

## CHAPTER 7

### CERTIFIED DUAL-POINT RIGGING PROCEDURES FOR MISSILE SYSTEMS

#### 7-1. INTRODUCTION

This chapter contains rigging procedures for dual-point missile system loads 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 dual-point rigging

procedures for missile system loads are in this section. Paragraphs 7-2 through 7-13 give detailed instructions for rigging loads.

**NOTE: Reach Pendants may be used on dual point loads. Place a Reach Pendant on each apex fitting. A static discharge person is not required when using a Reach Pendant.**

#### 7-2. M54A1/M54A2 Chaparral Launch Station

**a. Applicability.** The following items in Table 7-1 are certified for the helicopter(s) listed in the following table by the US Army Soldier Systems Center:

**Table 7-1. M54A1/M54A2 Chaparral Launch Station**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/ REAR	TYPE OF AIRCRAFT	RECOMMENDED AIRSPEED (KNOTS)
M54A1 Launch Station	13,000	25K	3/3	CH-47	100
M54A2 Launch Station	13,000	25K	3/3	CH-47	100

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

- (1) Sling set (25,000-pound capacity) with one additional apex fitting.
- (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 20 minutes.

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

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

- (a) Prepare the launch station for sling loading in accordance with TM 9-1425-2585-10-1.
- (b) Rotate the missile pedestal 90 degrees from the centerline to avoid sling interference.

**(2) Rigging.** Rig the load according to the steps in Figure 7-1.

**(3) Hookup.** Two hookup teams are required for this load. The hookup teams stand on the back of the gunner's compartment. The static wand person discharges the static electricity with the static wand. The forward hookup person places apex fitting 1 onto the forward cargo hook. The aft hookup person places apex fitting 2 onto the aft

cargo hook. The hookup teams then carefully dismount the missile platform and remain close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup teams quickly exit the area underneath the helicopter to the designated ren-

dezvous point.

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

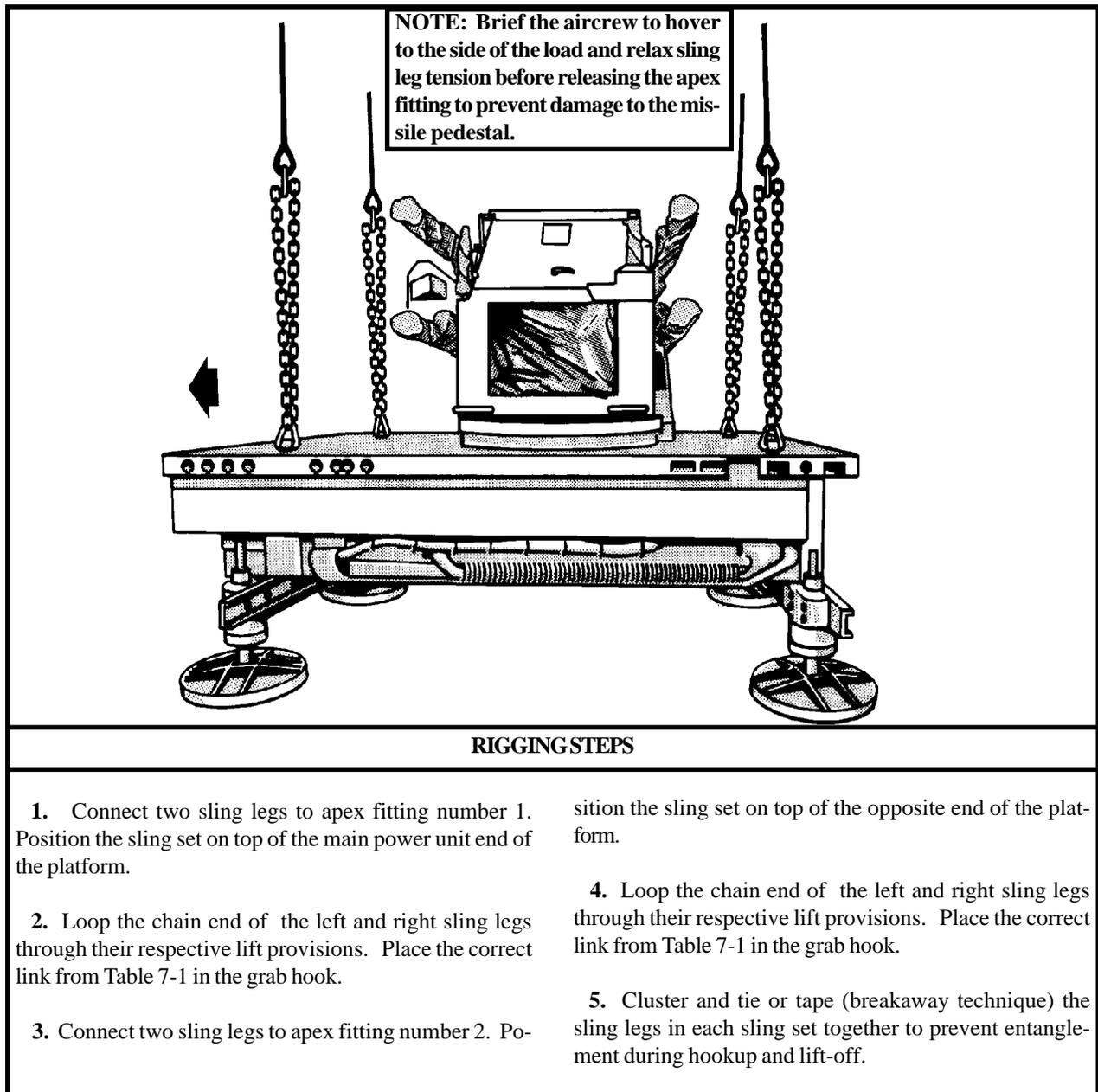


Figure 7-1. M54A1/M54A2 Chaparral Launch Station

### 7-3. Pedestal-Mounted Stinger (Avenger)

**a. Applicability.** The following items in Table 7-2 are certified for the helicopter(s) listed in the following table by the US Army Soldier Systems Center:

**Table 7-2. Pedestal-Mounted Stinger (Avenger)**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/ REAR	TYPE OF AIRCRAFT	RECOMMENDED AIRSPEED (KNOTS)
Stinger, Pedestal-Mounted on M998, (Avenger)	8,513	10K	50/5	CH-47	120
Stinger, Pedestal-Mounted on M1097, (Avenger)	9,087	10K	50/5	CH-47	120
Stinger, Pedestal-Mounted on M998, (Avenger)	8,513	15K	40/5	CH-53	120
Stinger, Pedestal-Mounted on M1097, (Avenger)	9,087	15K	40/5	CH-53	120
Stinger, Pedestal-Mounted on M998, (Avenger)	8,513	40K	32/4	CH-53	120
Stinger, Pedestal-Mounted on M1097, (Avenger)	9,087	40K	32/4	CH-53	120

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

- (1) Sling set (10,000- or 40,000-pound capacity) with one additional apex fitting for the sling set being used or two 15,000-pound capacity sling sets.
- (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) Fold the mirrors inward and secure with Type III nylon cord.
- (b) Ensure the Avenger fire unit is secured to the truck. Secure all equipment inside the fire unit with tape, lashings, or Type III nylon cord. Close and secure the door.
- (c) Disconnect the standard vehicle-mounted launcher connectors from the missile pods and secure them to the fire unit with tape or Type III nylon cord.
- (d) Secure all equipment inside the vehicle with tape or Type III nylon cord. Secure the doors shut (if installed).
- (e) Ensure the fuel tank is not over 3/4 full. Inspect the fuel tank cap, oil filler cap, and battery caps for proper installation.

(f) Engage the vehicle parking brake and place the transmission in neutral.

(g) Ensure the front wheels are pointed straight ahead. Tie down the steering wheel using the securing device attached under the dashboard.

(2) **Rigging.** Rig the load according to the steps in Figure 7-2.

(3) **Hookup.** Two hookup teams are required for this load. The hookup teams stand on top of the firing unit.

The static wand person discharges the static electricity with the static wand. The forward hookup person places apex fitting 1 onto the forward cargo hook. The aft hookup person places apex fitting 2 onto the aft cargo hook. The hookup teams then carefully dismount the vehicle and remain close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup teams quickly exit 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).

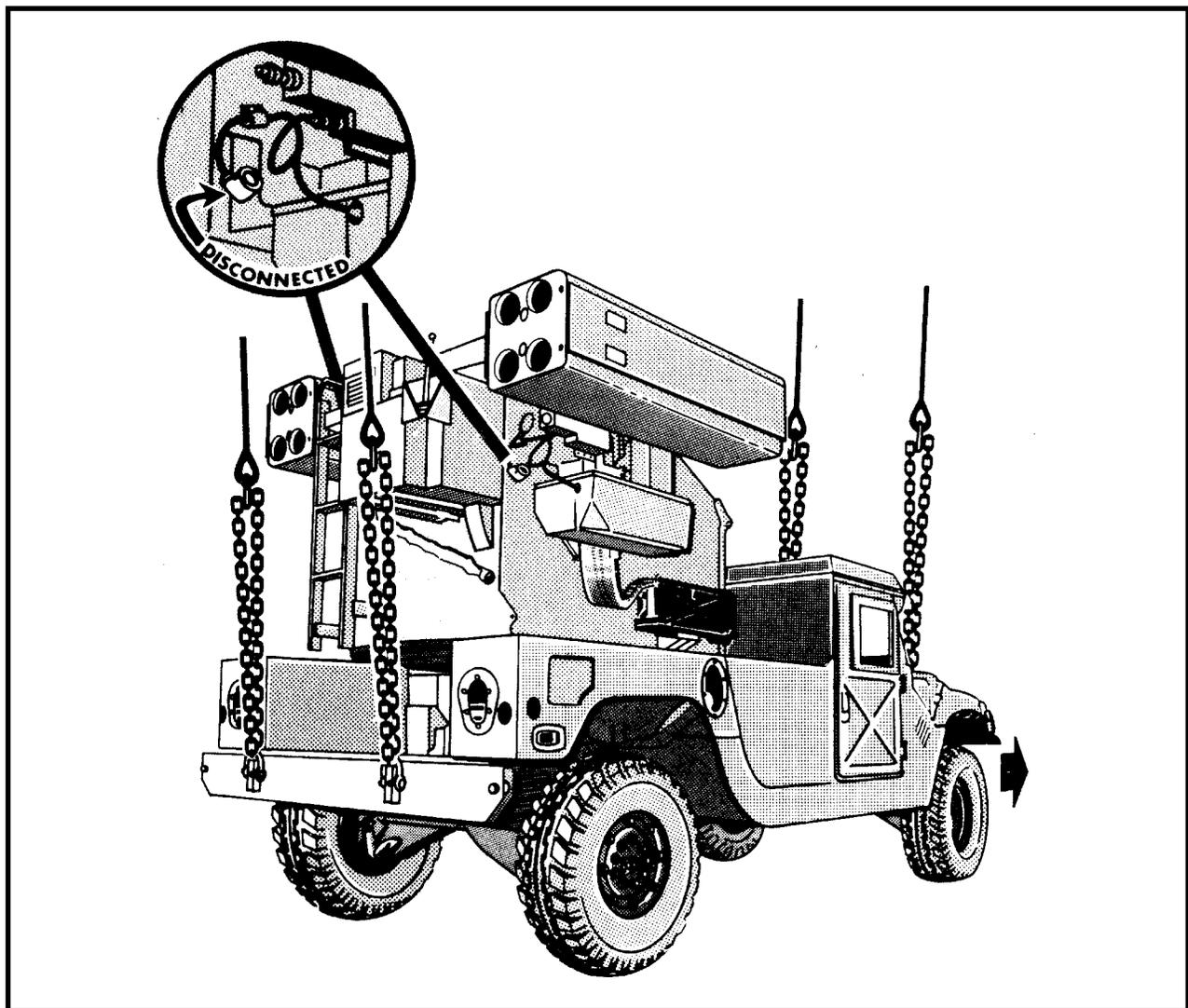


Figure 7-2. Pedestal-Mounted Stinger (Avenger)

**RIGGING STEPS**

**NOTE: When using the 15,000-pound capacity sling set, do not remove the two inner sling leg assemblies. Tape the two inner unused sling legs to the two outer load-carrying sling legs.**

1. Place two sling legs on apex fitting number 1. Position apex fitting number 1 on top of the firing unit.
2. Loop the chain end of the left and right sling legs through their respective lift provisions that protrude through the hood of the vehicle. Place the correct link from Table 7-2 in the grab hook. Secure excess chain with tape or Type III nylon cord.
3. Place two sling legs on apex fitting number 2. Posi-

tion apex fitting number 2 on top of the firing unit.

4. Loop the chain end of the left and right sling legs through their respective lift provisions located on the rear bumper. Place the correct link from Table 7-2 in the grab hook.

**CAUTION**

**DO NOT PLACE THE SLING LEGS IN THE SLING LEG GUIDES LOCATED ON TOP OF THE FIRING UNIT.**

5. Cluster and tie or tape (breakaway technique) the sling legs in each sling set together to prevent entanglement during hookup and lift-off.

*Figure 7-2. Pedestal-Mounted Stinger (Avenger) (continued)*

## 7-4. AN/MPQ-57 and AN/MPQ-61 High-Power Illuminator Radar (HIPIR) Phase II and Phase III Mounted on the M390 (Modified) Trailer

**a. Applicability.** The following items, components of the Hawk missile system, in Table 7-3 are certified for the helicopter(s) listed in the following table by the US Army Soldier Systems Center:

**Table 7-3. AN/MPQ-57 and AN/MPQ-61 High-Power Illuminator Radar (HIPIR)**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/ REAR	TYPE OF AIRCRAFT	RECOMMENDED AIRSPEED (KNOTS)
AN/MPQ-57 High-Power Illuminator Radar on M390 Trailer, Phase II	9,480	25K	25/3	CH-47	110
AN/MPQ-61 High-Power Illuminator Radar on M390 Trailer, Phase III	9,530	25K	25/3	CH-47	110

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

- (1) Sling set (25,000-pound capacity) with one additional apex fitting .
- (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.
- (5) Reach pendant (11,000- or 25,000-pound capacity) (2 each).

**CAUTION**  
**DO NOT MIX DIFFERENT CAPACITY REACH PENDANTS. USE TWO 11,000-POUND CAPACITY OR TWO 25,000-POUND CAPACITY REACHPENDANTS.**

**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) Ensure the 3 1/4-ton shackles initially provided with the M390C trailer chassis have been replaced by 6 3/4-ton clevises (NSN 4030-00-278-0699). Ensure the clevises are properly pinned and are not damaged.
- (b) Prepare the HIPIR for travel according to the operator's manual and engage the parking brakes.
- (c) Rotate the azimuth STOW lock clockwise until the stow pin is fully engaged with the torque tube and the antenna cannot be further moved in either direction. The antenna must face the lunette end of the trailer and be tilted slightly downward toward the ground. Secure the stow pin with tape or Type III nylon cord.
- (d) Remove the dust covers from the radar antennas.
- (e) Install the VTG sensor unit dust cover, if applicable.
- (f) Secure all tools and equipment inside the drawers and cabinets. Secure all doors and drawers with tape or Type III nylon cord.
- (g) Secure all hoses, cables, and chains to the trailer chassis or surrounding structure with tape or Type III nylon cord.

(h) Adjust the forward and rear leveling jacks to just above ground level so the HIPIR does not flip during takeoff or landing.

(i) Install a reach pendant on each of the apex fittings of the sling set.

(2) **Rigging.** Rig the load according to the steps in Figure 7-3.

(3) **Hookup.** Two hookup persons are required for this load. The forward hookup person stands on the radar set

group cabinet and places reach pendant 1 onto the forward cargo hook. The aft hookup person stands on the transmitter group cabinet (lunette end) and places reach pendant 2 onto the aft cargo hook. The hookup teams then carefully dismount the HIPIR and remain close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup teams quickly exit 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).

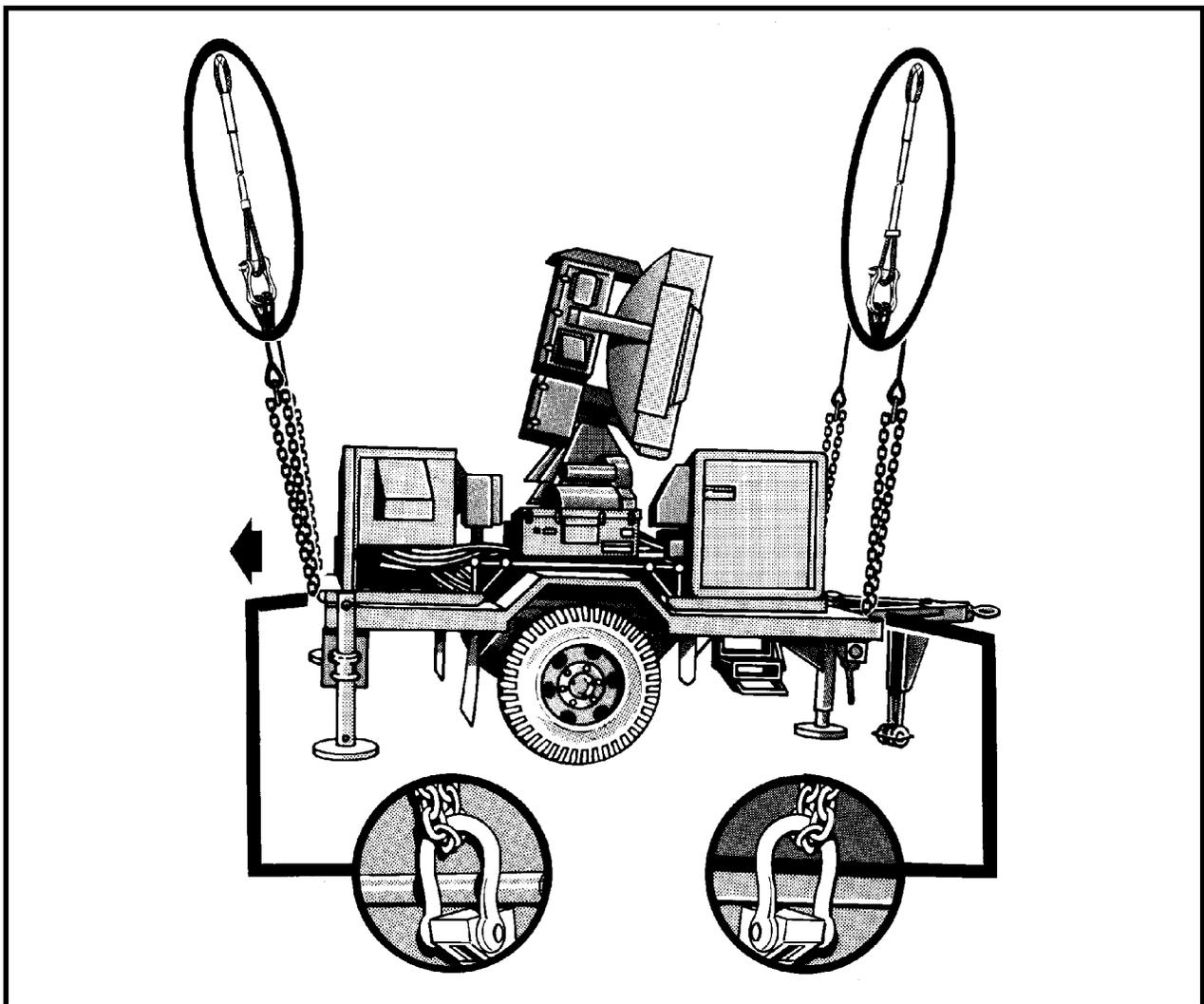


Figure 7-3. AN/MPQ-57 and AN/MPQ-61 High-Power Illuminator Radar (HIPIR)

<b>RIGGING STEPS</b>	
<p><b>1.</b> Place two sling legs on apex fitting number 1. Position apex fitting and reach pendant number 1 on top of the transmitter group cabinet (trailer lunette end).</p> <p><b>2.</b> Loop the chain end of the left and right sling legs through their respective lift provisions located on the front corners of the trailer chassis. Place the correct link from Table 7-3 in the grab hook. Secure the excess chain with tape or Type III nylon cord.</p> <p><b>3.</b> Pull the chain legs up and tape or tie (breakaway technique) the grabhooks to the top of the transmitter group cabinet.</p> <p><b>4.</b> Place two sling legs on apex fitting number 2. Posi-</p>	<p>tion apex fitting and reach pendant number 2 on the radar set group cabinet.</p> <p><b>5.</b> Loop the chain end of the left and right sling legs through their respective lift provisions located on the rear corners of the trailer chassis. Place the correct link from Table 7-3 in the grab hook.</p> <p><b>6.</b> Pull the chain legs up and tape or tie (breakaway technique) the grabhooks to the top of the radar set group cabinet.</p> <p><b>7.</b> Cluster and tie or tape (breakaway technique) the sling legs in each sling set together to prevent entanglement during hookup and lift-off.</p>

*Figure 7-3. AN/MPQ-57 and AN/MPQ-61 High-Power Illuminator Radar (HIPIR) (continued)*

## 7-5. HAWK Missile Launcher with or without Missiles

**a. Applicability.** The following items, components of the Hawk missile system, in Table 7-4 are certified for the helicopter(s) listed in the following table by the US Army Soldier Systems Center:

**Table 7-4. HAWK Missile Launcher with or without Missiles**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/ REAR	TYPE OF AIRCRAFT	RECOMMENDED AIRSPEED (KNOTS)
Missile Launcher, Empty	5,060	25K	72/80	CH-47	120
Missile Launcher with One Missile, Center Mounted	6,460	25K	72/80	CH-47	120
Missile Launcher with Two Missiles, Mounted on Sides	7,860	25K	72/80	CH-47	120
Missile Launcher with Three Missiles, Full Payload	9,260	25K	72/80	CH-47	120

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

(1) Sling set (25,000-pound capacity) with one additional apex fitting .

(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.

(5) Reach pendant (11,000- or 25,000-pound capacity) (2 each)

**CAUTION**  
**DO NOT MIX DIFFERENT CAPACITY REACH PENDANTS. USE TWO 11,000-POUND CAPACITY OR TWO 25,000-POUND CAPACITY REACHPENDANTS.**

**c. Personnel.** Two 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) Prepare the HAWK launcher and missiles for travel according to instructions in the operator's manual.

(b) Ensure each missile is properly locked into the appropriate rack on the pallet. If one missile is to be mounted, it must be on the upper center missile storage rack. If two missiles are to be mounted, they must be on the two outer missile storage racks.

(c) Engage the parking brakes.

(d) Adjust the leveling jack pads to just above ground level.

(e) Secure all hoses, cables, and chains to the adjacent structure with tape or Type III nylon cord.

(f) Secure the hydraulic valve box on the side of the launcher boom with tape.

(g) Install a reach pendant on each of the apex fittings of the sling set.

**(2) Rigging.** Rig the load according to the steps in Figure 7-4.

(3) **Hookup.** Two hookup persons are required for this load. The forward hookup person stands on the aft end of the launcher, **NOT on the missiles**, and places reach pendant 1 onto the forward cargo hook. The aft hookup person stands on the lunette end, **NOT on the missiles**, and places reach pendant 2 onto the aft cargo hook. The hookup teams then carefully dismount the launcher and

remain close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup teams quickly exit 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).

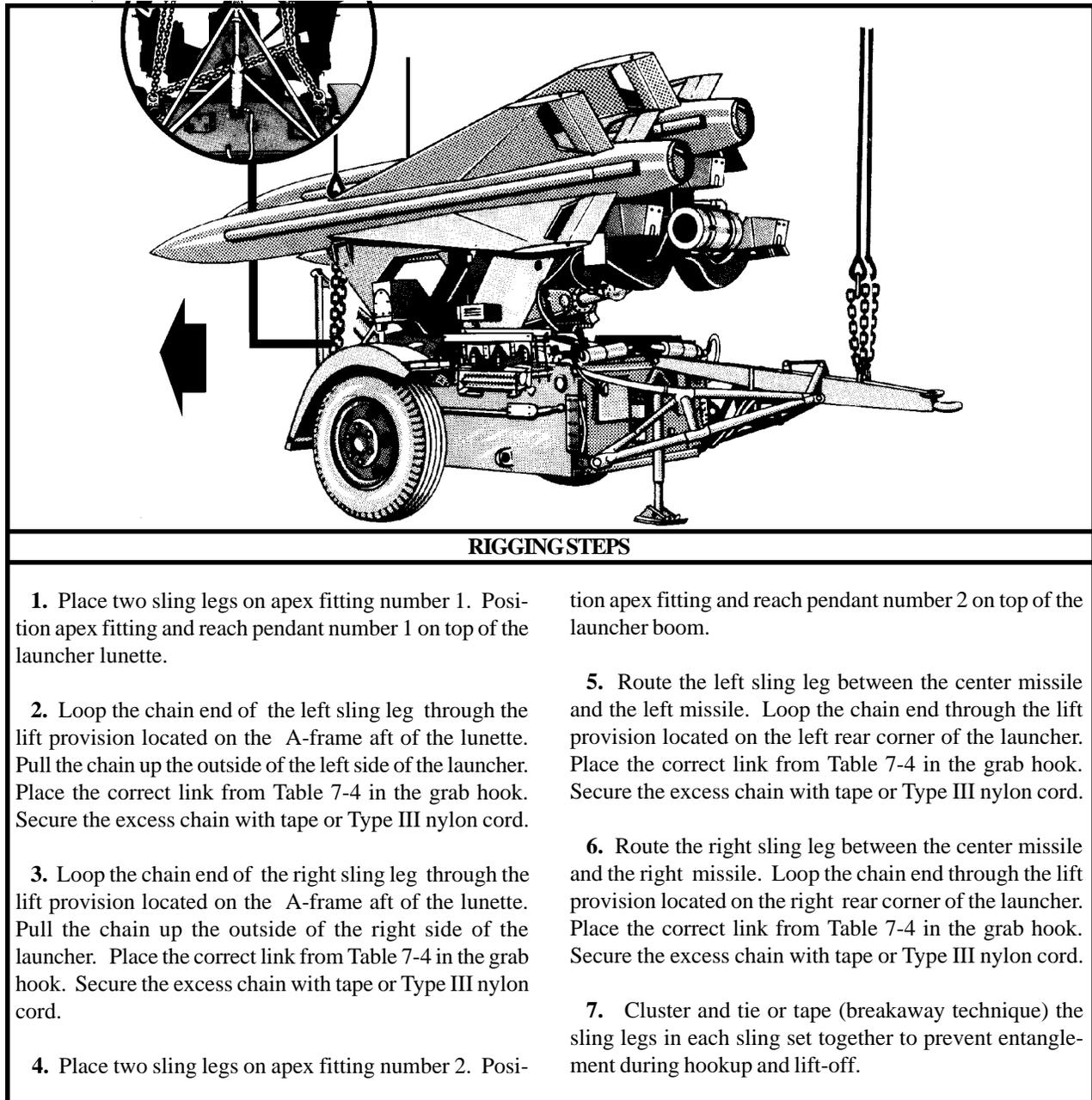


Figure 7-4. HAWK Missile Launcher with or without Missiles

## 7-6. HAWK Missile Launcher with Missiles (Offset Configuration)

**a. Applicability.** The following items, components of the Hawk missile system, in Table 7-5 are certified for the helicopter(s) listed in the following table by the US Army Soldier Systems Center:

**Table 7-5. HAWK Missile Launcher with Missiles (Offset Configuration)**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/ REAR	TYPE OF AIRCRAFT	RECOMMENDED AIRSPEED (KNOTS)
Launcher with One Missile Mounted on the Side	6,460	25K	As Listed in Rigging Steps	CH-47	120
Launcher with Two Missiles, Mounted on the Side and Center	7,860	25K	As Listed in Rigging Steps	CH-47	120

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

- (1) Sling set (25,000-pound capacity) with one additional apex fitting.
- (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.
- (5) Chain assembly, tiedown, MB-1 (10,000-pound capacity), NSN 1670-00-516-8405.
- (6) Reach pendant (11,000- or 25,000-pound capacity) (2 each).

**CAUTION**  
**DO NOT MIX DIFFERENT CAPACITY REACHPENDANTS. USE TWO 11,000-POUND CAPACITY OR TWO 25,000-POUND CAPACITY REACHPENDANTS.**

**c. Personnel.** Two 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) Prepare the HAWK launcher and missiles for travel according to instructions in the operator's manual.
- (b) Ensure each missile is properly locked into the appropriate rack on the pallet.
- (c) Engage the parking brakes.
- (d) Adjust the leveling jack pads to just above ground level.
- (e) Secure all hoses, cables, and chains to the adjacent structure with tape or Type III nylon cord.
- (f) Secure the hydraulic valve box on the side of the launcher boom with tape.
- (g) Install a reach pendant on each of the apex fittings of the sling set.

**(2) Rigging.** Rig the load according to the steps in Figure 7-5.

**(3) Hookup.** Two hookup persons are required for this load. The forward hookup person stands on the aft end of the launcher, **NOT on the missiles**, and places reach pendant 1 onto the forward cargo hook. The aft hookup person stands on the lunette end, **NOT on the missiles**, and

places reach pendant 2 onto the aft cargo hook. The hookup teams then carefully dismount the launcher and remain close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup teams quickly exit the area underneath the helicopter to the designated rendezvous point.

**NOTE:** The helicopter should hover forward of the load when releasing the forward hook and hover to the rear of the load when releasing the aft hook to avoid dropping the reach pendants on the missiles.

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

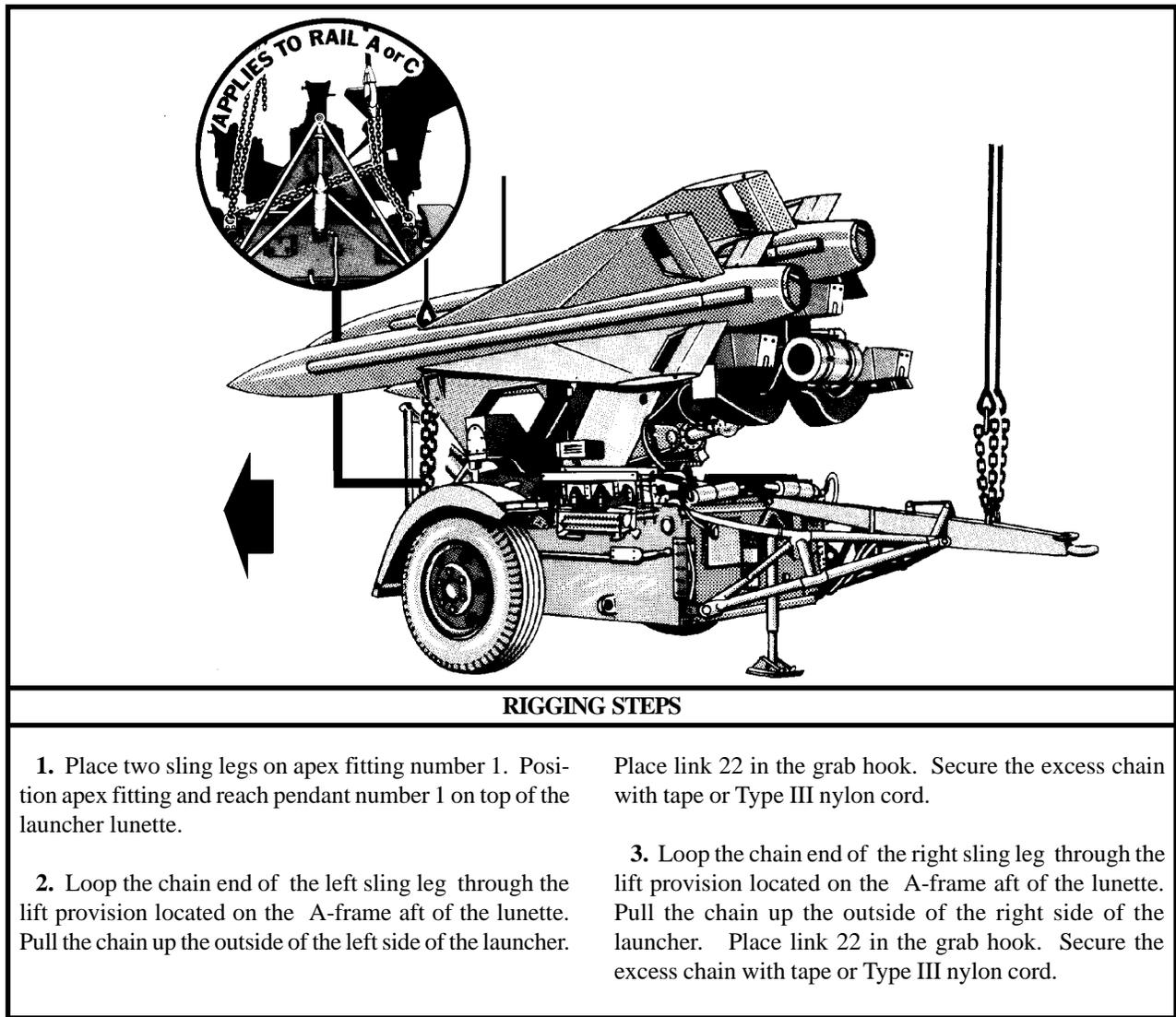


Figure 7-5. HAWK Missile Launcher with Missiles (Offset Configuration)

<b>RIGGING STEPS (continued)</b>	
<p><b>NOTE: The missiles are designated as follows:</b> "A" missile - curbside position, on the left side when facing the lunette end "B" missile - center position "C" missile - roadside position, on the right when facing the lunette end</p>	<p>chain through the left rear lift provision and around the right sling leg chain. Chain to itself so the loop is 47 inches. Tape the snubber chain in place.</p> <p><b>8.</b> If "C" missile is mounted with or without "B" missile, route the left sling leg between "B" missile (if mounted) and "C" missile. Loop the chain end through the lift provision located on the left rear corner of the launcher. Place link 26 in the grab hook. Secure the excess chain with tape or Type III nylon cord.</p> <p><b>9.</b> Loop the chain end of the right sling leg through the lift provision located on the right rear corner of the launcher. Place link 6 in the grab hook.</p> <p><b>10.</b> Use an MB-1 (10,000-pound capacity ) chain tiedown assembly to snub the left sling leg. Loop the snubber chain through the right rear lift provision and around the left sling leg chain. Chain to itself so the loop is 47 inches. Tape the snubber chain in place.</p> <p><b>11.</b> Cluster and tie or tape (breakaway technique) the sling legs in each sling set together to prevent entanglement during hookup and lift-off.</p>
<p><b>4.</b> Place two sling legs on apex fitting number 2. Position apex fitting and reach pendant number 2 on top of the launcher boom.</p>	
<p><b>5.</b> If "A" missile is mounted with or without "B" missile, route the right sling leg between "B" missile (if mounted) and "A" missile. Loop the chain end through the lift provision located on the right rear corner of the launcher. Place link 26 in the grab hook. Secure the excess chain with tape or Type III nylon cord.</p>	
<p><b>6.</b> Loop the chain end of the left sling leg through the lift provision located on the left rear corner of the launcher. Place link 6 in the grab hook.</p>	
<p><b>7.</b> Use an MB-1 (10,000-pound capacity ) chain tiedown assembly to snub the right sling leg. Loop the snubber</p>	

*Figure 7-5. HAWK Missile Launcher with Missiles (Offset Configuration) (continued)*

## 7-7. M192-1 HAWK Zero Length Missile Launcher (USMC)

**a. Applicability.** The following item, a component of the Hawk missile system, in Table 7-6 is certified for the helicopter(s) listed in the following table by the US Army Soldier Systems Center:

**Table 7-6. M192-1 HAWK Zero Length Missile Launcher (USMC)**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/ REAR	TYPE OF AIRCRAFT	RECOMMENDED AIRSPEED (KNOTS)
M192-1 Guided Missile Launcher, Zero Length	4,500	40K	25/34	CH-53	130

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

- (1) Sling set (40,000-pound capacity) with one additional apex fitting .
- (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 20 minutes.

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

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

(a) Prepare the HAWK launcher for travel according to instructions in the operator's manual.

(b) Secure all doors and vents with tape or Type III nylon cord.

(c) Engage the parking brakes.

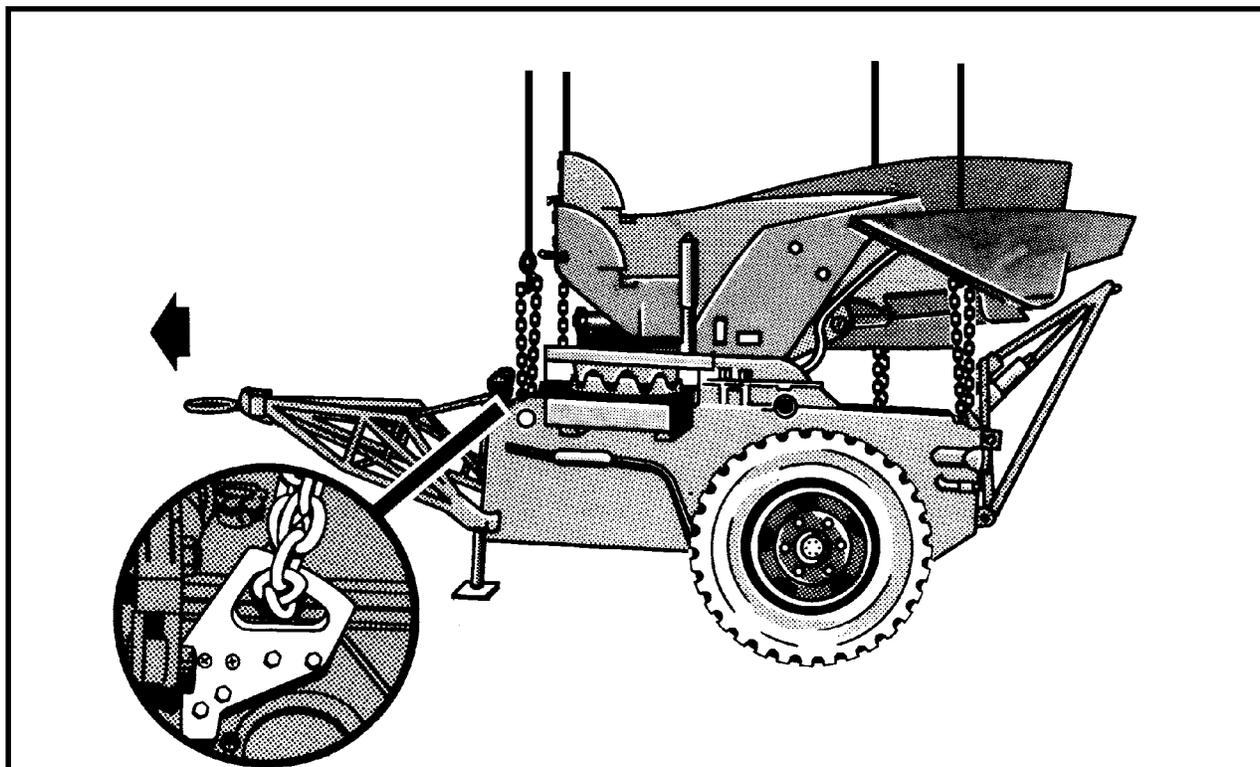
(d) Secure all hoses, cables, and chains to the adjacent structure with tape or Type III nylon cord.

(e) Place and secure the launcher section control box inside the helicopter.

(2) **Rigging.** Rig the load according to the steps in Figure 7-6.

(3) **Hookup.** Two hookup persons are required for this load. The forward hookup person stands on the side of the pedestal and places apex fitting number 1 onto the forward cargo hook. The aft hookup person stands on the other side of the pedestal and places apex fitting number 2 onto the aft cargo hook. The hookup teams then carefully dismount the launcher and remain close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup teams quickly exit 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. Place two sling legs on apex fitting number 1. Position apex fitting number 1 on top of the launch stand pedestal (lunette end).
2. Route the sling legs to the front of the launcher. Remove the access panel to improve clearance and loop the chain end of the left and right sling legs through their respective lift provisions located aft of the level cylinder, on the outboard side. Ensure the chain is routed from the inside to the outside with the chain running end facing outward. Place the correct link from Table 7-6 in the grab hook. Secure the excess chain with tape or Type III nylon cord. Replace and secure the access panel.
3. Place two sling legs on apex fitting number 2. Position apex fitting number 2 on top of the launch stand pedestal.
4. Route the sling legs to the rear of the launcher. Remove the access panel to improve clearance and loop the chain end of the left and right sling legs through their respective lift provisions located above the taillights. Ensure the chain is routed from the inside to the outside with the chain running end facing outward. Place the correct link from Table 7-6 in the grab hook. Secure the excess chain with tape or Type III nylon cord. Replace and secure the access panel.
5. Cluster and tie or tape (breakaway technique) the sling legs in each sling set together to prevent entanglement during hookup and lift-off.

Figure 7-6. M192-1 HAWK Zero Length Missile Launcher (USMC)

## 7-8. M501E3 Guided Missile Loader-Transporter

**a. Applicability.** The following item, a component of the Hawk missile system, in Table 7-7 is certified for the helicopter(s) listed in the following table by the US Army Soldier Systems Center:

**Table 7-7. M501E3 Guided Missile Loader-Transporter**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/ REAR	TYPE OF AIRCRAFT	RECOMMENDED AIRSPEED (KNOTS)
M501E3 Guided Missile Loader-Transporter	5,300	15K	5/20	CH-53	130

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

- (1) Sling set (15,000-pound capacity) with one additional web ring .
- (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 20 minutes.

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

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

(a) With the loader-transporter engine ON, raise the super structure about 3 feet using the EXTENSION lever. Using the ROLL/ELEVATION, AZIMUTH, and EXTENSION levers, position the super structure in the OPERATIONAL READY position. Shut the engine down and place the transmission in neutral.

(b) Secure the super structure arms in the operational position by engaging the lock pins. **THE SUPER STRUCTURE CANNOT BE ALLOWED TO MOVE.**

(c) Secure all doors and vents with tape or Type III nylon cord.

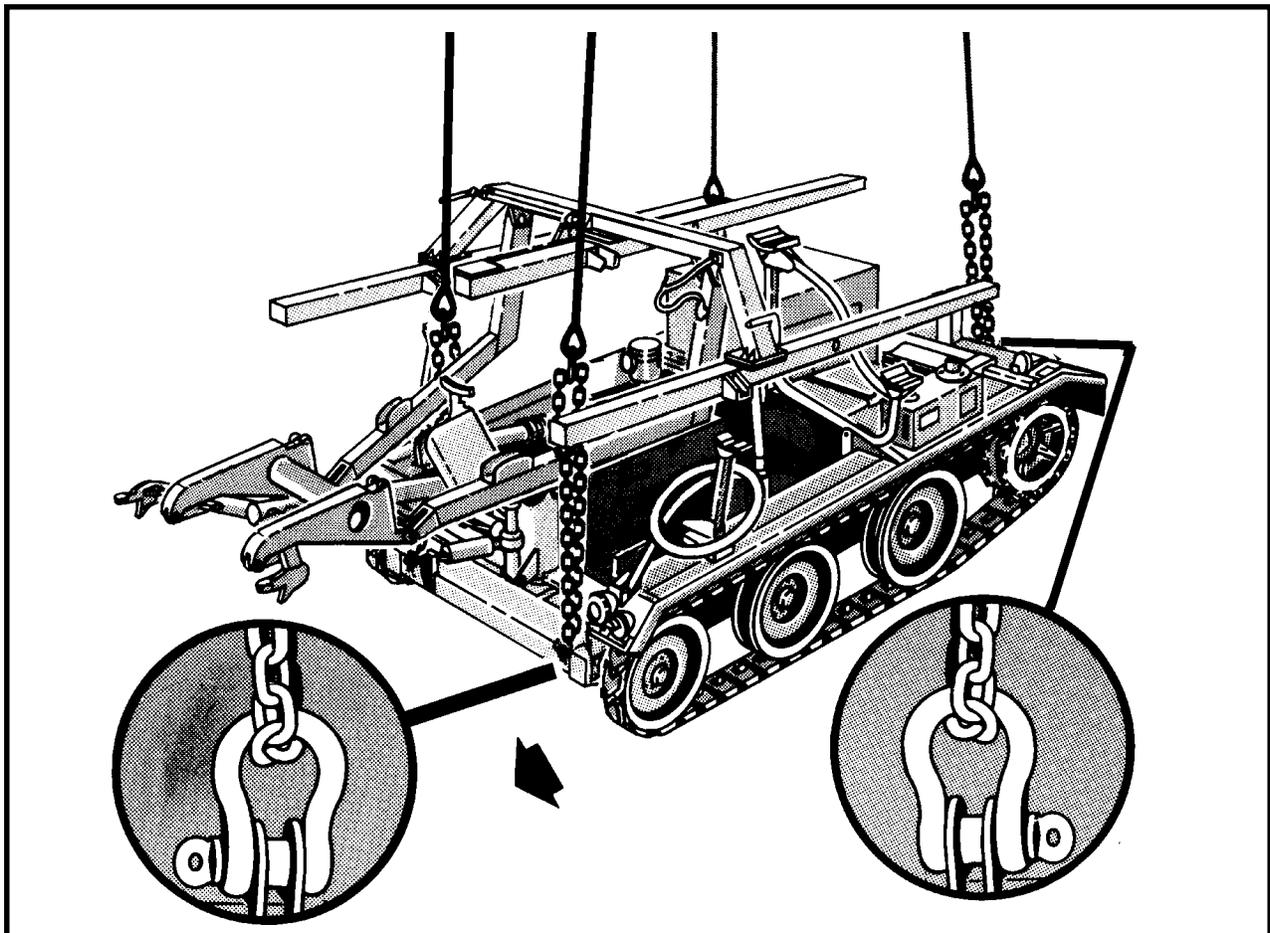
(d) Secure all hoses, cables, and chains to the adjacent structure with tape or Type III nylon cord.

(e) Ensure the fuel tanks are not over 3/4 full. Inspect the fuel tank cap, oil filler cap, and battery caps for proper installation.

(2) **Rigging.** Rig the load according to the steps in Figure 7-7.

(3) **Hookup.** Two hookup teams are required for this load. The static wand person discharges the static electricity with the static wand. The forward hookup person stands on the forward end of the vehicle and places apex fitting number 1 onto the forward cargo hook. The aft hookup person stands on the rear of the vehicle and places apex fitting number 2 onto the aft cargo hook. The hookup teams then carefully dismount the loader and remain close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup teams quickly exit 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.** Place two sling legs on web ring/apex fitting number 1. Position web ring/apex fitting number 1 on top of the loader arm on the driver's compartment end of the loader.

**2.** Route the chain end of the sling legs to the front of the vehicle. Ensure the sling legs are routed inboard of the outer two upper hoisting beams and outboard of the two lower super structure arms. Loop the chain end of the left and right sling legs through their respective lift provision located inboard of the front wheels. Place the correct link from Table 7-7 in the grab hook.

**3.** Place two sling legs on web ring/apex fitting number 2. Position web ring/apex fitting number 2 on top of the loader arm on the rear (engine compartment) of the loader.

**4.** Route the chain end of the sling legs to the rear of the vehicle. Ensure the sling legs are routed inboard of the outer two upper hoisting beams. Loop the chain end of the left and right sling legs through their respective lift provision located inboard of the rear fender. Place the correct link from Table 7-7 in the grab hook. Secure the excess chain with tape or Type III nylon cord.

**5.** Remove the slack from each sling leg and tape or tie (breakaway technique) the grab hooks or sling legs to the hoisting beams.

**6.** Cluster and tie or tape (breakaway technique) the sling legs in each sling set together to prevent entanglement during hookup and lift-off.

*Figure 7-7. M501E3 Guided Missile Loader-Transporter*

## 7-9. XM1E2 Loading and Storage Pallet

**a. Applicability.** The following items, components of the Hawk missile system, in Table 7-8 are certified for the helicopter(s) listed in the following table by the US Army Soldier Systems Center:

**Table 7-8. XM1E2 Loading and Storage Pallet**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/ REAR	TYPE OF AIRCRAFT	RECOMMENDED AIRSPEED (KNOTS)
XM1E2 Pallet on M390C Trailer with One Missile	6,155	25K	45/30	CH-47	120
XM1E2 Pallet on M390C Trailer with Two Missiles	7,560	25K	45/30	CH-47	110
XM1E2 Pallet on M390C Trailer with Three Missiles	9,005	25K	45/30	CH-47	100

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

- (1) Sling set (25,000-pound capacity) with one additional apex fitting.
- (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.
- (5) Clevis assembly, NSN 4030-00-278-0699 (6 each).
- (6) Webbing, nylon, tubular, 1,000-pound breaking strength.
- (7) Reach pendant (11,000- or 25,000-pound capacity) (2 each).

**CAUTION**  
**DO NOT MIX DIFFERENT CAPACITY REACH PENDANTS. USE TWO 11,000-POUND CAPACITY OR TWO 25,000-POUND CAPACITY REACHPENDANTS.**

**c. Personnel.** Two 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) Prepare the trailer, pallet, and missiles for travel according to instructions in the operator's manual.
  - (b) Ensure each missile is properly locked into the appropriate rack on the pallet. If one missile is being sling loaded, it must be on the upper center storage rack. If two missiles are being sling loaded, they must be mounted on the outside storage racks.
  - (c) Ensure the 3 1/4-ton clevises provided with the trailer chassis have been replaced with 6 3/4-ton clevises (NSN 4030-00-278-0699). Ensure the clevises are pinned and not damaged.
  - (d) Engage the parking brakes.
  - (e) Adjust the leveling jack pads to just above ground level.
  - (f) Secure all hoses, cables, and chains to the adjacent structure with tape or Type III nylon cord.
  - (g) Install a reach pendant on each of the apex fitting.

(2) **Rigging.** Rig the load according to the steps in Figure 7-8.

(3) **Hookup.** Two hookup persons are required for this load. The forward hookup person stands on the aft end of the trailer and places reach pendant 1 onto the forward cargo hook. The aft hookup person stands on the lunette end of the trailer and places reach pendant 2 onto the aft cargo hook. The hookup teams then carefully dismount the trailer and remain close to the load as the helicopter removes slack from the sling legs. When successful

hookup is assured, the hookup teams quickly exit the area underneath the helicopter to the designated rendezvous point.

**NOTE:** The helicopter should hover forward of the load when releasing the forward hook and hover to the rear of the load when releasing the aft hook to avoid dropping the reach pendants on the missiles.

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

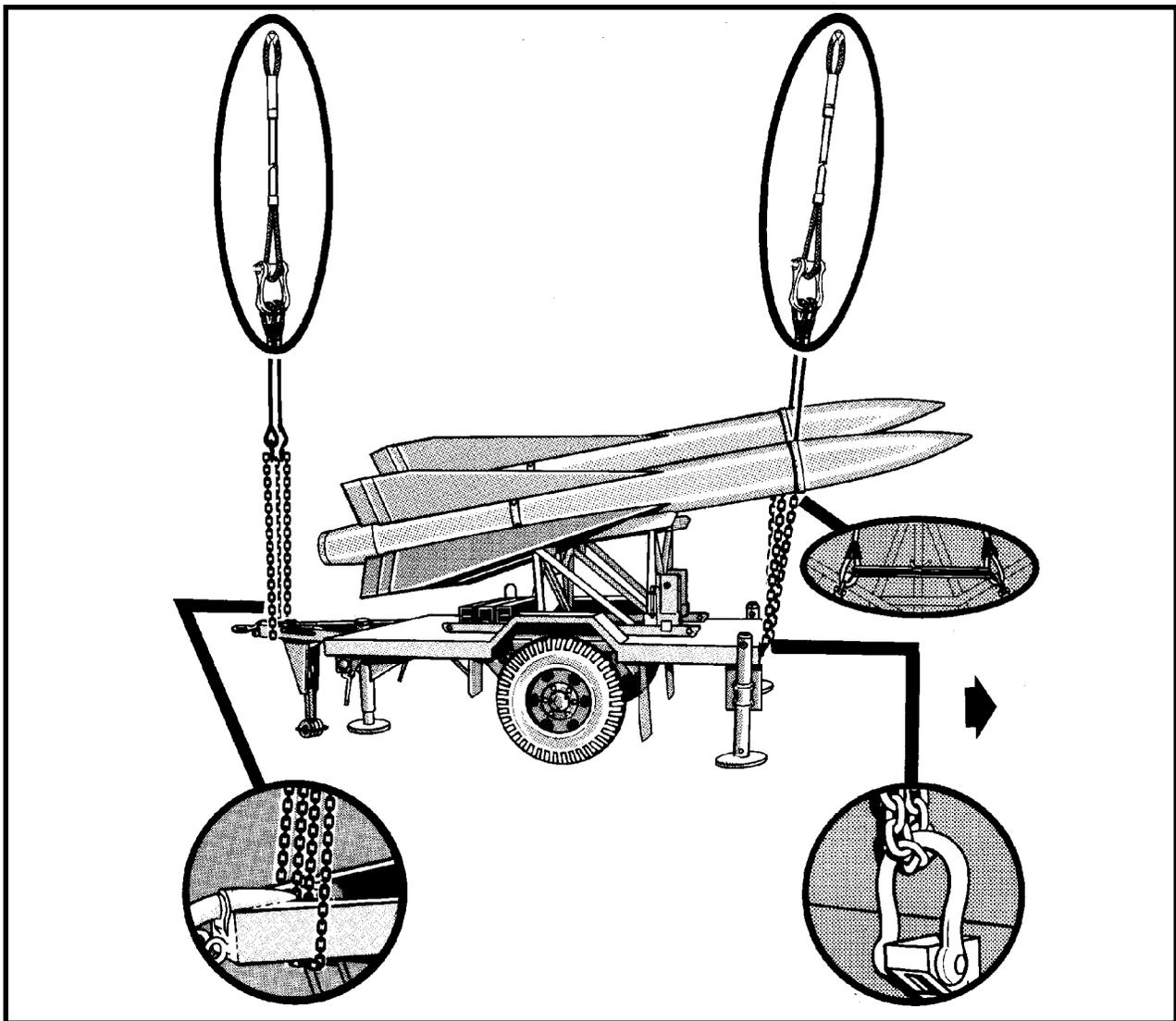


Figure 7-8. XMIE2 Loading and Storage Pallet

<b>RIGGING STEPS</b>	
<p>1. Place two sling legs on apex fitting number 1. Position apex fitting and reach pendant number 1 on top of the trailer lunette.</p> <p>2. Loop the chain end of the left sling leg down through the opening aft of the lunette and forward of the landing wheel. Pull the chain up the outside of the left side of the trailer A-frame. Place the correct link from Table 7-8 in the grab hook. Secure the excess chain with tape or Type III nylon cord.</p> <p>3. Repeat the above procedures using the right sling leg and pulling the chain up the outside of the right side of the trailer A-frame.</p> <p>4. Place two sling legs on apex fitting number 2. Position apex fitting and reach pendant number 2 on top of the center missile position.</p> <p>5. Route the left sling leg between the center missile and the left missile. Loop the chain end of the left sling leg through the lift provision located on the left rear corner of the launcher. Place the correct link from Table 7-8 in the grab hook. Secure the excess chain with tape or Type III nylon cord.</p> <p>6. Route the right sling leg between the center missile</p>	<p>and the right missile. Loop the chain end of the right sling leg through the lift provision located on the right rear corner of the launcher. Place the correct link from Table 7-8 in the grab hook. Secure the excess chain with tape or Type III nylon cord.</p> <p>7. Use a 16 foot length of 1/2-inch tubular nylon to prevent the rear slings from interfering with the two outer missiles. Route one end through the potted eye of one rear sling leg. Route the same end of the tubular nylon through the potted eye on the other rear sling. Position the potted eyes of the two sling legs 32 inches apart so the sling legs cannot contact the two outer launch missiles or the center missile. Using the remainder of the tubular nylon, repeat the procedure until there are at least five lengths of nylon (2 1/2 complete wraps) between the potted eyes of the two sling legs. Tie the two ends together with a square knot and an overhand knot in each running end.</p> <div style="border: 1px solid black; padding: 5px;"><p><b>NOTE: Do not route the tubular nylon between the chains or grab hooks. Failure to attach the tubular nylon between the sling leg potted eyes may result in damage to the missiles or failure of the load.</b></p></div> <p>8. Cluster and tie or tape (breakaway technique) the sling legs in each sling set together to prevent entanglement during hookup and lift-off.</p>

*Figure 7-8. XM1E2 Loading and Storage Pallet (continued)*

## 7-10. Platoon Support Van/Maintenance Center (PSV/MC)

**a. Applicability.** The following items, components of the Hawk missile system, in Table 7-9 are certified for the helicopter(s) listed in the following table by the US Army Soldier Systems Center:

**Table 7-9. Platoon Support Van/Maintenance Center**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/REAR	TYPE OF AIRCRAFT	RECOMMENDED AIRSPEED (KNOTS)
Platoon Support Van/Maintenance Center, M32	14,300	25K	8/46	CH-47	120
Platoon Support Van, M934A1/A2	14,300	25K	77/39	CH-47	120

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

(1) Sling set (25,000-pound capacity) with one additional apex fitting.

(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 60 minutes.

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

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

(a) Prepare the PSV/MC M32 van for travel according to instructions in the operator's manual.

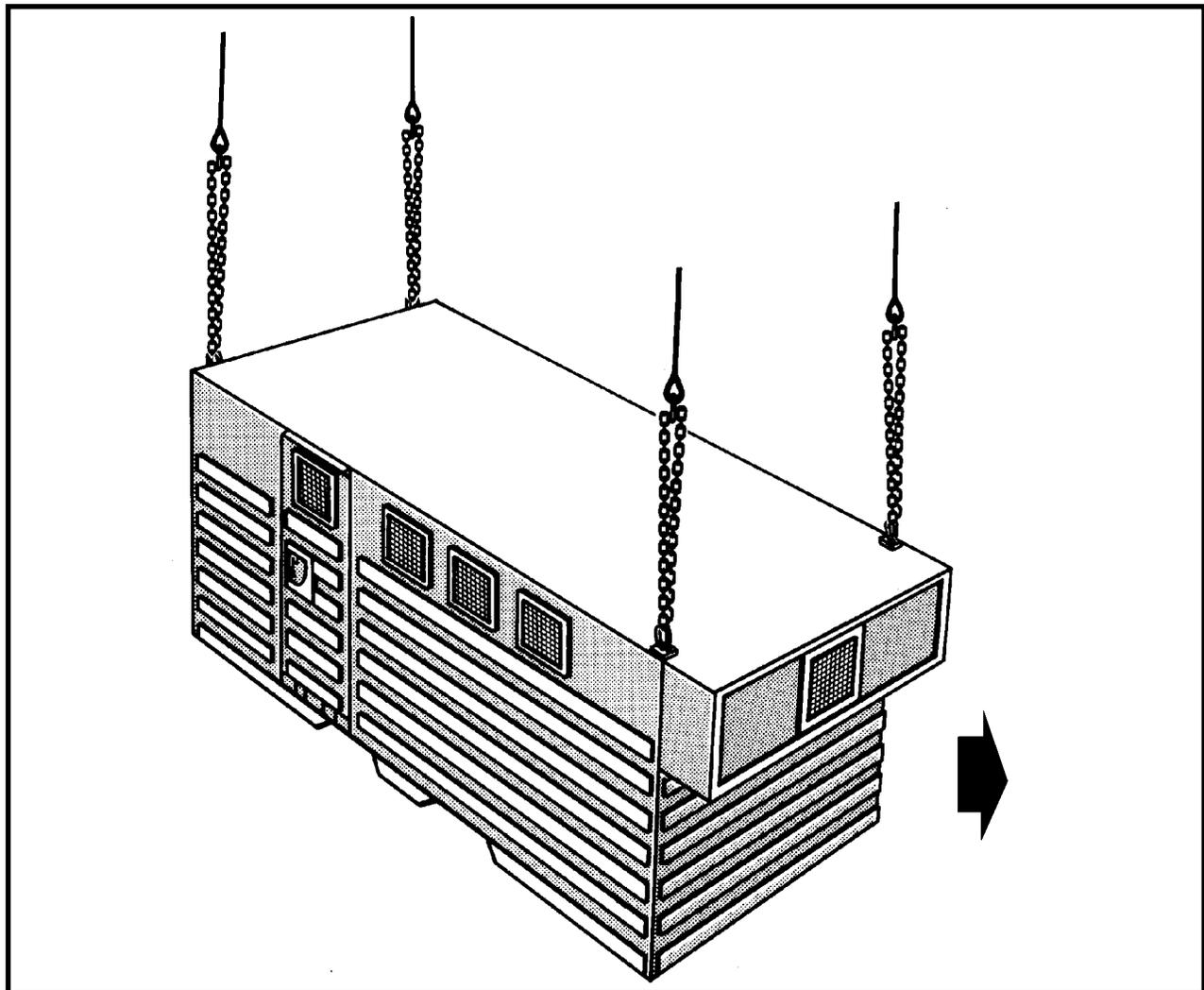
(b) Secure all loose equipment inside the shelter with tape or Type III nylon cord.

(c) Close and secure all doors and vents. Secure the door in the closed and locked position.

(2) **Rigging.** Rig the load according to the steps in Figure 7-9.

(3) **Hookup.** Two hookup teams are required for this load. The static wand person discharges the static electricity with the static wand. The forward hookup person stands on top of the shelter and places apex fitting number 1 onto the forward cargo hook. The aft hookup person stands on top of the shelter and places apex fitting number 2 onto the aft cargo hook. The hookup teams then carefully dismount the shelter and remain close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup teams quickly exit 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. Place two sling legs on apex fitting number 1. Position apex fitting number 1 on top of the environmental control unit ( ECU) end of the shelter.
2. Loop the chain end of the left and right sling legs through their respective lift provisions located on the front corners of the shelter. Place the correct link from Table 7-9 in the grab hook.
3. Place two sling legs on apex fitting number 2. Position apex fitting number 2 on top of aft end of the shelter.

4. Loop the chain end of the left and right sling legs through their respective lift provisions located on the rear corners of the shelter. Place the correct link from Table 7-9 in the grab hook. Secure the excess chain with tape or Type III nylon cord.
5. Cluster and tie or tape (breakaway technique) the sling legs in each sling set together to prevent entanglement during hookup and lift-off.

*Figure 7-9. Platoon Support Van/Maintenance Center, M32*

## 7-11. Field Maintenance Equipment Shops

**a. Applicability.** The following items, components of the Hawk missile system, in Table 7-10 are certified for the helicopter(s) listed in the following table by the US Army Soldier Systems Center:

**Table 7-10. Field Maintenance Equipment Shops**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/ REAR	TYPE OF AIRCRAFT	RECOMMENDED AIRSPEED (KNOTS)
Field Maintenance Equipment Shop 20, Electromechanical Shop	5,312	25K	75/75	CH-47	120
Field Maintenance Equipment Shop 23, Maintenance Repair Facility	5,341	25K	75/75	CH-47	120

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

- (1) Sling set (25,000-pound capacity) with one additional apex fitting.
- (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 30 minutes.

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

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

(a) Prepare the FME 20 shop shelter for travel according to instructions in the operator's manual.

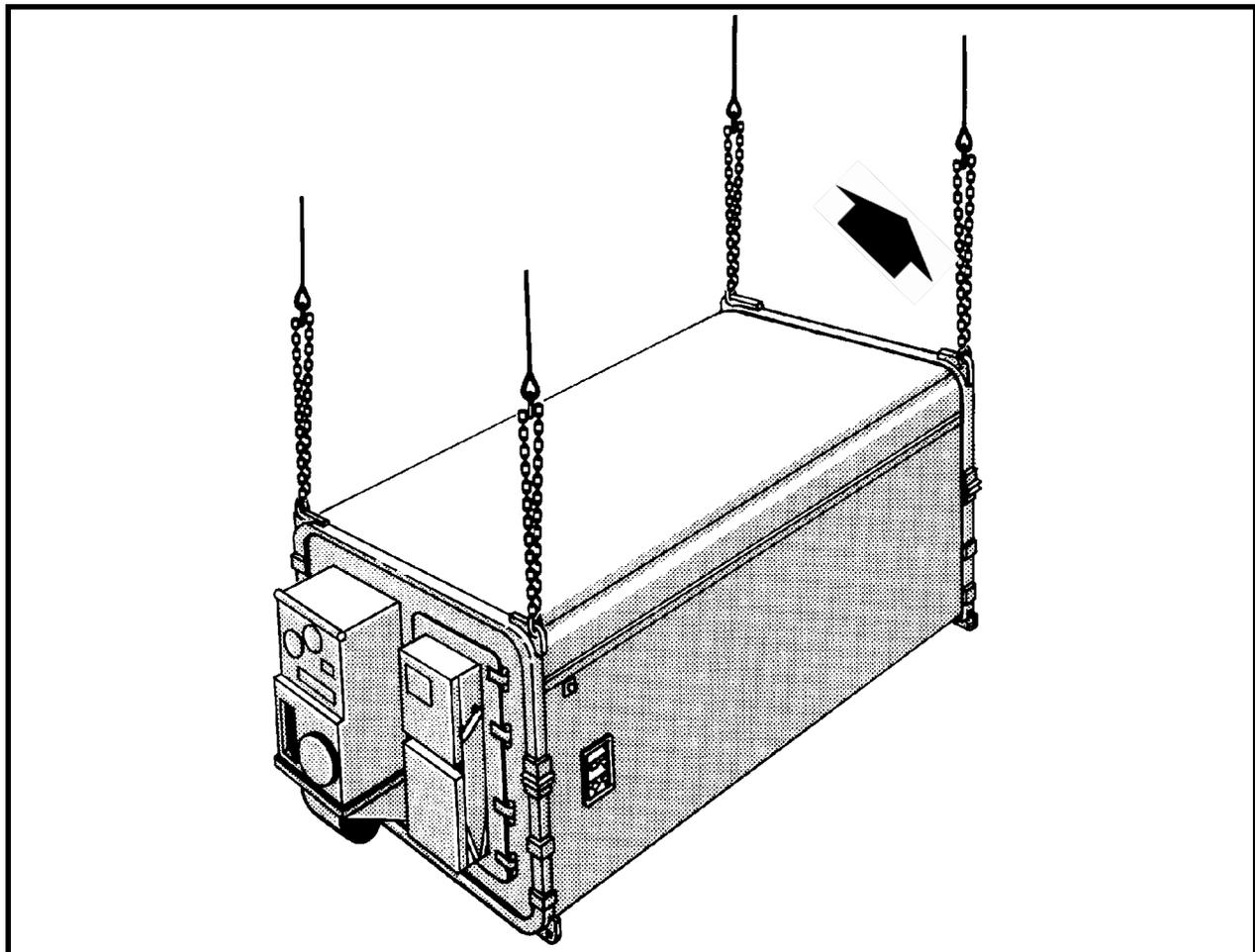
(b) Secure all loose equipment inside the shelter with tape or Type III nylon cord.

(c) Close and secure all doors and vents. Secure the door in the closed and locked position.

(2) **Rigging.** Rig the load according to the steps in Figure 7-10.

(3) **Hookup.** Two hookup teams are required for this load. The static wand person discharges the static electricity with the static wand. The forward hookup person stands on top of the shelter and places apex fitting number 1 onto the forward cargo hook. The aft hookup person stands on top of the shelter (ECU end) and places apex fitting number 2 onto the aft cargo hook. The hookup teams then carefully dismount the shelter and remain close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup teams quickly exit 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. Place two sling legs on apex fitting number 1. Position apex fitting number 1 on top of the shelter, opposite the ECU end.
2. Loop the chain end of the left and right sling legs through their respective lift provisions located on the front corners of the shelter. Place the correct link from Table 7-10 in the grab hook. Secure the excess chain with tape or Type III nylon cord.
3. Place two sling legs on apex fitting number 2. Position apex fitting number 2 on top of the ECU end of the shelter.
4. Loop the chain end of the left and right sling legs through their respective lift provisions located on the rear corners of the shelter. Place the correct link from Table 7-10 in the grab hook. Secure the excess chain with tape or Type III nylon cord.
5. Cluster and tie or tape (breakaway technique) the sling legs in each sling set together to prevent entanglement during hookup and lift-off.

*Figure 7-10. Field Maintenance Equipment Shop 20, Electromechanical Shop*

## 7-12. Field Maintenance Equipment Shop 21, Unmanned Shop, Electrical Equipment

**a. Applicability.** The following item, a component of the Hawk missile system, in Table 7-11 is certified for the helicopter(s) listed in the following table by the US Army Soldier Systems Center:

**Table 7-11. Field Maintenance Equipment Shop 21, Unmanned Shop, Electrical Equipment**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/ REAR	TYPE OF AIRCRAFT	RECOMMENDED AIRSPEED (KNOTS)
Field Maintenance Equipment Shop 21, Unmanned Shop, Electrical Equipment	5,639	25K	5/28	CH-47	120

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

(1) Sling set (25,000-pound capacity) with one additional apex fitting.

(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 30 minutes.

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

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

(a) Prepare the FME 21 shop shelter for travel according to instructions in the operator's manual.

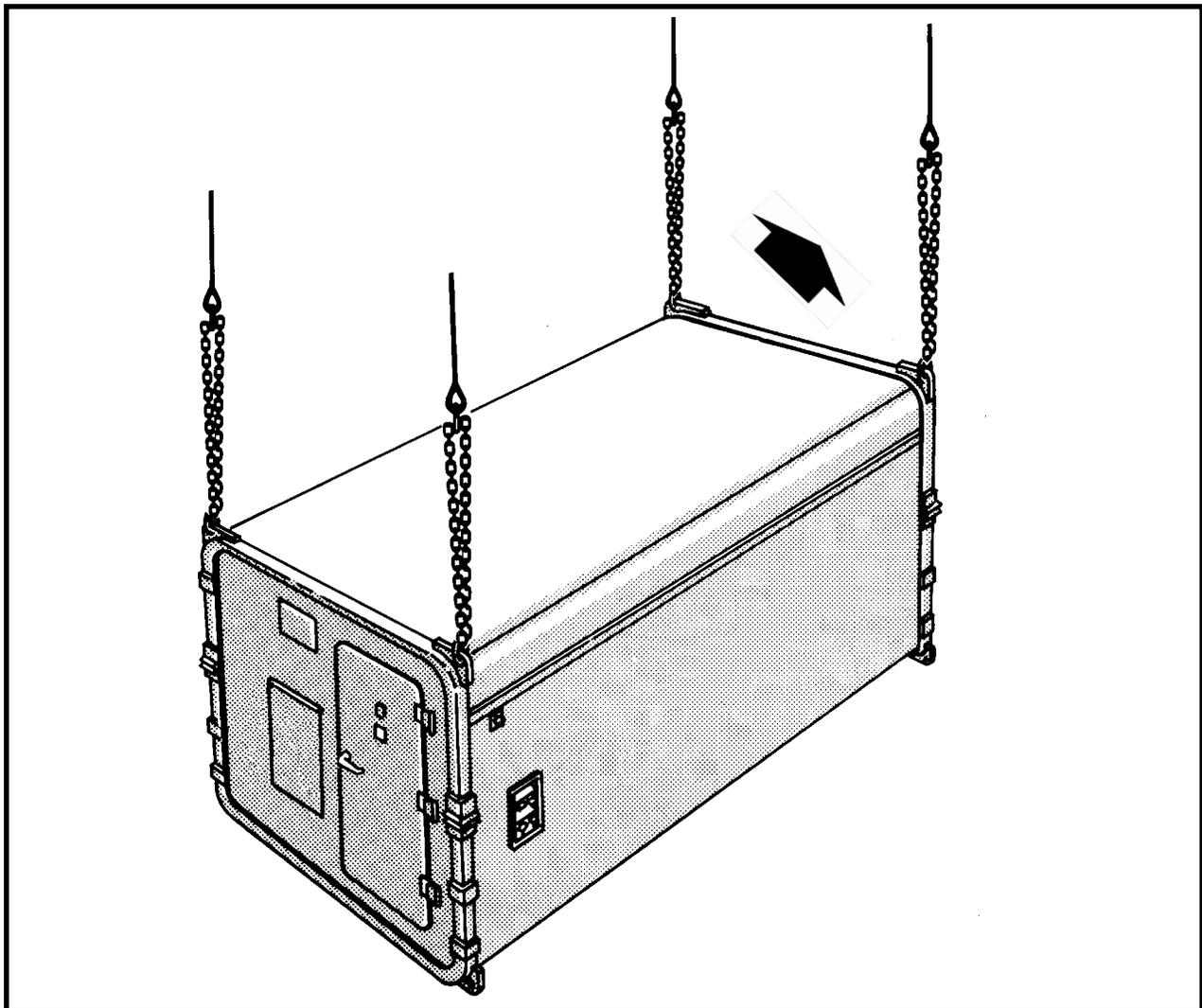
(b) Secure all loose equipment inside the shelter with tape or Type III nylon cord.

(c) Close and secure all doors and vents. Secure the door in the closed and locked position.

(2) **Rigging.** Rig the load according to the steps in Figure 7-11.

(3) **Hookup.** Two hookup teams are required for this load. The static wand person discharges the static electricity with the static wand. The forward hookup person stands on top of the shelter and places apex fitting number 1 onto the forward cargo hook. The aft hookup person stands on top of the shelter (door end) and places apex fitting number 2 onto the aft cargo hook. The hookup teams then carefully dismount the shelter and remain close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup teams quickly exit 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. Place two sling legs on apex fitting number 1. Position apex fitting number 1 on top of the shelter, opposite the door end.

2. Loop the chain end of the left and right sling legs through their respective lift provisions located on the front corners of the shelter. Place the correct link from Table 7-11 in the grab hook.

3. Place two sling legs on apex fitting number 2. Position apex fitting number 2 on top of the door end of the

shelter.

4. Loop the chain end of the left and right sling legs through their respective lift provisions located on the rear corners of the shelter. Place the correct link from Table 7-11 in the grab hook. Secure the excess chain with tape or Type III nylon cord.

5. Cluster and tie or tape (breakaway technique) the sling legs in each sling set together to prevent entanglement during hookup and lift-off.

Figure 7-11. Field Maintenance Equipment Shop 21, Unmanned Shop, Electrical Equipment

### 7-13. Platoon Command Post (PCP) / Battery Command Post (BCP)

**a. Applicability.** The following items, components of the Hawk missile system, in Table 7-12 are certified for the helicopter(s) listed in the following table by the US Army Soldier Systems Center:

**Table 7-12. Platoon Command Post/Battery Command Post**

NOMENCLATURE	MAX WEIGHT (POUNDS)	SLING SET	LINK COUNT FRONT/ REAR	TYPE OF AIRCRAFT	RECOMMENDED AIRSPEED (KNOTS)
Platoon Command Post, AN/MSW-20, Phase II, on M390C Trailer	10,244	25K	3/70	CH-47	125
Platoon Command Post, AN/MSW-20, Phase III, on M390C Trailer	9,300	25K	3/70	CH-47	125
Battery Command Post, AN/MSW-21, Phase III, on M390C Trailer	9,980	25K	3/70	CH-47	125

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

(1) Sling set (25,000-pound capacity) with one additional apex fitting .

(a) Chain length, part number 38850-00053-102, from a 25,000-pound capacity sling set (2 each).

(b) Coupling link, part number 664-241, from a 25,000-pound capacity sling set (2 each).

(2) Line, multiloop, 4-loop, 8-ply, NSN 1670-01-062-6307 (2 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) Clevis assembly, NSN 4030-00-278-0699 (6 each).

(7) Webbing, nylon, tubular, 1,000-pound breaking strength.

**CAUTION**

**DO NOT SUBSTITUTE ANY SLING EQUIPMENT IN PLACE OF THE SPECIFIED SLING SET OR MULTILoop LINES. THE TWO MULTILoop LINES AND THE SLING SET, WITH THE ADDITIONAL APEX FITTING, CHAIN LENGTHS, AND ADDITIONAL COUPLING LINKS, ARE TO BE STORED IN THE KIT BAG AND ONLY USED FOR SLING LOADING THE PCP/BCP.**

**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) Prepare the PCP/BCP for travel according to instructions in the operator's manual.

(b) Ensure the 3 1/4-ton clevises provided with the trailer chassis have been replaced with 6 3/4-ton clevises (NSN 4030-00-278-0699). Ensure the clevises are pinned and not damaged.

(c) Engage the parking brakes.

(d) Adjust the leveling jack pads to just above ground level. Lock into position.

(e) Secure all hoses, cables, and chains to the adjacent structure with tape or Type III nylon cord.

(f) Tape the towing provisions on the bottom corners of the shelter to prevent the rigging crew from routing the sling leg chain ends through the towing provisions.

(g) Using 1/2-inch tubular nylon, tie the front and rear lifting rings together tightly on top of the left side of the shelter so the lifting rings are facing each other. Repeat the procedure with the top lifting rings on the right side of the shelter.

(2) **Rigging.** Rig the load according to the steps in Figure 7-12.

(3) **Hookup.** Two hookup teams are required for this load. The static wand person discharges the static electricity with the static wand. The forward hookup person stands on top of the shelter and places apex fitting number 1 onto the forward cargo hook. The aft hookup person stands on top of the shelter and places apex fitting number 2 onto the aft cargo hook. The hookup teams then carefully dismount the shelter and remain close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup teams quickly exit 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).

**NOTE: Do not remove the additional chain sections from sling set 1. Keep sling sets 1 and 2 intact for ease in future use. Store the 12-foot multiloop lines in the kit bag with the two sling sets.**

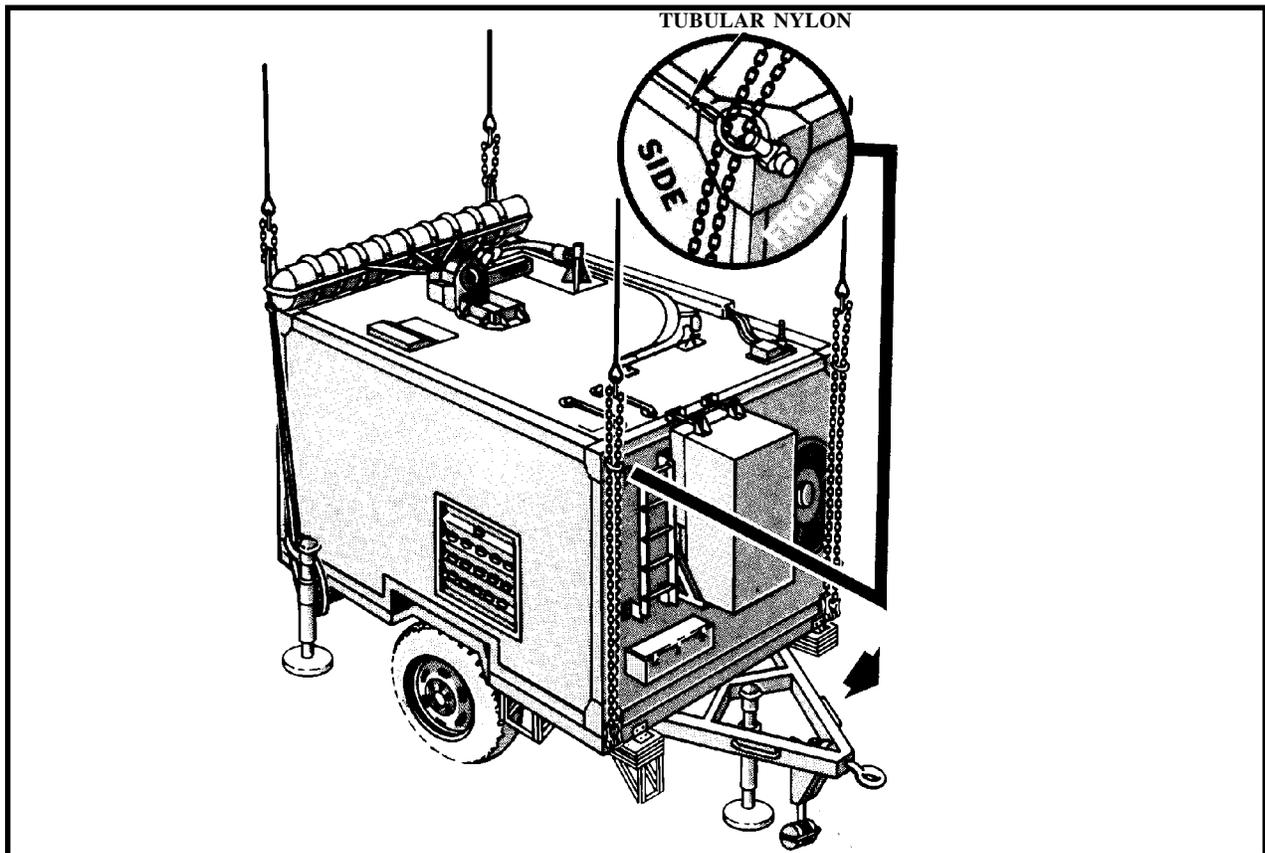


Figure 7-12. Platoon Command Post/Battery Command Post

<b>RIGGING STEPS</b>	
<p>1. Place two sling legs on apex fitting number 1. Connect an additional chain length to each sling leg chain using the coupling links. Position apex fitting number 1 on top of the shelter on the lunette end.</p> <p>2. Route the chain end of the left sling leg down through the upper lifting ring on the top left corner of the shelter, through the trailer lifting provision located on the front left corner of the trailer chassis, and back up through the upper lifting ring on the top left corner of the shelter. Place the correct link from Table 7-12 in the grab hook.</p> <p>3. Repeat the above procedures using the right sling leg and the right lifting provision.</p>	<p>plies of the multiloop line remain aligned. Tape or tie the multiloop line as necessary.</p> <p><b>NOTE: Do not route the 12-foot multiloop line through the towing provision on the base of the shelter.</b></p> <p>5. Repeat the above procedures on the right side of the shelter using the remaining 12-foot multiloop line.</p> <p>6. Place two sling legs on apex fitting number 2. Position apex fitting number 2 on top of the IFF end of the shelter.</p> <p>7. Loop the chain end of the left sling leg through the open loop at the free end of the 12-foot multiloop line on the left rear corner of the shelter. Place the correct link from Table 7-12 in the grab hook. Secure the excess chain with tape or Type III nylon cord.</p> <p>8. Repeat the above procedure using the right multiloop line and the right sling leg.</p> <p>9. Cluster and tie or tape (breakaway technique) the sling legs in each sling set together to prevent entanglement during hookup and lift-off.</p>
<p><b>NOTE: Do not route the chain ends through the towing provision on the base of the shelter.</b></p>	
<p>4. Choker hitch a 12-foot line around the rear left leveling jack stand on the trailer chassis. Ensure the loop of the knot is facing to the rear of the trailer. Route the free end of the 12-foot multiloop line up through the lifting ring on the top corner of the shelter. Ensure the choker hitch is tight around the jack stand and the individual</p>	

*Figure 7-12. Platoon Command Post/Battery Command Post (continued)*