

## CHAPTER 9

### CERTIFIED SINGLE-POINT RIGGING PROCEDURES FOR LIQUID CONTAINERS

#### 9-1. INTRODUCTION

This chapter contains rigging procedures for single-point lift of liquid containers that have been certified 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 certified loads. The certified single-point rigging

procedures for liquid containers are in this section. Paragraphs 9-2 through 9-6 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.**

#### 9-2. Lightweight Collapsible Fabric Tank

**a. Applicability.** The following item in Table 9-1 is certified for all helicopters with suitable lift capacity by the US Army Natick Research, Development, and Engineering Center:

**Table 9-1. Lightweight Collapsible Fabric Tank**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/REAR	RECOMMENDED AIRSPEED (KNOTS)
Tank, Fabric, Lightweight Collapsible, 160 gallon	1,400	5,000-pound capacity net	N/A	N/A

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

- (1) Net, cargo (5,000-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 15 minutes.

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

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

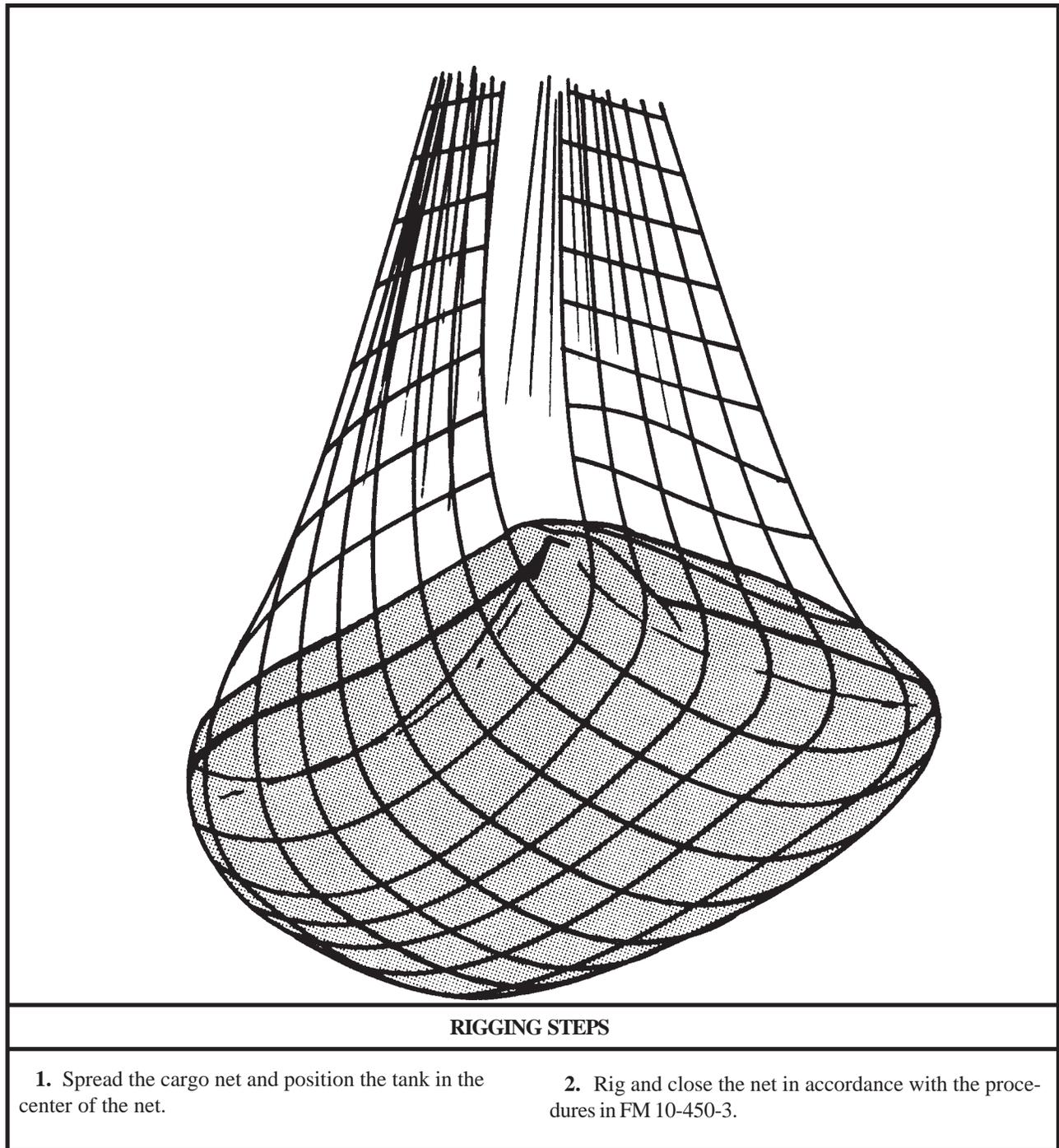
(a) Inspect the net in accordance with the inspection procedures in FM 10-450-3.

(b) Ensure all sharp edges on the tank are protected.

(2) **Rigging.** Rig the load according to the steps in Figure 9-1.

(3) **Hookup.** The hookup team stands alongside 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).



*Figure 9-1. Lightweight Collapsible Fabric Tank*

### 9-3. One to Four 500-Gallon Fuel Drums

**a. Applicability.** The following items in Table 9-2 are certified for all helicopters with suitable lift capacity by the US Army Natick Research, Development, and Engineering Center:

**Table 9-2. One to Four 500-Gallon Fuel Drums**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/REAR	RECOMMENDED AIRSPEED (KNOTS)
Drum, Fabric, Fuel, 500-gallon (1 each)	4,200	10K	3/3	80
Drum, Fabric, Fuel, 500-gallon (2 each)	8,400	10K	3/3	80
Drum, Fabric, Fuel, 500-gallon (3 each)	12,600	25K	3/55	80
Drum, Fabric, Fuel, 500-gallon (4 each)	16,800	25K	3/3	80

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

- (1) Sling set (10,000 or 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 5 to 15 minutes.

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

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

(a) Align the drums side by side in a row.

(b) Ensure the lifting clevises are serviceable.

(c) Rotate the drum hub so a clevis is in the top position.

(2) **Rigging.** Rig the load according to the steps in Figure 9-2.

(3) **Hookup.** The hookup team stands alongside 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).

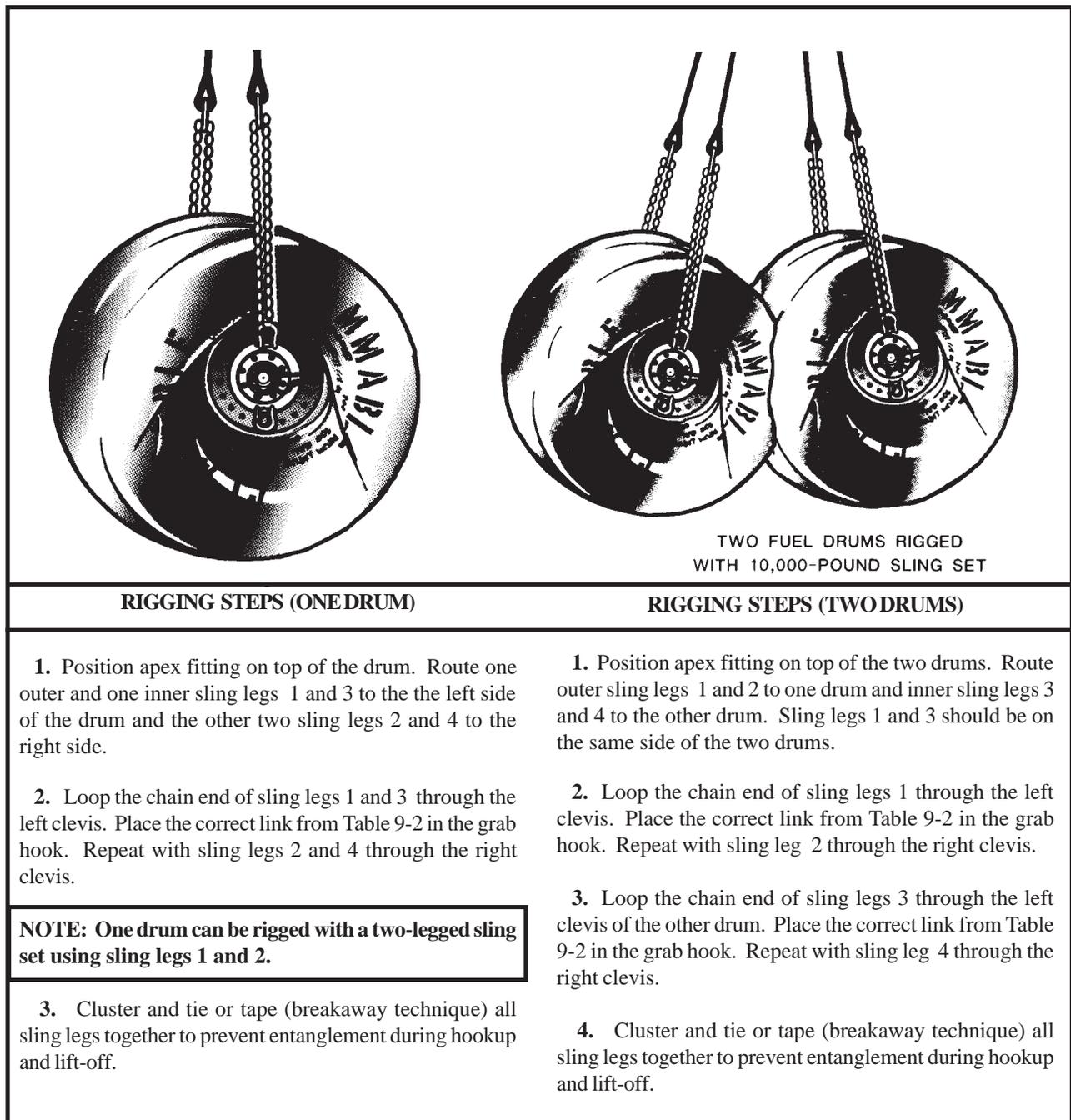


Figure 9-2. One to Four 500-Gallon Fuel Drums

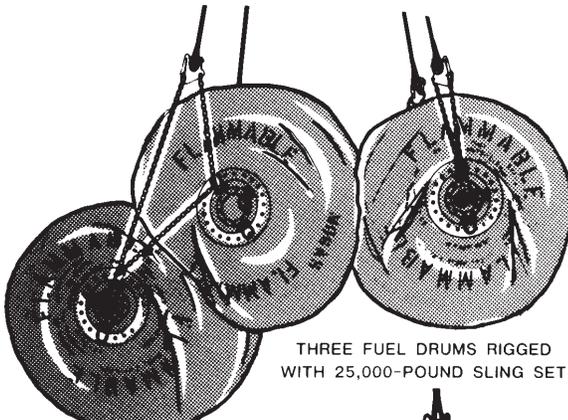
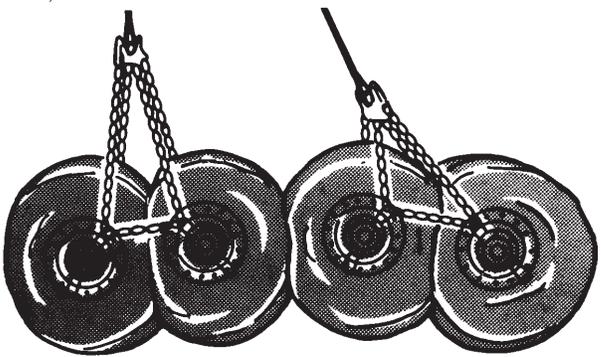
 <p>THREE FUEL DRUMS RIGGED WITH 25,000-POUND SLING SET</p>  <p>FOUR FUEL DRUMS RIGGED WITH 25,000-POUND SLING SET</p>	
RIGGING STEPS (THREE DRUMS)	RIGGING STEPS (FOUR DRUMS)
<ol style="list-style-type: none"> <li>1. Position apex fitting on top of the center drum. Route outer sling legs 1 and 2 to the middle drum and inner sling legs 3 and 4 to an outer drum. Sling legs 1 and 3 should be on the same side of the three drums.</li> <li>2. Loop the chain end of sling leg 1 through the clevis on the left hub of the middle drum, through the clevis on the left side of one of the outer drums. Place the correct link from Table 9-2 in the grab hook. Repeat with sling leg 2 through the clevises on the right side of the two drums.</li> <li>3. Loop the chain end of sling leg 3 through the clevis on the left hub of the outer drum not yet connected. Place the correct link from Table 9-2 in the grab hook. Repeat with sling leg 4 through the right side of the drum.</li> <li>4. Cluster and tie or tape (breakaway technique) all sling legs together to prevent entanglement during hookup and lift-off.</li> </ol>	<ol style="list-style-type: none"> <li>1. Position the apex fitting on the top of the drums. route outer sling legs 1 and 2 to two drums and inner sling legs 3 and 4 to the other two drums. Sling legs 1 and 3 should be on the same side of the load.</li> <li>2. Loop the chain end of sling leg 1 through the clevis on the left hub of one drum, over and through the clevis of the second drum. Place the correct link from Table 9-2 in the grab hook. Repeat with sling leg 2 through the other side of the the two drums.</li> <li>3. Loop the chain end of sling leg 3 through the clevis on the left hub of one of the other drums, over and through the clevis of the second drum. Place the correct link from Table 9-2 in the grab hook. Repeat with sling leg 4 through the other side of the two drums.</li> <li>4. Cluster and tie or tape (breakaway technique) all sling legs together to prevent entanglement during hookup and lift-off.</li> </ol>

Figure 9-2. One to Four 500-Gallon Fuel Drums (continued)

## 9-4. Six 500-Gallon Fuel Drums, Empty

**a. Applicability.** The following item in Table 9-3 is certified for all helicopters with suitable lift capacity by the US Army Natick Research, Development, and Engineering Center:

**CAUTION**  
**One to five empty fuel drums are not a stable load and are not certified for sling loading. One to five empty fuel drums may cause damage to the aircraft and endanger the aircrew due to violent oscillations and inherent instability.**

Table 9-3. Six 500-Gallon Fuel Drums, Empty

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/REAR	RECOMMENDED AIRSPEED (KNOTS)
Drum, Fabric, Fuel, 500-gallon, Empty (6 each)	4,500	10K	3/3/14	90

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

- (1) Sling set (10,000-pound capacity), with two additional sling leg assemblies.
- (2) Tape, adhesive, pressure-sensitive, 2-inch wide roll.
- (3) Webbing, tubular, nylon, 1/2-inch.
- (4) Cord, nylon, Type III, 550-pound breaking strength.
- (5) Webbing, cotton, 1/4-inch, 80-pound breaking strength.

**c. Personnel.** Four persons can prepare and rig this load in 20 minutes.

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

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

(a) Align the drums side by side in a row.

(b) Ensure the lifting clevises are serviceable and secure.

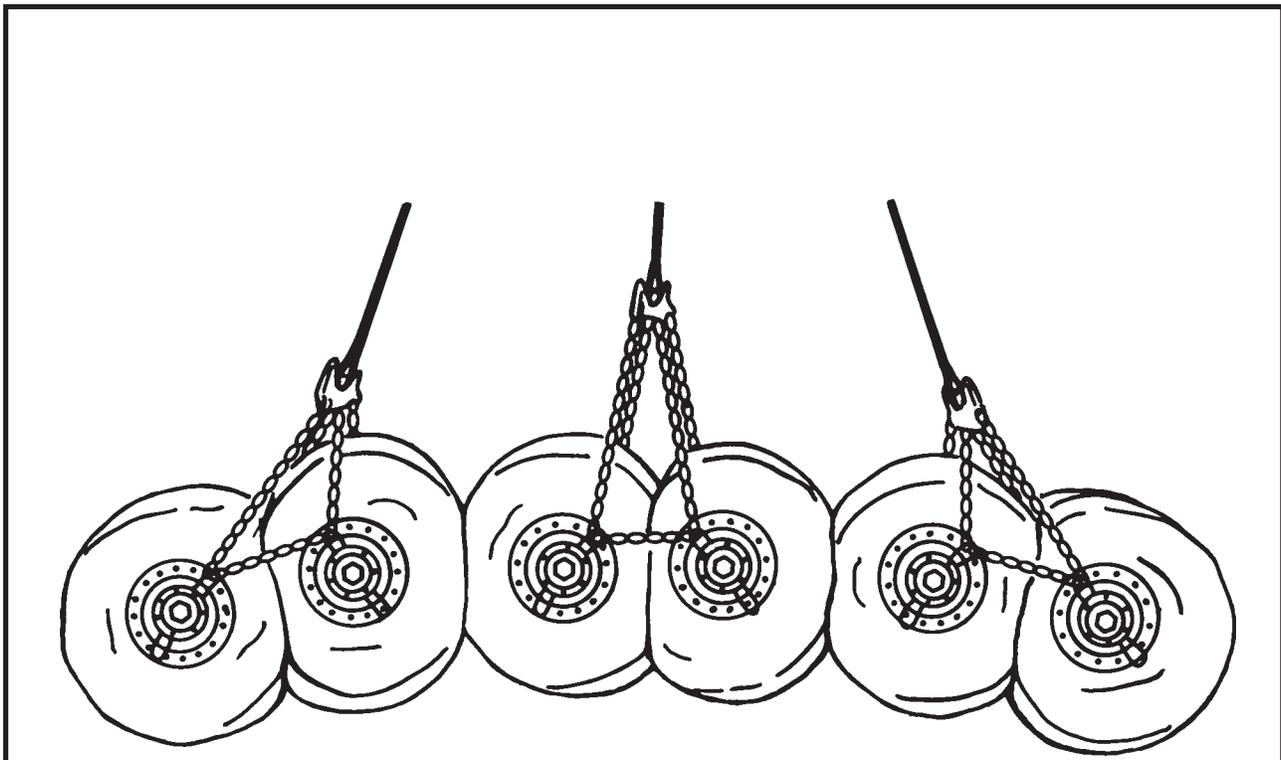
(c) Rotate the drum hub so a clevis is in the top position.

(d) Assemble a six-leg sling set in accordance with the procedures in FM 10-450-3.

(2) **Rigging.** Rig the load according to the steps in Figure 9-3.

(3) **Hookup.** The hookup team stands alongside 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

1. Route outer sling legs 1 and 2 to the forward outer drum, middle sling legs 3 and 4 to the rearward outer drum, and inner sling legs 5 and 6 to the two center drums.

2. Loop the chain end of sling leg 1 through the left clevis on the outer drum and through the left clevis of the next inner drum. Place the correct link from Table 9-3 in the grab hook. Repeat with sling leg 2 on the right side of the two drums.

3. Loop the chain end of sling leg 3 through the left clevis on the other outer drum and through the left clevis of the next inner drum. Place the correct link from Table 9-3 in the grab hook. Repeat with sling leg 4 on the right side of the two drums.

4. Loop the chain end of sling leg 5 through the left clevis on the two center drums. Place the correct link from

Table 9-3 in the grab hook. Repeat with sling leg 6 on the right side of the two center drums. Secure excess chain with wide tape or nylon cord.

5. Sling legs 1, 3, and 5 should be on the left side of the load.

**NOTE: At this point, you have effectively rigged three individual, 2-leg sling loads under one apex fitting. Now you must unite the three pairs of drums.**

6. Loop a length of tubular nylon through the clevis assemblies on each side of the load. Tighten as securely as possible.

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

Figure 9-3. Six 500-Gallon Fuel Drums, Empty

## 9-5. Storage Module, Fuel/Water, Six Compartment Container (SIXCON), Individual

**a. Applicability.** The following item in Table 9-4 is certified for all helicopters with suitable lift capacity by the US Army Natick Research, Development, and Engineering Center:

**NOTE: This load is certified at the FULL weight only.**

**Table 9-4. Storage Module, Fuel/Water, Six Compartment Container (SIXCON), Individual**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/REAR	RECOMMENDED AIRSPEED (KNOTS)
Storage Module, Fuel/Water, Six Compartment Container (SIXCON), Individual	10,000	15K	3/3	100

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

- (1) Sling set (15,000-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.** Four persons can prepare and rig this load in 5 minutes.

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

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

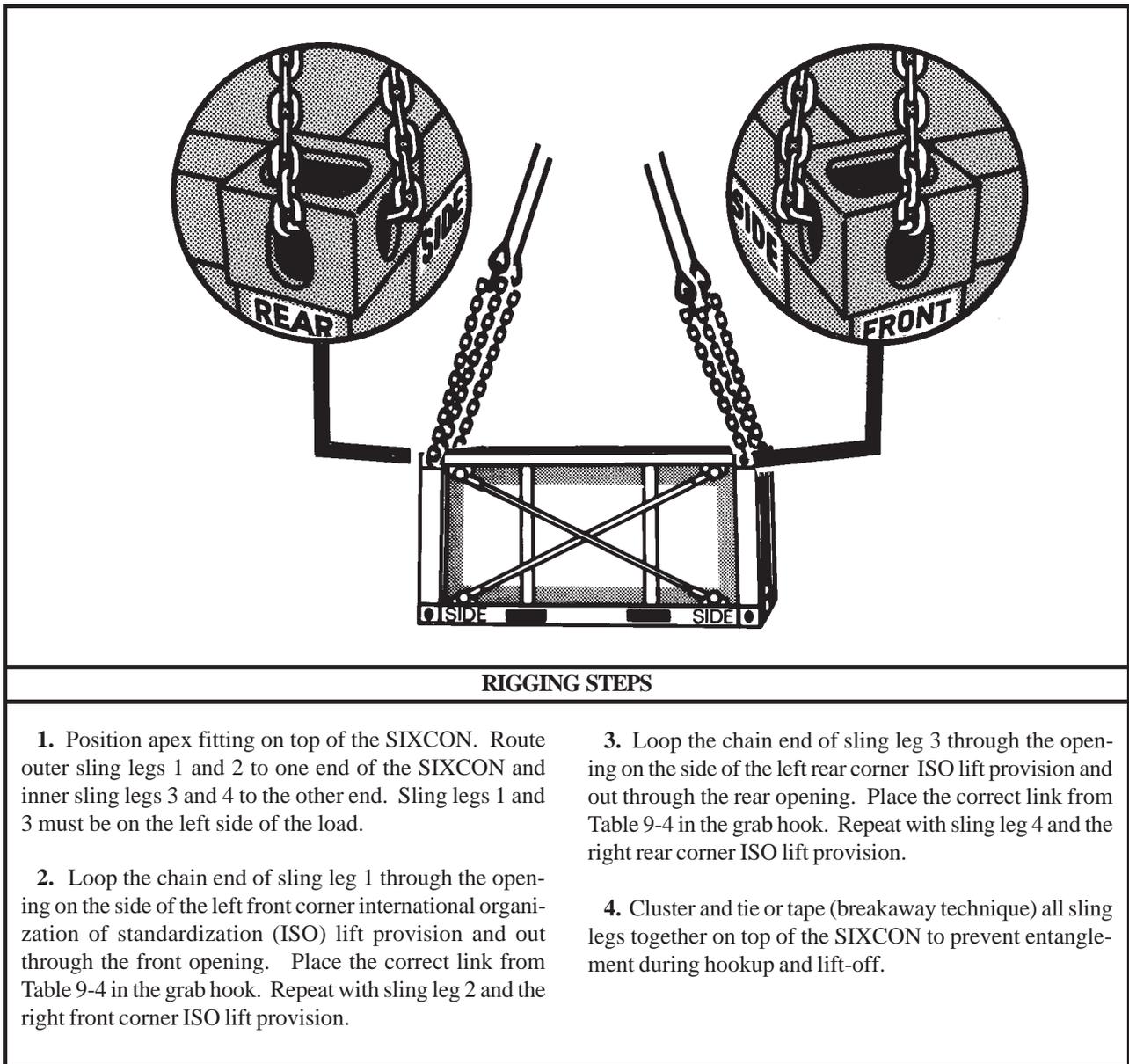
(a) Ensure the storage tank is completely full.

(b) Secure all hatches, hoses, valves, and loose equipment.

(2) **Rigging.** Rig the load according to the steps in Figure 9-4.

(3) **Hookup.** The hookup team stands on top of the SIXCON. 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).



*Figure 9-4. Storage Module, Fuel/Water, Six Compartment Container (SIXCON), Individual*

## 9-6. Two Storage Modules, Fuel/Water, Six Compartment Container (SIXCON), (Stacked)

**a. Applicability.** The following item in Table 9-5 is certified for all helicopters with suitable lift capacity by the US Army Natick Research, Development, and Engineering Center:

**NOTE: This load is certified at the FULL weight only.**

**Table 9-5. Two Storage Modules, Fuel/Water, Six Compartment Container (SIXCON), (Stacked)**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/REAR	RECOMMENDED AIRSPEED (KNOTS)
2 Storage Modules, Fuel/Water, Six Compartment Container (SIXCON), Stacked	20,100	40K	3/3	110

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

- (1) Sling set (40,000-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.** Four persons can prepare and rig this load in 15 minutes.

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

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

- (a) Position the two SIXCONs on top of each other. Ensure the ISO vertical corner connectors are properly secured.

(b) Tape the pins in the ISO vertical corner connectors.

(c) Ensure the storage tanks are completely full.

(d) Secure all hatches, hoses, valves, and loose gear.

**(2) Rigging.** Rig the load according to the steps in Figure 9-5.

**(3) Hookup.** The hookup team stands on top of the SIXCONs. 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).

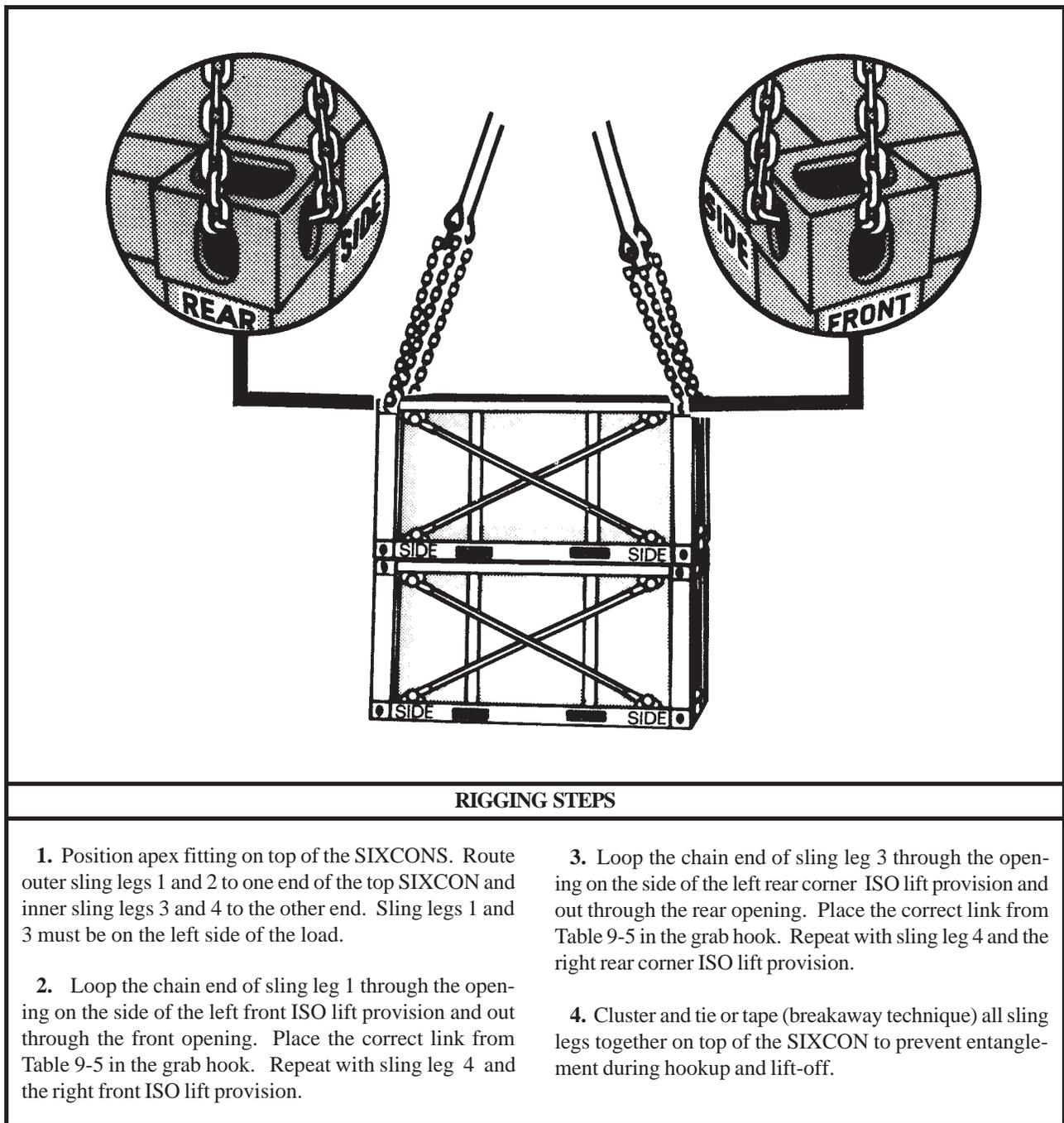


Figure 9-5. Two Storage Modules, Fuel/Water, Six Compartment Container (SIXCON), (Stacked)

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