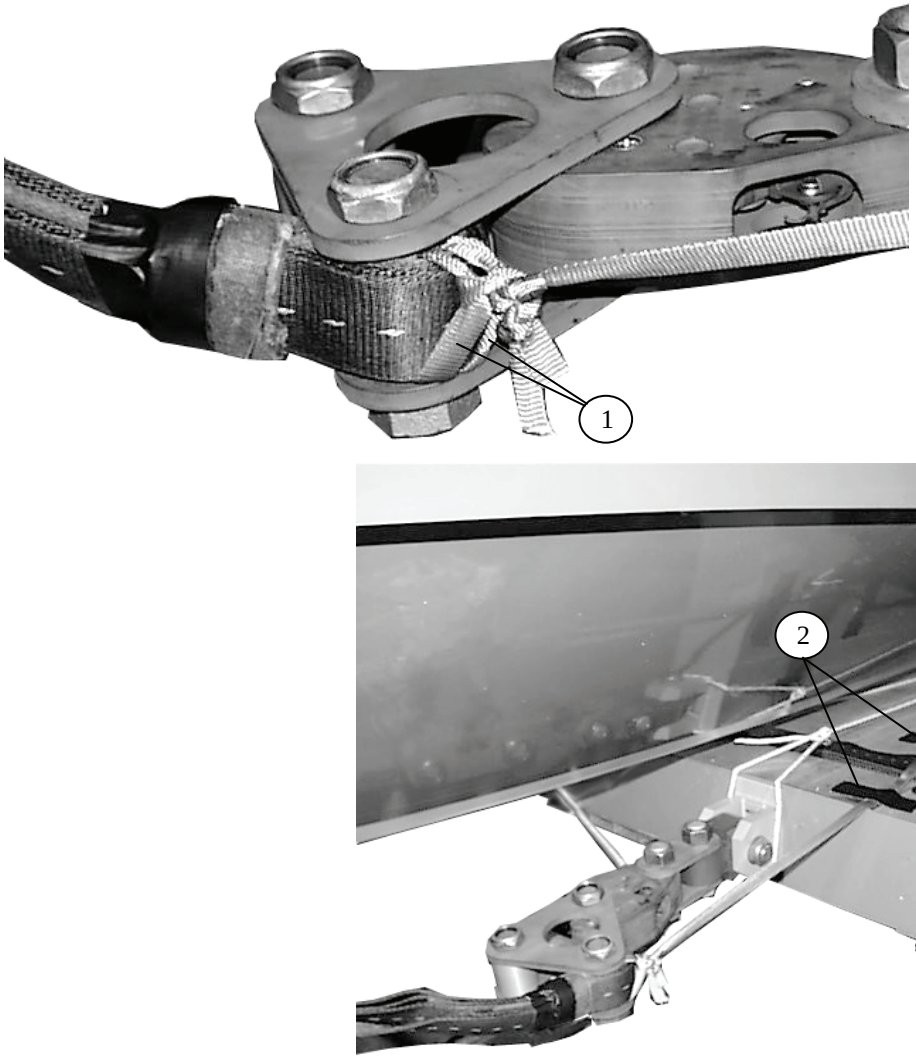


5. Place honeycomb under each set of caliper releases to protect the platform components from damage. Be sure that the honeycomb does not interfere with the scissor release units (not shown).
6. Be sure that the push rod cable is disconnected from the halyard shackle before testing the system (See Figure 4-6) (not shown).
7. Remove all eight safety pins from the caliper releases. Exert enough force on the pulley rope to allow the push rod T-pin to be removed. Releasing the rope test fires the caliper releases. All caliper releases should release the lashings simultaneously (not shown).
8. Repeat the steps in Figures 4-28 and 4-29 to reset the system for the next test fire. Test fire as explained in steps 1 through 3 above.
9. Repeat step 4 for the third test fire.
10. Reset the restraint system for airdrop as in the previous steps. Secure the shock cord with three alternating half-hitches and overhand knots in the running ends. Trim and tape the ends.
11. Roll under excess lashing and tape it to the outboard ply (not to both plies).
12. Ensure all ratchet handles are locked in the closed position. Tape around the handle to the outboard play of the lashing (not to both plies).
13. Attach the wire cable connected to the drawbar to the locking halyard shackle, and be sure the shackle is in the locked position (not shown).
14. Remove the pulley assembly.

Figure 4-30. Caliper Releases Test-Fired and Reset

CONNECTING M-21 CUTTER ARMING WIRE LANYARDS

4-17. Connect the M-21 cutter arming wire lanyards to the deployment line as shown in Figure 4-31.



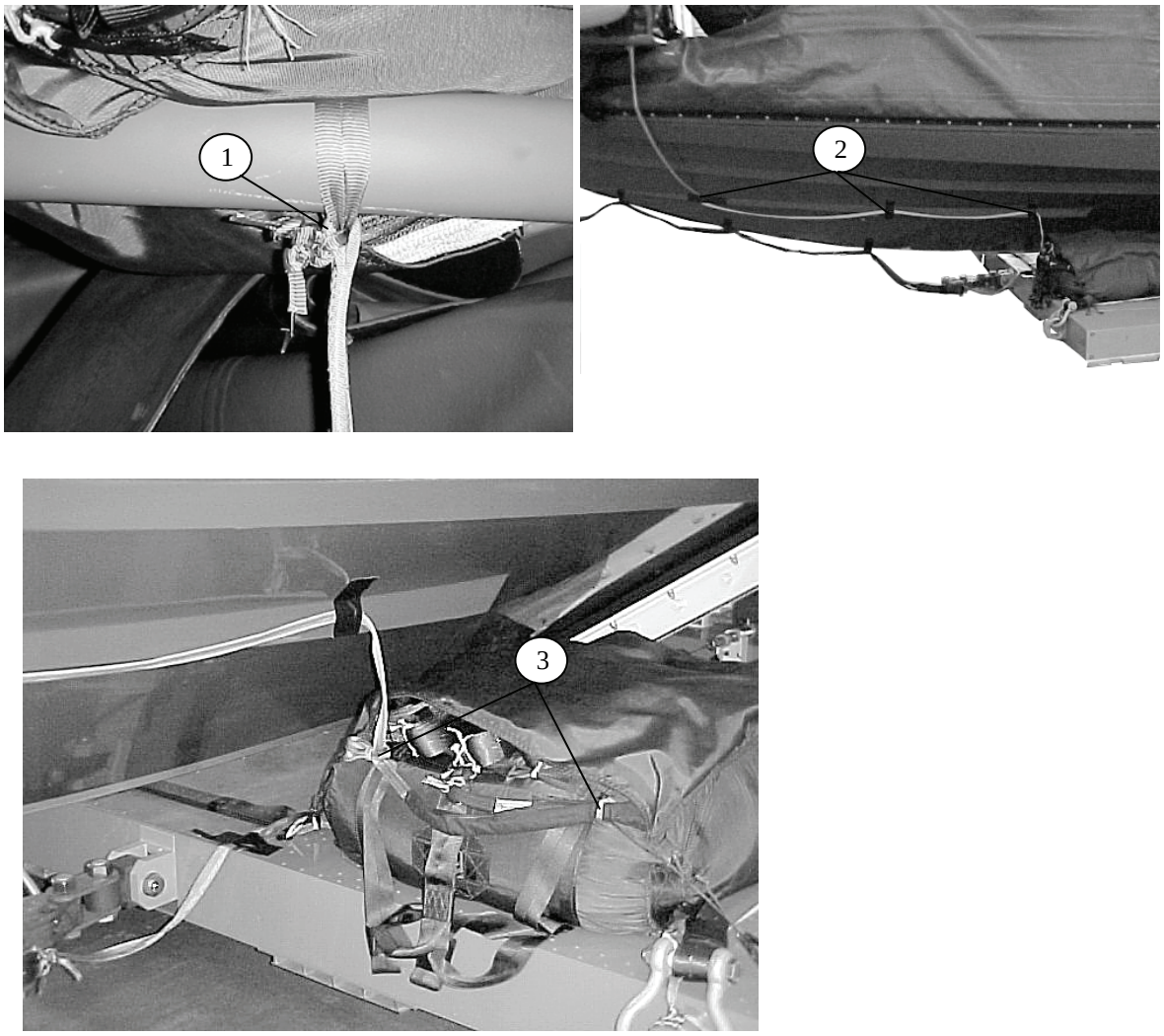
(1) Tie the running end of both cutter arming wire lanyards installed in Figure 4-6 to all plies (including the cotton buffer) of the 16-foot deployment line. Make these ties 60 inches from the top of the cutter cable tie.

(2) S-fold the excess 1/2-inch tubular nylon and tape it to the platform deck in two places.

Figure 4-31. Cutter Arming Wire Lanyards Tied to Deployment Line

SECURING G-12E PARACHUTE STATIC LINE

4-18. Tie and tape the G-12E parachute static line as shown in Figure 4-32.



1. Tie the G-12E parachute static line to the outer bar of the parachute stowage platform with two turns single of 1/2-inch tubular nylon, tied in a surgeon's knot, locking knot, and overhand knots in the running ends. Tie the knot over the static line.
2. Run the static line down to the bottom of the boat hull and horizontally along the rib, taping it in several places with cloth-backed adhesive tape.
3. Secure any excess static line to the G-12E deployment bag with retainer bands.

Figure 4-32. G-12E Parachute Static Line Secured

PLACING EXTRACTION PARACHUTES

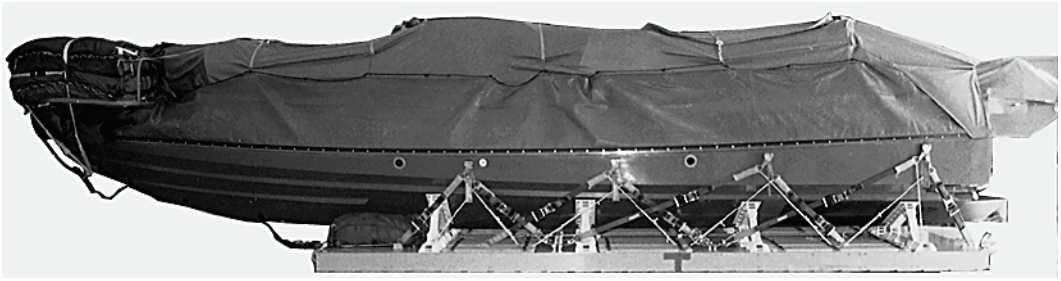
4-19. Select the extraction line and the extraction parachute needed using the extraction line requirements table in FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Place the extraction parachute and the extraction line on the load for installation in the aircraft.

MARKING THE RIGGED LOAD

4-20. Mark the rigged load according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Complete the Shipper's Declaration for Dangerous Goods.

CAUTION

Make the final rigger inspection and all other inspections specified in this manual before the load leaves the rigging site.



Rigged Load Data

Weight:	Load shown	18,500 pounds
	Maximum	20,640 pounds
Height:		100 inches
Width:		108 inches
Length:		432 inches
Overhang:	Front	42 inches
	Rear	138 inches
CB (maximum distance allowable from the front edge of the platform)		149.5 inches
Extraction System		EFTC

Figure 4-33. NSW RIB Rigged for Low-Velocity Airdrop

EQUIPMENT REQUIRED

4-21. Use the equipment listed in Table 4-1 to rig this load.

Table 4-1. Equipment Required for Rigging NSW Rib for Low-Velocity Airdrop

National Stock Number	*Item*	*Quantity*
8040-00-273-8713	Adhesive paste, 1-gal	As required
1670-00-568-0323	Band, rubber, parachute	As required
	Clevis, suspension,	
4030-00-090-5354	1-in, large	5
4030-00-678-8562	3/4-in, medium	2
8305-00-926-1559	Cloth, muslin, type II, 36-in	As required
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
8305-00-267-3114	Cord, elastic, .375, nat, type I	As required
1670-01-423-4103	Coupling, airdrop, extraction force transfer with cable, 24 ft	1
	Cover:	
1670-00-360-0328	Clevis, large	1
1377-00-060-0885	Cutter, cartridge actuated, M-21	2
8305-00-958-3685	Felt, sheet, 1/2-in	As required
5340-00-040-8219	Knife, multi para release, strap webbing	2
1670-01-183-2678	Leaf, extraction line (line bag)	2
	Line, drogue (for C-17)	
1670-01-064-4452	60-ft (1-loop), type XXVI	1
	Line extraction:	
1670-01-062-6313	For, C-130: 60-ft (3-loop), type XXVI	1
1670-01-107-7651	For, C-141: 140-ft (3-loop), type XXVI	1
1670-01-107-7651	140-ft (3-loop), type XXVI	1
1670-01-107-7651	For, C-17: 140-ft (3-loop), type XXVI	1
	Link assembly:	
	Two-point, 3 ¾-in	1
5306-00-435-8994	Bolt, 1-in diam, 4-in long	(2)
5310-00-232-5165	Nut, 1-in, hexagonal	(2)
1670-00-003-1953	Plate, side, 3 3/4	(2)
5365-00-007-3414	Spacer, large	(2)
	Two-point 5 1/2-in	1
5306-00-435-8994	Bolt, 1-in diam, 4-in long	(2)
5310-00-232-5165	Nut, 1-in, hexagonal	(2)
1670-00-003-1954	Plate, side, 51/2½	(2)
5965-00-007-3414	Spacer, large	(2)
1670-00-753-3928	Pad, energy-dissipating, honeycomb, 3- by 36- by 96-in	4 sheets
8135-00-160-7759	Paper, kraft, untreated	As required
	Parachute:	
1670-01-016-7841	Cargo G-11B	4
1670-01-065-3755	Cargo G-12E	1
1670-00-040-8135	Cargo extraction, 28-ft	1
1670-01-063-3715	Drogue, 15-ft (for C-17)	1
No NSN	Platform, 21-ft, Maritime Aerial Delivery System	1
5530-00-128-4981	Plywood, 3/4- by 48- by 96-in	1 sheet

Table 4-1. Equipment Required for Rigging NSW Rib for Low-Velocity Airdrop (continued)

National Stock Number	*Item*	*Quantity*
1670-01-097-8817	Release, cargo parachute, M-2	1
No NSN	Release, cargo, parachute, Conax, water activated	5
	Sling, cargo airdrop	
	For suspension:	
1670-01-064-4453	20-ft (4-loop), type XXVI nylon webbing	4
	For deployment:	
1670-01-063-7761	16-ft (2-loop), type XXVI nylon webbing	1
	For riser extension:	
1670-01-062-6313	60-ft (3-loop), type XXVI nylon webbing	4
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6712	Tape, adhesive, masking	As required
	Thread:	
8310-01-279-6073	Cotton, ticket# 8/4, orange	As required
8310-00-917-3945	Cotton, ticket# 8/7, natural	As required
1670-00-725-1437	Tie-down, cargo, aircraft, CGU-1/B	4
5310-00-057-3463	Washer, flat, 3/4-in	50
	Webbing:	
8305-00-268-2411	Cotton, ¼-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-268-2455	Nylon, tubular, 1-in	As required
8305-00-261-8585	Type VIII	As required

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Chapter 5

Rigging the Advanced Rescue Craft (ARC) on a Combat Expendable Platform (CEP)

SECTION I-RIGGING THE GP 800 ARC

DESCRIPTION OF LOAD

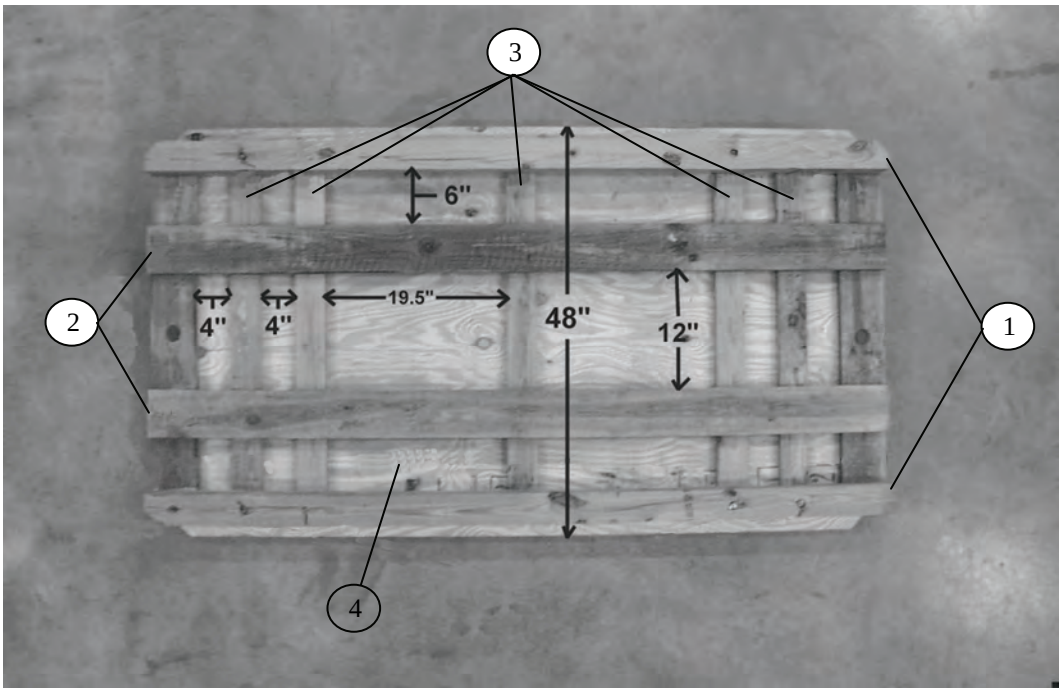
5-1. The GP 800 ARC shown in Figure 5-1 is rigged on a 48- by 87-inch combat expendable platform for low-velocity airdrop. This load can be rigged with or without a 20-man life raft and a rescue board, a rucksack, and an aid bag. The load requires one G-12E cargo parachute, a 15-foot cargo extraction parachute packed in a T-10 bag, and is only rigged with a hydraulic release.



Figure 5-1. GP 800 ARC

BUILDING THE COMBAT EXPENDABLE PLATFORM

5-2. Build the 48- by 87-inch combat expendable platform as shown in Figure 5-2.



1. Lay out two 4- by 4- by 87-inch and two 2- by 6- by 87-inch longitudinal stringers.
2. Secure the lateral stringers to the longitudinal stringers with 8d nails. Do not nail within 2 inches of the ends of the 4- by 4- by 87-inch longitudinal stringers.
3. Lay two 2- by 6- by 44-inch and four 2- by 4- by 44-inch lateral stringers on top and across the longitudinal stringers matching the measurements above.
4. Position the 3/4- by 48- by 87-inch plywood on top of the lateral stringers leaving a 2-inch overhang on each side of the 4- by 4- by 87-inch longitudinal stringers.

Figure 5-2. Combat Expendable Platform Built

5. Cut the corners of the platform at a 45-degree angle to include the corners of the 4- by 4- by 87-inch longitudinal stringers (not shown).
6. Turn the platform over and drill eight 3/4-inch holes for the carriage bolts. Ensure to drill again with a large enough drill bit in order to counter sink the bolt heads, washers, and nuts (not shown).
7. Install the carriage bolts from bottom to top and trim the threaded ends at the nuts. File sharp edges (not shown).
8. Drill a 2-inch hole centered on each end of the platform (not shown).

Figure 5-2. Combat Expendable Platform Built (continued)

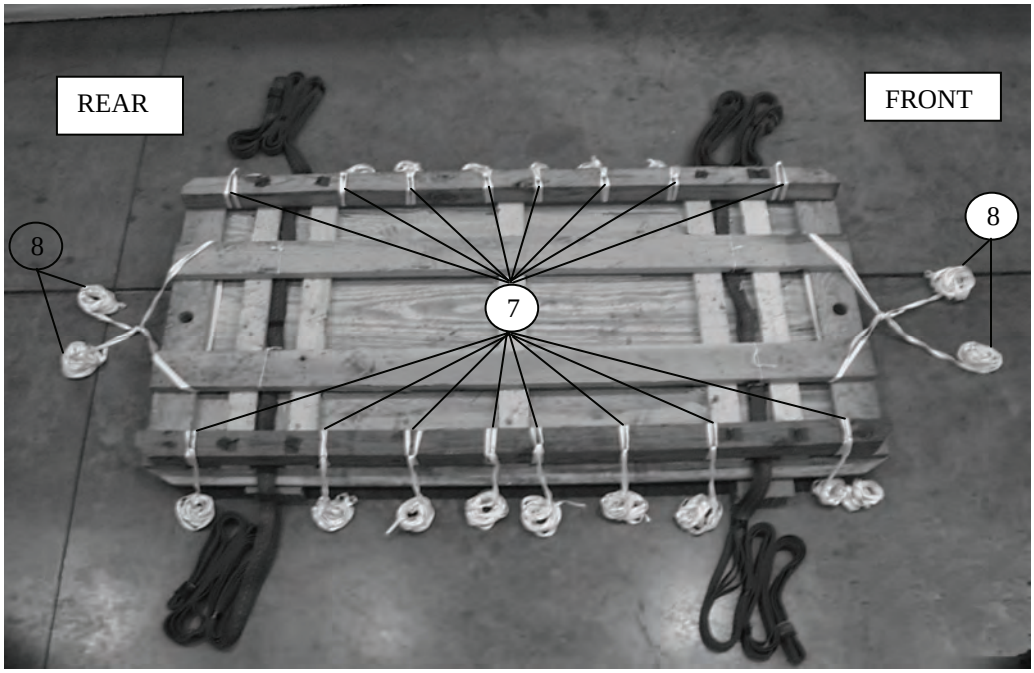
PREPARING THE PLATFORM

5-3. Prepare the 48- by 87-inch Combat Expendable Platform as shown in Figure 5-3.



1. Lay a 20-foot, 2-loop Type XXVI nylon sling centered across the rear suspension point.
2. Tape the suspension sling where it comes in contact with the two 2- by 6- by 87-inch longitudinal stringers with 2-inch cloth-backed adhesive tape.
3. Tie two 24-inch lengths of Type III nylon cord to the suspension sling making two wraps and securing with a surgeon's knot and locking knot, leaving equal amounts of running ends.
4. Route and center the suspension sling through the suspension sling slot in the platform.
5. Secure the suspension sling to the 2- by 6- by 87-inch longitudinal stringer with the lengths of Type III nylon cord with a surgeon's knot and locking knot.
6. Repeat for the front suspension sling.

Figure 5-3. Platform Prepared



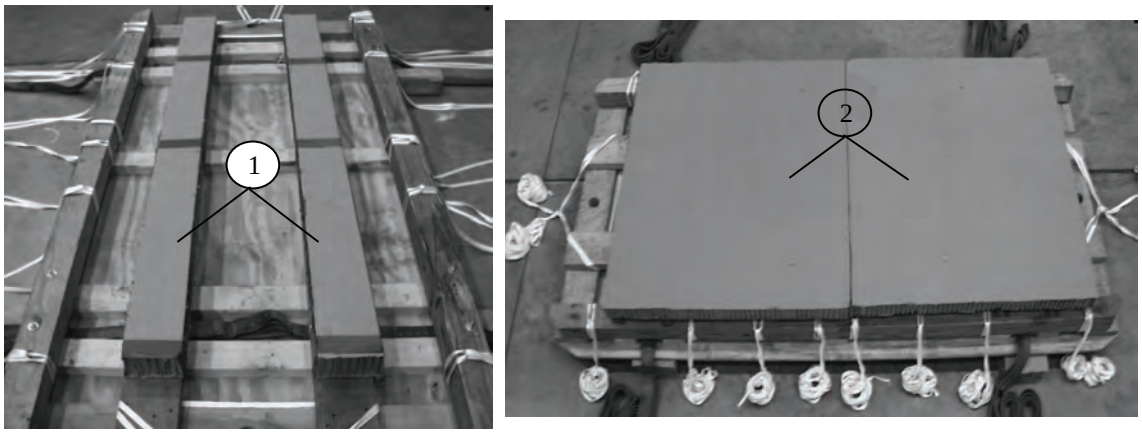
7 Girth hitch sixteen 15-foot lengths of 1/2-inch tubular nylon webbing to each 4- by 4- by 87-inch longitudinal stringers at positions shown above. Label right side positions 1 through 8 and the left side positions 1a through 8a.

8 Route two 20-foot lengths of 1/2-inch tubular nylon webbing around both of the 2- by 6- by 87-inch longitudinal stringers at the front and rear of the platform. Secure with an overhand knot as close to the platform as possible.

Figure 5-3. Platform Prepared (continued)

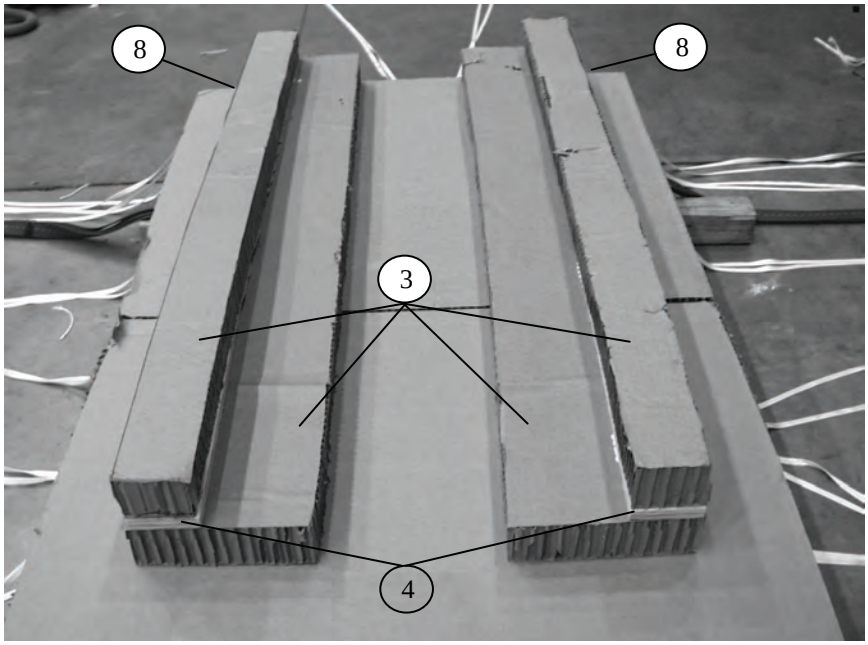
PREPARING AND POSITIONING HONEYCOMB

5-4. Prepare and position the honeycomb as shown in Figure 5-4.



1. Position one 6- by 72-inch piece of honeycomb on each 2- by 6- by 87-inch longitudinal stringer (centered) and secure in place with lengths of 2-inch cloth-backed adhesive tape.
2. Position **(do not glue)** two 36- by 42-inch pieces of honeycomb side by side on top of and flush with the honeycomb in step 1.

Figure 5-4. Honeycomb Positioned



(3) Cut one piece of honeycomb 10- by 58-inches and one 4- by 58 inches.

(4) Cut a piece of 3/4-inch plywood 4- by 24-inches.

(5) Glue the 4- by 24-inch piece of plywood flush to one corner of the 10- by 58-inch piece of honeycomb (not shown).

(6) Glue the 4- by 58-inch piece of honeycomb on top of the plywood and the 10- by 58-inch piece of honeycomb (not shown).

(7) Stack 2 is cut the same as stack 1.

(8) Position **(do not glue)** stacks 1 and 2 flush with the front of the honeycomb in Figure 5-4 and 7 inches in from the sides. Ensure the end with the plywood piece is to the rear of the platform.

***Note*.** Stacks 1 and 2 will have to be adjusted to the hull of the ARC.

Figure 5-4. Honeycomb Positioned (continued)

POSITIONING THE ARC

5-5. Position the ARC as shown in Figure 5-5.

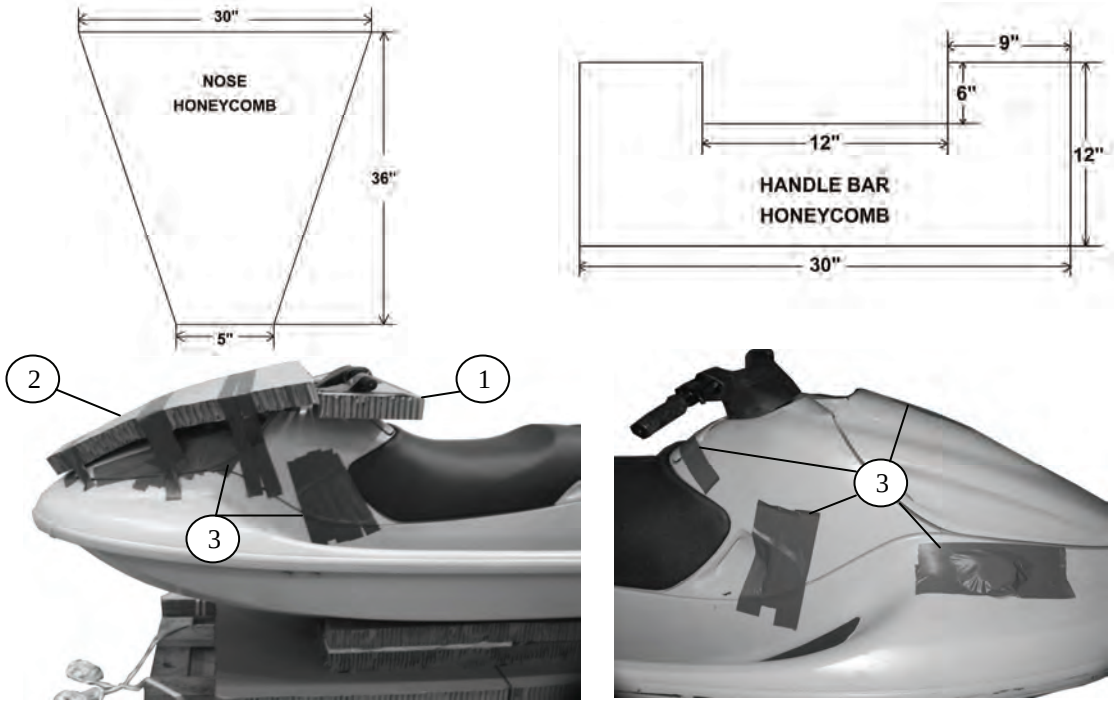


1. Position the ARC on honeycomb stacks 1 and 2 with the nose towards the rear of the platform.
2. Center it left and right (not shown).
3. Make sure there is a 14-inch overhang to the rear of the platform.

Figure 5-5. ARC Positioned

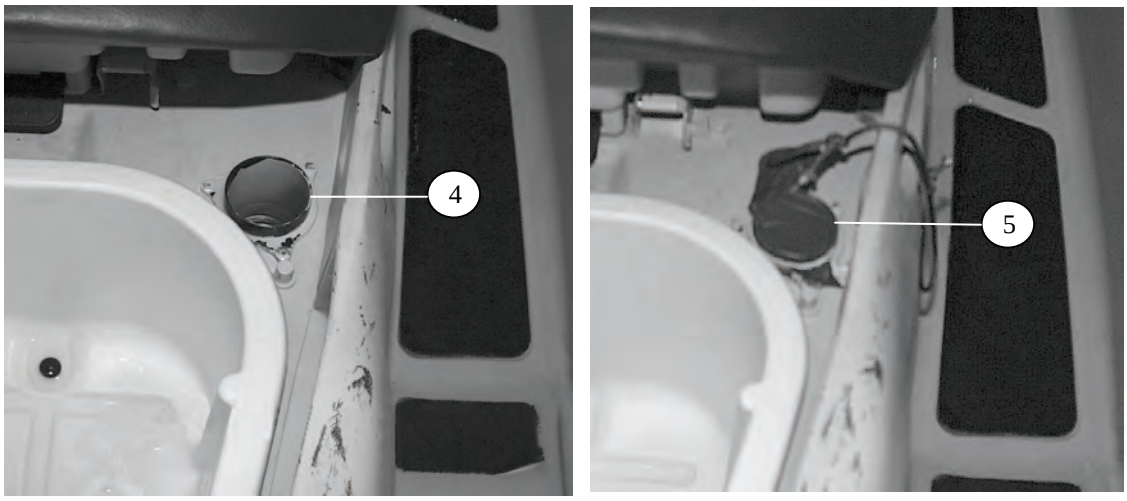
PREPARING THE ARC

5-6. Ensure the fuel tank is no more than ¾ full. Prepare as shown in Figure 5-6.



1. Cut handle bar honeycomb to prescribed measurements and install under the handle bars. Secure to the handlebars with 2-inch cloth-backed adhesive tape or lengths of Type III nylon cord.
2. Cut nose honeycomb to prescribed measurements and position over the nose. Secure to the nose with 2-inch cloth-backed adhesive tape or lengths of Type III nylon cord.
3. Tape over fuel cap, on/off switch, and compartments with 2-inch cloth-backed adhesive tape.

Figure 5-6. ARC Prepared

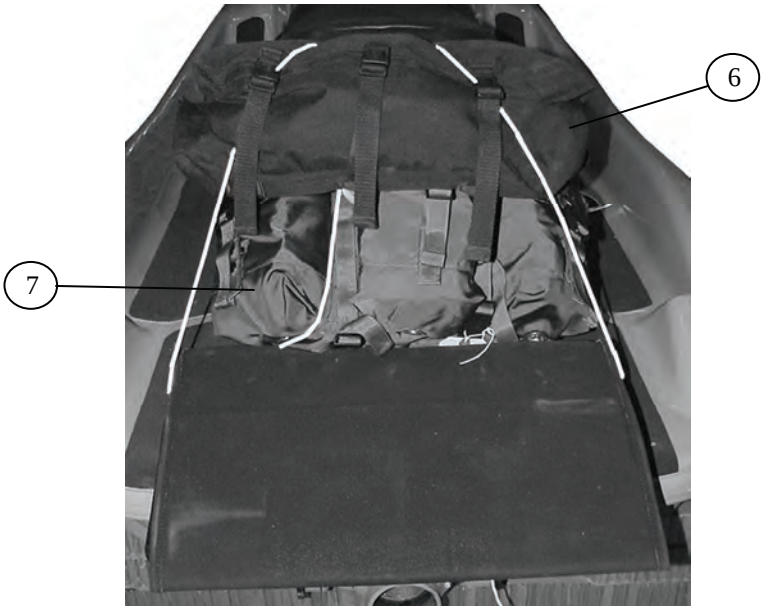


4 Remove the rear section of the ARC seat to expose the intake port.

5 Plug the intake port by taping over the opening with lengths of 2-inch cloth-backed tape. Secure the tape in place with a retainer band. Attach a 12-inch Type III nylon cord lanyard to the tape. Route the lanyard to the outside of the ARC and tape in place with 2-inch cloth-backed adhesive tape.

Figure 5-6. ARC Prepared (continued)

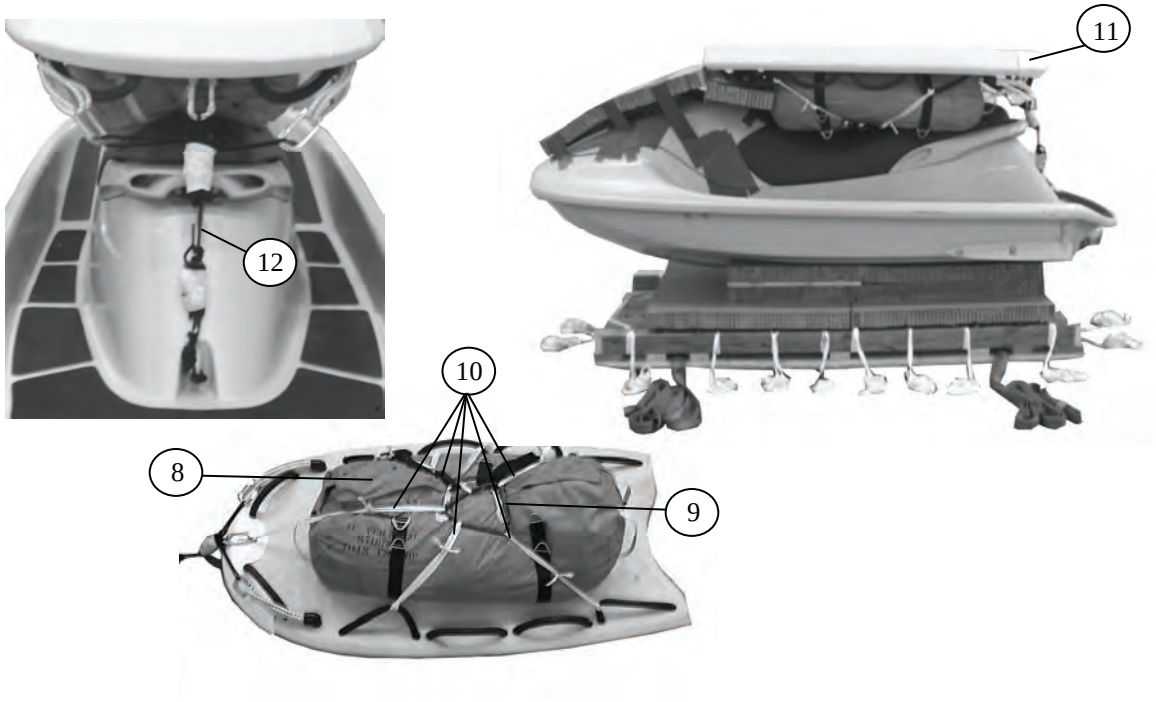
Note. If the rucksack and the first aid pack are to be rigged on the ARC use steps below.



6 Position the rucksack on the ARC behind the seat. Secure the rucksack to the rear handgrip and the tow ring with a length of Type III nylon cord.

7 Position the first aid pack on top of the rucksack and secure to the same locations with a length of Type III nylon cord.

Figure 5-6. ARC Prepared (continued)



8 Center a 20-man life raft on the rescue board with closing flap up.

9 Form an 8-inch tie-down ring, according to Figure 2-16. Center the tie-down ring on the 20-man life raft.

10 Girth hitch five 6-foot 1/2-inch tubular nylon ties to the rescue raft handles and secure to the tie-down ring with trucker's hitches.

11 Position the rescue board upside down on top of the seat and handlebars with the nose towards the rear of the ARC.

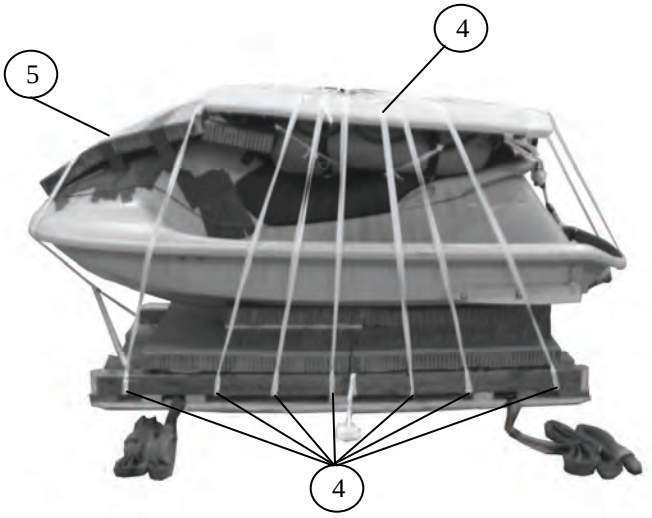
12 Attach the rescue board lanyard, or a 10-foot length of Type III nylon cord, to the tie-down ring on the aft of the ARC. S-fold the excess and tape with 2-inch masking tape.

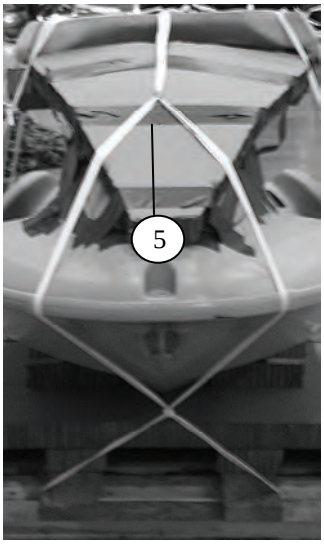
***Note*.** If the ARC is to be rigged without the 20-man life raft, make sure the rescue board is leveled with honeycomb.

Figure 5-6. ARC Prepared (continued)

LASHING THE ARC

5-7. Lash the ARC to the platform with two 6-foot, sixteen 15-foot, and four 20-foot lengths of 1/2-inch tubular nylon webbing as shown in Figure 5-7.





(1) Form a 10-inch tiedown ring, according to Figure 2-16. Center the tiedown ring on top of the load (not shown).

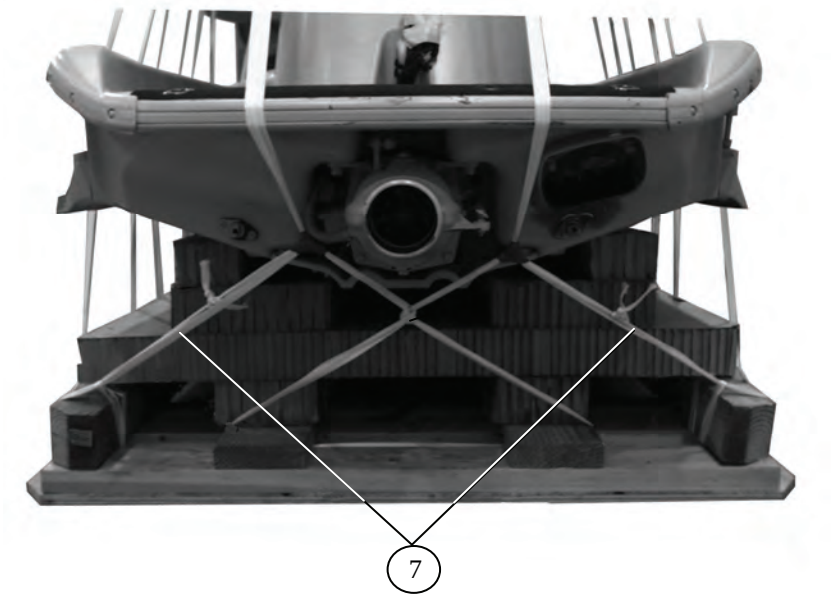
(2) Form a trucker's hitch at one end of the tiedown and pass that end under/over the tiedown ring (not shown).

(3) Route other end of the tiedown through the truckers hitch and tighten. Secure with three alternating half hitches with knot in running end.

(4) Tie all of the 15-foot lashings (except lashings 4 and 4a from the front of the platform), to the tiedown ring as described in Steps 2 and 3.

(5) Pass one end of the rear lashing around each side of the nose of the ARC. Tie the ends together with an overhand knot about 12 inches above the point of the nose. Tie the lashing to the tie-down ring as in Steps 2, 3, and 4.

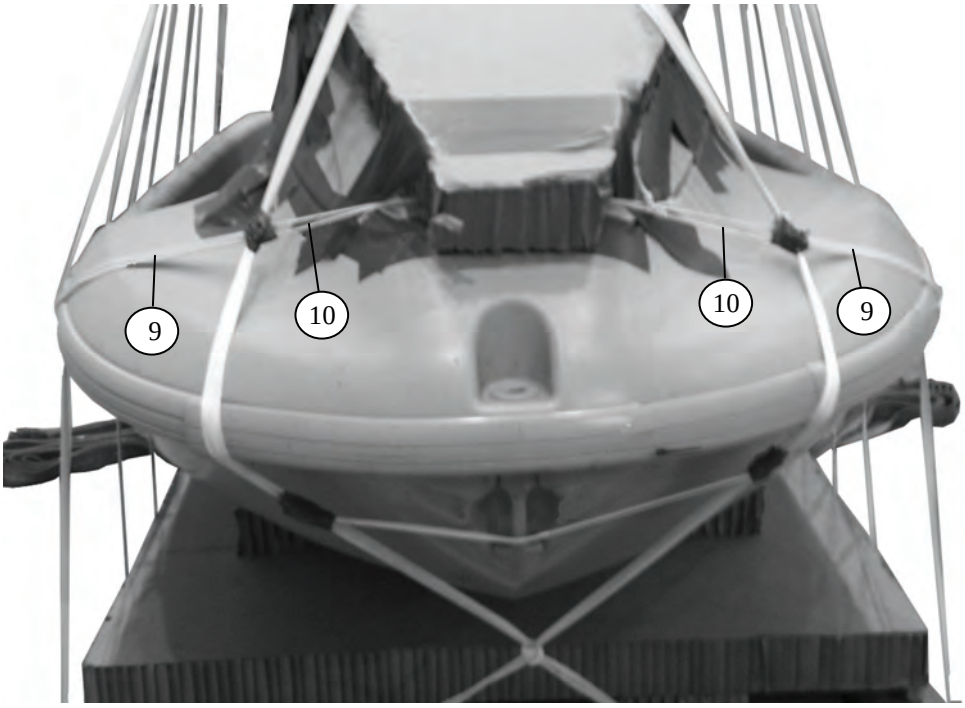
Figure 5-7. ARC Lashed to Platform



6 Tie the front lashing to the tiedown ring as mentioned in Steps 2 and 3.

7 Girth hitch one 6-foot 1/2-inch tubular nylon lashing to the very front of both longitudinal stringers. Tie the lashings to the front lashing, pulling the front lashing away from the jet drive and linkage. Tape around the knot with 2-inch cloth-backed adhesive tape.

Figure 5-7. ARC Lashed to Platform (continued)



(8) Tie lashings 4 and 4a, from the front of the platform, to the rear lashing approximately 6 inches above the point of the nose of the ARC.

(9) Tie a length of Type III nylon cord across the nose of the ARC at the points where the two lashings are secured in step 10. Tape the knots with 2-inch cloth-backed adhesive tape.

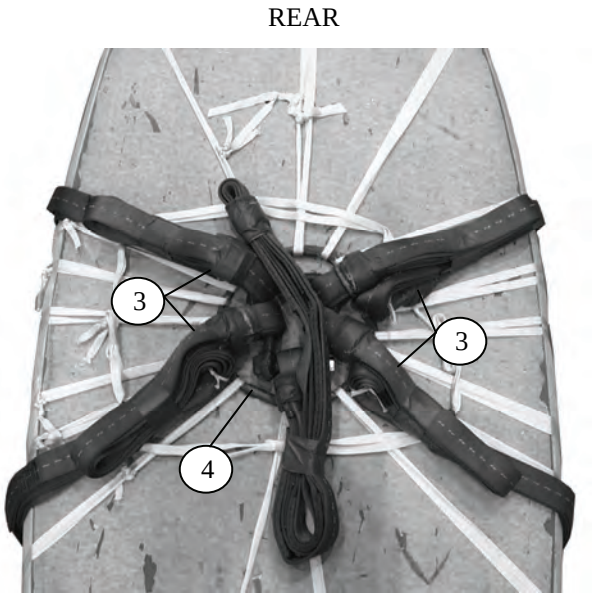
(10) Tie a length of Type III nylon cord to the rear lashing underneath the nose of the ARC. **Do not** route through tiedown ring. Tape the knots with 2-inch cloth-backed adhesive tape.

Figure 5-7. ARC Lashed to Platform (continued)

SAFETY TIEING SUSPENSION SLINGS

5-8. Safety the suspension slings as shown in Figure 5-8.



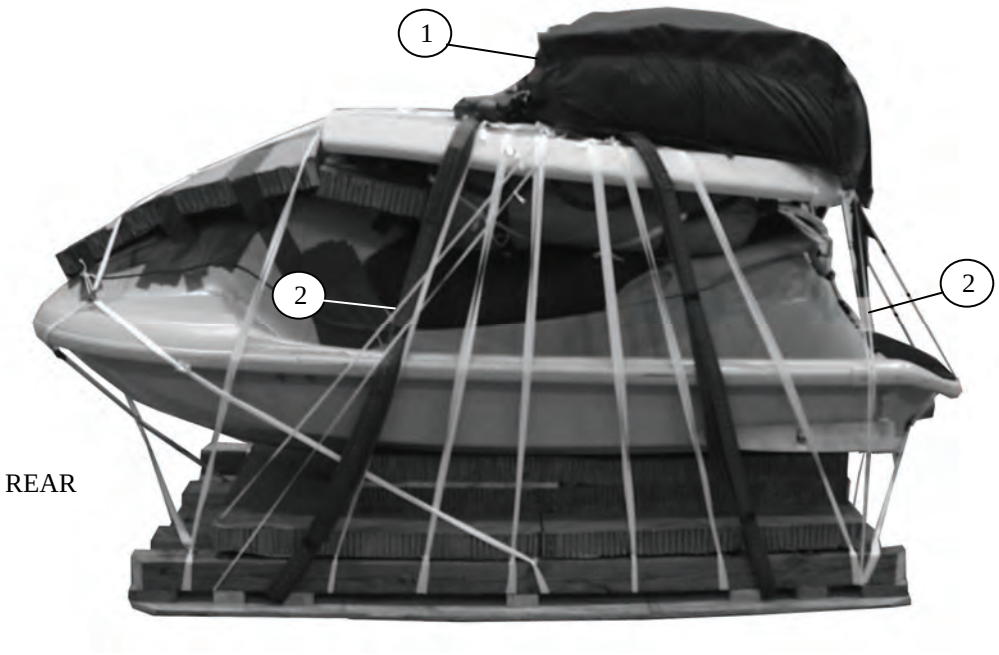


1. Raise the suspension slings.
2. Make the deadman's tie 6 to 8 inches above the load as described in FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Lower the suspension slings until they touch the tie-down ring and secure them to the tie-down ring with lengths of one turn, 1/4-inch cotton webbing.
3. Attach the suspension slings to the arms of a medium suspension clevis. Attach a 3-foot, 2-loop Type XXVI nylon suspension sling to the bolt end of the medium clevis.
4. S-fold the excess suspension sling and tape with one turn 2-inch cloth-backed adhesive tape.

Figure 5-8. Suspension Slings Safetied

STOWING PARACHUTE

5-9. Stow the G-12E cargo parachute as shown in Figure 5-9.



1. Position the G-12E cargo parachute with bridle towards the front, centered left and right, and flush to the front edge of the rescue board.
2. Secure all four corners of the G-12E D-bag to the platform with suitable lengths of 1/4-inch cotton webbing.

Figure 5-9. Cargo Parachute Positioned

INSTALLING THE AUTOMATIC CARGO PARACHUTE RELEASE

5-10. Install the automatic cargo parachute release as shown in Figure 5-10.

WARNING

The automatic cargo parachute release must be tested by the manufacturers' instructions prior to installation on the airdrop load.



1. Attach the running end of the 3-foot, 2-loop Type XXVI nylon suspension sling to the bottom release fitting shackle (small portion) with a small clevis. Tape the buffer with one turn 2-inch cloth-backed adhesive tape.
2. Attach one end of a 3-foot, 2-loop Type XXVI nylon riser extension to the main body section shackle with a small clevis. Attach the running end of the riser extension to the cargo parachute clevis. Tape the buffers with 2-inch cloth-backed adhesive tape.
3. Secure the small clevises of the release to a convenient point on the top of the load with lengths of one turn 1/4-inch cotton webbing.
4. Cut and remove the triple transportation tie on the cargo parachute clevis.

Figure 5-10. Automatic Cargo Parachute Release Installed

STOWING THE EXTRACTION PARACHUTE

5-11. Stow the 15-foot extraction parachute packed in a T-10 deployment bag as shown in Figure 5-11.

Note. For the 15-foot extraction parachute packing procedures refer to FM 4-20.108/TO 13C7-2-491.



1. Attach a 9-foot, 2-loop Type XXVI nylon extraction line to the bell portion of a medium suspension clevis. Attach the bridle of the G-12E cargo parachute to the bolted end of the medium clevis. Secure the clevis to the riser extension stow bar of the cargo parachute with a length of one turn single 1/4-inch cotton webbing.
2. Attach the 36-inch adapter web of a 15-foot extraction parachute packed in a T-10 D-bag to the bell portion of a medium suspension clevis. Attach the running end of the 9-foot, 2-loop extraction line to the bolt end of the medium clevis. S-fold and tape the excess extraction line with one turn 2-inch cloth-backed adhesive tape.

Figure 5-11. Extraction Parachute Installed



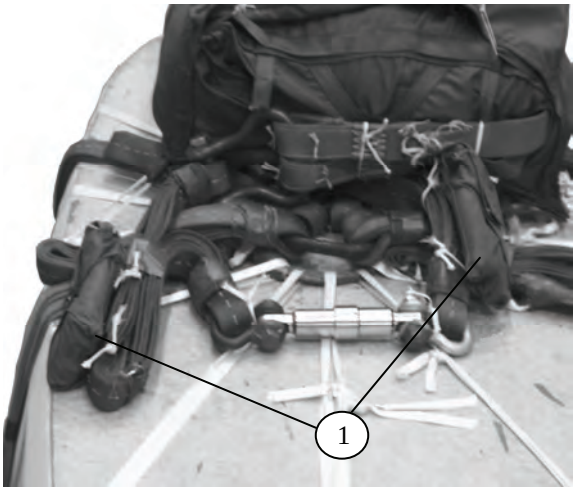
3 S-fold the 36-inch adapter web and place it and the extraction line centered on top of the G-12E cargo parachute. Place the 15-foot extraction parachute, with the mouth of the bag facing to the rear of the load and suspension line protective flap up, centered and on top of the adapter web and extraction line. Secure the extraction parachute to the front and rear riser extension stow bars of the cargo parachute with four lengths of ticket number 5 cotton thread.

4 Fit rubber retainer bands to the front riser extension stow bar. Fold the static line, and hold the folds in place with the rubber retainer bands.

Figure 5-11. Extraction Parachute Installed (continued)

ATTACHING FLOTATION DEVICES FOR TRAINING LOADS

5-12. Use flotation devices on training loads to help recover equipment. Install flotation devices as shown in Figure 5-12.





(1) Install one flotation device on the 3-foot suspension sling (below the release), and one on the 3-foot riser extension (above the release) with lengths of Type III nylon cord.

(2) Install a flotation device on the left front of the cargo parachute D-bag with lengths of Type III nylon cord.

Figure 5-12. Flotation Devices Installed

MARKING THE RIGGED LOAD

5-13. Mark the rigged load according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 5-13. Complete the Shipper's Declaration for Dangerous Goods.

***Note*.** Attach the load data tag on the rear of the ARC.



Rigged Load Data

Total Rigged Weight: Load shown..... 1,140 pounds
Height: .....70 inches
Width:.....48 inches
Length:.....111.5 inches
Overhang: Front .....10.5 inches
Rear .....14 inches
CB (from the front edge of the platform).....36.5 inches

Figure 5-13. The ARC Rigged on a Combat Expendable Platform

EQUIPMENT REQUIRED

5-14. Use the equipment listed in Table 5-1 to rig this load.

Table 5-1. Equipment Required for Rigging the GP 800 Advanced Rescue Craft

National Stock Number	*Item*	*Quantity*
	Plywood:	
5530-00-128-4981	3/4 x 48 x 96-inch plywood	1
5510-00-220-6146	2 x 4 x 44-inch lumber	5
5510-00-220-6148	2 x 6 x 44-inch lumber	2
	2 x 6 x 87-inch lumber	2
5510-00-220-6274	4 x 4 x 87-inch lumber	2
5315-00-010-4659	Nail, steel wire, common, 8D (or)	As required
Local purchase	1 1/2-inch Wood screw	As required
Local purchase	Bolt, Carriage, 3/8”Dia. 7” Long w/washer and nut	8
	Air Items:	
1670-01-062-6302	Line, 20-foot 2-loop Type XXVI	2
1670-01-062-6304	Line, 9-foot 2-loop Type XXVI	1
1670-01-062-6301	Line, 3-foot 2-loop Type XXVI	2
1670-01-678-8562	Clevis, Medium, Suspension	3
4030-00-360-0304	Clevis, Small 5/8-inch	2
4030-00-678-8560	Clevis, G-13	1
1670-01-065-3755	Parachute, Cargo G-12E	1
1670-01-063-3715	Parachute, Cargo 15-foot Extraction	1
1670-00-590-9909	D-bag, T-10 Personnel Parachute	1
1670-01-310-2875	Release, Automatic Cargo Parachute	1
4220-00-059-6061	Flotation Device, LPU-3/P	3
	Expendables:	
1670-00-753-3928	Pad, Energy Dissipating	3
8305-00-082-5752	Webbing, 1/2-inch Tubular Nylon	As required
4020-00-240-2146	Cord, Type III Nylon	As required
8305-00-268-2411	Webbing, 1/4-inch Cotton (80lb)	As required
8310-00-917-3945	Thread, Ticket 8/7 Cotton	As required
7510-00-266-5016	Tape, 2-inch Cloth-backed Adhesive	As required
7510-00-297-6655	Tape, 2-inch Masking	As required
1670-00-568-0323	Band, Rubber Retainer	As required

SECTION II-RIGGING THE XL1200 ARC

DESCRIPTION OF LOAD

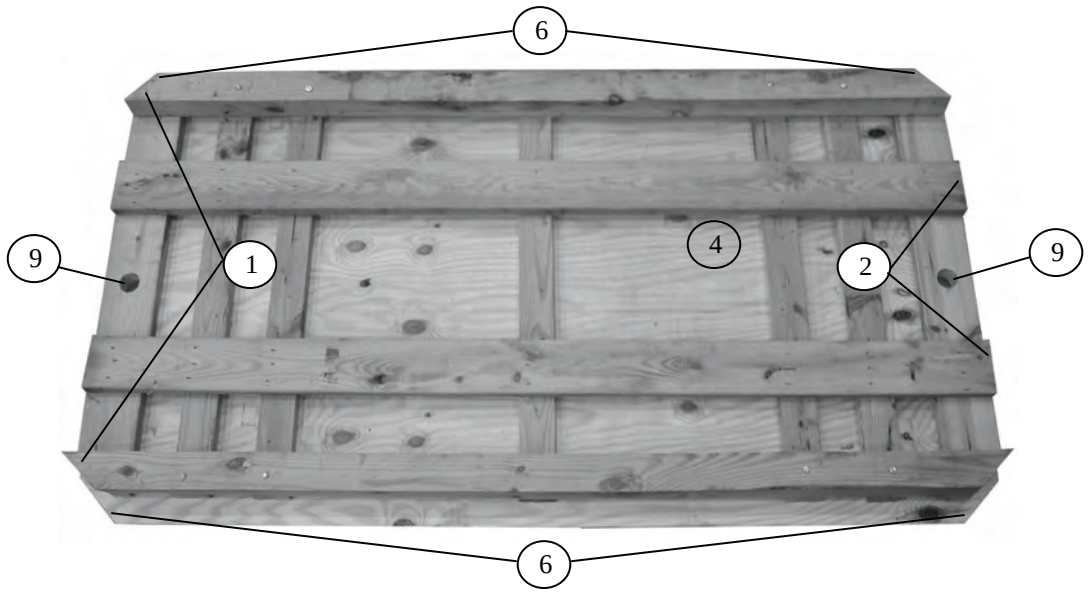
5-15. The XL1200 ARC shown in Figure 5-14, is rigged on a 48- by 87-inch Combat Expendable Platform for low-velocity airdrop. This load can be rigged with or without a 20-man life raft, a rescue board, a rucksack, and an aid bag. The load requires one G-12E cargo parachute and a 15-foot cargo extraction parachute packed in a T-10 deployment bag.



Figure 5-14. XL1200 ARC

BUILDING THE COMBAT EXPENDABLE PLATFORM

5-16. Build a new 48- by 87-inch CEP or inspect and repair a used platform as shown in Figure 5-15.



1. Lay out two 4- by 4- by 87-inch and two 2- by 6- by 87-inch longitudinal stringers.
2. Lay two 2- by 6- by 44-inch and four 2- by 4- by 44-inch lateral stringers on top and across the longitudinal stringers matching the measurements above.
3. Secure the lateral stringers to the longitudinal stringers with 8d nails. Do not nail within 2 inches of the ends of the 4- by 4- by 87-inch longitudinal stringers (not shown).
4. Position the 3/4- by 48- by 87-inch plywood on top of the lateral stringers leaving a 2-inch overhang on each side of the 4- by 4- by 87-inch longitudinal stringers.

Figure 5-15. Combat Expendable Platform Built

5 Secure the plywood to the lateral stringers with 8d nails at 6-inch intervals (not shown).

6 Cut the corners of the platform at a 45-degree angle to include the corners of the 4- by 4- by 87-inch longitudinal stringers.

7 Turn the platform over and drill eight 3/4-inch hole for the carriage bolts. Drill again with a large enough drill bit in order to counter sink the bolt heads, washers, and nuts (not shown).

8 Install the carriage bolts from bottom to top and trim the threaded ends at the nuts. File sharp edges (not shown).

9 Drill a 2-inch hole centered on each end of the platform.

Figure 5-15. Combat Expendable Platform Built (continued)

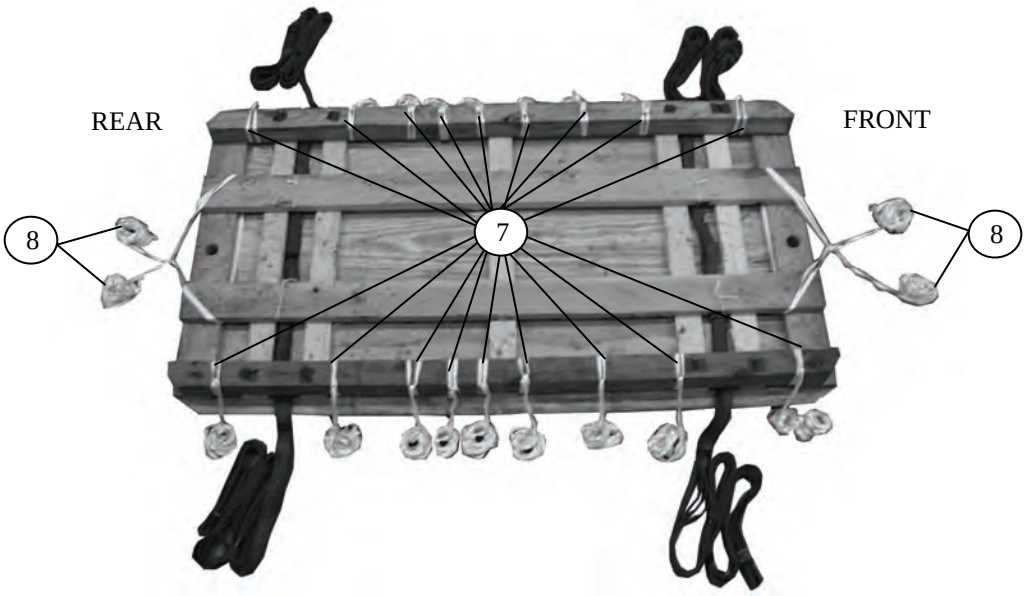
PREPARING THE PLATFORM

5-17. Prepare the Combat Expendable Platform as shown in Figure 5-16.



1. Lay a 20-foot, 2-loop Type XXVI nylon sling centered across the rear suspension point.
2. Tape the suspension sling where it comes in contact with the 2- by 6- by 87-inch longitudinal stringers with 2-inch cloth-backed adhesive tape.
3. Tie two 24-inch lengths of Type III nylon cord to the suspension sling making two wraps and securing with a surgeon's knot and locking knot, leaving equal amounts of running ends.
4. Route and center the suspension sling through the suspension sling slot in the platform.
5. Secure the suspension sling to the 2- by 6- by 87-inch longitudinal stringer with the lengths of Type III nylon cord with a surgeon's knot and locking knot.
6. Repeat for the front suspension sling.

Figure 5-16. Platform Prepared



7 Girth hitch eighteen 20-foot lengths of 1/2-inch tubular nylon webbing to the 4- by 4- by 87-inch longitudinal stringer as shown. Label right side 1 through 9 and left side 1a through 9a.

8 Route a 25-foot length of 1/2-inch tubular nylon webbing, doubled around both of the 2- by 6- by 87-inch longitudinal stringers at the front and rear of the platform. Secure the front with an overhand knot as close to the platform as possible. Secure the rear with an overhand knot, 24 inches from the rear edge of the platform.

Figure 5-16. Platform Prepared (continued)

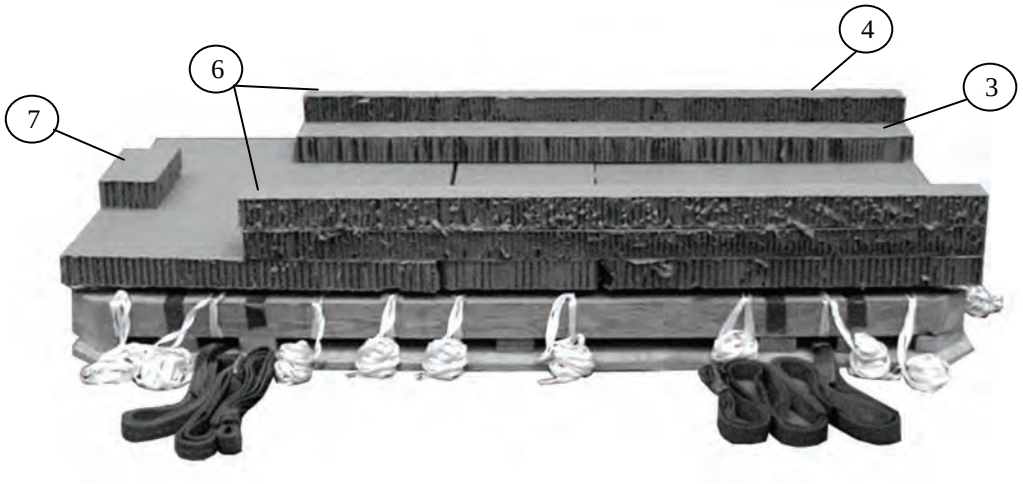
PREPARING AND POSITIONING HONEYCOMB

5-18. Prepare and position the honeycomb as shown in Figure 5-17.



1. Position one 6- by 87-inch piece of honeycomb on each 2- by 6- by 87-inch longitudinal stringer, flush with the sides. Secure in place with lengths of 2-inch cloth-backed adhesive tape.
2. Position (**do not glue**) two 36- by 42-inch pieces and one 15- by 42-inch piece of honeycomb on top of the honeycomb placed in step 1 centered and flush.

Figure 5-17. Honeycomb Positioned



3 Cut a 10- by 70-inch piece of honeycomb for a base.

4 Glue a 40- by 70-inch piece of honeycomb on top of the honeycomb in step 3 flush with one side.

5 Repeat steps 3 and 4 (not shown).

6 Position (**do not glue**) stacks 1 and 2 flush with the front and sides of the honeycomb in Figure 5-16.

7 Cut a 4- by 12 -inch piece of honeycomb. Position (**do not glue**) stack 3 centered and flush with the rear of the honeycomb in Figure 5-16.

***Note*.** Stacks 1, 2, and 3 will have to be adjusted to the hull of the ARC.

Figure 5-17. Honeycomb Positioned (continued)

POSITIONING THE ARC

5-19. Position the ARC as shown in Figure 5-18.



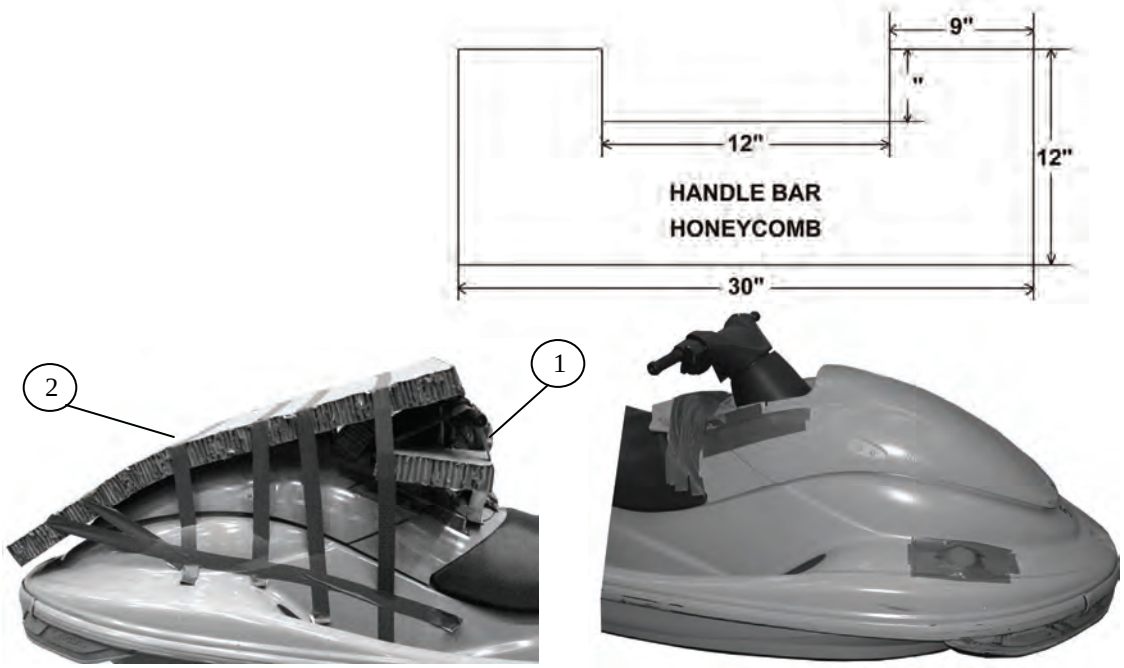
(1) Position the ARC on honeycomb stacks 1, 2, and 3 centered on the platform and nose of the ARC towards the rear of the platform.

***Note*.** There will be a 25-inch overhang in the rear and 12-inch overhang in the front of the platform.

Figure 5-18. ARC Positioned

PREPARING THE ARC

5-20. Ensure the fuel tank is no more than ¾ full. Prepare as shown in Figures 5-19 through 5-22.

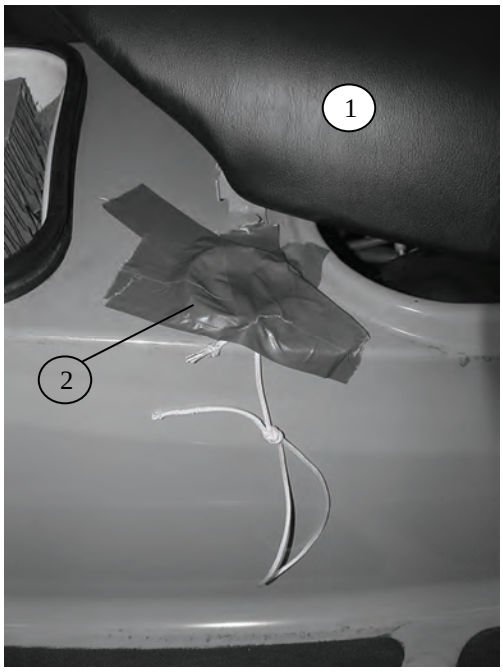


1. Cut handlebar honeycomb to prescribed measurements and install under the handle bars. Secure to the handlebars with 2-inch cloth-backed adhesive tape or lengths of Type III nylon cord.
2. Cut nose honeycomb to prescribed measurements and position over the nose. Secure to the nose with 2-inch cloth-backed adhesive tape or lengths of Type III nylon cord.
3. Tape over fuel cap, on/off switch, and compartments with 2-inch cloth-backed adhesive tape.

Figure 5-19. Nose and Handlebar Honeycomb Prepared

CAUTION

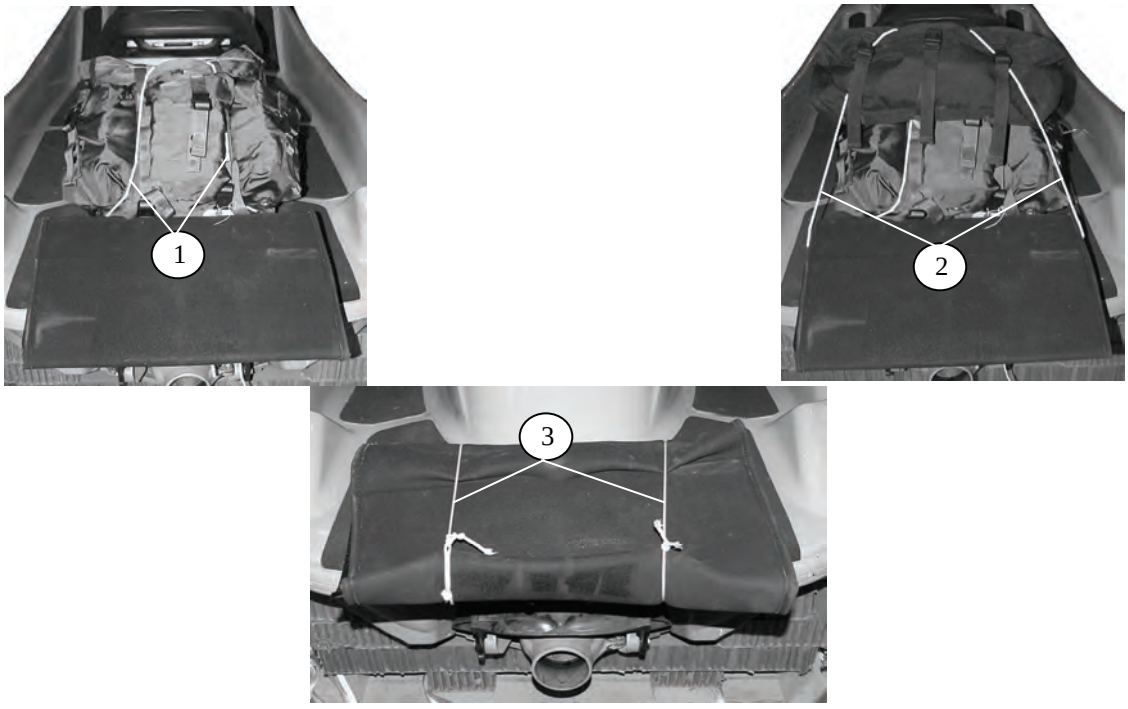
Ensure the drain plugs are securely tightened at the rear of the ARC.



1. Remove the rear section of the ARC seat to expose the intake port.
2. Plug the intake port by taping over the opening with lengths of 2-inch cloth-backed adhesive tape. Secure the tape in place with a retainer band. Attach a 12-inch Type III nylon cord lanyard to the tape. Route the lanyard to the outside of the ARC and tape in place with 2-inch cloth-backed adhesive tape.

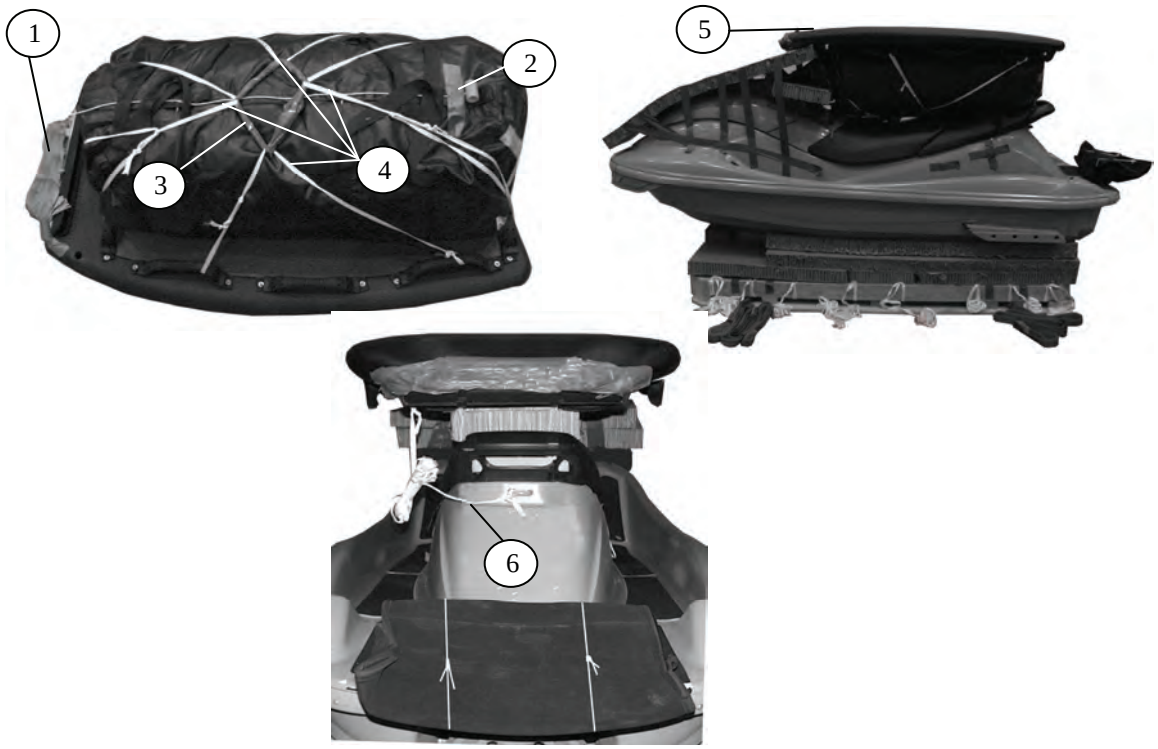
Figure 5-20. Intake Port Plugged

Note. If the rucksack and the first aid pack are to be rigged on the ARC use the steps below.



1. Position the rucksack on the ARC behind the seat. Secure the rucksack to tow ring and around the rescue board quick attach assembly with a length of 1/2-inch tubular nylon webbing.
2. Position the first aid pack on top of the rucksack and secure to the same locations with a length of 1/2-inch tubular nylon webbing.
3. Secure the protector flap around the rescue board quick attach link with two lengths of Type III nylon cord.

Figure 5-21. Rescue Board Quick Attach Link Installed



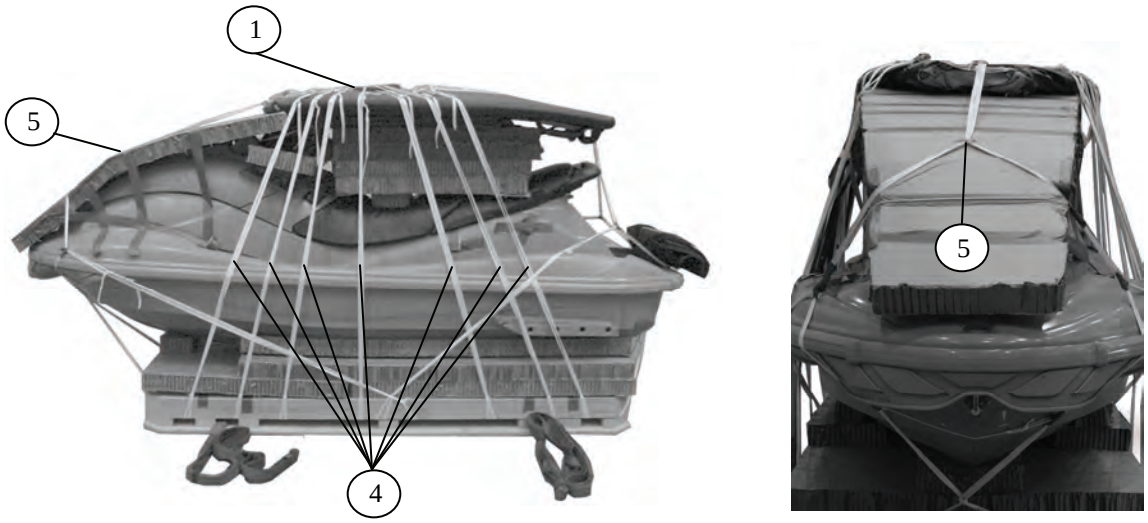
1. Pad the metal bracket on the nose of the rescue board with cellulose wadding and secure with 2-inch cloth-backed adhesive tape.
2. Center a 20-man life raft on the rescue board with closing flap up.
3. Form an 8-inch tiedown ring as shown in Figure 2-16. Center the tiedown ring on the 20-man life raft.
4. Cut four 6-foot lengths of 1/2-inch tubular nylon webbing for securing ties. Secure one end of the tie to a rescue board handle. Route the tie through the tiedown ring and secure to another rescue board handle with a trucker's hitch.
5. Position the rescue board upside down on top of the seat and handlebars with the nose towards the rear of the ARC.
6. Attach a 10-foot length of 1/2-inch tubular nylon webbing to a rescue board handle and the tow ring. S-fold the excess and tape with 2-inch masking tape.

***Note*.** If the ARC is to be rigged without the 20-man life raft, ensure rescue board is leveled with honeycomb.

Figure 5-22. Rescue Board Installed

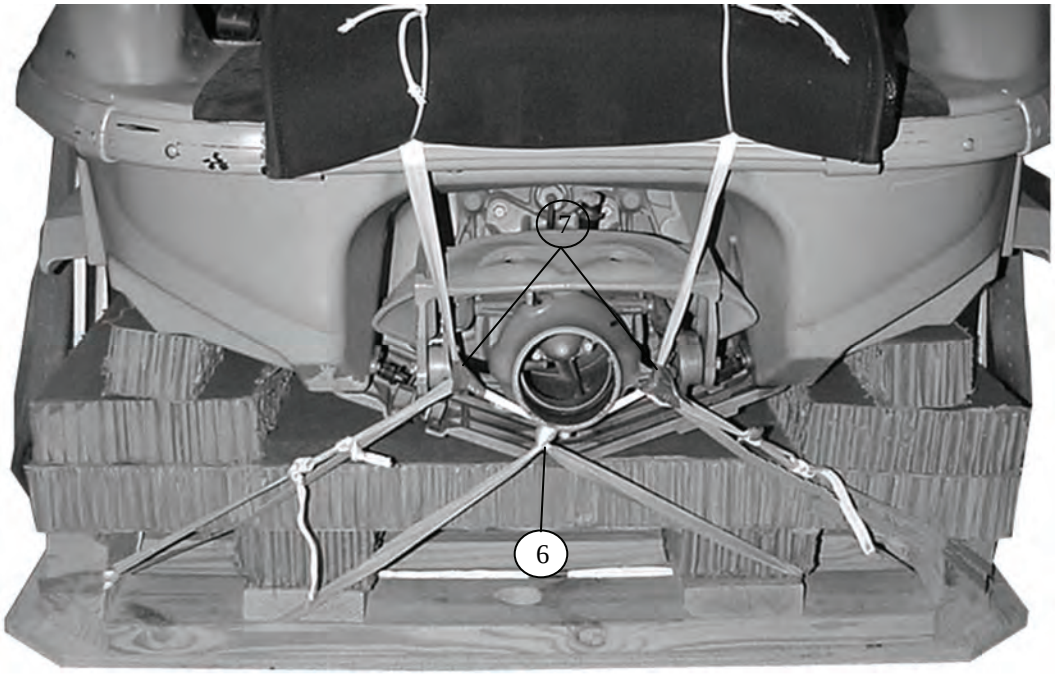
LASHING THE ARC

5-21. Lash the ARC to the platform with two 6-foot, eighteen 20-foot and two 25-foot (doubled) lengths of ½-inch tubular nylon webbing as shown in Figure 5-23.



1. Form a 10-inch tiedown ring as shown in Figure 2-16. Center the tiedown ring on top of the load.
2. Tie a loop in one end of each 20-foot lashing with an overhand knot. Tie the running end with an overhand knot (not shown).
3. Pass the looped end through the tiedown ring. Pass the opposite end of the lashing through the loop, pull it tight, and tie it with three alternating half hitches with a knot in the running end (not shown).
4. Tie all of the 20-foot lashings, (except 4 and 4a, and 5 and 5a from the front of the platform), to the tiedown ring as described in steps 2, 3, and 5.
5. Pass one end of the rear lashing around each side of the nose of the ARC. Tie the ends together with an overhand knot about 18 inches above the point of the nose. Tie the lashing to the tiedown ring as in steps 2, 3, and 4.

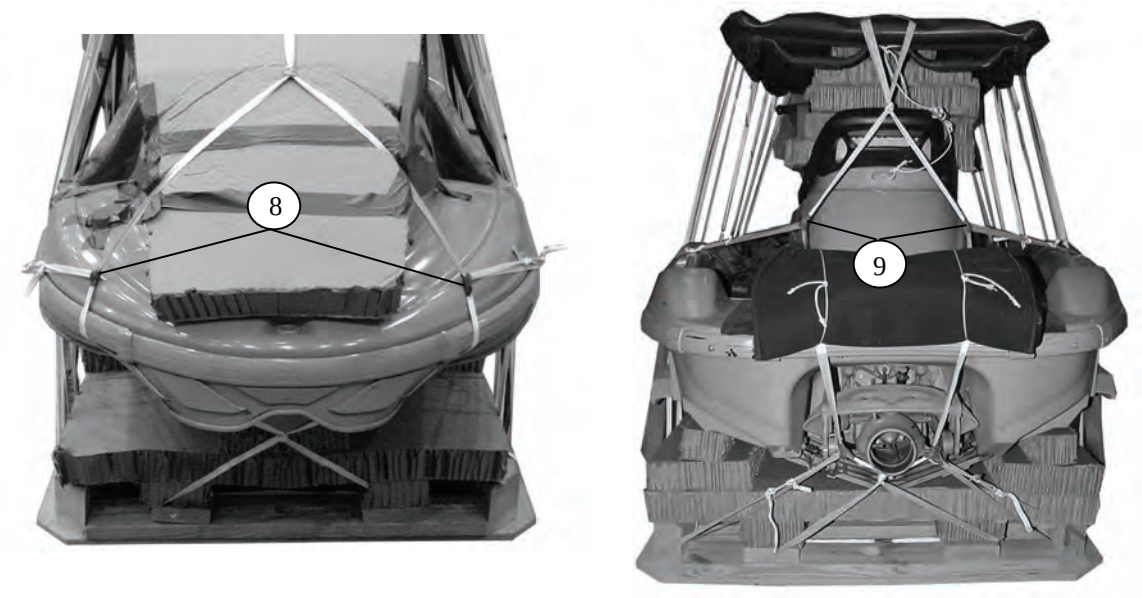
Figure 5-23. ARC Lashed to Platform



6 Pass one end of the front lashing around each side of the jet drive and the rescue board quick attach link. Tie the ends together with an overhand knot about 18 inches above the CEP. Tie the front lashing to the tiedown ring as described in steps 2, 3, and 4.

7 Girth hitch one 6-foot 1/2-inch tubular nylon webbing lashing to the very front of both longitudinal stringers. Secure to the front lashing with a trucker's hitch, pulling the front lashing away from the jet drive and linkage. Tape around the two lashings with 2-inch cloth-backed adhesive tape.

Figure 5-23. ARC Lashed to Platform (continued)



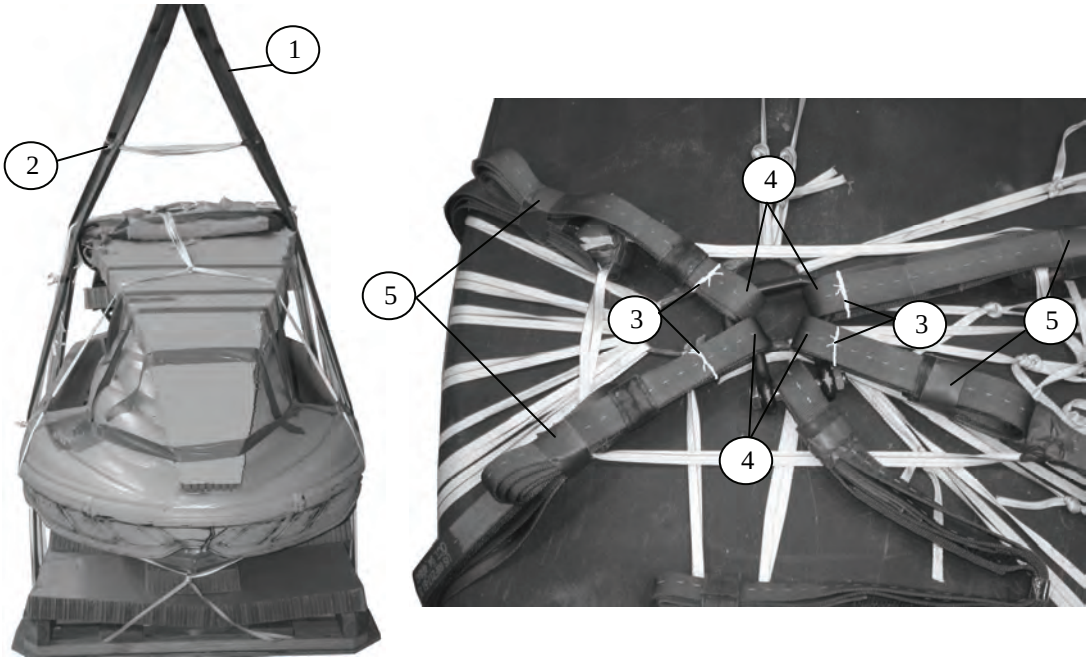
(8) Tie lashings 4 and 4a from the front of the platform, to the rear lashing approximately 6 inches above the point of the nose of the ARC. Secure the rear lashing with a trucker's hitch pulling the rear lashing away from the nose of the ARC. Tape around the two lashings with 2-inch cloth-backed adhesive tape.

(9) Tie lashings 5 and 5a from the front of the platform, to the front lashing approximately, Three inches above the rescue board quick attach link. Secure to the front lashing with a truckers hitch pulling the front lashing away from the rescue board quick attach link. Tape around the two lashings with 2-inch cloth-backed adhesive tape.

Figure 5-23. ARC Lashed to Platform (continued)

SAFETY TIEING SUSPENSION SLINGS

5-22. Safety tie the suspension slings as shown in Figure 5-24.

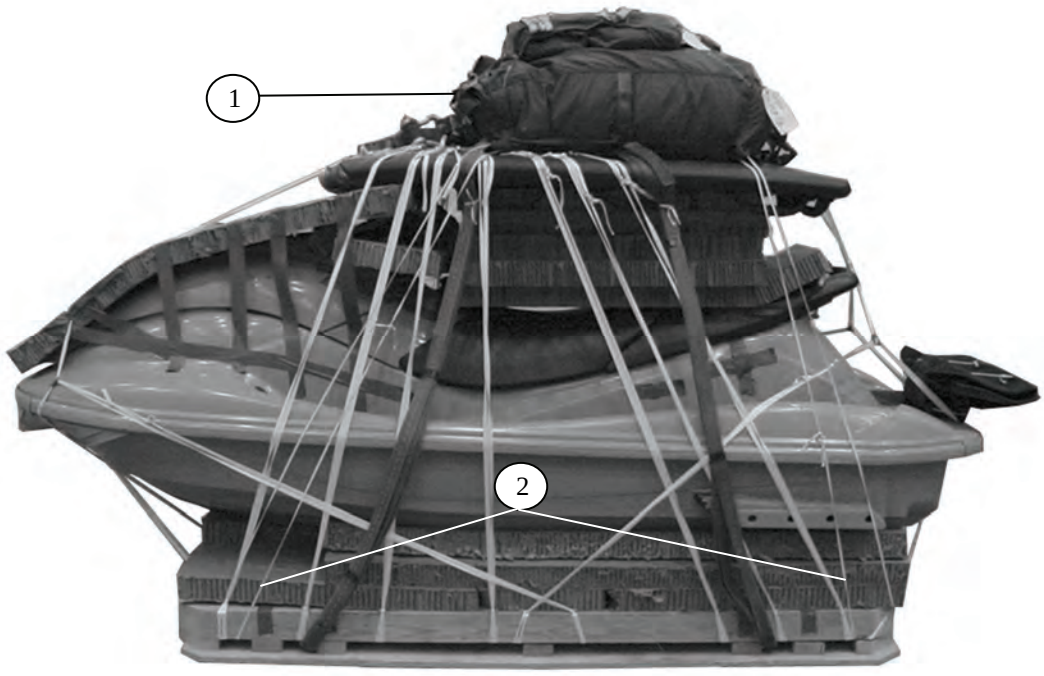


1. Raise the suspension slings.
2. Install the deadman's tie 6 to 8 inches above the load as described in FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C-7-1-5.
3. Lower the suspension slings until they touch the tiedown ring. Secure them to the tiedown ring with lengths of one turn 1/4-inch cotton webbing.
4. Attach the suspension slings to the arms of a medium suspension clevis. Attach a 3-foot, 2-loop Type XXVI nylon suspension sling to the bolt end of the medium clevis.
5. S-fold the excess suspension sling and tape with one turn 2-inch cloth-backed adhesive tape.

Figure 5-24. Suspension Slings Safety Tied

STOWING CARGO PARACHUTE

5-23. Stow the G-12E cargo parachute as shown in Figure 5-25.



1. Position the G-12E parachute with the bridle towards the front, centered on the rescue board.
2. Secure all four corners of the G-12E D-bag to the platform with suitable lengths of 1/4-inch cotton webbing.

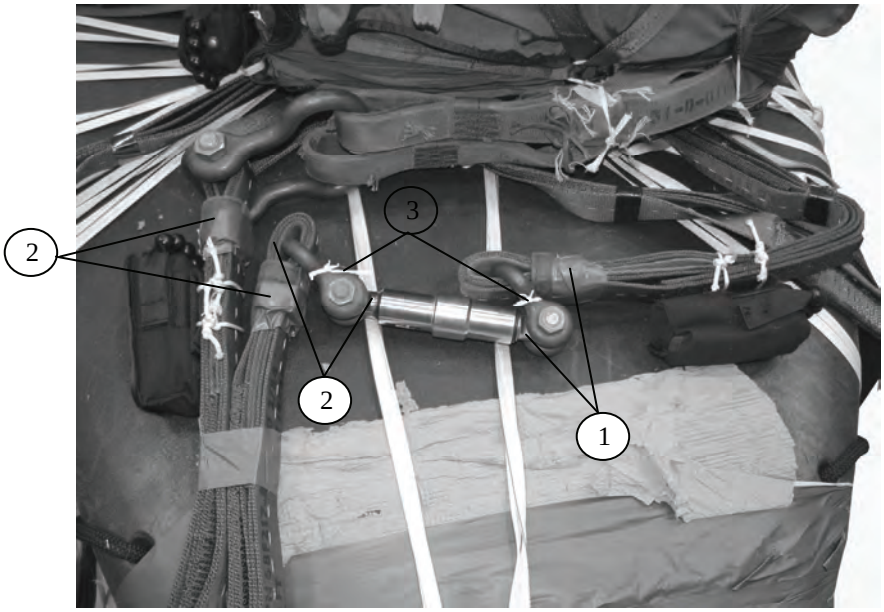
Figure 5-25. Cargo Parachute Stowed

INSTALLING THE AUTOMATIC CARGO PARACHUTE RELEASE

5-24. Install the cargo parachute hydraulic release as shown in Figure 5-26.

WARNING

The automatic cargo parachute release must be pre-drop tested according to the manufacturer's instructions prior to installation on the airdrop load.



1. Attach the running end of the 3-foot, 2-loop Type XXVI nylon suspension sling to the bottom release fitting shackle (small portion) with a suspension clevis. Tape the buffer with one turn 2-inch cloth-backed adhesive tape.
2. Attach one end of a 3-foot, 2-loop Type XXVI nylon webbing riser extension to the main body of the release with a suspension clevis. Attach the running end of the riser extension to the cargo parachute clevis. Tape the buffers with 2-inch cloth-backed adhesive tape.
3. Secure the suspension clevises of the release to a convenient point on the top of the load with suitable lengths of 1/4-inch cotton webbing.
4. Cut and remove the triple transportation tie on the cargo parachute clevis (not shown).

Figure 5-26. Automatic Cargo Parachute Release Installed

STOWING THE EXTRACTION PARACHUTE

5-25. Stow the 15-foot extraction parachute packed in a T-10 deployment bag as shown in Figure 5-27.

***Note*.** For the 15-foot extraction parachute packing procedures, see FM 4-20.108/TO 13C7-2-491.



1. Attach a 9-foot, 2-loop Type XXVI nylon webbing extraction line to the bell portion of a medium suspension clevis. Attach the bridle of the G-12E cargo parachute to the bolted end of the medium clevis. Secure the clevis to the riser extension stow bar of the cargo parachute with a length of one turn single ¼-inch cotton webbing.
2. Attach a 36-inch adapter web of a 15-foot extraction parachute packed in a T-10 deployment bag to the bell portion of a medium suspension clevis (not shown). Attach the running end of the 9-foot, 2-loop Type XXVI nylon webbing extraction line to the bolt end of the medium clevis. S-fold and tape the excess extraction line with one turn 2-inch cloth-backed adhesive tape.

Figure 5-27. Extraction Parachute Installed



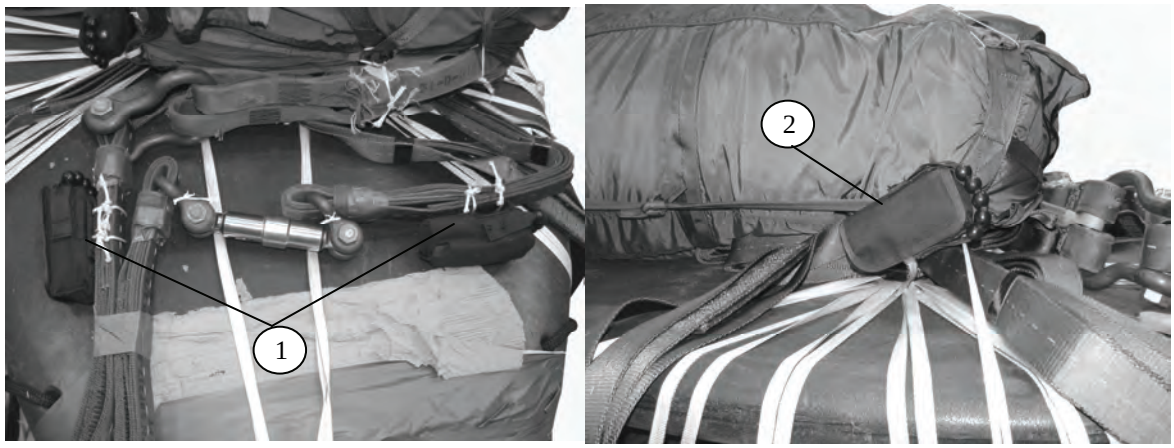
3 S-fold the 36-inch adapter web and place it and the extraction line centered on top of the G-12E cargo parachute. Place the 15-foot extraction parachute, with the mouth of the bag facing to the rear of the load and suspension line protective flap up, centered on top of the adapter web and extraction line. Secure the extraction parachute to the front and rear riser extension stow bars of the cargo parachute with four suitable lengths of ticket number 5, 8/7 cotton thread.

4 Fit rubber retainer bands to the front riser extension stow bar. Fold the static line, and hold the folds in place with the rubber retainer bands.

Figure 5-27. Extraction Parachute Installed (continued)

ATTACHING FLOTATION DEVICES FOR TRAINING

5-26. Use flotation devices on training loads to help recover equipment. Install flotation devices as shown in Figure 5-28.



1. Install one flotation device on the 3-foot suspension sling (below the release), and one on the 3-foot riser extension (above the release) with suitable lengths of Type III nylon cord.
2. Install a flotation device on the left front of the cargo parachute deployment bag with suitable lengths of Type III nylon cord.

Figure 5-28. Flotation Devices Installed

MARKING THE RIGGED LOAD

5-27. Mark the rigged load according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 5-29.

***Note*.** Attach the load data tag on the rear of the ARC.



Rigged Load Data

Weight: Load shown…….	(with a 20-man life raft)	1,450 pounds
	(without a 20-man life raft)	1,380 pounds
Height:		78 inches
Width:		48 inches
Length:		124 inches
Overhang:	Front	12 inches
	Rear	25 inches
CB (from the front edge of the platform)		36.5 inches

Figure 5-29. The XL 1200 ARC Rigged on a Combat Expendable Platform

EQUIPMENT REQUIRED

5-28. Equipment required to rig the ARC on the 48- by 87-inch combat expendable platform for low-velocity airdrop is listed in Table 5-2.

Table 5-2. Equipment Required for Rigging the XL 1200 Advanced Rescue Craft

National Stock Number	*Item*	*Quantity*
5530-00-128-4981	3/4- by 48- by 96-inch Plywood	1 Sheet
5510-00-220-6146	2- by 4- by 44-inch Lumber	5
5510-00-220-6148	2- by 6- by 44-inch Lumber	2
	2-by 6- by 87-inch Lumber	2
5510-00-220-6274	4-by 4- by 87-inch Lumber	2
5315-00-010-4659	Nail, steel, wire, common, 8d	As Required
	(or)	
Local Purchase	1 1/2-inch Wood screw	As Required
Local Purchase	Bolt, Carriage, 3/8-inch Dia. 7 inches long w/ washer and nut	8
	Air Items:	
1670-01-062-6302	Line, 20-foot, 2-loop Type XXVI	2
1670-01-062-6304	Line 9-foot, 2-loop Type XXVI	1
1670-01-062-6301	Line 3-foot, 2-loop Type XXVI	2
4030-00-678-8562	Clevis, Medium Suspension	3
4030-00-360-0304	Clevis, Suspension, air delivery	2
4030-00-678-8560	Clevis, G-13	1
1670-01-065-3755	Parachute, Cargo G-12E	1
1670-01-063-3715	Parachute, Cargo 15-foot extraction	1
1670-00-590-9909	D-bag, T-10 Personnel Parachute	1
1670-01-310-2875	Release, Automatic Cargo Parachute	1
4220-00-059-6061	Flotation Device, LPU-3/P	3
	Expendables:	
1670-00-753-3928	Pad, Energy Dissipating	4 Sheets
8305-00-082-5752	Webbing, ½-inch Tubular Nylon	As Required
4020-00-240-2146	Cord, Type III Nylon	As Required
8305-00-268-2411	Webbing, ¼-inch Cotton (80 lb.)	As Required
8310-00-917-3945	Thread, Ticket #5 Cotton	As Required
7510-00-266-5016	Tape, 2-inch Cloth-backed adhesive	As Required
7510-00-297-6655	Tape, 2-inch Masking	As Required
1670-00-568-0323	Band, Rubber Retainer	As Required

Chapter 6

Wind Supported Aerial Delivery System (WSADS) Snow Goose

DESCRIPTION OF LOAD

6-1. The Wind Supported Aerial Delivery System (WSADS) Snow Goose is a low-cost, reusable, fully autonomous, unmanned aerial vehicle (UAV) that can be used to carry out a variety of missions at otherwise inaccessible locations. It is quickly configurable for air or ground launch deployable missions.

Note. Before rigging the WSADS by this chapter, refer to the manufacturer's Pre-Flight Procedures to ensure all steps are adhered to. Mission requirements dictate the amount of fuel that is used, but each fuel cell will be full. Strict adherence to proper procedures is crucial to the survivability of this piece of equipment.

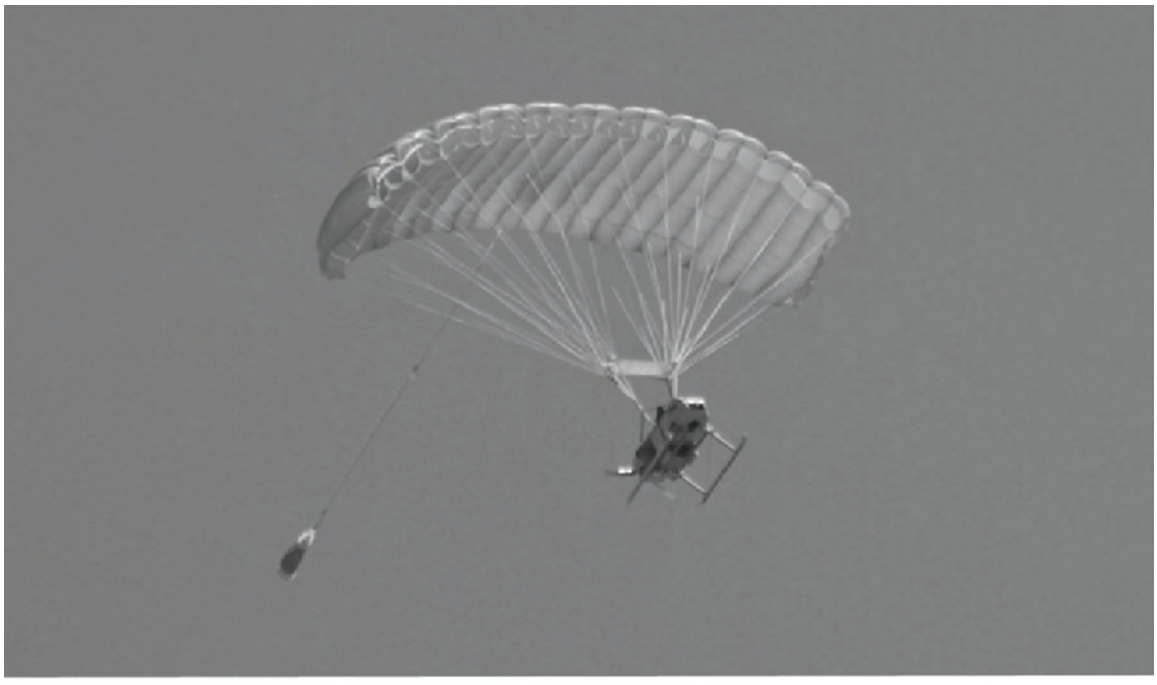


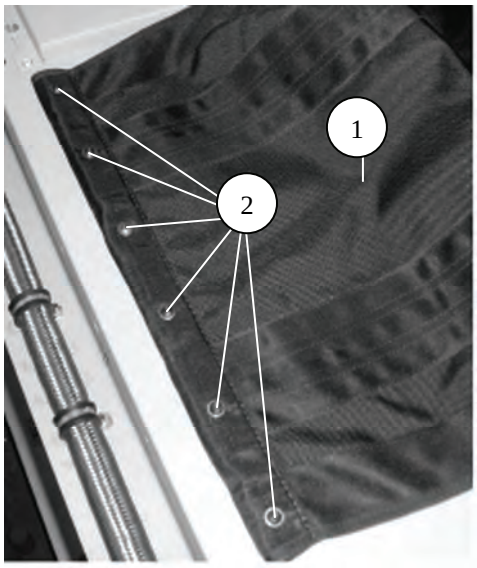
Figure 6-1. The Wind Supported Aerial Delivery System (Snow Goose)

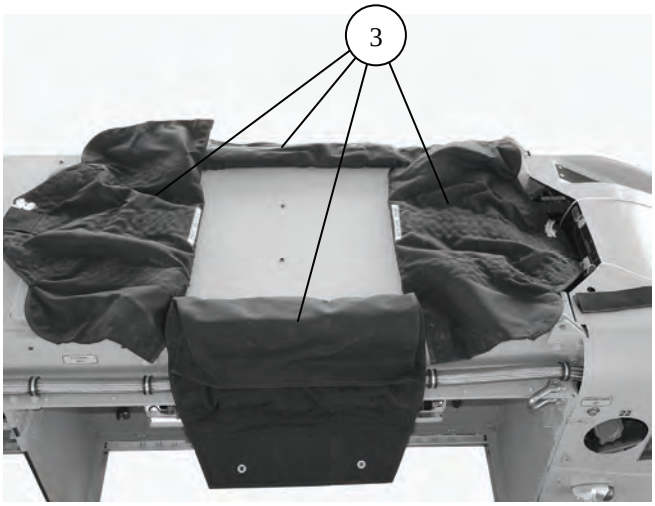
INSTALLING AIR LAUNCH PARACHUTE

6-2. Install the Air Launch Parachute as described and shown in Figure 6-2.

CAUTION

It is a mandatory requirement that only qualified riggers who have successfully completed the Mist Mobility Integrated Systems Technology (MMIST) Air Parachute training course are certified to pack both the air launch and drogue parachutes. Packing both parachutes requires following precise, detailed procedures to ensure the successful and timely deployment of both parachutes. The Air Launch Parachute will be packed prior to rigging the WSADS and according to the manufacturer's rigging procedures.

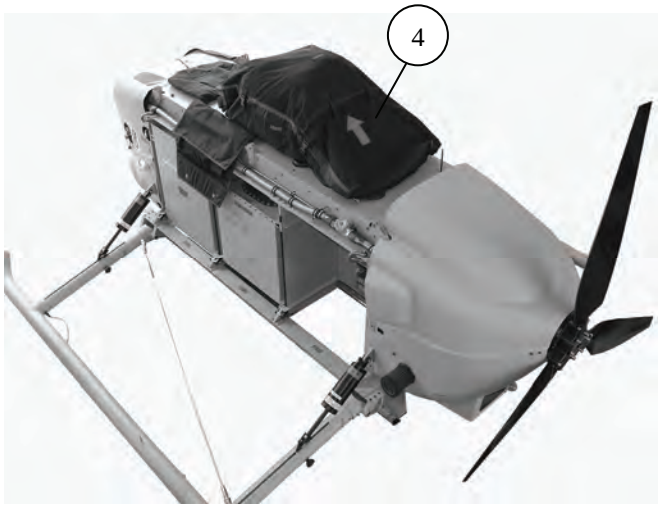


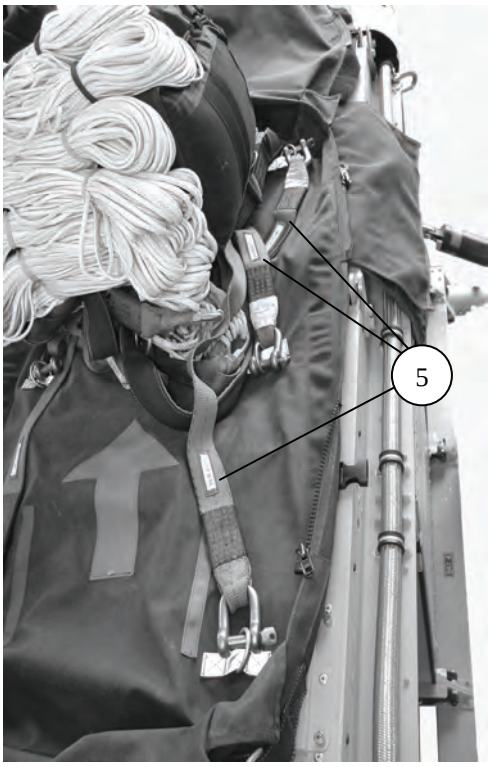


1. Install the Air Launch Parachute Container to the Snow Goose top panel.
2. Secure both side flaps with the hardware provided.
3. Unfold the parachute container rear flap, outer side flaps and inner side flaps leaving the front flap towards the front of the vehicle. The front flap has a channel guide for the locking pin bridle for easy identification.

Note. Ensure side flap with hook pile tape is installed on the right side.

Figure 6-2. Air Launch Parachute Installed



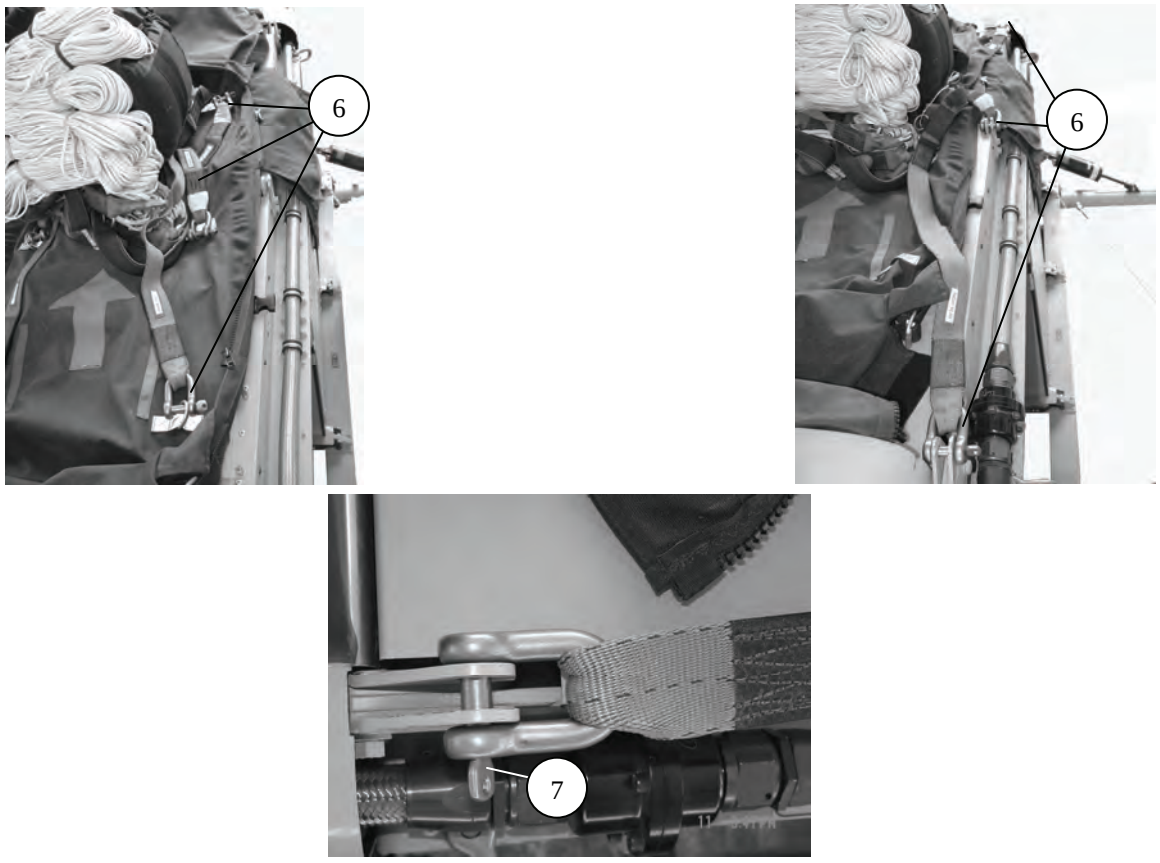


(4) Place the packed parachute in its recovery bag on top of the Snow Goose with the direction of flight arrow facing the front.

(5) Open the recovery bag exposing the six lower riser shackle bolts (right side shown).

Note. The green-tagged risers should be on the right.

Figure 6-2. Air Launch Parachute Installed (continued)

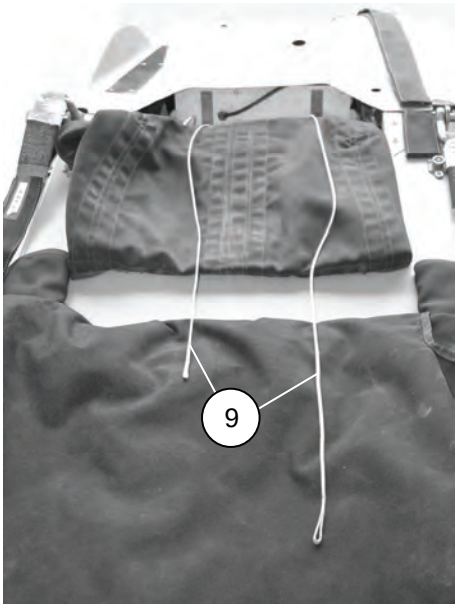


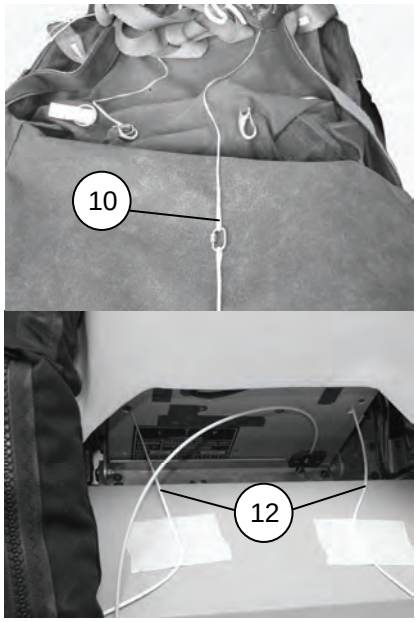
6 One at a time, disconnect each lower riser shackle from the recovery bag and immediately connect it to the corresponding attachment point on the vehicle.

7 Insert shackle bolts from the outboard to inboard and tighten until screw pin clicks.

8 Once all six shackles are connected, ensure there are no twists in the lower risers (not shown).

Figure 6-2. Installing Air Launch Parachute (continued)





(9) Pull each of the two Airborne Guidance Unit (AGU) steering lines to their full extension (called mechanical zero).

***Note*:** Right steering line should be 8 to 10 inches longer than the left steering line.

(10) Feed the left steering line through the left guide ring at the top of the lower riser and connect the left steering line end with the preset loop to the left parachute steering line extension using a rapide link connector.

(11) Visually check to ensure that the steering line extension runs directly from the brake, down the inner edge of the riser and then through the lower steering guide ring before the connection is made to the AGU steering line.

(12) Visually check to ensure that the AGU steering lines run directly from the AGU to the connection point, without twisting around the lower risers. Tape the steering lines with a suitable length of masking tape.

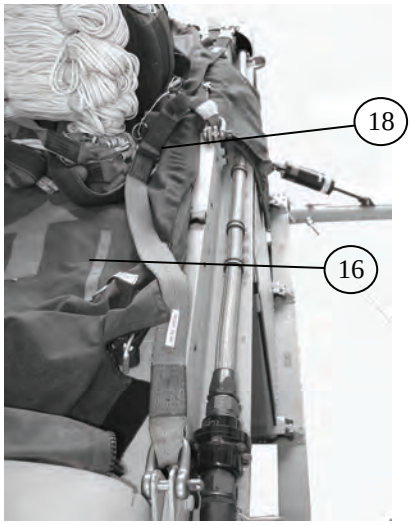
(13) Repeat steps 10 through 12 to connect the right AGU steering line to the right parachute steering line extension.

(14) Starting at the front, carefully stow the left steering line in the steering line channel on the lower front left riser and S-fold any excess at the rear of the channel (not shown).

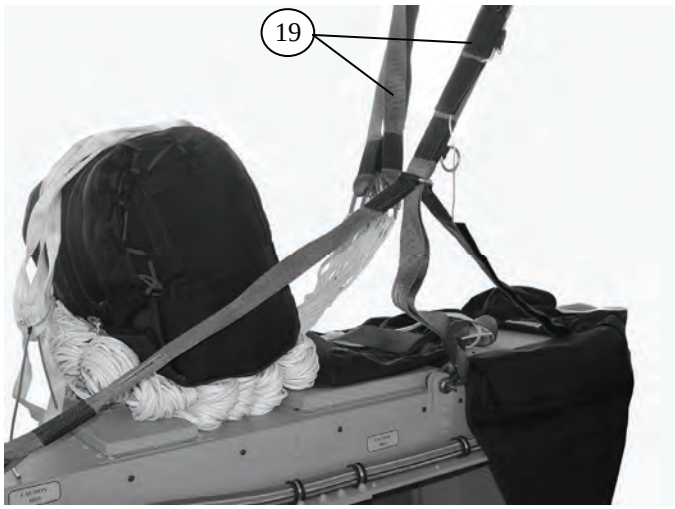
Note. Carefully stow all excess steering line in the upper rear riser steering line channel.

(15) Repeat the above step carefully stowing the right steering line in the right steering line channel.

Figure 6-2. Air Launch Parachute Installed (continued)







Note. This step requires a second individual to remove the recovery bag.

16 Remove the recovery bag, and place the packed parachute immediately in front of the engine intake, with the lines in front of the parachute.

17 Ensure the steering line or the brake setting does not get dislodged during the removal of the recovery bag.

18 Place the left set of lower risers over the left edge of the vehicle on top of the side flaps and repeat for the right set of lower risers.

19 Straighten the upper risers.

Figure 6-2. Air Launch Parachute Installed (continued)







(20) On the left side, pull the lower rear, middle, and front risers in the container area. S-fold the riser within the container area keeping all three lower risers tight.

Note. Ensure neither the steering line, nor the brake setting gets dislodged during the S-folding process. This step also requires a second individual.

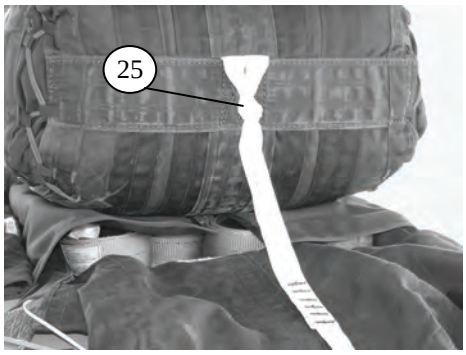
(21) Repeat the above step on the right side (not shown).

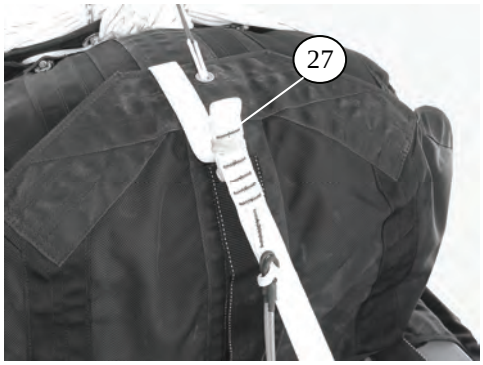
(22) Make sure that the left and right brake settings are still intact (not shown).

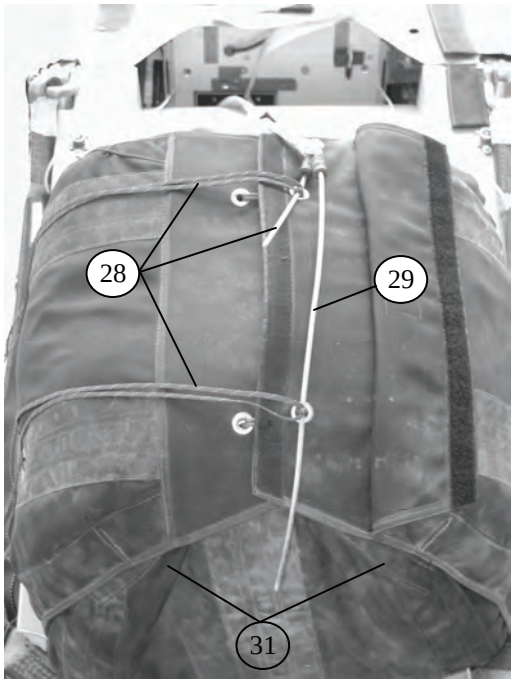
(23) Cover the risers with the two inner container side flaps.

(24) Roll the parachute over the S-folded risers leaving the lines at the rear of the vehicle.

Figure 6-2. Air Launch Parachute Installed (continued)







25 Girth hitch the locking pin bridle short end to the deployment bag loop.

26 Close the flaps of the container starting with the front and rear followed by the sides (not shown).

27 Before stowing the locking pin bridle, ensure bridle exits bag on the right side of the front flap grommet. Stow the excess bridle outside the container with a retainer band located at the top of the channel guide.

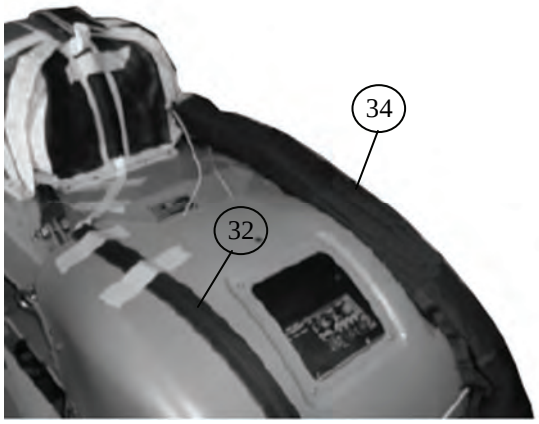
28 Route a pull-up cord through each soft loop. Route the front pull-up cord through the grommets in the following sequence: front, left, rear. Secure with short locking pin.

29 Repeat for rear pull-up cord using the long locking pin.

30 Remove the pull-up cords (not shown).

31 Ensure the corners of the front and rear flaps are neatly tucked under the side flaps.

Figure 6-2. Air Launch Parachute Installed (continued)





(32) Stow the drogue bridle in the bridle channel along the front of the container and along the channel on the cowl. Secure with masking tape at intervals of 4 to 6 inches.

WARNING

Ensure the drogue bridle is routed over top of the steering line.

(33) Connect the locking pin bridle to the drogue assembly with a small rapide link connector (not shown).

(34) Connect the hook pile tape on the drogue bag with the hook pile tape strip on the cowl. Ensure the drogue bag is flush against the parachute.

(35) S-fold excess locking pin bridle to keep off floor of the aircraft with a rubber retainer band.

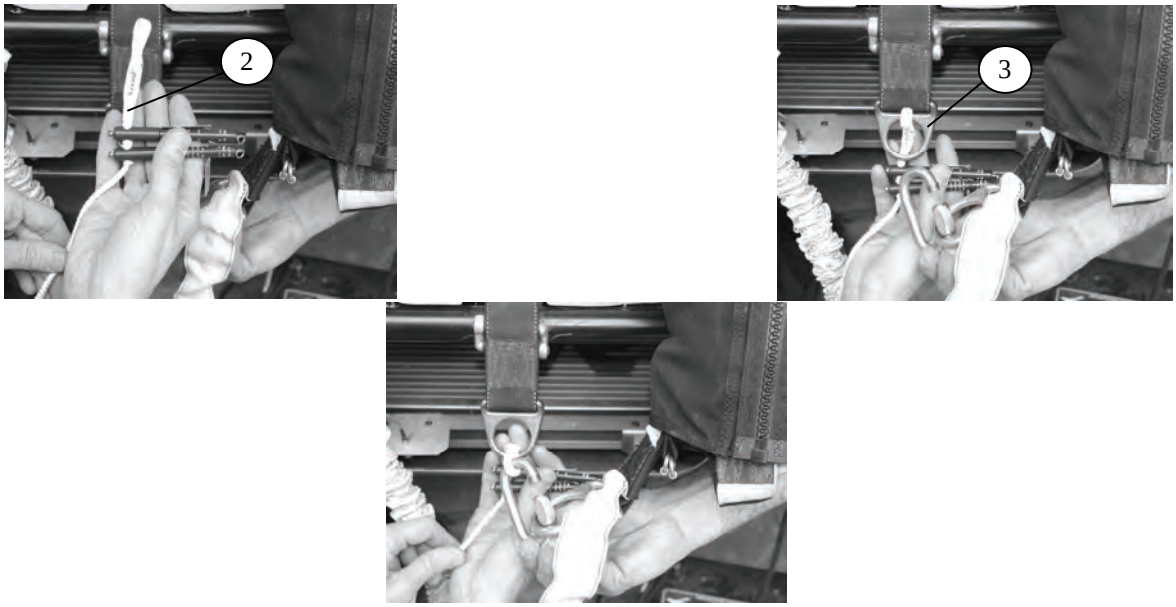
Figure 6-2. Air Launch Parachute Installed (continued)

INSTALLING PYROTECHNIC CUTTERS

6-3. Install pyrotechnic cutters as shown in Figure 6-3.

WARNING

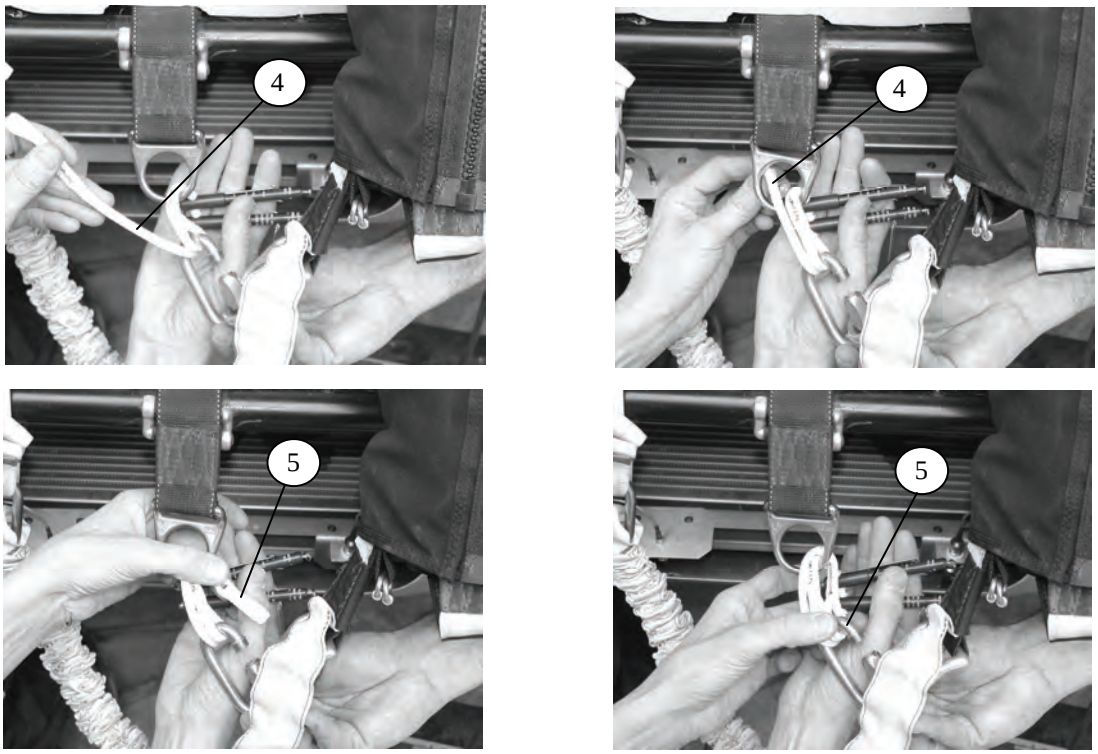
Never connect the drogue bridle ring directly to the Snow Goose drogue attachment point using the rapide link connector. A direct connection will prevent the pyrotechnic cutters from deploying the main canopy, causing critical failure of the system.



1. Install the pyrotechnic cutters between the Snow Goose drogue attachment point and the medium rapide link connector on the drogue bridle ring (not shown).
2. Route a 14-inch piece of braided dacron (1575 pound breaking strength) through two 6 second (E-3) pyrotechnic cutters approximately 3 inches from the looped end.
3. Route looped end up through the drogue attachment ring and attach it to the rapide link.

Note. Ensure that only the cutter loop connects the drogue bridle to the Snow Goose drogue attachment point.

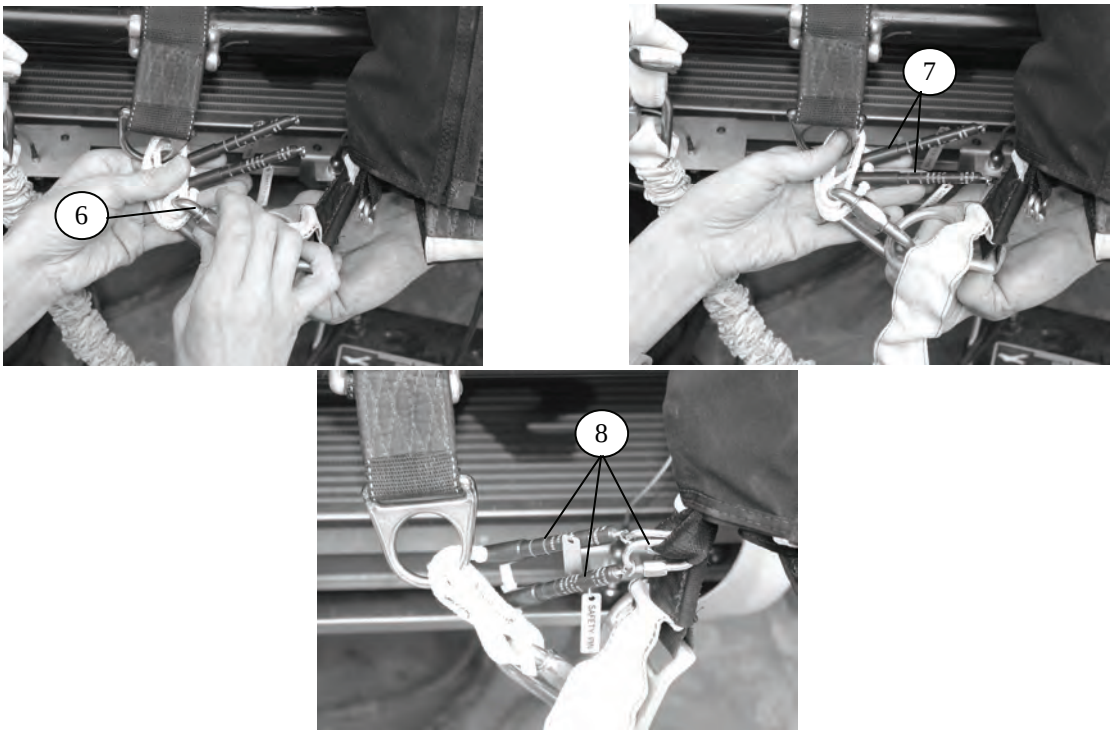
Figure 6-3. Pyrotechnic Cutters Installed



(4) Route opposite end of the braided dacron up through rapide link and down through the drogue attachment ring.

(5) Route over pyrotechnic cutters and attach to rapide link.

Figure 6-3. Pyrotechnic Cutters Installed (continued)



6 Close rapide link finger tight.

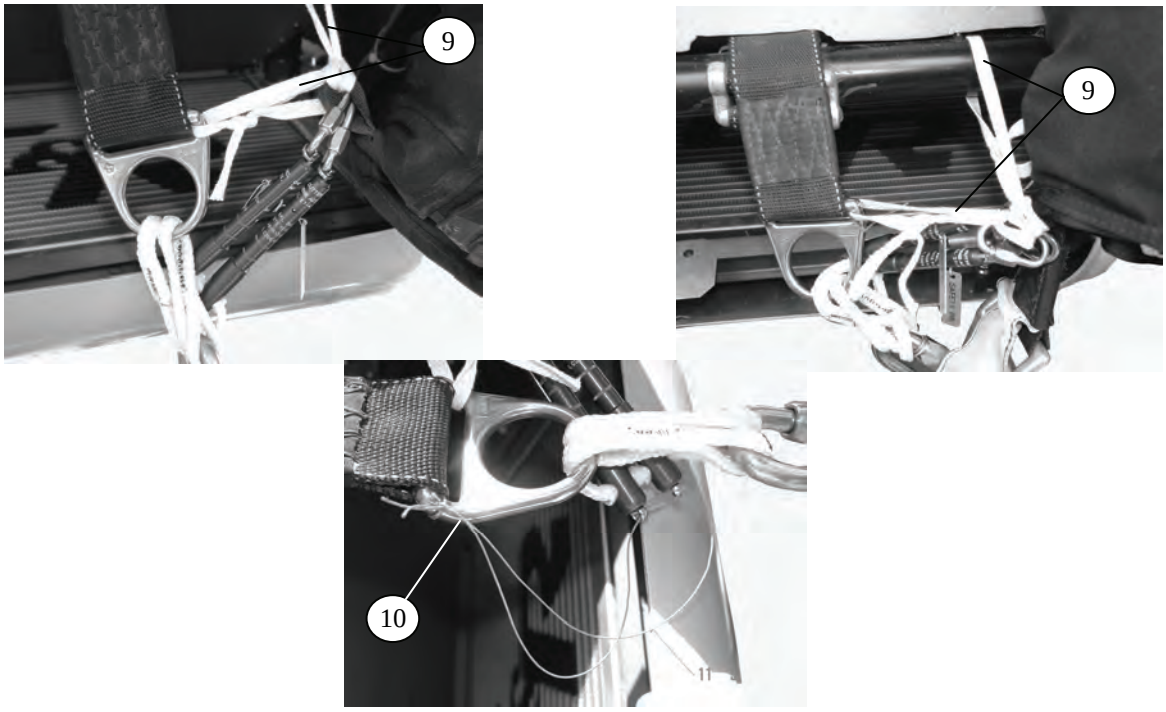
7 Once cutters are in place, ensure they are clear of the braided dacron cutter loop.

8 Connect two small rapide links to the sewn loop on the drogue bag, then connect a pyrotechnic cutter to each rapide link.

WARNING

Failure to connect the pyrotechnic cutters to the drogue attachment bag will prevent the parachute from being deployed.

Figure 6-3. Pyrotechnic Cutters Installed (continued)



(9) Girth hitch two lengths of type I, 1/4-inch cotton webbing to the sewn loop on the drogue bag. Tie one length to the drogue attachment ring, and the other to the front frame (this reduces lateral and vertical motion of the drogue bag and prevents early activation of the pyrotechnic cutters).

(10) Tie a length of ticket 5, 8/7 cotton thread across the pyrotechnic cutters to secure the cutters to the drogue attachment ring.

Figure 6-3. Pyrotechnic Cutters Installed (continued)

RECOVERY DISPATCH PIN PLACEMENT

6-4. Install recovery dispatch pin as shown in Figure 6-4.

WARNING

Failure to ensure the master-panel arming switch and the engine start enable switch are both in the off position could result in a premature engine start.

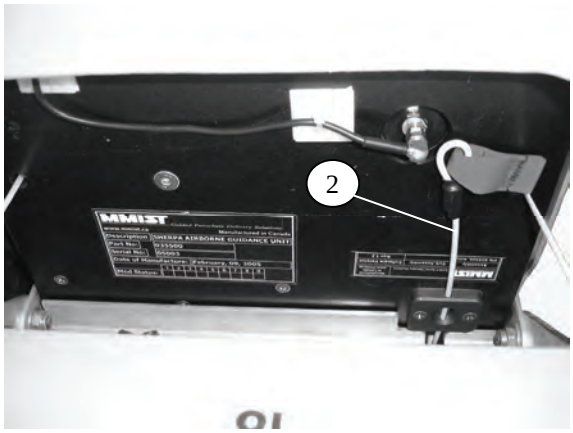


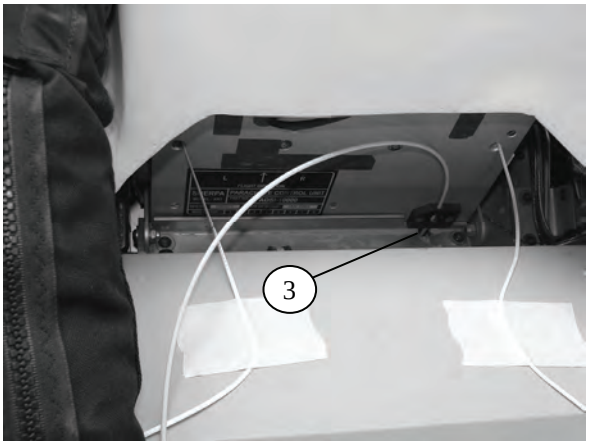
1 Ensure that both the Master Panel-Arming Switch and the Engine Start Enable Switch are both in the off position.

Figure 6-4. Recovery Dispatch Pin Installed

WARNING

Failure to replace the recovery dispatch pin will prevent the AGU from starting the engine after it leaves the aircraft resulting in the possible loss of the Snow Goose and a failed mission.





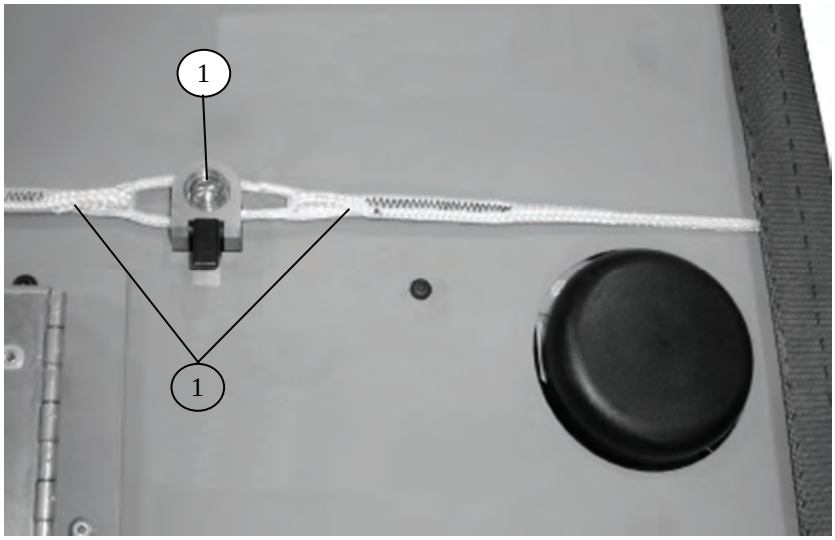
(2) Remove the recovery dispatch pin and immediately insert the drogue bag dispatch pin line.

(3) Push the dispatch pin line through the dispatch switch cover as far as possible to prevent accidental removal.

Figure 6-4. Recovery Dispatch Pin Installed (continued)

SECURING LANDING GEAR

6-5. Secure landing gear as shown in Figure 6-5.



(1) Depress the leg release pin and insert two leg support lanyards over the top of the pin and under the guard.

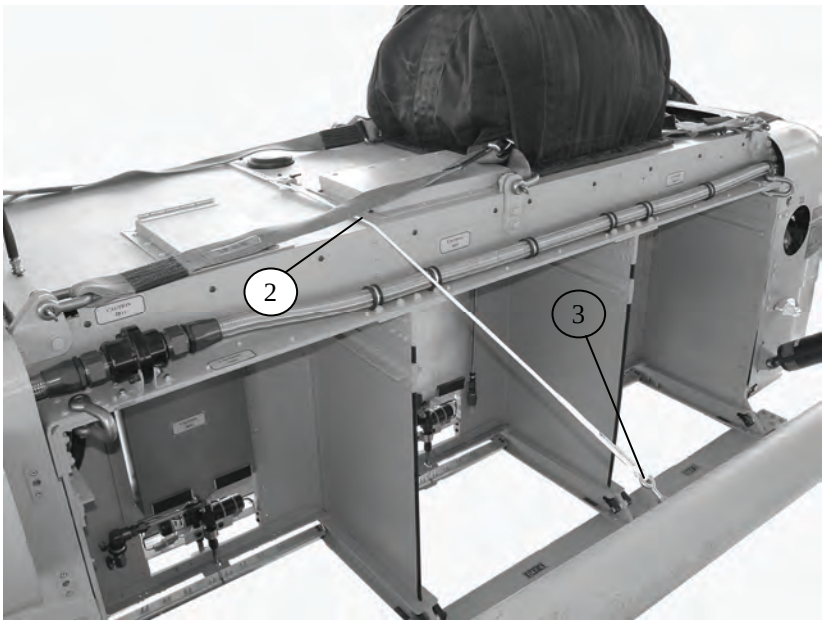
CAUTION

Ensure only the leg release pin and not the guard holds each lanyard.

WARNING

The landing gear support lanyards must pass underneath the parachute risers when securing the landing legs. Passing a lanyard over the top of the riser will result in damage to the Snow Goose, including the landing gear.

Figure 6-5. Landing Gear Secured



(2) Raise the left side of the vehicle skid and pass the other side of the left landing gear support lanyard underneath the parachute riser.

(3) Pass the unfinished end of the 53-inch braided dacron through the eyebolt and secure with three half hitches and a knot in the running end.

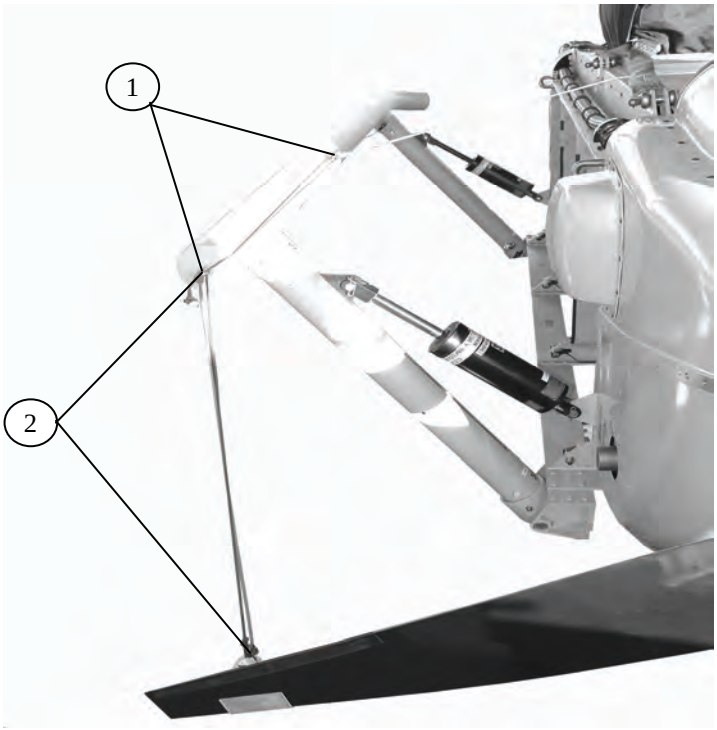
Note. The landing gear support lanyard will come from the manufacturer with one end finger trapped and 53 inches long.

(4) Repeat steps 2 and 3 for the right side landing gear support lanyard (not shown).

Figure 6-5. Landing Gear Secured (continued)

INSTALLING PROPELLER BRAKE

6-6. Install propeller brake as shown in Figure 6-6.



1. Install left propeller brake by passing the elastic lanyard end through the eyebolt on the rear end of the skid. Secure the free end of the brake release lanyard to the vehicles left skid center eyebolt with three half hitches and a knot in the running end.
2. Install the propeller brake 4 to 6 inches from the tip of the propeller. Route a suitable length of type III nylon cord through the left skid rear end eyebolt and tie it tight to the eyebolt using half hitches and a knot in the running end.

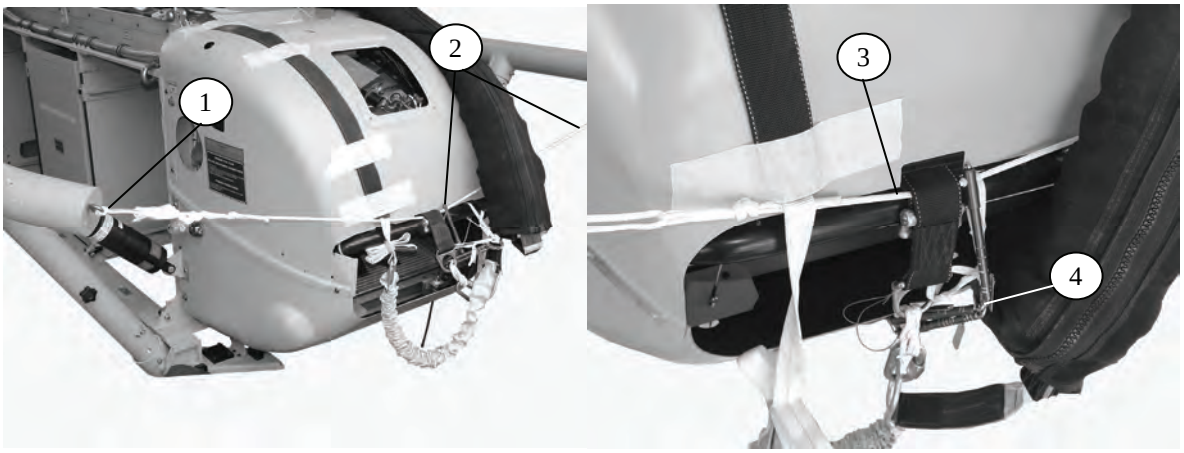
Note. Do not overcome the tension of the elastic lanyard with type III nylon cord.

3. Repeat steps 1 and 2 for the right side brake release making sure the propeller blades are evenly positioned and secured.

Figure 6-6. Propeller Brake Installed

INSTALLING DEFLECTOR LANYARDS

6-7. Install deflector lanyards as shown in Figure 6-7.



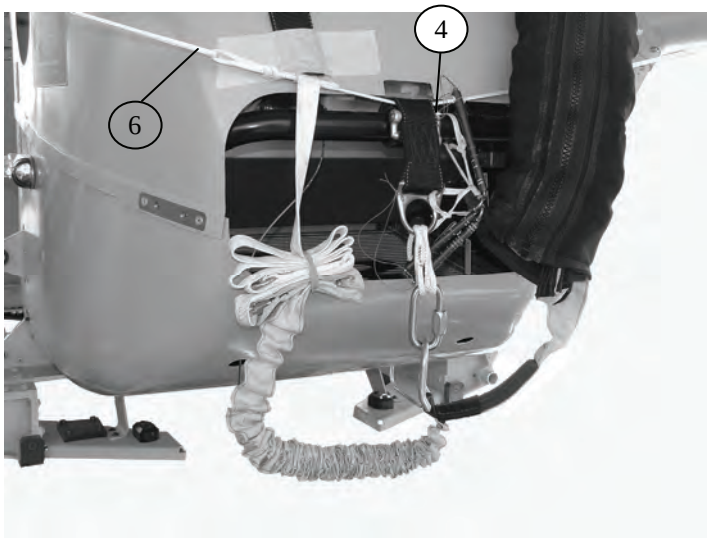
1. Secure the end of a riser deflector lanyard to the left skid front padeye or eyebolt with three alternating half hitches and a knot in the running end.
2. Route the deflector lanyard behind the drogue tube, through the 24 second (E-3) pyrotechnic cutter, between the drogue attachment strap, and behind the locking pin bridle.
3. Attach the opposite end of the deflector lanyard to the right skid front padeye or eyebolt and secure with three alternating half hitches with a knot in the running end.
4. Attach the cutter to a small rapide link, and safety with ticket 5, 8/7 cotton thread to the L-link above the drogue ring. Shown above and on the next page.
5. Route the riser deflector unfinished end through the right deflector overhand loop and secure through the eyebolt using three alternating half hitches with a knot in the running end (not shown).

Figure 6-7. Deflector Lanyard Installed

Note. Tension of the deflector lanyards must not overcome tension supplied by the leg support lanyards.

CAUTION

The deflector must be routed under the drogue tube and the locking pin bridle.



(6) Secure all lanyard loose ends with suitable lengths of masking tape (not shown).

Figure 6-7. Deflector Lanyard Installed (continued)

EQUIPMENT REQUIRED

6-8. Use the equipment listed below in Table 6-1 to rig this load.

Note. Along with the equipment list, it is recommended that an air drop kit with the following contents be added: (Braided Dacron lanyards, pyrotechnic cutters, propeller brakes, masking tape, cotton wadding and ticket 5).

Table 6-1. Equipment Required for Rigging the WSADS Snow Goose.

	Item	*Quantity*
	WSADS Battery Charger	1
	Mission Planner (MP) file created with the MP software	1
	Suitable computer with MP software installed	1
	Flight Termination Device (FTD)	1
	MP cable	1
	WSADS Tool Kit	1
	High Mobility Multipurpose Wheeled Vehicle (HMMWV), fitted with Launch Control Box (LCB) and a mounted Ground Launch Bracket (GLB)	1
	Hand Held Remote Control Unit (HRCU)	1
	Yellow Dispatch Pin	1
	Link, Rapide, medium	1
	Link, Rapide, small	3

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Glossary

AC	Aircraft
AFB	Air Force Base
AFMAN (I)	Air Force Manual Interservice
AFSOC	Air Force Special Operations Command
AFTO	Air Force technical order
AMC	Air Mobility Command
ARC	advanced rescue craft
ARNG	Army National Guard
attn	attention
AGU	Airborne Guidance Unit
C	change
CB	center of balance
CEP	combat expendable platform
CRRC	combat rubber raiding craft
d	penny
DA	Department of the Army
DC	District of Columbia
DD	Department of Defense
diam	diameter
DP	Dispatch Point
EFTC	extraction force transfer coupling
EMM	Engine Management Module
EZ	Electrical Zero
FAA	Federal Aviation Administration
FM	Field Manual
FOD	Foreign Object Debris
ft	foot/feet
FTD	Flight Termination Device
Gal	gallon
GLB	Ground Launch Bracket
GPS	global positioning system
HQ	headquarters
HSLLADS	high-speed, low-level, aerial delivery system
HMMWV	High Mobility Multipurpose Wheeled Vehicle

Hp	Horse Power
HRCU	Hand Held Remote Control Unit
in	inch
JAI	joint airdrop inspector
LAW	light anti-tank weapon
lb	Pound
LCB	Launch Control Box
LPU	life preserver, underarm
LCSM	Life Cycle Sustainment Manager
LOS	Line of Sight
LV	low-velocity
LVAD	low-velocity airdrop
MADS	maritime aerial delivery system
MARS	marine amphibious reconnaissance submersible
MCRP	Marine Corps Reference Publication
mm	millimeter
MMIST	Mist Mobility Integrated Systems Technologies Inc.
MP	Mission Planner
NAVSEA	Naval Sea Systems Command
no	number
NSN	national stock number
NSW RIB	Naval Special Warfare Rigid Inflatable Boat
psi	pounds per square inch
qty	quantity
RAMZ	rigging alternate method zodiac
rqr	requirement
SCUBA	self contained underwater breathing apparatus
sec	second
SOP	standing operating procedure
STS	special tactics squadron
TM	technical manual
TO	technical order
TRADOC	US Army Training and Doctrine Command
UAV	Unmanned Aerial Vehicle
US	United States
USAR	US Army Reserve
w	with
WAPR	water-activated parachute release
WSADS	Wind Supported Aerial Delivery System

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TM 4-48.04 (FM 4-20.142)
MCRP 4-11.3P
NAVSEA SS400-AD-MMO-010
TO 13C7-51-21
6 August 2012

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DISTRIBUTION:
Active Army, Army National Guard, and United States Army Reserve: To be distributed in accordance with the initial distribution number (IDN) 110924, requirements for TM 4-48.04.