CHAPTER 24

SUITABLE SINGLE-POINT RIGGING PROCEDURES FOR MISCELLANEOUS EQUIPMENT

24-1. Introduction

This chapter contains rigging procedures for single-point lift of miscellaneous equipment that is suitable for sling load. Each rigging procedure is found in a paragraph that includes a description of the load, materials required for rigging, and steps to complete the procedure. An applicability paragraph is also a part of each paragraph and identifies the suitable loads. The suitable single-point rigging procedures for miscellaneous equipment are in this section.

Paragraphs 24-2 through 24-6 give detailed instructions for rigging loads.

NOTE: Reach Pendants may be used on all single point loads. A static discharge person is not required when using a Reach Pendant.

24-2. Company Level Field Feeding Kit

a. Applicability. The following items in Table 24-1 are suitable for sling load by all **ARMY** helicopters with suitable lift capacity:

Table 24-1. Company Level Field Feeding Kit

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/REAR	RECOMMENDED AIRSPEED (KNOTS)
Company Level Field Feeding Kit with 8 Cases of T-Rations and Fuel/Water Containers at 75% full	950	A-22 Cargo Bag with one 10K sling leg	3	80

b. Materials. The following materials are required to rig this load:

(1) One sling leg from a 10,000-pound capacity sling set.

(2) Bag, cargo, A-22.

(3) Tape, adhesive, pressure-sensitive, 2-inch wide roll.

(3) Cord, nylon, Type III, 550-pound breaking strength.

(4) Webbing, cotton, 1/4-inch, 80-pound breaking strength.

(6) Skid board, plywood (53 1/2- x 48- x 3/4-inch)

(7) Padding, felt or suitable substitute.

(8) Webbing, nylon, tubular, 1/2-inch, 1000-pound breaking strength..

c. Personnel. Two persons can prepare and rig this load in 30 minutes.

d. Procedures. The following procedures apply to this load:

(1) Preparation. Prepare the load using the following steps:

(a) Drill a 3/4-inch hole along the edge of the plywood skid 8 inches from each corner.

(b) Thread an 8-foot length of 1/2-inch tubular nylon through the holes in each corner from bottom to top. This webbing is used to tie the skid board to the A-22 cargo bag suspension sling.

(c) Position the A-22 cargo bag and cover on top of the skid board. While facing the long side of the skid board, place the heater cabinet with its burner unit in the near left corner, set in about 1/2-inch from either side. Secure the burner to the cabinet frame with Type III nylon cord.

(d) Place the water jugs, toolbox, fire extinguisher, cutting board, tray pack opener, and water sterilizing bag in the heater cabinet. Pad as necessary and close and secure the cover.

(e) Moving counterclockwise, place the stacked pot assembly, including pots and burner, next to the heater cabinet. The burner should be parallel to the long side of the plywood. Place the extra pot cover on the burner before stacking the pot cradle on the stand. Pad between the heater cabinet and pot assembly. Secure the components of the pot assembly together with Type III nylon cord.

(f) Moving counterclockwise, place the two large food transporters in the next corner. The long side should be flush with the long side of the skid board. Place two boxes of T-rations in each transporter.

(g) Place the two gas cans (not stacked) between the food transporters and the pot assembly.

(h) Pad the lantern and place it on top of the gas cans.

(i) Stack the four beverage transporters with the two tall containers on top in the last corner.

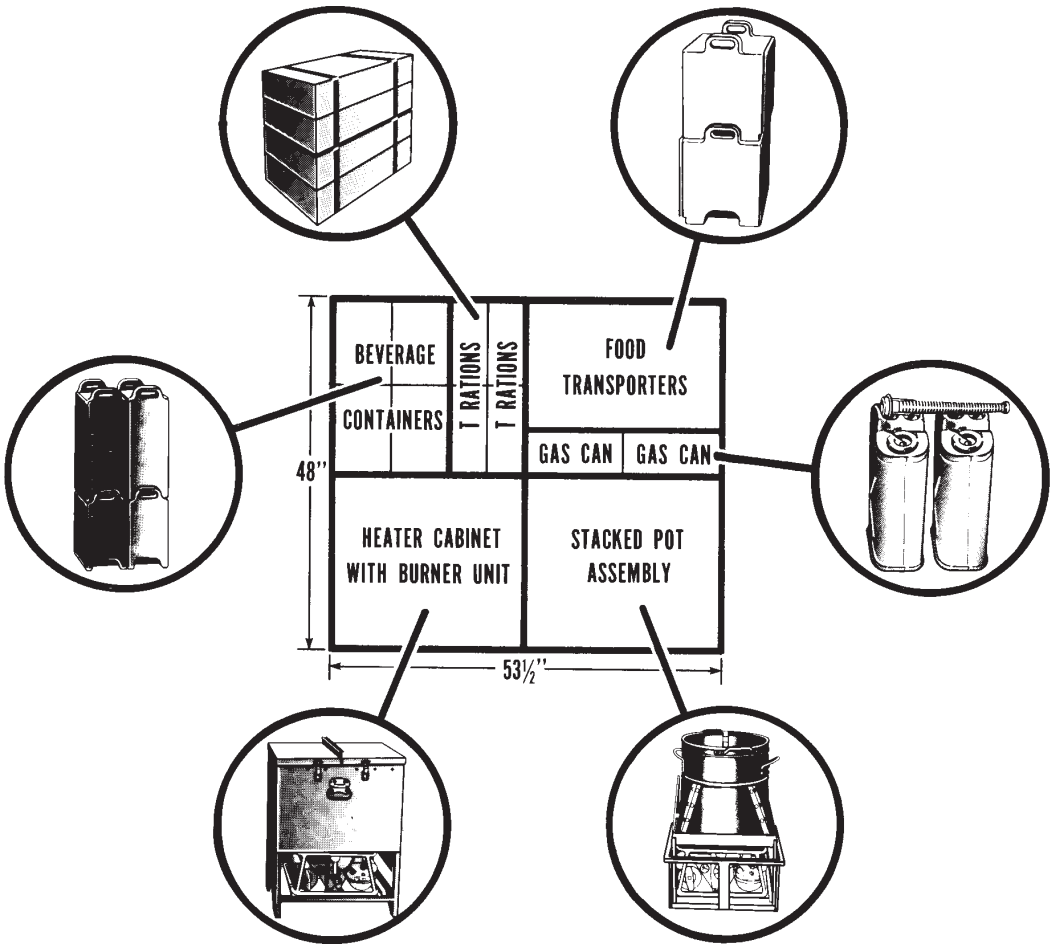
(j) Stack the four boxes of T-rations between the food transporters and the beverage transporters.

(k) Place the table across the heater cabinet and the pot assembly. Level the table with blocks of wood or scrap honeycomb.

(2) Rigging. Rig the load according to the steps in Figure 24-1.

(3) Hookup. The hookup team stands beside the A-22 cargo bag. The static wand person discharges the static electricity with the static wand. The hookup person places the apex fitting onto the aircraft cargo hook. The hookup team then moves clear of the load but remains close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup team quickly exits the area underneath the helicopter to the designated rendezvous point.

(4) Derigging. Derigging is the reverse of the preparation and rigging procedures in steps d (1) and d (2).



RIGGING STEPS

1. Close and secure the A-22 cargo bag in accordance with the procedures in FM 10-450-3.

2. Route the chain end of the 10,000-pound capacity through the suspension clevis of the A-22 cargo bag. Place the correct link from Table 24-1 in the grab hook

Figure 24-1. Company Level Field Feeding Kit

24-3. 350-GPM Pump Assembly

a. Applicability. The following item in Table 24-2 is suitable for sling load by all **ARMY** helicopters with suitable lift capacity:

Table 24-2. 350-GPM Pump Assembly

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/REAR	RECOMMENDED AIRSPEED (KNOTS)
Pump Assembly, 350-GPM	1,165	10K	50/50	60

b. Materials. The following materials are required to rig this load:

(1) Sling set (10,000-pound capacity).

(2) Tape, adhesive, pressure-sensitive, 2-inch wide roll.

(3) Cord, nylon, Type III, 550-pound breaking strength.

(4) Webbing, cotton, 1/4-inch, 80-pound breaking strength.

c. Personnel. Two persons can prepare and rig this load in 10 minutes.

d. Procedures. The following procedures apply to this load:

(1) Preparation. Prepare the load using the following steps:

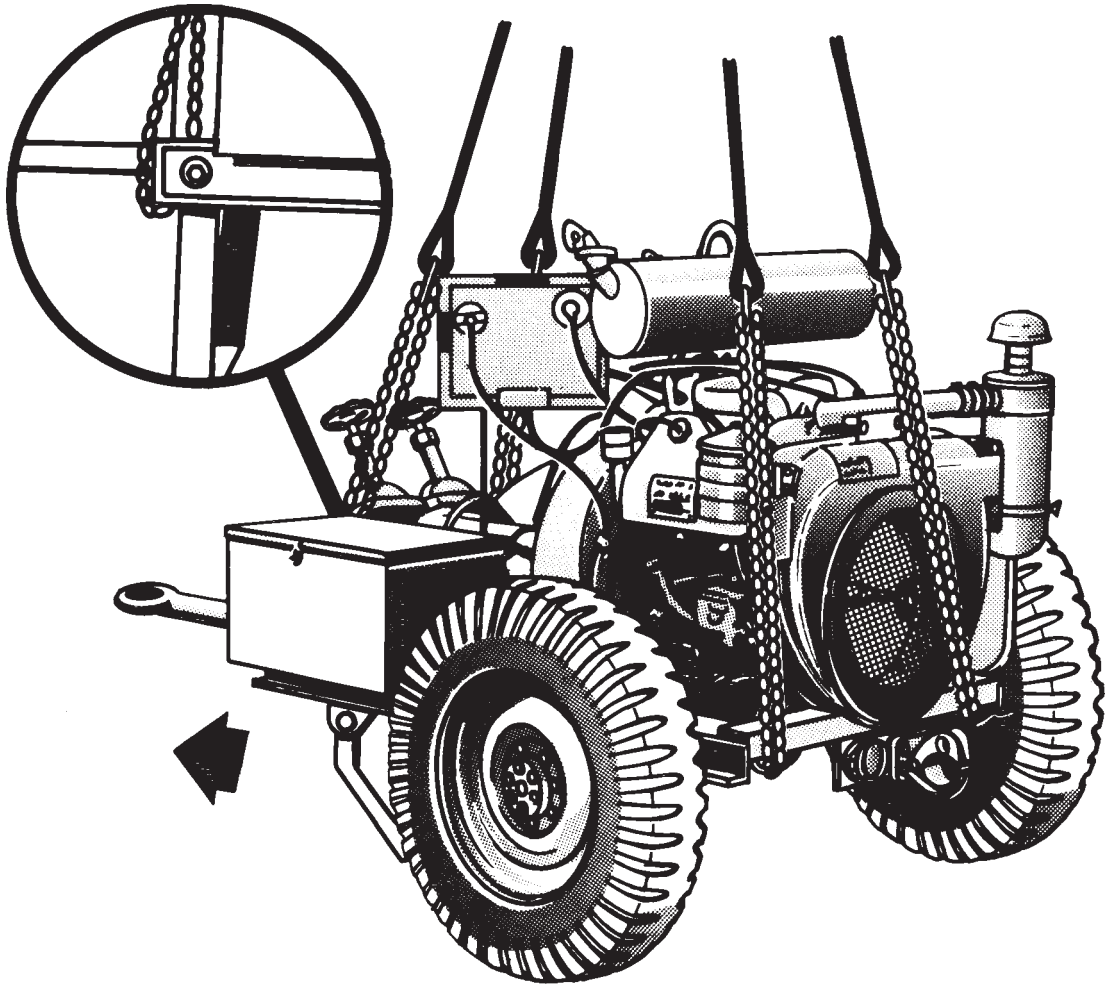
(a) Secure the engine cover and any other loose equipment with Type III nylon cord.

(b) Slide the tow bar all the way in and secure with safety pins.

(2) Rigging. Rig the load according to the steps in Figure 24-2.

(3) Hookup. The hookup team stands beside the pump. The static wand person discharges the static electricity with the static wand. The hookup person places the apex fitting onto the aircraft cargo hook. The hookup team then moves clear of the load but remains close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup team quickly exits the area underneath the helicopter to the designated rendezvous point.

(4) Derigging. Derigging is the reverse of the preparation and rigging procedures in steps d (1) and d (2).



RIGGING STEPS

1. Position apex fitting on top of the pump. Route outer sling legs 1 and 2 to the front of the load and inner sling legs 3 and 4 to the rear. Sling legs 1 and 3 must be on the left side of the load.

2. Loop the chain end of sling leg 1 around the left front corner of the frame and through the rings on the bottom of the frame. Place the correct link from Table 24-2 in the grab hook. Repeat with sling leg 2 and the right front corner of the frame. Secure the excess chain with Type III nylon cord.

3. Loop the chain end of sling leg 3 around the left rear corner of the frame and through the rings on the bottom of the frame. Place the correct link from Table 24-2 in the grab hook. Repeat with sling leg 4 and the right rear corner of the frame. Secure the excess chain with Type III nylon cord.

4. Pull each grab hook up and tie to the top corner of the load. Cluster and tie or tape (breakaway technique) all sling legs together to prevent entanglement during hookup and lift-off.

Figure 24-2. 350 GPM Pump Assembly

24-4. Light Tactical Floating Raft Bridge

a. Applicability. The following items in Table 24-3 are suitable for sling load by all **ARMY** helicopters with suitable lift capacity:

Table 24-3. Light Tactical Floating Raft Bridge

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/REAR	RECOMMENDED AIRSPEED (KNOTS)
M796, 4-Ton Bolster Trailer with Eight Half-Pontoons and Cradle	10,620	25K	3/13	80
Eight Half-Pontoons and Cradle	6,000	10K	3/3	80
LTR Superstructure, Light Bundle	5,250	10K	3/3	80
LTR Superstructure, Medium Bundle	7,000	10K	3/3	80
LTR Superstructure, Heavy Bundle	10,000	25K	3/3	80
Two Motors and Mounting Brackets	1,290	5K Cargo Net	N/A	80

b. Materials. The following materials are required to rig this load:

(1) Bolster trailer with pontoons and cradle:

(a) Sling set (25,000-pound capacity).

(b) Tie-down assemblies (10,000-pound capacity) (6 each).

(c) Tie-down strap, cargo, CGU-1/B (as required)

(d) Webbing, cotton, 1/4-inch.

(e) Tape, adhesive, pressure-sensitive, 2-inch wide roll.

(f) Cord, nylon, Type III.

(2) Pontoons and cradle:

(a) Sling set (10,000-pound capacity).

(b) Tape, adhesive, pressure-sensitive, 2-inch wide roll.

(c) Cord, nylon, Type III.

(d) Webbing, cotton, 1/4-inch.

(3) LTR (light bundle).

(a) Sling set (10,000-pound capacity).

(b) Tape, adhesive, pressure-sensitive, 2-inch wide roll.

(c) Cord, nylon, Type III.

(d) Webbing, cotton, 1/4-inch.

(e) Webbing, nylon, tubular, 1/2-inch.

(f) Panel, deck (4 each).

(g) Panel, filler, deck (8 each).

(h) Panel, filler, short deck (6 each).

(i) Panel, end, ramp (2 each).

(j) Assembly, articulating (2 each).

(k) Curb, normal (4 each).

(l) Curb, short (6 each).

(m) Cable, 5/8-inch, 26-feet long (2 each).

(n) Clamp, cable, 5/8-inch (8 each).

(o) Turnbuckle, 5/8- x 24-inch (2 each).

(4) LTR (medium bundle).

(a) Sling set (10,000-pound capacity).

(b) Tape, adhesive, pressure-sensitive, 2-inch wide roll.

(c) Cord, nylon, Type III.

(d) Webbing, cotton, 1/4-inch.

(e) Webbing, nylon, tubular, 1/2-inch.

(f) Panel, deck (6 each).

(g) Panel, filler, deck (6 each).

(h) Panel, filler, short deck (2 each).

(i) Panel, end, ramp (4 each).

(j) Curb, normal (6 each).

(k) Curb, short (4 each).

(l) Cable, 5/8-inch, 26-feet long (2 each).

(m) Clamp, cable, 5/8-inch (8 each).

(n) Turnbuckle, 5/8- x 24-inch (2 each).

(5) LTR (heavy bundle).

(a) Sling set (25,000-pound capacity).

(b) Tape, adhesive, pressure-sensitive, 2-inch wide roll.

(c) Cord, nylon, Type III.

(d) Webbing, cotton, 1/4-inch.

(e) Webbing, nylon, tubular, 1/2-inch.

(f) Panel, deck (8 each).

(g) Panel, filler, deck (16 each).

(h) Panel, filler, short deck (12 each).

(i) Panel, end, ramp (4 each).

(j) Curb, normal (8 each).

(k) Curb, short (12 each).

(l) Cable, 5/8-inch, 40-feet long (2 each).

(m) Clamp, cable, 5/8-inch (8 each).

(n) Turnbuckle, 5/8- x 24-inch (2 each).

(o) Assembly, articulating (4 each).

(6) Two motors and mounting brackets:

(a) Net, cargo (5,000-pound capacity).

(b) Tape, adhesive, pressure-sensitive, 2-inch wide roll.

(c) Cord, nylon, Type III.

(d) Webbing, cotton, 1/4-inch.

(e) Webbing, nylon, tubular, 1/2-inch.

c. Personnel. Eleven persons can prepare and rig these loads in the following time:

(1) Bolster trailer with pontoons and cradle, 30 minutes.

(2) Pontoons and cradle, 20 minutes.

(3) LTR (light bundle), 20 minutes.

(4) LTR (medium bundle), 25 minutes.

(5) LTR (heavy bundle), 30 minutes.

(6) Two motors and mounting brackets, 10 minutes.

d. Procedures. The following procedures apply to these loads:

(1) Preparation. Prepare the loads using the following steps:

(a) Bolster trailer with pontoons and cradle:

1. Secure the pontoons on the cradle and trailer according to the operator's manual.

2. Secure both sides of the cradle to the trailer with tie-downs.

3. Under the bottom pontoon and on top of the cradle, secure the cradle to the trailer by wrapping one tie-down strap

around the cradle and trailer frame at each side of the load in the vicinity of the rear wheels. Repeat this procedure at the forward wheels.

(b) Pontoons and cradle: Secure the pontoons to the cradle according to the operator's manual.

(c) LTR superstructure (light bundle):

1. Place two timbers on the ground as shoring approximately 6 feet apart.

2. Lay both cables on the ground parallel to and on the outside of the timbers.

3. Stack the four deck panels on the timbers. Face the deckplates of the bottom and third panels down and the second and top panels up. All male ends must be in the same direction.

4. Connect the two articulating assemblies and place them on top of the stack of deck panels.

5. Place two end ramp panels, butt end to butt end, on top of the articulating assemblies.

6. Place six deck filler panels in the space between the bottom and second deck panels.

7. Place remaining two deck filler panels, six short deck filler panels, and six short curbs in the space between the third and top deck panels.

8. Place the four normal curbs in the space between the top deck panel and the articulating assemblies.

9. Close off the ends of the deck panels and articulating assemblies by lacing 1/2-inch tubular nylon webbing across the ends of the stack.

10. Bring cables up over load, route each end through the turnbuckle, secure each end with two cable clamps, and tighten turnbuckle.

CAUTION
Do not over tighten the cables as damage to the load will occur.

11. Tie the two cables together with 1/2-inch tubular nylon webbing.

(d) LTR superstructure (medium bundle):

1. Place two timbers on the ground as shoring approximately 6 feet apart.

2. Lay both cables on the ground parallel to and on the outside of the timbers.

3. Stack two parallel sets of deck panels, three panels high, with male ends facing in same direction.

4. Place two end ramp panels, butt end to butt end, on top of each stack of deck panels.

5. Place deck filler panels between deck panels.

6. Close off ends of deck panels by lacing 1/2-inch tubular nylon webbing across ends of stacks.

7. Place three normal curbs on each side of load, alternating short curbs in between the normal curbs.

8. Bring cables up over load, route each end through turnbuckle, secure each end with two cable clamps, and tighten turnbuckle.

CAUTION
Do not over tighten the cables as damage to the load will occur.

9. Tie each short curb to the turnbuckle with nylon webbing.

10. Tie the two cables together with 1/2-inch tubular nylon webbing.

(e) LTR superstructure (heavy bundle):

1. Place two timbers on the ground as shoring approximately 6 feet apart.

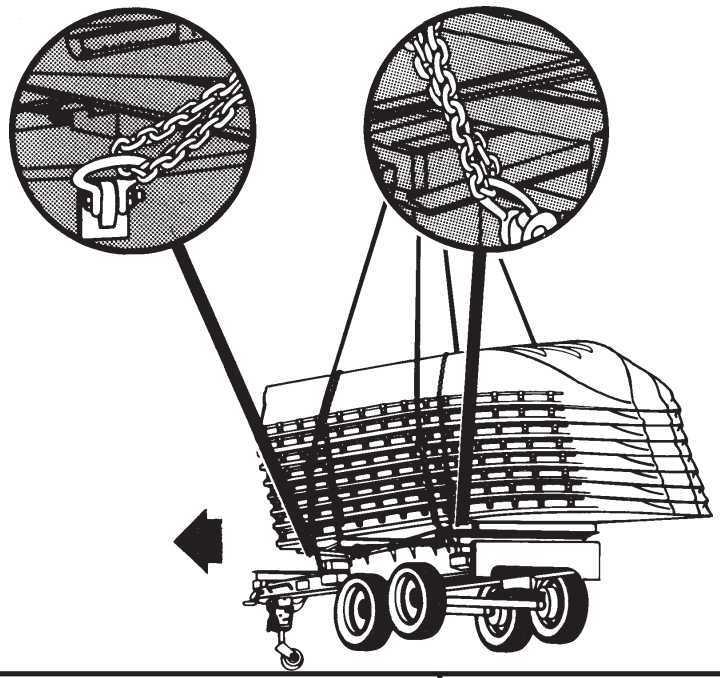
2. Lay both cables on the ground parallel to and on the outside of the timbers.

3. Configure two light bundle stacks side-by-side and secure each end of the load with cables.

(2) Rigging. Rig the load according to the steps in Figure 24-3.

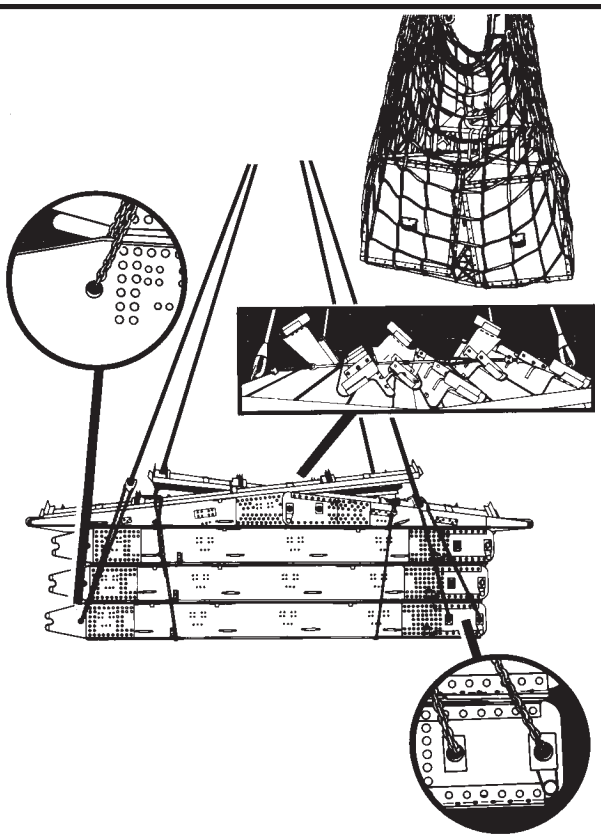
(3) Hookup. The hookup team stands on top of the pontoons, on top of the superstructure bundles, or alongside the cargo net, depending on the load. The static wand person discharges the static electricity with the static wand. The hookup person places the apex fitting onto the aircraft cargo hook. The hookup team then moves clear of the load but remains close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup team quickly exits the area underneath the helicopter to the designated rendezvous point.

(4) Derigging. Derigging is the reverse of the preparation and rigging procedures in steps d (1) and d (2).



RIGGING STEPS-BOLSTER TRAILER	RIGGING STEPS CRADLE AND PONTOONS ONLY
1. Position apex fitting on top of the pontoons. Route outer sling legs 1 and 2 to the front of the trailer and inner sling legs 3 and 4 to the rear. Sling legs 1 and 3 must be on the left side of the load.	**1.** Position apex fitting on top of the pontoons. Route outer sling legs 1 and 2 to the front of the trailer and inner sling legs 3 and 4 to the rear. Sling legs 1 and 3 must be on the left side of the load.
2. Loop the chain end of sling leg 1 through the left front lift provision mounted on the left front corner of the frame. Place the correct link from Table 24-3 in the grab hook. Repeat with sling leg 2 and the right front corner of the trailer.	**2.** Loop the chain end of sling leg 1 through the left front lift provision located on the cross beam of the cradle. Place the correct link from Table 24-3 in the grab hook. Repeat with sling leg 2 and the right front lift provision.
3. Loop the chain end of sling leg 3 through the left rear lift provision mounted on the left rear corner of the trailer. Place the correct link from Table 24-3 in the grab hook. Repeat with sling leg 4 and the right rear corner of the trailer. Secure the excess chain with Type III nylon cord.	**3.** Loop the chain end of sling leg 3 through the left rear lift provision located on the cross beam of the cradle. Place the correct link from Table 24-3 in the grab hook. Repeat with sling leg 4 and the right rear lift provision.
4. Pull each grab hook up and tie to one of the boat rails with 1/4-inch cotton webbing. Cluster and tie or tape (breakaway technique) all sling legs together to prevent entanglement during hookup and lift-off.	**4.** Pull each grab hook up and tie to one of the boat rails with 1/4-inch cotton webbing. Cluster and tie or tape (breakaway technique) all sling legs together to prevent entanglement during hookup and lift-off.

Figure 24-3. Light Tactical Floating Raft Bridge



RIGGING STEPS- LTR (LIGHT, MEDIUM, & HEAVY)	RIGGING STEPS- MOTORS & BRACKETS
1. Position apex fitting on top of the load. Route outer sling legs 1 and 2 to the female end of the deck panels and inner sling legs 3 and 4 to the male ends. Sling legs 1 and 3 must be on the left side of the load. **2.** Loop the chain end of sling leg 1 through the inside hole and back out through the outside hole of the bottom deck panel. Place the correct link from Table 24-3 in the grab hook. Repeat with sling leg 2 on the opposite side of the load. **3.** Loop the chain end of sling leg 3 through the hole at the male end of the bottom deck panel. Place the correct link from Table 24-3 in the grab hook. Repeat with sling leg 4 on the opposite side of the load. **4.** Remove the safety pins and place them in the boat motor box or safety tie them with Type III nylon cord. **5.** Cluster and tie or tape (breakaway technique) all sling legs together to prevent entanglement during hookup and lift-off.	**1.** Spread the 5,000-pound capacity cargo net on the ground. **2.** Secure the motors, pins, paddles, and miscellaneous items in the containers. Secure the lid closed with Type III nylon cord. **3.** Center the containers on the cargo net. **4.** Place the mounting brackets on top of the containers. **5.** Rig and close the cargo net in accordance with FM 10-450-3.

Figure 24-3. Light Tactical Floating Raft Bridge (continued)

24-5. Medium-Span Bridge

a. Applicability. The following item in Table 24-4 is suitable for sling load by all **ARMY** helicopters with suitable lift capacity:

Table 24-4. Medium-Span Bridge

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/REAR	RECOMMENDED AIRSPEED (KNOTS)
Bridge Erection Set, Medium Girder Section	13,800	25K	5/5	60

b. Materials. The following materials are required to rig this load:

(1) Sling set (25,000-pound capacity).

(2) Multiloop line, Type XXVI nylon, 12-foot, 4-loop (4 each).

(3) Tape, adhesive, pressure-sensitive, 2-inch wide roll.

(4) Cord, nylon, Type III, 550-pound breaking strength.

(5) Webbing, cotton, 1/4-inch, 80-pound breaking strength.

(6) Padding, felt or suitable substitute.

(7) Clevis, large (4 each).

(8) Tie-down strap, cargo, CGU-1/B (as required).

c. Personnel. Six persons can prepare and rig this load in 30 minutes.

d. Procedures. The following procedures apply to this load:

(1) Preparation. Prepare the load using the following steps:

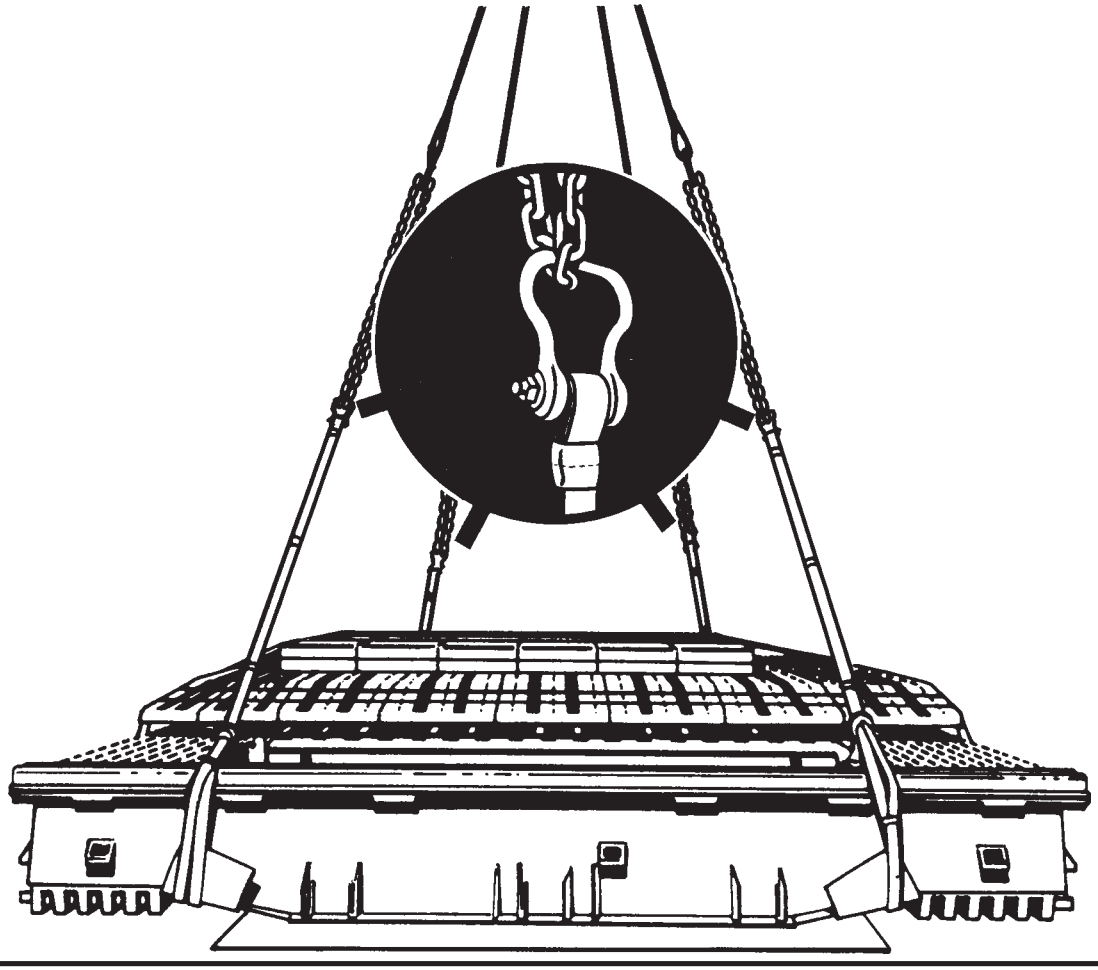
(a) Position the ramp sections on top of the bridge main structure. Secure with tie-down straps.

(b) Secure the four pieces of padding on the bottom side at each corner where the nylon straps are choker-hitched.

(2) Rigging. Rig the load according to the steps in Figure 24-4.

(3) Hookup. The hookup team stands on top of the bridge center. The static wand person discharges the static electricity with the static wand. The hookup person places the apex fitting onto the aircraft cargo hook. The hookup team then moves clear of the load but remains close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup team quickly exits the area underneath the helicopter to the designated rendezvous point.

(4) Derigging. Derigging is the reverse of the preparation and rigging procedures in steps d (1) and d (2).



RIGGING STEPS

1. Position apex fitting on top of the bridge. Route outer sling legs 1 and 2 to the front of the load and inner sling legs 3 and 4 to the rear. Sling legs 1 and 3 must be on the left side of the load.

2. Choker-hitch a 12-foot, 4-loop, Type XXVI nylon sling through the opening in each corner of the bridge.

3. Insert a large clevis in the running end of each 12-foot sling. Ensure the bolt runs through the sling and the nut is tight on the bolt.

4. Loop the chain end of sling leg 1 through the large clevis on the 12-foot sling on the front left corner of the bridge . Place the correct link from Table 24-4 in the grab hook. Repeat with sling leg 2 and the right front corner of the bridge.

5. Loop the chain end of sling leg 3 through the large clevis on the 12-foot sling on the rear left corner of the bridge . Place the correct link from Table 24-4 in the grab hook. Repeat with sling leg 4 and the right rear corner of the bridge.

6. Cluster and tie or tape (breakaway technique) all sling legs together to prevent entanglement during hookup and lift-off.

Figure 24-4. Medium-Span Bridge

24-6. M4T6 Bridge

a. Applicability. The following item in Table 24-5 is suitable for sling load by all **ARMY** helicopters with suitable lift capacity:

Table 24-5. Medium-Span Bridge

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/REAR	RECOMMENDED AIRSPEED (KNOTS)
Bridge, Floating, Aluminum, Highway Type, Deck-Balk Superstructure on Pneumatic Floats, M4T6	9,000	25K	4/4	50

b. Materials. The following materials are required to rig this load:

(1) Sling set (25,000-pound capacity).

(2) Tape, adhesive, pressure-sensitive, 2-inch wide roll.

(3) Cord, nylon, Type III, 550-pound breaking strength.

(4) Webbing, cotton, 1/4-inch, 80-pound breaking strength.

c. Personnel. Two persons can prepare and rig this load in 10 minutes.

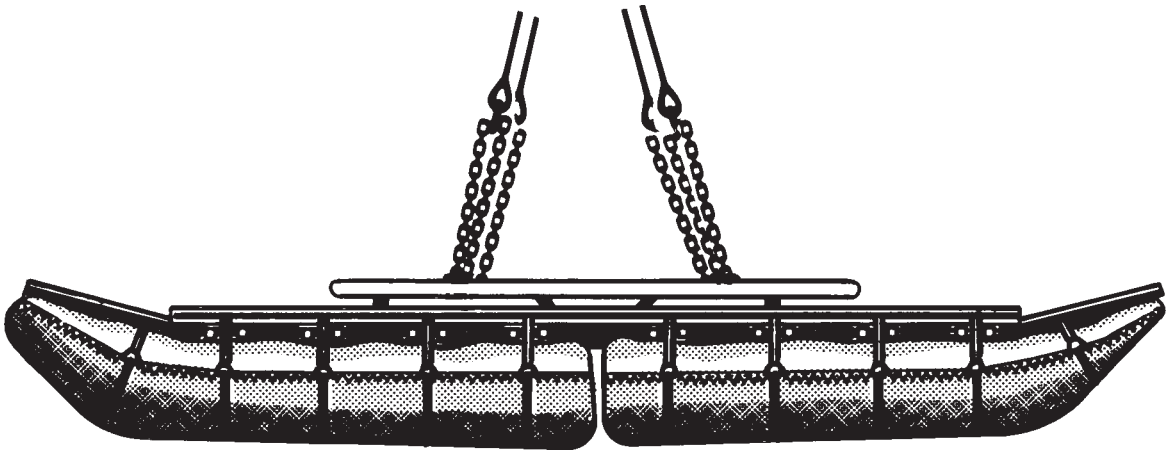
d. Procedures. The following procedures apply to this load:

(1) Preparation. Ensure all components are securely attached together.

(2) Rigging. Rig the load according to the steps in Figure 24-5.

(3) Hookup. The hookup team stands on top of the bridge. The static wand person discharges the static electricity with the static wand. The hookup person places the apex fitting onto the aircraft cargo hook. The hookup team then moves clear of the load but remains close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup team quickly exits the area underneath the helicopter to the designated rendezvous point.

(4) Derigging. Derigging is the reverse of the preparation and rigging procedures in steps d (1) and d (2).



RIGGING STEPS

1. Position apex fitting on top of the center of the bridge. Route outer sling legs 1 and 2 to the forward end of the balk connecting stiffener and inner sling legs 3 and 4 to the rear. Sling legs 1 and 3 must be on the left side of the load.

2. Loop the chain end of sling leg 1 around the seventh balk connection pin from the forward end on the left balk connecting stiffener. Place the correct link from Table 24-5 in the grab hook. Repeat with sling leg 2 and the seventh connection pin from the forward end of the right balk stiffener.

3. Loop the chain end of sling leg 3 around the seventh balk connection pin from the rear end on the left balk connecting stiffener. Place the correct link from Table 24-5 in the grab hook. Repeat with sling leg 4 and the seventh connection pin from the rear end of the right balk stiffener.

4. Cluster and tie or tape (breakaway technique) all sling legs together to prevent entanglement during hookup and lift-off.

Figure 24-5. M4T6 Bridge