DEPARTMENT OF THE ARMY TECHNICAL MANUAL

Air Transportability Procedures

M38A1C AND M151A1C 1/4-TON TRUCKS, WITH MOUNTED 106-MM RECOIL-LESS RIFLES, IN CH-47 HELICOPTER

Headquarters, Department of the Army, Washington, D.C.
8 December 1966

1. Purpose and Scope

a. This manual presents transportability procedures for movement of M38A1C and M151A1C Y4-ton trucks, with mounted 106-mm recoilless rifles, in the CH-47 helicopter and prescribes the materials and manpower needed to prepare, load, and tie down the trucks and to off-load them from the helicopter.

b. Users of this manual are encouraged to submit recommended changes or comments for its improvement. Comments should be keyed to the specific page, paragraph, and line of the text in which a change is recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. Comments should be forwarded direct to the Commander, U.S. Army Transportation Engineering Agency, Military Traffic Management and Terminal Service, ATTN: MTT-TG, Fort Eustis, Va. 23604.

2. Applicability

The instructions in this manual apply when the trucks are transported in the CH-47 helicopter. With the consent of the helicopter commander, a transported unit can add cargo within allowable load limits and restrictions prescribed by pertinent safety regulations (app). The load described in this manual is not necessarily a maximum load.

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Warning: The M38A1C and M151A1C 1/4ton trucks, with mounted 106-mm recoilless rifles, in the CH-47 helicopter shall be loaded and tied down in accordance with the instructions in this manual except when, for operational reasons or to accommodate additional cargo, the helicopter commander may designate a location other than that shown in the loading diagram. If the trucks are relocated, 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 trucks are secured to tiedown fittings of at least the same strength and in the same location relative to the trucks as those fittings used in the tiedown diagram.**

***c*. The trucks face as shown in the tiedown diagram.**

3. Responsibilities

a. Transported Unit Commander.

(1) Prepare equipment for air transport with supervision and assistance as required from appropriate field support units.

(2) Load, tie down, and off-load equipment transported aboard the helicopter, subject to approval by the helicopter commander or his authorized repre

sentative. Such approval is to insure that loading, tiedown, and off-loading are accomplished as prescribed by this manual.

(3) Effect advance coordination with the transporting unit to include a request for the tiedown devices required.

(4) Provide manpower and the necessary materials needed to prepare, load, and off-load the equipment.

(5) Provide guidance to the helicopter commander relative to safety and to any technical peculiarities of the trucks and the mounted 106-mm recoilless rifles which may affect their safe and reliable air transport.

b. Transporting Unit Commander.

(1) Supply a sufficient quantity of the type of tiedown devices requested.

(2) Operate helicopter-associated equipment, and monitor loading, tiedown, and offloading procedures to insure conformance with this manual.

(3) Inspect the helicopter for serviceability appropriate to the mission, and comply with pertinent aviation directives and maintenance manuals.

4. Load Description

The approximate dimensions and weights of the trucks with mounted 106-mm recoilless rifles are as follows:

Item	Dimensions			Weight (lb)
	Length (in)	Width (in)	Height (in)	
Truck, 1/4-ton, M38A1C, with 106mm recoiless rifle	152	68	71	3, 220
Truck, 1/4-ton, M151A1C, with 106-mm recoilless rifle	148	72	64	3, 235

5. Preparation and Loading

a. Materials. Four small clevis assemblies (FSN 1670-360-0304), for use with Mi151AlC truck only.

b. Procedures.

(1) Insure that the following is accomplished for each truck:

(a) Remove truck top and store in truck; strap down the top supports.

(b) Lower the windshield and side rearview mirror.

(c) Bend antenna base section forward, and secure the antenna.

(d) Inspect rifle's secureness to mount.

(e) Insure that trucks' fuel tanks are filled to only three-fourths of their capacity.

(2) Attach a clevis to each of the four axle hubs of the M151A1C truck.

(3) Align helicopter auxiliary ramps with wheels of trucks.

(4) Position guides in helicopter and at left front of trucks to observe clearances and to signal drivers as necessary.

(5) Back M38A1C truck into helicopter to tiedown position; place transmission in gear and set brakes.

(6) Repeat (5) above for M151AlC truck.

Note. Exercise extreme caution to insure that all securement chains and straps used around axles are located so as not to damage hydraulic brake lines.

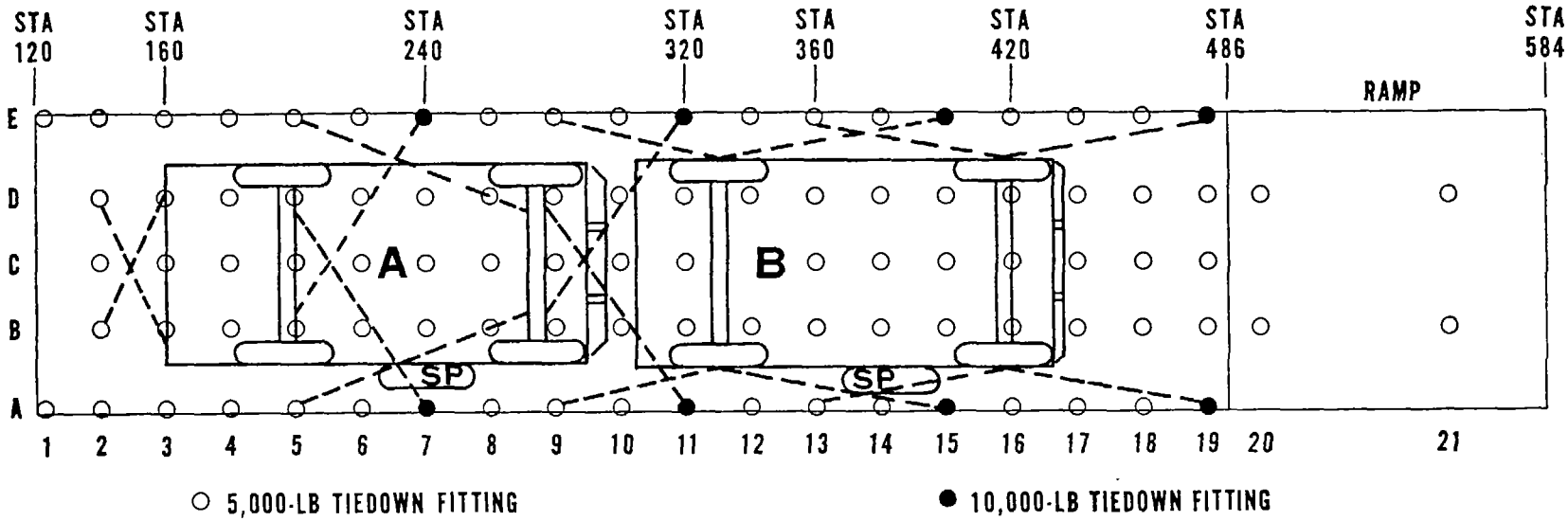
(7) Tie down the trucks in accordance with figure 1 and table 1. Four CGU-i/B and four MB-1 tiedown devices are required to tie down each truck.

(8) Four men can prepare, load, and tie down the trucks in approximately 20 minutes.

Note. It is emphasized that times given for the operations described in this manual are for guidance purposes only and may vary, dependent upon existing conditions.

6. Off-Loading

The off-loading procedures are essentially the reverse of those used in loading. Position guides and drive trucks from the helicopter. Four men can off-load the trucks from the helicopter in approximately 10 minutes.



NOTE: FLOOR AREA BOUNDED BY ROWS 11 AND 13, AND COLUMNS B AND D INCLOSE UTILITY HATCH.

Item	Description of item	Item facing	Location of reference point		Location of C.G.	Approx. wt [lb]
			Reference point	Station		
A	M38A1C ¼-ton truck, with mounted 106-mm recoilless rifle.	Aft	Rear Axle	197	230	3, 220
B	M151A1C ¼-ton truck, with mounted 106-mm recoilless rifle.	Aft	Rear Axle	330	380	3, 235

Figure 1. Tiedown diagram for M38A1C and M151A1C 1/4-ton trucks, with mounted 106-mm recoilless rifles, in CH-47 helicopter.

Table 1. Tiedown Data for M38A1C and A151A1C 1/4-Ton Trucks, With Mounted 106-mm Recoilless Rifles, in CH-47 Helicopter

Item	Tiedown fitting No.	Capacity of tiedown fitting In 1,000 lb	Type device*	Attach to item
A	B2	5	CGU-1/B	Left rear lifting point.
	D2	5	CGU-1/B	Right rear lifting point.
	A5	5	CGU-1/B	Around front axle, right side.
	E5	5	CGU-1/B	Around front axle, left side.
	A7	10	MB-1	Around rear axle, left side.
	E7	10	MB-1	Around rear axle, right side.
	A11	10	MB-1	Around front axle, left side.
	E11	10	MB-1	Around front axle, right side.
B	A9	5	CGU-1/B	Right rear wheel clevis.
	E9	5	CGU-1/B	Left rear wheel clevis.
	A13	5	CGU-1/B	Right front wheel clevis.
	E13	5	CGU-1/B	Left front wheel clevis.
	A15	10	MB-1	Right rear wheel clevis.
	E15	10	MB-1	Left rear wheel clevis.
	A19	10	MB-1	Right front wheel clevis.
	E19	10	MB-1	Left front wheel clevis.

*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. Field Manual

FM 1-100 .....Army Aviation Utilization.

2. Technical Manuals

TM 5-315 .....Firefighting (Structures, Aircraft, Petroleum, and Nuclear Material) and Rescue Operations in Theaters of Operations.
TM 9-1000-205-12 .....Operator and Organizational Maintenance Manual: 106-mm Recoilless Rifle M40A1 with Cal. .50 Spotting Gun M8C on Mount M79 or M92 with Tripod M27; and 106-mm Recoilless Rifle M40A1C used on Multiple 106-mm ft SP Rifle M50.
TM 9-2320-218-10 .....Operator's Manual, Truck, Utility: 34-Ton, 4x4, M151.
TM 9-8014 .....Operator and Organizational Maintenance Manual: Truck, Ambulance: Front Line, 1/4-Ton, 4x4, M70; Truck, Utility: Y-Ton, 4x4, M38A1, M38A1C and M38A1D.
TM 55-450-9 .....Air Transport of Supplies and Equipment: Internal-Transport Procedures.
TM 55-1520-209-10 .....Operator's Manual, Army Model CH-47A Helicopter.
TM 57-210 .....Air Movement of Troops and Equipment.

3. Technical Bulletin

TB 55-46 .....Standard Characteristics (Dimensions, Weight, and Cube) for Transportability of Military Vehicles and Equipment.

4. Army Regulations

AR 385-40 .....Accident Reporting and Records.
AR 705-35 .....Criteria for Air Portability and Air Drop of Materiel.

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To be distributed in accordance with DA Form 12-31, requirements for operator and crew instructions for CH-47 Helicopter, and DA Form 12-40, Section 1, requirements for operator and crew instructions for Rifle, Recoilless 106-mm M40A1 on Mount M79.

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 decagram = 10 grams = .35 ounce
1 hectogram = 10 decagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. deka meters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

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