

FM 55-700

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Reference

FM 55-700

DEPARTMENT OF THE ARMY FIELD MANUAL

AIR TRANSPORT PROCEDURES

TRANSPORT OF SPARTAN WARHEAD SECTION IN SHIPPING AND STORAGE CONTAINER, XM553, BY CH-47 HELICOPTER

Headquarters, Department of the Army, Washington, D.C.
27 January 1975

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1. Purpose and Scope

a. This manual presents Department of the Army approved procedures for transport of the Spartan warhead section in the shipping and storage container, XM553 (also referred to as "item"), as an internal load by US Army CH-47 helicopter. Materials and qualified manpower needed to prepare, load, tie down, and unload the item are prescribed herein. Where appropriate, metric equivalents are given in parentheses following the dimension or other measurement.

b. The transport procedures in this manual apply when the Spartan warhead section in the container, XM553, is transported by the CH-47 helicopter. Additional internal cargo, including different types of nuclear weapons and/or personnel within allowable load limits and

restrictions prescribed by AR 50-5 and pertinent safety regulations (app), may be transported.

c. Times given to prepare, load, tie down, and unload the loads described in this manual may vary, dependent upon existing conditions.

2. Reporting of Publication Improvements

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded to Director, Military Traffic Management Command Transportation Engineering Agency, ATTN: MTT-TRP, P.O. Box 6276, Newport News, Virginia 23606.

3. General Safety and Security Considerations

a. The following warnings will be observed by personnel performing operations, procedures, and practices that are included or implied in this manual. Disregard of these warnings could result in personal injury or loss of life.

(1) Prior to each nuclear cargo mission, the aircraft commander will be familiar with the provisions of AR 50-5. In addition, he will become familiar with the security, safety, and technical peculiarities of the items that may affect air transport. Flight plans should avoid populated areas to the maximum extent possible. *The Spartan warhead section is not to be jettisoned under any circumstances.*

(2) To determine compatibility of any other nuclear weapons or other dangerous cargo considered for transport with the warhead section, ordnance support channels must be consulted. Information on compatibility is contained in TM 39-45-51C and TM 38-250, which are distributed to major headquarters, nuclear weapons depots, and direct support and general support levels. Restrictions listed in TM 39-20-7 will not be exceeded when additional, different types of nuclear weapons are transported with the warhead section.

(3) The items will be loaded and tied down in accordance with the procedures in this manual except that they may be repositioned for helicopter operational reasons, or when loading additional nuclear weapons or other cargo and/or personnel. If a location other than that shown in the tiedown diagram is used, the helicopter commander must insure that—

(a) The number and load capacity of the tiedown devices are as prescribed in this manual.

(b) The tiedown devices restraining the item are secured to tiedown fittings in the same location relative to the item as those fittings used in the tiedown diagram.

(c) The item faces as shown in the tiedown diagram.

(d) The center of gravity of the helicopter is maintained within limits specified in the operator's manual (app).

b. The following operational precautions will be observed during loading, tiedown, transport, and unloading of the item.

(1) MB-1 tiedown devices, as used to secure the item described in this manual, must be inspected prior to use to insure serviceability. Inspect each device for excessively worn or defective working parts, improper operation,

cracks, distortion, and corrosion. If any of these conditions are present, the devices must be replaced.

(2) Movement of the container must be controlled to prevent damage to the item or the helicopter. During winching of the container into the helicopter a safety restraining device; that is, type XXVI nylon web strapping, should be used. One end of the strapping is fastened to the container and the free end is passed through a strap fastener (NSN 1670-00-360-0340), which is attached to a tiedown fitting in the forward part of the helicopter. The free end of the strapping is then *manned outside and to the rear of the helicopter*. As the container is winched into the helicopter, slack is taken out of the strapping so that in the event of winch or cable failure the container will be restrained in place.

(3) When attaching tiedown devices to cargo and to tiedown fittings, approximately equal tension must be maintained throughout tiedown arrangements. Tiedowns must be checked during flight and tightened as necessary.

(4) Security and safety measures as established by pertinent publications (app), will be observed during all phases of air transport. All operations described herein will be in strict compliance with TM 9-1115-700-50/1 and *Safety Rules for Operations With the Safeguard Nuclear Weapons Systems* (when published).

(5) The danger areas around helicopters must be cleared of personnel, other aircraft, and vehicles before the engines are started.

(6) The high noise level of helicopter engines can cause permanent damage to the ear. All personnel working in the vicinity will wear hearing protectors and avoid entering engine noise danger areas.

(7) During winching operations, the area behind the container must be cleared of personnel, and only the necessary personnel will be in the cargo compartment.

NOTE

The front end of the container, XM553, contains the humidity indicator plug, pressure equalizing valves, desiccant, and records holder.

4. Air Transportability and Handling Data

a. The dimensions, volume, and approximate weight of the container, XM553 (fig 1), with Spartan warhead section, are as follows:

<u>Length</u>	<u>Width</u>	<u>Height</u>	<u>Volume</u>	<u>Weight*</u>
144.0 in. (3.66 m)	63.0 in. (1.60 m)	68.0 in. (1.73 m)	357.0 cu ft (10.10 cu m)	6,290 lb (2,853 kg)

* Approximate weight of empty container is 2,650 lbs (1,202 kg).

b. The container, XM553, must be inspected for damage other than minor scratches and abrasions. If container is damaged to such an extent that the contents are believed to have been damaged, or if the humidity indicator reading is 50 percent or over, notify the support unit.

c. The 48 tee bolts securing the container cover to the base must be tightened, if necessary.

d. Four men can prepare, load, and tie down the container in the helicopter in approximately 30 minutes.

e. Four men can remove tiedowns and unload the container from the helicopter in approximately 15 minutes.

f. The container and conveyors must rest on shoring when transported in the CH-47 helicopter.

g. Plywood may be used as parking and rolling shoring in place of all or part of the 2- by 12-inch lumber shoring, except blocking shoring, as prescribed in paragraph 5 below. The plywood shoring must be 1½ inches thick (two layers of ¾-inch or three layers of ½-inch), and

at least 16 inches wide under each conveyor section to provide for the required distribution of container weight on helicopter ramp and floor. Layers of plywood shoring must be nailed together to prevent sliding.

5. Preparation and Loading

Materials and procedures for transporting one container, XM553, in CH-47 helicopter.

a. Materials.

(1) Parking shoring: two pieces, 2- by 12-inch by 12-foot.

(2) Rolling shoring: two pieces, 2- by 12-inch by 12-foot; four pieces, 2- by 12-inch by 8-foot; plywood, two pieces, ¾- by 16-inch by 10-foot.

(3) Blocking shoring: approximately 22 pieces, 2- by 12- by 20-inch; two pieces, 2- by 4- by 30-inch (spacers).

(4) Wheeled or roller conveyor: two sections, 10-foot (NSN 3910-00-903-1303), or equivalent.

(5) Restraint device: 14 MB-1 tiedown devices (NSN 1670-00-545-9062), or equivalent.

(6) Truck, forklift or crane: one, 10,000-pound-minimum capacity.

(7) Nylon web strapping, ½-inch, type XXVI (NSN-8305-00-177-5069): or equivalent, as required.

(8) Strap fastener (NSN 1670-00-360-0340): one each.

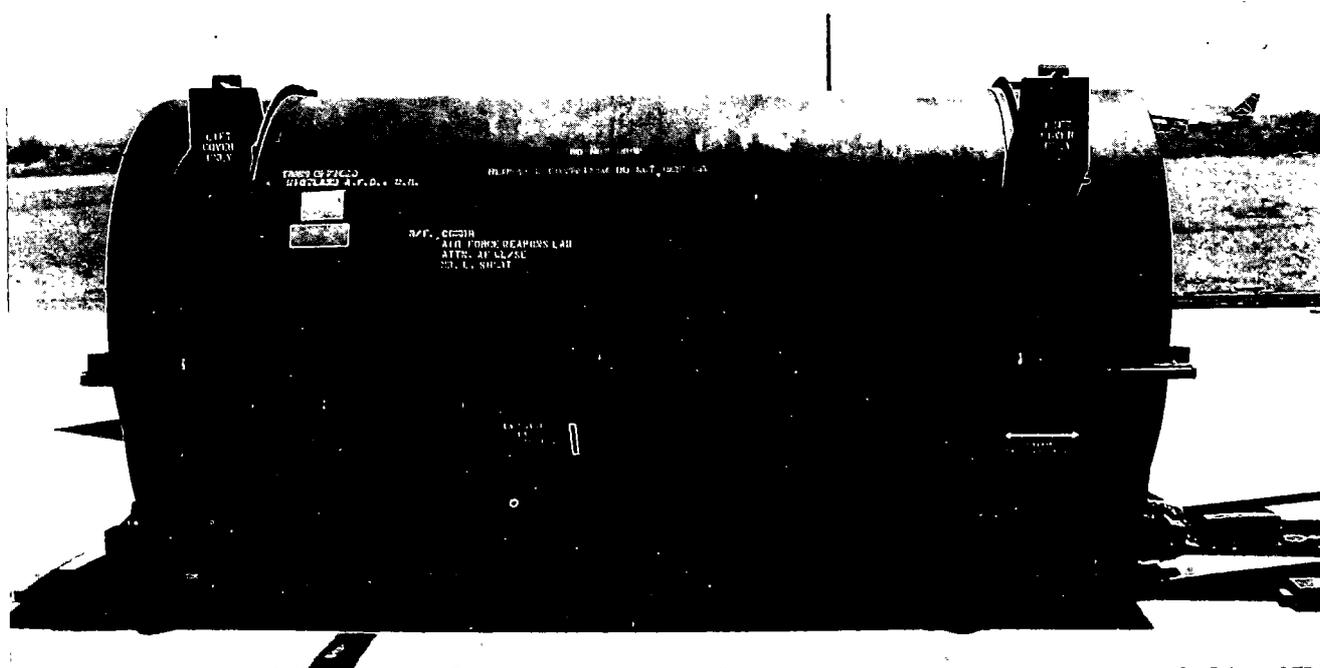


Figure 1. Shipping and storage container, XM553, for Spartan warhead section.

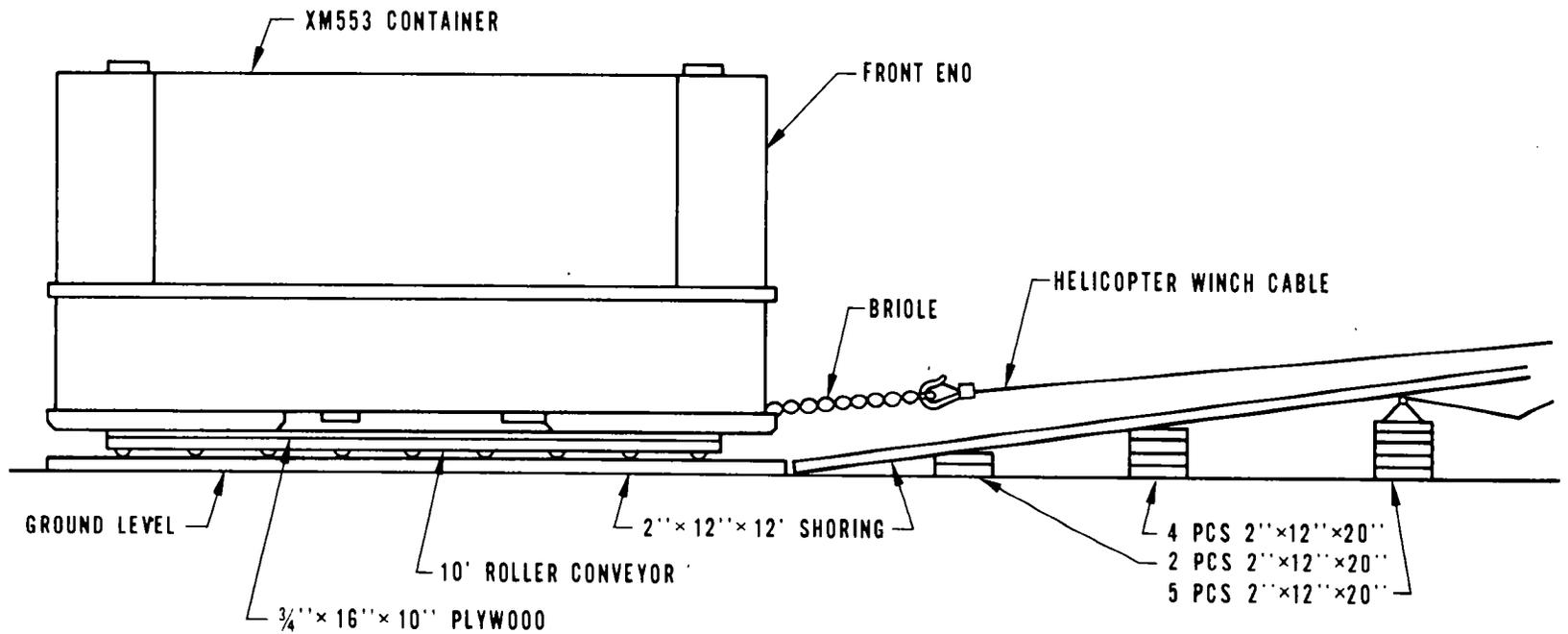


Figure 2. Side view schematic of rolling and blocking shoring positioned for loading the container, XM553, with Spartan warhead section, into CH-47 helicopter.



Figure 3. Rolling shoring and conveyors positioned for loading the container, XM558, with Spartan warhead section, into CH-47 helicopter. Note position of blocks and ties to maintain alignment of conveyors.

b. Loading.

(1) Position rolling shoring and two helicopter auxiliary loading ramps to align with skids of container.

(2) Position shoring and conveyors, rollers down, as shown in figure 2. Use two 8-foot pieces on ramp and two 8-foot pieces as first extension into the cargo compartment. Extend parking shoring forward in compartment. Place two 2- by 4- by 30-inch blocks between conveyors (fig 3) to maintain alignment while item is being winched into helicopter. Tie the conveyors together with nylon web strapping to hold the 30-inch blocks in place as shown in figure 3.

(3) Place $\frac{3}{4}$ - by 16-inch by 10-foot plywood on the conveyors.

CAUTION

When using a forklift to side-lift the container, insure that the forks extend through fork pockets on the opposite side. During movement, the container must be tilted to rest against the forklift lift assembly.

(4) Position container (front end towards helicopter) on conveyors (fig 1) using forklift or crane.

(5) Place wood block at ramp hinge, beneath winch cable, to protect helicopter floor.

(6) Secure chain tiedown device across cargo compartment forward of container tie-

down location, and butt parking shoring against chain to prevent movement of shoring during loading.

(7) Position guides to adjust shoring, observe clearances, and signal winch operator as necessary.

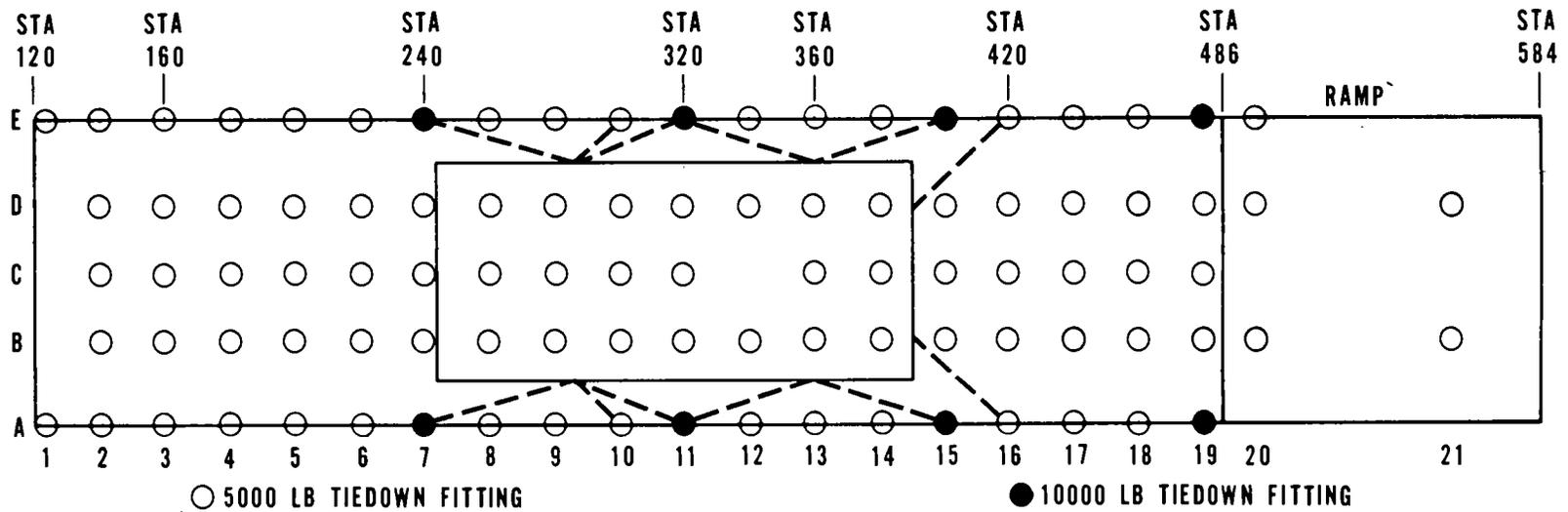
(8) Form a bridle with chain from tiedown device passed through the towing eyes on the front end of the container, and attach safety restraining device (para 3b(2)). Attach helicopter winch cable hook to the bridle (safety-tie cable hooks that have missing or inoperable safety latches, to prevent accidental release), and slowly winch container into the helicopter (on floor center line) to its tiedown location. As the container center of balance approaches the crest of the ramp hinge, the ramp may be raised to floor level position for ease of loading.

(9) Apply fore and aft restraints to the container, and release tension on the winch cable. The bridle and winch cable may remain attached to the container during flight for use in unloading.

(10) Tie down the container (on the conveyors) in accordance with figure 4 and table 1.

(11) Reposition materials required during unloading, and tie down as directed by the helicopter commander.

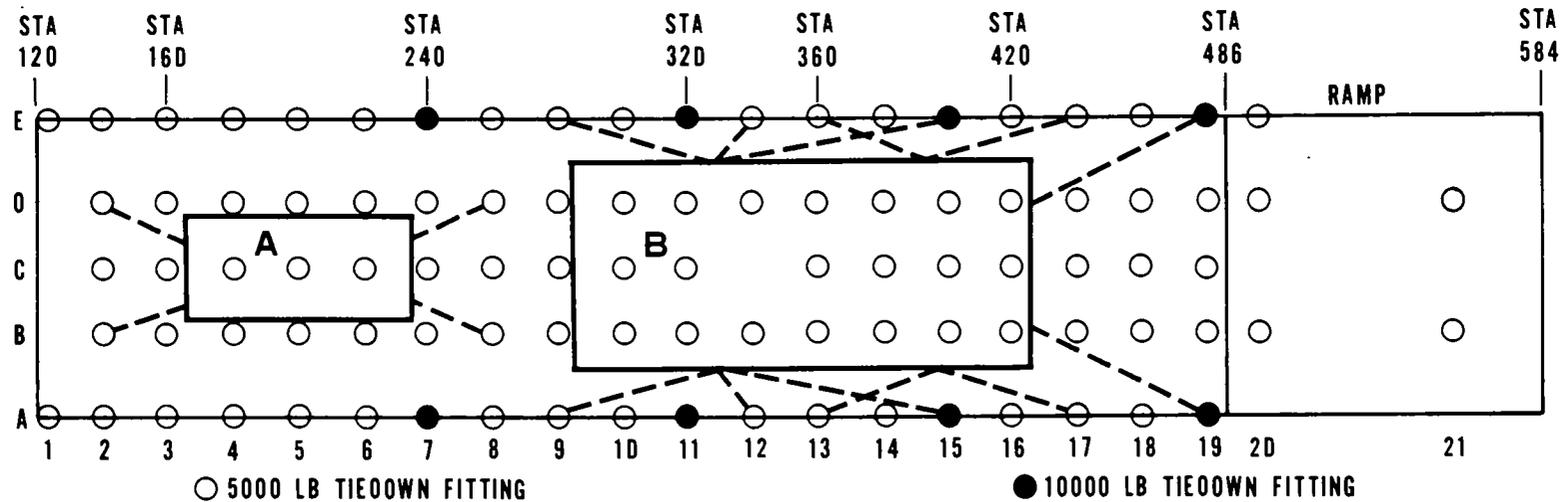
c. Unloading. Unloading procedures are essentially the reverse of loading procedures. Use the helicopter winch as a safety restraint when container, on conveyors, is pushed from the



NOTE: UTILITY HATCH DOOR IS LOCATED IN THE CENTER OF THE FLOOR BETWEEN STATIONS 320 AND 360.

DESCRIPTION OF ITEM	ITEM FACING	LOCATION OF REFERENCE POINT		LOCATION OF CG (STA)	APPROX WT (LB)
		REFERENCE POINT	STATION		
XM553 CONTAINER WITH SPARTAN WARHEAD SECTION	FORWARD	FORWARD EDGE OF CONTAINER	244	324	6290

Figure 4. Tiedown diagram for one container, XM553, with Spartan warhead section, in CH-47 helicopter.



NOTE: UTILITY HATCH DDR IS LOCATED IN THE CENTER OF THE FLOOR BETWEEN STATIONS 32D AND 36D.

ITEM	DESCRIPTION OF ITEM	ITEM FACING	LOCATION OF REFERENCE POINT		LOCATION OF CG (STA)	APPROX WT (LB)
			REFERENCE POINT	STATION		
A	XM542 CONTAINER WITH SPRINT WARHEAD SECTION	FDRWARD	FORWARD EDGE DF CONTAINER	165	200	872
B	XM553 CONTAINER WITH SPARTAN WARHEAD SECTION	FDRWARD	FORWARD EDGE OF CONTAINER	284	364	6290

NOTE: LOAD CG IS AT STATION 323 BASED ON THE ABOVE DIAGRAM, AND WITH THE FLIGHT ENGINEER AT STATION 105 AND THE TROOP COMMANDER AND THREE ESCORT PERSONNEL AT STATION 195. TOTAL WEIGHT OF THE FIVE PERSONNEL IS 1000 POUNDS.

Figure 5. Tiedown diagram for one container, XM542, with Sprint warhead section, and one container, XM553, with Spartan warhead section, in CH-47 helicopter.

helicopter. Care must be exercised when container center of balance passes over the ramp hinge.

6. Mixed Loads

Mixed loads of Spartan and Sprint warhead section containers may be transported in the CH-47 helicopter in accordance with the provi-

sions identified in paragraph 3a(3). Materials and procedures for transporting the containers, XM553 (Spartan) and XM542 (Sprint), are prescribed by Field Manuals 55-700 and 55-750 respectively. When transporting one container, XM553, and one container, XM542 simultaneously, the containers will be positioned and tied down in accordance with figure 5 and table 2.

Table 1. Tiedown Data for One Container, XM553, With Spartan Warhead Section, in CH-47 Helicopter

Tiedown fitting		Tiedown device		
designation	capacity in 1,000 lb	type	capacity in 1,000 lb	Attach to container base assembly
A7	10	MB-1	10	Left forward lift fixture
E7	10	MB-1	10	Right forward lift fixture
A10	5	MB-1	10	Left forward lift fixture
E10	5	MB-1	10	Right forward lift fixture
A11	10	MB-1	10	Left forward lift fixture
E11	10	MB-1	10	Right forward lift fixture
A11	5	MB-1	10	Left rear lift fixture
E11	5	MB-1	10	Right rear lift fixture
A15	10	MB-1	10	Left rear lift fixture
E15	10	MB-1	10	Right rear lift fixture
A16	5	MB-1	10	Left rear tow fixture
E16	5	MB-1	10	Right rear tow fixture

Table 2. Tiedown Data for One Container, XM542, With Sprint Warhead Section, and One Container XM553, With Spartan Warhead Section, in CH-47 Helicopter

Tiedown fitting			Tiedown device*		Attach to container base assembly
Item	designation	capacity in 1,000 lb	type	capacity in 1,000 lb	
A	B2	5	CGU-1/B	5	Left forward tow fixture
	D2	5	CGU-1/B	5	Right forward tow fixture
	B8	5	CGU-1/B	5	Left rear tow fixture
	D8	5	CGU-1/B	5	Right rear tow fixture
B	A9	5	MB-1	10	Left forward lift fixture
	E9	5	MB-1	10	Right forward lift fixture
	A12	5	MB-1	10	Left forward lift fixture
	E12	5	MB-1	10	Right forward lift fixture
	A13	5	MB-1	10	Left rear lift fixture
	E13	5	MB-1	10	Right rear lift fixture
	A15	10	MB-1	10	Left forward lift fixture
	E15	10	MB-1	10	Right forward lift fixture
	A17	5	MB-1	10	Left rear lift fixture
	E17	5	MB-1	10	Right rear lift fixture
	A19	10	MB-1	10	Left rear tow fixture
E19	10	MB-1	10	Right rear tow fixture	

*MC-1 tiedown device may be substituted for the CGU-1/B; C-2 tiedown device may be substituted for the MB-1.

APPENDIX REFERENCES

1. Army Regulations (AR)

10-16	US Army Nuclear and Chemical Surety Group.
40-14	Control and Recording Procedures: Occupational Exposure to Ionizing Radiation.
50-5	Nuclear Weapons and Materiel: Nuclear Surety.
55-203	Movement of Nuclear Weapons, Nuclear Components, and Related Classified Nonnuclear Materiel.
95-27	Operational Procedures for Aircraft Carrying Dangerous Materials.
360-43	Information Guidance: Nuclear Accidents and Nuclear Incidents.
385-40	Accident Reporting and Records.
(FOUO) 700-65	Nuclear Weapons and Nuclear Weapons Materiel.
740-1	Storage and Supply Activity Operations.

2. Field Manuals (FM)

1-100	Army Aviation Utilization.
55-750	Transport of Sprint Warhead Section in Shipping and Storage Container, XM542, by CH-47 Helicopter.

3. Technical Bulletins

(SRD) 9-380-1	Security Classification of Nuclear Items (U).
385-2	Nuclear Weapons Firefighting Procedures.

4. Technical Manuals (TM)

5-315	Fire Fighting and Rescue Procedures in Theaters of Operations.
9-1115-700-50/1	Depot Maintenance, Including Repair Parts and Special Tools List (Assembly, Test, Maintenance and Storage Procedures), XM217E1 Atomic Warhead Section, XM218 and XM219 Training Atomic Warhead Section.
9-1300-206	Ammunition and Explosives Standards.
38-250	Packaging and Handling of Dangerous Materials for Transportation by Military Aircraft.
(CRD) 39-0-1A	Numerical Index to Joint Atomic Weapons Publications (Including Related Publications) (Army Supplement) (U).
(SRD) 39-20-7	Nuclear Safety Criteria (U).
(CRD) 39-20-11	General Firefighting Guidance for Nuclear Weapons (U).
39-45-51	Transportation of Nuclear Weapons Materiel.
39-45-51C	Transportation of Nuclear Weapons Materiel (Supplement) Preparation and Shipment by Military Aircraft.
(SRD) 39-45-51A	Transportation of Nuclear Weapons Materiel (Supplement) Shipping and Identification Data for Stockpile Major Assemblies (U).
55-450-15	Air Movement of Troops and Equipment (Nontactical).
55-450-18	Air Transport of Supplies and Equipment: Internal and External Loads, CH-47 Helicopter.
55-1520-227-10	Operator's Manual: Army Model CH-47B and CH-47C Helicopters.

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