TECHNICAL MANUAL

TRANSPORTABILITY GUIDANCE

APPLICATION OF BLOCKING, BRACING, AND TIEDOWN MATERIALS FOR RAIL TRANSPORT

This copy is a reprint which includes current pages from Changes 1 through 4.

HEADQUARTERS, DEPARTMENT OF THE ARMY
MAY 1978

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CHANGE
No. 4

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TRANSPORTABILITY GUIDANCE
APPLICATION OF BLOCKING, BRACING, AND TIEDOWN
MATERIALS FOR RAIL TRANSPORT

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NO. 3)

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TRANSPORTABILITY GUIDANCE
APPLICATION OF BLOCKING, BRACING, AND TIEDOWN
MATERIALS FOR RAIL TRANSPORT

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D-17 through D-32.8	D-17 through D-32.10
None	D-42.1 and D-42.2
E-1 through E-2.3	E-1 through E-2.3
E-67 and E-68	E-67 and E-68
E-77 through E-80	E-77 through E-80
E-83 and E-84	E-83 and E-84
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None	E-126.1 and E-126.2
E-129 and E-130	E-129 through E-130.2
F-1 and F-2	F-1 and F-2
F-5 and F-6	F-5 and F-6
None	F-12.1 and F-12.2
F-21 and F-22	F-21 through F-22.2
F-31 and F-32	F-30.1 through F-32.2
H-1 and H-2	H-1 and H-2

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Change
No. 2

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TRANSPORTABILITY GUIDANCE
APPLICATION OF BLOCKING, BRACING, AND TIEDOWN
MATERIALS FOR RAIL TRANSPORT

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i	i
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A-1 and A-2	A-1 and A-2
B-1 and B-2	B-1 and B-2
C-1	C-
D-1 through D-4	D-1 through D-4
D-7 through D-10	D-7 through D-10
D-15 through D-32.4	D-15 through D-32.4
None	D-32.5 through D-32.8
E-1 and E-2	E-1 and E-2
None	E-2.1 through E-2.4
E-3 through E-8	E-3 through E-8
E-55 through E-66	E-55 through E-66
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E-105 and E-106	E-105 and E-106
E-107 and E-108	E-107
None	E-108.1 through E-108.7
F-23 and F-24	F-23 and F-24
None	F-24.1 and F-24.2
H-1 through H-3	H-1 and H-2
S-1 and S-2	S-1 and S-2
T-1	T-1
None	Y-1 and Y-2

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No. 55-2200-001-12

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WASHINGTON, D.C., 31 May 1978

TRANSPORTABILITY GUIDANCE APPLICATION OF BLOCKING, BRACING, AND TIEDOWN MATERIALS FOR RAIL TRANSPORT

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*This publication supersedes TM 55-601, 11 August 1971.

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PREFACE

This manual provides procedures for load planning and general guidance for military and civilian personnel in loading, blocking, and bracing military equipment on railway cars. Its purpose is further described in Section 1-la. It was compiled using information described in Section 1-lb. Change 4 also adds information extracted from the following sources:

For operation within the North Atlantic Treaty Organization (NATO) countries, the appropriate NATO Standardization Agreements (STANAGs), as listed below, have been included.

This publication implements the following international agreements:
-2152, Loading Ramps.

-2173 (Edition 3), Regulations for the Securing of Military Tracked and Wheeled Vehicles on Railway Wagons.

-2175 (Edition 3), Classification and Designation of Flat Wagons Suitable for Transporting Military Equipment.

-2832, Restrictions for the Transport of Military Equipment by Rail on European Railways.

-2890, Regulations for Safety in the Transport of Military Ammunition and Explosives by Rail.

-2943, Regulations for the Lateral or End-on Loading and Unloading of Wheeled or Tracked Military Equipment Transported on Railway Wagons.

For operation in other theaters, the directives of the theater commander and the rules of the host nation railroad system must be consulted.

Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

The proponent of this publication is Director, Military Traffic Management Command Transportation Engineering Agency (MTMCTEA). Send comments and recommendations on DA Form 2028-2.
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For section 1-1 and appendixes A through Y, address electrically transmitted messages to: DIR WMICTEA FT EUSTIS VA //MTE-TRM/. Telephone inquiries may be made by calling DSN 9274646 or commercial (804) 8784646. For sections 5-1 through 8-1, address messages to: CMDT USATSCH FT EUSTIS VA //ATSP-TDL//. Make telephone inquiries to DSN 927-6416, or (804) 878-6416.

1-1. Purpose and Scope

a. This manual provides basic loading rules and procedures for proper application of materials used in loading and securing military cargo in/on open top railcars.

b. Information contained in this manual is extracted from the Association of American Railroads (AAR) manual, *General Rules Governing the Loading (of Commodities on Open Top Cars and Trailers*, AR 55-355, Military Traffic Management Regulation, and other civilian and military publications, as shown in appendix A. More specifically the information contained herein pertains to railway equipment availability, to railcar designations and characteristics, and to procedures to be used in loading, blocking, and bracing as well as to rail impact and over the-road test procedures. The AAR loading rules that govern the loading of commodities in/on open top cars are obtainable from the Secretary, Mechanical Division, Association of American Railroads, 59 East Van Buren Street, Chicago, Illinois 60605.

c This manual is a user guide for the loading, blocking, and bracing of military equipment in/on open top railcars and for the Computerized Movement Planning and Status System (COMPASS) detail and summary listing of blocking and bracing material (BBM) requirements applicable to the loading of Army unit vehicles.

d. Users of this publication are encouraged to submit recommended changes and comments to improve it. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons will be provided for each comment to insure understanding and complete evaluation. Comments should be prepared on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded direct to the Commander, Military Traffic Management Command Transportation Engineering Agency, ATTN: MTT-TRC, P.O. Box 6276, Newport News, Virginia 23606. Electrically transmitted comments should be sent to CDRMTMCTEA FT EUSTIS VA//MTT-TRC//.

2-1. General

a. The Association of American Railroads loading rules are formulated to provide safe and economical methods of loading railcars. The materials specified in these rules are the minimum required, based on many years of exacting studies and experiments. All of the general rules and requirements contained in the AAR open top loading manual for blocking and securing loads, outlined in AAR General Rules Section 1 (app D), are mandatory, unless otherwise provided in the individual loading figures in AAR Loading Rules Section 6 (app E), which pertains to the loading of Department of Defense (DOD) materials. Loading methods depicted in other sections, for instance, appendix F of the AAR manual, may be used for loading DOD material if an appropriate loading figure is not available in appendix E.

b. The AAR loading rules that govern the loading of various commodities on open top cars are primarily intended for the safe movement of the car and load from origin to destination. The AAR makes no provision to protect commodities from the elements or from other forms of damage. When additional protection from damage becomes necessary, this then becomes a matter to be decided between the shipper and receiver of the commodity.

c. When cars with steel in lieu of wood floors are furnished any floor blocking or metal anchor plate that is specified by a particular figure or rule to be nailed to the wood floor must be bolted rather than nailed to the steel floor.

d. All floor blocking applied to control lateral movement of the load on cars equipped with nailable steel flooring must extend to the sides of the car using backup blocking. On flatcars, backup blocking must extend to the stub stakes. This requirement does not apply to the composite or combination wood and steel type of nailable flooring.

e. When a sizeable number of vehicles are to be shipped, consideration should be given to using multilevel or single-deck flatcars with chain tiedowns. This type of equipment almost always reduces or eliminates the requirement for blocking and bracing, speeds up the tiedown process, and reduces the number of flatcars required for a large movement. See figures 87, 88, 88B, 300, 302, 303, and 304, appendix E. The advantages and cost savings possible through the use of special purpose cars (app G) should not be overlooked.

3-1. AAR General Rules

a. General Rule 1(b)(1) begins by stating, "Special authority must be procured by the shipper from the originating carrier for shipments of any commodity on open top cars not covered by a specific figure in sections 2 to 7 inclusive..."; and *General Rule 1l(b)(3) further advises*. "Originating carrier and shipper must confer as to appropriate blocking and bracing methods for loads not covered by a specific figure, and consideration must be given to such details as topography, distance traveled. multiple track system, grades, curves, train speeds, etc., which the shipment will incur over its entire route from origin to destination."

b. *Shipper and Carrier Agreement*. The conference between the shipper and originating carrier need not be formal; a phone call by the installation transportation officer to the railroad inspector, explaining the intended securement method, will usually suffice to determine if the inspector agrees with the method. If not, the inspector will suggest the loading method considered safe and proper. Follow the instructions; after all, before the load can be shipped, it must be physically inspected and approved by an inspector of the "originating carrier."

c. Recommended Loading Methods. Military loads for which no loading drawings exist are shipped frequently and usually present no special problem. Normally, the best way to avoid problems is to secure the equipment as nearly as possible in the manner shown on an AAR figure for a similar item. The following guidelines are provided for securing items on flatcars with wood decking. All figure references are derived from section 6, AAR Rules.

(1) *Trucks.*

(a) Trucks of normal size and shape may be secured as shown in figure 88-A, appendix E, using the same type of, or similar, chock blocks, wheel side blocking, and wire rope for the primary tiedowns. Size of the wire rope depends on weight of vehicles, as follows:

Vehicle Weight	Diameter of Wire Rope (6 x 19. *IWRC*)
to 8500 lb	3/8-in, single strand
8500 to 16000 lb	3/8-in, complete loop
16001 to 25000 lb	1/2-in, complete loop
25001 to 40000 lb	5/8-in, complete loop

(b) Special-purpose trucks and articulated vehicles may require individually tailored tiedown arrangements. This includes vehicles such as the Gama Goat (fig 304, app E), GOER (fig 100, app E); trucks with special gear built-in or attached that may block or hide the tiedown shackles; and commercial-type vehicles such as the M880/890 models, that have no tiedown shackles or hooks and bumpers faired into the body, and therefore offer no handy attachment points. Axles, frame members, or other strong points on the under body may be used to tie down these vehicles providing the tiedowns do not interfere with any electrical or hydraulic lines.

(2) *Trailers and semitrailers.* Tiedowns for these vehicles should follow the general securement methods shown in figures 62, 62-A, 63 through 65A, 67, 68, and 69 through 75, appendix E, depending on the size and type of trailer, stacking method, and so forth. Trailers with other equipment permanently affixed to the bed or frame of the basic trailer so as to form an integral unit (such as generators, radar sets, antennas, and/or instruments of shop vans), are tied down as the basic trailer would be secured, except that the additional weight must be considered when selecting the cable size to be used. Also, if the trailer is to be shipped in a level attitude (with the hitch end raised instead of resting on the deck), a support or stanchion must be built to block up the front end. Figures 65, 65-A, 67 and 68, appendix E, show such supports; figure 65A shows construction detail as to blocking details 90 and 91, section 6, AAR Loading Manual. Trailers shipped with the tractor (prime mover) attached should be considered as separate units and must be secured as such.

(3) *Trucked vehicles.* These vehicles should be tied down, generally. as shown in figures 78 through 82-A, appendix E, with the tiedown method patterned after the one shown for the figure most nearly resembling the item to be shipped. Where 1 W-inch steel rods or /2-inch alloy chains are shown in the figure, %-inch wire rope, doubled (formed in a complete loop), may be used in lieu of the rods or chains. When flatcars equipped with chains are used to transport tracked vehicles, the following criteria should be used: M-60 tanks, 2-inch alloy chain, proof test 27,500-pounds. Use six chains at each end of the tank. This securement applies for all tracked vehicles weighing over 60,000 pounds. For vehicles weighing 25,000 to 60,000 pounds, use /-inch alloy chain, proof test 27,500, four chains at each end of track vehicle. For vehicles weighing less than 25,000 pounds, use %-inch alloy chains, proof test 18,000 pounds, 4 chains at each end of vehicle. Where cars are equipped with chains of lesser strength, additional chains must be used to provide the same level of restraint afforded by the stronger chains. Side blocking and chock blocks, as shown in appropriate loading figures, are also required.

(4) *Miscellaneous vehicles*. Vehicles such as materials-handling equipment (forklifts, warehouse trucks and cranes, and straddle trucks) and road-making or road-grading equipment, may be secured similarly to examples in figures 46 through 48 and figures 52 through 58, appendix E. Other examples of securing the above types of equipment as well as the large cranes, shovels, draglines, farm tractors, and ditch diggers, occasionally shipped by DOD agencies, can be found in sections 3 and 4, AAR Rules (app F). Any other figures in the entire AAR manual may be used as a pattern for securing a similar load.

(5) *Piggyback loading.* The vehicle on which other vehicles are piggybacked will be secured as specified by the appropriate AAR loading procedure, appendix F. The size (diameter) of the wire rope selected will be based on the total weight (see (1) "Trucks" above). The piggybacked equipment will be secured to the basic vehicle so as to insure stability and security of the load.

(6) *Application of AAR General Rules.* The blocking, bracing, and tiedown methods and materials must follow the guidelines in section 1, AAR General Rules (especially General Rules I through 16, 19, 19-A and 19B, app D). Special care should be exercised in the application of the following:

(a) Brake .,wheel clearance. Leave sufficient clearance around the wheel as specified in General Rule 2.

(b) *Wire rope, twisted wire, and steel strap* Application of these items should follow instructions in General Rule 15 except that for military loads the wire rope should be of the type and grade in Federal Specification RR-W-410C, Table X, 6 x 19 IWRC, rather than the hemp-center wire rope specified. When applying and twisting black annealed wire, be sure to leave the twister in place (app Q) and secure it so that the twisted wire cannot unwind (General Rule 15(k), sketch 4). Where steel strapping (high tension band) is used, corner protectors or other suitable filler material must be placed under the bands at all sharp edges and corners

CAUTION: Cut off excess wire rope. If this is not possible, fasten the excess to the pulling strand with an additional clip, or coil the excess on the deck and nail it down.

(c) Wire rope clips (clamps). Use correct size and quantity to match cable size and apply in accordance with General Rule 15.

(d) Thimbles. Use size to match cable, and apply wherever the cable goes over a sharp edge or makes a tight bend.

(e) Filler material. Where thimbles are not available or are difficult to apply, before applying the cable, bend metal filler around sharp corners or edges, such as stake pockets, to increase the radius.

(f) Antichafing material. Always use burlap, waterproof paper, or similar antifriction material between rubber tires and wheel sideblocking. Use burlap, rags, sections of hose slipped over wire rope, or other material to prevent chafing where wire or wire ropes cross and touch each other. Fasten in place with tape or safety wire.

(g) Blocking and bracing. Follow General Rules 3 and 9. When using a standard pattern, make the item exactly like the pattern. Use the proper size and quantity of nails.

(h) Summary. Keep everything neat and square and professional-looking. The load will be more secure and the railroad inspector will be more likely to approve the arrangement than he would if he were confronted with a sloppy job. All of the above applies only to vehicles or other loads shipped on a one-time basis or at very infrequent intervals. For DOD items shipped in quantity, or on a regular or scheduled basis, steps should be taken to have a loading figure approved and added to section 6, AAR Rules (see General Rule 1(c), section 1, AAR General Rules and appendix S).

(7) Blocking sand bracing construction details

(a) Block patterns (.appendix K). Each BBM block pattern description includes reference to the appropriate section. Material requirements for block patterns (that is, lumber and nails) follow the block pattern description in the BBM Detail List (para 4d below).

(b) Block potter;)to. 16, section 6. This widely used chock or wheel block is normally constructed from a 6-inch by 8-inch by 24-inch piece of lumber. The BBM data material requirements are based on a 6-inch by 8-inch by 72-inch piece of lumber for four block patterns no. 16; this represents a 25-percent saving and is accomplished by laying out and cutting four overlapping block patterns, as shown in appendix R.

(c) Detail and sketch drawings. Construction details for these drawings are in the AAR reference source, if available, or otherwise in the DA reference. Material requirements are included in BBM data following the detail or sketch description.

(8) Maintenance of current AAR rules. Organizations desiring to maintain a current set of AAR rules may submit orders as follows:

(a) Complete set: section nos. **1 through 7, revised September 1983** $90.00

(b) Sections.

No. 1- General $10.00
No. 2 - Loading of Steel Products Including Pipe 20.00
No. 3 - Loading of Road Grading, Road Making, and Farm Equipment Machinery 12.00
No. 4 - Loading of Miscellaneous Commodities 16.00
No. 5 - Loading of Forest Products Including Miscellaneous Commodities 12.00
No. 6 - Loading of Department of Defense Materials 16.00
No. 7 - Rules Governing the Loading of Commodities on Open Top trailers to be Handled in Trailer-on-Flatcar (TOFC,Service 12.00

(c) Orders.

Address to Mechanical Division, Association of American Railroads, ATTN: Ms. P. L. Tucker. 59 East Van Buren Street, Chicago. IL 60605.

Remittances must he payable to the Association of American Railroads.

When purchasing individual sections, section no 1 must be included with any purchase of sections 2 through 6.

4-1. Rail Blocking and Bracing Material Data

a. General. The US Army Forces Command Computerized Movement Planning and Status System (COMPASS), appendix V, includes an automated source for rail blocking and bracing material (BBM)data. The BBM data file provides a detailed bill of materials, appendix W, for securing wheeled and tracked vehicles on open top rail flatcars. In addition, a summary listing, appendix X, is provided for each reporting unit showing the total requirement for each material category.

b. Source of BBM data.

(1) The detailed bill of materials provided for each vehicle is normally derived from the applicable section and figure of the Association of American Railroads (ARR) Rules Governing the Loading of Commodities on Open Top Cars and Trailer. In some instances, the only source for a detailed bill of materials is the applicable transportability guidance technical manual which is cited as the "DA Reference." These sole source TGTM's are listed at appendix A.

(2) When the BBM Detail List is annotated "No Data Available," the user must determine such requirements by test loadings. Technical assistance may be obtained by contacting the MTMC Transportation Engineering Agency, ATTN: MTT-TRC, PO Box 6276, Newport News, VA 23606 (AUTOVON 927-4646 or commercial (804) 595-7852).

c. Availability of BBM data. BBM data are designed primarily to be produced from a COMPASS unit movement data report (FORSCOM Reg 55-1). To obtain BBM data based on actual unit movement requirements, a current and accurate unit movement data report must be included in the COMPASS master file. BBM data also may be obtained based on TOE authorizations. In this case, the standard requirements code (SRC) for each battalion and separate company included in the requirement must be furnished. All requests for BBM data will be forwarded to HQ US Army Forces Command, ATTN: AFLG-TRU (COMPASS), Fort Gillem, Forest Park, GA 20050 (AUTOVON 797-5691).

d. Use of BBM Detail List. A BBM detailed bill of materials, appendix V, is provided for each vehicle reported by line item number (LIN) in a COMPASS unit movement data report, except for aircraft and LIN's not included in TB 55-46-1. A BBM Detail List annotated "No Data Available" indicates that AAR loading rules have not been developed for the indicated LIN. In such cases, apply the provisions of AAR General Rule 1(b), Special Authority. The BBM Detail List is designed to facilitate the positioning of materials for each vehicle at the rail loading site. The material descriptions are arranged in entry number sequence, corresponding to the sequence of instructions in the referenced AAR or TM loading instructions. Each data heading of the BBM Detail List is described as follows:

(1) Prepared For: A force description, such as 9th Infantry Division, obtained from a special data retrieval applying to unit consolidations above battalion level.

(2) Applies To: The unit designation and location obtained from the COMPASS unit movement data report.

(3) Vehicle LIN: The LIN identification of the vehicle to which the BBM data applies.

(4) Description: The generic nomenclature applying to the vehicle LIN.

(5) Qty: The number of vehicles reported for the indicated LIN. It should be noted that this quantity is applied only to the summary data. The BBM Detail List reflects the material quantity applicable to one vehicle.

(6) Empty Wt (lb): The empty weight of the vehicle. If the vehicle is shipped with a cargo load, then the size of the wire tiedowns must be adjusted accordingly.

(7) AAR Reference:

(a) Sec and Fig: The applicable AAR section and figure used as the source for the BBM requirements. The AAR Reference, when available, will always govern the loading procedures.

(b) Var: An entry under this heading indicates that more than one loading procedure exists for the section and figure reference, such as for four and six-wheel vehicles. The variation number is an automated technique used to differentiate between those procedures and is not included in the AAR Rules. The variation number, if any, must be included in any communication concerning the related data.

(8) Other Ref. An entry under this heading indicates that no official source exists for the BBM data. The material requirements have been estimated based on comparable loading procedures. This identification will be used in any communication concerning the related data.

(9) DA Reference: The 55-series TM shown under this heading also contains approved loading procedures. When an AAR Reference is not shown, the cited TM is the sole source for approved loading procedures.

(10) Entry No: A number assigned to each description, rule, or remark for reference purposes. Entries are arranged in the same sequence as they appear in the source reference document.

(11) Material Description, AAR Rules and Remarks. Information under this heading includes in-the-clear material descriptions, AAR rule references, and applicable remarks. Specific attention is invited to the following special conditions:

(a) When the remarks "(AN ALTERNATE METHOD OF BLOCKING AND BRACING)"or "(SUBSTITUTE ITEM FOR ENTRY XX)" immediately follow a material description, that material requirement is not included in the summary data.

(b) All other material requirements annotated by remarks, such as "NOT REQUIRED WHEN VEHICLE EQUIPPED WITH GUN BRACE" or "NOT REQUIRED FOR EQUIPMENT LOADED ON FLOOR OF CAR," are included in the summary data.

(c) When a description, such as "SKETCH NO. 1" or "BLOCK PAT NO 16, SEC. 6," is used, the material requirements, such as "NAIL, 200" and "LUMBER, 2 X 6 IN," immediately follow the material description.

(12) Quantity (each): An entry under this heading indicates the number of the material description applicable to a single vehicle. As previously noted, the total quantity of the specific material for the reporting unit is aggregated in the summary data. A quantity is not shown for rules, details, figures, items, sketches, and comments.

(13) Length (in.)(each): An entry under this heading indicates the approximate length in inches applicable to the material description. Length is used to describe such items as lumber, wire rope, and common annealed wire. The total length in inches of a specific material requirement for the specified vehicle is obtained by multiplying the LIN Qty by Quantity (each by Length (in). See summary data for linear feet and board feet totals.

(14) Weight (lb)(each): An entry under this heading indicates the weight in pounds applicable to the material description. The total weight in pounds of a specific material requirement is obtained either by multiplying LIN Qty by Quantity (each) by Weight (lb each) or by multiplying LIN Qty by Weight (lb)(each).

e. Use of BBM Summary. A BBM summary data listing, appendix X, accompanies the BBM detail listings for each reporting unit; that is, company or battalion. In addition, a summary data listing may be obtained for other consolidations, such as for a brigade, support command, division artillery, an entire division, og an installation. The BBM summary (app X) is designed to facilitate computation of procurement and storage requirements. These functions are normally performed by the installation facility engineer. A copy of the BBM summary, plus sup4-1

porting detail listings, should be included with the unit movement plan and freight train loading SOP. Each data heading of the BBM summary is described as follows:

(1) Prepared For: A unit description and location if prepared for a single reporting unit or a force description for other consolidations.

(2) Material Description: All requirements for the indicated material description included in the unit or force are aggregated as a single entry in the summary data.

(3) Total Quantity: The aggregated quantity applying to the specific material description. This total is obtained by multiplying the LIN Qty by the Quantity (each) for each LIN and computing the total for all LIN's.

(4) Total Linear Ft: The aggregated total for all material requirements (except lumber) containing a Length (in.) entry. This total is obtained by multiplying the LIN Qty by the Quantity (each) and by the Length (in) for each LIN and then the total for all LIN's is divided by 12.

(5) Total Board Ft: This total is computed only for lumber requirements. It is obtained by computing the linear feet total and multiplying the product by the width and thickness of the lumber in inches and then dividing by 12.

(6) Total Weight (lb): The aggregated total for each material description containing a Weight (lb) entry. This total is obtained by multiplying the LIN Qty by the Quantity (each), if present, by the Weight (lb) and computing the total for all LIN's. A different procedure is used for NAILS. In this case, the LIN Qty is multiplied by the Quantity (each) and the total quantity for each type nail is divided by the number of nails per pound for the specific type nail (para 7) to obtain the total weight.

(7) Computed by Purchasing Agent: The headings under this description are provided for local use in computing cost data.

f. Number of nails per pound The following conversion factors used in BBM data were obtained from Federal Specification FF-N-1085 for Type II, Style 10-Common Nails (steel wire, flat head, diamond point, round smooth shank, bright, zinc or cement coated):

Size of nail	Approximate number per pound		
	Common	Cement coated	Ring-shanked
Fourpenny (4D)	294		
Sixpenny (6D)	167		
Sevenpenny (7D)			118
Eightpenny (SD)	101	101	
Tenpenny (10D)	66	66	
Twelvepenny (12D)	61	61	
Sixteenpenny (16D)	47	47	
Twentypenny (20D)	30	30	(Screw nail) 35
Thirtypenny (30D)	23	23	
Fortypenny (40D)	17	17	
Fiftypenny (50D)	14	14	
Sixtypenny (60D)	11	11	

5. THIS SECTION IMPLEMENTS STANAG 2175 (EDITION 3) AND STANAG 2832 (EDITION 21

5-1. INTRODUCTION-RAIL MOVEMENT PLANNING

Responsibilities for planning and shipment of Army equipment and material by railroad are normally divided among two or more agencies at military installations. These are the troop unit or activity making the shipment, the installation engineer officer, and the installation transportation officer (ITO). Their separate responsibilities are discussed below.

5-2. THE SHIPPING ACTIVITY OR TROOP UNIT

The following individuals are responsible for planning railcar loading: commanders of table of organization and equipment (TOE) units, tables of distribution and allowances (TDA) troop units, and the chiefs of depot and installation activities concerned with making rail shipments. The unit commander goes first to the ITO. The ITO then goes to MTMCTEA and Forces Command (FORSCOM). The ITO should create files covering the transportation requirements of all units at his installation. The shipping data, configurations of vehicles, and other information are in the vehicle and equipment characteristics guide (refer to TB 55-46-1).

a. Overseas (Water Shipments). Military Sealift Command (MSC) rules govern these shipments. This includes military equipment, impedimenta, and vehicles moving through water terminals. Units should ship vehicles at reduced configuration (refer to TB 55-46-1). Use the vehicle's cargo capacity to load the maximum amount of equipment inside. The remainder of the unit's equipment is shipped as breakbulk cargo.

b. Shipper Responsibilities. The unit commander or shipper must submit unit movement requirements in accordance with Military Standard Transportation and Movement Procedures (MILSTAMP). They should be sent to the appropriate supporting ITO or movements control center. First, the unit is notified of the type, quantity, and arrival schedule of railcars. The unit is then responsible for packing, crating, banding, blocking, and bracing. The shipping activity actually loads the cars. A transportation representative provides the technical supervision.

5-3. THE INSTALLATION ENGINEER OFFICER

The director of facilities engineering (DFE) is normally responsible for securing and furnishing materials to the shipping unit. This includes crating, packing, blocking, and bracing materials needed to load military impedimenta and other TOE equipment on railcars. The DFE also provides tools, technical advice, and assistance as required. At Army depots, the shipping activity or responsible supply agency may furnish these materials and services. They will conform with local organization and depot command policies. The individual responsible for engineer functions on the commander's staff may be called the director of engineering and housing, or the post engineer, at some installations.

5-4. THE INSTALLATION TRANSPORTATION OFFICER (ITO)

The ITO is responsible for technical advice to shipping units on car capacity, AAR loading rules, and blocking and bracing requirements. The ITO should ensure that he and all his staff understand the transportation aspects of strategic mobility planning. This is a critical point; lack of knowledge in this area can cause significant problems. The ITO acts as the sole official liaison with MTMCTEA and the railroad representative in ordering the requisite number and kind of cars. The ITO should inspect these cars during both receiving and loading phases (see para 3-4). The ITO secures necessary routing instructions from the appropriate MTMC area, in accordance with AR 55-355. In conjunction with the representative of the originating rail carrier, he checks applicable route clearances for each shipment of overweight or outsize items. The official AAR diagram of approved clearances is illustrated in appendix J.

a. NATO Railcar Load Clearances. In NATO countries, height and width restrictions are prescribed in STANAGs 2175 (app BB) and 2832 (app CC).

b. Government-Owned Cars. ITOs should consider the use of military-owned interchange freight cars if MTMC can make them available. The use of Defense Freight Rail Interchange Fleet (DFRIF) equipment allows more flexibility in loading and unloading. This eliminates the demurrage charges that can accrue on commercial railcars held too long. When DFRIF cars are used, ITOs will report their movements. Reports will go to MTMC Eastern Area, in accordance with AR 55-355.

c. NATO Flatcar Classification and Designation. NATO countries prescribe classification and designation of flatcars suitable for transporting military equipment in STANAG 2175 (app BB).

5-5. PORTS AND OCEAN TERMINALS

a. No single individual in a continental United States Army (CONUSA) terminal is responsible for procuring blocking and bracing material for rail shipments. At these CONUS installations, procurement of such materials is the installation engineer's responsibility (as indicated in para 1-3).

b. In small CONUS terminals (and many overseas terminals) this work is performed by civilian contractors.

c. In large CONUS terminals, the dunnage section provides railcar blocking and bracing materials. The support section of the Cargo Support Branch, Cargo Division, carries out the actual blocking, bracing, and tiedown.

d. In overseas terminals operated by TOE units, this responsibility would normally be exercised by the shore platoon of a terminal service company. In a small operation, it would be a specially designated unit. The Transportation Terminal Brigade or Group has this responsibility in a large operation.

5-6. DISCREPANCIES IN SHIPMENT

Report transportation discrepancies, such as improper loading, stowing, handling, blocking, lashing, or bracing of shipments within 24 hours after discovery. Prepare an SF 361, (Discrepancy in Shipment Report) and distribute in accordance with AR 55-38.

6. CAR REQUIREMENTS

6-1. INTRODUCTION

In planning rail shipments, unit commanders (for unit movements) and installation shipping activities will compute railcar requirements based on the shipping configuration of the items to be shipped. Report this information to FORSCOM under the Computerized Movement Planning And Status System (COMPASS) requirements. Include the information in the data printout which accompanies the movement order. Department of Army policy generally requires maximum use of the available loading space to reduce the carrier's transportation charges. The dimensions, weight, and cube of various items of military vehicles and equipment are in TB 55-46-1. Inspect equipment for modifications; modifications, whether field or otherwise, may change dimensions and weight shown in TB 55-46-1. Items not listed therein should be measured, as required, when preparing loading plans. See appendixes AA through EE for transportability guidance of specific Army vehicles.

6-2. Car Capacities

a. General. Freight car capacities are restricted by the car size, dimensions, and load limits. All railroad freight cars in CONUS used in interchange service have essential information stenciled on the sides of the car. This information includes the following: the owner's initials, the car number, its length, width, and height (for closed cars), the capacity in pounds, the lightweight (weight of the car empty) in pounds, and the load limit in pounds (see the glossary and app G and H).

b. Capacity (CAPY). This is the nominal capacity of the car, expressed in pounds, and is used to place the car in a specific tonnage group; for instance, 100,000 pounds is a 50-ton car. The weight capacity of flatcars is rarely reached, except with tracked vehicles.

c. Load Limit (LD LMT). The load limit indicates the maximum load the car is designed to carry. Do not load beyond this limit. If the load limit is not stenciled on the side of the car get this information from the ITO or the railroad representative before loading the car.

d. Lightweight (LT WT). This is the empty weight of the car.

e. Loading Drawings.

(1) The drawings shown in appendixes E and F indicate the suggested number of vehicles (by type) that can be loaded on specified railcars.

(2) If a particular load meets the AAR drawings exactly as shown in appendixes E or F, but the railroad representative requires additional securement devices, contact MTMCTEA for assistance.

7. THIS SECTION IMPLEMENTS STANAG 2890 (EDITION 2) AND STANAG 2943 (EDITION 1)

7-1. INTRODUCTION-Car loading

The basic requirements for car loading are in the AAR loading rules. Although discussed in more detail in the AAR rules of this manual, they are listed below for emphasis.

a. Car Suitability. Cars must be safe for transportation of the proposed lading. This is determined by inspection as soon as empty cars arrive.

b. Safety. Load limits must not be exceeded.

c. Clearance. Loads must not exceed the width and height restrictions over the proposed route. The standard AAR clearance diagram for North America is shown in appendix I.

d. Restraint. Loads must be adequately secured on cars.

e. Idler Cars. Idler cars must be used if required by the lading.

f. After Loading. Cars and lading must be inspected after loading to determine compliance with AAR rules.

7-2. Loading Principles

This section provides entraining officers and loading crews with the essential principles of loading, blocking, and bracing of vehicles on open-top cars. The shipping transportation officer will assist in determining the proper method of loading. Most of the information in this section has been extracted from the AAR manual, "Rules Governing the Loading of Commodities on Open-Top Cars." Extracts are in appendixes C through Y. Prior to loading vehicles, a check with the shipping transportation officer will ensure that information herein is current. Railroad representatives will conduct acceptance inspections. For operation within NATO countries, regulations for the loading and unloading of military vehicles onto railroad cars are in STANAG 2943 (app EE).

a. Fuel in Tanks of Individual Units. Gasoline tanks on generator sets and space heaters should be emptied. Vehicles should have fuel tanks %-full and securely closed.

b. Mixed Loads. Ammunition (basic load) and gasoline, other than fuel in tanks of the vehicles will not be loaded together on unit vehicles for rail movement. Refer to the Department of Transportation (DOT) hazardous materials regulations (Title 49, Code of Federal Regulations, Parts 100-177) for more details.

c. NATO Ammunition and Explosives in Military Trains. In NATO countries, the regulations for safety in the transport of ammunition and explosives by military trains are in STANAG 2890 (app DD).

d. Guided Missile Equipment. Guided missile equipment must be loaded in accordance with outloading procedures and diagrams developed by U.S. Army Missile Command and approved by the AAR. Copies of the approved diagrams must be at the loading site. For additional information, contact the U.S. Army Defense Ammunition Center and School (USADACS), Savannah, Illinois.

7-3. AAR Loading Rules

AAR loading rules are applicable to both the railroad and the ITO or shipper. This means that a railroad can refuse to accept and improperly loaded shipment; the ITO or shipper can refuse a car that he finds unsuitable for the load he plans to ship. However, after the car is inspected and is found acceptable, the shipper has full responsibility to comply with the AAR rules. In cases of doubt, advice and assistance should be requested from local transportation officers and/or railroad representatives.

a. Open-Top Cars. The AAR rules governing the loading of commodities on open-top cars are specific on the placement and weight distributions of various loads. To aid the shipper, numerous illustrations detail weight distribution, positions of both load and bearing pieces, and banding requirements. Where there is a reference to general rules on a particular illustration, these rules also apply and must be followed in detail. These illustrations and rules applicable to common items of military equipment are in appendixes C through Y.

b. Restrictions. Restrictions on loading include the following general rules:

(1) Under no circumstances will the load limit of a car be exceeded.

(2) The load must be placed on a car so there will not be more weight on one side than the other. If necessary, balance the load by using bearing pieces. Refer to the glossary for an explanation of bearing pieces.

(3) The weight of the load placed over one of the car trucks must not exceed half of the load limit stenciled on the car. Another limit on weight distribution is that 30 percent of the total weight limit of the car should be loaded between truck centers and the ends of the car, or 15 percent at each end. These percentages assume that the center of gravity of the load is at the center of the car. Sometimes the center of the load gravity

varies from this point, such as a load limit that is reduced to 66 percent of the car's weight limit; in such cases, the center of load weight cannot be nearer to either truck center than one-fourth the distance between truck centers (refer to app E).

(4) Large and heavy items, not otherwise covered by rules, must be loaded with the largest dimensions and heaviest weight on the floor; this will prevent tipping.

(5) Items having a high center of gravity must also be secured to prevent tipping while in transit.

(6) Use idler cars when a load protrudes beyond the end sill of the carrying car; use this same procedure when necessary to space two carrying cars (for long loads). The measure of overhang is not the distance the load extends past the end of the car; it is the distance the load extends past the center point of the trucks. An off-balance load, where the center of load weight is not at midpoint in the car, is likely to involve overhang at one end of the car. To determine the permissible length of overhang and the percentage of stenciled load limit, base calculations on the length of the material being loaded and the length of the car (refer to app E).

7-4. Car Inspection

Cars arriving on the installation will be inspected by the following people: the ITO or his representative, the responsible unit or other activity loading officer, and a representative of the railroad. This inspection will be made to determine the car's suitability for the intended lading before they are placed at platforms, ramps, or warehouses for loading. The final inspection will be made after the cars are loaded to ensure that the contents are loaded, blocked, and braced in compliance with AAR loading rules. These rules are mandatory for all shippers. Details of the required inspections are discussed below.

a. Preloading Inspections. Cars will be inspected before loading to ensure that flatcar decks are suitable for loading and are free of excessive amounts of bolts, nails, and old blocking. Wooden decking must have a minimal number of holes and be in sound condition. On chain-tiedown-equipped railcars, ensure that anchor channels are not bent or obstructed, and that the chain anchoring and locking devices are in working order.

b. After-Loading Inspections. Cars will be inspected after loading to ensure that

(1) Loads are evenly distributed.

(2) Load limits are not exceeded.

(3) Ladings are adequately secured by blocks, braces, cables, and chains in accordance with AAR loading rules.

7-5. Unloading Cars

a. Consignees and ITOs must ensure that commercially-owned railcars are unloaded promptly after being placed for unloading; this will avoid payment of demurrage or detention charges. Tariffs usually allow 48 hours free time for unloading. No demurrage accrues on Government-owned DFRIF cars when such cars are held on tracks owned by or leased to the Government; they should be unloaded promptly so that they can be returned to MTMC for other assignment in accordance with AR 55-355. In no case will DFRIF cars be detained by ITOs more than 10 days without prior approval of Headquarters, Eastern Area, MTMC.

b. The uniform freight classification obligates consignees of carload freight to remove from such cars at their expense, all dunnage, debris, or other foreign matter so as to return railway freight cars to the carrier clean and in condition for reloading. ITOs will ensure that on military installations, blocking, dunnage, and banding are removed from unloaded cars prior to release to the carrier. The ITO may require the shipping unit to remove all blocking and bracing material after the vehicles have been unloaded.

8. THIS SECTION IMPLEMENTS STANAG 2152 (EDITION 5) AND STANAG 2173 (EDITION 3)

8-1. INTRODUCTION-Loading procedures for open-top cars

A loading ramp must be provided to move vehicles and other wheeled equipment onto railcars. The construction of a conventional ramp made of heavy timbers with a 62,500-pound capacity, illustrated in figure 8-1, is discussed in paragraph b below. Use of an improvised ramp is discussed in paragraph c below. A leveled roadbed to the top of the rails is required for maneuvering the equipment onto the ramp. Lumber, dirt, or cinders may be used for this purpose. When it is not certain that the movement may terminate at a place where unloading facilities are available, temporary ramps should be carried with the movement for use at destination.

8-2. Ramps

a. Conventional Ramp. This ramp, figure 8-1, is capable of handling equipment of gross weight not to exceed 62,500 pounds (28 350 kgs). For heavier items, a stronger ramp is required (consult with the installation engineer for assistance). Materials required and procedures are as follows:

2	1 x 6-inch x 16-foot pieces of lumber
10	6 x 10-inch x 16-foot pieces of lumber
10	6 x 10-inch x 12-foot pieces of lumber
21	standard railroad ties

The ties are placed across the tracks as shown in figure 8-1. The ties on which the 6x 10-inch boards rest are leveled, so that the boards are not resting on the edges of the ties. The ramp must be even with both sides of the flatcar, allowing an 8-inch opening between runners when a standard flatcar is used. Guide boards are nailed on the inner sides of the runners. Both ends of the ramp are beveled for ease of loading. The lower ties are held firmly in place by stakes on a dirt runway, or nails on a timber runway. All ties and runners are spiked to prevent slippage. The approach angle is the angle between the ground and the ramp. Most military vehicles are designed to drive up a ramp with an approach angle of 15°. The smaller the approach angle, the better.

b. NATO Loading/Unloading Ramps. In NATO countries, the erection of loading ramps with railway sleepers (or railroad ties) is prescribed by STANAG 2152 (app Z). The use of these ramps to load and unload military vehicles is also described in this regulation.

c. Improvised Ramp. A field-expedient ramp may be created by using the first flatcar of the string to be loaded as a ramp. This procedure will not be used without prior arrangement with (and supervision by) the railroad and the car owner. Where no permanent loading ramps exist, the ITO can improvise a ramp at any point he selects; this makes loading and unloading operations very flexible. A minimum quantity of crossties or other suitable timbers are required for cribbing and treadway. The flatcar body can be lifted by jacks or by medium truck wrecker (or any other type crane with lifting capacity).

(1) Disconnect truck brakes at the top of the truck line lever by removing the cotter and brake rod pin.

(2) Lift the flatcar body and roll the truck a safe distance away.

(3) Place the proper block underneath and lower flatcar body until the coupler pocket rests on block placed between the rails.

(4) Block the sides of the flatcar to rail level (both sides) and place additional blocks and timbers to form a runway.

(5) Load the vehicles in conventional "circus" method, as discussed in paragraph 8-6.

(6) Block and brace the vehicles on the railcars.

(7) Replace the truck under the flatcar and reconnect the brake rigging.

(8) After the car truck has been replaced, have the railway representatives inspect the car thoroughly to see if the underframe or the brake incurred rigging damage.

d. Spanners.

(1) Spanners are used to bridge the distance between cars and make one continuous roadbed of the train. Spanners are not necessary if flatcars designed for "piggyback" operation are available.

Extra long spanners may be required for special cars with long couplers.

(2) When any of the equipment to be moved over the spanner has a gross weight between 17,500 and 62,500 pounds, construct each spanner using three 6x 12x 40-inch pieces of lumber and two 2x 6x 36-inch pieces of lumber. Spike three 6x 12-inch boards to two 2x 6-inch boards and place them 10 inches apart. Taper the ends of the spanners, as shown in figure 8-2.

(3) Construct spanners to support the heaviest vehicle to be loaded. Spanners should be inspected periodically to ensure they are suitable for use and have not deteriorated. When constructing spanners, consider using pressure-treated lumber for longer life.

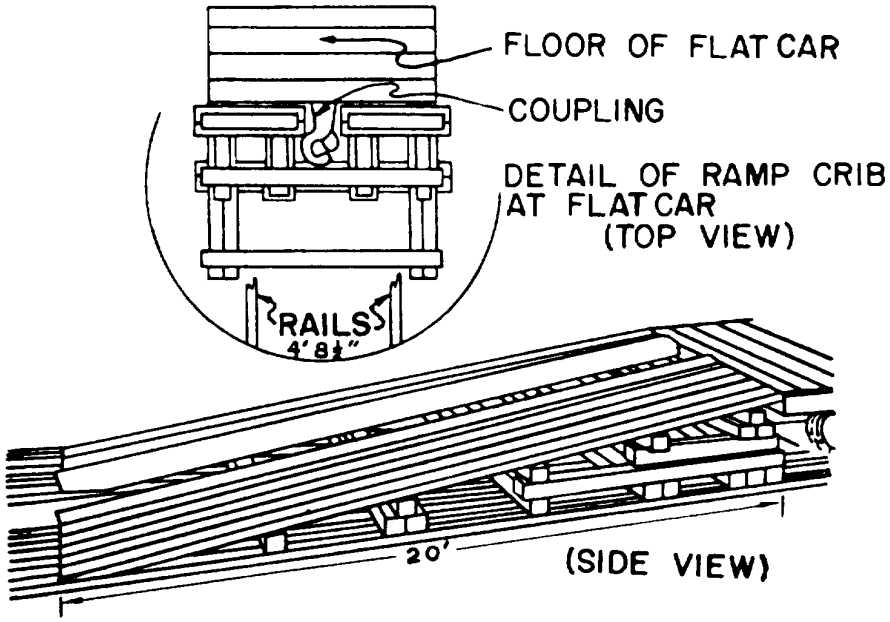


Figure 8-1. Ramp, capacity 62,500 pounds.

8-3. Materials

The patterns shown in the material chart (see app K) give the description and specifications for the blocking and bracing materials required for loading military vehicles and equipment on railcars. After determining the overall requirements for blocking material from the loading diagrams (app E and F), the unit or loading activity should submit a request to the installation engineer office for the necessary quantities of each pattern (refer to para 5-3).

a. Blocking and Bracing Tiedown Material. Material used in securing lading on railway freight cars will comply with specifications listed in appendix D.

b. Use of Restraining Materials. Movement by rail subjects the load to lengthwise, sidewise, and vertical motions; this occurs as the train starts, stops, traverses curves, and runs over crossings and switches and rail joints. These various motions are controlled as follows:

(1) Lengthwise motion of vehicles and similar equipment is controlled by nailing chocks (see app O and other illustrations) against the wheels. Nails in wheel chock blocks should be driven at right angles to the floor.

(2) Sidewise motion is controlled by nailing side blocks of 2x 4-inch lumber of suitable length against the wheel. Chafing of tires against the side blocks is prevented by nailing burlap, fiberboard, or other waterproof barrier material under 8-2 Change 4 the blocks and extending it a minimum of 2 inches above them (see example in app M).

(3) Vertical motion is controlled by wire rope usually attached to stake pockets, as shown in appendix N.

8-4. Table of Organization and Equipment

The TOE of a military unit will generally be of two types for shipping purposes. One-military impediment, which is boxed, containerized, and/ or crated; and two-guns and vehicles, which are loaded "as is" on flatcars. To reduce transportation charges, all available space will be used when loading cars. This will require the preparation of a systematic loading plan, based on the known capacities of certain types and sizes of cars. This plan will include the list of all crated items put in containers and the position of each uncrated item loaded on each car.

8-5. Impedimenta

Impedimenta will be loaded into organic vehicles whenever practicable. Ensure that the vehicles are not overloaded. All railcars will be loaded to "visible" capacity. Do not exceed the load limit of the railcar. Maximum use should be made of organic vehicle compartments in loading military impedimenta. The blocking and tie downs illustrated herein from the AAR loading manual are based on the loading of empty vehicles. When vehicles contain cargo, some additional restraint may be required, based on the load and weight

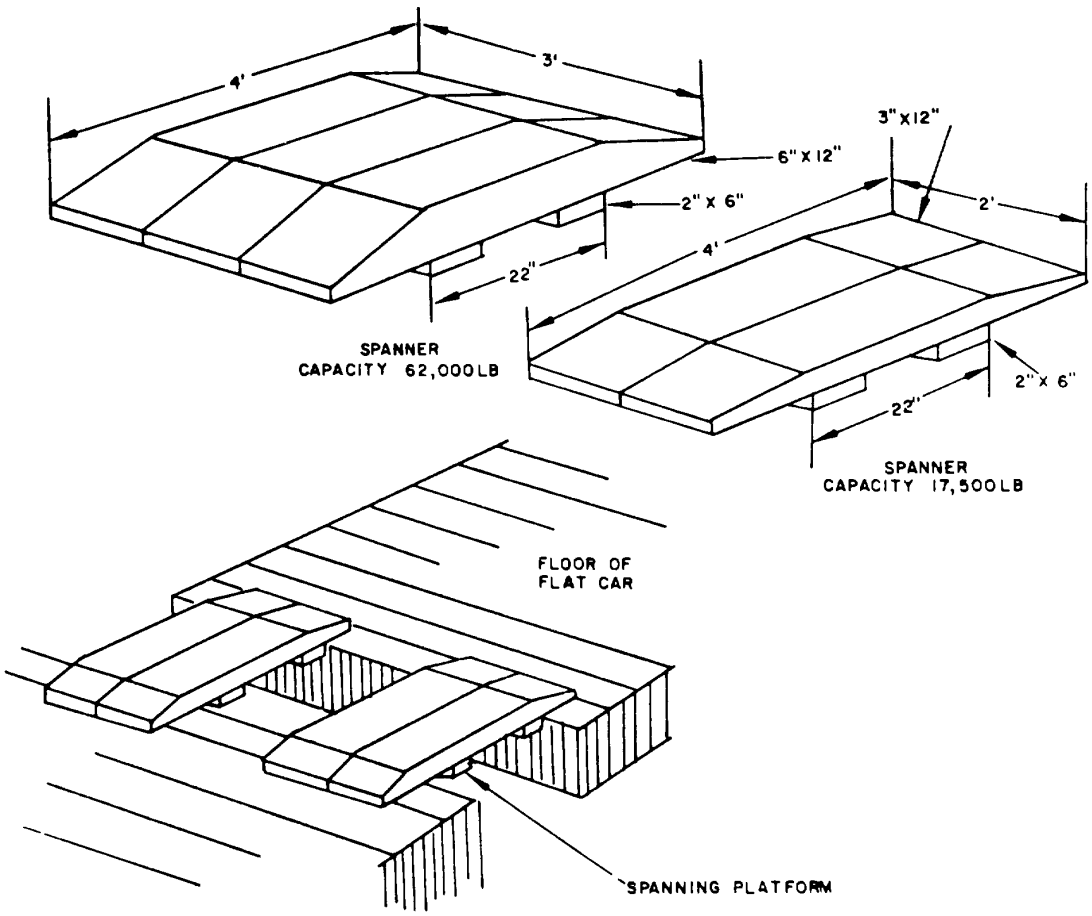


Figure 8-2. Use of spanners.

evaluation. For example, the diameter of wire rope used may have to be upgraded from %- to %-inch.

8-6. Vehicle Loading

The most common and expeditious method of loading vehicles is the "circus method." This method uses flatcars as a roadbed with spanners placed between cars. Tanks can be loaded without spanners. All vehicles are placed on the rearmost car and then moved forward to their assigned places. It is necessary to have the vehicles move onto the rear car in a definite order, taking into consideration the arrangement of the cars in the train. When loading trailers, care must be taken to avoid damage to tailgate and lights. When loading trailers piggyback, the tongues should be pointed in the same direction to reduce handling problems. In loading "full trailers" used with missile equipment, the tongue or drawbar which is attached to the front dolly will be rotated 180°.and secured under the trailer body.

a. Loading Diagrams. Appendixes E and F illustrate the method of loading, blocking, and bracing various types of vehicles and equipment on or in freight cars. The overall material requirements for the unit are determined from these diagrams and requisitioned from the director of facilities engineer (refer to para 1-3).

b. Moving Equipment onto Cars.

(1) After the proper order for loading the train has been determined, the vehicles are brought up to the ramp and driven onto the flatcar in the order they are to be placed. Trailers used for handling bulldozers and other construction equipment over highways must not be placed on railroad car because tie down devices on the trailer may not be sufficient to restrain the load on the trailer during rail movement.

(2) There should be a guide stationed on the ramp and on each flatcar to direct vehicles and to

aid drivers. A guide should also be stationed at each side of the flatcar near the spanners. His duty is to move the spanners so the distance between spanners conforms to the wheel width of the particular vehicle. When heavy equipment is loaded, spanners should be spiked flush with the side of each car.

c. Arrangement of Vehicles on Cars.

(1) Weight. The weight of the load may never exceed the load limit, but try to plan so that cars are loaded as near as possible to the load limit. Loads will be placed on the cars so the weight will be evenly distributed on each set of wheels. (See general rules in app D.)

(2) Brake Wheel Clearance. Brake wheel clearance on loaded open-top cars is prescribed by rule 2, section 1 of the AAR rules governing the loading of commodities on open-top cars (app D). Sufficient space must be provided around the brake wheel on open-top cars to ensure accessibility to rail operating personnel.

d. Idler Cars. When an idler car is used, precautions must be taken. (See app D.)

e. Clearance Limits. The height and width of the load on the car, without overhang, must be within the clearance limits of the railroads over which it is to be moved. If an overwidth shipment is to be made (loading a vehicle which overhangs the side of the railcar), ensure that the load is centered on the railcar; the overhang must be equal on both sides. Rules 16 and 18 govern loads requiring the use of more than one car. The transportation officer and originating carrier must verify clearance limits over the entire route prior to movement. It is good transportation practice to make sure that all loads requiring a clearance check be placed on one train; this will reduce or eliminate movement delays on other trains. See clearance diagram in appendix J.

f. Brakes and Transmission. Generally, vehicle handbrakes must be tightly set and levers must be wire-tied or blocked. Place the transmission in the neutral position with the lever wire-tied in place. Ensure that diesel and multifuel vehicles are never left in gear when loaded on a railcar, as the lengthwise forces during rail movement may cause the vehicles to self-start. Specific guidance on the position of both brake and transmission for guided missile weapons systems controls are in the applicable USADACS drawing. These instructions are mandatory for the shipper.

g. Rotating Parts of Vehicles. Lock turrets and guns to prevent rotation in transit. The turret-lock handwheel and elevating-mechanism handwheel must be wired to prevent rotation. For detailed information, refer to rule 19, appendix D and the diagram for the particular item of equipment in appendix F or G. Whenever possible, all vehicles having guns, booms, and cranes should be loaded so that the gun, boom, or crane will trail in the direction of movement of the train.

h. Vehicle Key Location. Finding the location of keys for vehicles shipped by rail can pose a problem for unloading personnel. When keys cannot be located, delays in unloading cars incur added costs to the Government for demurrage and contractor man-hour labor. Government bill of lading (GBL) on such shipments should show the location of keys. The keys must accompany the shipment and not travel separately. If each key is on the matching vehicle, a notation such as "Keys are wired to the radiator of each vehicle" or "Keys are taped to the underside of the hood on each vehicle" should be entered on the GBL. If the keys for all the vehicles on the car are assembled in one lot, the notation should show "Keys for all vehicles on this railcar are in the glove compartment of vehicle USA Reg No. XX XXX." Show the specific vehicle that has the keys to preclude wasted time looking through all the vehicles.

i. Vehicle Tires. The pneumatic tires on all vehicles moved by rail must be inflated to 10 pounds above normal tire pressures. Tighten all valve caps to prevent air loss.

j. NATO Securing Methods. In NATO countries the regulations for securing military tracked and wheeled vehicles on railway wagons or railcars are in STANAG 2173 (refer to app AA).

8-7. Tiedown Techniques

The detailed procedures for tiedown of vehicles and equipment are in the AAR rules in appendixes D through Y. A brief discussion of these procedures follows:

a. Application of U-Bolt Cable Clips and Wire Rope for Securing Purposes on Open-Top Cars. All wire rope used for securing purposes must be used in a complete loop with the ends overlapped sufficiently to accept a minimum of three (and preferably four) U-bolt cable clips. Each complete loop will be secured with the required number of cable clips; the U-bolt part of the clip will be positioned over the dead-ends of the wire rope. See appendixes D and P for more detail.

(1) Clips are made in sizes to suit the cable to be used, for instance, %-inch cable uses %-inch clips. Since the load strength of the clips is less than the load of the cable, enough clips should be

used to equal or slightly exceed the cable strength. Clips should not be closer together than six times the diameter of the cable.

(2) Thimbles are often used as fillers between cables and sharp edges as prescribed by AAR rules.

b. Blocks. The various sizes and shapes of wooden blocks required for chocking wheels, are illustrated in the material chart in appendix K. Methods of placing these blocks against vehicle wheels and nailing them in place are shown in appendix Q.

c. Reuse of Blocking, Bracing and Tiedown Material. Wire rope, U-bolt cable clips, and wooden blocks may be reused for subsequent moves as long as they are serviceable. Do not reuse nails.

APPENDIX A

REFERENCES

1. Association of American Railroads Manual, General Rules Governing the loading o f Commodities on Open Top Cars and Trailers.

2. Official Railway Equipment Register, The Railway Equipment and Publication Company.

3. FM 5S-65, Preparation for Unit Movement Overseas lay Surface Transportation.

4. TB 55-46-1, Standard Characteristics (Dimensions, Weight, and Cube) for Transportability of Military Vehicles and Other Outsize/Over weight Equipment (In Toe Line Item Number Sequence).

5. TM 55-603, Movement of Military impedimenta by Commercial Carriers.

6. AR 55-355, Military Traffic Management Regulation.

7. TB 55100, Transportability Criteria Shock and Vibration.

8. Sole Source Technical Manuals. The following TM's provide the only approved source of loading procedures for the applicable equipment.

TM 55-2200-058- 14	Transportability Guidance: Transport of Cargo On the Railway Car. Flat, 140-Ton-Capacity.
TM 55-2320-238-20- 1	Transportability Guidance: Recovery Vehicle, Full-Tracked, Light-Armored, M578
TM 55-2320-242-15-1	Transportability Guidance: Truck, Cargo,1-'/--Ton,6 x 6, M561 (NSN 2320-00-873-5407)
TM55-2320-258-15-1	Transportability Guidance: Heavy-Equipment Transporter (MET) System; Truck-Tractor, 22-'/--Ton, 8 x 8, M746 (NSN 2320-00-089-7264); Semitrailer, Low Bed, Heavy-Equipment Transporter, 52-'/z^Ton, M747 (NSN 2330-00-089-7265)
TM55-2350-215-10-15	Transportability Guidance: Tank, Combat, Full-Tracked, M60-Series; M60, 105-MM Gun (NSN 2350-00-678-5773); M60A1, 105-MM Gun (NSN 2350-00-756-8497); M60AZ, 152-MM Gun (NSN 2350-00-930-3590); M60A3, 105-MM Gun (NSN 2350-00- 148-6548)
TM55-2350-255-14	Transportability Guidance: Tank, Combat, Full-Tracked, 105-MM Gun M1; 120-MM Gun, MlR1 (General Abrams)
TM 55-3810-240-20-1	Transportability Guidance: crane' Wheel-Mounted; 20-Ton, 3/-Cubic Yard, 2 Engine, Diesel-Driven: 4 x 4, Rough-Terrain; with Attachments
TM 55-3930-243- 15- 1	Transportability Guidance: Truck, Forklift, Rough-Terrain, 10,000-Pound Capacity, Army Models MHE 199 and MHE 215
TM 55-5420-204-15-2	Transportability Guidance: Mobile Floating Assault Bridge/Ferry Transporter (NSN 5420-00-017-8226): Superstructure Assembly, End-Bay, for Bridge/Ferry (NSN 5420-00-017-8225); Superstructure Assembly, Interior-Bay, for Bridge/Ferry (NSN 5420-00-017-8224)
TM 55-2300-216-14	Transportability Guidance: Gun, Air Defense Artillery, Self-Propelled, 20-MM, M163A1, NSN 2350-01-017-2113. Gun, Air Defense Artillery, Towed, 20-MM, M167Al, NSN 1005-01-014-0837
TM55-3810-229-14	Transportability Guidance: Crane, Truck-Mounted, Hydraulic, 25-Ton Harnischfeger Model MT-250 (NSN 3810-00-018-2021)

9. Federal Specifications.

FF-B-561	Bolts (Screw) LAG
FF-C-450	Clamps, Wire Rope
FF-N -105	Nail, Brads, Staples and Splices: Wire, Cut and Wrought
FF-T-276	Thimbles, Rope
QQ-S-781	Strapping, Steel and Seals
QQ-W-461	Wire, Steel, Carbon, (Round, Bare and Coated)
RR-C-271	Chains and Attachments, Welded and Weldless
RR-W - 410	Wire Rope and Strand

MISSILE SYSTEMS GROUND SUPPORT EQUIPMENT. Rail loading drawing can be obtained from: Director, US Army Development and Readiness Command Ammunition Center, ATTN: SARAC-DEO, Savanna, IL 61074

APPENDIX B

DEFINITIONS

LISTING OF RAILCAR AND LOADING TERMS

(The following information is extracted from the Association of American Railroads Manual, General Rules Governing-the Loading of Commodities on Oven Too Cars arid Trailers).

"A" End of Car. The opposite end to that on which the brake wheel is located. In the event there are two brake wheels, the ends are designated by stenciling the letters "A" and "B." respectively, on both sides, near the ends.

Anti-Skid Plates. A metal plate with sharp projections on each side used between wood members or containers to retard movement.

"B" End of Car. The end on which the brake wheel is located. In the event there are two brake wheels, the ends are designated by stenciling the letters "A" and "B." respectively, on both sides, near the ends.

Bards, High Tension. Steel strapping of various widths and thicknesses; each with a standard load strength, used to secure lading.

Bearing Pieces. Material placed on car floor, underneath lading, to facilitate loading or unloading; to maintain 4-in. clearance below overhanging portion of load and any part of idler car or cars; and to distribute weight of lading over floor of car.

Blocks. Wood material, nailed, bolted or wired in position to secure lading in place.

Bolster, Body. The transverse members of the underframe over the trucks which transmit the load carried by the longitudinal sills to the trucks through the center plates.

Bolster, Load, Pivoted. The members equipped with center plates and side bearing on which the load of a two or three-car shipment rests. The slotted member permits the longitudinal movement of the load in transit.

Bolster, Load, Stationary. The stationary members without center plates on which the load of a two or three-car shipment rests.

Braces. Material used to retain lading or blocking in position.

Brake Shaft. The metal shaft, usually vertical, having a hand wheel, or handle, on one end, by means of which a chain, connected to the brake shaft and brake levers, may be wound on the shaft and brakes applied. In some instances brake shafts are in horizontal position, in other instances cars are equipped with brake shafts normally in vertical position but which may be lowered to horizontal position and still remain operative.

Brake Wheel. Wheel attached to the end of the brake shaft by which the latter is turned to apply the brakes by hand.

Cable. A lading securement of definite size, composed of a number of twisted strands of a certain number of wires each.

Cable Clips. Metal fittings equipped with bolt, or bolts, used to secure cable to car or lading.

Capacity. As applied to a freight car, the nominal load in pounds which the car is designed to carry, also the cubic foot capacity. These figures are stenciled on each side of car.

Center Plate. One of a pair of plates which fit one into the other and which support the car body on the trucks, allowing them to swivel freely under the car. Also used near each end of load requiring the use of pivoted bolsters.

Center Sill. The center longitudinal member of the car underframe.

Chock Block. Concave or mitered blocking pieces used to secure objects in position.

Clamping Piece. Wood member placed across top of load to keep lading in position, secured to car or stake pockets with rods. Also used on machinery or vehicles to secure movable parts.

Clearance, Brake Wheel. The necessary clearance, as shown in figure 2, to permit the safe operation of hand brakes by trainmen.

Clearance, Lading. Limitations for height and width of cars and loads, as published in the "Railway Line Clearances." Special authority must be obtained for handling loads exceeding published clearances and for those which exceed dimensions as shown in tables 1 through 35 inclusive.

Cleats. Wooden pieces nailed to floor to reinforce blocking. Also pieces nailed to floor or blocking against lading to retain lading in position.

Constant Tensioning Devices. A securement device permanently applied to car comprising of a spring or other compressive material designed to maintain proper tensioning of high tension banding used to secure lading to car.

Cribbing. Metal or wood pieces or framing placed under or against lading to support, stabilize or hold lading in position and secured to prevent displacement.

Crossties, Side Stake. Wood, wire or metal ties used to keep stakes in position, and retain the alignment of the lading.

Deck. The wood floor of a flat car.

Depressed Car. A flat car having the portion of the floor between trucks depressed to provide increased head room for certain classes of lading.

Double Load. A shipment requiring the use of two carrying cars.

Drop End Gondola. A freight car with sides and ends but without top covering. The ends are in the form of doors, which can be lowered to facilitate loading and unloading, or for transporting long material which extends beyond ends of car.

End Blocking. Blocking used to prevent end movement of lading.

End Sill. The transverse member of the underframe extending across ends of all the longitudinal sills.

Eye Bolt. Closed eye fittings with threaded end used to secure wire and band lading ties.

Filler. Wood pieces used between car and lading, car and blocking, or between two sections of blocking or lading, to retain lading and blocking in position.

Filler, Metal. Metal protectors used under wire or band securements to prevent the failure of the securement as a result of contacting sharp edges of either car or lading.

Fish Belly Sill. Type of heavy, deep, built-up side or center sill.

Fixed Add Gondola. A freight car with fixed sides and ends but without top covering. Used for the transportation of freight in bulk.

Flat Car. A freight car having the floor laid over sills, and without any sides or body above.

Floating Load. A load in which the lading is prepared into a unit with space between unit and ends of car and end blocking omitted. This type of loading permits the dissipating of impact shocks by the lengthwise movement of lading over floor of car.

Flooring. The general term given to the layer of material which is placed on top of the underframe of a car and provides the direct support of lading.

Gondola. A freight car with sides and ends but without a top covering. May be equipped with high or low sides, drop or fixed ends, solid or drop bottoms and is used for shipment of any commodity not requiring protection from the weather.

Gondola, Drop End. See "Drop End Gondola."

Gondola, Fixed End. See "Fixed End Gondola."

Green Sapling. A recently cut young tree in which the moisture content still exceeds the saturation point and the ratio of sapwood to heartwood, on a radius from bark to center, is at least 2 to 1.

Gross Weight. The total of the car weight (light weight) and the total weight of lading permitted (load limit) which is the maximum weight permitted on rail. The light weight and load limit for each car is stenciled on sides of car.

Guide Strips. Longitudinal pieces secured to floor of car against sides of unit or skids to prevent side shifting.

Hand Brake Wheel. See "Brake Wheel."

Hopper Car. A freight car with sides and ends but without a top covering, and the floor sloping from ends and center to permit the entire lading to be discharged by gravity through the hopper doors.

Idler Car. A freight car used to protect overhanging loads or used between carrying cars loaded with long material on bearing pieces or pivoted bolsters.

"J" Bolt. Open end fittings with threaded ends, used to secure wire or band ties, or as a direct tie-down securement. The open end closed by the application of a plate over end and stem of bolt.

"L " Side. Left-side-the side of car on the left of the observer when standing inside of car and facing the "A" end of car.

Lading Strap Anchor. Point of securement provided on cars for the application of high tension band and wire. (Cables, rods or chains are not to be attached to lading strap anchors.)

Lag Screw. Screw type securement for blocking or as a retarding device between blocking and skids on machinery shipment.

Laminate. The use of two or more wood, or wood and steel, members, in the makeup of a blocking detail or skid.

Light Weight. The weight of any empty freight car. This figure is stenciled on sides of car.

Load Cushioner. A flanged metal seal which is to be crimped to a band and nailed to the car floor for the retardation of longitudinal movement of the load.

Load Limit. The maximum load in pounds which the car is designed to carry. This figure is stenciled on sides of car.

Mechanical Brakeman. See definition for "Snubber Plates and for Load Cushioner."

Metal Bluing. Suitable metal sections which are acceptable as alternates for wood blocking securement.

Overhanging Load. The portion of lading overhanging one or both ends of car. The length of overhang is measured from center line of truck bolster.

Pallet. A platform or skid on which lading is placed and secured, used to facilitate handling of small sized commodity shipments by mechanical means.

Palletized Load. -A method of loading palletized units.

Pile. A load or portion of load, composed of one or more units which may be either located side by side or

one on top of another, or both, which may be secured as a single unit.

Proof Test (Chain). Tensile test applied to a chain by a manufacturer for the purpose of detecting defects in the material or manufacture. The tensile test indicates the actual load in pounds that the chain will withstand without failure.

Protection Plates. Metal protectors used under wire or band securements to prevent the failure of the securement as a result of contacting sharp edges of either car or lading.

"R " Side. Right side. The side of car on the right of the observer where standing inside of car and facing the "A" end.

Release Lever. A rod with a bent handle forming a lever, usually attached to the end sill, by which the lock of the automatic coupler is opened and the cars uncoupled without the necessity of going between them.

Raid Brace Load. A load in which the lading is secured by blocking, etc., to prevent any movement of the lading in transit.

Rotary Machine. Machines designed to rotate totally or in part and necessitate securement of the rotary feature in transportation.

Semi-Floating Load. A load where lading is secured in two units with a space at center but with no space between units and the ends of car. This permits movement of each unit in one direction only.

Separators. Material placed crosswise between layers of load and extending through the full width of load, to facilitate loading and unloading; to provide level support for additional layers and to provide space for application of load securement items.

Side Bearing Clearance. The space provided between body and truck side bearings to permit free curvature of trucks.

Sill, Center. The center longitudinal member of the car underframe.

Sill, End. The transverse member of the underframe extending across ends of all the longitudinal sills.

Sill, Intermediate. The main longitudinal members of the car underframe between the side sills and the center sills.

Sill, Side. The outside longitudinal members of the car underframe.

Single load. A shipment requiring the use of one car.

Skids. A platform composed of two or more longitudinal members and two or more cross members to which lading is attached to facilitate handling and to evenly distribute load weight in transportation, or composed of two or more members secured to lading to facilitate handling.

Snubbed Load. A method of loading using anti-skid plates, lag screws or other retarding devices which permits a restricted lengthwise movement of the load

Snubber Plates. Slotted metal plates nailed to f100r of car used to retard movement of lading. The retarding action is caused by the frictional resistance of the load securement bands passing through slotted hole in plate.

Spacers. Material placed crosswise between layers of pile extending for width of pile only, to facilitate loading and unloading; and to provide space for the application of load securement items.

Spacing Blocks. Metal blocks used between face of striking plate and coupler horn ot completely fill space after cars have been jacked apart, to take up all slack in cars handling shipments requiring the use of two or three cars.

Specially Equipped Car. A specially equipped car is one that has integral devices to either partially or fully secure the lading.

Stake. A piece of timber or metal inserted in the stake pocket on sides or ends of flat cars to hold load in place, extending slightly higher than top of load. Also used on inside of gondola cars to secure lading in position.

Stake Pocket. A metal receptacle attached to side or ends of flat cars to receive end of stake used in securing loads.

Stake, Stub. A piece of timber or metal inserted in the stake pocket on sides or ends of flat cars extending sufficiently above floor to provide protection against side or end movement of lading.

Stickers. Material placed crosswise within bundles extending for width of bundles only, to provide rigidity and prevent slippage of individual pieces within the bundles.

Strapping-Non-Metallic. Synthetic material of various widths and thickness, each with a standard load strength, used to secure lading.

Tare Weight. The weight of any empty freight car.

Thimble. Metal protectors used to prevent cutting or breaking at sharp turns of cable securement.

Triple Load. A shipment requiring the use of two carrying cars with an idler between them.

Truck Centers. The distance from center line to center line of the freight car truck bolsters.

Well Hole Car. A flat car with a depression or opening in the center to allow load to extend below the normal floor level when it could not otherwise come within the overhead clearance limits.

Wheel Chocks. Concave or mitered blocking used to secure wheeled units.

Wire, Common. Soft wire of various sizes used as a lading securement.

Wire, High Tension. Steel wire of definite size and load strength used as a lading securement.

Working Road Limit (Chain). Maximum load in pounds which should ever be applied to chain even when chain is new and when the load is uniformly applied in direct tension to a straight length of chain.

APPENDIX C

RAILCAR DESIGNATIONS

(The following information is extracted from The Official Railway Equipment Register)

Class F-Flat Car Type

"FA" Flatcar specifically equipped with superstructure or containers for transporting set-up vehicles. Not suitable for miscellaneous commodities.

"FB" Bulkhead flatcar. Equipped with fixed or permanently attached movable bulkheads or ends a minimum of three feet in height and flat floor for general commodity loading

"FC" Flatcars specifically equipped to carry trucks, trailers, containers, or removable trailer bodies for the transportation of freight in TOFC/COFC service.

"FD" Depressed center flatcar of special construction having the portion of floor extending between trucks depressed to provide necessary overhead clearance for lading.

"FL" Flat logging car or logging truck. This is either an ordinary flatcar or car consisting of two trucks fitted with cross supports over truck bolsters; the trucks connected by a skeleton or flexible frame and logs loaded lengthwise on cross supports.

"FM" Ordinary flatcar for general service. This car has flooring laid over sills and without sides or ends.

"FW" Flatcar with hole to enable lading to be lowered due to clearance limits.

Note

Where cars are equipped with permanent racks for stowing parts, or are specially modified or equipped to provide for loading of a particular commodity, the letter "S" should be affixed to the applicable designated letters.

APPENDIX D
AAR GENERAL RULES
SECTION 1

(The following information is extracted from the Association of American Railroads manual, General Rules Governing the Loading of Commodities on Open Top Cars and Trailers)

Association of American Railroads

OPERATIONS AND
MAINTENANCE DEPARTMENT
MECHANICAL DIVISION

SECTION No. 1

GENERAL RULES GOVERNING THE Loading of Commodities On Open Top Cars

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Adopted by the
Former Master Car Builders' Association
as Recommended Practice, 1896
Advanced to Standard 1908

PUBLISHED FEBRUARY 1, 1960
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1920 L Street, N. W. Washington, D.C. 20036

Sec. I--General Rules (Rev. -9-1984)

PREFACE

The Rules Governing The Loading of Commodities on Open Top Cars and Trailers are covered under the following Sections:

Section No.	Description
1	General Rules (Applicable to Sections 1 to 6).
2	Steel Products, Including Pipe.
3	Road Grading, Road Making, and Farm Equipment Machinery.
4	Miscellaneous Commodities, Including Machinery.
5	Forest Products.
6	Department of Defense Materiel.
7	Open Top Trailers In TOFC Service (General Rules and Figures).

(1) These rules have been formulated to provide safe movement of car and commodity from point of origin to destination by using uniform and economical methods of securernent. The securement materials specified in these rules are minimum requirements.

(2) Insofar as the unloading of a commodity prepared to a specific figure and/or a General Rule is concerned, where a shipment is delivered for unloading to the consignee's plant or siding track, the securement details specified have served the primary purpose for which they were Intended. Because the rules deal with transportation, no attempt has ever been made to formulate or standardize on unloading practices and the responsibility of providing safe and efficient unloading methods must remain with the consignee.

(3) All of the General Rules and the requirements for blocking and securing of loads as outlined under the individual figures are mandatory and must be used unless their omission is specified In the individual figures.

(4) When the dimensions and kind of materials to be used for securing the load are not specified under the figures, the General Rules, Section No. 1 or Section No. 7, which are to be carefully observed in connection with all loading, will govern.

Sec. 1-General Rules (Rev.-9-1984)

GENERAL RULES

Rule 1. Inspection and Compliance.

(a) General Requirements.

(1) The responsibility for properly preparing a load for movement by rail is defined for the shipper by the Uniform Freight Classification Rule 27, Section No. 3.

(2) The responsibility of the rail carrier, when accepting open top loads is governed by Rule 89, Section "B", paragraph 1, sub-paragraph (a) of the AAR Interchange Rules "Field Manual."

(3) Shippers must observe the drawings and specifications of an applicable figure where a figure is involved, as well as all applicable rules regulating the safe loading of freight as published herein; and must also inspect shipments to see that they are properly and safely secured and that all applicable details in Rules 1 to 21 inclusive, as well as all applicable figures, where figures are involved, have been complied with in all cases, before shipments are tendered to carrier.

(4) Drawings depicting specific figures are provided for guidance in the preparation of loads. When such loads are prepared or offered in Interchange, the application or placement of securement items may vary from the detailed drawings. In all instances, the specifications of the specific figure will govern allowing for minor variances in placement of securement details and provided no securement items have been omitted.

(5) Loads of hazardous materials must conform to the regulations of the agency of authority of the countries within which the shipment will move.

(6) Unless otherwise specified, all of the figures in Section Nos. 3, 4 or 6, covering various types of vehicles, are applicable only when vehicles are empty.

(7) Unless otherwise specified, shippers must implement all new figures, revisions to figures, or instructions covered by circulars within but not later than three months from the date shown on such releases. This period is to allow for the dissemination of information and to permit for depletion of securement and blocking materials that may be on hand to provide for the procurement of new securement materials. When It is necessary to correct a hazardous practice, a circular letter will be Issued stating that the specifications of a new figure or revisions to an existing figure are effective immediately. When this occurs, the three month provision is nullified and will be implemented as soon as received by the shipper and originating carrier. In such cases, the shipper and originating carrier will be notified by wire or by other expeditious means. Where clarification of the intent of a rule or specifications of a figure is requested and no change is made to the securement details or where editorial changes in a rule and/or figure is required, the Open Top Loading Rules Committee has the prerogative to inform the industry of such clarifications and/or editorial changes with a circular letter, which may specify an effective date, to be no later than three (3) months after the date of the circular letter.

(8) When a load is received in interchange not in compliance with a figure, circular letter, or revised pages with an effective date for implementation, acceptability will be governed by the waybill, provided it was issued prior to the established effective date.

(9) In the loading of such cars the hazards connected with speed, multiple track railroads, tunnels, bridges, overhead structures, electric conductors and the necessity of protecting human life and property should be borne in mind.

(10) When ordering cars for loading concentrated weights of heavy commodities, shippers have the responsibility of notifying serving carriers of this purpose.

(11) Floors and all supporting details of cars selected for the loading of commodities of heavy concentrated weight must be of sufficient strength to prevent load breaking through floor while shipments are enroute.

(12) Fixed supports, brackets or other appurtenances on lading, must be of sufficient strength to safely support unit in transit or body of same must be adequately supported for rail transportation.

(13) All cars All items described under the figures for securing loads must be applied as specified, except when otherwise indicated under each figure.

(14) Unless otherwise specified in the figures, the securements are shown for loads on fiat cars not exceeding 60 ft. in length. When lading requires fiat cars longer than 50 ft., the shipper and originating carrier are to confer as to additional securement required.

(15) Loads of dimensions and weight which make it necessary to handle them under restricted speeds must be reported by the originating carrier to the carriers over whose lines they are to be transported.

(16) Piles or units, loaded on one car may be secured to different specific figures or General Rules and located not closer than two feet to the adjacent pile or unit.

(17) In preparing these loading rules. no attempt is made for the protection of commodities involved either from the elements or from other forms of damage such as vandalism. inherent property of the commodity, hidden defects, design or manufacturing deficiencies, etc. The shippers must ensure that, in the shipment of crated material, the crates have sufficient strength to accept securement items to the car and to retain internal contents. Contents must be suitably braced to retain lading and prevent crate failure. If crates are to be stacked, bottom crates must be of sufficient strength to support the additional weight. Where additional protection from damage is necessary, this then becomes a matter to be decided between the shipper and receiver of the commodity.

(18) When tarpaulins or other type covers are used to cover or protect the lading during, transit, they must be adequately secured in such a manner as to prevent them from working loose and thus becoming an operational safety hazard.

Section No. 1 General Rules (Rev.--9-1983)

(19) Cards bearing advertisements or trademarks or banners must not be attached to cars, nor to permanent stakes which are a part of tile car, nor to temporary stakes supplied by shipper solely for the purpose of carrying such advertisements. They may,. however, be applied to the load or to temporary stakes used to secure load provided they are safely secured to such stakes or lading. Paper or cloth banners or size requiring supporting frames, metal or wooden banners with or without supporting frames, must be securely fastened by bolts, wires or bands.

(b) Special Authority.

(1) Special authority must be procured by the shipper from the originating carrier for shipments of any commodity on open top cars not covered by a specific figure in Sections 2 to 6 inclusive; also, for shipments of any commodity unless covered by a specific figure in Sections 2 to 6 inclusive, when loaded on a well hole, depressed floor or specially designed cars. Consistent loading of a commodity on a conventional or specially designed car places an obligation on the shipper to request promptly, approval of a specific figure to cover. Originating carriers involved with commodities consistently shipped have the responsibility of notifying the AAR Open Top Loading Rules Committee and informing shipper they must submit appropriate proposal to cover new methods of loading. Consistent shipping is defined as repetitive shipments secured in the same manner and made at the rate of one (1) shipment and/or more per month, and or when it is expected that more than twenty-five (25) shipments will be secured in the same manner regardless of the duration of time to originate the shipments.

(2) Loading on specially equipped open top cars incorporating either integral or special tie-down securement, unless covered by a specific figure in Sections 2 to 6 inclusive, is not covered by these rules insofar as securement details are concerned; where not covered, the loads and securement must conform with General Rules 1 through 21.

(3) Originating carrier and shipper must confer as to appropriate blocking and bracing methods for loads not covered by a specific figure and consideration must be given to such details as the topography, distance traveled, multiple track system, grades, curves, train speeds, etc., which the shipment will incur over its entire route from origin to destination. When in the interchange of such shipments, exceptions are taken by receiving carrier to method of securement, carriers participating in the movement of controversial shipment are to be contacted by receiving carrier in an effort to resolve an acceptable method of loading the commodity in question. Where differences of opinion arise between or among carriers which, they cannot resolve amongst themselves or with the assistance of local interchange bureaus or similar associations, then the dissenting carrier may request the Chairman of the Open Top Loading Rules Committee to appoint three neutral members of this committee, preferably from the same region over which the controversial shipments will move, to decide which side of the dispute should be upheld, having full authority to render an immediate decision after an on-the-ground investigation Is made at the originating point. In cases where this neutral group decides that the existing loading method is adequate and safe, any intermediate or destination carrier would thereafter have to make at its own expense any changes or additions pertaining to items of securement, which It might deem necessary, upon receipt of such shipments on its line.

(4) Gondola cars with removable roofs or hoods, without special load retaining fixtures, are subject to the mandatory requirements of the Open Top Loading Rules.

(5) The loading and bracing of ground servicing units, used with the various Missile Systems shipped by the Department of Defense, because of the very specialized nature, are covered by individual drawings. When approval of these methods of loading is acknowledged .jointly by the Department of Defense Subcommittee of the A.A.R. Committee on Loading Rules and U.S. Army Transportation Engineering Agency, Military Traffic Management Command, a letter of authorization, is issued by the Director, Rules and Inspection, of the A.A.R. Mechanical Division which designates the drawing reference and unit classification. Copies of these drawings are maintained in a special file in the office of the Secretary of the A.A.R. Mechanical Division and they ate also available at Department of Defense military sites where these units are loaded.

(c) Instructions New Submissions Experimental Loads.

(1) These rules are based on many years of exacting studies and requirements, however the railroads stand ready at all times to cooperate with the shippers for betterments. Suggestions made to the Director, Rules and Inspection Mechanical Division, Association of American Railroads, American Railroads Building, 1920 L Street, N. W., Washington, D.C., 20036, will be given prompt attention.

(2) Shippers of Department of Defense material desiring new revision of or additions to the present rules or specifications must submit such proposals to the Military Traffic Management Command, Transportation Engineering Agency, 12388 Warwick Boulevard, P.O. Box G2.2. Newport News, Virginia 23606, through the appropriate channels for handling with the Mechanical Division of the Association of American Railroads.

(3) Shippers desiring to deviate front the AAR Open Top Loading Rules or desiring approval of a method not now covered by these rules, must submit to the Director, Rules and Inspection, Mechanical Division, Association of American Railroads or the Chairman, Open Top Loading Rules Committee. twenty (20) drawings, size 1, in. x 22 in., giving plan, end and side views, with all items of securement identified with capital letters similar to drawings as presently shown in the rules, also twenty (20) copies of specifications in similar form to those likewise contained in the Open Top Loading Rules.

(4) On receipt of any submission in the above form, the matter will be transmitted to the Open Top Loading Rules Committee for their review and comments, after which the issuance of experimental load cards will be dependent on the decisions rendered by this Committee.

Section No. 1-General Rules (Rev.-11-1978)

(5) When an impact test Is deemed necessary for evaluation of a new submission, there will be no charge for expenses incurred by the Open Top Loading Rules Committee for conducting these tests. There will be a charge of S700 to the proponent to cover the Committee's expenses when a impact test is needed to evaluate a request for revision of existing figures, when in the Committees opinion, the load securement is lessened by either a reduction of the size or number of securement items or an increase in weight or volume of the commodity. The charge will be payable to the Association of American Railroads when an agreement is reached on the time and place to conduct the impact test.

(6) When issuing over the road test cards, the Sub-Committee will give the shipper guide lines for evaluation of test results, taking into consideration the following:

1. Consideration of load condition at destination.
2. Displacement of the load, both laterally and longitudinally at destination.
3. Any shifting of the load that would affect weight distribution.
4. Adjustment of load in transit.
5. Loose or broken package bands or ties.
6. Loose or broken tie-down securements.
7. Loose or displaced blocking items.

(7) Shipper, after having received authority for experimental shipments, will be furnished stickers worded as outlined below. He will affix one to bill of lading and attach another to be affixed to waybill by agent. This to insure proper handling of experimental load cards.

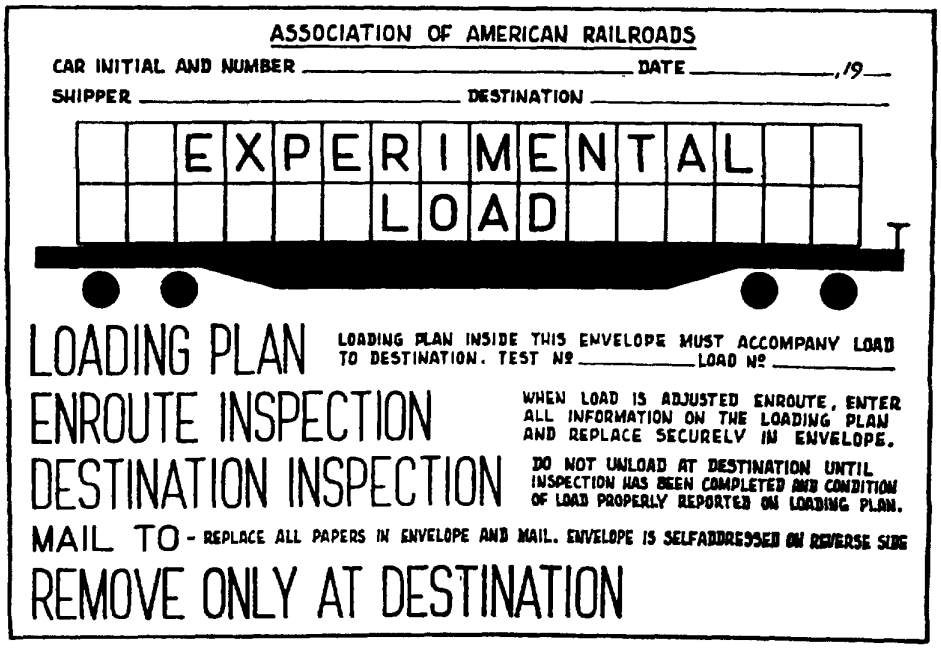
ASSOCIATION OF AMERICAN RAILROADS
EXPERIMENTAL LOAD

The Association of American Railroads, through the Committee on Loading Rules, has authorized the application of experimental load cards to Car.

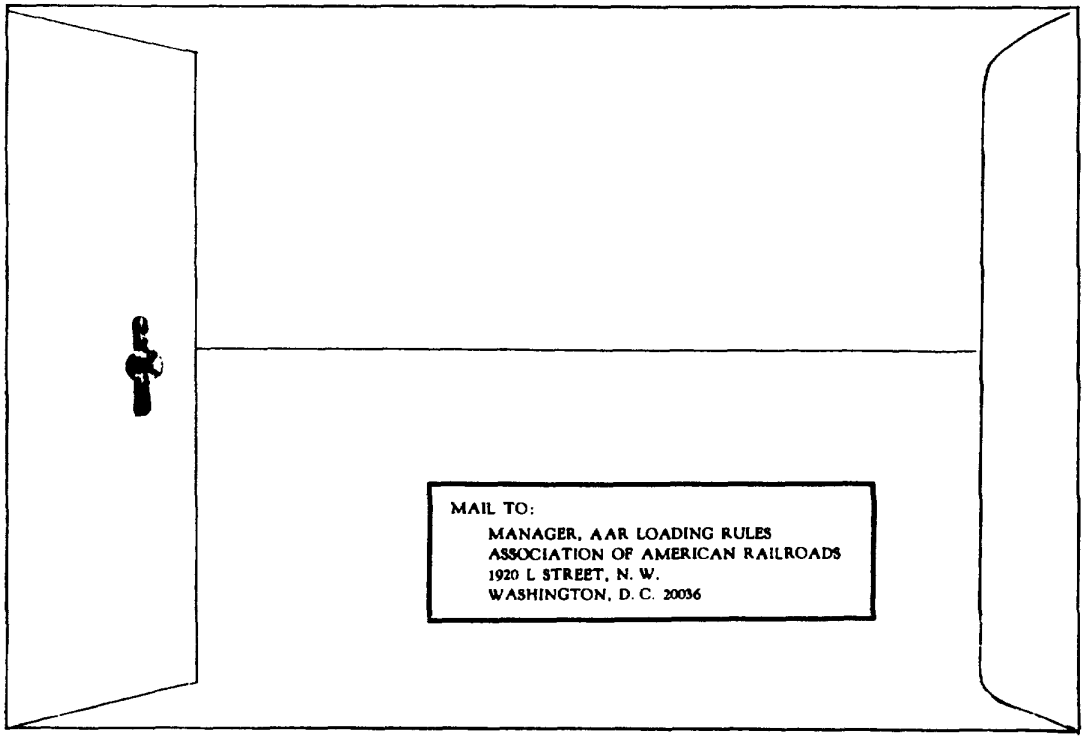
(Initial) (Number)

Shipper will be furnished waterproof envelopes, as per Figure 1, shown below, same to be properly filled in and attached to one side of car by shipper. Only one car need be so identified in connection with twin or triple loads.

Fig. 1
FRONT VIEW OF TEST LOAD CLASP ENVELOPE SIZE 7 1/2 X 10 1/2 "



BACK VIEW OF TEST LOAD CLASP ENVELOPE



The envelope will contain instructions to shippers for preparation of the load and instructions to handling carriers and consignees for reporting of enroute adjustments and final destination inspection. These instructions and reporting forms are illustrated under Figure 1-A.

Section No. 1-General Rules (Rev.-9-1982)

Fig. 1-A

ASSOCIATION OF
AMERICAN RAILROADS
OPERATIONS AND MAINTENANCE DEPARTMENT • MECHANICAL DIVISION
AMERICAN RAILROADS BUILDING • WASHINGTON, D. C. 20036

EXPERIMENTAL LOAD CARD
GENERAL RULE 1-(c). FIG. 1-A
SHEET 1 OF 4

TO WHOM IT MAY CONCERN:

To Shipper at Loading Site

Please enclose copies of loading plan, specifications and inspection forms in each experimental test load envelope and carefully secure to car. Furtherance loads are not to be used for test purposes.

It would greatly assist the enroute and final inspection if you would arrange to insert with each shipment, photographs illustrating the load at originating point.

Notify the Manager, AAR Loading Rules, Washington, D. C., by wire or phone, for each load shipped giving all information specified as per following:

Initial & Number..... Lading..... Date Shipped.....

Shipped From..... To..... Consignee.....

Routed Via..... Test No..... Load No.....

Shipper.....

To Consignee at Unloading Site

This test was authorized by the Committee on Loading Rules after careful study and field impact tests. The attached loading plan and specification was used in loading this car and will assist you in making a mechanical inspection. Please contact the nearest Mechanical Officer of the delivering railroad to arrange and make this inspection **before the car is unloaded.**

Should your plant be in a remote area, and railway inspection is not available, you will assist us by completing the attached forms, indicating who made the inspection, and mailing the self-addressed envelope promptly. In the event that no inspection forms are on car, this would indicate that delivering carrier has inspected load at last mechanical point where inspectors were available prior to placement at your unloading facilities. If at all possible, **please submit photographs with this report.**

Manager, AAR Loading Rules
(202) 835-9274

Section No. 1—General Rules (Rev. 9-1977)

Fig. 1-A (Continued)

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EXPERIMENTAL LOAD CARD

Sheet 2 of 4

(Return this form completed in the attached envelope)

Shipper's Originating Information:

Test No.....Load No.....Contents.....

Car No. & Initial.....Shipper.....

Consignee.....At.....

Date Loaded.....

En-route Load Adjustment: (Adjustment should conform to enclosed specifications)

When Load is adjusted enroute please advise data below, in detail, and replace this form in the envelope and secure to car for completion at final destination.

1. Date, Location and Railroad making adjustment.
2. Reason for Load Adjustment
3. Show how load adjusted and resecured.
4. Was load adjusted by repositioning to approximate position and/or package placement?

   Yes..... No.....

5. Were broken securement items replaced in kind as specified on attached test specifications?

   Yes..... No..... If no,

   Please advise type of securement used and number of pieces applied.

   Type.....No. of Pieces.....

6. Please furnish photos of load before and after adjustment.

Important:

If car requires load transfer, please complete this side of form, remove envelope from car and return self-addressed envelope as this particular load will be considered cancelled from this test.

Section No. 1—General Rules (Rev.—9-1977)

Fig. 1-A

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EXPERIMENTAL LOAD CARD

Sheet 3 of 4

FINAL DESTINATION INSPECTION TO BE COMPLETED BY
MECHANICAL DEPT. DELIVERING RAILROAD (ATTACH—PHOTOS IF POSSIBLE)

Load Test No..... Load No.....

(Refer to Attached Specifications and Complete Form)

CONDITION OF LOAD

	Yes	Distance	No
Load Shifted			
Endwise Shift			
Sidewise Shift			
Load Leaning			

Diagonal Shift ☐ Yes ☐ No
Distance.....
Distance .....

If Load Extends Beyond Car Dimensions, Show Distance-End.....Size.....

Explain .....

CONDITION OF SECUREMENT

		OK	Number Loose	Number Broken	Number Improperly Applied
Bands ☐ Unitizing	Item.....				
☐ Tie Down	Item.....				
☐ Package	Item.....				

Loose or Broken Bands ☐ Broken in Body ☐ Pulled Thru Seal
(check one)

Show Location of Break ☐ Lading Strap Anchor ☐ Stake Pocket ☐ On Commodity

Explain.....

.....

Chains—Item..... ☐ OK ☐ Number Loose ☐ Number Broken

Show Cause and Location of Break.....

Wires—Item..... ☐ OK ☐ Number Loose ☐ Number Broken

Show Location of Break ☐ Lading Strap Anchor ☐ Stake Pocket ☐ On Commodity

Other
Explain:.....

.....

Cable—Item..... ☐ OK ☐ Number Loose ☐ Number Broken

If Frayed or Broken Show Location ☐ Lading Strap Anchor ☐ Stake Pocket ☐ On Commodity ☐ Other

Explain:.....

.....

Section No. 1—General Rules (Rev. 4-1980)

Fig. 1-A (Continued)

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AMERICAN RAILROADS BUILDING • WASHINGTON, D. C. 20036

EXPERIMENTAL LOAD CARD

Sheet 4 of 4

FINAL DESTINATION INSPECTION (cont'd.)

LOAD TEST NO. _____ LOAD NO. _____

CONDITION OF BEARING PIECES, SEPARATORS, BLOCKS, ETC.

Item	No Exceptions	Number Displaced	Number Broken	Improperly Applied
Bearing Pieces				
Separators, Vertical				
Separators, Horizontal				
Side Blocks				
Wheel Blocks				
Back-Up Blocks				

Other (Describe).....

.....

Explain.....

.....

Type of Car: ☐ Flat ☐ Bulkhead Flat ☐ Gondola ☐ Hopper Cushion Underframe: Yes ☐ No ☐

Type of Trailer: ☐ Flat ☐ Bulkhead Flat ☐ Expandable

Cause of Load Defect

Poor Loading: ☐ Yes ☐ No Defective Material: ☐ Yes ☐ No

Deviation from Attached Test Specifications: ☐ Yes ☐ No

Explain.....

.....

Date..... .... Inspector.....
Mo. Day Yr.

Railroad.....

Location.....

(7) Upon completion of an Experimental Load Test the Open Top loading Rules Committee will review all reports and if the results are found satisfactory a figure will be published, or an existing figure may be revised to cover the approval of the method of loading tested. If the Committee decides that the result of the test are not satisfactory the parties concerned will be notified accordingly. A shipper desiring to use the method of loading tested for the period between termination of the test and published approval may request the Manager, AAR Loading Rules, "Mechanical Division, for supply of cards shown below, Fig. 1-B - "Extension of Experimental Load Test." On receipt of such request, the Manager, AAR Loading Rules, will confer with the Chairman of the Open Top Loading Rules Committee and based on a preliminary review of the reports received, a decision will be made as to whether or not cards per Fig. 1-B will be issued, and the shipper notified. Shippers who are supplied with these cards will fill in the necessary data and affix one card on each side of loaded car. The shipper will keep a record of all loads on which these cards are applied and supply this information to the Manager, AAR Loading Rules, Mechanical Division, if requested to do so. The record is to show the car initial and number, contents, date shipped, routing, destination and consignee. Cards to Fig 1-B to be removed and destroyed when car is unloaded. Issuance of card, to Fig. 1-B does not imply final approval for publication because such action is the prerogative of the Open Top Loading Rules Committee after full and detailed review is made of all reports received.

ASSOCIATION OF AMERICAN RAILROAD8

MECHANICAL DIVISION

Fig. 1-B—Sec. 1

EXTENSION OF EXPERIMBNTAL LOAD TEST

..... (Shipper) hereby certifies that

Car Initial and Number .....Contents .....

has been loaded in accordance with loading specifications for A.A.R. Experimental Load Test No .....

Date ..... Signed.....
(Shipper)

Origin.....Consignee.....

Destination .....

This load is authorized for movement In interchange under authority of Rule 1 of the General Rules, Section No. 1 of the General Rules Governing the Loading of Commodities on Open Top Cars.

This Card To Be Removed And Destroyed When Car Is Unloaded.

Sec. 1-General Rules (Rev.-11-1978)

(d) AAR Open Top Loading Rules Inspection Department.

1. This department is responsible for inspecting and checking the mandatory requirements provided in the manual Governing the Loading of Commodities on Open Top Cars and Trailers, to Insure compliance with the General Rules, Section No. 1 and specific figures, Section Nos. 2 to 7, inclusive.

2. Responsibilities and Duties of Open Top Loading Inspectors.

(a) Inspect loads at railroads and interchange points; inspect loads at request of shippers, railroad interchange bureaus and/or associations.

(b) Assist shippers and railroads in setting up loading patterns for new commodities already covered by a figure when a revision or alternate figure is desired; for loads not specifically covered in the figure; for overdimentional loads and for irregular type loads.

(c) Call on shippers, accompanied by railroad mechanical personnel to discuss loading procedures.

(d) Discuss loading problems with railroad personnel.

(e) Assist in settling disputes wvith shippers or amongst carriers.

(f) Check on veracity of load adjustments and/or transfer charges at interchange points.

(g) Determine that shippers, railroads, interchange bureaus and/or associations have and are using current publications of the Rules Governing the Loading of Commodities on Open Top Cars and Trailers.

3. Reporting.

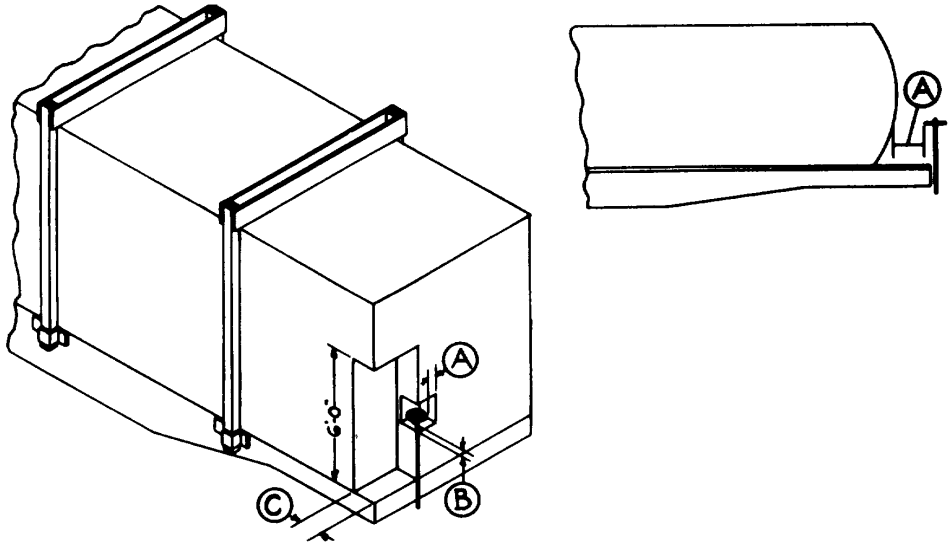
(a) Inspectors will submit report to the Manager, AAR Loading Rules and also advise verbally supervisory personnel at points visited of exceptions taken.

(b) When consistent violations of a specific figure and/or General Rule are found on loads originating on individual railroads, the Director of Rules and Inspection will forward a report covering such violations, furnishing car numbers, dates and shipper and/or shippers to the Chief Mechanical Officer of the carrier involved. If noted violations persist after the initial notification, a second report will be promptly forwarded requesting that advice be promptly furnished on corrective action to be taken.

Rule 2. Brake Wheel Clearance.

(a) The brake wheel clearance must not be less than requirements shown in drawing, Figure 2, below and should be increased as much as consistent with proper location of load.

Fig. 2
BRAKE WHEEL CLEARANCE



Item	Description
A	6 in. clearance In back, on both sides of, and above brake wheel, except as shown for tanks and similar shapes in one piece.
B	4 in. clearance underneath brake wheel.
C	12 In. minimum clearance from end of car to load, extending from center of brake wheel to side of car and 6 ft. above car floor. On gondola cars this space may be utilized from floor of car to 4 In. below bottom of brake wheel, Item "B."

(b) In the loading and hauling of long commodities requiring more than one car, handbrakes may be omitted on all save one of the cars while they are thus combined for such purpose. (See Supplementary Act No. 188 Approved April 14, 1910, Federal Statute reference 36 Stat. L., 298, of the current edition of the U.S. Safety Appliances).

(c) Brake Wheel clearance should be increased as much as consistent with proper location of load.

Rule 3. Wood Securement Items -- Quality and Species

(a) Where "lumber," "wood" or "hardwood" is specified in various figures In Sections 2 through 6 and for loads prepared in accordance with the General Rules in Section 1, the following species are commercial species* of woods acceptable for all uses:

Ash (White,* Oregon, Pumpkin)
Beech (American)
Birch (Alaska Paper, sweet, yellow)
Butterbough
Button (Mangrove)
Cherry (black)
Douglas Fir (coast type)
Elm (American cedar, rock, slippery and winged)
Hemlock (mountain)
Hickory (true* and pecan*)
Larch (western)
Locust (black)
Mangrove
Maple (hard* and red)
Oak (red* and white*)
Pine (Southern yellow*, pond, sand, South Florida, Slash, Table Mountain and Virginia)
Sweetgum
Tamarick
Tupelo (water)
Walnut (black)
Yew, Pacific

Section No. 1 General Rules (Rev.-11-1978)

(b) In addition to species in paragraph (a), the following species of woods are acceptable for uses other than stakes or clamping pieces except as noted in paragraph (d):

Bald Cypress
Birch (paper)
Cedar (Southern red & eastern red)
Cypress (Arizona)
Douglas Fir (intermediate type & Rocky Mountain type)
Hemlock (eastern and western)
Juniper (Rocky Mountain and Utah)
Madone, Pacific
Magnolia (Fraser and southern)
Maple (bigleaf and striped)
Mountain-laurel
Pine (pitch and Jack)
Poplar (Canadian Western White) (For Loading of Steel Pipe, Part No. 8, Section No. :)
Sycamore
Tamarack
Tupelo (black)

(c) In addition to species in paragraphs (a) and (b), the following species of woods are acceptable for uses other than stakes, bearing pieces, separators and clamping pieces except as noted in paragraph (d):

Aspen (bigtooth and quaking)
Cedar (Alaska & Port Orford)
Cotton wood (black and eastern'
Fir (California Red, grand, noble Pacific Silver, and white)
Juniper
Pine (lodge pole)
Redwood, Old Growth
Spruce (East. *, Engelmann, & Sitka)
Yellow-poplar

(d) The following species of wood may be used for all purposes when the number of pieces or size specified under a figure Is increased by 25 percent or more:

Birch (paper)
Cedar (Alaska, Eastern red, Port Orford, and Southern red)
Cottonwood
Cypress (Arizona)
Douglas Flr (intermediate type & Rocky Mountain type)
Fir (California Red, grand, noble, Pacific Silver, and white)
Hemlock (eastern and western)
Juniper (Rocky Mountain and Utah)
Madrone, Pacific
Magnolia (Fraser and southern)
Maple (big leafed and striped)
Mountain-laurel
Pine (Jack, Jeffrey, Lodgepole, pitch, eastern white, timber, Ponderosa & sugar)
Pinyon
Redwood-Old Growth
Spruce (eastern*, Engelmann & Sitka)
Sycamore
Tupelo (black)

(e) Shippers desiring approval and inclusion of a species not listed in paragraphs (a), (b), (c), and (d) should forward request for consideration to the Director, Rules and Inspection or to the Chairman, Open Top Loading Rules Committee, furnishing name of species and listing properties for use in determining if it is acceptable.

(f) For lumber loads only, covered by figures in Section No. 5 or by the General Rules, items of securement, made from wood, with the exception of stakes, may be of the same species as the lumber in the load. Stakes must be in accordance with paragraphs (a) and/or (d).

(g) All woods must be of good sound quality, straight grained, free of decay and strength impairing knots.

(h) Excepting stakes, dimensions specified in specific figures or General Rules for wood securement items are permissible as rough or finished commercial dressed sizes. Dimensions of stakes must be to the minimum sizes in the specific figures or General Rules, whether rough or finished.

*Commercial Species
Ash-white (blue, green and white)
Hickory-true (mockernut, pignut, shagbark, and shellbark)
Hickory-pecan (butternut, nutmeg, pecan, and water)
Maple-h4rd (black and sugar)
Oak-red (black, cherrybark, laurel, northern red, nuttal, pin, scarlet, Shumard, southern red, water and willow)
Oak-white (bur, canyon live, chestnut, Chinkapin, live, Oregon White, overcup, post, swamp chestnut, and white)
Pine-southern yellow (loblolly, longleaf, shortleaf, and slash)
Spruce-eastern (black, red, and white)

Section No. 1-General Rules (Rev.-9-1982)

Rule 4. Single Cars, Maximum Load Weight.-

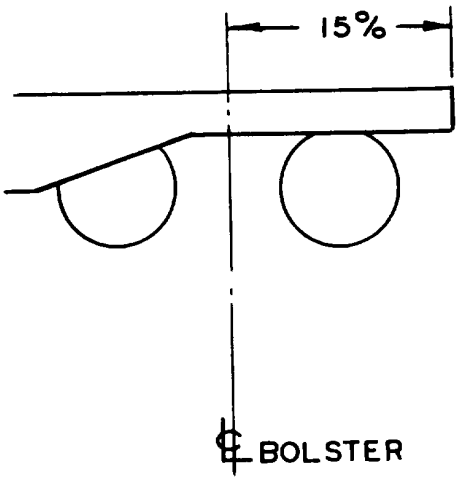
(a) The weight of load on a car must not exceed the load limit stenciled on car.

(b) When the load is lapped or staggered between truck centers and covers about the full length of car and the weight of load does not exceed the stenciled load limit of car, the tables under paragraph (d) do not apply.

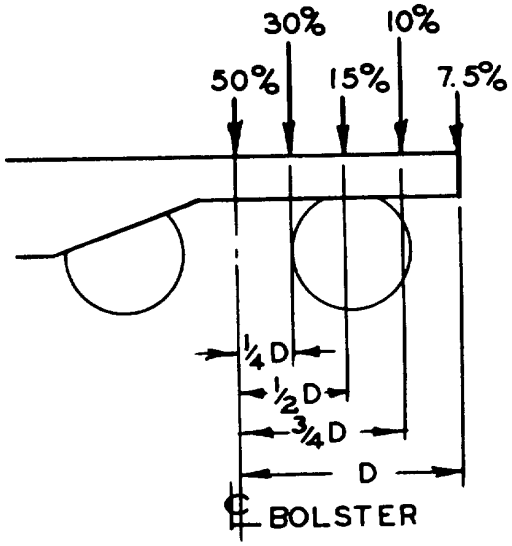
(c) Weight, uniformly distributed, of material loaded from truck centers to ends of car must not exceed 30% of stenciled load limit (that is 15% each end). (See Sketch 1).

(d) Load concentrations between body bolsters and end sills must not exceed the following percentages. (See Sketch 2).

Location	Permissible Concentrated Load Percent of Stenciled Load Limit
C/L of Bolster	50
¼ distance between bolster center and end sill	80
½ distance between bolster center and end sill	15
¾ distance between bolster center and end sill	10
at end sill	7.5



SKETCH 1
EVENLY DISTRIBUTED LOADS



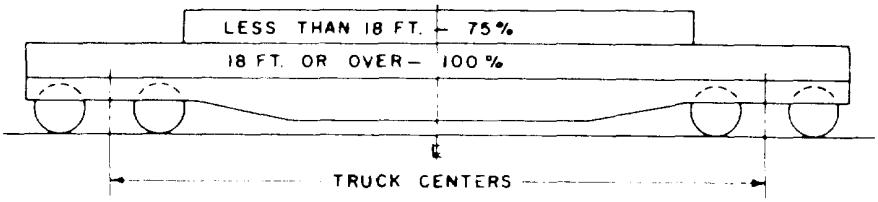
SKETCH 2
LOAD CONCENTRATED AT SPECIFIC POINTS

(e) The percentages of stenciled load weight limits, as shown below, must not be exceeded unless car owner has otherwise designated, by note, in the Official Equipment Register that these percentages may be changed.

Section No. 1-General Rules (Rev.-9-1982)

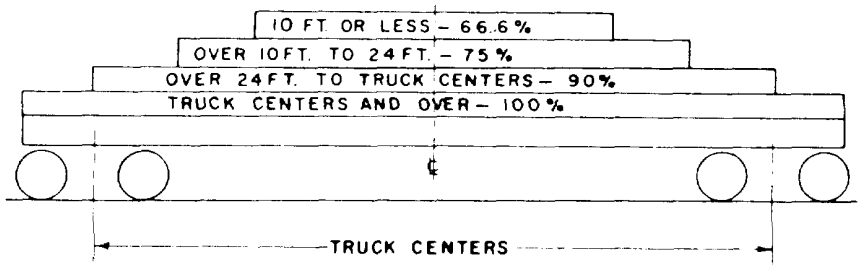
1. Flat cars with both fish-belly center and fish-belly side sills and all fiat cars built after January 1, 1965.

Less than 18 ft	75 percent
18 ft. or over	100 percent



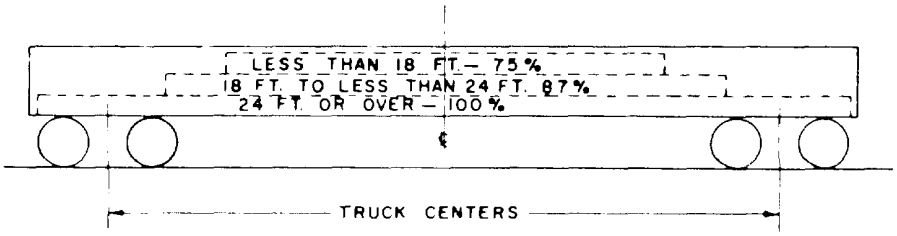
2. Flat cars not equipped with both fish-belly center and fish-belly side sills built prior to January 1, 1965.

10 ft. or less	66.6 percent
Over 10 ft. to 24	75 percent
Over 24 ft. to truck centers	90 percent
Truck centers and over	100 percent



3. Gondola cars.

Less than 18 ft	75 percent
18 ft. to less than 24 ft.	87 percent
24 ft. or over	100 percent



(f) The weight concentration percentages shown in (e) are based on the center of load weight (that is, the center of gravity of the load) being located on the center of the car length. The center of the load weight must not be nearer to either truck center than the distance shown below:

When load weight is reduced to 66.6%	-one-fourth distance between truck centers.
75%	-One-third distance between truck centers.
87%	-Three-sevenths distance between truck centers.
90'%	-Nine-twentieths distance between truck centers.

(g) The distance between crosswise bearing pieces (center to center) under lapped or staggered portion must be placed so as to prevent excessive concentration of weight over specified spaces shown in the above tables.

(h) Bearing pieces, lengthwise of car, of suitable strength and length to provide for extended distribution of weight over the specified spaces, shown in the above tables, may be used.

(i) When crosswise bearing pieces are used, the distance between the outside bearing pieces (center to center) must not be less than the minimum distance specified in the above tables.

Section No. 1-General Rules (Rev.-9-1983)

Rule 5. Location of Load - All Cars.

(a) The weight of load on one truck must not exceed one-half of the load weight limit stenciled on car. In case of doubt, this must be verified by weighing.

(b) The load must be located so that the weight along both sides of car is equal for the entire length of the load. When the load is of such character that it cannot be placed so as to obtain equal distribution of weight, crosswise of car, suitable ballast must be used to equalize the weight.

(c) Gondola cars-Loads not covered by individual figures and where the vacant space across car between the piles and between the load and car sides exceeds a total of 18 Inches, must be secured so as to prevent moving or tipping towards sides of car.

(d) All cars-Regardless of the vacant space across car, the load must be secured so as to prevent it falling off car.

(e) Large and heavy material such as ingots, slabs, billets, molds, castings, machines, etc., not covered by individual figures, must be loaded with the largest dimension on floor to prevent tipping. Such lading should not be loaded above the top of the gondola sides if there is available space within the car to contain the entire load below the top of the car sides. When load extends above the top of car sides, side stakes and/or rods must be used as securement. When weight of load exceeds 25 tons and total vacant space across the car exceeds 8 inches, the load must be secured to prevent moving or tipping toward sides of car.

(f) Machines and other items, having high center of gravity or narrow base, must be secured to prevent them from tipping over in transit.

(g) Single trailer must be secured to the hitch at the end of car to ensure that the trailer wheels will be located near the center of the car. See Figure 104, Section No. 4.

(h) Container cars suitable for multiple units must have containers placed on car as shown in Figure 105, Section No. 4.

Rule 6. Weight of Load (Rule 4) on Bearing Pieces, 2 or More Cars, With or Without Sliding Pieces.

(a) Weight carried on one bearing piece of car should not exceed the percentage of stenciled load weight limit, as shown in column 8 of tables Nos. 80 to 72, inclusive, of Rule 18, depending on the class of car as shown in the tables.

Rule 7. Overdimenslonal Loads.

(a) The height, width and length of a load on one car for unrestricted movement must be within the outline diagram published in "Railway Line Clearances". Rules 16 and 18 must govern loads requiring the use of more than one car. For loads on one car exceeding dimensions shown in Rules 16 and 18, shipper and originating carrier must verify clearances over the entire route prior to movement. This rule does not authorize shippers to exceed the height, width and length dimensions, when shown in specific figures.

(b) Lading equipped with doors or other appurtenances, including machinery with adjustable treads or wheels, liable to become loose and extend Into line of clearances, must be adequately secured.

(c) Cylindrical objects subject to rotating and having protruding appurtenances which may become involved in clearances, must be properly secured.

Rule 8. Idler Cars.

To be used as follows:

(a) When load projects beyond end sill of carrying car, or cars, or when necessary to space two carrying cars, used for handling long load.

(b) Sufficient clearance must be provided, when loading, to maintain 4 inch clearance below overhanging portion of load and any part of idler car which load may contact.

(c) Space on idler cars may be utilized for loading, provided. the ends of such materials are located not less than 2 ft. from ends of overhanging portions for cars equipped with conventional draft gears, and not less than 6 ft. from the ends of overhanging portions for cars, when either one or all, are equipped with sliding or end-of-car cushioning devices.

Section No. 1--General Rules (Rev.-9-1984)

(d) When gondola car is used for an idler, the width of overhang, as shown in Tables 1 and 2, must be reduced by an amount equal to the difference between 12 ft. and the minimum inside width of gondola car, as per following example:

60'-0" Length of load. (Table No. 1).
46'-0" Length of car used. (Table No. 1).
8'-9" Assumed width of idler car used.
12'-0" Arbitrary figure for all loads. Rule 8, Sec. (d).
12'-0"-8'-9"-3'-3" Amount of reduction, Rule 8, Sec. (d).
7'-0" Allowable width of load. (Table No. 1) Flat car as idler.
7'-0"-3'-3"-3'-9" Allowable width of load. Rule 8, Sec. (d). Gondola car as idler.

Rule 9. Bearing Pieces, Sliding Pieces, Separators, Clamping Pieces, Braces, Cleats, Wedges, Blocks, Guide Rails.

(a) Such items of lumber must be in accordance with General Rule 3. Substitute, if desired, suitable metal sections of equal strength. When metal items are specified, substitutions cannot be made. For bearing pieces, sliding pieces, separators and cleats, the width of the pieces must not be less than the height.

(b) Bearing Pieces-The width of base must not be less than its height. The length must not be less than the width of car, that is the distance between the inside face of the stake pockets. For General Rule loads, bearing pieces must be secured. If the load is prepared under a specific figure that does not require securement, it will not be necessary to secure bearing pieces. Bearing pieces 5 in. high or less must be in one piece. Bearing pieces over 5 in. high may be laminated to increase height, providing no laminations are less than 2 in. thick and all pieces are full width and length of bearing piece and adequately secured together. When bearing piece is 6 in. x 8 in. or larger and additional bearing piece height is required, longitudinal risers of 2 in. x 6 in. minimum size and projecting 18 in. beyond each side of bearing piece may be added, providing height of risers does not exceed width. Risers must be located at points of load concentration, using 5 risers for bearing pieces less than 12 in. x 12 in. and 3 risers for bearing pieces over 12 in. x 12 in. Risers must be secured to car floor, underneath of and at right angles to bearing pieces. (The foregoing provisions for lamination and build-up of bearing pieces do not apply to Forest Products Loading, Section No. 5.) Bearing pieces under loads requiring the use of more than one car must be secured so as to prevent displacement. For loads requiring the use of more than one car and pivoted bolsters, see General Rule 17.

(c) 1. Bearing pieces, separators and guide rails must be of uniform thickness and width for their entire length, unless otherwise provided for under a specific figure.

2. Bearing pieces and separators, where specified under Forest Products Loading, Section No. 5 must not be built up or laminated unless the method of lamination has been tested and approved by the AAR. The bearing pieces and separators must be stamped on both ends with the letters AAR and the fabricators identifying mark. The following fabricators have had their product tested and approved:

Name of Fabricator	**Identification Mark**
Strickler-Taylor Lumber Co.	AAR-STL

(d) Sliding Pieces - Length must be equal to width of car and width of base not less than its height. Placing them directly over bolsters is preferred but they may be placed between bolsters. To provide specified clearance of flexible material, they may be located not more than 18 in. from center of bolsters toward end of car. When sliding piece is 6 in. x 8 in. or larger and additional sliding piece height is required, longitudinal risers of 2 in. x 6 in. minimum size and projecting eighteen (18) inches beyond each side of sliding piece may be added, providing height of risers does not exceed width. Risers must be located at points of load concentration using five (5) risers for sliding pieces less than 12 in. x 12 in. and three (3) risers for sliding pieces over 12 in. x 12 in. Risers must be secured to car floor, underneath of and at right angles to sliding pieces. Risers are to be toe-nailed to car floor with 20-D nails, spaced about 12 inches apart on both sides. Sliding pieces must be secured through risers and car floor with 34 In. bolts, length to suit, countersunk to clear top of sliding, piece.

(e) Steel sliding plates, 1/4 in. x 6 in., length equal to width of car. Must be secured with two 3/4 in. dia. Countersunk head bolts, etc., heads to be flush with or below top of plate. They must be grease[] so as to provide free movement of load to destination..

(f) When rods, etc., used to secure loads, not covered in detailed figures, are passed through car floor, a 4 in. x 4 in. x 18 in. hardwood cleat, or 1/2 in. x 4 in. x 18 in. steel plate must be placed lengthwise of car under floor. When rods, etc., pass through stake pocket, a 1/2 in. x 4 in. x 10 in. steel plate must be placed lengthwise of car under stake pocket.

(g) When sloping wedges are used for end blocking against vertical surfaces, the flat side of wedge should be placed on floor.

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(h) Nails or spikes in the blocking should, when practicable, be driven vertically. Where It is specified In a specific figure that predrilling is required, predrilling will depend on the species of wood used to avoid splitting and to facilitate the proper application of nails.

(i) Unless otherwise specified, i-he length of nails, used in the assembly of blocking consisting of two or more pieces, must be at least one inch longer than the thickness of the block member, and unless otherwise specified one nail shall be used at each point of contact, equally spaced, for each two inches of width or fraction thereof.

(j) When steel floored cars are furnished in lieu of wood floored cars, any floor blocking or metal anchor plates required under figures or rules to be nailed to wood floors, must be bolted to steel floors.

(k) All floor blocking applied to control lateral movement of load on cars equipped with nailable steel flooring must extend, through the use of back-up blocking, to the sides of the car. In the case of flat cars, back-up blocking must extend to the stub stakes, when stub stakes are required. This requirement does not apply to the Composite or Combination wood and steel type nailable flooring.

(l) The use of inflatable dunnage bag for the purpose of securing or blocking a load is prohibited unless otherwise provided for in a specific figure.

Note

It is the intent that separators, where specified, must be one piece, except If over 5 in. high, they may be built up of lumber of suitable strength. Not applicable to Forest Products Loading Section No. 5.)

Rule 10. Stakes-Requirement, Quality, Dimension, Tying, Application of.

(a) Unless otherwise provided for in the Individual figures of Section Nos. 2 to 6 inclusive, when more than fifty (50) per-cent of top layer of multiple tiered load extends above the top of the car side or ends, side stakes must be used.

(b) Lumber for stakes must be in accordance with General Rule 3. Substitute, it desired, suitable metal sections of equal strength. When metal items are specified, substitutions cannot be made.

(c) Green saplings of the species listed in General Rule 3 may be substituted for sawed stakes only when specified under the figures: A green sapling is a recently cut young tree in which the moisture content still exceeds the saturation point and the ratio of sapwood to heartwood, on a radius from bark to center, is at least 2 to 1. When used, they must be tapered to fully ft the stake pocket.

(d) The alternate use of laminated side stakes is permissible under all figures, except for poles; stakes to be laminated in the following manner: Material to conform with requirements of this rule and all pieces used to be full length of completed stake. Stakes may be made up of two pieces of 2 in. x 6 in. rough or surfaced lumber. If surfaced lumber is used, a suitable tiller piece, not less than 2 ft. long, must be secured with two 8-D nails to the side of the stake in the stake pocket. so as to completely fill the stake pocket and the stake wedged in the conventional manner. The laminated pieces must be straight and contact at least 80 per cent of the adjoining surfaces. The pieces must be joined with 16-D nails spaced 9 inches apart and staggered, applying approximately an equal number from each side. Stakes must be applied with edges of lamination toward the load.

(e) Residual cores from veneer logs are not acceptable as stakes.

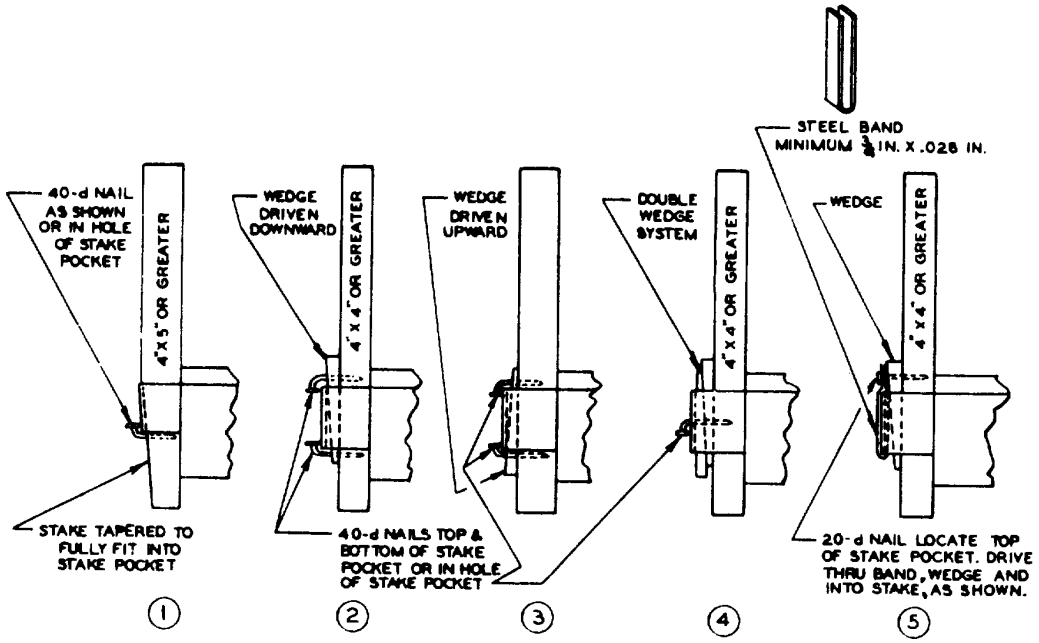
(f) Unless otherwise specified, the dimensions of sawed stakes must be as follows: For cars having sides less than 30 in. high, 4 in. x 5 in. For cars having sides 30 in. high or over, 4 in. x 4 in. The diameter of green saplings used instead of 4 in. x 5 in. stakes must be 5 in., and when used instead of 4 In. x 4 in., they must be 4 1/2 in., measured midway between top and bottom.

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(g) Unless otherwise specified, use at least 3 pairs per pile 20 ft. long or less, and 4 pairs per pile more than 20 ft. in length.

(h) Stakes must fully fit into stake pockets or be wedged to provide tight fit and secured as per illustrated examples shown below. Tapered end on green saplings and 4 in. x 5 in. stakes must not be less than 4 in. x 4 3/4 in. measured at the top of stake pocket. When metal stakes do not accurately fit the stake pockets, they must be wedged or built up to fill the pockets; also, secured so they cannot slip through the pocket. Stakes may be placed either in or out of stake pockets on inside of gondola cars with sides 30 in. high or over, provided they rest on floor and are securely wedged to car sides by lading.

(i) Examples for securing stakes.



(j) Unless otherwise specified, each pair of side stakes must be tied together across top of load with either of the following items:

(1) PILE 12 IN. OR LESS ABOVE GONDOLA CAR SIDES, OR FLAT CAR FLOOR.
Boards--One 1 in. x 5 in., nailed to ea. stake with five 10-D nails.
No. 7, 8. or 9 gage annealed wire--Two strands.
No. 11 gage annealed wire-Four strands.
High tension band-One-Load strength 2,000 lbs.
High tension wire-One-Load strength 2,000 lbs.

(2) PILE MORE THAN 12 IN. ABOVE GONDOLA CAR SIDE, OR FLAT CAR FLOOR.
Boards-Two-l in. x 5 In., nailed to ea. stake with five 10-D nails.
No. 7 gage annealed wire-Two strands.
No. 8 gage annealed wire--Three strands.
No. 9 gage annealed wire-Four strands.
No. 11 gage annealed wire-Six strands.
High tension band-One-Load strength 2,000 lbs.
High tension wire-One-Load strength 2,000 lbs.
High tension wire-One-Load strength 1,275 lbs.

Note
Applies only to Section No. 5.

(k) Examples for tying.

(l) 1 strand wrapped around a pair of opposite stakes, with both ends tied together, forming a complete loop, constitutes 2 strands. In other words, each complete loop formed doubles the number of strands. Any number of complete loops may be formed with a single strand, provided each end of the continuous strand forming such loops is tied together.

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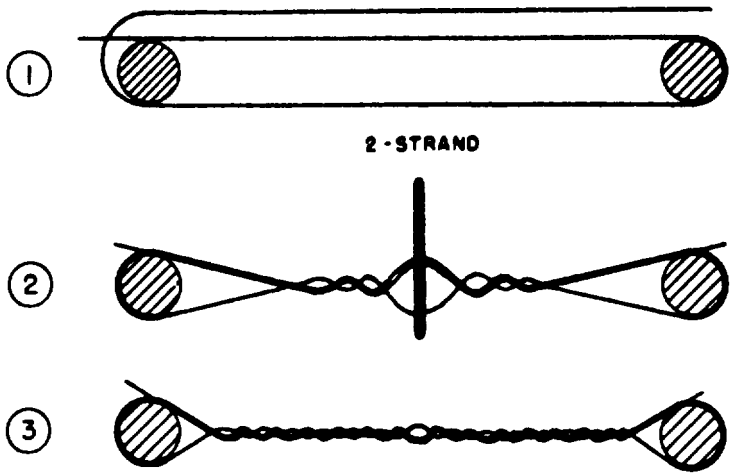
(2) The number of strands specified, when not forming a complete loop with both ends tied together, must be used in cases where each end of such wires is attached to stake pocket or other point of attachment.

(3) The above items must be located about 2 in. above top of load, unless otherwise specified, and wires must be twisted taut.

(4) Use staples or nails bent over to prevent bands or wires from working off stakes or binders.

(5) Boards, used to retain stakes in vertical position, applied lengthwise of car, must be nailed to inside face of stakes,

(6) Side stakes used for loads in gondola cars not covered in the figures must be secured so as to remain In sufficiently vertical position to protect the load.



Note

PLACE A LOOP OF WIRE AROUND TWO OPPOSITE STAKES IN SUCH A MANNER THAT ONE END OF WIRE IS TERMINATED UNDER THE LOOP AT ONE STAKE AND THE OTHER END IS TERMINATED UNDER THE LOOP AT THE OTHER STAKE, SO THAT WHEN THE STRANDS, THUS FORMED, ARE TWISTED THE LOOSE ENDS BECOME SECURED UNDER EACH LOOP

(1) Such fastenings need not be used when top tier of "H" and "I" beams with flanges 6 in. wide or more re loaded flatwise, and lower edges of flanges extends at least 2 in. below top of car sides and confined inside the flanges of beams underneath.

Rule 11. Securement of Parts and Accessories.

(a) All attached parts or accessories of a load must be adequately secured to prevent loosening, damage or loss in transit.

(b) Detached parts, boxed material, etc., must be loaded as far from car sides and ends as practicable and secured substantially to prevent displacement vertically, laterally and longitudinally.

(c) Cardboard or similar type material, subject to deterioration, must be waterproof or protected against the elements and must be of such strength to support the securement items.

(d) Loose and/or miscellaneous parts, piled or stacked more than one high must be unitized by banding in two directions and/or bolting together to form a unitized package and secured to car floor with suitable blocking applied on all four sides. A minimum of one (1) 1¼ in. x .035 in. punched steel anchor band is to be applied to prevent vertical displacement. If height of package exceeds the width, a minimum of two (2) 1 1/4 in. x .035 in. punched steel anchor bands must be used. Attachments and or parts that cannot be unitized must be banded into a bundle. Bundle must be secured to car floor with a minimum of two (2) 1 1/4 in. x .035 in. punched steel anchor bands to prevent vertical displacement and suitably blocked to prevent longitudinal and/or lateral displacement.

(e) For guidance. see "Illustrations for Securing Loose Parts, Section No. 1".

Section No. 1 --General Rules (Rev. 10-1981)

Rule 12. Partial Loading or Unloading.

(a) Partial unloading of a load from a car is not recommended. In the event that a load is partially unloaded, the remainder of the load on the car must comply with or be arranged to comply with an existing figure or the General Rules before further movement.

Rule 13. Vacant.

Section 1-General Rules (Rev.-9-1983)

Rule 14. Nails, Staples and Lag Screws.

(a) Where nails are designated by penny-weight, for example "40-D", they may be either common or cement-coated, unless otherwise specified.

Size of Common Nails

8-D	2 1/2 Inch	20-D	4 Inch
9-D	2 3/4 Inch	30-D	4 1/2 Inch
10-D	3 Inch	40-D	5 Inch
12-D	3 1/4 Inch	50-D	5 1/2 Inch
16-D	3 1/2 Inch	60-D	6 Inch

Size of Cement-Coated Nails

8-D	2 3/8 Inch	20-D	3 3/4 Inch
10-D	2 7/8 Inch	30-D	4 1/4 Inch
12-D	3 1/8 Inch	40-D	4 3/4 Inch
16-D	3 1/4 Inch	60-D	5 3/4 Inch

(b) Power driven nails and/or staples may be used but the number specified in the applicable figure must be increased by one-third. The approved size substitution is as follows:

Common Nail	Power Driven Nail	Power Driven Staple Diameter	Power Driven Staple Leg Length
8-D	8-D or 10-D	.080	2 1/2 in. or 2 3/4 in.
10-D	8-D or 10-D	.080	3 in. or 31/4 in.
16-D, 20-D	16-D or 20-D	.080	3 1/2. in.
30-D	30-D		
40-D	40-D		

(c) Manufacturers who have had their power-driven nails and power-driven staples tested by the AAR are listed be- low with approved nail and or staple sizes shown.

Manufacturer	Power Driven Nail Sizes	Power Driven Cement Coated Nail Sizes	Power Driven Staple Sizes
Paslode	8-D, 16-D, 20-D, 30-D & 40-D		.080 x 2 1/2, 2 3/4
Senco	8-D, 10-D and 16-D		3, 3 1/4 & 3 1/2
Duo-Fast Corporation	8-D and 10-D	16-D, 20-D. 30-D and 40-D	
Acme Steel, Canada, Ltd.	16-D, 20-D and 40-D		

(d) Lag screws may be used where nails are specified. When used, they must be properly applied by pre-drilling and torquing by mechanical means. Lag screws must not be driven by hammering.

Lag screws 3/8 in. diameter may be used in place of common nails as follows:

(1) Same number as specified for nails 20-D and greater.

(2) One-half the number specified for nails less than 20-D.

The length of the lag screw must be at least 2 in. longer than blocking being secured.

Greater diameter lag screws may be used but using the same number as permitted above.

Rule 15. Bolts, Nuts, Rods, Bands, Wires, Wire Rope, Cable, Chains, Non-Metallic Strapping, Band or Wire Protectors, Points of Attachment, Substitutions Permissible, Turnbuckles and Constant Tensioning Devices.

(a) Bolts, Nuts, Rods and Washers.

(1) Rods or bolts, having rolled threads of the same diameter as that of U.S. Standard cut threads, may be used. Bending of threaded portion of rods or bolts is prohibited.

(2) When rods are used for tiedowns passing through large diameter holes in the lading, a plate or plates of sufficient strength to prevent bending, must be placed between the lading and the nut of the rod.

(3) When rods, etc., used to secure loads not covered in detailed figures are passed through car floor, a 4 in. x 4 in. x 18 in. hardwood cleat or 1/2 in. x 4 in. x 18 in. steel plate must be placed lengthwise of car under door on wood, nailable steel floor and composite wood and steel flooring. Length of steel plate may be reduced to 1/2 in. x 4 In. x 6 in. on cars with floors constructed of steel plate. When rods, etc., pass through stake pocket, a 1/2 in. x 4 in. x 10 in. steel plate must be placed lengthwise of car under stake pocket.

(4) The use of rods with open hook ends on load or car is prohibited.

(5) Where bolts, with washers to prevent splitting, are specified for clamping pieces, they may be substituted with 1 1/4 inch high tension bands, sealed in conformance with "Minimum Joint Strength-Pounds" shown in table of High Tension Bands under Paragraph (J) of this rule.

(6) To retain nuts In original position, three or more threads on rods or bolts must be nicked, chisel hacked, flattened or otherwise distorted immediately behind single or double nuts or nuts tack welded to rods to insure that nuts will not back off. When less than three threads extend beyond nuts, there must be sufficient length for rods or bolts to be riveted over to prevent nuts front backing off. Not required when nut locks or lock nuts are used. Lock washers are not acceptable substitutes.

(7) The bending of rods around stake pockets and then welding the overlapping portion to the main rod is prohibited.

(8) Rods should be located so that they are not in contact with each other. When rods do contact each other suitable means to prevent chafing or wear must be provided.

(9) One splice is permitted for securement items 18 ft. or less in length, made from bars and/or rods. When necessary to increase length, one splice may be added for each additional 18 ft. or less in length.

(10) When necessary to weld threaded rod to flat bar or rods for the purpose of securement or when necessary to splice the tie-down item to increase length, there must be sufficient overlap with continuous weld on both sides to equal the strength of the original securement item. The strength of the weld is to be based on a value of 600 lbs. per 1/2 inch fillet 1 inch long. All welding must be done by a qualified welder.

(b) High Tension Steel Bands.

(1) Shipper should be in position to show that a banding or wire product used for securement of open top loads meets AAR requirements.

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(2) High tension bands, less than .031 inch thickness must have a percentage of elongation in 6 inches from 5 to 16 percent inclusive. High tension bands .031 inch thickness or over, must have a percentage of elongation in 6 inches from 6.5 to 16 percent inclusive and ductility as contained in the ASTM Specification D3953 (latest edition).

(3) High tension bands encircling pile must be machine tensioned and sealed on top of the load, when possible, and located as far away from end of load as practical.

(4) High tension bands attached to stake pockets must be sealed no closer than 18 inches from top of stake pockets. (See Sketch 3. Paragraph (j).)

(5) Free ends of bands must not extend more than 12 inches from seals.

(6) When a long free span exists between points of attachment of high tension bands, a dampening arrangement to prevent excessive vibration of bands must be applied midway between points of contact, by tying bands to sides of box, crate, lading, etc., with common annealed wire.

(7) High tension bands should be applied to packages and/or loads with markings facing outward.

(8) The welding of high tension bands is prohibited except where required In the process of manufacturing.

(9) The use of second hand or reclaimed high tension bands for such Items specified in the rules and detailed figures is prohibited. A high tension band that has been tensioned and is cut or broken becomes a second hand band and must not be reused In the preparation of new loading or in the readjusting of loads.

(10) 1 in. x .031 in. punched steel anchor banding, minimum breaking strength 3500 lbs. may be used to secure loose or boxed materials to car floors.

(c) Wire-High Tension and Common.

(1) High tension wires must have a percentage of elongation In 10 inches from 6.5 to 16 percent inclusive.

(2) When common annealed wire is used for securement purposes, the method of tying, tightening and determining the number of strands is to be in accordance with "Examples For Tying" as shown in General Rule 10. Twist wire taut with rod, bolt, pipe or appropriate length of 2 inch x 2 inch piece of lumber and secure to prevent unwinding.

(3) High tension wires encircling pile must be machine tensioned and twist tied on top of load, when possible, and located as far away from end of load as practical.

(4) High tension wire attached to stake pockets, lading strap anchors or other means of attachments must be machine tensioned. The location of the twist tie or washer attachment must not exceed 6 inches from point of anchorage.

(5) The use of secondhand or reclaimed high tension wire or common wire for such Items specified in the rules and detailed figures is prohibited.

(d) Wire Rope/Cable.

(1) Where wire rope/cable is specified under detailed figures, the ends must be overlapped a minimum of 12 inches and must be secured with the number of "U" bolt cable clips as shown in the tables.

(2) The wire rope/cable must be protected at-all sharp corners and/or sharp edges. Where thimbles are used to prevent sharp turns and protect wire rope/cable from sharp edges, they must be secured with a "U" bolt cable clip. Tighten wire rope/cable with turnbuckle or suitable tensioning device or twist taut with rod, bolt or pipe and secure to prevent unwinding.

(3) Wire rope/cable. when used, should he located so that they are not in contact with each other When cables do contact each other, suitable means to prevent chafing or wear of these items must be provided.

(e) Band and/or Wire Protectors.

(1) Band and/or wire protectors sufficient to provide a suitable radius must be used to protect bands and wires at stake pockets, slotted holes In car sides and at all points having sharp edges on either equipment or lading. Protectors must be applied so as to prevent dislodgement. High tension bands, when used as protectors. must be secured to tie bands by sealing. In so far as possible, the carriers should furnish cars with stake pockets and anchorage holes or slots rounded to the extent that the protectors are not required to protect sharp corners at such points of attachment. When cars in this condition are not available, the carrier should arrange to either grind off the sharp edges on such anchorage details or weld rounded metal thereon having a radius of at least 3/10 inch before cars are placed for loading. In cases where cars are placed for loading which do not have the sharp edges corrected on such details, the shipper and carrier shall negotiate as to the proper procedure to be followed.

(2) Band protectors, made of formed treated hardboard and/or composition material must not be used under load securement bands and or unitizing bands on loads of steel sheets or plates. Metal protectors only are acceptable for this purpose.

(3) Where reference is made to "Protection angles, 20 gage, 4 inches wide applied so as to prevent displacement" in the specifications of any figure in Section No. 2, the use of manufactured edge protectors giving equivalent band protection is permissible except for locations in General Rule 15(e)(2).

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(f) Securement Devices-Holes, Slots, Stake Pockets and Strap Anchors.

(1) Holes not to exceed 1 1/2 inches in diameter may be made in car bodies (excluding stakes, braces and sills) for the application of wires. bolts or rods. Holes may not exceed 1 inch diameter in top chord angles. To prevent making holes larger than necessary, the drilling instead of cutting of round holes is preferred.

(2) Slots 1/2" inch x 2 1/2 inches may be made in car bodies (excluding top chord angles, stakes, braces and sills), except when equipped with lading strap anchors the length of the slot must not exceed l1' inches, for the application of wires or bands.

(3) Cutting of holes or slots in heavy duty flat cars, such as well hole, depressed floor or specially designed cars may be done only with the authority of the car owner. For other cars, exacting efforts must be made to refrain from cutting unnecessary holes or slots or to confine them to the minimum number and dimensions, required to secure the load.

(4) Points of attachment must be at least as strong as securement used.

(5) When a figure requires wires or bands to be secured to stake pockets, it will be satisfactory for these items to be secured to lading strap anchors provided the strength of the anchors is equal to or greater than the strength of anchors shown on page C-22A (latest revision) of the Manual of Standards and Recommended Practices. Cables, rods or chains are not to be attached to lading strap anchors.

(6) "U" bolts, closed "I" bolts, 3/4 inch in diameter, or similar devices may be used for securing bands to car bodies except as otherwise specified.

(7) Attaching rods, bands or wires to stake pockets, inside of gondola cars, is not permitted unless they are so constructed and so attached to car to approximately equal the strength of each rod, band or wire tire.

(8) (a) The welding of such items as rods, flat bars and straps directly to both the load and car for the purpose of securing the load is prohibited unless otherwise provided for in a specific figure.

(b) One end of the aforementioned items may be welded to either load or car and the opposite end secured In an approved manner.

(c) Slotted angles, eye bolts and similar devices may be bolted or welded to the load or the car body for the application of rods, flat bars and straps. When the aforementioned items are bolted to the load and car, the in between securement items may be welded. When the aforementioned items are welded to the load and car, the in between securement items must not be welded but may be secured in an approved manner.

(d) The strength of such attachment devices and the portion nf the load or car to which they are attached must equal the breaking strength of the ties.

(9) Turn-buckles must not be locked by welding turnbuckle to threads.

(10) The welding of lading directly to car is prohibited.

(11) Securement items must not be attached to or interfere with car safety appliances, which include handholds, ladders, coupler operating levers, etc.

(g) Chain and Chain Assemblies:

1. At least one link in every five feet of chain shall carry the manufacturer's permanent and distinctive mark of symbol identifying the grade of chain.

2. Grabhooks shall be of the clevis type except as provided elsewhere in this rule.

3. Closed eye grabhooks of high test steel or alloy steel may be used with chains of the appropriate size and grade when such hooks carry the manufacturer's permanent and distinctive mark identifying the grade of the hook.

Note: Chain assemblies provided by a chain manufacturer with the grabhooks joined by a flash or butt-welded connecting link or grabhooks attached by a repair type connecting link of the type pictured in Fig. 1, and carrying the manufacturer's permanent and distinctive mark identifying the grade of the link are exempt from the previsions of the Rule 15 (g) (3). All grabhooks shall carry the size, manufacturers identification and maximum chain grade identification.

4. Chains, binders, chain attachments anchor points shall be maintained In good condition. The following conditions, which are Illustrative and not all-inclusive, are prohibited:

4.1 Cracked welds or links in binders or binder attachments.

4.2 Bent, twisted, stretched or collapsed links.

4.3 Links weakened by gouges or pits.

4.4 Chain repaired or joined with other than repair links of a type as illustrated. (Fig. 1)

4.5 Links obviously worn or showing other visible evidence of loss of strength.

4.6 Knots or twists in any portion of the chain.

4.7 Spread or distorted grabhooks.

4.8 An anchor point used in the securement of the load which is in a weakened condition or shows evidence of loss of strength because of cracks, breaks, distortion or other deterioration.

5. Binders and Procedure for Testing:

5.1 Binders are to be marked with the rated capacity which is equal to their ultimate breaking strength. When binders are listed under paragraph 5.6, they will be identified as to size of chain with which they are to be used. The Committee will take into consideration the working load limit of the chain as related to the maximum breaking strength of the binder to identify the binder size and the type of chain with which the binder is to be used. Generally, the working strength of the chain should be equal to Y of the rated capacity of the binder,

5.2 Binder manufacturers are requested to contact the Director, Rules and Inspection, concerning the testing of their products for approval for use on open top loading.

5.3 Upon request by a binder manufacturer, the Director, Rules and Inspection, will designate a member of the Open Top Loading Rules Committee to call upon the manufacturers and randomly select three binders of each model the manufacturer desires tested. Binders will be appropriately identified and forwarded to the AAR Research Center for testing at the manufacturer's expense.

5.4 Binders are expected to fail at a point equal to or greater than their capacity as marked on the binder.

5.5 Failure of one of the three binders does not exclude the product from further consideration, provided analysis of the test does not reveal significant defects. An additional three binders may be selected and tested. Successful performance of the three binders qualifies the binders for inclusion in a list of acceptable binders.

5.6 List of Acceptable Binders

	Type of Chain			
	3/8 HT	**3/8 Alloy**	**1/2 HT**	**1/2 Alloy**
Binder MFG. & MODEL				
ACCO Industries, Inc. Model BX 300		X		
ACCO Industries, Inc. Model BXR 310		X		
ACCO Industries, Inc. Model BX 400				X
ACCO Industries, Inc. Model BX 600		X		
Midland Forge Model 105		X		
Midland Forge Model 105-C		X		
Midland Forge Model 106		X		
Campbell Chain Model C7R		X		
Campbell Chain Model C7L		X		
Durbin-Durco Model DD-7-1		X		

5.7 Binders will be considered acceptable for use with Alloy Steel Chain provided they demonstrate a breaking force for size and grade not less than the following table:

SIZE	GRADE	DEMONSTRATED BREAKING FORCE-POUNDS
3/8	43	16,200
3/8	70	26,400
3/8	80	25,600
1/2	43	27,600
1/2	70	45,200
1/2	80	45,600

a. To determine the acceptability of binders not listed above, the ratio between the demonstrated breaking force and the chain working load limit must be 3.0 for Grade 43 Alloy Chain; 4.0 for Grade 70 Alloy Chain; and 3.5 for Grade 80 Alloy Chain.

b. Binders must be compatible with the size of chain with which they are to be used.

5.8 Binders must be equipped with two grabhooks except when chain assemblies contain grabhooks intended to shorten chains.

5.9 The welding of binders to chain is prohibited except in the manufacturing process. Binders may be attached to chain using a repair type connecting link of the type in Fig. 1 of this rule, which has equivalent strength of chain.

5.10 Binders of a style which could open during transit must have the operating handle wired or otherwise secured to prevent undesired opening.

6. Chain Attachment

6.1 Welding of chains directly to the car is prohibited.

6.2 Permanent attachment of chains to car stake pockets is not encouraged. Stake pockets purpose is defeated when chains are permanently attached therein.

6.3 Attachment of chain to welded anchors is permitted provided attachment has sufficient lineal inches of weld to provide a rated strength equal to 125% of the ultimate failure-rating for the chain.

6.4 Use of U-bolt cable clamps as a means of securing chains to car which meet ASTM specifications is permissible. For 3/8 inch highest and alloy chain use 1/2 Inch U-bolt cable clamp having 32,500 lb. minimum breaking strength. For 1/2 inch high test and alloy chain use 8 inch U-bolt cable clamp having 50,000 lb. minimum breaking strength.

6.5 Whenever possible, chains should pass around or through stake pockets with the grabhooks engaging the chain. (See Fig. 4)

7. Chain Repairs

7.1 Repairs to chains must be made using a repair device of the illustrated type (See Fig. 1) which is rated by the manufacturer to equal the type of chain in which it is used. Repair links made by the following manufacturers are acceptable; Crosby Company (LOK A LOY), Campbell Chain Company (QUICK A LOY), Dominion Chain Company, Ltd. (KUPLEX CHAIN JOINER), Columbus McKinnon (HAMMERLOCK), Dominion Chain Company (ACCOLOY), Acco Industries, Inc. (Kuplok Mechanical Coupling Link). Locate repair links where they will not impair the use of comer protectors, tensioning devices, locking devices or other features of the chain assemblies.

7.2 Repairing of chains by welding is prohibited.

7.3 Use of missing link type connecting links (See Fig. 2), lap links, and cold shuts is prohibited.

7.4 The tying of chains for any purpose is prohibited.

7.5 The use of bolts to repair broken chains or to secure ends of chains when hooks are missing is prohibited.

8. Application of Chains

8.1 A sufficient number of chains will be used to safely restrain the lading. The chain's rated working load limit will be the restraining capacity used In determining the number of chains required.

8.2 Except as specifically provided in figures, the number of chains required will be determined using the following basic formula:

$$\text{Chains Required} = \frac{\textbf{Weight of Lading}}{\textbf{Working Load Limit}}$$

with a minimum of three chains used.

This formula is applicable to fiat loaded commodities not subject to rolling. When the commodity is subject to rolling, the following general formula applies:

$$\text{Chains Required} = \frac{\textbf{Weight of Lading}}{\textbf{Working Load Limit} \times 2}$$

with a minimum of four chains used, two in each direction.

8.3 Chains used in the securement of flat loaded commodities will be applied over the top of the load, and will be at an approximate right angle 190°) angle to the side of the car whenever possible, except when method of chain application is prescribed in a specific figure.

8.4 Chains used for the securement of commodities subject to rolling should be applied in such a manner as to provide the greatest restraint against longitudinal movement.

8.5 Whenever practical, all available car chains should be used. Unused chains must be securely fastened to prevent dislodgment.

APPROVED TYPE OF REPAIR LINKS
FIG. 1

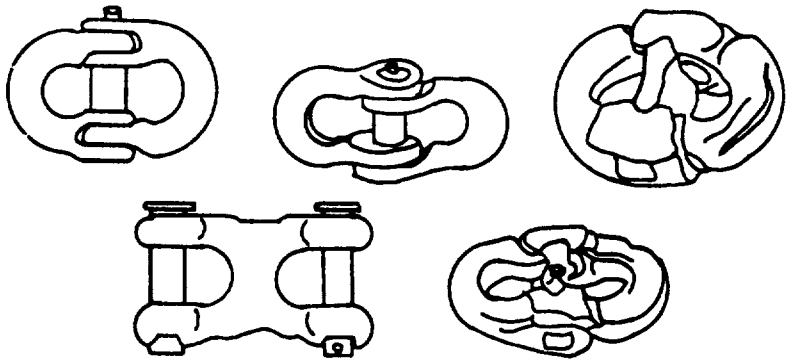


FIG. 2
PROHIBITED FOR ALL APPLICATIONS

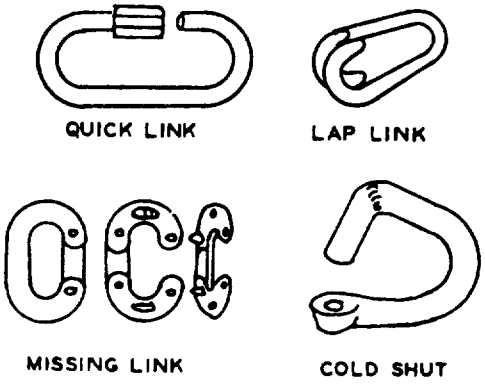


FIG. 3

CLEVIS TYPE GRABHOOK CLEVIS CLAW HOOK

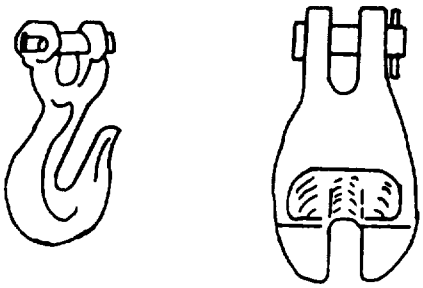
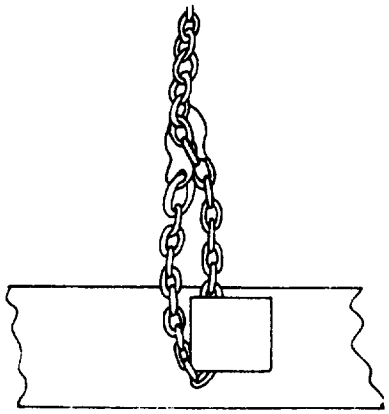


FIG. 4
ATTACHMENT OF CHAIN ENDS



Section No. 1--General Rules (Rev.-9-1981)

9 CHAIN AND CHAIN TIE-DOWN ASSEMBLIES, Dimensions and Working Load.

Welded Link Chain
Working Load Limit In Pounds

Nominal Size Inches	BBB Steel Chain ASTM Spec. A-413 (Latest Rev.)	High Test Steel Chain ASTM Spec. A-413			Alloy Steel Chain ASTM Spec. A-391		Special Alloy Steel Chains
		Latest Rev.	Grade 43	Grade 70	Latest Rev.	Grade 80	
3/8	2,750	5.100	5,400	6,600	6,600	7300	9000
7/16		6,600					
1/2	4,750	8,200	9,200	11.300	11,250	13,000	13,750
9/16	5,875						
5/8	7,250	11,500			16,500	23,000	
3/4	10,25	16,200			23,000	29,300	
7/8	12,000				28,750	39,900	
1					38,750		

Note

(a)-All chain assembly components must be equivalent in structural strength to the component chain in the manner that the component acts or reacts in the force system of chain assembly. Accessory components in the chain assembly must meet the specified working load strength of the chain used in the assembly.

Note

(b)-The above table excludes chains and tie-down assemblies used on auto-rack cars.

Section No. 1

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Section No. 1--General Rules (Rev.-9-1984)

(h) Strapping.

(1) Non-metallic strapping may be used for load securement only when specified in a figure

(1) Substitution of Securement Items, Unless Otherwise Specified in a Figure.

Note: Approved load securement items, listed under General Rule 15 must be used or may be substituted in accordance with the following provisions.

(1) High tension bands and high tension wires may be substituted for each other, if of equal or greater breaking strength.

(2) High tension bands may be substituted by an equal number of high tension bands of lesser dimensions if of equal or greater breaking strength.

(3) High tension bands used to secure load to car may be substituted by chains and/or cables if of equal or greater breaking strength. When used, chains and/or cables must be properly tensioned.

(4) High tension wires may be substituted by an equal number of high tension wires of lesser diameter if of equal or greater breaking strength.

(5) High tension bands and high tension wires, where both are specified in an item of a figure, may be substituted in kind only, in accordance with paragraphs (i-2) and (1-3) of this rule.

(6) Rods, bolts or fiat bars with threaded ends must not be' substituted by high tension bands, high tension wires or common annealed wires.

(7) Common annealed wire may be substituted by wires of other gage if the total breaking strength is equal or greater.

(8) Common annealed wire may be substituted by wire or cable of equal or greater breaking strength.

(9) Missing or broken chains may be substituted by wire rope or cable of equal or greater breaking strength.

(10) Mechanical brakeman may be substituted by Load Cushioners.

(j) High Tension Bands, minimum breaking strength, sealing and marking.

HIGH TENSION BANDS

Width & Thickness Inches	Width & Thickness Millimeters	Minimum Beaking Strength-Pounds	Minimum Joint Strength-Pounds	Recommended Minimum No of Pairs of Notches On Joint (Except-See Note 3)	Recommended Minimum No. of Pairs of Crimps on Joint (Except - See Note 3)					
Package Bands					**Surface finish**					
				Surface Finish All Types	**Uncoated-Dry**		**Coated Not Waxed**		**Waxed**	
1/2 x .020		1280	960	2	NIL		NIL		NIL	
5/8 x .020		1600	1200	2	NIL		NIL		NIL	
3/4 x .020		1920	1390	2	NIL		NIL		NIL	
3/4 x .023		2280	1710	2	NIL		NIL		NIL	
3/4 x .025	19 x .56	2280	1710	2	NIL		NIL		NIL	
3/4 x .028		2280	1710	2	NIL		NIL		NIL	
3/4 x .031	19 x .75	2850	2140	2	2		3		4	
3/4 x .035		2850	2140	2	2		3		4	
1 1/4 x .020		3200	2400	2	NIL		NIL		NIL	
3/4 x .044		4050	3040	2	2		4		4	
3/4 x ..050		4050	3040	2	2		4		4	
Securement Bands										
1 1/4 x .031	32 x .75	4750	3565	2	3		3		4	
1 1/4 x .035		4750	3565	2	3		3		4	
1 1/4 x .044		6750	5065	4	4		4		4	
1 1/4x.050		6750	5065	4	4		4		4	
1 1/4 x .065		8900	6675	NIL	4		4		6	
					Std.	Grit	Std.	Grit	Std.	Grit
2 x .044		10600	7950	4	4	4	4	4	6	4
2 x .050		10600	7950	4	4	4	4	4	6	4
2 x .065		13800	10350	4	4	4	4	4	6	4

(1) A sufficient number of seals must be applied to accommodate the recommended number of pairs of notches or crimps.

(2) The above recommended minimum number of notches or crimps are based on current general recommendations of high tension banding manufacturers on the basis of tensioning and sealing tools being in proper operating condition. A lesser number of notches or crimps may be used provided the shipper can demonstrate that the joint has the minimum strength shown in table under column "Minimum Joint Strength-Pounds."

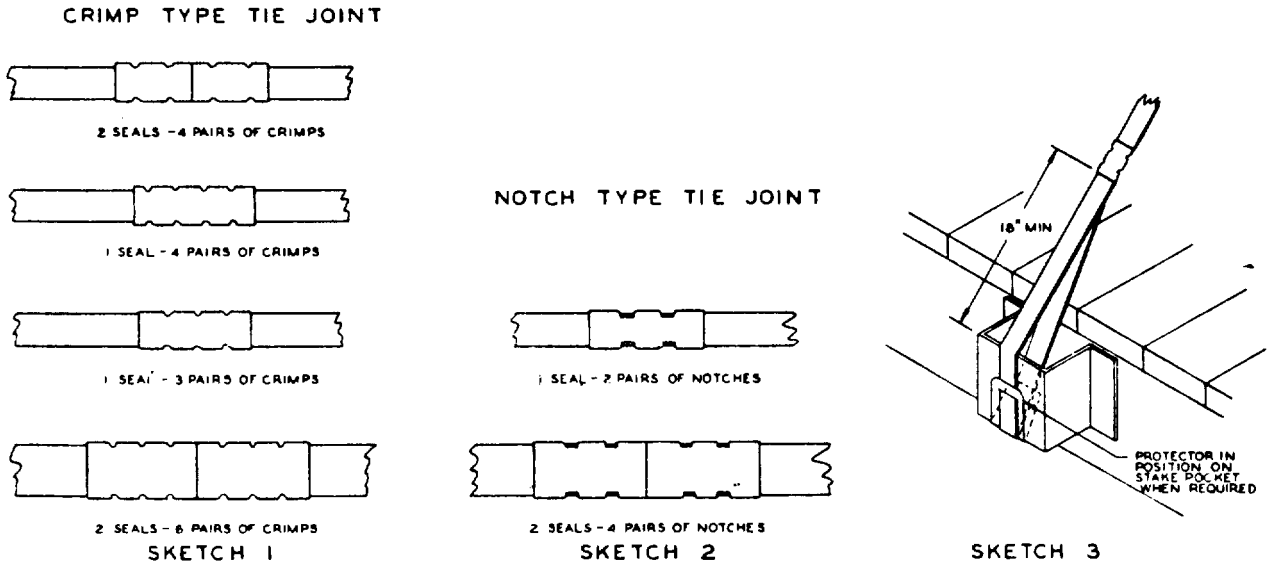
The following seals are acceptable with three (3) crimps or notches on 2 in. x .044 in. and 2 in. x .050 in. Uncoated-Dry, Coated-Not Waxed, high tension bands.

Company	Seal No.
Signode	203
Acme	1656L
Stanley	4733-32

(3) In all cases, a sufficient number of notches or crimps must be used to achieve the minimum joint strength-pounds as shown in the column headed "Minimum Joint Strength-Pounds" except that a minimum of 2 pairs of notches or crimps are acceptable on bands forming a loop joint at point of anchorage. (See Sketch 3.)

(4) Users of tensioning and sealing equipment should be properly instructed in the correct use of these tools. It is recommended that users insure that the tools used for tensioning and sealing are compatible with the type of high tension bands and seals used. The compatibility of tools and materials should be verified by checking the strength of sealed joints at periodic intervals.

(5) Following are illustrations of notch and crimp types of seal joints:



SKETCH 1 SKETCH 2 SKETCH 3

(6) High tension band sizes 1 1/4" and 2" used for load securements, as specified under appropriate figures or in the General Rules, are to be marked to indicate manufacturer's or Supplier's name and the letters "AAR" to show compliance with the requirements of the A.A.R. Rules Governing the Loading of Commodities on Open Top Cars.

(7) Markings shall consist of the letters "AAR", the manufacturer or distributor's name, or abbreviated name, or registered trade mark, or symbol. or AAR code consisting of two digits. Markings shall be in characters not less than 3/8 high for steel die imprint and not less than 1/4 " high for paint, ink surface printing or embossing, spaced not more than 5 ft. intervals.

(8) Method used to code bands for identifying manufacturer or supplier is to be reported to tile A.A.R. Open Top Loading Rules Committee and will be listed under this rule.

Section No. 1--General Rules (Rev.-9-1984)

(9) The following methods of marking for purpose of identification, have been assigned to manufacturers and suppliers whose products have been tested by the AAR and found to meet the requirements of this Rule. Marking applied to high tension bands manufactured to metric dimensions must be followed by the letter "M" of the same size as the original marking.

Name	Method of Marking	Markings
Acme Steel Company of Canada, Ltd.	Ink Print	AAR 22
American Banding Corporation	Ink Print	AAR 24
Brainard Strapping Division, Sharon Steel Corporation	Steel Die Imprint	AAR 26
Delta Strapping Industries	Ink Print	AAR 27
A. J. Gerrard & Company	Steel Die Imprint	AAR 28
Gibraltar Steel Corporation	Steel Die Imprint	AAR 29
Gibraltar Steel Corporation	Ink Print	AAR 29
Interlake, Incorporated	Steel Die Imprint	AAR 30
Pacific Steel & Supply	Ink Print	AAR 32
Samuel Strapping Systems, Ltd.	Ink Print	AAR 83
Signode Corporation	Paint Emboss	AAR*
Signode Corporation	Paint Emboss	AAR 11
Signode Canada, Ltd.	Ink Print	AAR 35
Stanley Strapping Systems, Division of The Stanley Works	Ink Print	AAR 36
Stanley Strapping Systems, Division of The Stanley Works, Ltd.	Ink Print	AAR 37
Steel Distributors, Ltd.	Ink Print	AAR 45
U. S. Steel Corporation, Cuyahoga Works	Paint Emboss	AAR 39
United States Steel Supply Division	Steel Die Imprint	AAR 42
Kasie Steel Corporation	Paint Emboss	AAR 43
Unimart, Incorporated	Paint Emboss	AAR 44
Kohan Kogyo Company, Ltd.	Ink Print	AAR (K)
Concept Metals, Ltd.	Ink Print	AAR 46
Samuel Strapping Systems, Inc.	Ink Print	AAR 47

*Reg. Signode Trademark.

IMPORTANT - High tension bands should be applied to packages and/or loads with markings facing outward.

Section No. 1--General Rules (Rev.-9-1984)

(10) Constant Tensioning Devices For Use With High Tension Bands Performance. Testing And Approval.

A. Performance

1. Design of Device
   (a) To provide prescribed tensioning.
   (b) Quick and positive release, when provided.
   (c) Operate satisfactorily under all weather conditions.
   (d) Component parts must not seize because of rust or deformation.
   (e) Compression units, non metallic type, to be operable to -40F and not susceptible to deterioration because of weather temperatures between -40F and 200F and sunlight radiation.
   (f) Point of band attachment to allow 10" angling laterally when applied to car.
2. Accept bands up to 2 in. x .065 in., or other sizes as specified for the device.
3. Have a locking feature that will not release under vibration or shock, but only when desired by operator.
4. Compression unit to absorb 3,000 lbs. band compression and still have reserve travel for an additional 3,000 lbs. compression.
5. Attachment to car
   (a) Easy
   (b) Renewable
   (c) Attachment must be a minimum of equal strength of device.
   (d) No parts of device to exceed clearance outline in either locked or unlocked position.
   (e) Must not have parts susceptible to dragging when not In use.

B. Testing

1. Complete device to be submitted to static testing equal to 1.5 times the breaking strength of the band size for which it is designed.
2. Complete device to be submitted to dynamic testing equal to the breaking strength of the band size to which It is designed cycled 100 times in one hour.
3. Under the above testing, no component part or the complete device is to have a failure or deformation in order to be considered acceptable.
4. Three complete devices must be tested in accordance with testing listed above, and all must pass the testing successfully.
5. Test may be conducted by the AAR Research Center or an Independent Certified Testing Laboratory. Test conducted by the manufacturer will not be considered acceptable.
6. Breaking strength values for the high tension bands used in testing of devices. are to be as published in General Rule 15(J), Section No. 1 of the Open Top Loading Rules Manual.

C. Approval

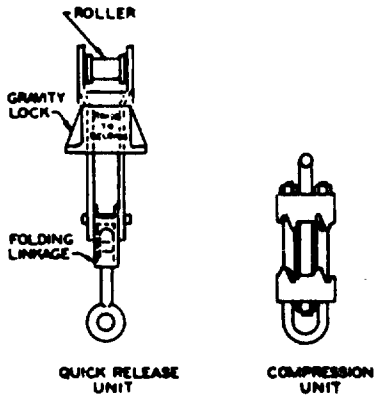
1. Devices that have passed the testing procedure successfully and comply with the performance requirement will be submitted to the AAR Open Top Loading Rules Committee with all pertinent documents for evaluation.
2. Successful passing of testing requirements will not automatically constitute approval of the device. The Committee may request over-the-road testing of a specific number of devices and a defined number of loads before granting approval.
3. The Committee will either approve the device or return the submission to proponent explaining reasons for not granting approval. Resubmission by the proponent will receive due consideration of the Committee.
4. Upon granting approval, the device, model number, or other identification and name of manufacturer will be published in General Rule 15(J)(11), Section No. 1 of the Open Top Loading Rules Manual, listing approved "Constant Tensioning Devices".

Section No. 1--General Rules (Rev.-9-1984)

(11) The following "Constant Tensioning Devices" have been approved for use with 1¼/4 inch and 2 inch high tension bands for load securement when specified in a specific figure.

NAME OR TYPE

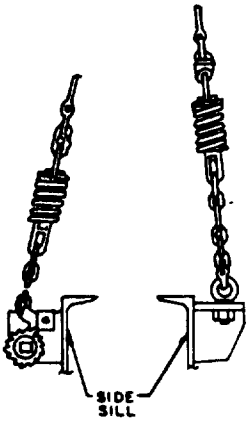
PORTEC, with or without quick Release Device.



SKETCH 1

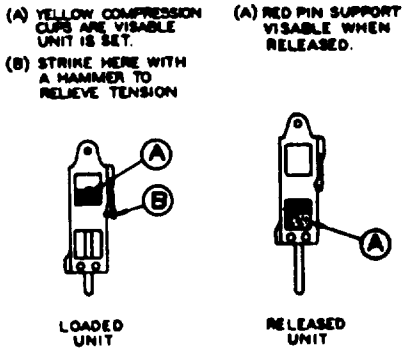
NAME OR TYPE

Spring type design, with or without quick release, similar to Sketch 3.



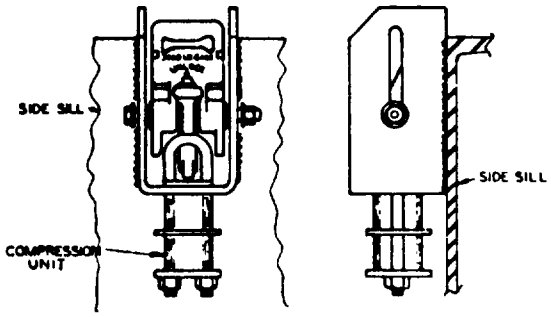
SKETCH 3

MAC-LEAN FOGG, with or without quick Release Device.



SKETCH 2

AZEE, with quick Release Device.



SKETCH 4

Note

Constant Tensioning Devices must be applied in a manner that the compression unit is not hindered in developing the minimum tension specified, either by the loaded commodity and/or car structural members.

Section No. 1--General Rules (Rev.-9-1980)

(k) High Tension and Common Annealed Wire. Dimensions. Breaking and Joint Strength, Application.

(1) HIGH TENSION WIRE

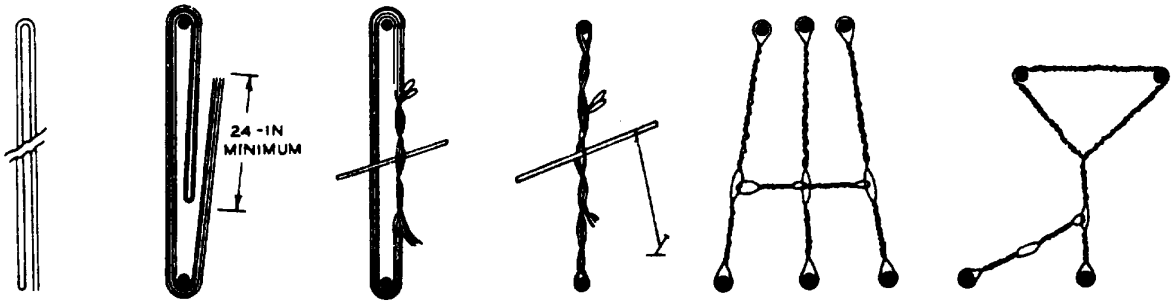
Gage	Diameter Inches	Minimum Breaking Strength-Pounds	Minimum Joint Strength-Pounds
No. 8	.1620	2000	1700
No. 10	.135	2000	1700
No. 11 1/2	.113	1880	1150
No. 12	.1055	1875	1080

(2) COMMON ANNEALED WIRE

Gage	Diameter Inches	Minimum Breaking Strength-Pounds
8	1/4	2200
7	3/16	1100
8	11/64	950
9	5/32	800
11	1/8	500

Section No. 1--General Rules (Rev.-9-1976)

(3) EXAMPLES FOR APPLYING 8-STRAND COMMON ANNEALED WIRE.



SKETCH 1
Single strand of wire eight times length of span between tie-down points plus 8 feet. Double In half and double In half again.

SKETCH 2
Apply the strand around one point of attachment and around the other, having strands overlap approximately half way between points of attach-ment.

SKETCH 3
Hand-twist the strands ends.

SKETCH 4
Finish twisting taut at center with -appropriate length of pipe, rod, or 2-in. x 2-in. lumber. Do not remove twist-er. Secure to car floor or tiedown point to prevent untwisting.

ALTERNATE SKETCH 4
Twister may be removed when tie-downs are wired to prevent untwisting as shown above.

Note (a).

Wires may be cut to twice the length between tie-down points, plus two feet. The cut lengths of wire are to be placed together and wrapped around the two points of attachment as shown In Sketch 2. Follow the procedure shown in Sketches 3 and 4, to complete the tying. Each piece of wire cut in this manner will equal two applied strands.

Note (b).

Wires to be pretwisted or cable twisted are to be cut eight times length of span between tie-down points, plus 8 feet. Double in half and pretwlst. Follow the procedure shown In Sketches 2, 3, and 4 to complete the tying.

Diameter Inches	Minimum Breaking Strength - Pounds*
1/2	5.200
5/8	8,100
3/4	11,700
7/8	16,200
1	21,100
1 1/8	25,800
1 1/4	32,800
1 3/8	38,600
1 1/2	46,900

(m) FLAT BARS AND PLATES
Dimensions and Breaking Strength*

Size Inches	Minimum Breaking Strength-Pounds	Size Inches	Minimum Breaking Strength-Pounds	Size Inches	Minimum Breaking Strength-Pounds
1/16 x 2	5,800	1/4 x 10	102,500	1/2 x 3	57,000
1/16 x 3 1/2	10,300	1/4 x 12	123,000	1/2 x 4	76,000
1/8 x 1	5,500	3/8 x 7/8	12,800	1/2 x 5	95,000
1/8 x 1 3/4	9,600	3/8 x 1 1/8	16,500	1/2x 6	114,000
1/8 x 2 1/2	13,800	3/8 x 1 1/2	22,000	1/2 x 12	228,000
1/8 x 3 1/2	19,300	3/8 x 1 7/8	27,400	5/8 x 1	23,100
1/8 x 4 1/2	24,800	3/8 x 2	29,250	5/8 x 1 1/8	26,000
3/16 x 2	16,100	3/8 x 2 3/8	34,700	5/8 x 1 1/2	34,700
3/16 x 5	40,350	3/8 x 2 7/8	42,000	5/8 x 1 3/4	40,500
1/4 x 1/2	5,100	3/8 x 3	43,900	5/8 x 2	46,300
1/4 x 7/8	9,000	3/8 x 3 1/2	51,200	5/8 x 3	69,400
1/4 x 1 1/4	12,800	3/8 x 4	58,500	3/4 x 3/4	20,300
1/4 x 1 3/4	18,000	3/8 x 5	73,100	3/4 x 1	27,000
1/4 x 2 1/4	23,100	3/8 x 6	87,750	3/4 x 1 1/4	33,800
1/4 x 2 3/4	28,200	3/8 x 12	175,500	3/4 x 1 1/2	40,500
1/4 x 3	30,750	1/2 x 7/8	16,600	3/4 x 1 3/4	46,300
1/4 x 3 3/4	38,500	1/2 x 1 1/8	21,400	3/4 x 2	54,000
1/4 x 4	41,000	1/2 x 1 3/8	26,100	3/4 x 2 1/2	67,500
1/4 x 4 1/4	43,600	1/2 x 1 3/4	33,300	3/4 x 3	61,000
1/4 x 6	61,500	1/2 x 2	38,000	3/4 x 6	162,000
1/4 x 7	71,750	1/2 x 2 1/8	40,400	1 x 6	210,000
1/4 x 9	92,250	1/2 x 2 5/8	50,000	1 1/8 x 6	229.500

Section No. 1--General Rules (Rev.-11--1978)

(n) WIRE ROPE AND/OR CABLE, Dimensions, Strength, Securement.

Plow Steel (6 x 7) Hemp Center				Plow Steel (6 x 19) Hemp Center			
Diameter Inches	Minimum Strength-Pounds	Minimum Joint Strength-Pounds	Minimum Number Clips or Clamps	Diameter Inches	Minimum Strength-Pounds	Minimum Joint Strength-Pounds	Minimum Number Clips or Clamps
3/4	8,800	7,400	2	3/8	9,200	7,800	2
1/2	15,500	13,100	3	1/2	16,200	13,800	3
5/8	24,100	20,400	3	5/8	25,200	21,400	3
3/4	34,400	9,200	4	3/4	36,000	36,000	4
7/8	46,400	39,400	4	7/8	48,700	41,400	4
1	60,000	51,000	4	1	63,300	53,800	4

Note (a).

The number of clips and/or clamps shown above is the minimum for safe operation. Proper type of cable clip and/or wire rope clamp suitable for the type and size of cable being applied must be used. In applying wire rope clips and/or clamps, the "U" bolt or bolt assembly must be applied on the short end of the rope. The distance between clips and/or clamps should be equal to six times the rope diameter. When the number of clips and/or clamps shown in the table is used and clips and/or clamps are properly applied, they will develop 85 percent of the minimum breaking strength of the wire rope and/or cable.

Note (b).

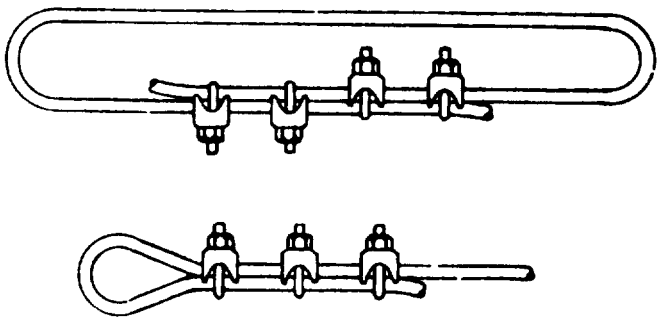
Values shown under "Minimum Breaking Strength-Pounds" in the above tables are based on 87 percent of the breaking strength of the wire rope and/or cable as supplied by the manufacturer. The minimum number of clips and/or clamps shown are based on manufacturers' recommendations.

Note (c).

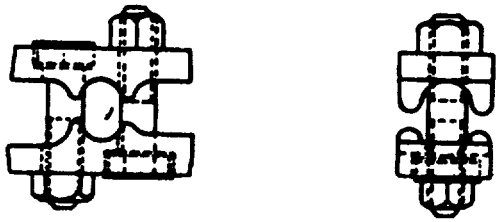
3/8 diameter (6 x 19) cable may be substituted by 5/16 galvanized aircraft cable (7 x 19) strand, using tools designed for securing cable with the following approved aluminum connectors: (1) one aluminum connector using a minimum of five (5) mechanical machined crimps and/or (2) one inch closed aluminum connector using a minimum of two (2) mechanical machined broad crimps and/or (8) one three inch open sided aluminum connector using a minimum of four (4) mechanical machined crimps.

EXAMPLES FOR APPLYING "U" BOLT CABLE CLIPS AND/OR CLAMPS

TYPE III, CLASS 2 DOUBLE GRIP DOUBLE SADDLE WIRE ROPE CLAMP (FEDERAL SPECIFICATION FF-C-450C, LATEST REV.)



Sketch 1



Sketch 2

(o) Turnbuckles

(1) Turnbuckles must meet Federal Specifications FF-T-791, latest revision and must be open body forged type.

(2) Each turnbuckle shall be permanently marked with a working load and the manufacturer's name and trademark.

(3) Turnbuckles when used must be locked to prevent loosening by using jam nuts or wiring.

(4) Turnbuckles used in tie-down systems In conjunction with cables, chains or rods must have a working load value not less than the component parts of the securement system.

(5) Turnbuckles using open hooks must have hooks wired unless equipped with a retaining feature.

(6) The following table shows the breaking strength and working loads of turnbuckles in combination with end attachments used.

BREAKING STRENGTH AND END PULL OF TURNBUCKLES

Size, Nominal Outside Diameter of Thread Inches	Breaking Strength Minimum Jaw, Eye, or Stub End Pulls Pounds	Hook End Pulls Pound.	Recommended Working Loads Jaw, Eye, or Stub End Pulls Pounds	Hook End Pulls Pounds
3/4	20,000	10,200	4,000	2,000
7/8	29,000	12;Q00	5,800	2,400
1	38,000	14,500	7,600	2,900
1 1/4	60,000	23,000	12,000	4,600
1 3/8	72,000	29,000	14,000	5,800
1 1/2	85,000	36,000	17,000	7,200

Section No. 1--General Rules (Rev.-9-1982)

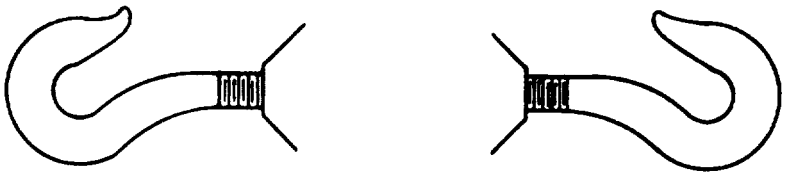
The following illustration shows the combination of turnbuckles and different end attachments.



STUB AND STUB



EYE AND EYE



HOOK AND HOOK



HOOK AND EYE



JAW AND JAW



JAW AND EYE

Section No. 1--General Rules (Rev.-9-1981)

Rule 16. Loads on One Car Overhanging One End or Both Ends of Car.

(a) The length or load or width of overhanging portion of load, as shown in Tables 1 and 2, must not be exceeded.

(b) Length of overhang is the distance from center of truck to the extreme end of overhanging portion of load. For intermediate lengths of load not shown in table, use next longest length of load shown.

(c) When the material in the overhang is of various lengths, the allowable width shall be based on the total width of the overhang at the extreme ends. For placement of bearing pieces between bolsters and ends of car, see General Rule 4 (c).

(d) Length of car as shown in tables means length over end sills. For intermediate lengths of cars not shown in table, use next shortest length car shown.

(e) Weight of load on one car, overhanging one end of car, must not exceed the percentage of load limit of carrying car as shown in Table 1. Allowable weight of load must be obtained by multiplying the stenciled load limit of car by the percentage shown In the table for the respective length of overhang and car.

(f) When material is of unequal lengths and overhanging one end, the weight of load shall be based on the average lengths of pieces in the overhang.

(g) Long steel, liable to take a permanent set by bending, must be supported to prevent sagging.

(h) Section No. 1, Figure References, Figures 5-A and 5-B, governs methods of narrowing loads of poles and lumber to keep within clearance width limits as shown in Tables 1 and 2.

(I) Authority must be procured from carriers for handling loads which measure more than 8 ft. from top of rail to center of load (including bearing pieces) or those exceeding width and length as shown in Tables Nos. 1 and 2. Heights specified in the figures must not be exceeded.

(j) The following tables are based on 10 ft. 6 in. clearance width limits, 15 degree curvature and 3 inches tolerance on each side of load.

(k) Table calculations are based on truck centers being located 5 ft. 6 in. from end sills for cars 75 ft. In length or less and 10 ft. 6 in. from end sills for cars over 75 ft. in length or truck centers as shown in the tables.

(l) Table 1 is based on the end of load opposite the overhanging end being located 18 in. from the face of end sill of car. In cases where the type of brake and load permits utilizing part or all of this space, thereby making the overhang less than specified in the tables, the width of load and the percentage of load weight may be increased in accordance with the shorter overhang. For placement of bearing pieces between bolster and ends of car, see General Rule 4 (c).

Section No. 1--General Rules (Rev.-9-1983)

Rule 19. Machinery, Rotary or Swinging Type, With Or Without Moveable Portions-inspection And Carding.

Machinery (including covered machinery) of this type, such as cranes, derricks, mechanical shovels, bulldozers, pipelayers. mining, earth moving, etc., because of extraordinary hazards in transporting, whether loaded on cars or moving on its own wheels, must have the rotating or swinging portions including booms, extensions, gun turrets, secured or unsecured counterweights. etc. tied down to car or machine to prevent displacement in addition to locking devices that might be provided on the machine. Telescoping booms and outriggers must be fully retracted and locked. Machines with outriggers or other retractable or movable portions must have positive locking device, If so equipped, engaged In retracted or retention position recommended for movement.

Machine equipped or not equipped with positive locking devices for moveable portions, must have moveable portions secured with steel cable or wire rope not less than 1/2 in. diameter and attached to the machine or car to prevent displacement in transit. This security must be certified by an authorized inspector of the originating railroad who shall fill out two cards of the form printed below. One card is to be attached to each side of machine moving on its own wheels. or to each side of car upon which the machine is loaded. The securement of movable portions for loads covered by a specific figure shall be in accordance with the requirements of the individual figure and certified by using the form shown below.

Form ( ) (Card)
(Size 5 in. x 8 in.)

MACHINERY-ROTARY TYPE

INITIAL & NUMBER .....CONTENTS..... DESTINATION
SHIPPER .....PLACE ..... DATE .....

This is to certify that I, the undersigned, have on this date, inspected the load on the above car or trailer and found it secured in accordance with Fig.....Section..... or the General Rules .....of the AAR Open Top Loading Rules.

I inspected this machine, moving on its own wheels, secured in accordance with Fig..... Section.....or the General Rules ..... of the AAR Open Top Loading Rules and found the propelling mechanism disengaged.

....
Point of Inspection Inspector Railroad

Rule 19-A. Machines-Motivated by Gasoline or Fuel Oil.

(a) Positive methods must be used by the shippers to make It impossible to cause accidental starting of engines in transit.

(b) The transportation of automobiles, motorcycles, tractors or other self-propelled vehicles, engines or motors (internal combustion) truck bodies or trailers on flat cars are also governed by Department of Transportation regulations contained in Bureau of Explosives 6000, Section 173.120 and Canadian Transport Commission Regulations for the Transportation of Dangerous Commodities by Rail, Section 73.120.

Rule 19-B. Machines-Equipped with Pneumatic Tires.

(a) Tires must be inflated as uniformly as possible to the tire manufacturers recommended pressures.

(b) Valve caps and/or valve assemblies must be securely tightened to prevent their loss or loosening in transit. Valve caps designed for the purpose of removing valve stems are prohibited.

(c) Suitable protective material between tires of units and side blocking must be used to prevent chafing and damage to tire walls on all Department of Defense shipments and on such other shipments when deemed necessary by the shipper.

Rule 19-C. Machines-Power Units and Related Components.-Vehicles, including tractors, equipped with automatic transmissions must have selector levers placed in neutral position to prevent damage to transmissions. Securement of the selector levers is at the discretion of the shipper.

Rule 20. Gondola Cars-Drop Doors.

(a) Door openings in gondola cars need not be covered when loading material such as coal, coke, ballast, metal borings, loose tin, sheet steel cuttings not over 1/8-inch thick, and similar material, also loose scrap which is interlaced so as to prevent falling through drop door openings.

(b) Door openings must be covered with boards two inches thick, secured to prevent displacement, when loading any of the following material short enough to fall through door openings; stone, ferro-manganese or other ferro products of similar density, or fluxing, any or all of which is larger than ballast, small castings, ingots, short billets, pig iron, short rolled material, baled scrap, or sheet steel cuttings over 1/8-inch thick, except when door openings do not exceed 25 percent of the floor surface and the material is secured to prevent bearing or shifting on to drop doors.

Rule 20-A. Hopper Cars.

(a) Hopper cars are designed to carry specific bulk and loose material.

(b) The following materials can be loaded in hopper cars with dump doors, hinges, and locks in good condition.
Coal or Coke
Ballast or Fluxing Stone
Stone or Ores (including beneficiated) 6 in. or less in size and weighing 175 lbs. per cubic foot or less.
Ferro alloys weighing 175 lbs. per cubic foot or less.
Loose tin or sheet metal cuttings K in. thick or less.
Bailed scrap or loose metal scrap which is interlaced to prevent it from falling through door openings.
Other similar materials.

(c) The following materials may be loaded in hopper cars. If cross hopper cars are used, the door must be secured in accordance with Figure 89, Section No. 2.
Stone or Ores over 6 in. in size or weighing more than 175 lbs. per cubic foot.
Ferro Alloys weighing more than 175 lbs. per cubic foot.
Small castings, small ingots, short billets or pig iron.
Scrap metal cuttings over 1/8 in. thick.
Other similar materials.

(d) For proper distribution of materials in the car, see Figure 88, Section No. 2.

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Section No. 1--General Rules (Rev.-9-1984)

PART 2

RECOMMENDED PROCEDURES FOR Measuring Loads Which Exceed Published Railway Line Clearances AND Method Of Determining Combined Center Of Gravity Above Top Of Rail

D-32.10

Section No. 1--General Rules (New--1-1976)

GENERAL NOTES

1. The loaded car or cars must be on level track when measured.
2. All vertical height measurements must be perpendicular to the plane of the tops of level rails.
3. All horizontal width and length measurements must be parallel to the plane of the tops of level rails.
4. Locate longitudinal center line of car. The longitudinal center line is the line (from one end of car to the other end of the car) that is parallel to the sides of the car and divides the width of the car into two equal parts.
5. Measure width from the longitudinal center line of car (or from the vertical projection of this line) to all points on each side of load where width changes and double (or multiply by two) each such measurement so as to obtain the maximum widths of the load.
6. Use straightedge across rails and measure to top of car deck.
7. Measure height above deck of car to all points on each side of load where width changes.
8. The height above top of rail (ATR) is obtained by adding the height of the car deck, above top of rail, to the height or heights of the load where the width changes.
9. For double, triple and end overhanging load, the heights "H" and the widths "W" must be given for the overhanging ends and also between the load bolsters at the location where the load is the maximum size. If there are changes in size of the load on the overhang(s) or on the load between the bolsters, dimensions must be shown for these changes and their location defined with respect to load bolster or truck center.
10. For recording or reporting purposes, all changes in width are to be shown by giving maximum width (twice width from center-line of car) and height ATR (height above top of rail) for each change in width.
11. In recording and reporting dimensions of load projecting beyond end sill, one or more cars, furnish the following:

(a) Oar numbers.
(b) Overall length of load.
(c) Type of load, whether single, double triple or single or double end overhang.
(d) Length of overhangs and complete dimensions of same. Length of overhang must be measured from center of truck on carrying car to end of load.
(e) Distance center to center of load bolsters.
(f) Distance from nearest truck center to center of load bolster on double or triple loads.

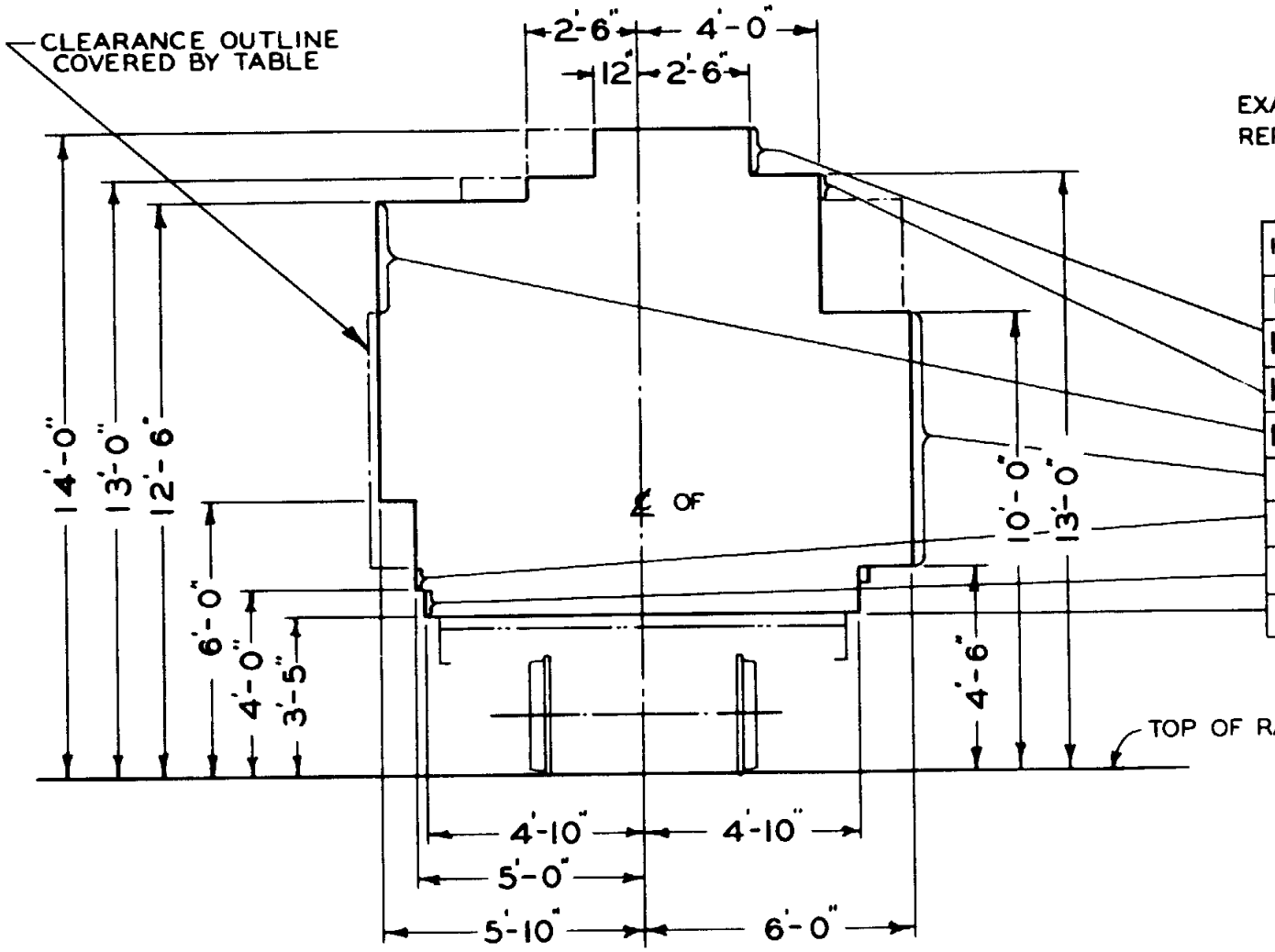
12. See General Rule 7 for additional information.

LEGEND

"B" -Distance center to center of load bolster.
"C" -Length of car over end sills.
"CL" -Coupled length.
"D" -Distance between truck centers or centers of span bolsters.
"H" -eight above top of rail (ATR).
"L" -Length of load.
"O" -End overhang.
"P"- -Longitudinal distance to projections.
"T" -Distance from nearest truck center to center of load bolster.
"W" -Width.

THE DIAGRAMS WHICH FOLLOW SHOW EXAMPLE OF GENERAL DIMENSIONS NECESSARY TO OBTAIN CLEARANCE FOR MOVEMENT OF DIMENSIONAL LOADS

MEASURING DIMENSIONAL LOADS

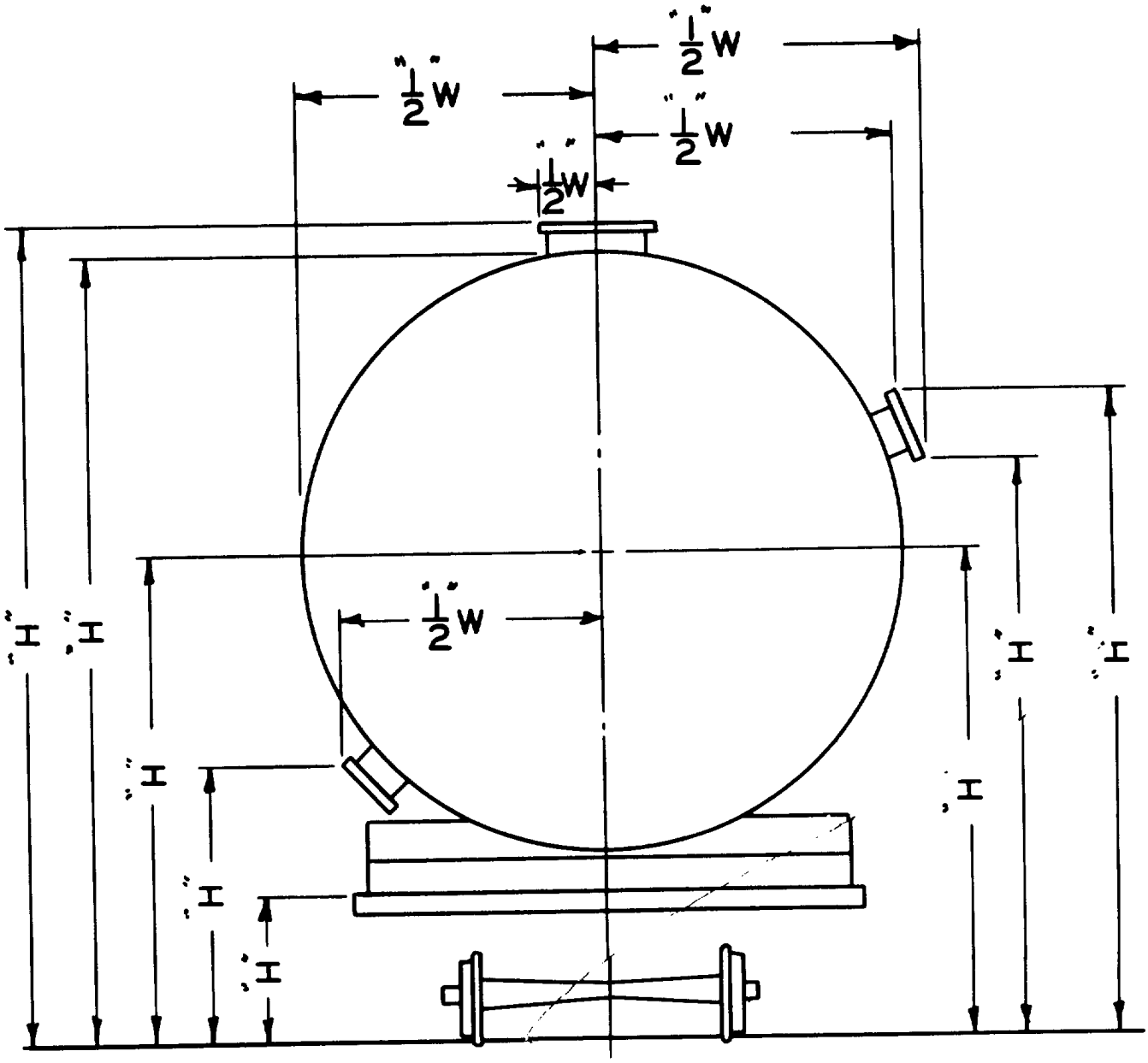


EXAMPLES OF DIMENSIONS TO BE REPORTED TO OBTAIN CLEARANCE FOR MOVEMENT

HEIGHT A.T.R.				WIDTH / 2		WIDTH	
FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
13	0	14	0	2	6	5	0
12	6	13	0	4	0	8	0
10	0	12	6	5	10	11	8
4	6	10	0	6	0	12	0
4	0	4	6	5	0	10	0
3	5	4	0	4	10	9	8
0	0	3	5	CAR DECK			

END VIEW
BOX TYPE LOAD

MEASURING DIMENSIONAL LOADS

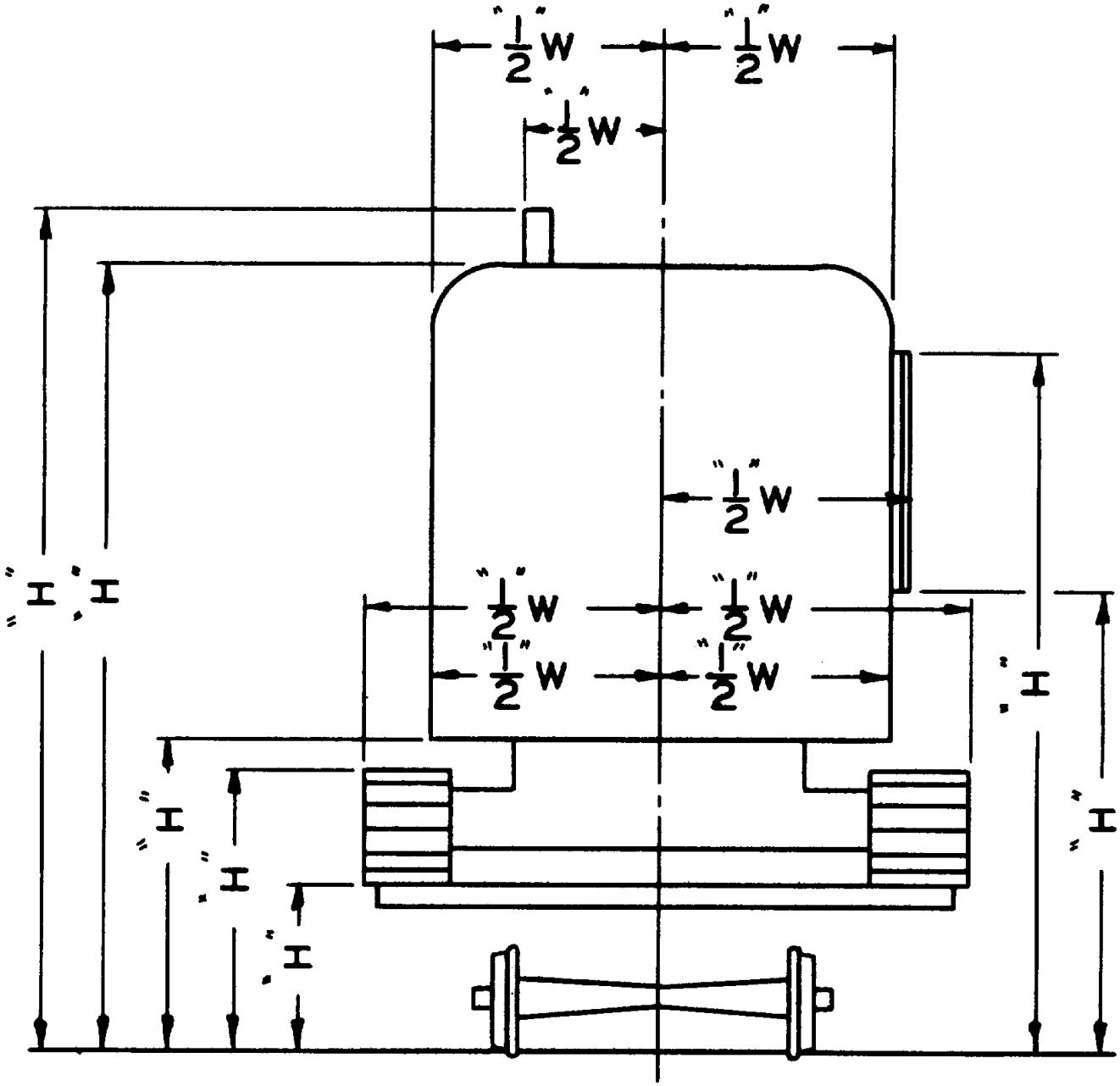


END VIEW

CYLINDRICAL TYPE LOAD

MEASURING DIMENSIONAL LOADS

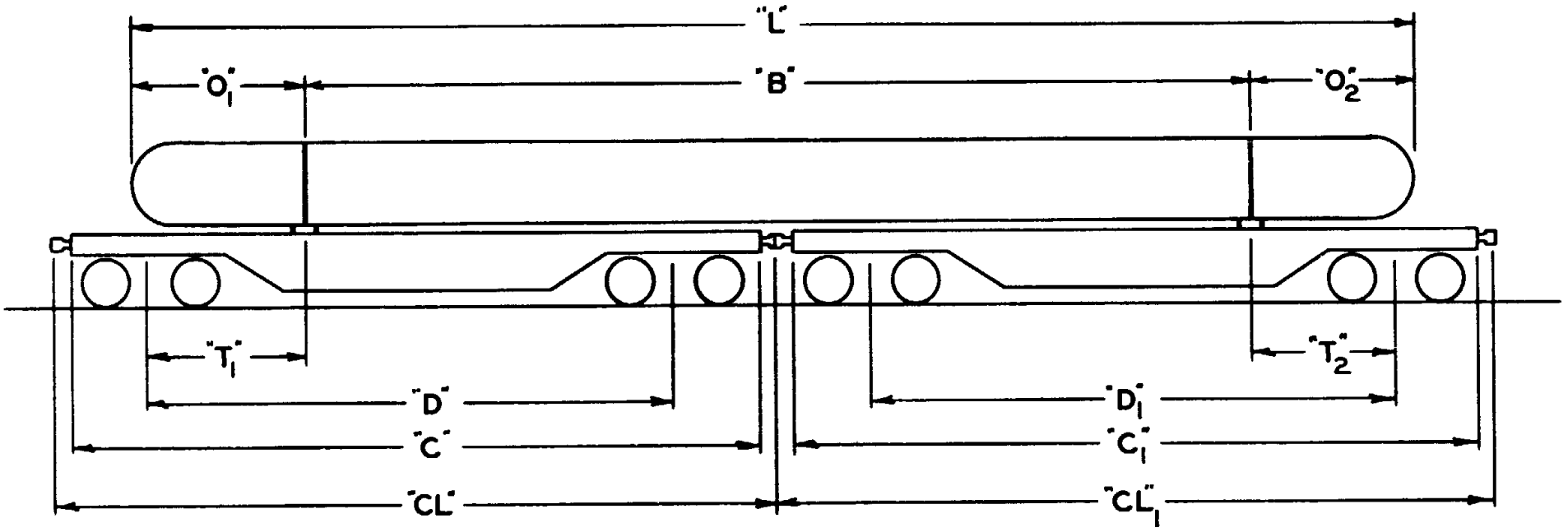
END VIEW



MACHINE TYPE LOAD

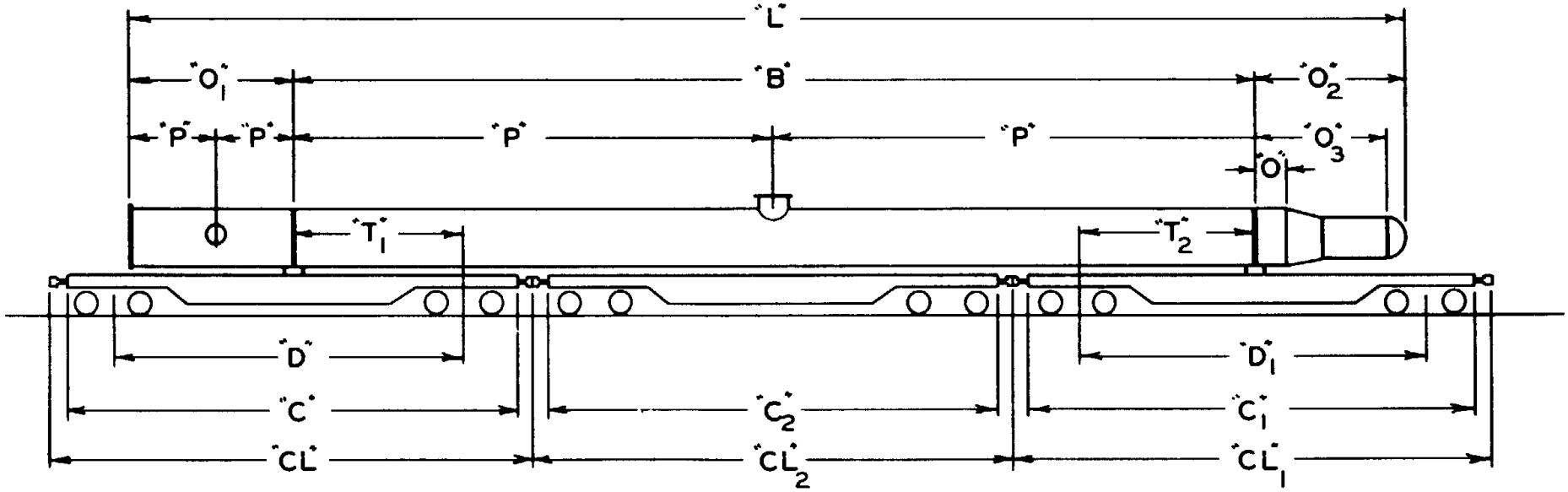
MEASURING DIMENSIONAL LOADS

DOUBLE LOAD



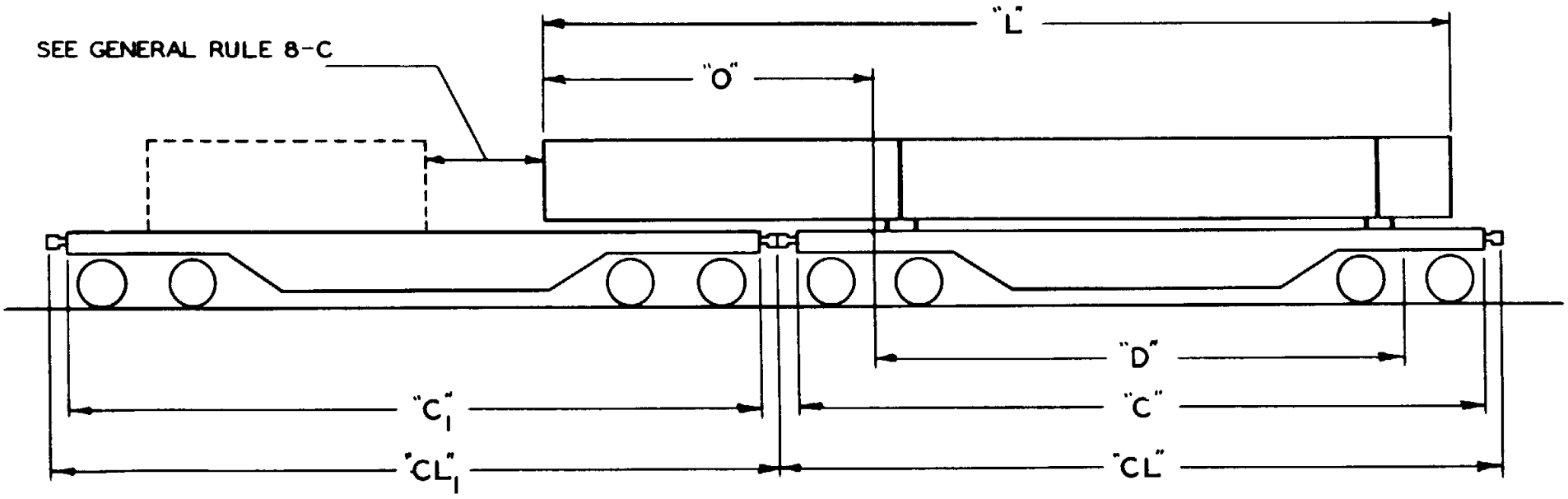
MEASURING DIMENSIONAL LOADS

TRIPLE LOAD



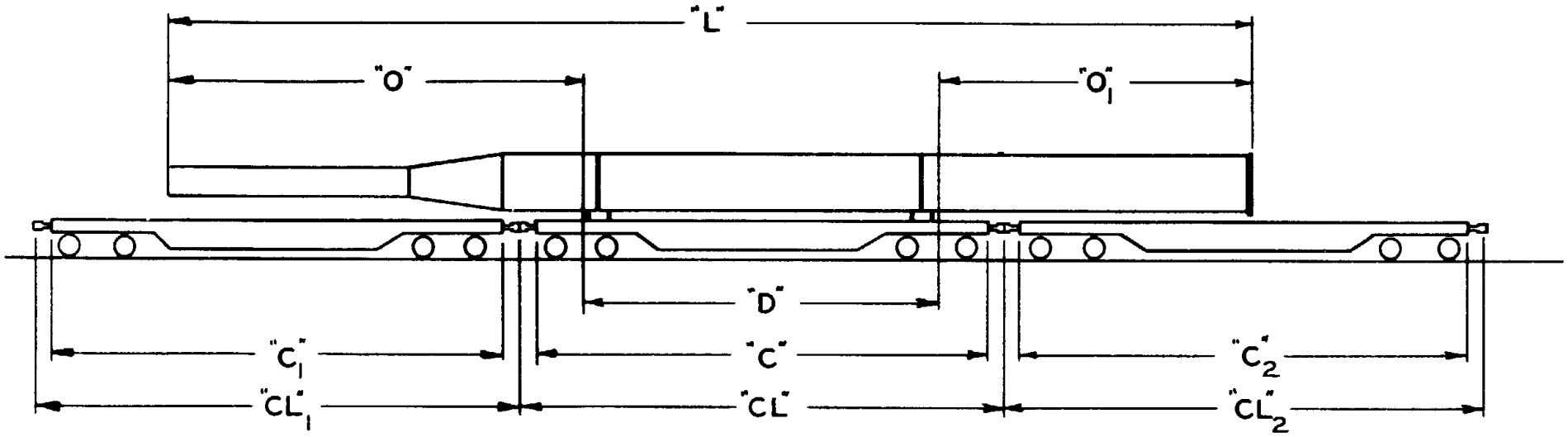
MEASURING DIMENSIONAL LOADS

SINGLE END OVERHANG LOAD



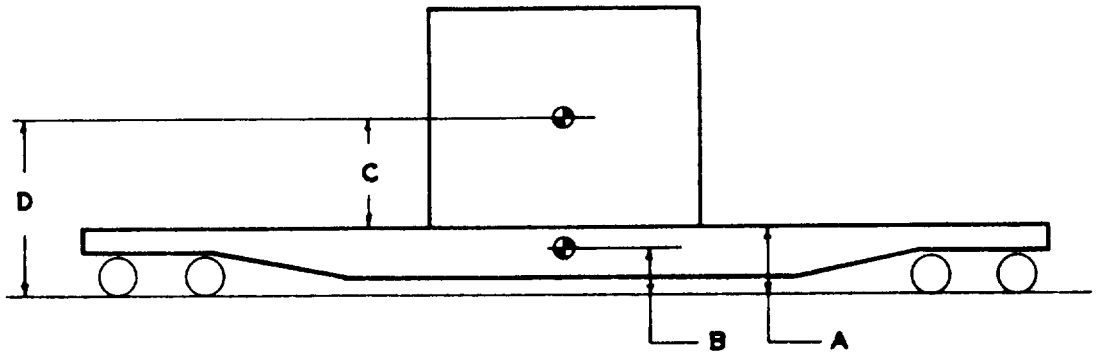
MEASURING DIMENSIONAL LOADS

DOUBLE END OVERHANG LOAD



Section No. 1--General Rules (New-9-1984)

PROCEDURES FOR DETERMINING COMBINED CENTER OF GRAVITY OF LOAD ON CAR ABOVE TOP OF RAIL OF LOADED OPEN TOP CARS



The following information is necessary to determine the combined center of gravity of a loaded open top car.

A = Height of car deck from top of rail.

B = Center of gravity of car above top of rail, obtainable from car owner.

C = Center of gravity of load from base of load, obtainable from shipper.

D = Combined height of center of gravity of load, (C), plus height of car deck, (A), that is (C) + (A).

E = Lightweight of car, in pounds, as stenciled on car.

F = Weight of load, obtainable from shipper.

The calculation to arrive at the center of gravity is as follows:

$$\frac{(B \times E) + (D \times F)}{E+F} = \text{Combined center of gravity above top of rail.}$$

Example:

A = 44 inches

B = 27 inches

C = 60 inches

D = (60 + 44) = 104 inches

E = 55,000 Lbs.

F = 120,000 Lbs.

Formula:

$$\frac{(B \times E) + (D \times F)}{E+F} + \text{C. G. ATR}$$

$$\frac{(27 \times 55{,}000) + (104 \times 120{,}000)}{55{,}000 + 120{,}000}$$

$$\frac{1{,}485{,}000 + 12{,}480.000}{175{,}000} = \frac{13{,}965{,}000}{175{,}000} = 79.8 \text{ inches ATR}$$

Notes:

1. The above is an example of a basic calculation for determining the combined center of gravity of load and car.
2. Where the load consists of multiple piles or pieces with differing centers of gravity, the entire C.O. of the entire load must be calculated before it is combined with the car weight and C.O.
3. Acceptable centers of gravity for interchange purposes are governed by Rule 89. Section B. 1, e of the Field Manual of the AAR Interchange Rules.

Section No. 1

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PART 3

RECOMMENDED PROCEDURES

FOR
Conducting Field Impact Tests

OF
Loaded Open Top Cars

Section 1-General Rules (Rev.-11-1978)

RECOMMENDED PROCEDURES FOR CONDUCTING FIELD IMPACT TESTS OF LOADED OPEN TOP CARS

1. SCOPE

(a) This method is intended only for practical tests in the field to evaluate loading and bracing of lading in or on open top cars.

2. EQUIPMENT

(a) The specimen load car should be representative of the type car intended for use in transporting the commodity under tests and, unless otherwise agreed to, cars are to be equipped with standard draft gears and conventional underframe.

(b) Five empty cars are selected as the buffer or struck cars. Loaded cars may also be used. in either case, the total weight of the buffer cars is to be approximately 250,000 lbs.

(c) One locomotive.

(d) A minimum of 200 ft. length of reasonably level tangent track between the buffer cars and the test car is required to attain speeds for impact testing before accelerating locomotive for testing.

(e) Speed measurement devices, any one of the following is acceptable.

1. Electric timers.

2. Stop watches (min. 2), and torpedoes, toy torpedoes preferred (min. 8). Stop watches to have a minimum readable subdivision for 1/5 second.

3. Radar equipment

(f) If desired, impact registers may be used as a performance check. They should not be used as speed recorders When used, the registers must be nailed to the car floor and tapes marked and recorded after each impact.

3. PREPARATION

The test load or loads must be prepared specimens representative of the intended loading and bracing method. The arrangement of articles or containers and the bracing securement of them must be identical to the contemplated procedure. If safety or other reasons preclude the use of actual commodity, the specimen must be equal in weight and general character to the materials to be shipped.

4. ARRANGEMENT OF TEST EQUIPMENT

(a) Place buffer cars at far end of track and set air and hand brakes. Struck end of first buffer car must have standard draft gear.

(b) Locate test car between buffer cars and locomotive.

(c) Brief train crew on the procedure. Delegate one person to advise appropriate member of the train crew in regard to when moves are to be made. All participants and observers should be instructed to take precaution for their personal safety and observe safety practices of the carrier and/or company conducting tests. If desirable, train crews should have a test run without impacting the test load to establish accuracy of speed.

(d) Electric timer: Place switch contacts on track in accordance with manufacturers instructions.

(e) When stop watch and torpedoes are employed to obtain speeds, measure torpedo locations. The first torpedo shall be placed beyond face of knuckle on first buffer car and located one foot more than the distance between the center of the leading wheels and knuckle face of test car. The second torpedo shall be 50 feet along track from the first torpedo. The relationship of time lapse speed for travel of distance for 50 feet is shown on chart, Figure No. 1.

(f) Radar equipment: Position radar scanner in a appropriate location and follow manufacturers instructions.

RECOMMENDED PROCEDURES FOR CONDUOTING FIELD IMPACT TESTS OF LOADED OPEN TOP OARS-(Concluded)

5. PROCEDURE

The specimen car carrying test load should be pulled a sufficient distance from the buffer cars. The test load car is then pushed toward the buffer cars until the desired speed is obtained and then released and allowed to roll freely into the buffer cars having knuckles positioned for coupling.

There should be four impacts of the test loads. The first three at 4, 6, and 8 miles per hour, respectively, (track speeds of test car), in the same direction and as described above. The first two impacts shall be approximately 4 and 6 miles per hour, respectively, whereas, the third and fourth impacts must equal or exceed 8 miles per hour.

The fourth impact, at 8 miles per hour, shall be at opposite end of test car from the first three impacts. If it is not possible to turn test car, because of track layout, this may be accomplished by running test load car to opposite end of buffer cars, impacting as above.

If above conditions for fourth impact are impossible, then a loaded car having a total weight on rail equal to or exceeding weight of test load car may be used as a striking car. (This striking car preferably should be a gondola loaded with ballast, sand, or gravel, et cetera). The test load car must be placed clear of other equipment with air and hand brakes set. This fourth test at 8 miles per hour will impact the striking car against the test load car.

If readjustment of lading or reconditioning of bracing or items of securement is permitted during the impact tests, testing will stop and a complete new impact test initiated.

6. RECORD OF TESTS

An accurate record of the tests is to be maintained, tabulating the number and speed of impacts, and observations of blocking and lading after each impact.

IMPACT SPEED CONVERSION TABLE FOR 50 FEET TRAVEL

TIME SECS.	SPEED MPH	TIME SECS.	SPEED MPH	TIME SECS.	SPEED MPH	TIME SECS.	SPEED MPH
2.0	17.05	4.0	8.52	6.0	5.68	8.0	4.26
2.1	16.23	4.1	8.31	6.1	5.59	8.1	4.21
2.2	15.50	4.2	8.12	6.2	5.50	8.2	4.16
2.3	14.82	4.3	7.93	6.3	5.41	8.3	4.11
2.4	14.20	4.4	7.75	6.4	5.35	8.4	4.06
2.5	13.64	4.5	7.58	6.5	5.24	8.5	4.01
2.6	13.11	4.6	7.41	6.6	5.17	8.6	3.96
2.7	12.62	4.7	7.25	6.7	5.09	8.7	3.92
2.8	12.17	4.8	7.10	6.8	5.01	8.8	3.87
2.9	11.76	4.9	6.96	6.9	4.94	8.9	3.83
3.0	11.36	5.0	6.82	7.0	4.87	9.0	3.79
3.1	11.00	5.1	6.68	7.1	4.80	9.1	3.75
3.2	10.65	5.2	6.56	7.2	4.73	9.2	3.71
3.3	10.33	5.3	6.43	7.3	4.67	9.3	3.67
3.4	10.03	5.4	6.31	7.4	4.61	9.4	3.63
3.5	9.74	5.5	6.20	7.5	4.55	9.5	3.59
3.6	9.47	5.6	6.09	7.6	4.49	9.6	3.55
3.7	9.21	5.7	5.98	7.7	4.43	9.7	3.51
3.8	8.97	5.8	5.88	7.8	4.37	9.8	3.48
3.9	8.74	5.9	5.78	7.9	4.32	9.9	3.44
						10.0	3.41

APPENDIX E
AAR LOADING RULES SECTION 6
(Department of Defense)

(The following information is extracted from the Association of American Railroads manual, *General Rules Governing the Loading of Commodities on Open Top Cars and Trailers.)*

SECTION No. 6
(Rev.-1-1976)

RULES GOVERNING

THE
Loading of Department of Defense Materiel On Open Top Cars

NOTICE

See General Rules-Section No. 1 for the following:

Preface.

Attention Shippers.

index.

General Rules.

instructions - Experimental Loads.

Dictionary of Car and Loading Terms.

Table Nos. 1 to 35, inclusive.

Where reference is made in the specifications of any of the figures in these rules to Fig. Nos. 1-B, 2, 8, 4, 5, 5-A or 5-B see General Rules-Section No. 1.

Shippers of Department of Defense materiel desiring new, revision of, or additions to the present rules or specifications, must submit such proposals to U.S. Army Transportation Engineering Agency, Military Traffic Management Command, Newport News, Virginia 23606 through the appropriate channels for handling with the Mechanical Division of the Association of American Railroads.

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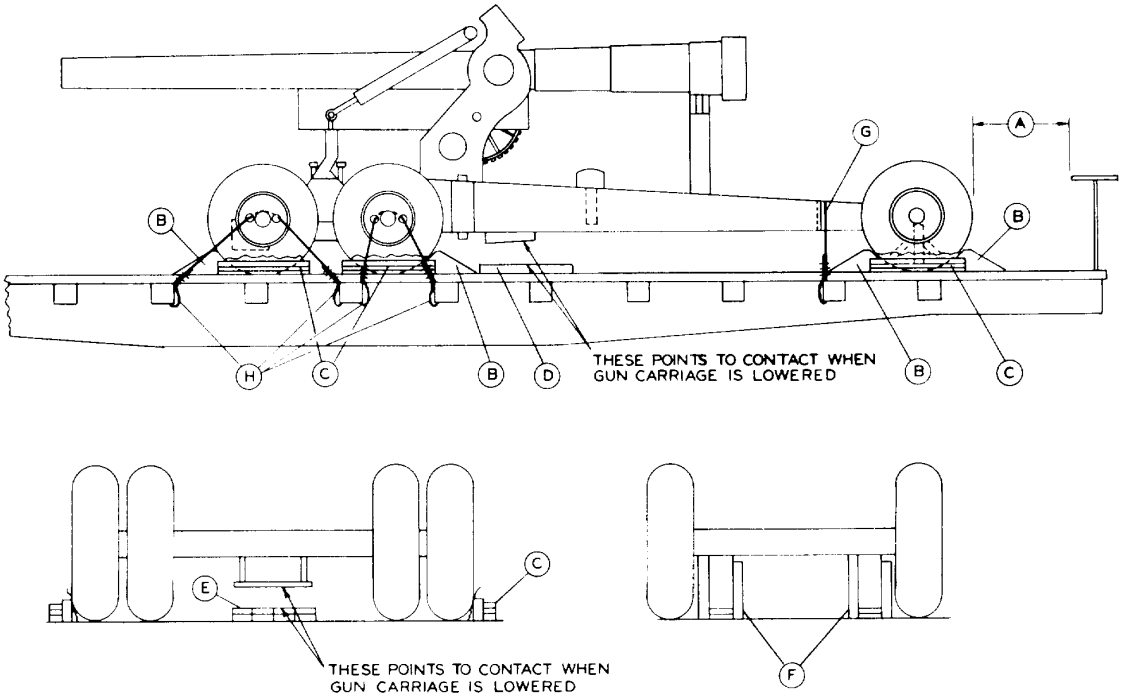
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Sec. 6-Fig. 2 (Rev.-9-1977)
(Drawing Redrawn 9-1977)
155 M. M. GUN M-I AND 8 INCH HOWITZER CARRIAGE-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	8	Blocks, pattern 16. Locate 45 degree portion of block against front and rear of front wheels, in front of outside intermediate wheels and in back of outside rear wheels. Secure heel of block to floor with three 40-D nails and toe-nail that portion under tire to floor with two 40-D nails before Items "C" are applied.
C	One per wheel.	Block pattern 89, Section 6, for side blocking of wheels. Use suitable protective material, such as waterproof paper or burlap, between tire and blocking. Locate bottom portion of material under Item "C", top portion to extend two inches above Item "C".
D	2 each side	2 in. x 4 in. x 36 in. Place side by side, lengthwise of car and secure each to floor with three 40-D nails. Lower carriage to rest on Items "D" enough to partially relieve weight on tires.
E	As required.	Fill space under front end of gun carriage with 2 in. x 4 in. x 36 in. pieces. Wedge tight and secure with 30-D nails to prevent displacement.
F	2	Support, pattern 62, length 1/4 in. longer than tile distance between axle of limber and floor. Place between floor and axle to partially relieve weight on tires. Secure each to floor with six 40-D nails.
G	1	Wire rope 1/2 in., 6 x 19 IWRC. Secure to stake pocket on one side of car, then make a complete loop around rear end of gun trail (go over trail first, then under and back over) to stake pocket on opposite side of car. Secure wire rope with three 1/2 in. cable clips at each end. Apply thimble at bottom of each stake pocket and fasten to wire rope with one 1/2 in. cable clip.
H	4	Wire rope 1/2 in., 6 x 19 IWRC. Apply single strand through holes in front wheels and secure to stake pockets as shown above. Fasten each end with three 1/2 in. cable clips. Apply thimble at bottom of each stake pocket and fasten to wire rope with 1/2 in. cable clip.

Note:
1. Hand brakes must be set and levers wired or blocked.

See General Rules 1, 2, 3, 4, 5, 9, 11, 14, 15 and 19-B for further details.

Section No. 6

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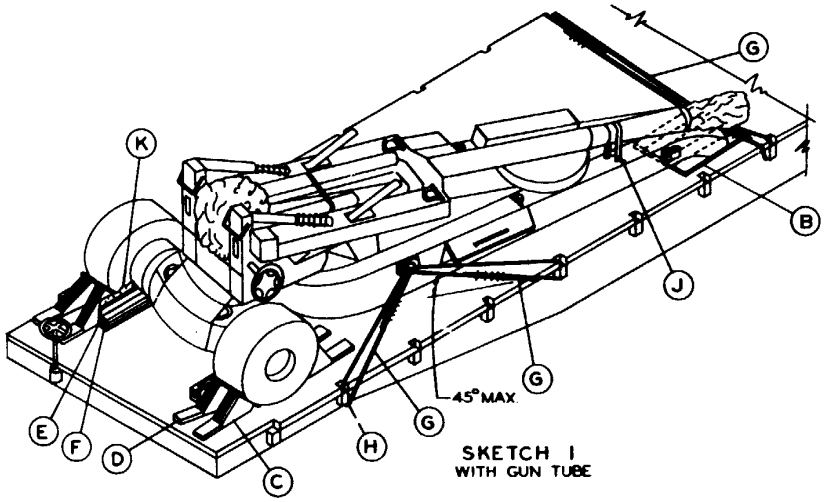
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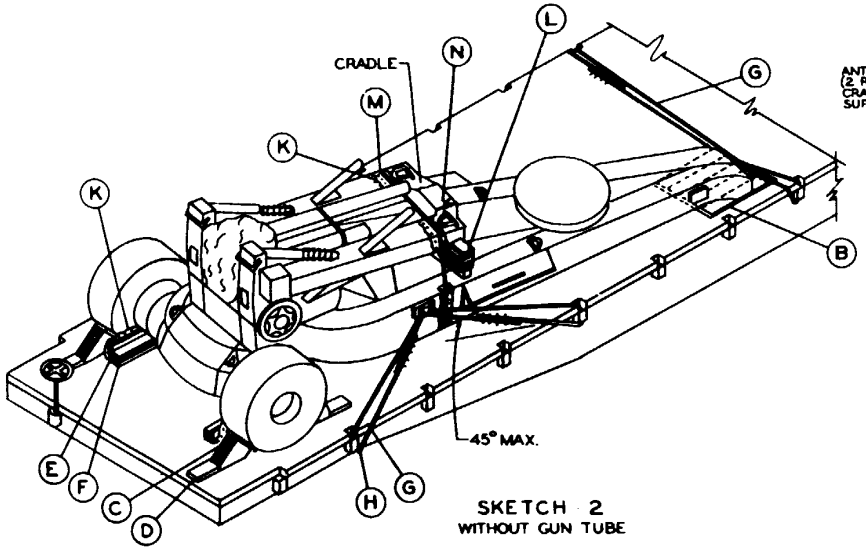
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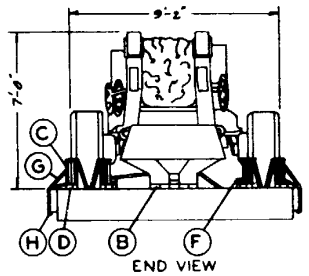
Sec. 6-Fig. 7 (New-11-1978)



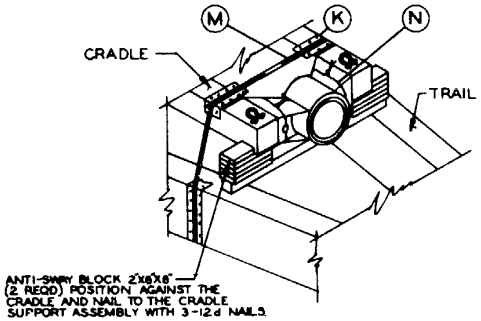
SKETCH 1
WITH GUN TUBE



SKETCH 2
WITHOUT GUN TUBE

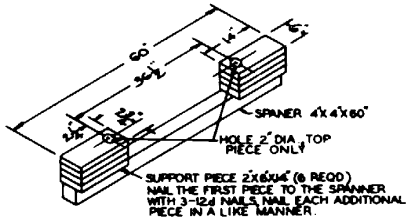


END VIEW



CRADLE SECURMENT DETAIL

CENTER THE CRADLE BETWEEN THE TRAILS, POSITION THE CRADLE SUPPORT ASSEMBLY AGAINST THE UNDERSIDE OF THE CRADLE MAKING SURE THAT THE PROTRUDING BOLTS/NUTS ARE PROPERLY INSERTED INTO THE HOLES ON THE LOCK PIECES. LOWER THE CRADLE UNTIL THE SPANNER PIECE IS RESTING ACROSS THE TRAILS. POSITION THE ANTI-SWAY BLOCK AGAINST THE CRADLE AND NAIL IN PLACE.



SKETCH 3
CRADLE SUPPORT ASSEMBLY

NOTE: FIELD CHECK THE 38 1/2 CENTER TO CENTER DIMENSION BETWEEN THE LIFTING EYE BOLTS PRIOR TO FABRICATING THE CRADLE SUPPORT ASSEMBLY.

M 198 155 MM-HOWITZER-FLAT CARS

Sec. 6-Fig. 7 (New-11-1978)

M 198 155 MM-HOWITZER-FLAT CARS

Item	No. of Pcs.	Description
A		Brake Wheel Clearance. See Fig. 2, Section No. 1.
B	5	Platform, 2 in. x 6 in. x 36 in. lumber. Preposition and nail each piece to car floor with three(3) 30-D nails at each end.
C	8 per Sketch 1.	Chock block, pattern 86, Sec. No. 6. Position with the face plate against wheel. Nail through
	4 per Sketch 2.	heel of block with two 60-D nails. Toe-nail to car floor with two (2) 40-D nails on each side.
D	8 per Sketch 1.	Back up piece, lumber, 2 in. x 6 in. x 12 in. Position against chock block, Items "C" and nail
	4 per Sketch 2.	to car floor with three (3) 30-D nails.
E	2	Rubbing strip, lumber, 2 in. x 6 in. x 48 in. Position on edge and nail to bottom piece of Item "F" with five (5) 12-D nails.
F	2	Side blocking, lumber, 3 pieces 2 in. x 6 in. x 48 in., laminated. Nail the first piece with Item "E" attached to car floor using five (5) 30-D nails. Nail other pieces on top in a like manner.
G	6	Wire Rope 5/8 in. 6 x 19 IWRC. install 4 cables to approximate angle shown to form a complete loop from stake pocket on car through tie-down devices on Howitzer trail and back to stake pocket. install 2 cables to form a complete loop from stake pockets on car through eye of lunette and back to stake pocket. Secure each cable with five (5) cable clips. When loaded without gun tube, 1/2 in. 6 x 19 IWRC wire rope may be used.
H	10	Thimble 5/8 in. Use one per stake pocket and one per lading tie-down device. Secure to cable with one clip per thimble.
J	As required.	Wire, No. 14 gage annealed. Use to wire tie the pin which locks the gun tube stowage bracket in such a manner that the pin cannot come out during transit.
K	As required.	Waterproof paper or burlap of a sufficient size to position under and extend 2 in. above Item "F". When shipped with tube off apply in a like manner to Item "M". (See Sketch 2 for Item "M").
L	1	Cradle Support Assembly. Required only when shipped with tube off. (See Sketch 3).
M	1	Cradle securement strapping, 2 in. x .050 in. high tension band. Encircle cradle and trail as near to Item "L" as possible. (See Sketch 3).
N	As required.	Wire, No. 14 gage annealed. Tie the washers to the cradle as shown in Sketch 3.

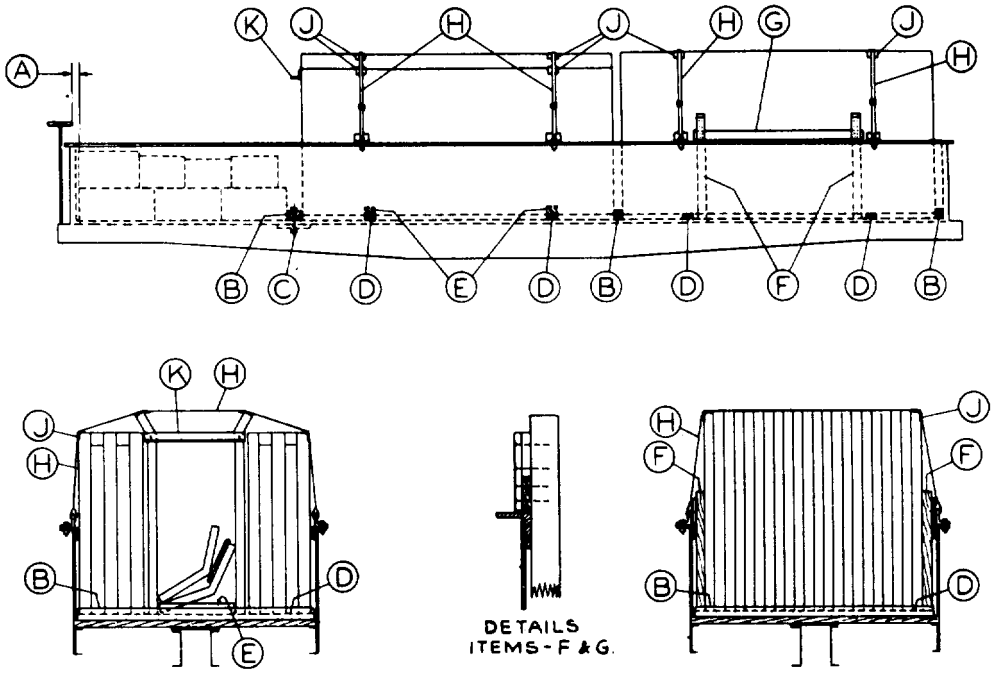
Notes:

1. Two (2) Howitzers may be shipped on a 10 ft. 6 in. wide flat car. Position the first Howitzer at one end of car diagonally and position the second Howitzer at the opposite end of car diagonally with barrels pointing inwardly.

2. If only one Howitzer is shipped, locate centrally on car.

See General Rules 1, 2, 3, 4, 5, 9, 10, 11, 14, 15 and 19-B for further details.

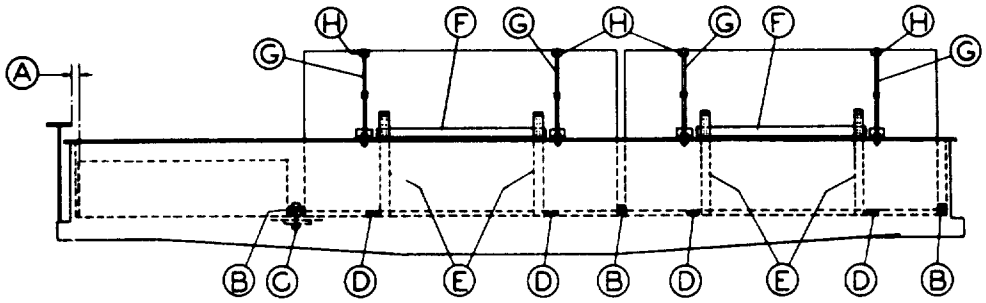
CAR NO. 1 (THREE-CAR-SHIPMENT) BARGES, BOLTED, SECTIONAL, FOR LIQUID OR DRY CARGO, SECURED WITH HIGH TENSION BANDS-GONDOLA CARS

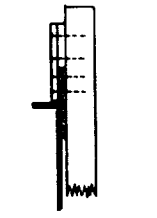


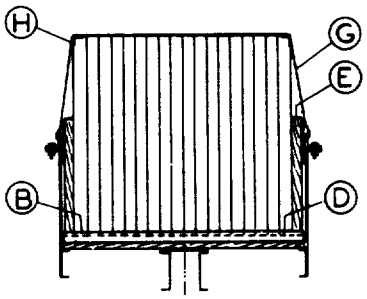
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	3	End and intermediate floor blocks, as shown, length about equal to inside width of car, width to suit, height sufficient to contact bottom of lading.
C	2	3/4 in. dia. bolt, long enough to pass through Item "B" and floor.
D	2 ea. pile.	Floor bearing pieces, as shown, length about equal to inside width of car, width to suit, height sufficient to keep lading off floor. Width must exceed height.
E	2	Crosswise spacers, as shown, dimensions to suit. Locate on top of and secure to Item "D" to prevent displacement.
F	4	Vertical fillers, as shown, length and width to suit, thick enough to completely fill space between lading and car sides.
G	1 ea. pr. of Items "F"	Horizontal ties as shown. Secure to each Item "F" with four 10-D nails. When it cannot be placed between vertical filler and car side, secure same to outside face of each vertical filler as near top of car side as possible with four 10-D nails. Use suitable filler above same, cover filler and tie with one 1 in. x 4 in. x 12 in. piece secured to vertical and horizontal fillers with three 10-D nails in each. (See Details Items "F" and "G").
H	2 per pile.	2 in. x .050 in. bands. Attach by passing through an eye bolt or angle securely bolted to top side angle.
J	As required.	Protection angles, 20 gage, 4 in. wide, applied so as to prevent displacement.
K	2 per pile.	1 1/2 in. x 1 1/2 in., angles, as shown, securely bolted to barge sections, to retain load in upright position.

See General Rules 4, 5, 7, 9, 10, 11, 14 and 15 for further details.

CAR NO. 2 (THREE-CAR-SHIPMENT) BARGES, BOLTED, SECTIONAL, FOR LIQUID OR DRY CARGO, SECURED WITH HIGH TENSION BANDS-GONDOLA CARS



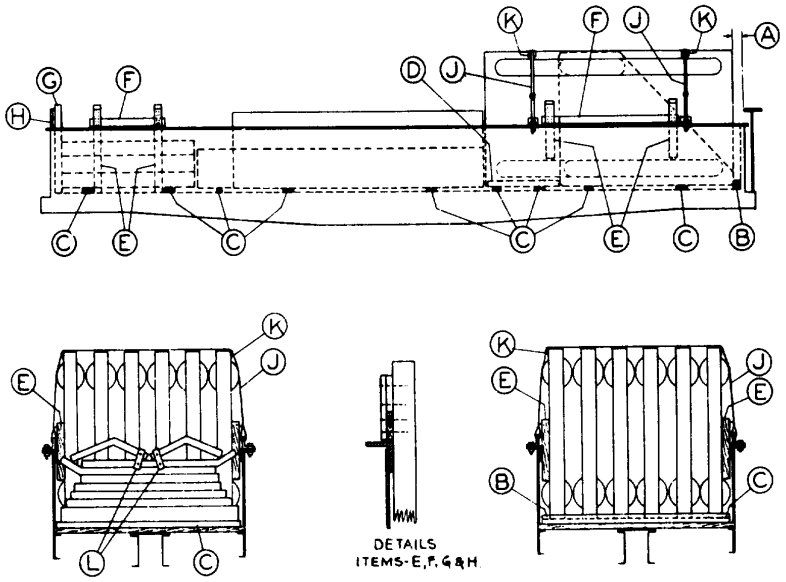




Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	3	End and intermediate floor blocks, as shown, length about equal to inside width of car, width to suit, height sufficient to contact bottom of lading.
C	2	3/4 in. dia. bolt, long enough to pass through Item "B" and floor.
D	2 ea. pile.	Floor bearing pieces, as shown, length about equal to inside width of car, width to suit, height sufficient to keep lading off floor. Width must exceed height.
E	2 pr. ea. pile.	Vertical fillers, as shown, length and width to suit, thick enough to completely fill space between lading and car sides.
F	1 ea. pr. of Items "E"	Horizontal ties, as shown, secure to each Item "E" with four 10-D nails. When it cannot be placed between vertical filler and car side, secure same to outside face of each vertical filler as near top of car side as possible with four 10-D nails. Use suitable filler above same, cover filler and tie with one 1 in. x 4 in. x 12 in. piece, secured to vertical and horizontal fillers with three 10-D nails in each. (See details Items "E" and "F".)
G	2 per pile.	2 in. x .050 in. bands. Attach by passing through an eye bolt or angle securely bolted to top side angle.
H	As required.	Protection angles, 20 gage, 4 in. wide, applied so as to prevent displacement.

See General Rules 4, 5, 7, 9, 10, 11, 14 and 15 for further details.

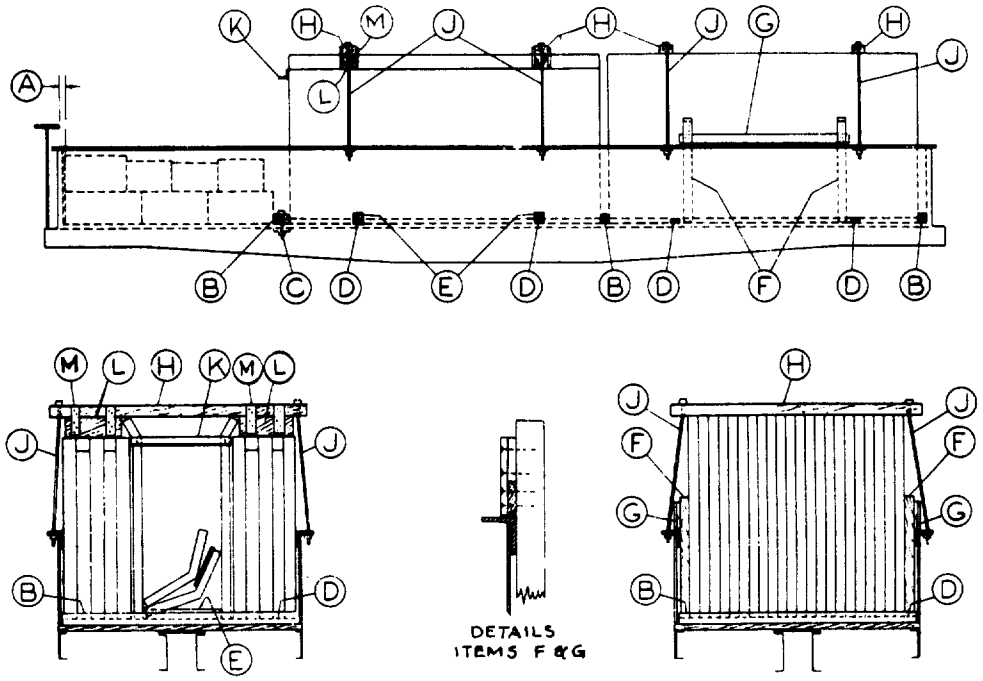
CAR NO. 3 (THREE-CAR-SHIPMENT) BARGES, BOLTED, SECTIONAL, FOR LIQUID OR DRY CARGO, SECURED WITH HIGH TENSION BANDS-GONDOLA CARS



Item	No. of Pca.	Description
A		Brake wheel clearance. See Fig. 2.
B	1	End floor block, as shown, length about equal to inside width of car, width to suit, height sufficient to contact bottom of lading.
C	9	Floor bearing pieces, as shown, length about equal to inside width of car, width to suit, height sufficient to keep lading off floor. Width must exceed height.
D	2	Longitudinal end blocking for short section of barge. Locate on top of and secure to Items "C" with two 20-D nails at each location.
E	2 pr. ea. end pile.	Vertical fillers, as shown, length and width to suit, thick enough to completely fill space between lading and car sides.
F	1 ea. pr. of Items "E"	Horizontal ties, as shown. Secure to each Item "E" with four 10-D nails. When it cannot be placed between vertical filler and car side, secure same to outside face of each vertical filler as near top of car side as possible with four 10-D nails. Use suitable filler above same, cover filler and tie with one 1 in. x 4 in. x 12 in. piece, secured to vertical and horizontal fillers with three 10-D nails in each. (See Details Items "E", "F", "G" and "H".)
G	2	Vertical end fillers, as shown, length and width to suit, thick enough to completely fill space between lading and end of car.
H	1	Horizontal tie, as shown. Secure to each Item "G" with four 10-D nails. When it cannot be placed between vertical filler and car end, secure same to outside face of each vertical filler as near top of car end as possible with four 10-D nails. Use suitable filler above same, cover filler and tie with one 1 in. x 4 in. x 12 in. piece, secured to vertical and horizontal fillers with three 10-D nails in each. (See Details Items "E", "F", "G" and "H".)
J	2	2 in. X .050 in. bands. Attach by passing through an eye bolt or angle securely bolted to top side angle.
K	As required.	Protection angles, 20 gage, 4 in. wide, applied so as to prevent displacement.
L	4	Tie plates securely bolted to hold barge sections together and prevent displacement. See General Rules 4, 5, 7, 9, 10, 11, 14 and 15 for further details.

Sec. 6--Fig. 17

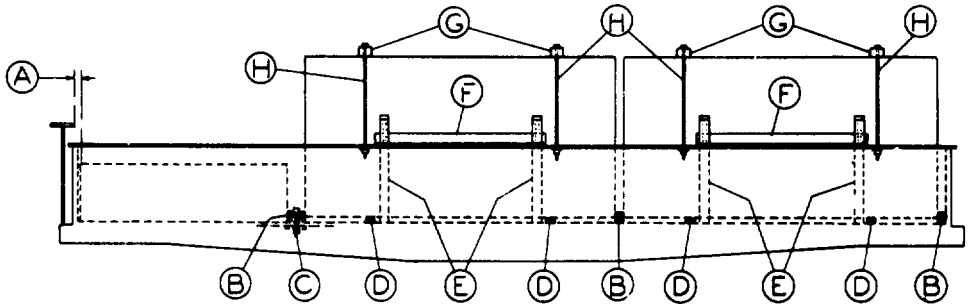
(CAR NO. 1 ;THREE-CAR-SHIPMENT) ARGES, BOLTED, SECTIONAL, FOR LIQUID OR DRY CARGO, SECURED WITH CLAMPS AND RODS-GONDOLA CARS

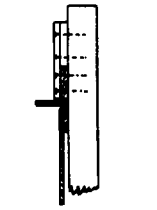


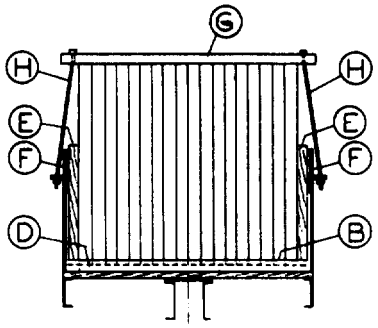
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	3	End and intermediate floor blocks, as shown, length about equal to inside width of car, width to suit, height sufficient to' contact bottom of lading.
C	2	3/4 in. dia. bolt, long enough to pass through Item "B" and floor.
D	2 ea. pile.	Floor bearing pieces, as shown, length about equal to inside width of car, width to suit, height sufficient to keep lading off floor. Width must exceed height.
E	2	Crosswise spacers, as shown, dimensions to suit. Locate on top of and secure to Item "D" to prevent displacement.
F	4	Vertical fillers, as shown, length and width to suit, thick enough to completely fill space between lading and car sides.
G	1 ea. pr of Items "F"	Horizontal ties, as shown. Secure to each Item "F" with four 10-D nails. When it cannot be placed between vertical filler and car end, secure same to outside face of each vertical filler as near top of car end as possible with four 10-D nails. Use suitable filler above same, cover filler and tie with one 1 in. x 4 in. x 12 in. piece, secured to vertical and horizontal fillers with three 10-D nails in each. (See Details Items "F" and "G".)
H	2 ea. pile.	6 in. x 8 in., as shown, with 1/2 in. dia. bolt at each end to prevent splitting.
J	2 ea. Item "H".	7/8 in. diameter rods, as shown, passed through Item "H" and top side angle.
K	2 per pile.	1 1/2 in. x 1 1/2 in. angles, as shown, securely bolted to barge sections, to retain load in upright position.
L	As required.	Suitable fillers, as shown, secured to Items "H".
M	8	Cleats, dimensions to suit, securely nailed to Items "H" and "L".

See General Rules, 4, 5, 7, 9, 10, 11, 14 and 15 for further details.

CAR NO. 2 (THREE-CAR-SHIPMENT) BARGES, BOLTED, SECTIONAL, FOR LIQUID OR DRY CARGO, SECURED WITH CLAMPS AND RODS-GONDOLA CARS



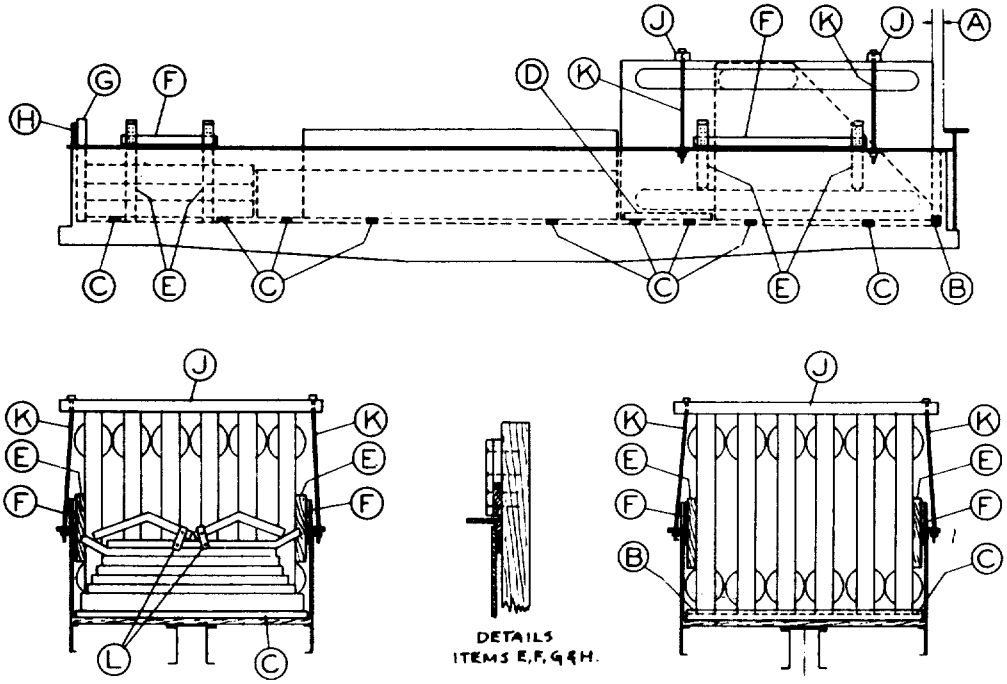




Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	3	End and intermediate floor blocks, as shown, length about equal to inside width of car, width to suit, height sufficient to contact bottom of lading.
C	2	3/4 in. dia. bolt, long enough to pass through Item "B" and floor.
D	2 ea. pile.	Floor bearing pieces, as shown, length about equal to inside width of car, width to suit, height sufficient to keep lading off floor. Width must exceed height.
E	2 pr. per pile.	Vertical fillers, as shown, length and width to suit, thick enough to completely fill space between lading and car sides.
F	1 ea. pr. of Items "E".	Horizontal ties, as shown. Secure to each Item "E" with four 10-D nails. When it cannot be placed between vertical filler and car side, secure same to outside face of each vertical filler as near top of car side as possible with four 10-D nails. Use suitable filler above same, cover filler and tie with one 1 in. x 4 in. x 12 in. piece, secured to vertical and horizontal fillers with three 10-D nails in each. (See Details Items "E" and "F".)
G	2 ea. pile.	6 in. x 8 in., as shown, with 1/2 in. dia. bolt at each end to prevent splitting.
H	2 ea. Item "G".	7/8 in. diameter rods, as shown, passed through Item "G" and top side angle.

See General Rules 4, 5, 7, 9, 10, 11, 14 and 15 for further details.

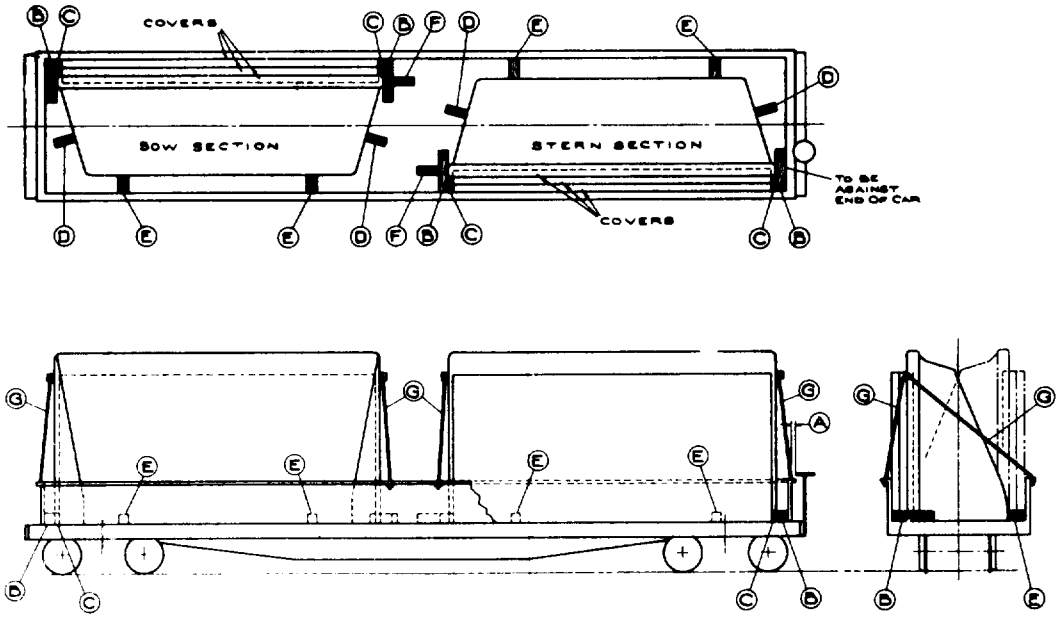
CAR NO. 3 (THREE-CAR-SHIPMENT) BARGES BOLTED, SECTIONAL, FOR LIQUID OR DRY CARGO, SECURED WITH CLAMPS AND RODS-GONDOLA CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	1	End floor block, as shown, length about equal to inside width of car, width to suit, height sufficient to contact bottom of lading.
C	9	Floor bearing pieces, as shown, length about equal to inside width of car, width to suit, height sufficient to keep lading off floor. Width must exceed height.
D	2	Longitudinal end blocking for short section of barge. Locate on top of and secure to Items "C" with two 20-D nails at each location.
E	2 pr. ea. end pile.	Vertical fillers, as shown, length and width to suit, thick enough to completely fill space between lading and car sides.
F	1 ea. pr. of Items "E"	Horizontal ties, as shown. Secure to each Item "E" with four 10-D nails. When it cannot be placed between vertical filler and car side, secure same to outside face of each vertical filler as near top of car side as possible with four 10-D nails. Use suitable filler above same, cover filler and tie with one 1 in. x 4 in. x 12 in. piece, secured to vertical and horizontal fillers with three 10-D nails in each. (See Details Items "E", "F", "G" and "H".)
G	2	Vertical end fillers, as shown, length and width to suit, thick enough to completely fill space between lading and end of car.
H	1	Horizontal tie, as shown. Secure to each Item "G" with four 10-D nails. When it cannot be placed between vertical filler and car end, secure same to outside face of each vertical filler as near top of car end as possible with four 10-D nails. Use suitable filler above same, cover filler and tie with one 1 in. x 4 in. x 12 in. piece, secured to vertical and horizontal fillers with three 10-D nails in each. (See Details Items "E", "F", "G" and "H".)
J	2	6 in. x 8 in., as shown, with 3/4 in. dia. bolt at each end to prevent splitting.
K	2 ea. Item "J"	7/8 in. dia. rods, as shown, passed through Item "J" and top side angle.
L	4	Tie plates securely bolted to hold barge sections together and prevent displacement.

See General Rules 4, 5, 7. 9, 10, 11, 14 and 15 for further details.

CAR NO. 1 (TWO-CAR-SHIPMENT) BARGES, BOLTED, SECTIONAL, FOR DECK CARGOES-GONDOLA CARS



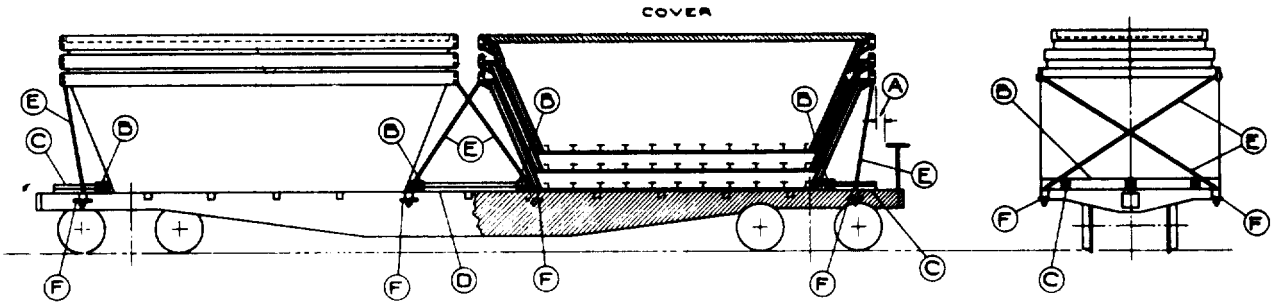
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	4	8 in. x 8 in., length to suit. Locate against ends of units, as shown, and secure each to floor with two 3/4 in. dia. bolts.
C	4	Filler block, 8 in. in height, length and thickness to suit, toe-nailed to Items "B".
D	4	6 in. x 8 in. x 24 in. Locate against sides of end sections, suitably spaced, as shown, and secure each with two 3/4 in. dia. bolts.
E	4	6 in. x 8 in., length to suit. Locate suitably spaced between units and car sides, as shown, and toe-nail each to floor with six 40-D nails.
F	2	6 in. x 8 in. x 24 in. Locate against inside Items "B", as shown, and secure each to floor with two 3/4 in. dia. bolts.
G	8	1 in. dia. rods. Attach to top of end sections, as shown, and pass through top side angles.

Each unit consisting of bow or stern sections, and three covers, must be adequately secured together at top with two 7/8 in. dia. rods.

Units must be loaded in diagonal corners of car

See General Rules 4, 5, 9, 11, 14 and 15 for further details.

CAR NO. 2 (TWO-CAR-SHIPMENT) BARGES, BOLTED, SECTIONAL, FOR DECK CARGOES-FLAT CARS

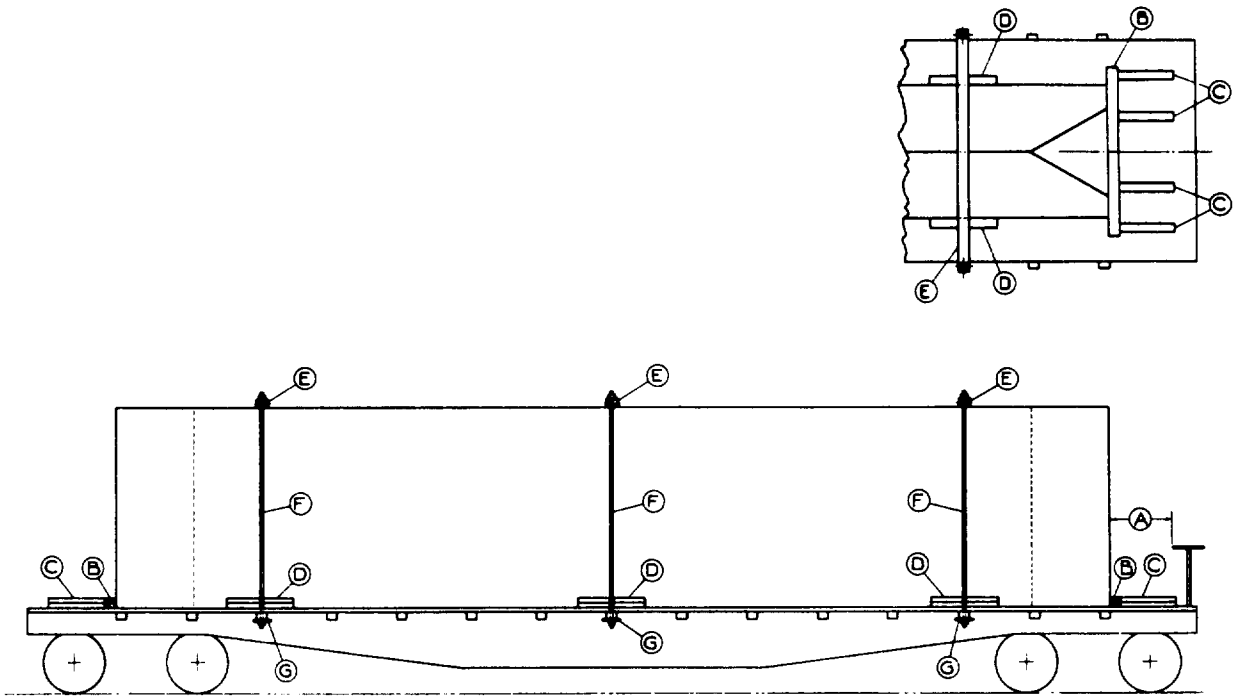


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	4	6 in. x 8 in., length to suit. Locate against ends of unit, as shown, and secure each to floor with four 3/4 in. dia. bolts.
C	6	Each to consist of two pieces of 2 in. x 4 in. x 36 in. Locate, as shown, suitably spaced against outside Items "B", and secure lower piece to floor with six 30-D nails and top piece to one below in like manner.
D	3	Each to consist of two pieces of 2 in. x 4 in., length to fully fill space between inside Items "B", suitably spaced. Secure lower piece to floor with four 30-D nails and top piece to one below in like manner.
E	8	1 in. dia. rods. Attach to each end of unit, as shown, and pass through opposite stake pockets. And Item "F".
F	8	1/2 in. x 4 in. x 10 in. plates.

Covers attached to barge sections must be adequately secured with bolts.

See General Rules 4, 5, 9, 11, 14 and 15 for further details.

BARGES, TWO-SECTION-FLAT OR GONDOLA CARS

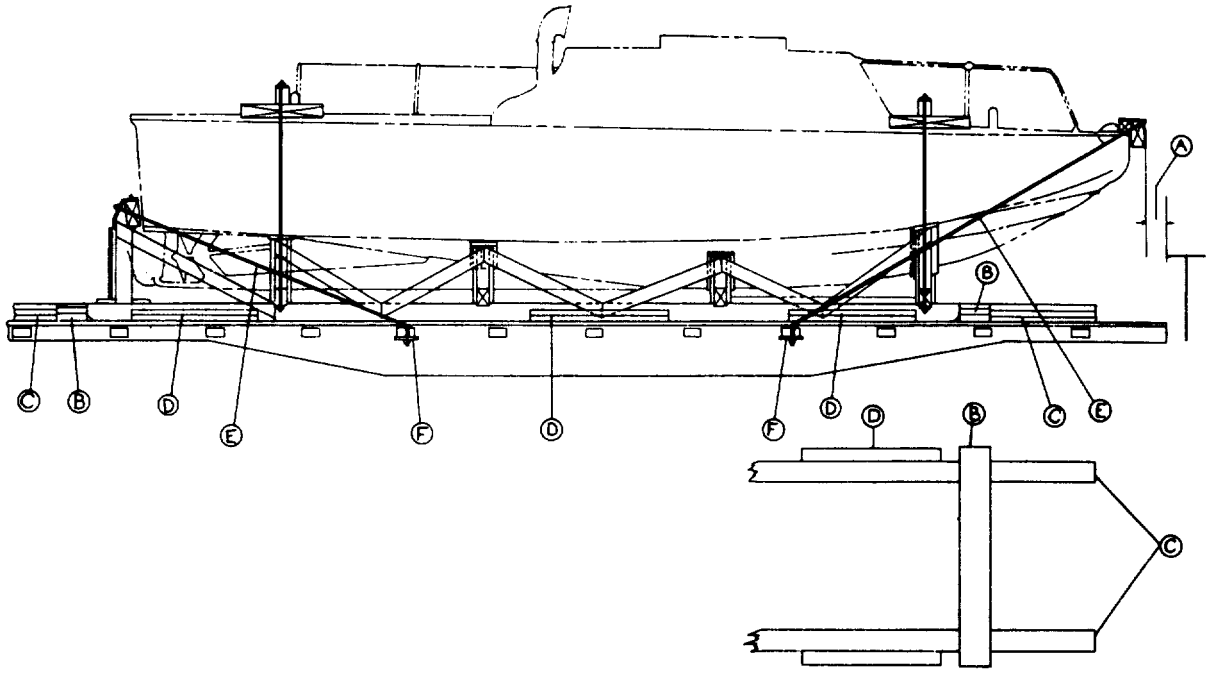


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	2	Each to consist of two pieces of 2 in. x 6 in., length to suit. Locate against ends of units, as shown, and secure lower piece to floor and, with eight 30-D nails and top piece to one below in like manner.
C	8	Each to consist of two pieces of 2 in. x 4 in. x 36 in. Locate against Item "B", suitably spaced, As shown, and secure lower piece to floor with six 30-D nails and top piece to one below in like manner.
D	6	Each to consist of two pieces of 2 in. x 4 in. x 36 in. Locate against each side of units, suitably spaced, as shown, and secure lower piece to floor with six 30-D nails and top piece to one below in like manner.
E	3	4 in. x 6 in., length to suit. Use one bolt; 1/2 in. dia., crosswise, at each end, to prevent splitting
F	2 ea. Item "E"	7/8 in. dia. rods with plate washers. Pass through Items “E", stake pocket, and Items "G". On units loaded in gondola cars, rods may be attached to top side angle.
G	As required.	1/2 in. x 4 in. x 10 in. plates.

Barge sections must be secured together at top of load with two 7/8 in. dia. rods, suitably spaced.

See General Rules 4, 5, 9, 11, 14 and 15 for further details.

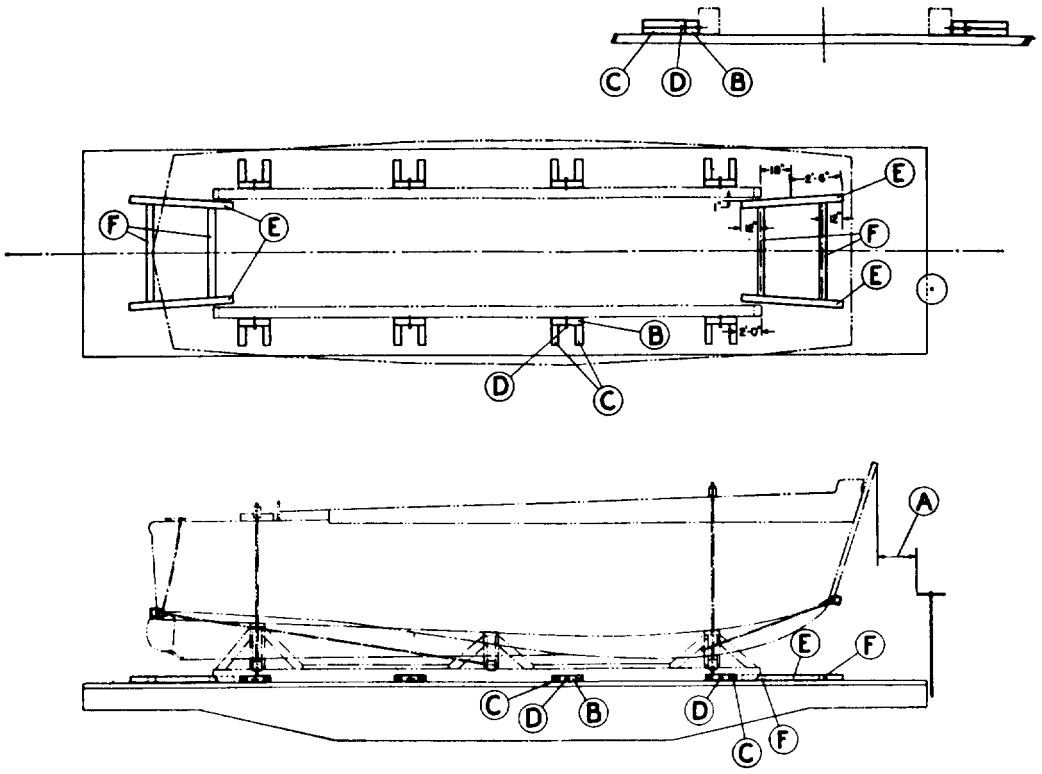
Sec. 6-Fig. 20 (Rev.-10-1968)
BOATS IN CRADLES-FLAT OR GONDOLA CARS



Item	No. of Pca.	Description
A		Brake wheel clearance. See Fig. 2.
B	2	Each to consist of three pieces of 2 in. x 6 in., length to suit. Locate at ends of cradles, as shown, And secure lower piece to floor with six 80-D nails and top pieces to those below in like manner.
C	4	Each to consist of three pieces of 2 in. x 4 in. x 36 in. Locate suitably spaced, as shown, against Item "B" and secure lower piece to floor with six 80-D nails and top pieces to those below in like manner.
D	6	Each to consist of two pieces of 2 in. x 4 in. x 24 in. Locate suitably spaced, as shown, against cradle and secure lower piece to floor with four 80-D nails and top piece to one below in like manner.
*E	4	3/4 in. dia. rods. Attach to each corner of cradle, as shown, and pass through stake pocket and Item "F", or through floor. Substitute, if desired, 1/2 in. diameter 6 x 19 IWRO wire rope applied in a complete loop and secured with three cable clips. All sharp edges at points of attachment to the car and commodity are to be protected with 1/2 in. thimbles secured to the cable with one cable clip for each thimble.
F	As required.	1/2 in. x 4 in. x 10 in. plates. Cradles must be strong enough to prevent failure in transit. Boats must be adequately secured to cradles.

See General Rules 4, 5, 9, 11, 14 and 15 for further details.

BOATS, LANDING CRAFT, IN CRADLES-FLOATING TYPE LOAD-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	8	4 in. x 4 in. x 18 in. Locate, as shown, against cradle longitudinal skid members. Secure each to floor with four 60-D nails. Pre-drill for 60-D nails and Items "D".
C	2 ea. Item "B".	Each to consist of two pieces of 2 in. x 4 in. x 12 in. Locate against Items "B", as shown. Secure lower piece to floor with three 30-D nails and top piece to one below in like manner.
D	1 ea. Item "B".	1/2 in. x 6 in. lag screws. Locate in pre-drilled hole in Items "B" and turn into cradle skid a minimum of 1/2 in. All Items "D" to be turned into skid members an equal distance.
E	4	4 in. x 4 in. x 5 ft. Locate as shown. Secure each to floor with seven 60-D nails.
F	4	4 in. x 4 in. length and cut to suit. Locate as shown and secure each to floor with five 60-D nails.

Cradles must be strong enough to prevent failure in transit.

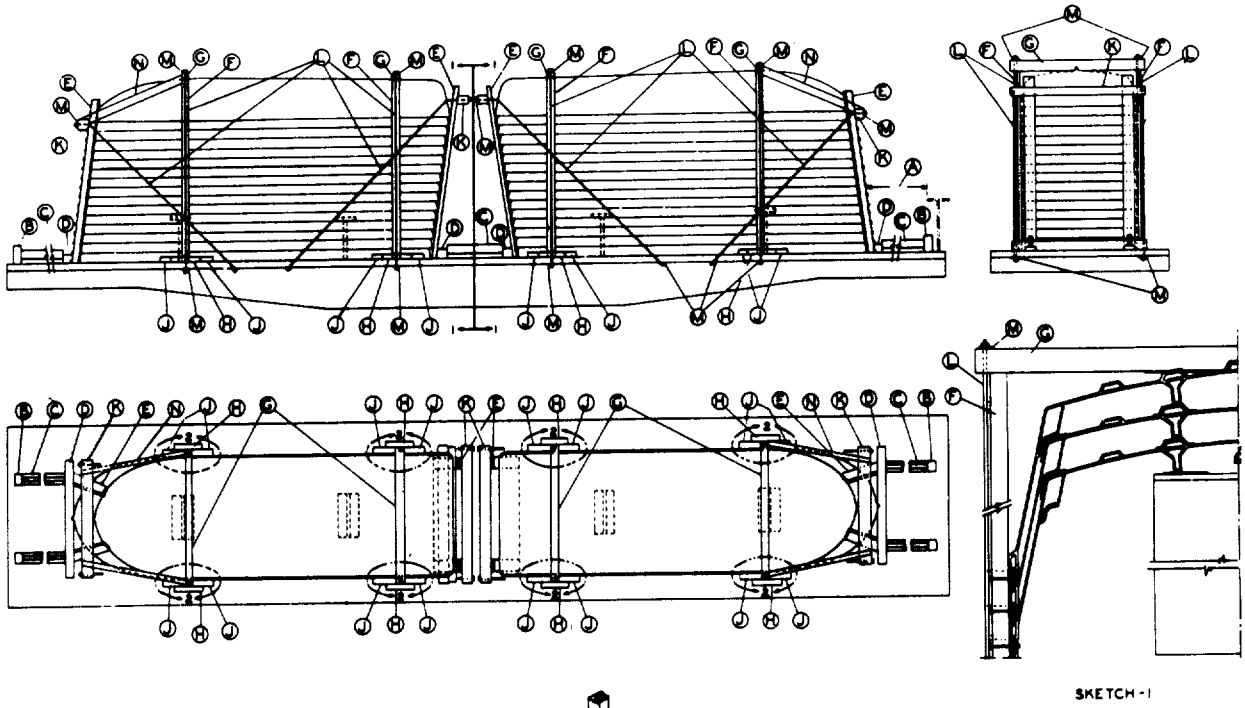
Boats must be adequately secured to cradles.

Units must have a minimum of 6 ft. of vacant floating space at each end.

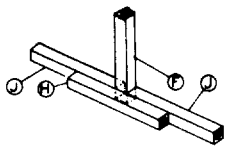
See General Rules 4, 5, 7, 9, 11, 14, 15 and 19-A for further details.

Sec. 6-Fig. 21-A (New-1-1962)

ASSAULT BOATS, NESTED, RACKED-FLAT OR GONDOLA CARS



SKETCH - 1

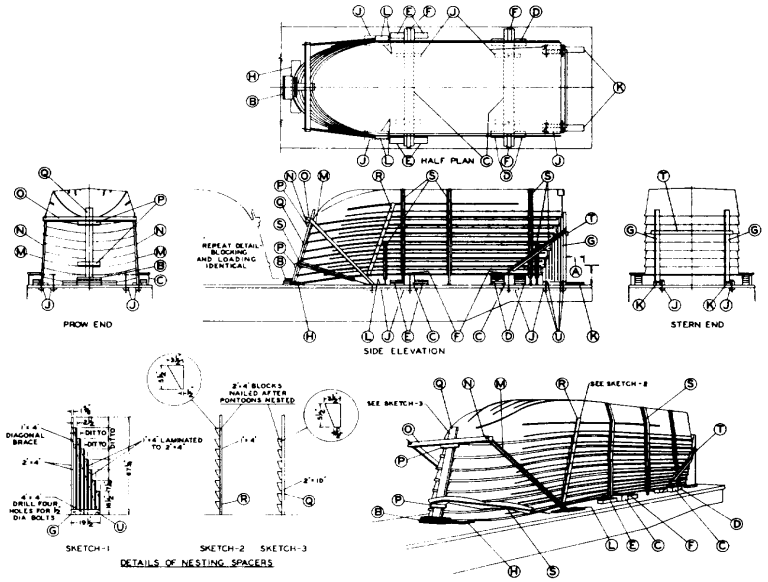


SKETCH - 2

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4	End stakes, secured in end stake pockets. Not required when loaded in gondola cars.
C	6	Each to consist of two 2 in. x 6 in. pieces, length to suit, nailed together to form an inverted "T" and secured' to car floor with 16-D nails, to fill space between Items "B" and "D".
D	4	4 in. x 6 in., length to suit, located at ends of stacks as shown and secure to car floor with four 40-D nails.
E	8	2 in. x 6 in., length to suit, located vertically against ends of stacks as shown.
F	8	4 in. x 4 in., length to suit, vertical uprights with supporting blocks bolted to sides as shown in Sketch 1 for racking the boats.
G	4	4 in. x 4 in., length to suit, cross-ties shaped to fit top boat per Sketch 1.
H	8	4 in. x 6 in., length to suit, secured to car floor with 16-D nails.
J	16	4 in. x 6 in., length to suit, secured to car floor with 16-D nails.
K	4	4 in. x 6 in., length to suit, located as shown at top ends of stacks.
L	16	1/2 in. diameter steel rods secured to cross-ties, Items "G", also to Items "K" and through car floor, to provide tie-down of stacks and diagonal bracing.
M	As required.	1/2 in. x 4 in. x 10 in. plates.
N	4	3 in. x 4 in., length to suit, support braces tapered as required, locate as shown. Toe-nail at each end with 30-D nails.

See General Rules 3 4, 5, 7, 9, 14, 15 and 19-A for further details.

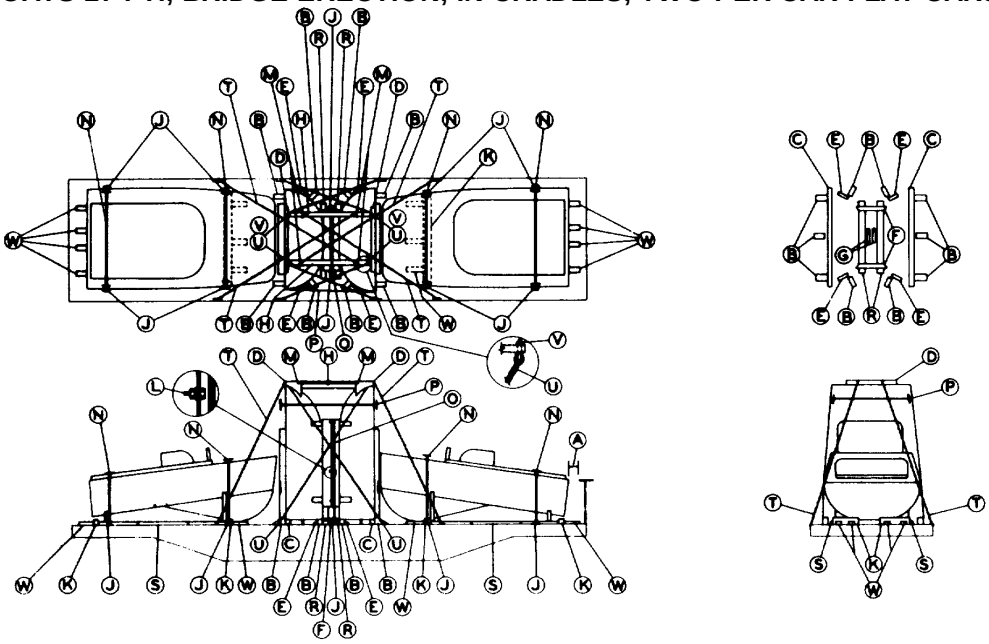
Sec. 6-Fig. 21-B (New-9-1963)
PONTOONS, ONE OR MORE STACKS, EIGHT EACH-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	1 ea. stack.	Each to consist of four pieces of 2 in. x 10 in. x 24 in. Locate as shown against Item "Q". Secure lower piece to car floor with six 20-D nails and top pieces to one below in like manner.
C	2 ea. stack.	Bearing pieces, 10 in. x 10 in. x 109 in. Locate as shown and secure with two 2 in. dia. bolts x length to suit to extend thru car floor and Items "J".
D	4 ea. stack.	Each to consist of six pieces of 2 in. x 6 in. x length to suit. Locate against Items "C" at stem of pontoon, as shown. Secure lower piece to car floor with five 20-D nails and top pieces to one below in like manner.
E	4 ea. stack.	Each to consist of three pieces of 2 in. x 6 in. x 14 in. Locate against Items "C" at prow of pontoon and secure lower pieces to car floor with five 20-D nails and top pieces to one below in like manner.
F	4 ea. stack.	2 in. x 6 in. x 11. Locate against each side of unit, as shown. Secure to Items "C" with five 20-D nails.
G	2 ea. stack.	Fabricate as shown per Sketch 1. Secure each with four 1/2 in. dia. bolts, Items "U".
H	1 ea. stack.	Each to consist of two pieces of 2 in. x 6 in. x 18 in., cut to fit curvature of prow. Locate as shown and secure lower piece to car floor with five 20-D nails and top piece to one below in like manner.
J	8 ea. stack.	4 in. x 4 in. x 18 in., hardwood cleats or 1/2 in. x 4 in. x 18 in. steel plates, located as shown under car floor.
K	2 ea. stack.	Each to consist of two pieces of 2 in. x 6 in. x 24 in. Locate as shown and secure lower piece to car floor with six 20-D nails and top piece to one below in like manner.
L	4 ea. stack.	2 in. x 4 in. x 12 in. Locate as shown and secure with three 20-D nails to car floor.
M	2 ea. stack.	2 in. x 4 in. x 72 in., cut to correct angle and located as shown. Secure with two 1/2, in. dia. bolts, length to suit. Bolt and secure bottom to blocks Items "L" on car floor. Secure top with three 10-D nails per unit.
N	2 ea. stack.	Rod, 1/2 in. dia., length to suit, threaded at both ends. Locate as shown.
O	1 ea. stack.	4 in. x 4 in. x 72 in. Locate as shown and secure with four 30-D nails to Item "Q".
P	2 ea. stack.	2 in. x 4 in. x 13 in. Locate as shown and secure with three 12-D nails to Item "Q".
Q	1 ea. stack.	Fabricate as shown per Sketch 3.
R	2 ea. stack.	Fabricate as shown per Sketch 2.
S	7 ea. stack.	1 1/4 in. x .050 in. high tension bands. Locate as shown, with rubber or other similar padding as required. Secure to Pattern 84 anchor plates. Secure each plate to car floor with eight 20-D cement coated nails.
T	1 ea. stack.	2 in. x 4 in., length to suit. Locate as shown. Secure to Item "G" with three 12-D nails.
U	8 ea. stack.	1/2 in. dia. bolt, length to suit. Locate as shown for securement of Items "G".

See General Rules 3, 4, 5, 7, 9, 14 and 15 for further details.

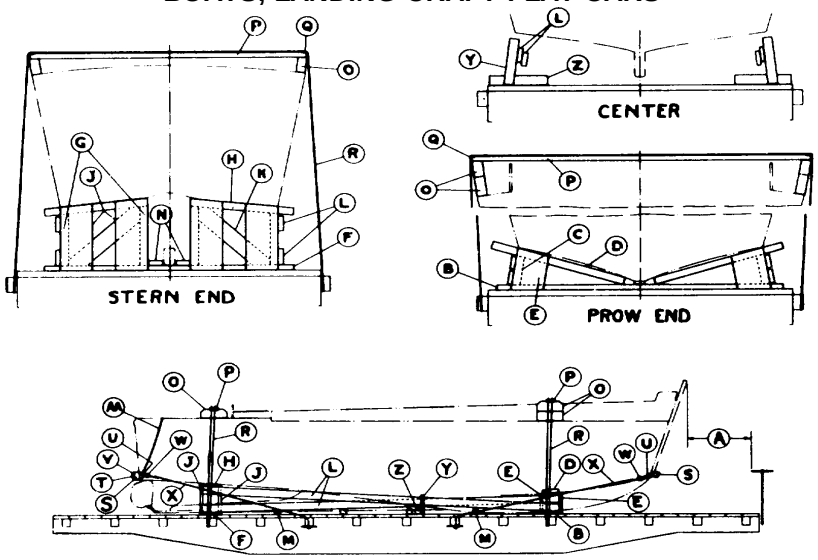
Sec. 6-Fig. 21-C (New-10-1966)
BOATS 27 FT., BRIDGE ERECTION, IN CRADLES, TWO PER CAR-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	10	Block pattern 67. Nailed to car floor with three 60-D nails and two 30-D nails, and toe-nail each side with two 30-D nails.
C	2	4 in. x 4 in. x 96 in. nailed to floor with 40-D nails spaced 8 in. apart.
D	2	2 in. x 4 in. x 48 in. placed at top of forward end of bow sections and secured under Item "T".
E	4	4 in. x 4 in. x 24 in., top, tapered entire length of 3 1/4 in. thickness at one end and wedged under bow sections as shown. Toe-nailed to car floor with three 16-D nails.
F	2	2 in. x 4 in. x length cut to suit. Ends cut to fit contour of bow section. Nailed to Item "R" with two 16-D nails at each joint.
G	2	3 1/4 in. x 4 in. x 24 in. for bow section cradles to rest upon. Nailed to car floor with three 40-D nails.
H	2	4 in. x 4 in. x 51 1/2 in.; ends notched to fit within the knee brackets.
J	10	Metal anchor plates; fastened to car. floor with eight 20-D cement coated nails
K	6	4 in. x 4 in. x length cut to suit. Pieces placed crosswise against each end of each of the stern section cradles and nailed to floor with 60-D nails placed 6 in. apart.
L	8	Steel bolts, 3/8 in. x 1 1/4in. with flat washer, lock washer and nut, fastening cradles of bow sections together. Four to each side of cradles.
M	4	Steel bolts 7/8 in. x 6 in. with fiat washer, lock washer and nut. Placed through knee brackets.
N	4	Girth strap, high tension band 2 in. x .050 in. x length as required, fastened to floor by anchor plates Item "J".
O	1	Hold down, high tension band 1 1/4 in. x .050 in. x 25 feet long, placed over one cradle base Fastened to the car floor by anchor plates Item "J".
P	1	Girth strap, high tension band 1 1/4 in. x .050 in. x 28 feet long. Place around both bow sections.
R	2	3 in. x 6 in. x 72 in. nailed to car floor with 40-D nails spaced 8 in. apart.
S	4	2 in. x 4 in. x 48 in. side blocking for stern sections cradles, nailed to car floor with six 20-D nails.
T	4	Each to consist of 6 strands of No. 8 gage annealed wire. Pass through stake pockets to top bolts, Item "M" on upright bow ends of boats.
U	4	Each to consist of 6 strands of No. 8 gage annealed wire. Pass through stake pockets to top eye bolts, Item "V", on upright bow end of boat.
V	4	Each to consist of a shoulder nut eye with nuts and lock washers inserted through 1 in. pipe spacer 3 3/4 in. long. Bolts to be 3/4 in. diameter with a 6 in. long shank.
W	14	2 in. x 4 in. x 12 in. longitudinal blocks placed against Item "K" and nailed to car floor with 40-D nails spaced 3 in. apart.

See General Rules 4, 5, 7, 9, 14 and 15 for further details.

Sec. 6-Fig. 22
BOATS, LANDING CRAFT-FLAT CARS

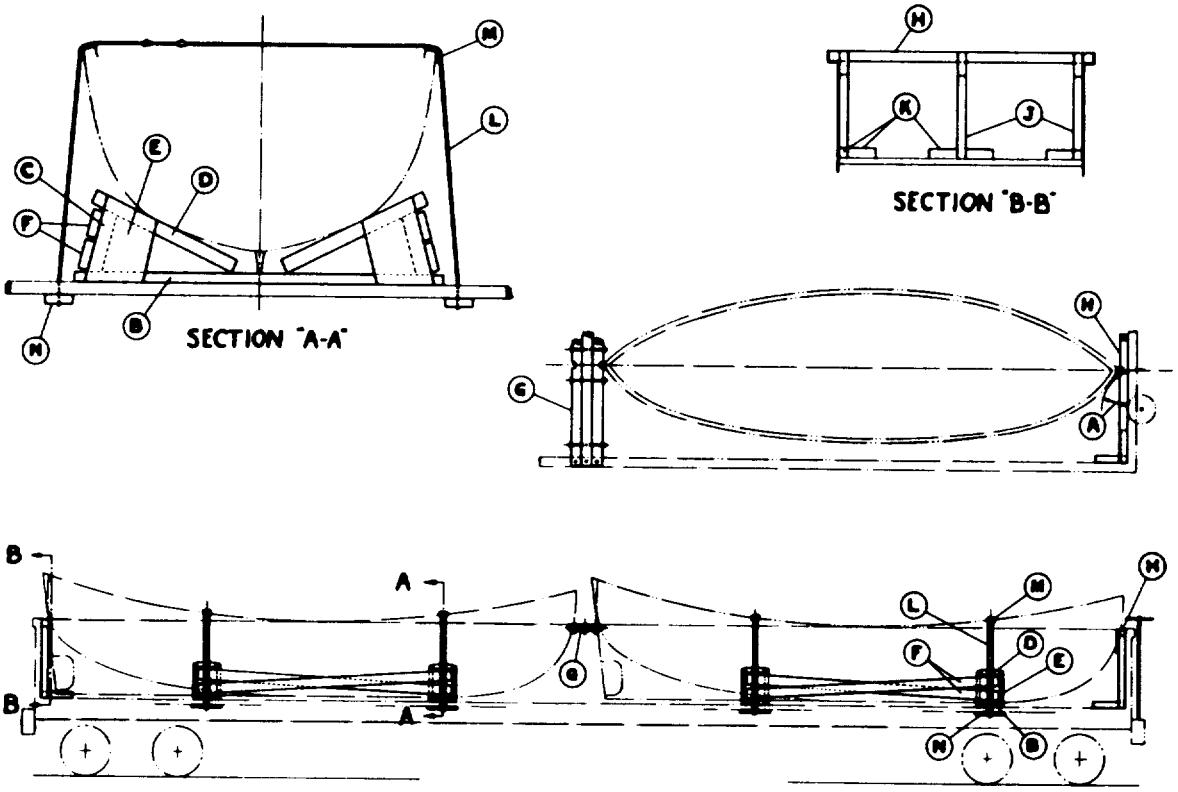


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	1	2 in. x 12 in., length to suit. Locate on floor under prow end of boat, as shown, and secure with eight 30-D nails.
C	2	3 in. x 12 in., length to suit. Locate, as shown, and secure to Item "B" with three 30-D nails before application of Item "B"
D	2	3 in. x 12 in., length to suit. Locate, as shown, and secure to Items "B" and "C" with three 30-D nails at each location.
E	4	2 in. x 12 in., length and cut to suit. Locate, as shown, and secure to Items "B" and "D" with three 30-D nails at each location.
F	1	2 in. x 12 in., length to suit. Locate on floor under stern end of boat, as shown, and secure with eight 30-D nails.
G	4	3 in. x 12 in., length to suit. Locate, as shown, and secure each to Item "F" with three 30-D nails before application of Item "F"
H	2	3 in. x 12 in., length to suit. Locate, as shown, and secure to Items "G" with three 30-D nails at each location.
J	8	2 in. x 12 in., length and cut to suit. Locate, as shown, and secure to Items "F", "G" and "H" with three 30-D nails at each location.
K	2	2 in. x 6 in., length and cut to suit. Locate, as shown, and secure to Items "F", "H" and "G" with two30-D nails at each location.
L	4	2 in. x 6 in., length to suit. Locate, as shown, and secure to each Item "C" and outside Items "G" with three 30-D nails at each location.
M	4	4 in. x 6 in., wedges. Locate suitably spaced under keel, as shown, and secure each to floor with two 30-D nails.
N	2	2 in. x 6 in. x 12 in. Locate, as shown, and secure each to Item "F" with two 30-D nails.
O	4	Filler pieces, length, height and width to suit, minimum thickness 4 in. Locate, as shown.
P	2	2 in. x 6 in., length to suit. Locate, as shown, and secure to Items "O" with two 30-D nails at each location.
Q	4	Protection angles, 20 gage, 4 in. wide, applied so as to prevent displacement.
R	2	5/8 in. x 6 x 7 steel cable, doubled. Locate, as shown, over Items "O", "P" and "Q", and pass through opposite stake pockets.
S	3	4 in. x 6 in., length to suit. Locate, as shown, one on prow and two on stern end.
T	1	3/16 in. x 3 in. x 7 ft. metal bridle support, attached to Items "U" and "S" on stern end.
U	4	3/16 in. x 3 in. metal bridle straps. Locate over each end of Item "S" on prow end and outside ends of Items "S" and "V" on stern end.
V	2	4 in. x 6 in., length and tapered to suit. Secure to outside ends of Items "S" on stern end.
W	4	3/4 in. bolts. Attach to Items "U" and "X", as shown.
X	4	3/4 in. diameter rods. Attach to each Item "U" and pass through stake pockets and 1/2 in. x 4 in. x 12 in. plate, as shown.
Y	2	2 in. x 4 in., length to suit. Locate, as shown, and secure to Items "L" and "Z" with three 30-D nails at each location.
Z	2	4 in. x 6 in., length to suit. Locate, as shown, and toe-nail each to floor with four 30-D nails.
AA	2	1/2 in. diameter rod. Secure to top of boat and to Items "U" on stern end, as shown.

See General Rules 4, 5, 7, 9, 11, 14, 15 and 19-A for further details.

Sec. 6-Fig. 23

BOATS-MOTOR WHALE-GONDOLA CARS

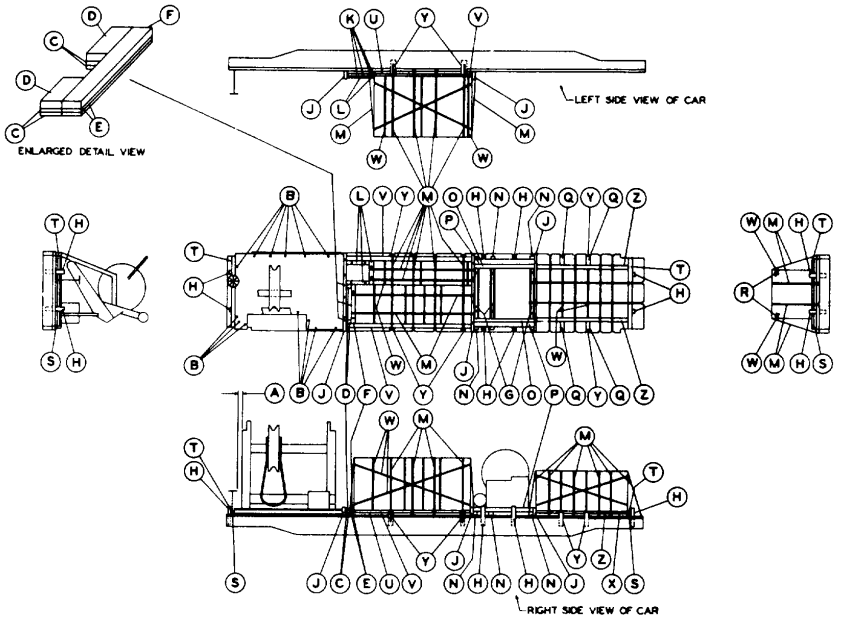


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	4	2 in. x 12 in., length to suit. Locate, as shown and secure each to floor with eight 30-D nails.
C	8	3 in. x 12 in., length to suit. Locate, as shown, and secure to Items "B" with three 30-D nails before application of Items "B".
D	8	3 in. x 12 in., length to suit. Locate, as shown, and secure to Items "B" and "C", with three 30-D nails at each location.
E	16	2 in. x 12 in., length and cut to suit. Locate, as shown, and secure to Items "B" and "D" with three 30-D nails at each location.
F	8	2 in. x 6 in., length to suit. Locate, as shown, and secure to each Item "C" with three 30-D nails.
G	3	4 in. x 6 in., length equal to outside width of car. Secure each to car sides with 1/2 in. diameter bolts. Outside Items "G" notched as shown for boat keels. Apply four 5/8 in. diameter split bolts suitably spaced, as shown, through all Items.
H	2	4 in. x 5 in., length to suit. Locate as shown, against ends of car, supported by and securely nailed to each Item "J" with 1 in. x 4 in. x 12 in. cleats, as shown.
J	6	4 in. x 4 in., length equal to distance from floor to underside of Items "H". Locate, as shown.
K	12	4 in. x 4 in. x 15 in. Locate, as shown, to secure Items "J" in position and secure each to floor with three 30-D nails.
L	4	5/8 in. x 6 x 7 steel cable, doubled. Locate, as shown, passed over top of boat, through floor and Items "N".
M	8	Rubber or other similar padding, as required. Locate under cable, as shown.
N	8	2 in. x 4 in. x 8 in., drilled to match cable holes through floor, located as shown.

When boats do not fill entire space between Items "H" at each end of car, sufficient dunnage must be placed between Items "H" and ends of car to completely fill vacant space.

See General Rules 4, 5, 9, 11, 14, 15 and 19-A for further details.

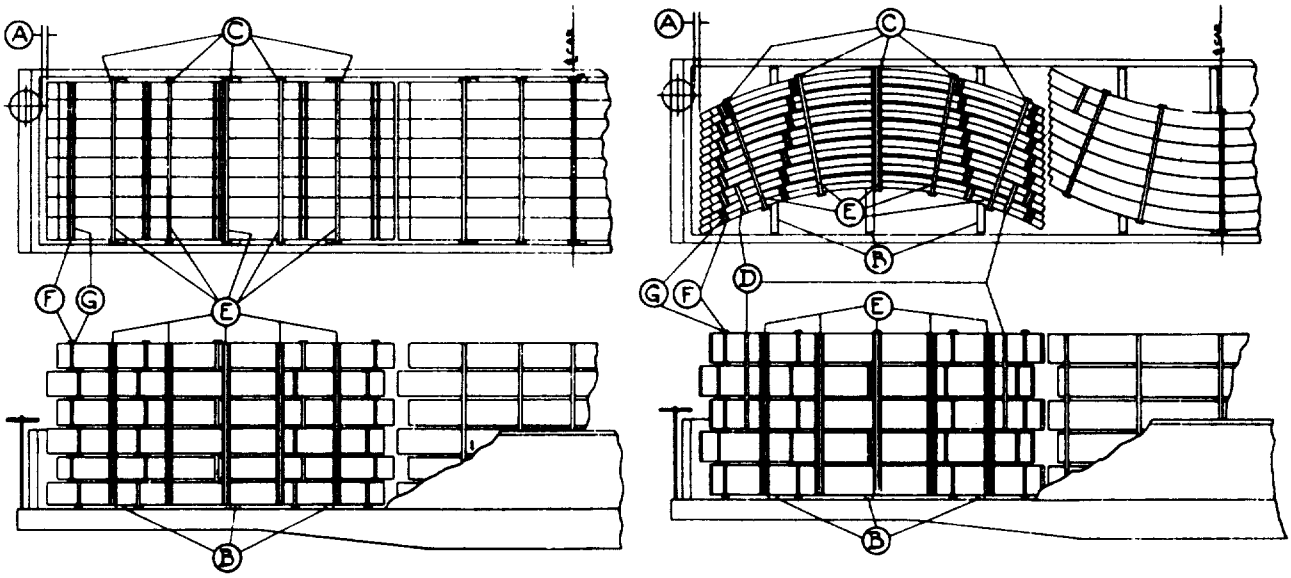
Sec. 6-Fig. 23-A (New-9-1963)
HOIST MECHANISM GROUP (SONAR DEVICE)-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	13	7/8-9-NC-2 x 5 1/2 in. Hex. or sq. hd. bolts with nuts and washers. To secure shipping skid to car floor.
C	2 sets	Each to consist of two pieces of 3 in. x 6 in. x 1 ft. 8 in., hardwood. Secure lower piece to floor with four 60-D nails and top piece to one below in like manner.
D	2	4 in. x 6 in. x 1 ft. 8 in., hardwood. Locate on top piece of Item "C" and secure with four 60-D nails.
E	2	3 in. x 6 in. x 5 ft. 3 in., hardwood. Locate pieces on floor, one on top of another, place Item "F" on top and secure with two 7/8-9-NC-2 Hex or sq. hd. bolts with nuts and washers through car floor.
F	1	4 in. x 6 in. x 5 ft. 3 in., hardwood. Locate on top of Item "E" and secure as noted in Item "E".
G	3	4 in. x 4 in. x 7 ft., hardwood. Locate each on top of each of Item "N" and secure each with two 7/8-9-NC-2 Hex or sq. hd. bolts, long enough to pass through Item "N" and floor of car, with nut and washers.
H	8	Hardwood stakes per General Rule 10, Sec.,1. Long enough to extend 10 in. above top of car floor.
J	3	4 in. x 12 in. x 10 ft., hardwood. Secure to floor with four 7/8-9-NC-2 Hex or sq. hd. bolts with nuts and washers.
K	3 sets	Each to consist of two pieces of 3 in. x 6 in. x 3 ft. 2 in., hardwood. Locate pieces on floor one on top of another, place Item "L" on top and secure with two 7/8-9-NC-2 Hex or sq. hd. Bolts with nuts and washers through car floor.
L	3	4 in. x 6 in. x 3 ft. 2 in., hardwood. Locate on top of Item "K" and secure as noted in Item "K".
M	14	2 in. x .050 in. high tension bands, encircling entire pile.
N	3	6 in. x 6 in. x 9 ft. 2 in., hardwood. Locate on car floor and secure as noted in Item "G".
O	2	4 in. x 6 in. x 7 ft. 2 in., hardwood. Locate on top of Item "N" and secure with three 7/8-9-NC-2 bolts with nuts and washers.
P	2	6 in. x 6 in. x 7 ft. 2 in., hardwood. Locate on top of Item "N" and next to Item "O" and secure with three 7/8-9-NC-2 bolts, long enough to pass through Item "N" and car floor, with nuts and washers.
Q	As required.	3 in. x 4 in. x length as required, hardwood. Locate between Item "Z" and Item "Y" and secure to floor with 60-D nails.
R	As required.	1 1/4 in. anchor plates.
S	2	4 in. x 6 in. x 9 ft., hardwood. Secure to floor with eleven 60-D nails.
T	2	3 in. x 6 in. x 9 ft., hardwood. Locate on top of Item "S" and secure with eleven 60-D nails.
U	2	4 in. x 6 in. x 16 ft. 2 in., hardwood. Secure to floor with nineteen 60-D nails.
V	2	3 in. x 6 in. x 16 ft. 2 in., hardwood. Locate on top of Item "U" and secure with nineteen 60-D nails.
W	As required.	1 1/4in. x .050 in. high tension bands, encircling individual piles.
X	2	4 in. x 6 in. x 11 ft. 8 in., hardwood. Secure to floor with fourteen 60-D nails.
Y	As required.	Hardwood side stakes per General Rule 10, Sec. 1. Long enough to extend 7 in. above top of car floor.
Z	2	3 in. x 6 in. x 11 ft. 8 in., hardwood. Locate on top of Item "X" and secure with fourteen 60-D nails.

See General Rules 3, 4, 5, 7, 9, 10, 14 and 15 for further details.

BUILDINGS, PREFABRICATED, STRAIGHT AND CURVED RIB CRATES-GONDOLA CARS



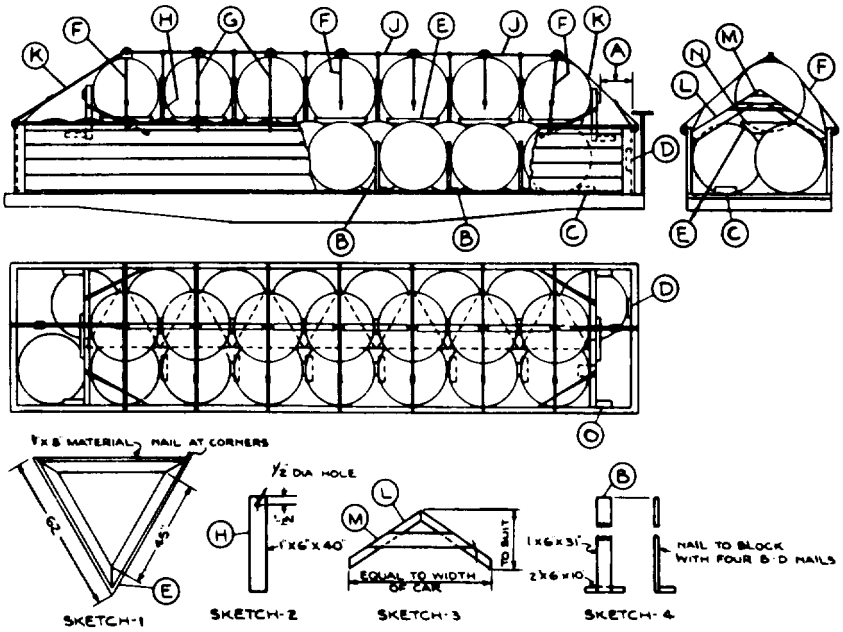
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	3 per pile.	2 in. x 4 in., length about 2 in. less than width of car. Locate one about 2 ft. from each end of pile.
C	10 per pile.	2 in. x 4 in., length equal to height of pile. Locate under Items "E" as shown
D	2 per pile.	1 1/4 in. x .035 in. high tension bands. Locate about 2 ft. from ends of pile. Bands to encircle about 6 crates and must go around one crate extending at least 4 in. below top-of car side as shown. Not required on straight rib crates.
E	5 per pile.	1 1/4 in. x .035 in. high tension bands. Locate end bands about 18 in. front ends of crate, intermediate bands to be equally spaced. On curved rib crates apply radially as shown.
F	5 per crate.	1 1/4 in. x .035 in. high tension bands. Locate end bands about 10 in. from each end of crate, intermediate bands to be equally spaced.
G	10 per crate.	1 in. x 3 in., length equal to width of crate. Locate under Item "F" top and bottom of crate.

Battens, Item "G", must be uniformly spaced so as to provide proper contact when stagger nested as shown.

On end piles locate battens on top row of crates inside of battens on next row below, as shown.

See General Rules 4, 5, 7, 9, 11 and 15 for further details.

Sec. 6-Fig. 25
BUOYS, MARINE-GONDOLA CARS

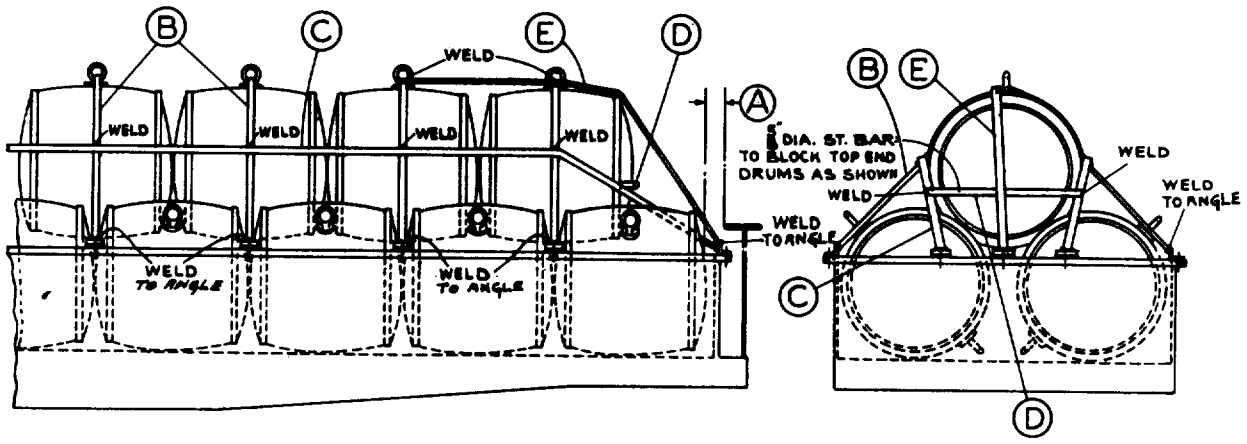


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	As required.	Vertical separators, per Sketch 4. Locate between buoys to prevent them from contacting each other and between buoys and end of car when steel end cars are used.
C	1	To consist of two pieces of 2 in. x 6 in. x 10 in. Locate as shown. Secure lower piece to floor, against buoy, with three 20-D nails and top piece to one below in like manner.
D	As required.	Suitable blocking to fill space between end buoy and end of car.
E	1 ea. top buoy.	Cradle, per Sketch 1. Locate under each top buoy.
F	3	1 1/4 in. x .035 in. high tension bands. Pass through hole in top plate of end and center buoys and attach to top of car sides.
G	4	3/4 in. x .035 in. high tension bands. Pass through hole in top plate of intermediate buoys and attach to top car sides.
H	As required.	1 in. x 6 in. x 40 in., vertical separators. Use one between each two buoys in top row. Secure to Items "J" with one strand of No. 8 ga. black annealed wire.
J	1 ea. two adjacent buoys.	1/4 in. x .035 in. high tension band. Pass through holes in top plates of buoys.
K	1 ea. end of load.	1 1/4 in. x .035 in. high tension band. Pass through hole in top plate of buoys and attach to top of car ends.
L	1 ea. end of load.	Brace, per Sketch 3. Each to consist of two pieces of 4 in. x 4 in., length to suit. Locate against end buoys in top row, toe-nail bottom ends to car sides with three 20-D nails in each, and toe-nail to each other at top in like manner.
M	1 ea. Item "L".	Cleat, per Sketch 3.1 in. x 8 in., length to suit. Secure to Item "L" with four 8-D nails in each end.
N	1 ea. Item "L".	Each to consist of two pieces of1 1/4 in. x .035 in. high tension band. Attach lower ends to car sides and pass around outside of Item "L".
O	2 ea. Item "L".	4 in. x 4 in. x 12 in., wedge-shaped block. Secure one each to car side, against each lower end of Items "L", with three 30-D nails.

See General Rules 4, 5, 9, 11, 14 and 15 for further details.

Sec. 6-Fig. 26 (Rev.-10-1960)

BUOYS, MARINE (BILGED DRUMS)-GONDOLA CARS

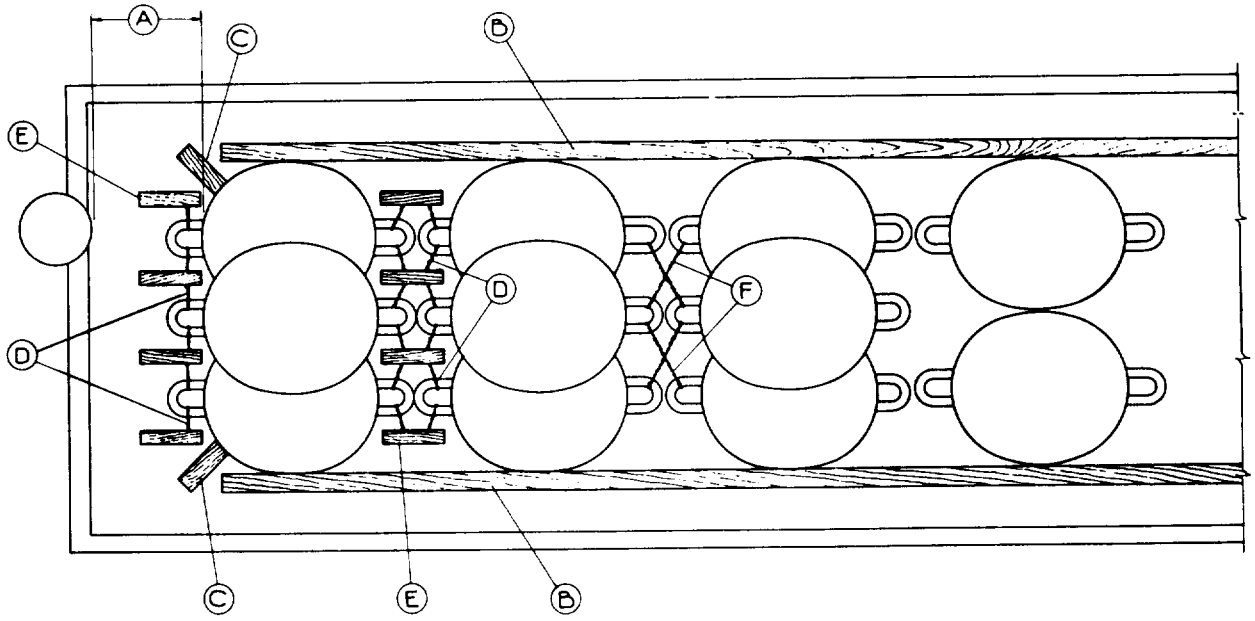


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	1 ea. top buoy.	No. 10 ga. steel strap, 2 1/2 in. wide, length to suit. Pass one end through ring of buoy angle weld to angle bolted to top side angle.
C	2 per load.	No. 10 ga. steel strap, 2 1/2 in. wide, length to suit. Locate on each side of top row and weld at each junction with Items "B". Weld ends to angle bolted to top end angle.
D	1 ea. end of load.	5/8 in. dia. rod. Form to fit contour of buoy and weld ends to Items "C".
E	1 ea. end of load.	No. 10 ga. steel strap, 2 1/2 in. wide, length to suit. Locate along side of rings on top of end and next to end buoys, weld to Items "B" at each location and weld lower end to angle bolted to top end angle.

See General Rules 4, 5, 9 and 15 for further details.

Sec. 6-Fig. 27 (Rev.-10-1960)

MARINE BUOYS-GONDOLA CARS

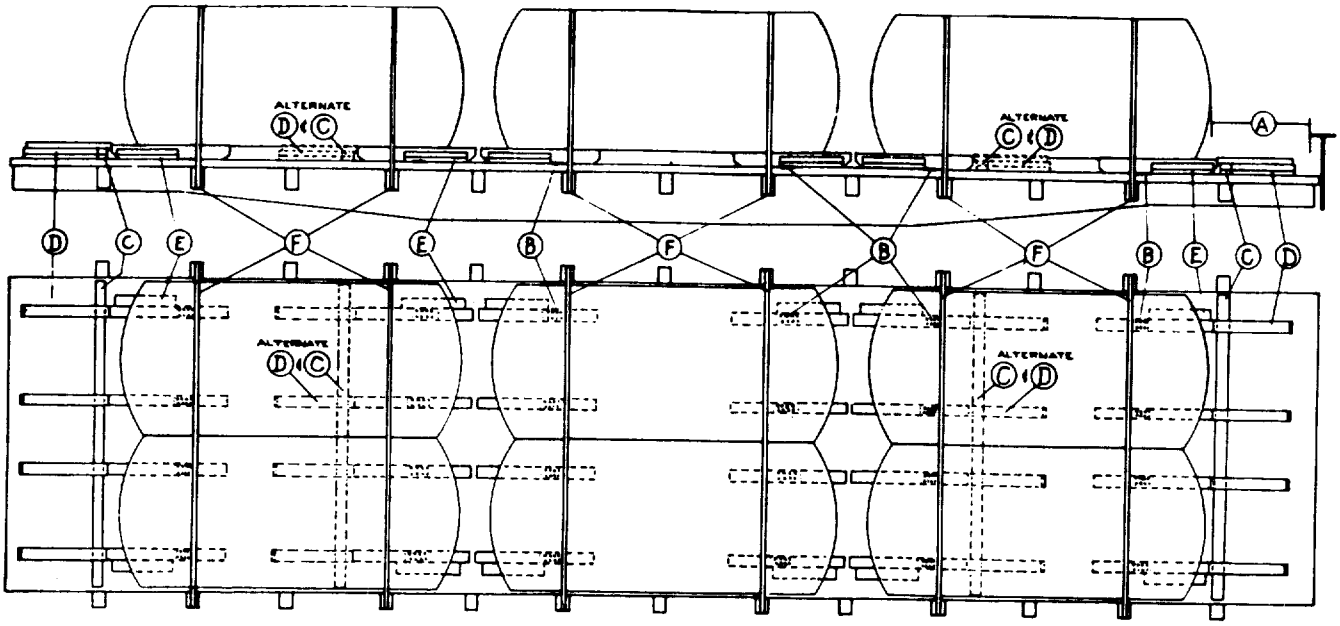


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	2	2 in. x 6 in., length to suit. Locate one against each side of units and secure to floor with 30-D nails spaced about 18 in. apart.
C	4	2 in. x 6 in., length to suit. Locate two at outside ends of bottom row of units, as shown. Secure each to floor with four 30-D nails.
D	4 per unit.	Each to consist of two strands No. 8 gage black annealed wire. Attach two at each end of unit, as shown, and pass around cleat, Item "E".
E	As required.	2 in. x 4 in. x 36 in. Locate, as shown, and secure each with six 30-D nails.
F	As required.	Each to consist of two strands No. 8 gage black annealed wire. Attach two at each end of top unit and to units in bottom layers of adjacent piles, as shown.

See General Rules 4, 5, 9, 11, 14 and 15 for further details.

Sec. 6-Fig. 28 (Rev.-10-1966)

*AIRPLANE ENGINE CONTAINERS, LOADED OR EMPTY, LENGTHWISE, SIDE BY SIDE, SINGLE-DECKED-FLAT CARS



Item	No. of Pcs.	Description
B	4 ea. unit.	Anti-skid plates, pattern 63. Locate between skids of units and floor, as shown. Load must be stenciled on both sides in one inch letters to read, "Anti-Skid Plates".
C	2	Each to consist of two pieces of 2 in. x 6 in., length to suit. Locate at each end of load, as shown, and secure lower piece to floor with eight 30-D nails and top piece to one below in like manner.
D	4 ea. Item "C".	Each to consist of three pieces of 2 in. x 4 in. x 36 in. Locate suitably spaced as shown, with intermediate and bottom pieces against Item "C" and secure bottom piece to floor with six 30-D nails. Secure intermediate piece to bottom piece in like manner. Extend top piece across Item "C" against butt-end of skid and secure to intermediate piece with six 30-D nails.
E	4 ea. pile.	Each to consist of two pieces of 2 in. x 4 in. x 24 in. Locate at each end of each side of pile, as shown, and secure lower piece to floor with four 30-D nails and top piece to one below in like manner.
F	2 ea. pile.	2 in. x .050 in. high tension bands. Locate, as shown, suitably spaced.

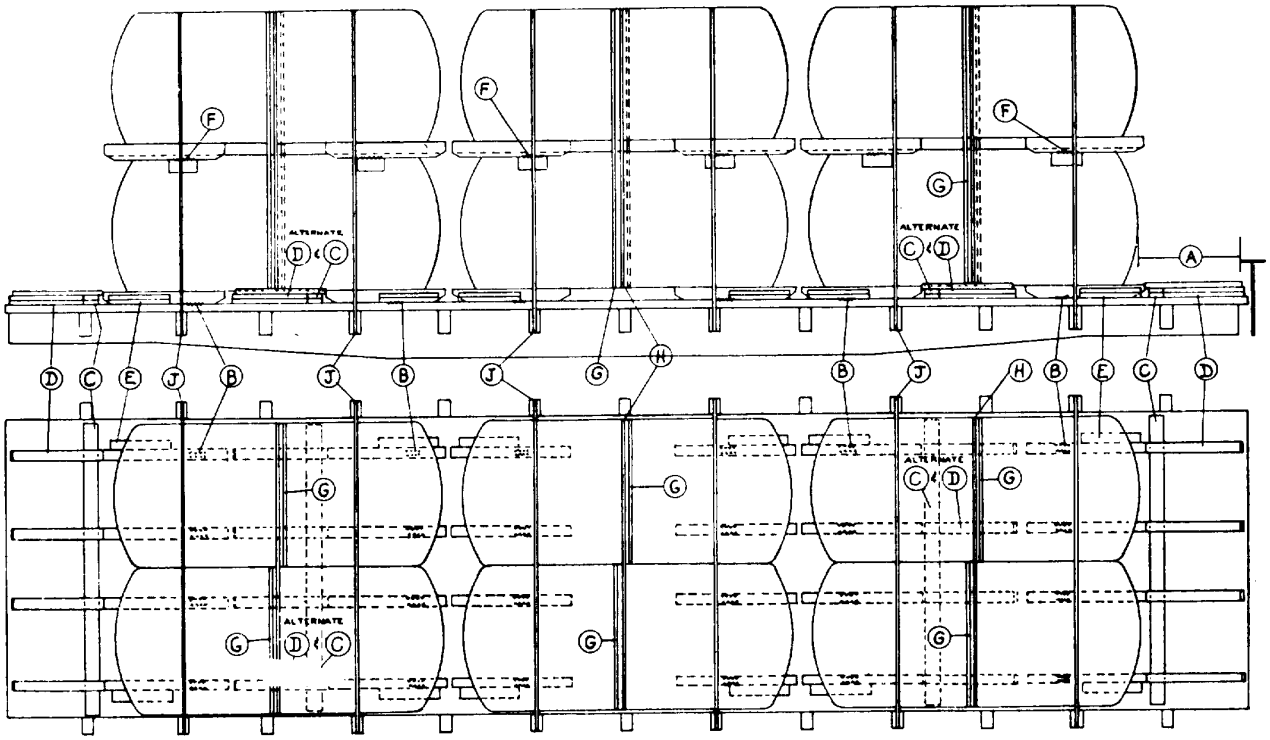
Units should be located with not more than 1 inch space between ends of skids of adjacent pies, and between skids and Items "C".

Alternate locations of Items "C" and "D" are shown for use on flat cars too short to be arranged as above.

See General Rules 4, 5, 9, 11, 14 and 15 for further details.

Sec. 6-Fig. 30 (Rev.-10-1966)

AIRPLANE ENGINE CONTAINERS, EMPTY, LENGTIHWISE, SIDE BY SIDE, DOUBLE DECKED WITH IN. 2 IN. X .050 HIGH TENSION BANDS-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. unit in bot-	Anti-Skid Plates, pattern 63. Locate between skids, of units and floor, as shown. Load must tom layers be stenciled on both sides in one inch letters to read, "Anti-Skid Plates".
C	2	Each to consist of two pieces of 2 in. x 6 in., length to suit. Locate at each end of load, as shown, and secure lower piece to floor with eight 30-D nails and top piece to one below in like manner.
D	4 ea. Item "C".	Each to consist of three pieces of 2 in. x 4 in. x 36 in. Locate suitably spaced as shown, with intermediate and bottom pieces against Item "C" and secure bottom piece to floor with six 30-D nails. Secure intermediate piece to bottom piece in like manner. Extend top piece across Item "C" against butt-end of skid and secure to intermediate piece with six 30-D nails.
E	4 ea. pile.	Each to consist of two pieces of 2 in. x 4 in. x 24 in. Locate at each end of each side of pile, as shown, and secure lower piece to floor with four 30-D nails and top piece to one below in like manner.
F	4 ea. unit in top	Anti-Skid Plates, pattern 64. Locate, as shown, between stacking lugs on bottom layers and layers skids of units on top layers.
G	2 ea. pile.	2 in. x .050 in. high tension bands. Locate as shown, encircling each top and bottom unit of pile.
H	1 ea. pile.	2 in. x .050 in. high tension bands. Locate as shown, encircling pile.
J	2 ea. pile.	2 in. x .050 in. high tension bands. Locate as shown, suitably spaced.

Units should be located with not more than 1 inch space between ends of skids of adjacent piles, and between kids and Items "C".

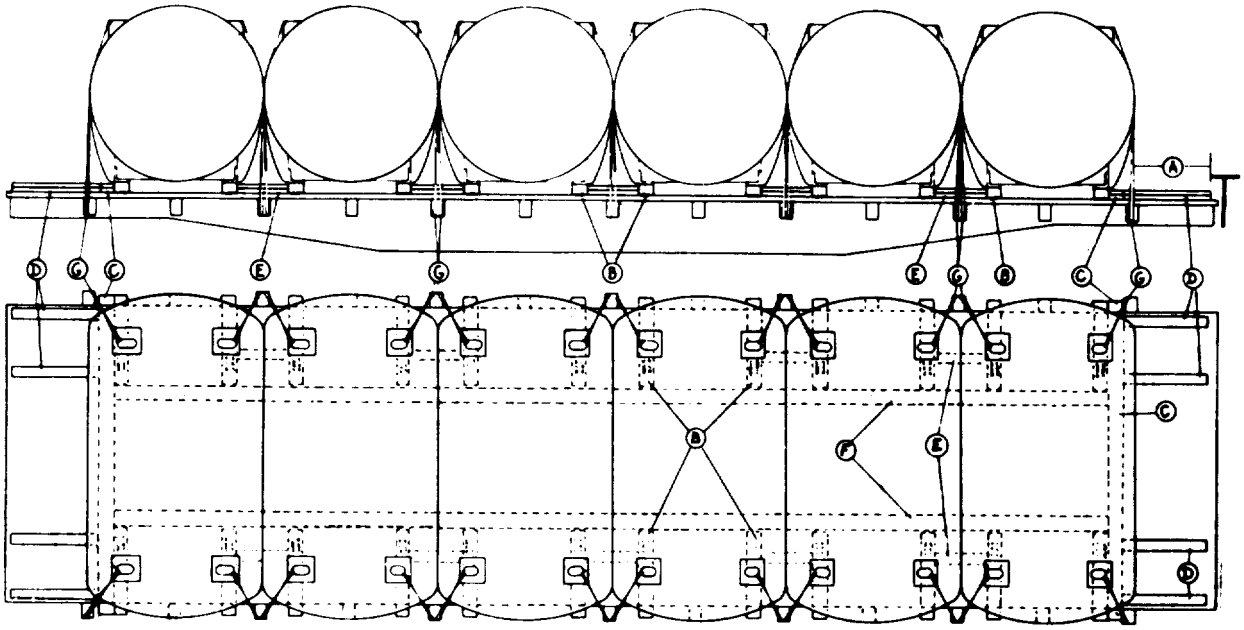
When pattern 64 anti-skid plates cannot be applied, the use of other suitable types are permissible if of equivalent strength, and secured to prevent displacement.

Alternate locations of Items "C" and "D" are shown for use on flat cars too shoat to be arranged as above.

See General Rules 4, 5, 9, 11, 14 and 15 for further details.

Sec. 6-Fig. 31

ROTARY ENGINE CONTAINERS, LOADED OR EMPTY, CROSSWISE, SINGLE-DECKED-FLAT CARS



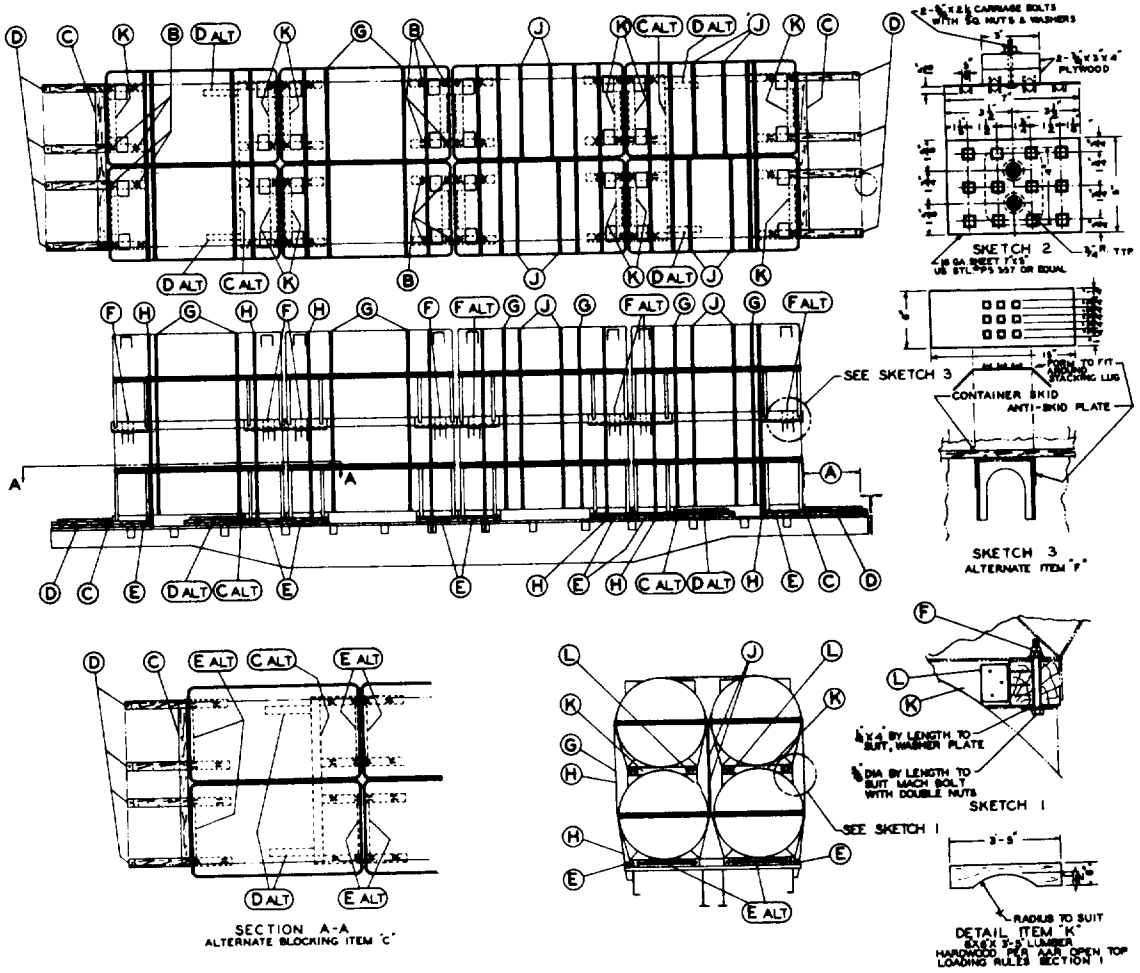
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. unit.	Anti-Skid Plates, pattern 63. Locate between skids of units and floor, as shown. Load must be stenciled on both sides in one inch letters to read, "Anti-Skid Plates".
C	2	Each to consist of two pieces of 2 in. x 6 in., length to suit. Locate at each end of load, as shown, and secure lower piece to floor with eight 30-D nails and top piece to one below in like manner.
D	4 ea. Item "C".	Each to consist of two pieces of 2 in. x 4 in. x 36 in. Locate suitably spaced, as shown, against Item "C" and secure lower piece to floor with six 30-D nails and top piece to one below in like manner.
E	As required.	Each to consist of two pieces of 2 in. x 6 in., length to suit. Locate on each side, as shown, between outside skids of units and secure lower piece to floor with three 30-D nails and top piece to one below in like manner.
F	2	Each to consist of two pieces of 2 in. x 4 in., length to suit. Locate, as shown, against inside of skids of units and secure lower piece to floor with 30-D nails spaced about 18 in. apart and top piece to one below in like manner.
G	4 ea. unit.	2 in. x .050 in high tension bands. Locate at each corner of unit attached to stacking lugs or a slotted angle shaped plate, minimum thickness .134 in., secured to top face of container flange with two 5/ in. dia. bolts, and to stake pockets.

Piles must be loaded with reinforcing rims contacting each other.

See General Rules 4, 5, 7, 9, 11, 14 and 15 for further details.

Sec. 6-Fig. 31-A (Rev.-12-1969)

AIRPLANE ENGINE CONTAINERS, LOADED OR EMPTY, LENGTHWISE, SIDE BY SIDE, DOUBLE DECKED-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	8 ea. unit in bottom layers.	Anti-skid plates, Pattern 63, locate between skids of units and floor, 2 each individual skid.
C	2 pcs.	Each to consist of two pieces of 2 in. x 6 in. x length equal to width of car deck. Locate at each end of load, and secure lower piece to floor with eight 30-D nails and secure top piece to bottom piece in same manner. Alternate location shown.
D	4 ea. Item "C."	Each to consist of three pieces of 2 in. x 6 in. x 36 in. lumber. Locate in line with the skids of the container against Item "C." Secure the bottom piece to the car floor with six 30-D nails. Secure the intermediate piece to the bottom piece in a like manner. Extend top piece across Item "C" against the butt end of skid and secure to intermediate piece with six 30-D nails. Alternate location shown.
E	2 ea. bottom	Each to consist of two pieces of 2 in. x 4 in. x 36 in. lumber. Locate against outside edge of container skids at each end and secure lower piece to floor with four 30-D nails. Nail top piece to bottom piece in a like manner. Alternate location shown, when outside of container skids are flush with edge of car deck. Place crosswise of car, length to suit between skids, each end of container.

Sec. 6-Fig. 31-A (Rev.-12-1969) (Concluded)

AIRPLANE ENGINE CONTAINERS, LOADED OR EMPTY, LENGTHWISE, SIDE BY SIDE, DOUBLE DECKED-FLAT CARS

Item	No. of Pcs.	Description
F	4 sets ea. unit in top layer. See Sketches 1 and 2.	On containers with open top stacking lugs, use , in. x 4 in. x length to suit washer plate with 5/8 in. dia. machine bolts x length to suit, double nuts, located as shown, to fasten upper and lower containers together. Substitute if desired anti-skid device fabricated per Sketch 2. Alternate arrangement for containers with solid stacking lugs, use anti-skid plates fabricated per Sketch 3. Bend and form over stacking lugs, locate as shown and apply bands per Item J.
G	2 ea. pile.	Unitizing bands 2 in. x .050 in. high tension bands. Encircle 4 containers. Locate one band near each end of each group of 4 containers as shown.
H	2 ea. pile.	Tie-down bands, 2 in. x .050 in. high tension bands. Locate one on each end of each group of 4 containers. Secure to car stake pocket or anchor on sides of car. Metal fillers sufficient to provide a suitable radius must be used to protect bands at stake pockets and applied so as to prevent dislodgment.
J	2 ea. per top and bottom containers.	2 in. x .050 in. high tension bands encircling 2 containers, top and bottom, near each end of the containers. Used only when containers have solid stacking lugs, and anti-skid plates, per Sketch 3, are used between containers.
K	2 ea. per container.	Cradle support blocks, 6 in. x 6 in. x 41 in., to be constructed of solid or laminated hardwood. The cradle radius must be uniform and provide a firm fit to the top of the bottom container. Locate between the bottom and top containers in line with vertical end base framing of top container and in front of stacking lugs of bottom container. See Detail of Item K. If lamination is necessary, construct each cradle of 3 pieces of 2 in. x 6 in. lumber, nailed together with 30-D nails and two 3/8 in. dia. carriage bolts x length to suit, nails spaced in a pattern design. See illustration #14 of Section 4, Part 2. Not required when containers are shipped empty.
L	2 ea. per Item "K."	Light gauge metal connecting angle 4 in. x 4 in. x 4 in. attached to cradle support blocks and container skids with six 30-D nails.

Load to be stenciled on both sides of car "Anti-skid plates."

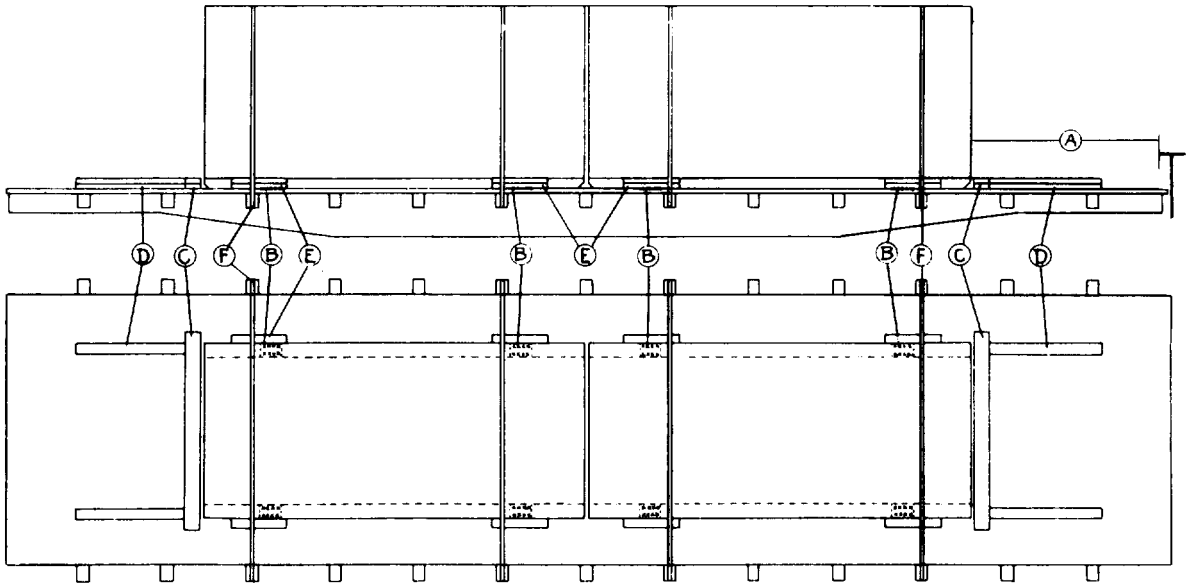
Load as shown is depicted on a car with a 10 ft. 6 in. wide deck.

See General Rules 3, 4, 5, 7, 9, 14 and 15 for further details.

This load exceeds outline diagram for single loads, without end overhang, on open top cars and is to be handled in accordance with General Rule 7.

Sec. 6-Fig. 32 (Rev.-10-1966)

AIRPLANE ENGINES IN WOODEN CONTAINERS, LENGTHWISE, SINGLE-DECKED-FLAT OR GONDOLA CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. unit.	Anti-Skid Plates, pattern 63. Locate between skids of units and floor, as shown. Load must be stenciled on both sides in one inch letters to read, "Anti-Skid Plates".
C	2	Each to consist of two pieces of 2 in. x 6 in., length to suit. Locate at each end of load, as shown, and secure lower piece to floor with eight 30-D nails and top piece to one below in like manner.
D	2 ea. Item "C".	Each to consist of two pieces of 2 in. x 4 in. x 36 in. Locate suitably spaced, as shown, against Item "C" and secure lower piece to floor with six 30-D nails and top piece to one below In like manner.
E	4 ea. pile.	Each to consist of two pieces 2 in. x 4 in. x 24 in. Locate at each end of each side of pile, as shown, and secure lower piece to floor with four 30-D nails and top piece to one below in like manner.
F	2 ea. pile.	2 in. x .050 in. high tension bands. Locate, as shown, suitably spaced.

Units should be located with not more than 1 inch space between ends of skids of adjacent piles, and between skids and Items "C".

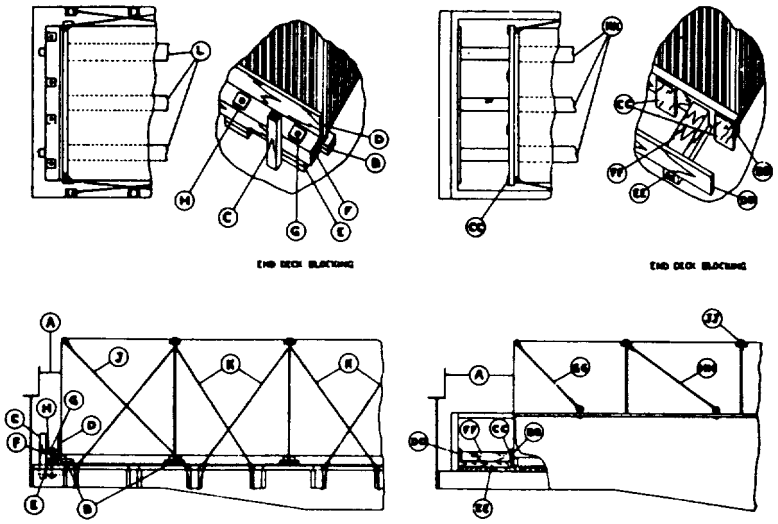
Boxes must be strong enough to prevent failure in transit.

For units loaded in gondola cars Items "F" must be attached to top side angle.

See General Rules 4, 5, 9, 11, 14 and 15 for further details.

Sec. 6-Fig. 33

CONTAINERS, CONEX TYPE, FULL OR HALF-SIZE, CROSSWISE, LOADED OR EMPTY, SINGLE DECK-FLAT OR GONDOLA CARS WITH WOOD OR STEEL FLOORS



FLAT CARS

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	As required.	Each to consist of 2 pieces of 2 in. x 8 in. x 12 in. Secure lower piece to floor with three 20-D nails and top piece to one below in like manner.
C	2 ea. end of load.	4 in. x 5 in., length to suit. Locate as shown in opposite end stake pockets beyond ends of load.
D	1 ea. end of load.	2 in. x 8 in., length equal to width of units. Locate as shown, on end of and against lower portion of unit. Secure to Item "F" with five 20-D nails before placing against unit.
E	8 ea. end of load.	Each to consist of 2 pieces 2 in. x 8 in. x 12 in. Locate under Item "F" as shown.
F	1 ea. end of load.	6 in. x 8 in., length equal to width of load. Secure each to floor of car with four 5/ in. dia. bolts, Items "G"; each passing through Items "E", "F", "H" and "N".
G	4 ea. end of load.	Ys in. dia. bolts, length to suit. Locate as shown.
H	4 ea. end of load.	% in. x 4 in. x 4 in. washer. Locate as shown, on top of Item "F" and secured with Item "G".
J	2 ea. end unit.	Each to consist of 6 strands No. 8 gage black annealed wire. Pass through lifting lug at end units on each side and through stake pockets as shown.
K	As required.	Each to consist of 6 strands No. 8 gage black annealed wire. Pass through each two adjacent lifting lugs on each side and to stake pockets as shown.
L	3 per car.	1 in. x 6 in. length equal to length of load. Locate as shown and secure to floor of car with 10-D nails.
M	As required.	Each to consist of 6 strands, No. 8 gage black annealed wire. Pass through each two adjacent inner lifting lugs, twist tie. Not required for full size transporters.
N	1 ea. Item "G".	4 in. x 4 in. x 18 in. hardwood cleat, or 1/2 in. x 4 in. x 18 in. plate.

Sec. 6-Fig. 33 (Concluded)

CONTAINERS, CONEX TYPE, FULI. OR HALF-SIZE, CROSSWISE, LOADED OR EMIPTY, SINGLE DECK-FLAT OR GONDOLA CARS WITH WOOD OR STEEL FLOORS

GONDOLA CARS WITH WOOD FLOORS

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
BB	1 ea. end of load.	2 in. x 8 in., length equal to width of units. Locate as shown on end of and against lower portion of unit.
CC	4 ea. end of load.	1 in. x 6 in., length to suit. Locate as shown, secure each to Item "BB" with five 8-D nails. Use optional.
DD	1 ea. end of load.	2 in. x 8 in. length to suit. Locate against inside of end of car as shown. If there is any space between Item "DD" and end of car, sufficient dunnage must be used to completely fill space opposite Items '"FF".
EE	3 ea. end of load.	4 in. x 6 in. length to suit. Locate under each Item "FF" as shown.
FF	2 ea. end of load.	6 in. x 6 in. length to suit. Locate on top of Items "EE" and between Items "BB" and "DD" as shown. Toenail to Items "BB", "DD" and "EE".
GG	2 ea. end unit.	Each to consist of 6 strands No. 8 gage black annealed wire. Pass through lifting lug at end unit on each side and through 1/2 in. eye bolts in top rail of car as shown.
HH	As required.	Each to consist of 6 strands No. 8 gage black annealed wire. Pass through lifting lugs of each two adjacent units and through 1/2 in. eye bolts in top rail of car as shown.
JJ	As required.	Each to consist of 6 strands No. 8 gage black annealed wire. Pass through each two adjacent lifting lugs on each side of units beyond end units and securely twist tie.
KK	3 per car.	1 in. x 6 in. length equal to length of load. Locate as shown and secure to floor of car with 10 D nails. Not required for empty transporters.

GONDOLA CARS WITH STEEL FLOORS

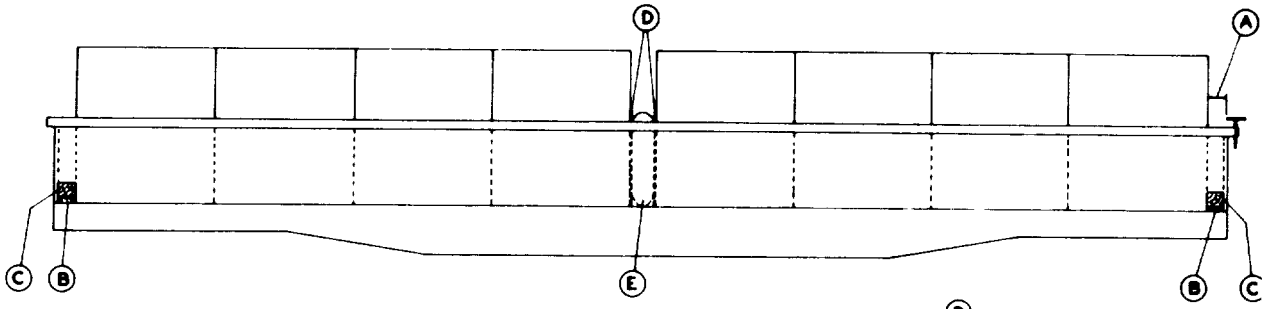
A		Brake wheel clearance. See Fig. 2.
BB	1 ea. end of load.	2 in. x 8 in , length equal to width of units. Locate as shown on end of and against lower portion of units.
CC	4 ea. end of load.	1 in. x 6 in., length to suit. Locate as shown. Secure each to Item "BB" with five 8-D nails. Use optional.
DD	1 ea. end of load.	2 in. x 8 in., length to suit. Locate as shown against inside of end of car. If there is any space between Item "DD" and end of car, sufficient dunnage must be used to completely fill space opposite Items "FF".
EE	3 ea. end of load.	4 in x 6 in., length to suit. Locate as shown on top of Items "KK" and under Items "FF".
FF	3 ea. end of load.	6 in. x 6 in., length to suit. Locate as shown on top of Items "EE" and between Items "BB" and "DD". Toenail to Items "BB" and "DD". Secure outside pieces to floor of car with one 5/8 in. dia. bolt Items "LL", each passing through Items "MM", "EE", "FF", "KK" and "NN".
GG	2 ea. end unit.	Each to consist of 6 strands No. 8 gage black annealed wire. Pass through lifting lug at end unit on each side and through 1/2 in. eye bolts in top rail of car.
HH	2 ea. end of load.	Each to consist of 6 strands No. 8 gage black annealed wire. Pass through lifting lugs of first and second units and through 1/2 in. eye bolts in top rail of car.
JJ	As required.	Each to consist of 6 strands No. 8 gage black annealed wire. Pass through each two adjacent lifting lugs on each side of units beyond end units and securely twist tie.
KK	3 per car.	1 in. x 6 in., length to suit.
LL	3 ea. end of load.	5/8 in. dia. bolts, length to suit.
MM	3ea. end of load.	3/8 mi. x 4 in x 4 in. washer. Locate on top of Items "FF", and secure with Item "LL".
NN	1 ea. Item "LL".	4 in. x 4 in. x 18 in. hardwood cleat, or 1/2 in. x 4 in. x 18 in. plate.

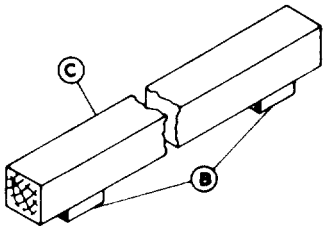
Where 6 strands of No. 8 black annealed wire is specified, 3/8 in. dia. cable may be substituted.

See General Rules 4, 5, 9, 10, 11, 14 and 15 for further details.

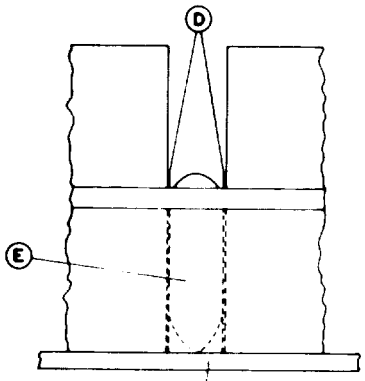
Sec. 6-Fig. 33-A (New-10-1968)

CONTAINERS, CONEX TYPE, FULL OR HALF SIZE, CROSSWISE, LOADED OR ENIPTY, SINGLE DECKED, WITH PNEUMATIC DUNNAGE-GONDOLA CARS WITH WOOD OR STEEI, FLOORS





SKETCH - 1



SKETCH - 2

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4	2 in. x 8 in. x 8 In., lumber. Locate as shown in Sketch 1 and nail to bottom side of Item "C" with four 12-D nails.
C	2	8 in. x 8 in. lumber, length equal to inside width of car. Locate one against each end of car. Load the Conex Containers against each Item "C" towards the center of the car.
D	2	Fiberboard sheet, 48 in. x 96 in. Locate as shown in Sketch 2 between the Conex Containers and pneumatic dunnage.
E	2	"Inflatable pneumatic dunnage mattresses, 48 in. x 48 in. Locate the two mattresses side by side in void space between Conex Containers at center of car. Inflate the mattresses to 4 psi. air pressure. Check air pressure during inflation to prevent over inflation as well as to ensure proper inflation of 4 psi."

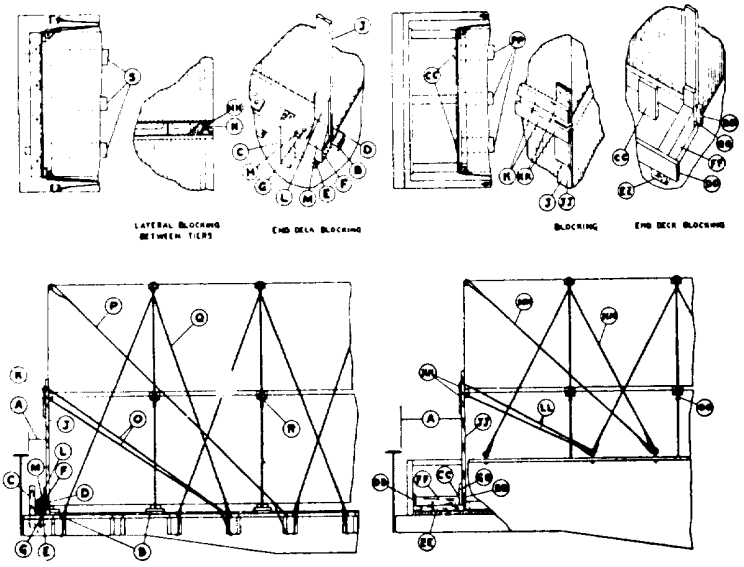
Note.

Maximum space between the Conex Containers at the center of the car must not be greater than 16 inches. Eight full size or sixteen half-size containers may be loaded In a 52 foot 6 inch long gondola car.

See General Rules 3, 4, 5, 9 and 14 for further details.

Sec. 6-Fig. 34 (Rev.-10-1968)

CONTAINERS, CONEX TYPE, FULL OR HALF-SIZE, CROSSWISE, EMPTY, DOUBLE DECKED-FLAT OR GONDOLA CARS WITH WOOD OR STEEL FLOORS



FLAT CARS

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	As required.	Each to consist of 2 pieces of 2 in. x 8 in. x 12 in. Secure lower piece to floor with three 20-D nails and top piece to one below in like manner.
C	2 ea. end of load.	4 in. x 5 in., length to suit. Locate as shown in opposite end stake pockets beyond end of load.
D	1 ea. end of load.	2 in. x 8 in., length equal to width of units. Locate as shown against lower portion of units. Secure to Item "F" with five 20-D nails before placing against unit.
E	1 ea. end of load.	Each to consist of 2 pieces 2 in. x 8 in. x 12 in. Locate under Item "F" as shown.
F	1 ea. end of load.	6 in. x 8 in., length equal to width of load. Secure each to floor of car with four 5/8 in. dia. bolts, Item "G", each passing through Item "E", "F", "H" and "U".
G	4 ea. end of load.	5/8 in. dia. bolts, length to suit, locate as shown.
H	4 ea. end of load.	3/8 in. x 4 in. x 4 in. washer. Locate as shown on top of Item "F" and secured with Item "G".
J	2 ea. end of load.	2 in. x 8 in. length to suit. Locate on end at each side of unit as shown, with bottom of item on top of Item "D".
K	2 ea. end of load.	2 in. x 8 in., length equal to width of unit. Secure to each Item "J" with five 16-D nails. 2 in. x 4 in. x 8 in. cleat under each item, secured to Item "J" with four 16-D nails.
L	2 ea. end of car.	2 in. x 8 in. x 15 in. Locate on top of Item "F", against Items "D" and "J". Secure to end Items "D" and "J" with four 16-D nails.
M	2 ea. end of car.	6 in. x 6 in. x 8 in. wedge block. Locate on top of Item "F" and against Item "L" as shown. Secure with four 20-D nails.
N	As required.	2 in. x 4 in., length and cut to suit. Locate between stacking lugs of bottom and top tier as shown.
O	2 ea. end of load.	Each to consist of six strands of No. 8 gage black annealed wire. Pass around end of car on top of each Item "K". and to opposite stake pockets as shown.
P	2 ea. end of load.	Each to consist of 6 strands No. 8 gage black annealed wire. Pass through lifting lug at end units on each side and through stake pockets as shown.
Q	As required.	Each to consist of 6 strands of No. 8 gage black annealed wire. Pass through each two adjacent lifting lugs on each side and to stake pockets as shown.
R	As required.	Each to consist of 6 strands of No. 8 gage black annealed wire. Pass through each two adjacent lifting lugs on each side between bottom and top tiers as shown.
S	3 per car.	1 in. x 6 in., length equal to length of load. Locate as shown and secure to floor of car with 10-D nails.
T	As required.	Each to consist of 6 strands, No. 8 gage black annealed wire. Pass through each two adjoining lifting lugs and twist taut. Not required for full size cargo transporters.
U	1 each Item "G".	4 in. x 4 in. x 18 in. hardwood cleat, or 1/2 in. x 4 in. x 18 in. plate.

Sec. 6-Fig. 34 (Rev. 10-1968) (Concluded
CONTAINERS, CONEX TYPE, FULL OR HALF-SIZE, CROSSWISE, EMPTY, DOUBLE DECKED-FLAT OR GONDOLA CARS WITH WOOD OR STEEL FLOORS

GONDOLA CARS WITH WOOD FLOORS

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
BB	1 ea. end of load.	2 in. x 8 in., length equal to width of units. Locate as shown on each of and against lower portion of unit.
CC	2 ea. end of load.	1 in. x 6 in. length to suit. Locate as shown, secure to Item "BB" with five 8-D nails.
DD	1 ea. end of load.	2 in. x 8 in. length to suit. Locate against inside of end of car as shown. If there is any space between Item "DD" and end of car, sufficient dunnage must be used to completely fill space opposite Item "FF".
EE	3 ea. end of load.	4 in. x 6 in. length to suit. Locate under each Item "FF" as shown.
FF	3 ea. end of load.	6 in. x 6 in. length to suit. Locate on top of Item "EE" and between Items "DD" and "GG" as shown. Toenail to Items "DD", "EE" and "GG"
GG	2 ea. end of load.	2 in. x 8 in. length to suit. Locate as shown and secure each to Items "BB" and "JJ" with five 8-D nails in each.
HH	As required.	2 in. x 8 in. length and cut to suit. Locate between stacking lugs of bottom and top tiers as shown.
JJ	2 ea. end of load.	2 in. x 8 in. length to suit. Locate on end and each side of end unit as shown, with bottom of item on top of Item "BB".
KK	2 ea. end of load.	2 in. x 6 in. length equal to width of unit. Secure to each Item "JJ" with five 16-D nails. 2 in. x 4 in. x 8 in. cleat under each item, secured to Items "JJ" with four 16-D nails.
LL	2 ea. end of load.	Each to consist of 6 strands of No. 8 gage black annealed wire. Pass around end of car on top of each Item "KK" and through 1/2 in. eye bolts in top rail on opposite sides of car as shown.
MM	2 ea. end of load.	Each to consist of 6 strands of No. 8 gage black annealed wire. Pass through lifting lugs at end units on each side and through 1/2 in. eye bolts in top rail on opposite sides of car as shown.
NN	As required.	Each to consist of 6 strands No. 8 gage black annealed wire. Pass through each two adjacent lifting lugs on each side and through 1/2, in. eye bolts on each side in top rail on opposite sides of car as shown.
OO	18 required for 16 full size containers.	Each to consist of 6 strands of No. 8 gage black annealed wire. Pass through each two adjacent lifting lugs of the bottom containers and through each two adjacent skids of the upper containers. Also through the lifting lug of the bottom container and the skid of the upper container at each end of the load. Twist the wire taut to unitize the upper and lower containers together.
PP	3 per car.	1 in. x 6 in. length equal to length of load. Locate as shown and secure to floor of car with 10-D nails.

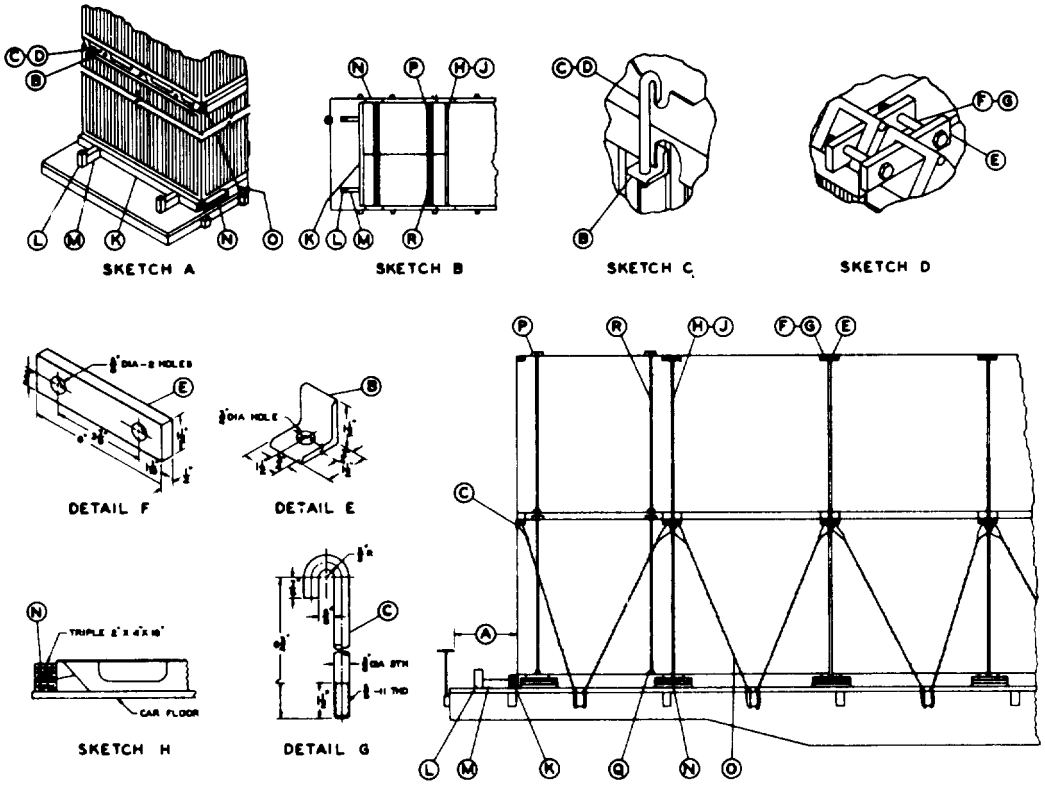
GONDOLA CARS WITH STEEL FLOORS

A		Brake wheel clearance. See Fig. 2.
BB	1 ea. end of load.	2 in. x 8 in., length equal to width of units. Locate as shown on each of and against lower portion of units.
CC	2 ea. end of load.	1 in. x 6 in. length to suit. Locate as shown. Secure to Item "BB" with five 8-D nails.
DD	1 ea. end of load.	2 in. x 8 in. length to suit. Locate as shown against inside of end of car. If there is any space between Item "DD" and end of car, sufficient dunnage must be used to completely fill space opposite Item "FF".
EE	3 ea. end of load.	4 in. x 6 in. length to suit. Locate as shown on top of Items "PP" and under Items "FF".
FF	3 ea. end of load.	6 in. x 6 in. length to suit. Locate on top of Items "EE" and between Items "DD" and "GG" as shown. Toenail to Items "DD" and "GG". Secure each to floor of car with one 5/8 in. dia. bolt, Item "QQ" passing through Items "RR", "EE", "FF", "PP" and "TT".
GG	2 ea. end of load.	2 in. x 8 in. length to suit. Secure each to Items "BB" and "JJ" with five 8-D nails in each.
HH	As required.	2 in. x 4 in. length and cut to suit. Locate between stacking lugs of bottom and top tiers.
JJ	2 ea. end of load.	2 in. x 8 in. length to suit. Locate on end and each side of end unit as shown, with bottom of item on top of Item "BB".
KK	2 ea. end of load.	2 in. x 6 in. length equal to width of unit. Secure to each Item "JJ" with five 16-D nails. 2 in. x 4 in. x 8 in. cleat under each item, secured to Items "JJ" with four 16-D nails.
LL	2 ea. end of load.	Each to consist of 6 strands of No. 8 gage black annealed wire. Pass around end of car on top of each Item "KK" and through 1/2 in. eye bolts in top rail on opposite sides of car.
MM	2 ea. end of load.	Each to consist of 6 strands of No. 8 gage black annealed wire. Pass through lifting lugs at end units on each side and through 1/2 in. eye bolts in top rail on opposite sides of car.
NN	As required.	Each to consist of 6 strands No. 8 gage black annealed wire. Pass through each two adjacent lifting lugs on each side and through 1/2 in. eye bolts on each side in top rail on opposite sides of car.
OO	As required.	Each to consist of 6 strands No. 8 gage black annealed wire. Pass through each two adjacent lifting lugs on each side between bottom and top tiers.
PP	3 per car.	1 in. x 6 in., length to suit.
QQ	3 ea. end of load.	5/8 in. dia. bolts, length to suit.
RR	3 ea. end of load.	3/8 in. x 4 in. x 4 in. washer. Locate on top of Items "FF" and secure with Item "QQ".
TT	1 ea. Item "QQ".	4 in. x 4 in. x 18 in. hardwood cleat, or 1/2 in. x 4 in. x 18 in. plate.

Where 6 strands of No. 8 gage black annealed wire is specified, 3/8 in. dia. cable may be substituted.
See General Rules 4, 5, 9, 10, 11, 14 and 15 for further details.

Sec. 6-Fig. 34-A (New-10-1968)

CONTAINERS, CONEX TYPE, FULL OR HALF-SIZE, CROSSWISE, EMPTY, DOUBLE DECKED--FLAT CARS OR GONDOLA CARS WITH WOOD OR STEEL FLOORS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2 each side of a two container stack.	1 1/2, in. x 1 1/2 in. x 1/4 in. steel angle clip by 1 1/2, in. long. See detail "E." Locate within corrugation groove of the lower container as shown in Sketch "C" and secure with Items "C" and "D." On one side of stack locate within the third groove from one end and within the second groove on the other end.
C	1 ea. per Item "B."	5/8 in. diameter tie-down "J" bolt, 6 3/4 in. long. See detail "G." Insert bolt through Item "B," locate hook of "J" bolt over the skid of the upper container as shown in Sketch "C" and secure with Item "D."
D	1 ea. per Item "C."	5/8 in. locknut. Used to secure Items "B" and "C" as shown in Sketch "C."
E	2 ea. at adjacent top corners of containers in top layer.	1/2 in. x 1 1/2 in. x 6 in. steel connector plate. See detail "F." Locate as shown in Sketch "D" and secure with Items "F" and "G."
F	2 ea. per Item "E."	1/2 in. x 5 in. steel bolt. Insert bolt through Items "E" as shown in Sketch "D" and secure with locknut Item "G."
G	2 ea. per Item "F."	1/2 in. locknut. Used to secure Items "E" and "F."
H	As required.	Anti-chafing board, 2 in. x 4 in. by load height in length. Position between containers stacks inside Items "C" and secure to skids of top and bottom containers with Item "J." See Sketch "B."
J	As required.	One strand of No. 8 gage black annealed wire. Used to secure Items "H" to prevent dislodgment.

Sec. 6-Fig. 34-A (New-10-1968) (Concluded)

CONTAINERS, CONEX TYPE, FULL OR HALF-SIZE, CROSSWISE, EMPTY, DOUBLE DECKED--FLAT CARS OR GONDOLA CARS WITH WOOD OR STEEL FLOORS

Item	No. of Pcs.	Description
K	1 ea. end of load for flat cars. 2 ea. end of load for gondola cars.	Header, 4 in. x 6 in. x length equal to width of load. Locate as shown with 6 in. dimension against the load. Secure to the car floor with 40-D nails, toenailed. When wood floor gondolas are used, place on Item "K" against the load and one Item "K" against the end of the car. Secure to the car floor with 40-D nails, toenailed. When steel floored gondolas are used, secure the Items "K" through the car floor with a minimum of two % in. diameter bolts, length to suit.
L	4	End stake, 4 in. x 6 in. x length to suit, oak or similar hardwood. Cut and tapered for a drive fit. Locate as shown in end stake pockets beyond each end of load. For gondola loading, substitute another piece of Item "K" for the two stakes which are adjacent to Item "M" and secure to car floor as specified in Item "K."
M	2 each end of load as required.	Strut, 4 in. x 6 in. x length to suit. Toenail to Items "K" and "L" with six 20-D nails at each end and secure to car floor with two 20-D nails on each side, toenailed. When steel floored gondolas are used, toenail each Item "M" to Items "K" with six 20-D nails at each end and secure through the car floor with one 3/4 in. diameter bolt, length to suit.
N	As required.	Side blocking, each piece to consist of three pieces of 2 in. x 4 in. x 18 in. lumber. Secure bottom piece to car floor with three 20-D nails and the top piece to the one below in a like manner. See Sketch "H."
O	32 required.	Each to consist of six strands of No. 8 gage black annealed wire. Pass through each two adjacent lifting lugs on each side of lower containers, as well as lifting lugs of lower containers at each end of the load and through the stake pockets of the car as shown. Substitute, if desired, 3g in. diameter steel cable (IWRC) in a complete loop and secure with two 3g in. cable clips. Thimble must be used at the stake pocket to protect the steel cable and secured to the steel cable with one cable clip.
P	2 required for ea. 2 half-size containers.	Strapping board, 2 in. x 6 in. x load width in length. See Sketch "B."
Q	2 required for each Item "R."	Edge protector. Position under Item "R" at lower edge of container.
R	2 required for ea. 2 half-size containers.	2 in. x .050 in. high tension band. Locate as shown. Staple to Item "P."

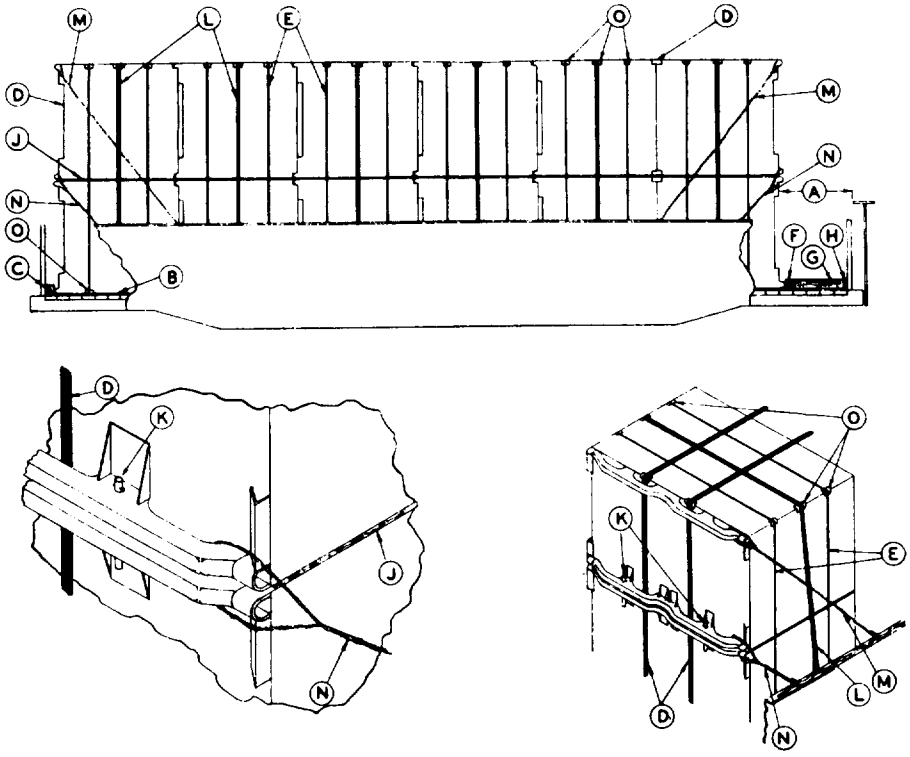
Note.-Items "P" through "R" only required with half-size containers.

When flat cars without end stake pockets are used, each Item "K" will be bolted to the car floor with four 3/4 in. diameter bolts. Locate four wedge shaped back-up blocks, 4 in. wide x 6 in. high x 18 in. long, against each Item "K" and secure to the car floor with two 40-D nails and three 20-D nails.

See General Rules 2, 3, 4, 5, 9, 10, 14 and 15 for further details.

Sec. 6-Fig. 35

CONTAINERS, CONEX TYPE, FULL OR HALF-SIZE, CROSSWISE, LOADED ON SIDES, EMPTY, DOUBLE-DECKED -GONDOLA CARS WITH WOOD OR STEEL FLOORS



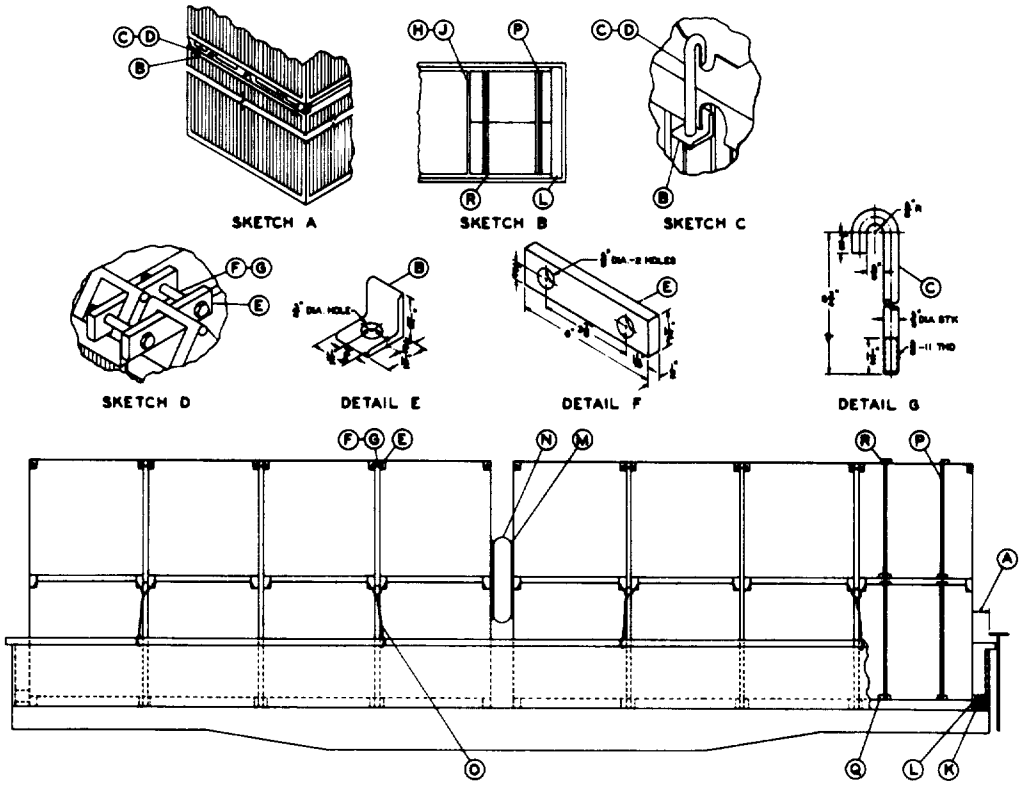
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	3 per car.	1 in. x 6 in. full length of car.
C	1 at "A" end of car.	6 in. x 6 in. length full width of car. Place against end of car. Skid of transporter to be placed against Item "C" and skids of each adjacent transporter to be recessed except last unit which should be reversed with skids facing "B" end of car.
D	2 per load.	2 in. x .050 in. high tension bands encircling entire load lengthwise of car.
E	2 ea. unit.	1 1/4 in. x .035 in. high tension bands crosswise and encircling top and bottom transporters into a unit.
F	1 at "B" end of car.	6 in. x 6 in. length full width of car placed against skid of end transporter. To be secured to floor with five 60-D nails or three 5/8 in. bolts.
G	3 at "B" end of car.	6 in. x 6 in. length to suit. Locate between Items "F" and "H". To be secured to floor with five 60-D nails or one 5/8 in. bolt.
H	As required.	Filler block against end of car, full width of car. Dimensions to suit.
J	3 per load.	1 in. x 6 in. separators, full length of load. To be placed between tiers.
K	2 ea. end of load.	1 3/4 in. dia. x 12 in. pin with crosswise retainer top and bottom. Insert through round holes in skids of top and bottom transporters as shown.
L	1 per unit.	2 in. x .050 in. high tension band to pass over each unit from top of car side to opposite top of car side or band anchorage.
M	2 ea. end of load.	Each to consist of six strands of No. 8 ga. black annealed wire. Pass through each corner skid opening of top transporters diagonally and through to top of car side or band anchorage as shown.
N	2 ea. end of load.	Each to consist of six strands of No. 8 ga. black annealed wire. Pass through each top and bottom corner skid opening at corner of transporters and to top of car side as shown.
O	As required.	Stake pocket protector. To be used where items "D", "L", and "E" pass over sharp corners as shown.

Where 6 strands of No. 8 ga. black annealed wire is specified, 3/8 in. dia. cable of equal strength may be substituted.

See General Rules 4, 5, 7, 9, 11, 14 and 15 for further details.

Sec. 6-Fig. 35-A (New-10-1968)

CONTAINERS, CONEX TYPE, FULL OR HALF-SIZE, CROSSWISE, EMPTY, DOUBLE DECKED-GONDOLA CARS WITH WOOD OR STEEL FLOORS, SECURED WITH PNEUMATIC, DUNNAGE, RUBBER, RE-USABLE TYPE



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2 each side of a two container stack.	1 1/2 in. x 1 1/2 in. x 1/4 in. steel angle clip by 1 1/2 in. long. See detail "E." Locate within corrugation groove of the lower container as shown in Sketch "C" and secure with Items "C" and "D." On one side of stack locate within the third groove from one end and within the second groove on the other end.
C	1 ea. per Item "B."	5/8 in. diameter tie-down "J" bolt, 6 3/4 in. long. See detail "G." Insert bolt through Item "B," locate hook of "J" bolt over the skid of the upper container as shown in Sketch "C" and secure with Item "D."
D	1 ea. per Item "C."	1/2 in. locknut. Used to secure Items "B" and "C" as shown in Sketch "C."
E	2 ea. at adjacent top corners of containers in top layer.	1/2 in. x 1 1/2 in. x 6 3/4 in. steel connector plate. See detail "F." Locate as shown in Sketch "D" and secure with Items "F" and "G."
F	2 ea. per Item "E."	1/2 in. x 5 in. steel bolt. Insert bolt through Items "E" as shown in Sketch "D" and secure with locknut Item "G."
G	2 ea. per Item "F."	1/2 in. locknut. Used to secure Items "E" and "F."
H	As required.	Anti-chafing board, 2 in. x 4 in. by load height In length. Position between containers stacks inside Items "C" and secure to skids of top and bottom containers with Item "J." See Sketch "B."
J	As required.	One strand of No. 8 gage black annealed wire. Used to secure Items "H" to prevent dislodgment.

Sec. 6-Fig. 35-A (New-10-1968) (Concluded)

CONTAINERS, CONEX TYPE, FULL OR HALF-SIZE, CROSSWISE, EMPTY, DOUBLE DECKED-GONDOLA CARS
WITH WOOD OR STEEL FLOORS, SECURED WITH PNEUMATIC, DUNNAGE, RUBBER, RE-USABLE TYPE

Item	No. of Pcs.	Description
K	4	2 in. x 8 in. x 8 in. lumber. Locate on the bottom side of Item "L" and nail with four 12-D nails.
L	2	8 in. x 8 in. lumber, length equal to inside width of car. Locate one against each end of car. Load the Conex containers against each Item "L" towards the center of the car.
M	2	Fiberboard sheet, 48 in. x 48 in. Locate as shown between the Conex containers and pneumatic dunnage mattresses.
N	1	Inflatable pneumatic dunnage, rubber, re-usable type, 48 in. x 48 in. Locate the pneumatic dunnage bag in void space between Conex containers at the center of the car, positioned midway between top and bottom tiers and at center width of these tiers. Inflate to 3 psi. air pressure. Check air pressure during inflation to prevent over inflation as well as to ensure proper inflation of 3 psi.
O	8	Each to consist of four strands of No. 8 gage black annealed wire. Locate at adjacent lifting lugs of first and second containers and the third and fourth containers from each end of the car. Pass the wire through the adjacent lifting lugs of the lower containers and attach to the lading strap anchors on each side of the car.
P	2 required for ea. 2 half-size containers.	2 in. x .050 in. high tension band. Locate as shown. Staple to Item "R."
Q	2 required for ea. Item "P."	Edge protector. Position under Item "P" at lower edge of container.
R	2 required for ea. 2 half-size containers.	Strapping board, 2 in. x 6 in. x load width In length. See Sketch "B."

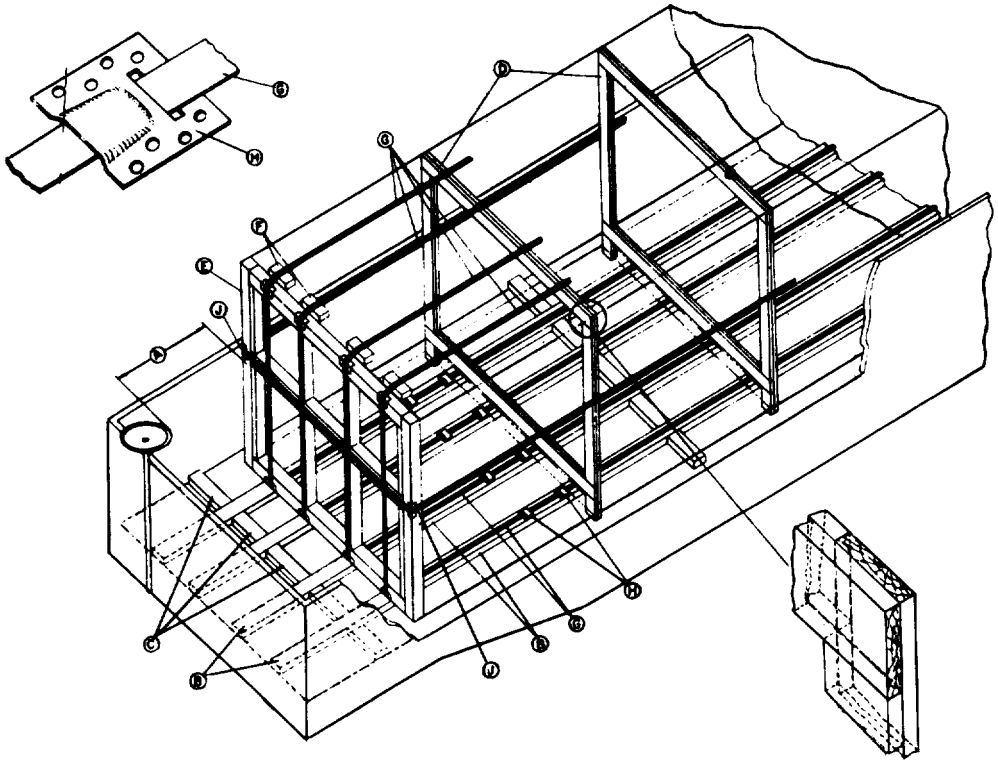
Note.-Items "P" through "R" only required with half-size containers.

Maximum space between the Conex containers at the center of the car must not be greater than 16 inches. Sixteen full size or thirty-two half-size containers may be loaded in a 52 foot 6 in. long gondola car.

See General Rules 2, 3, 4, 5, 9, 10, 14 and 15 for further details.

Sec. 6-Fig. 36

CONTAINKR8, CONEX TYPE, FULL OR HALF SIZE, CROSSWISE, LOADED OR EMPTY, SINGLE DECK-GONDOLA CARS WITH WOOD OR STEEL FLOORS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	Wood floor cars, 2 or 3. Steel floor cars, 4.	Floor bearing pieces. Wood floor cars-1 in. x 6 in. full length of car. Locate to coincide with spacing of skids on containers. Secure to floor with ten, 10-D nails spaced about 12 in. apart. Steel floor care-2 in. ·x 8 in. full length of car. Locate to coincide with spacing of bands.
C	As required, steel floor cars only.	Spacers, 2 in. x 4 in. length to suit. Locate between each Item "B" and sides of car. Secure to Items "B" with two 10-D nails.
D	As required.	Separators as shown. Locate between each container.
E	1 ea. end of load.	Bulkheads as shown.
F	4 ea. end of load.	Band supports, 2 1/2 in. x 6 in. x 12 in. Locate on top of Items "E", as shown.
G	4 per load.	2 in. x .050 in. high tension bands encircling entire load longitudinally. For cars having wood floors, locate the two outside bands 15 in. from sides of containers, with other two bands equally spaced. For -cars having steel floors, locate bands in center on top of Items "B"
H	4 per each Item "G"	Snubber plates. Locate two at each end of load with Items "G" threaded through. Space one 386 in. from each end container and the other one 48 in. from end of container at each end of load. For wood floor cars, secure to floor and for steel floor cars, secure to Items "B".
J	1 per load.	2 in. x .050 in. high tension girth band, encircling entire load. Locate just above top of car sides.

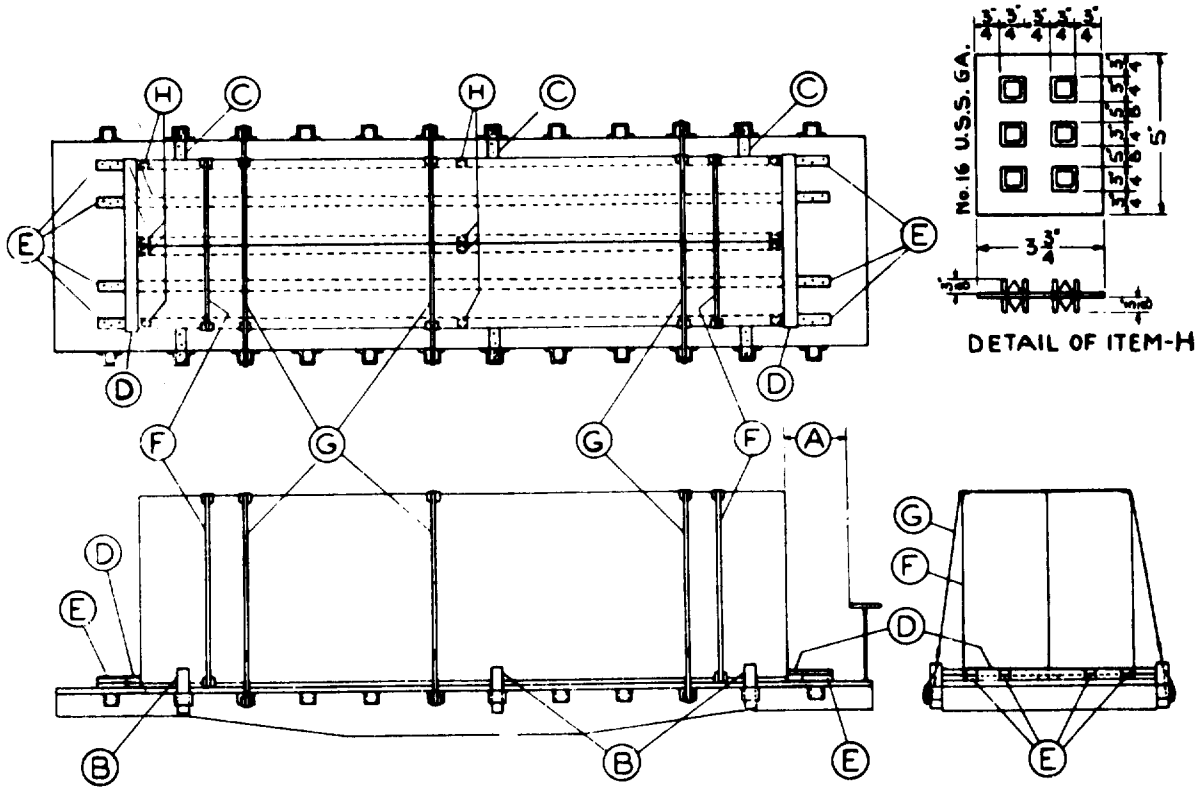
There must be at least 5 ft. of vacant space between load and end of car at each end.

Corner protectors are to be placed under all bands at top and bottom edges of Items "E"

See General Rules 4, 5, 9, 14 and 15 for further details.

Sec. 6-Fig. 37

FUSELAGES, WINGS, WING SECTIONS, SURFACES, ETC.-BOXED--FLAT CARS



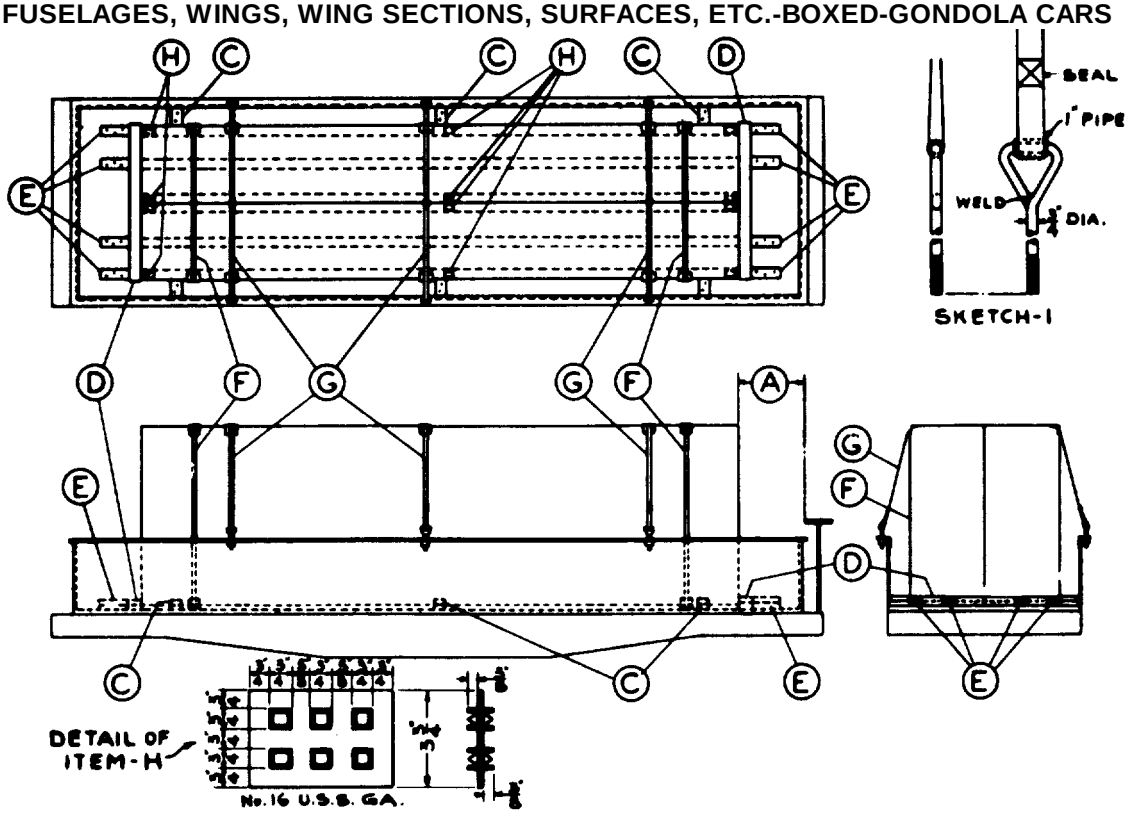
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	3 pr. per pile.	Side stakes, long enough to extend 6 in. above top of car floor. When width of pile will not permit application of side stakes, use one additional Item "F" and "G" for each pile over 90 ft. long.
C	1 ea. Item "B".	Each to consist of two pieces of 2 in. x 4 in., length to suit. Secure lower piece to floor with 20-D nails and top piece to one below in like manner. Not required when load completely fills the distance between Items "B".
D	As required ea. end of load.	Each to consist of two pieces of 2 in. x 4 in., length equal to width of load when the end of one box does not extend beyond the end of adjacent box. When end of one box extends beyond the other, place one, length equal to width of box, against each box. Secure lower piece to floor with six 20-D nails and top piece to one below in like manner.
E	Boxes 5 ft. wide or less; 2 ea. end. Boxes over 5 ft. wide; 4 ea. end.	Each to consist of two pieces of 2 in. x 4 in. x 16 in. Locate against Item "D" and secure lower piece to floor with three 20-D nails and top piece to one below in like manner. When Items "E" cannot be applied Items "D" must be adequately secured with M in. dia bolts.
F	2 per pile.	2 in. x .050 in. high tension bands, encircling pile. Required only when two or more boxes are loaded side by side.
G	3 per pile.	2 in. x .050 in. high tension bands.
H	6 per box.	Anti-Skid Plates, pattern 63. Place between box and floor, as shown. Load must be stenciled on both sides in 1 in. letters to read, "Anti-Skid Plates".

When box is more than twice as high as its width at base, add two additional Items "G" tie-down bands, locating same about 1/4 the length of box from each end.

See General Rules 4, 5, 7, 9, 10, 11, 14, and 15 for further details.

Sec. 6-Fig. 38

FUSELAGES, WINGS, WING SECTIONS, SURFACES, ETC.-BOXED-GONDOLA CARS



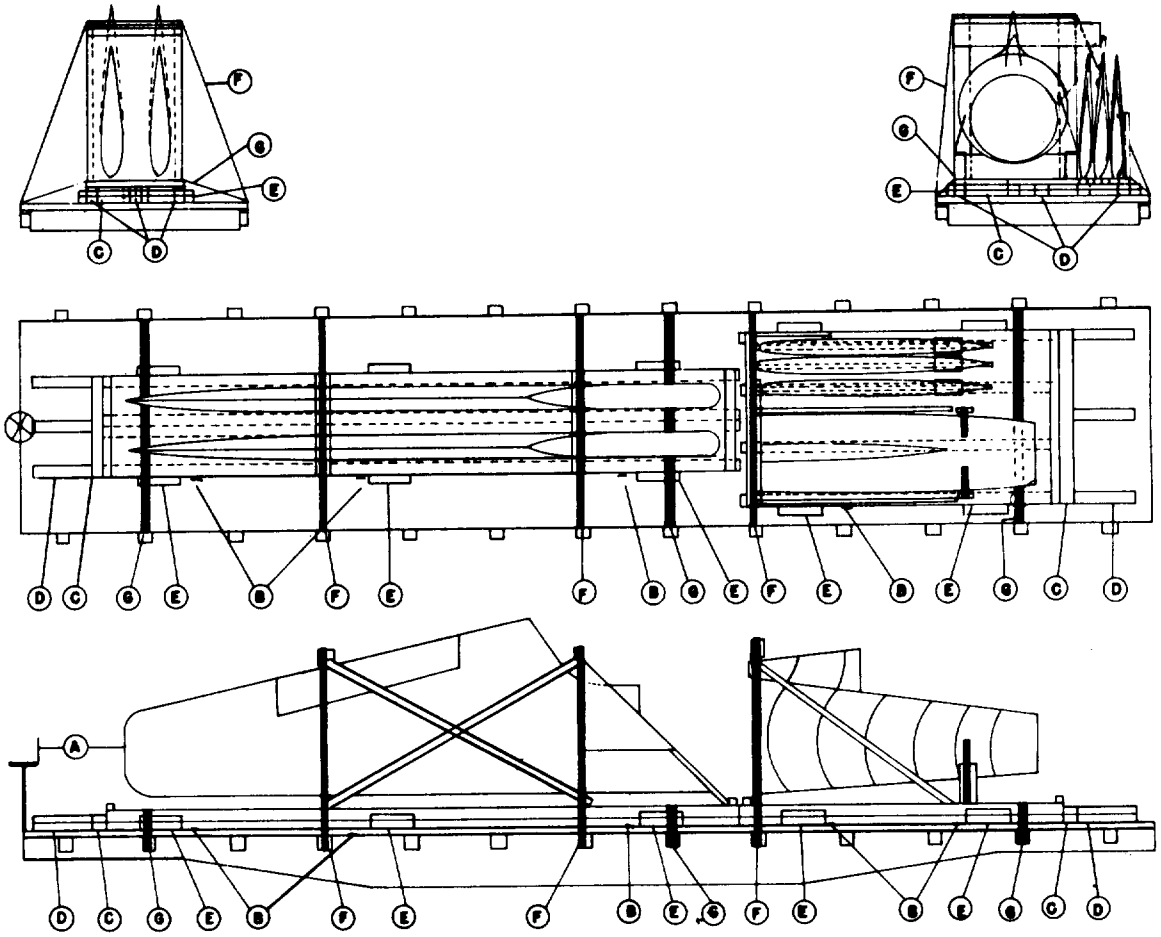
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B		Vacant.
C	3 ea. side of pile.	Each to consist of two pieces of 2 in. x 4 in., length equal to distance between side of car and side of load. Secure lower piece to floor with 20-D nails and top piece to one below in like manner. Secure to steel floors with two 5/8 in. dia. bolts.
D	As required ea. end of load.	Each to consist of two pieces of 2 in. x 4 in., length equal to width of load when the end of one box does not extend beyond the end of the adjacent box. When end of one box extends beyond the other, place one, length equal to width of box, against each box. Secure lower piece to floor with six 20-D nails and top piece to one below in like manner. Secure to steel floors with three 5/8 in. dia. bolts.
E	Boxes 5 ft. wide or less; 2 ea. end. Boxes over 5 ft. wide; 4 ea. end.	Each to consist of two pieces of 2 in. x 4 in. x 16 in. Locate against Item "D" and secure lower piece to floor with three 20-D nails and top piece to one below in like manner. Secure to steel floors with two 5/8 in. dia. bolts. When Items "E" cannot be applied, Items "D" must be adequately secured with 3/4 in. dia. bolts.
F	2 per pile.	2 in. x .050 in. high tension bands, encircling pile. Required only when two or more boxes are loaded side by side.
G	3 per pile.	8 in. x .050 in. high tension bands. Attach to top side angle as per Sketch 1, or by equally effective method.
H	6 per box.	Anti-Skid Plates, pattern 63. Place between box and floor, as shown. Load must be stenciled on both sides in 1 in. letters to read, "Anti-Skid Plates".

When box Is more than twice as its width at base, add two clamps, each to consist of one piece 4 in. x 6 in., across top of box with 3/4 in. dia. rods through each end of same and through top chord angle or floor. Locate about 1/4 the length of box from each end. Use suitable plate washer on top of clamping piece to prevent splitting.

See General Rules 4, 5, 7, 9, 11, 14 and 15 for further details.

Sec. 6-Fig. 39

AIRCRAFT WINGS AND AFT SECTION MOUNTED ON WOOD FRAME, UNBOXED ON SKID BASE-FLAT CARS

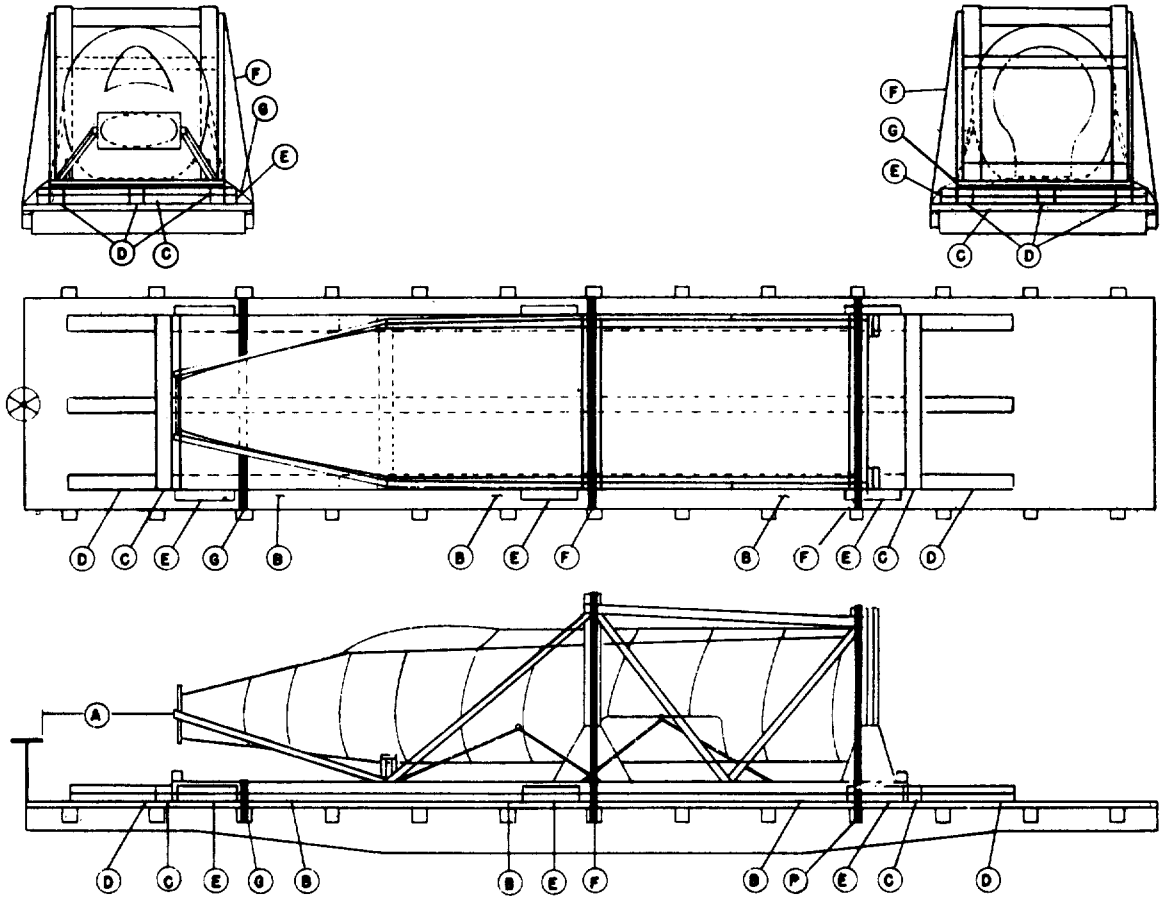


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	6 per wing, 4 ea. per AFT Section.	Anti-Skid Plates, pattern 63. Locate between skids of units and floor, as shown. Load must be stenciled on both sides in one Inch letters to read, "Anti-Skid Plates".
C	1 ea. end of load.	Each to consist of two pieces 2 in. x 4 in. length equal to width of load. Secure lower piece to floor with six 30-D nails and top piece to one below in like manner.
D	3 ea. Item "C".	Each to consist of two pieces 2 in. x 4 in. x 24 in. Locate suitably spaced, as shown, against Item "C". Secure lower piece to floor with six 30-D nails and top piece to one below in like manner.
E	6 ea. per wing unit; 4 ea. per AFT Section.	Each to consist of two pieces, 2 in. x 4 in. x 24 in. Locate at each side of load as shown. Secure lower piece to floor with four 30-D nails and top piece to one below in like manner.
F	2 per wing section. 1 per AFT Section.	2 in. x .050 in. high tension bands. Locate as shown, attaching to opposite stake pockets of car. Substitute, if desired, steel cable 3/8 in. x 6 x 7.
G	2 per wing section. 1 per AFT Section.	2 in. x .050 in. high tension bands. Locate as shown, attaching to opposite stake pockets of car.

See General Rules 4, 5, 7, 9, 10, 11, 14 and 15 for further details.

Sec. 6-Fig. 40

AIRCRAFT FUSELAGE MOUNTED ON WOOD FRAME UNBOXED ON SKID BASE-FLAT CARS

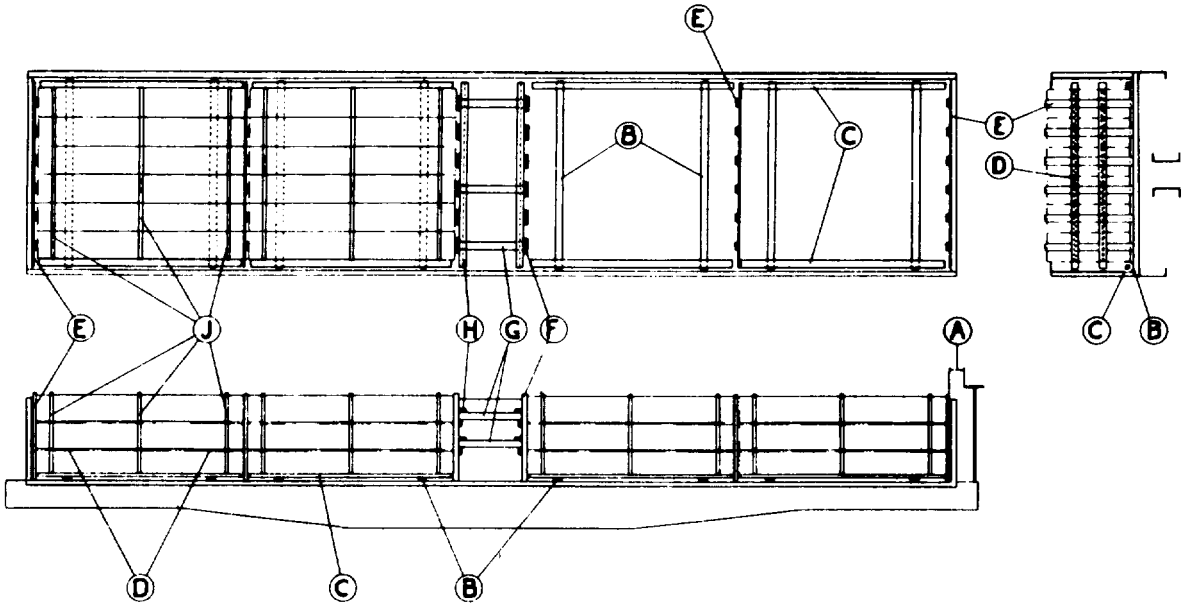


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	6 per unit.	Anti-Skid Plates, pattern 63. Locate between skids and floor as shown. Load must be stenciled on both sides in one inch letters to read, "Anti-Skid Plates".
C	1 ea. end of load.	Each to consist of two pieces 2 in. x 4 in. length to equal to width of load. Secure lower piece to floor with, six 30-D nails and top piece to one below In like manner.
D	8 ea. Item "C".	Each to consist of two pieces 2 in. x 4 in. x 24 in. Locate suitably spaced as shown against Item "O". Secure lower piece to floor with six 30-D nails and top piece to one below in like manner.
E	6 per unit.	Each to consist of two pieces 2 in. x 4 in. x 24 in. Locate at each side of load as shown. Secure lower piece to floor with four 30-D nails and top piece to one below in like manner.
F	2 ea. unit.	2 in. x .050 in. high tension bands. Locate as shown, attaching to opposite stake pockets of car. Substitute, if desired, steel cable 3/8 in. x 6 x 7.
G	1 ea. unit.	2 in. x .050 in. high tension bands. Locate as shown, attaching to opposite stake pockets of car.

See General Rules 4, 5, 7, 9, 10, 11, 14 and 15 for further details.

Sec. 6-Fig. 41

LANDING MATS IN BUNDLES-GONDOLA CARS



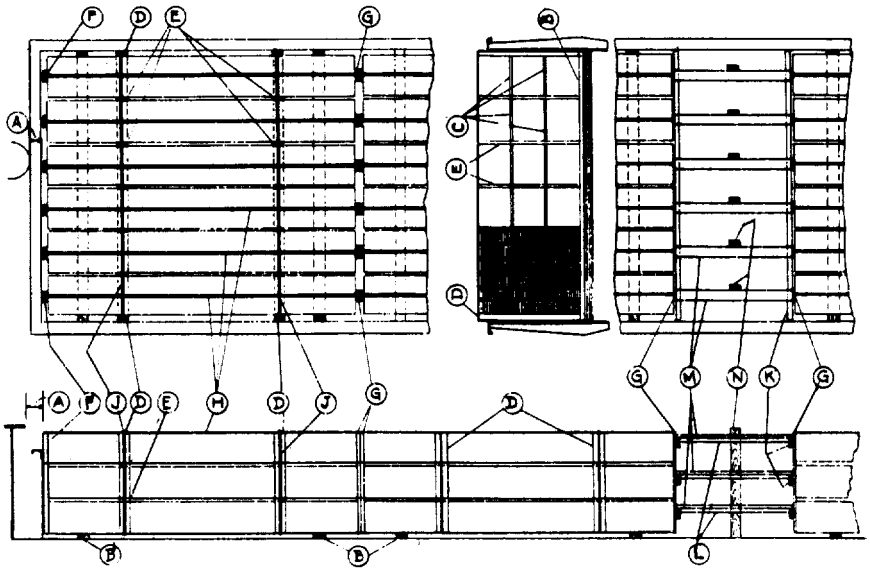
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig 2.
B	2 per pile.	2 in. x 4 in., length equal to about 2 in. less than width of car. Locate one about 16 in. from each end of pile and secure each with three 20-D nails.
C	2 per pile.	2 in. x 4 in., length to suit. Locate against each side of pile and secure to each Item "B" with two 30-D nails.
D	As required.	1 in. x 4 in.. length equal to width of pile. Locate two, as shown, suitably spaced, between layers.
E	As required.	End and intermediate gates, height and width to suit, built up of six 2 in. x 4 in. uprights and two 1 ill. x 4 ill. crosspieces. Locate between piles and between piles and ends of car, as shown.
F	2	Center gates, height and width to suit, built up of six 3 in. x 8 in. uprights and two 2 in. x 4 in, crosspieces. Locate against ends of piles at center of load, as shown.
G	6	4 in. x 4 in., length sufficient to fill space between Items "F". Locate suitably spaced, as shown, three above bottom crosspieces, and three above top crosspieces of Items "F". Secure ends to Items "F" with two 30-D nails.
H	4	2 in. x 4 in., length to suit. Locate, as shown, against Items "F" and on top of Items "G". and secure to each Item "G" with two 30-D nails.
J	3 per pile.	2 in. x .050 in. high tension bands. Locate, as shown, suitably spaced encircling pile.

Cars must be loaded from each end leaving vacant space, if any, as near to center of car as practicable.

See General Rules 4, 5, 9, 11, 14 and 15 for further details.

Sec. 6-Fig. 42

LANDING MATS IN BUNDLES-GONDOLA CARS



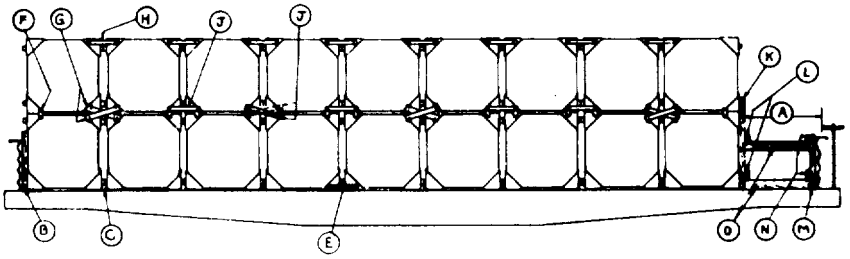
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	2 ea. pile.	2 in. x 4 in., length about equal to inside width of car. Locate about 14 in. from each end of pile.
C	2 between successive layers of ea. stack.	1 in. x 4 in., length equal to width of bundle. Locate in line with Items "D" and "E", as shown. Use optional.
D	4 ea. pile.	2 in. x 4 in., length equal to height of pile. Locate about 30 in. from each end of pile, as shown. Drive one 20-D nail through each of these Items and between the mats to help prevent their displacement.
E	2 between successive stacks.	1 in. x 4 in., length equal to height of pile. Locate about 30 in. from each end of pile. Drive one 10-D nail through each of these items and between the mats to help prevent their displacement.
F	1 ea. stack.	2 in. x 4 in., length equal to height of pile. Locate at center of and adjacent to outside end or end stacks, as shown. Drive one 20-D nail through each of these items, near top and between mats to help prevent their displacement.
G	1 or 2 ea. stack.	1 in. x 4 in., length equal to height of pile. Locate at center of and against inside ends of stacks, as shown. Drive one 10-D nail through each of these items near top and between mats to help prevent their displacement.
H	1 ea. stack.	1 1/4 in. x .035 in. high tension band. Locate at center of and encircling stack and Items "F" and "G", or Items "F". If desired these items may be applied in chain fashion.
J	2 ea. pile.	1 1/4 in. x .035 in. high tension bands. Locate as shown to encircle pile and Items "D" and “E”.
K	2 ea. layer.	2 in. x 4 in., length about equal to width of pile. Locate top edge about 3 in. from top of layer and secure to each Item "G" with two 20-D nails.
L	As required.	2 in. x 4 in. length equal to distance between Items "K". Locate as shown with top of 4 in. side even with top edge of Items "K" and secure each end to these items by toe-nailing with two 20-D nails.
M	As required.	2 in. x 4 in., length equal to distance between inside ends of load. Locate on top of Items "K" and "L" and secure each to these items with six 20-D nails.
N	As required.	2 in. x 4 in., long enough to extend from floor to about 3 in. above top Items "M". Locate about at center of Items "L" and "M" and secure to each with two 20-D nails. Not required when distance between inside ends of load does not exceed 3 ft.

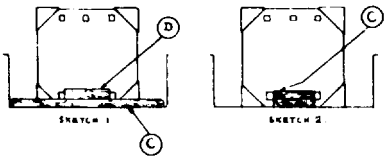
Cars must be loaded from each end leaving vacant space, if any, as near to center of car as practicable.

See General Rules 4, 5, 9, 10, 11, 14 and 15 for further details.

Sec. 6-Fig. 43

PONTOONS, STEEL-TWO LAYERS-GONDOLA CARS



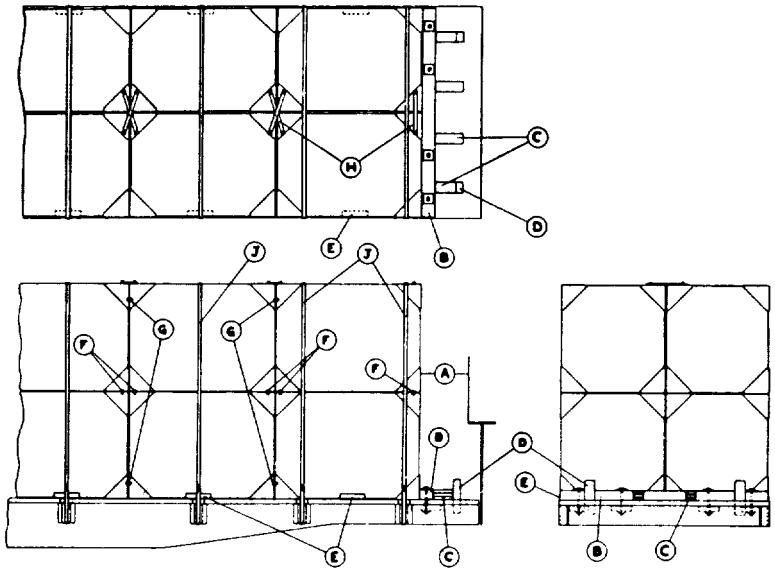


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	2 per load.	2 in. x 4 in., long enough to extend from floor to top of car end. Locate about 4 ft. apart and secure with one 1 in. x 3 in. at top, to prevent toppling over.
C	1 ea. bottom pontoon.	2 in. x 4 in., length 1 in. less than width of car, per Sketch 1. Substitute, if desired, on wood floor cars, 2 pieces 2 in. x 4 in., length equal to distance between inside face of lugs. Secure lower piece to floor with four 30-D nails and top piece to one below in like manner, per Sketch 2. Not required when Items "E" are used.
D	1 ea. bottom pontoon.	2 in. x 4 in., length equal to distance between inside face of lugs. Secure on top of Item "C" with four 30-D nails. Not required when Items "C", per Sketch 2, or Items "E", are used.
E	As required.	Each to consist of two pieces of 2 in. x 4 in. x 24 in. Locate and space equally against each side of adjoining pontoon. Secure lower piece to floor with five 80-D nails and top piece to one below in like manner. Not required for steel floor cars or when Items "C" and "D" are used.
F	4ea. pr. pontoons.	1/4 in. x 2 1/2 in. x 5 3/4 in. plates. Secure to top and bottom pontoons with two 3/4 in. dia. bolts. Use washer or plate under head of bolt.
G	6 pr. per load.	1/4 in. x 2 1/2 in. x 25 1/2 in. plates. Locate as shown. Secure to pontoons, on top of Items "F" with one 34 in. dia. bolt at each end.
H	As required.	1/4 in. x 2 1/2 in. x 25 1/2 in. plates. Locate, as shown, secure to pontoons with one , in. dia. bolt at each end. Use washer or plate under head of bolt.
J	As required.	1/4 in. x 2 1/2 in. x 25 1/2 in. plates. Locate as shown either horizontally or diagonally and secure to pontoons on top of Item "F" with one 3/4 in. dia. bolt at each end.
K	8 per load.	2 in. x 6 in., long enough to extend from floor to top of car end. Locate both end pieces outside of outside lugs and one piece under center lug.
L	2 per load.	2 in. x 4 in., length 1 in. less than width of car. Secure to each Item "K", above Items "O", with three 30-D nails.
M	8 per load.	2 in. x 6 in., long enough to extend from floor to top of car ends, spaced same as Items "K".
N	2 per load.	2 in. x 4 in., length 1 in. less than width of car. Secure to each Item "M" with three 30-D nails.
O	6 per load.	4 in. x 4 in., length equal to distance between Items "K" and "M". Secure to Items "K" and "M", as shown, with six 30-D nails each.

See General Rules 4, 5, 9, 11, 14 and 15 for further details.

Sec. 6-Fig. 44

PONTOONS, STEEL, DOUBLE-DECKED-RECTANGULAR SECTIONS-FLAT CARS

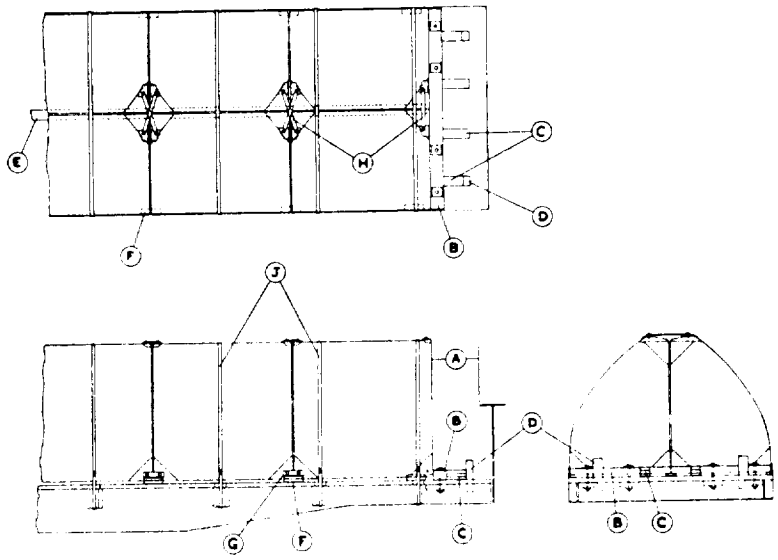


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	2 per car.	6 in. x 8 in., length equal to width of load. Locate against ends of load and secure each to floor with four 5/8 in. dia. bolts and washers, as shown.
C	4 ea. Item "B".	Each to consist of three pieces of 2 in. x 6 in., length to suit. Locate two between Items "B" and "D" and two suitably spaced, as shown. Secure lower pieces to floor with five 30-D nails and top pieces to those below in like manner.
D	4 per car.	End stakes, length sufficient to extend 9 in. above floor. Locate, as shown, in end stake pockets. Where end stake pockets are not available, apply two additional Items "C" at each end of load.
E	As required.	3/8 in. x 3 in. x 4 in. x 15 in. angles. Locate as shown, against outside of each unit. Secure each to floor with three 3/8 in. x 2 in. lag screws or five drive screws prior to loading.
F	As required.	5/8 in. dia. bolts. Locate, as shown, between each unit in top andbottom layers.
G	As required.	5/8 in. dia. bolts. Locate, as shown, between each side by side unit, at top of top layer, and at bottom of bottom layer.
H	As required.	1/4 in. x 2 in., plates, length to suit. Locate two, as shown, crossed between units in top layers and secure at each location with one 5/8 in. dia. bolt. Only one Item "H" required at outside end of end units.
J	As required.	2 in. x .050 in. high tension bands. Locate two over top of side by side units at ends, and one over top of intermediate side by side units, as shown. Secure to opposite stake pockets.

See General Rules 4, 5, 7, 9, 10, 11, 14 and 15 for further details.

Sec. 6-Fig. 45

PONTOONS, STEEL-RAKE END SECTIONS-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	2 per car.	6 in. x 8 in., length equal to width of load. Locate against ends of load and secure each to floor With four 5/8 in. dia. bolls and washers as shown.
C	4 ea. Item "B".	Each to consist of three pieces of 2 in. x 6 in. length to suit. Locate two between Items .'B'' and “D'' and two suitably space as shown. Secure lower pieces to floor with five 30-D nails and top pieces to those below in like manner.
D	4 per car.	End stakes length sufficient to extend 9 in. above floor. Locate, as shown, in end stake pockets. Where end stake pockets are not available, apply two additional Items “C'' at each end of load.
E	1 per car	2 in. x 6 in., full length of car. Locate, as slowly, and secure to floor prior to loading with 8-D nails spaced about 12 in. apart.
F	As required.	Each to consist of two pieces of 2 in. x 4 in. x 12 in Locate lower pieces underneath and against outside lugs of end to Units, and top pieces against sides of end To units, us shown. Secure lower piece to floor with four 30-D nails and top piece to one below in like manner.
G	As required.	1/4 in. x 3 in., plates, length to suit. Locate, as shown on outside of each end to end unitand secure at each location with the standard 1 1/2 in. dia. pontoon stud bolt equipped with lock washers.
H	As required.	1/4 in. x 2 in., plates, length to suit. Locate two, as shown, crossed between units in top layers and secure at each location with one 5/8 in. dia. bolt. Only one Item "H'' required at outside end of end units.
J	As required.	2 in. x .050 in. high tension bands. Locate two over top of side by side units at ends, and one over top of intermediate side by side units, as shown. Secure to opposite stake pockets.

See General Rules 4, 5, 7, 9, 10, 11,14 and 15 for further details.

Section No. 6

NOTE:

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Section No. 6

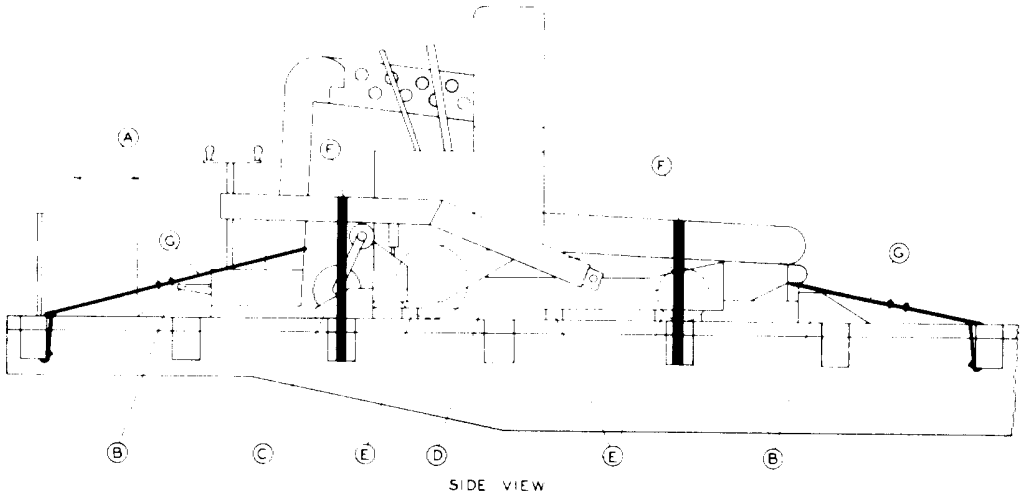
NOTE:

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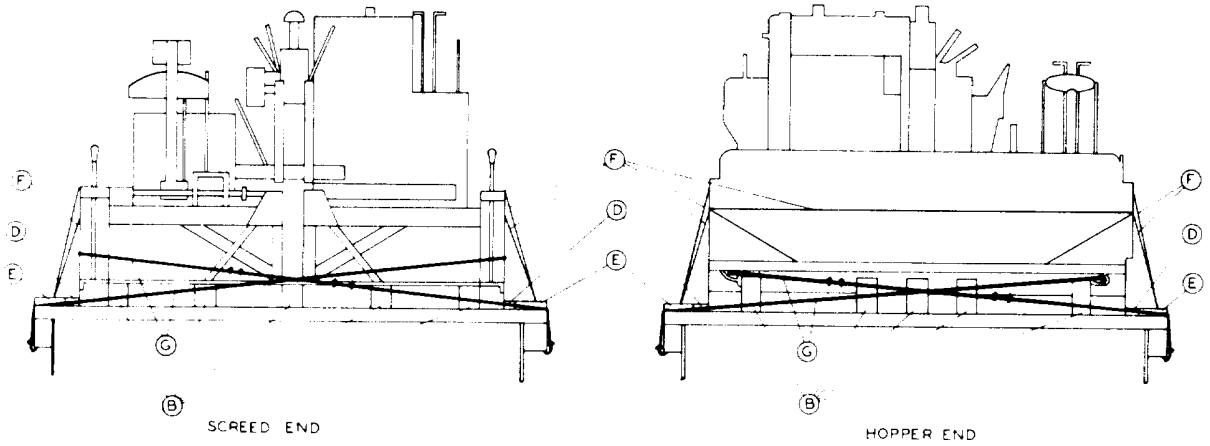
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Sec. 6-Fig. 47-A (New-1-1962)

PAVING MACHINE-BITUMINOUS MATERIAL --CRAWLER MOUNTED -FLAT CARS



SIDE VIEW



SCREED END

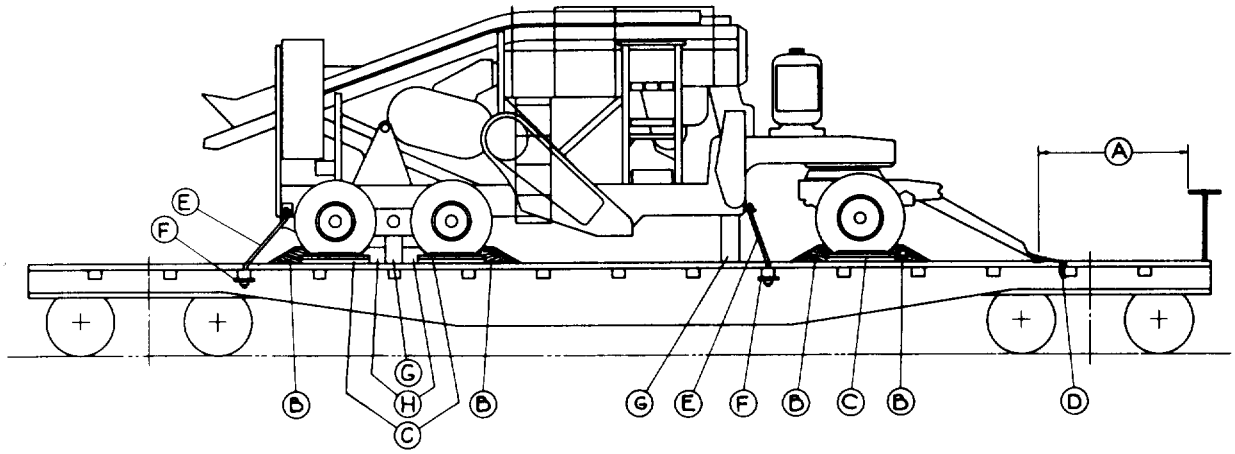
HOPPER END

Item	No. of Pcs.	Description
A		Brake wheel clearance. Fig. 2, Sec. 1.
B	10	Blocks Pat. 67. Locate 5 ea. against screed plate and 5 ea. against truck roller support frame as shown. Nail each to floor with two 60-D, two 40-D and two 20-D nails, and toe-nail each side with two 40-D nails.
C	2	Blocks Pat. 68. Locate against each side of main frame of tractor unit as shown. Nail each to floor with five 60-D nails.
D	2	Each 2 in. x 4 in. x 96 in. Locate one each against outer edge of crawler treads as shown. Nail to floor with 20-D nails every 20 inches.
E	6	Blocks, 2 in. x 4 in. x 6 in. Locate inner ends against Item "D" as shown. Nail each to floor with three 20-D nails.
F	2	Each 2 in. x .050 in. high tension bands. Pass one over leveler arms and one over hopper and through stake pockets as shown.
G	4	Each 1/2 in. x 6 x 19, independent wire rope core, preformed steel cable, length to suit, doubled. Screed end, attach one to each main screed support brackets, hopper end, attach one to each lifting eye. Cables to be passed through stake pockets, over 1/2 in. thimbles, on sides of car opposite to points of attachment on unit. Secure ends of cable with two 1/2 in. "U" bolt cable clips and thimbles with one "U" bolt cable clip.

See General Rules 4, 5, 7, 9, 14, 15 and 19A for further details

Sec. 6-Fig. 48 (Rev.-3-1965)

SIX WHEEL CRUSHING AND SCREENING PLANTS, EQUIPPED WITH PNEUMATIC TIRES AND DUAL FRONT WHEELS-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	8	Blocks, pattern 16. Locate 45 degree portion of block against front and rear of outside front wheels, in front of intermediate wheels and in back of rear wheels. Secure heel of block to floor with three 40-D nails and toe-nail that portion under tire with two 40-D nails.
C	6	Each to consist of two pieces of 2 in. x 4 in. x 36 in. Locate against outside of wheels and secure lower piece to floor with four 30-D nails and top piece to one below in like manner.
D	2	Each to consist of four strands No. 8 gage black annealed wire. Attach to lunnette of machine and pass through opposite stake pocket.
E	4	7/8 in. diameter rods. Attach to frame of machine, as shown, and pass through stake pockets and Items "F". Substitute, if desired, 5/8 in. x 6 x 7 steel cable, doubled.
F	As required.	1/2 in. x 4 in. x 10 in. plates.
G	2 per unit.	Support blocks, fabricated from 8 in. x 8 in. x length equal to width of car. Locate as shown, and secure to the car with a minimum of two 3/4 in. bolts.
H	4	Wheel blocks, similar to pattern 67, cut to required length. Locate between wheel and rear support block, as shown. Secure to support block and floor of car with six 40-D nails.

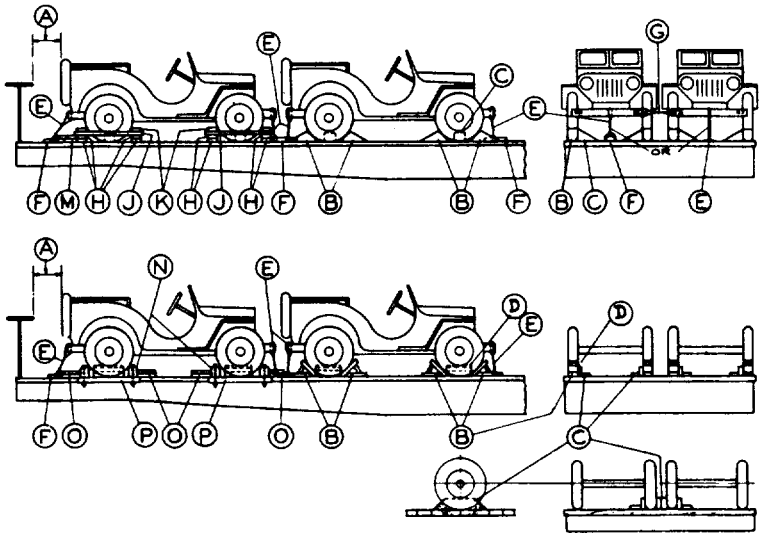
Waterproof paper, burlap or other suitable material must be used between Items "C" and tires.

Hand brakes must be set and levers wired or blocked.

See General Rules 2, 3, 4, 5, 7, 9, 14, 15, 19-A and 19-B for further details.

Sec. 6-Fig. 49 (Rev.-4-1980)

1/4 TON, 4 X 4 TRUCKS, LENGTHWISE, SINGLE OR DOUBLE ROWS-FLAT CARS-SINGLE ROWS-GONDOLA CARS WITH WOODEN FLOORS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1..
B	8 per unit.	Blocks, pattern 25. Locate 53 degree portion of block against front and rear of wheels. Secure heel of block to floor with three 40-D nails and toe-nail that portion under tire to floor with two 40-D nails. Substitute, if desired, at each location, blocks, pattern 18, 24 or 67. When units are loaded, side by side on fiat cars, Items "B" not required against inside of inside front and rear wheels.
		Items "B" not required when Items "H", "J", "K" and "L" or "N", "O" and "P" are used.
C	1 ea. wheel.	Blocks, pattern 25. Locate 53 degree portion against inside of each wheel and secure heel of block to floor with three 40-D nails and toe-nail other end to floor with one 40-D nail. Substitute, if desired, at each location, blocks, pattern 20. Secure to floor with four 30-D nails at each location. If desired, each block, pattern 25, or pattern 20, located against wheels nearest side of car may be omitted, provided a double 2 in. x 4 in. x 24 in. block is used between inside wheels of side by side units to prevent contacting each other. Secure lower piece to floor with four 20-D nails and top piece to one below with four 30-D nails in each.
		Not required when Items "H", "J", "K" and "L" are used.

Sec. 6-Fig. 49 (Rev.-4-1980)

1/4 TON, 4 X 4 TRUCKS, LENGTHWISE, SINGLE OR DOUBLE ROWS-FLAT CARS-SINGLE ROWS-GONDOLA CARS WITH WOODEN FLOORS

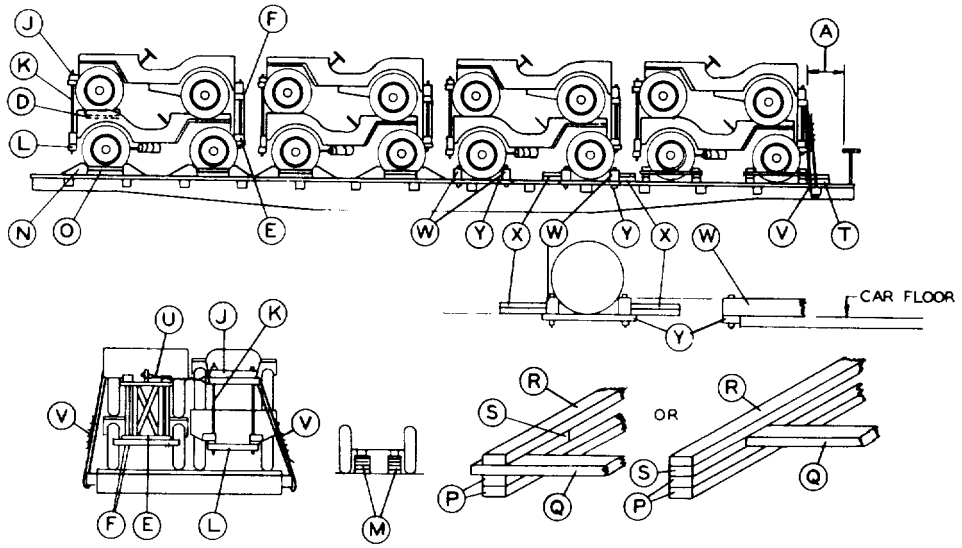
Item	No. of Pcs.	Description
D	1 ea. wheel.	Suitable material, such as waterproof paper, burlap, etc., Locate bottom portion under Item "C", top portion to extend 2 in. above Item "C". Not required when blocks, pattern 25 or Items "H", "J", "K" and "L" or "N", "O" and "P" are used.
E	2 ea. unit.	1 in. No. 14 B. W. gage hot rolled steel, with anchor plates, pattern 19. Locate over bumper at front end and through pulling hook at rear end and secure each plate to floor with eight 20-D cement-coated nails. Substitute, If desired, at each location, 4 strands, No. 8 gage black annealed wire. Pass over bumper or through pulling hook, underneath and around Item "F". After car springs have been compressed as much as possible, bring both ends together, and twist taut after Item "F" has been nailed in place.
F	1 ea. Item "E".	2 in. x 4 in. x 18 in. Locate one under front bumper at center of unit and one under rear pulling hook. Secure each to floor with four 30-D nails. Not required when steel straps, pattern 19, are used.
G	1 ea. end of ea. unit.	6 strands, 3 wrappings, No. 8 gage black annealed wire. Pass around pintle hook of one unit and around frame of adjacent unit, or around pintle hooks or frames of adjacent units.
H	4 ea. unit.	Each to consist of two pieces of 2 in. x 4 in., long enough to extend to outside face of outside tires of units loaded side by side and long enough to admit of application of Items "J" on units loaded in single row. Locate so that Items "K" will contact tires of wheels. Secure lower piece to floor with ten 30-D nails and top piece to one below in like manner. Not required when Items "B" and "C" or "N", "Q", and "P" are used.
J	1 ea. outside wheel.	2 in. x 4 in., long enough to extend 2 in. beyond outside face of Items "H", or Items "N" when used on units loaded in single row. Locate against wheel and secure to each Item "H" or Item "N" with three 20-D nails. Not required when Items "B" and "C" or "N", "O" and "P" are used.
K	4 ea. unit.	2 in. x 4 in., length equal to length of Items "H". Locate against tires, on top of Items "J" and "L". Secure to Items "J" and "L" with three 20-D nails at each location. Not required when Items "B" and "C" or "N", "O" and "P" are used.
L	2 ea. Item "J".	2 in. x 4 in. x 12 in. Locate between Items "H" and "K" with one end against Item "J". Secure to Item "H" with two 20-D nails in each. Not required when Items "B" and "C" or "N", "O" and "P" are used.
M	2 ea. end of load.	Each to consist of two pieces of 2 in. x 4 in. x 18 in. Locate on floor with one end against Item "H". Secure lower piece to floor with four 30-D nails and top piece to one below with four 20-D nails. Not required when Items "B" and "O" or "N", "O" and "P" are used.
N	4 ea. single or side by side row.	4 in. wide, 6 in. high, long enough to extend to outside face of outside tires of units loaded side by side and long enough to admit of application of Items "J" on units loaded in single row. Locate against front and rear tires. Toe-nail to floor with four 30-D nails. Not required when Items "B" or "H", "J", "K" and "L" are used.
O	4 ea. Item "N".	Each to consist of two pieces of 2 in. x 4 in. x 18 in. Locate one near each end and two near center of Items "N". Secure lower piece to floor, lengthwise of car, with four 30-D nails and top piece to one below in like manner. Not required when Items "B", or "H", "J", "K" and "L" are used.
P	1 ea. Item "N".	2 in. x 4 in., long enough to extend 1 in. beyond outside face of Items "N". Locate 2 in. edge against end of floor, under Items "N". Secure each end to Items "N" with one 1/2 in. dia. bolt. Multiple length pieces may be used provided they protect two or more complete units and are secured to each Item "N" throughout their length. Not required when Items "B", or "H", "J", "K", and "L" are used.

Hand brakes must be set and levers wired or blocked.

See General Rules 4, 5, 9, 11, 14, 15, 19-A and 19-B for further details.

Sec. 6-Fig. 50 (Rev.-9-1977)
(Drawing Redrawn 9-1977)

1/4 TON, 4 X 4 TRUCKS, DOUBLE DECKED, LENGTHWISE, SINGLE OR DOUBLE ROWS--FLAT CARS-SINGLE ROWS-GONDOLA CARS WITH WOODEN FLOORS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
*B	2 ea. unit.	3 in. x 3 in. x 7 in. Locate between frame and each front spring. Secure in position with No. 14 ga. wire.
*C	2 ea. lower unit.	4 in. x 4 in. x 5 in. Locate between frame and each rear spring. Secure in position with No. 14 ga. wire.
D	2 ea. lower unit.	Blocks, pattern 34. Locate one each on tool and chain box of each lower unit.
E	1 ea. lower unit.	Frame, pattern 35. Locate on top of frame of lower unit, in front of radiator and underneath rear cross members of upper unit. Secure to inside Items "F", in four places, with No. 14 ga. wire.
F	4 ea. Item "E".	3/4 in. dia. rods. Pass two through each Item "G" at top and through each Item "H" at bottom.
'G	2 ea. upper unit.	Plates, pattern 36. Locate on top of frame of upper unit, behind Item "E".
'H	2 ea. lower unit.	Plates, pattern 37. Locate below frame of lower unit. Secure in position with Items "F".
J	1 ea. upper unit.	Blocks, pattern 38. Locate on top of frame of upper unit, in front of radiator.
K	2 ea. Item "J".	3/4 in. dia. rods. Pass through Items "J" and "L". Draw taut to compress springs as much as possible.
L	1 ea. lower unit.	Blocks, pattern 39. Locate under rear cross member of lower unit. Secure in position with Items "K".
M	4 ea. lower unit.	Blocks, pattern 40, height 1/4 in. greater than distance between main spring clips and floor. Locate under spring clips and secure lower pieces to floor with two 20-D nails in each end and upper pieces to those below with six 10-D nails in each.
N	8 ea. lower unit.	Blocks, pattern 25. Locate 53 degree portion of block against front and rear of each wheel of lower units. Secure heel of block to floor with three 40-D nails and toe-nail that portion under tire to floor with two 40-D nails. Not required when Items "P", "Q", "R" and "S" or "W", "X" and "Y" are used.

Sec. 6-Fig. 50 (Rev.-9-1977) (Concluded)
(Drawing Redrawn 9-1977)

1/4 TON, 4 X 4 TRUCKS, DOUBLE DECKED, LENGTIIWISE, SINGLE OR DOUBLE ROWS-FLAT CARS-SINGLE ROWS-GONDOLA CARS WITH WOODEN FLOORS

Item	No. of Pcs.	Description
O	4 ea. lower vehicle	Block pattern 88, Section 6 for side blocking of wheels. Use suitable protective material, such as waterproof paper or burlap, between tire and blocking. Locate bottom portion under Item "O", top portion to extend two inches above Item "O".
P	4 ea. lower unit.	Each to consist of two pieces of 2 in. x 4 in., long enough to extend to outside face of outside tires of units loaded side by side and long enough to admit of application of Items "Q" on units loaded in single row. Locate so that Items "R" will contact tires of wheels. Secure lower piece to floor with ten 30-D nails and top piece to one below in like manner. Not required when Items "N" and "0" or "W", "X" and "Y" are used.
Q	1 ea. outside wheel of lower unit.	2 in. x 4 in., long enough to extend 2 in. beyond outside face of Items "P". Locate against wheel and secure to each Item "P" or Items "W" with three 20-D nails. Not required when Items "N" and "O" or "W", "X" and "Y" are used.
R	4 ea. lower unit.	2 in. x 4 in., length equal to length of Items "P". Locate against tires, on top of Items "Q" and "S". Secure to Items "Q" and "S" with three 20-D nails at each location. Not required when Items "N" and "O" or "W", "X" and "Y" are used.
S	2 ea. Item "Q".	2 in. x 4 in. x 12 in. Locate between Items "P" and "R", with one end against Item "Q". Secure to Item "P" with two 20-D nails in each. Not required when Items "N" and "O" or "W", "X" and "Y" are used.
T	2 ea. end of load.	Each to consist of two pieces of 2 in. x 4 in. x 18 in. Locate on floor with one end against Item "P" and secure lower piece to floor with four 30-D nails and top piece to one below in like manner.
U	1 ea. end of ea. upper unit.	6 strands, 3 wrappings, No. 8 ga. black annealed wire. Pass around pintle hook of one unit and around frame of adjacent unit, or around pintle hooks or frames of adjacent units.
V	4 for each set of 4 vehicles.	Wire rope 3/8 in., 6 x 19 IWRC. Apply in complete loop. Pass wire rope around frame at each corner of each upper unit loaded in single row, and around frame at outside corners of each upper unit loaded in double row, and through stake pockets on each side of car. Secure wire rope with four 3/8 in. cable clips. Apply thimble at bottom of each stake pocket and secure it to the wire rope with cable clip.
W	4 ea. single or side by side row.	4 in. wide, 6 in. high, long enough to extend to outside face of outside tires of units loaded side by side and long enough to admit of application of Items "Q" on units loaded in single row. Locate against front and rear tires of lower unit. Toe-nail to floor with four 30-D nails. Not required when Items "N" or "P", "Q", "R" and "S" are used.
X	4 ea. Item "W".	Each to consist of two pieces of 2 in. x 4 in. x 18 in. Locate one near each end and two near center of Items "W". Secure lower piece to floor, lengthwise of car, with four 30-D nails and top piece to one below in like manner. Not required when Items "N" or "P", "Q", "R" and "S" are used.
Y	1 ea. Item "W".	2 in. x 4 in., long enough to extend 1 in. beyond outside face of Items "W". Locate 2 in. edge against end of floor, under Items "W". Secure each end to Items "W" with one 1/2 in. dia. bolt. Multiple length pieces may be used provided they protect two or more complete units and are secured to each Item "W" throughout their length. Not required when Items "N" or "P", "Q", "R" and "S" are used.

*Application of these items do not appear on drawing.

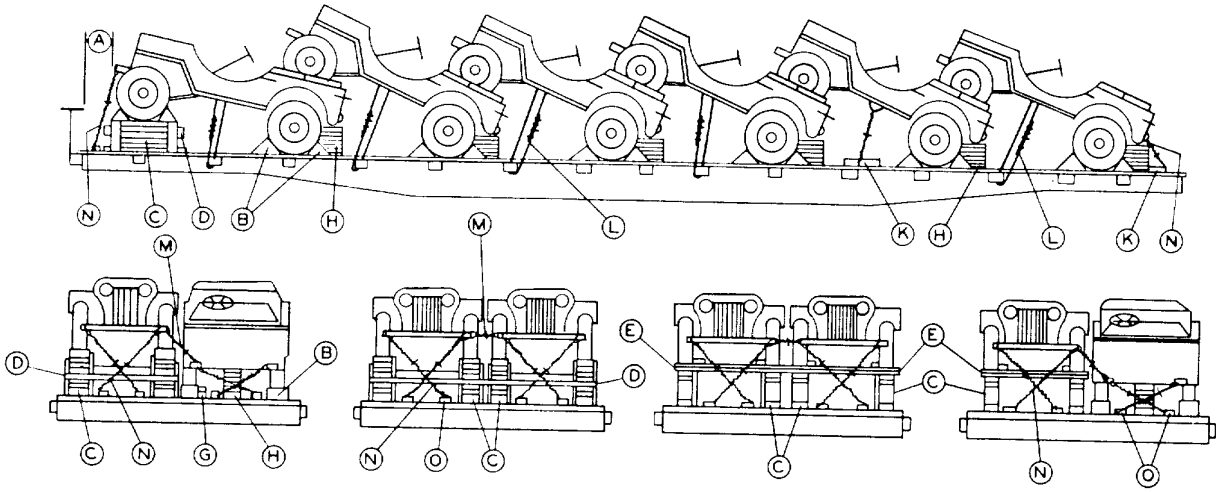
Note:

1. Hand brakes must be set and levers wired or blocked.

See General Rules 1, 2, 3, 4, 5, 9, 11, 14, 15, 19-A and 19-B for further details.

Sec. 6-Fig. 51 (Rev.--4-1980)
(Drawing Redrawn 9-1977)

1/4 TON, 4 X 4 TRUCKS, LENGTHWISE, INCLINED, SINGLE OR DOUBLE ROWS--FLAT CARS



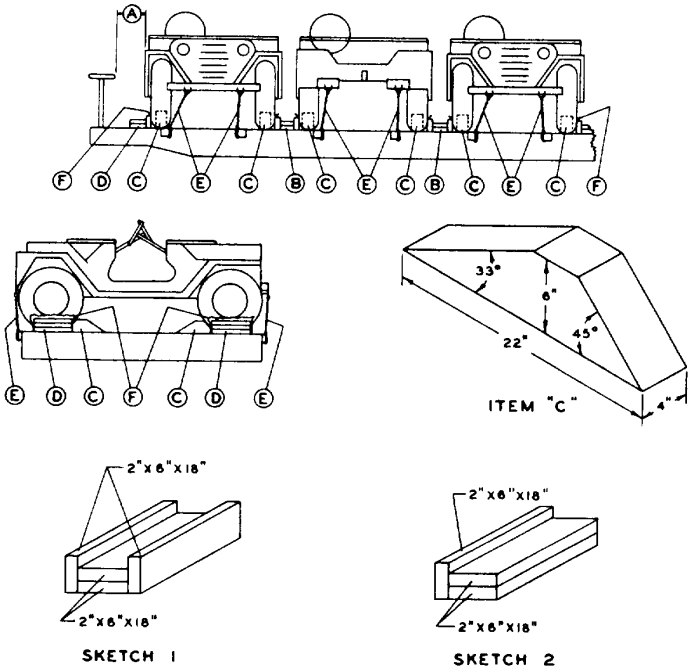
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	2 ea. rear wheel, all units and 2 ea. front wheel of first unit in ea. row.	Blocks, pattern 25. Locate 53 degree portion of block against front and rear of front wheels of first unit in each row, against front and rear of outside rear wheels and against rear of Inside rear wheels of all units. Secure heel of block to floor with three 40-D nails and toe-nail that portion under tire to floor with two 40-D nails. Blocks on top of Items "C", pattern 41, to be nailed in same manner to Items "C". Substitute, if desired, blocks, pattern 17,18 or 67 at each location.
C	4	Front wheel supports, pattern 41. Locate under front wheels of first unit in each row. Secure to floor with three 30-D nails in each end and toe-nail bottom pieces to floor with two 30-D nails on each side. Substitute, if desired, supports, pattern 42. Secure each to floor with six 30-D nails.
D	4	2 in. x 4 in., long enough to extend to outside face of adjacent Items "C", pattern 41. Not required when Item "C", pattern 42, is used.
E	As required.	Each to consist of two pieces of 2 in. x 4 in., long enough to extend to outside face of Items "C", pattern 42. Locate in front and rear of front wheels of first unit, or units, in each row. Secure lower piece to Items "C" with two 30-D nails at each location and top piece to one below with three 30-D nails near each end. Not required when Items "C", pattern 41, are used.
F	2ea. unit.	Blocks, pattern 43. Locate one on seat box of all units except rear unitin each row.
G	1 ea. inside rear wheel.	Each to consist of two pieces of 2 in. x 4 in. x 18 in. Locate against inside face of rear wheel. Secure lower piece to floor with four 30-D nails and top piece to one below in like manner. Not required when frame, Item "J", is used.
H	1 ea. unit.	Fill space between floor and rear of each unit with 2 in. x 8 in. x 12 in. pieces. Secure pieces to each other with three 10-D nails in each and toe-nail to floor with four 30-D nails.
J	1 ea. unit.	Frame, pattern 44. Locate on floor, under rear wheels. Secure each horizontal piece to floor with sixteen 30-D nails. Use optional on cars 9 ft. 4 in. wide or over.
K	1 ea. unit.	2 in. x 4 in. x 18 in. Secure to floor, lengthwise of car, with four 30-D nails in each. Not required when Items "L" are attached to stake pockets.
L	1 ea. vehicle.	Wire rope, 3/8 in., 6 x 19, IWRC, doubled. Pass over top and around frame to stake pocket on car. Metal fillers or thimbles sufficient to provide a suitable radius must be used to protect wire rope at stake pockets and at vehicle tiedown point and must be applied so as to prevent dislodgment. Cable clips must be applied in accordance with General Rules 15d and 15n. If wire must be used i8 strands) pass over top and around frame and through stake pockets or underneath and around Item "K".
M	1 ea. side by side unit.	4 strands, No. 8 ga. black annealed wire. Pass through bumpers of adjacent units.
N	2 ea. end unit.	6 strands, No. 8 ga. black annealed wire. Pass around front and rear bumpers and underneath and around Items "O".
O	2 ea. end unit.	2 in. x 4 in. x 18 in. Secure each to floor lengthwise of car, on top of Items "N", with four 30-D nails.

Notes:
1. Load should be started at brake shaft end of car.
2. Units in both rows may face in same direction when width of car will permit, or when Items ""J" are used.
3. Hand brakes must be set and levers wired or blocked.

See General Rules 1,2, 3, 4, 5, 9, 11, 14, 15, 19-A and 19-B for further details.

Sec. 6-Fig. 51-A (Rev.-4-1980)
(Drawing Redrawn 11-1978)

1/4 TON, 4 X 4 TRUCKS, CROSSWISE-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	16 required for 9 vehicles on 53'6" car.	Each to consist of two pieces of 2 in. x 6 in. x 18 in. lumber and two pieces of 2 in. x 8 in. X 18 in. lumber. Nail the bottom edge of the two 2 in. x 6 in. x 18 in. pieces to the bottom2 in. x8 in. x 18 in. piece with three 12-D nails on each side as shown in Sketch 1. Secure the assembled pieces to the car floor through the 2 in. x 8 in. piece with three 20-D nails. Nail the other 2 in. x 8 in. piece to the one below In a like manner. Locate as shown. See Sketch 1.
C	4 ea. vehicle.	Wheel block 4 in. x 6 in. x 22 in. Locate 45 degree portion of the block against the inside of the front and rear wheels as shown. Nail heel of block to the car floor with three 30-D nails and toenail that portion of the block under the tire with two 30-D nails on each side. Substitute, if desired, blocks, pattern 67, at each location.
D	4	Each to consist of one piece of 2 in. x 6 in. x 18 in. lumber and two pieces of 2 in. x 8 in. x 18 in. lumber. Nail one edge of the 2 in. x 6 in. x 18 in. piece to the bottom piece of 2 in. x 8 in. x 18 in. piece with three 12-D nails as shown in Sketch 2. Place against the tire and nail to the car floor with three 20-D nails. Nail the other 2 in. x 8 in. x 18 in. piece to the one below in a like manner. Locate as shown. See Sketch 2.
E	4 ea. vehicle.	Each to consist of four strands of No. 8 gage common annealed wire. Attach to the lifting shackles located at each end of the vehicle and to the stake pockets as shown. Metal fillers sufficient to provide a suitable radius must be used to protect the wire at stake pockets and applied so as to prevent dislodgment. Twist wires taut with a rod, bolt or suitable length of 2 in. x 2 in. lumber and secure to prevent unwinding. Substitute, if desired, 3 in. IWRC wire rope in a complete loop and secure with three 3 in. cable clips. Thimbles must be used at the stake pockets to protect the wire rope and secured to the wire rope with one cable clip.
F	1 ea. Items "B" and "D".	Suitable material such as waterproof paper or burlap, etc. Locate bottom portion under Items "B" and "D", the top portion to extend 2 inches above Items "B" and "D".

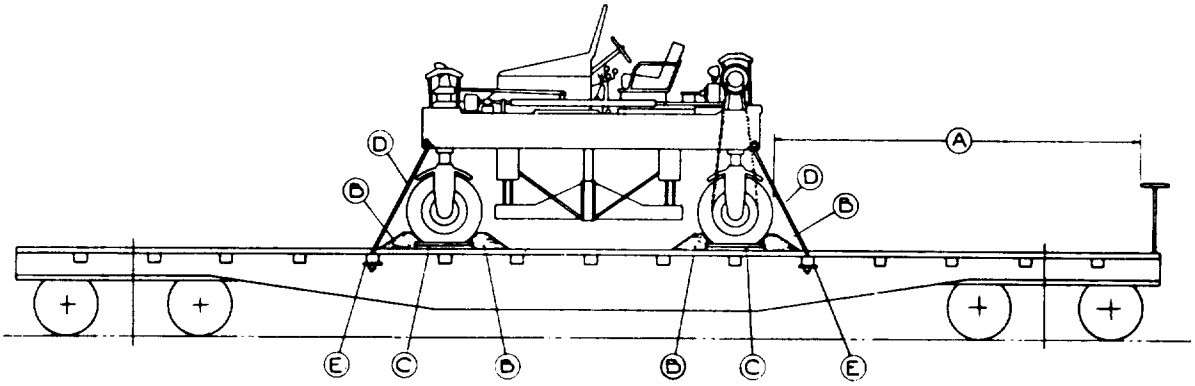
Notes:

1. Shippers should specify cars 9'6" wide or wider., 53'6" in lengthfor the loading of nine vehicles.
2. Hand brakes must be set.
3. Gearshift lever must be placed in neutral position.
4. Tie-down wires or wire rope shall be applied as near to parallel to each other as possible. Tie-down wires or wire rope must not be crossed.
5. When rail line clearances require, spare wheel assembly and mounting bracket, rear bumperettes, towing pintle, water/gas cans and carrier shall be removed from the vehicle prior to loading.

See General Rules 1, 2, 3, 4, 5, 7, 9, 14, 15, 19A, 19B and 19C for further details.

Sec. 6-Fig. 52 (Rev.-1-1976)

STRADDLE TRUCKS-FLAT OR GONDOLA CARS



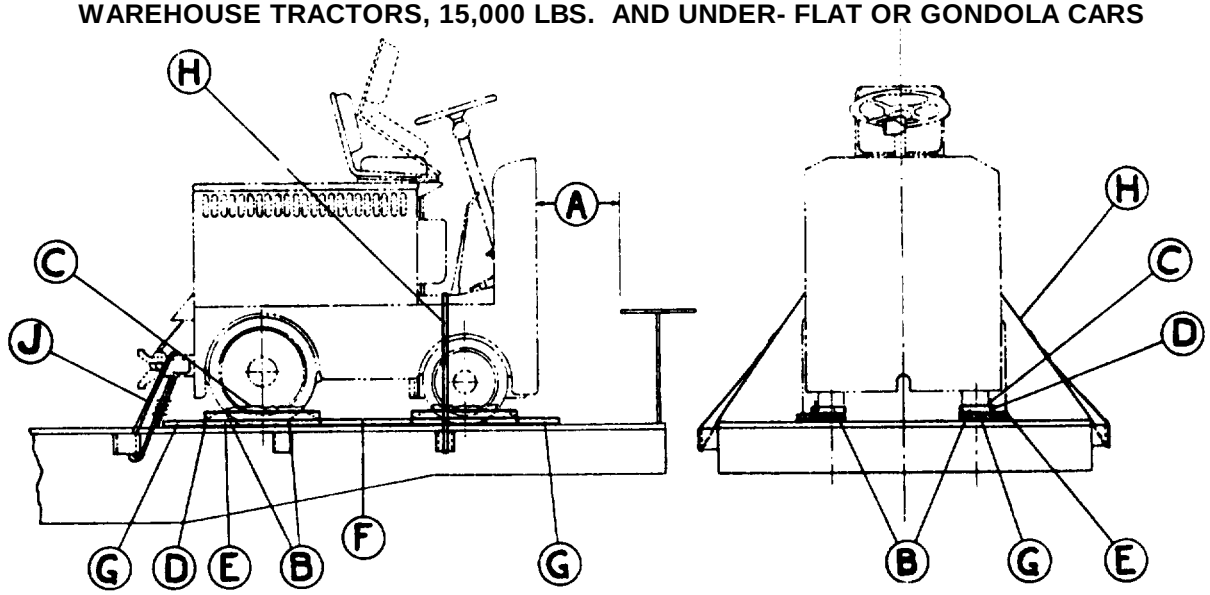
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	8 per unit.	Blocks, pattern 16. Locate 45 degree portion of block against front and rear of each wheels Secure heel of block to floor with three 40-D nails and toe-nail that portion under tire to floor with two 40-D nails. Substitute, if desired, at each location, blocks, pattern 17 or 18.
C	4 per unit.	Block Pattern 89, Section No. 6 Material Chart. Each to consist of one piece of 2 in. x 6 in. x 36 in. lumber and three pieces of 2 in. x 4 in. x 36 in. lumber. Nail 2 in. x 6 in. piece to edge of bottom 2 in. x 4 in. piece with five 12-D nails. Place against tire with suitable protective materials, such as waterproof paper or burlap between tire and 2 in. x 6 in. piece. Nail to car floor through the 2 in. x 4 in. piece with four 20-D nails. Nail the other two pieces of 2 in. x 4 in. lumber to the one below in the same manner.
D	4 per unit.	7/8 in. dia. rods. Attach one to frame at each corner of unit and pass through stake pocket, and Item "E", or through floor. Substitute, if desired, at each location 5/8, in. x 6 x 19 IWRC wire rope, doubled.
E	As required.	1/2 in. x 4 in. x 10 in. plates. Units must have elevators placed in fully lowered position.

Hand brakes must be set and levers wired or blocked.

See General Rules 1, 2, 3, 4, 5, 9, 11, 14, 15, 19-A and 19-B for further details.

Sec. 6-Fig. 53 (Rev.-9-1984)
(Drawing Redrawn 9-1984)

WAREHOUSE TRACTORS, 15,000 LBS. AND UNDER- FLAT OR GONDOLA CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	8 per unit.	Blocks, pattern 82. Locate 45 degree portion o! block against front and rear of wheels. Secure each to floor with three 40-D nails.
C	As required.	Suitable material, such as waterproof paper, burlap, etc. Locate between Items "D" and tires.
D	4 per unit.	1 in. x 4 in., length to suit. Locate against Items "B", as shown, and secure to each Item "B" with two 20-D nails.
E	4 per unit.	2 in. x 4 In., length to suit. Locate against Items "D", as shown, and secure each to floor with five 80D nails.
F	2 per unit.	2 in. thick, width and length to suit. Locate, as shown, between inside Items "B" and ends of Items "D". Secure each to floor with four 80-D nails.
G	4 per unit.	2 in. thick, 12 in. in length, width to suit. Locate, as shown, against outside Items "B" and ends of Items "D", and secure each to floor with four 30-D nails.
H	1 per unit.	1 1/4 in. x .050 in. high tension band. Locate as shown and secure to opposite stake pocket. Where two units are loaded side-by-side, pass Item "H" across both units and secure to opposite stake pocket. On units loaded in gondola cars, attach Item "H" to floor with anchor plates, pattern 84. Secure each with eight (8) 20-D cement coated nails.
J	2 per unit.	3/8 in. 6 x 19 IWRC wire rope. Apply one complete loop on each side between the towing provision of the tractor and stake pocket on each side of car.

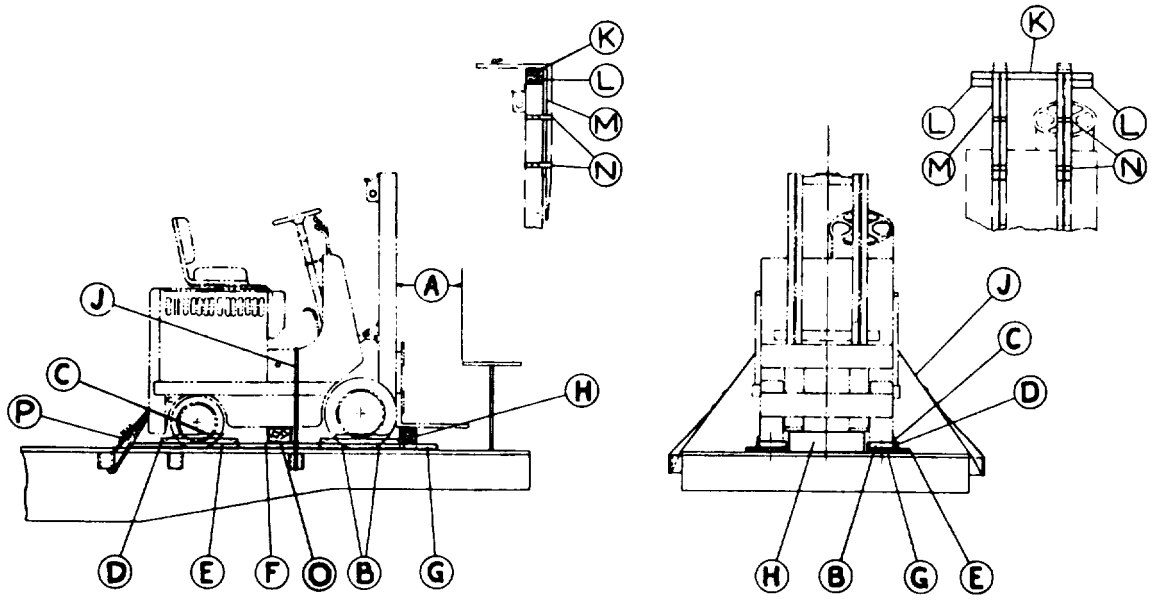
On units equipped with a single rear wheel, and, or where wheel blocking, Items "B", cannot be used, adequate blocking must be applied at both ends and sides of unit.

Hand brakes must be set and levers wired or blocked.

See General Rules 1, 2, 3, 4, 5, 9, 11, 14, 15, 19-A and 19-B for further details.

Sec. 6-Fig. 54 (Rev.-9-1984)
(Drawing Redrawn 9-1984)

FORK LIFT TRUCKS-FLAT OR GONDOLA CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	8 per unit.	Blocks, pattern 82, for units weighing under 15,000 lbs.; and blocks, pattern 16, chamfered at rear for application of Items "F" and "G", for units 15,000 lbs. and over. Locate 45 degree portion of block against front and rear of wheels. Secure each to floor with three 40-D nails.
C	As required.	Suitable material, such as waterproof paper, burlap, etc. Locate between Items "D" and tires.
D	4 per unit.	1 in. x 4 in., length to suit. Locate against Items "B", as shown, and secure to each Item "B" with two 20-D nails.
E	4 per unit.	2 in. x 4 in., length to suit. Locate against Items "D", as shown, and secure each to floor with five 30-D nails.
F	2 per unit.	2 in. thick, width and length to suit. Locate, as shown, between inside Items "B" and ends of Items "D". Secure each to floor with four 30-D nails.
G	4 per unit.	2 in. thick, 15 in. in length, width to suit. Locate, as shown, against outside Items "B" and ends of Items "D", and secure each to floor with four 30-D nails.
H	1 ea. unit.	Thickness width and length to suit. Locate under lifting fork at front and toe-nail to floor with four 40-D nails. Not required when forks are detached.
J	1 per unit.	1 1/4 in. x .050 in. high tension band. Locate as shown and secure to opposite stake pocket. Where two units are loaded side-by-side, pass Item "J" across both units and secure to opposite stake pocket. On units loaded in gondola cars, attach Item "J" to floor with anchor plates, pattern 84. Secure each with eight (8) 20-D cement coated nails.
K	1 ea. unit.	2 in. x 6 In., length to suit. Locate on top of truck mast.
L	2 per unit.	2 in. x 4 in. x 6 in. block. Locate against outside edge of truck mast under Item "K", as shown. Secure to Item "K" with two 20-D nails.
M	2 per unit.	1 in. x 6 in., length to suit. Locate on front side of truck mast with end of Item "M", even with top edge of Item "K", as shown. Secure with three 8-D nails.
N	4 per unit.	1 1/4 in. x .035 in. high tension bands. Locate as shown, suitably spaced on forks and mast. If required, apply cushioning under bands at all sharp corners or 90 degree corners on steel parts.
O	2 per unit.	Stabilizer block, thickness, width and length to suit. Locate under each side of fork lift frame. Secure to car floor with four (4) 60-D nails each. Use required only on rough terrain hydraulically pressured fork lifts.
P	2 per unit.	3/8 in. 6 x 19 IWRC wire rope. Apply one complete loop on each side between the towing provision of the tractor and stake pocket on each side of car.

On units equipped with a single rear wheel, and, or where wheel blocking, Items "B", cannot be used, adequate blocking must be applied at both ends and sides of unit.

Hand brakes must be set and levers wired or blocked.

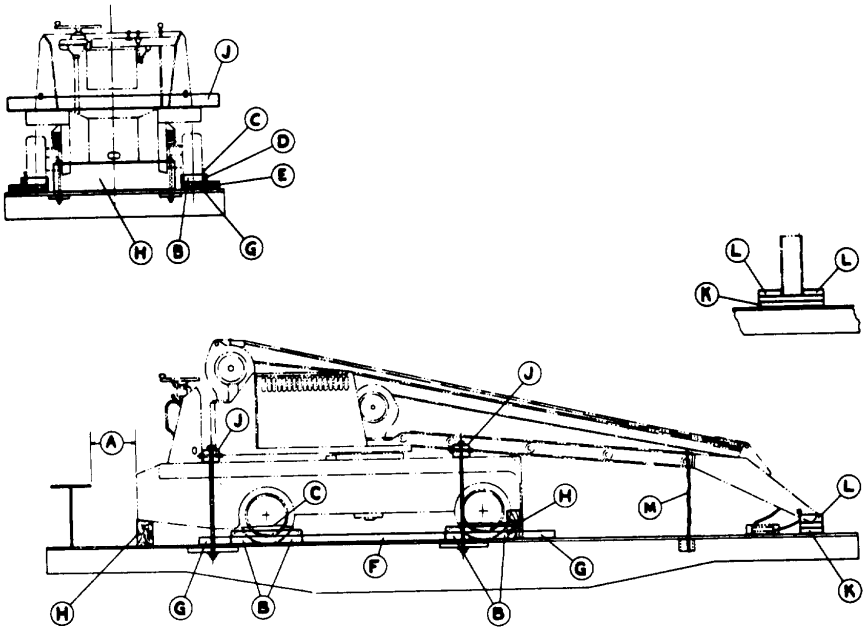
Lifting forks must be placed and secured in lowered position, except when detached and secured to top of truck mast.

Items "K", "L", "M" and "N" not required unless fork is detached and secured to truck mast.

See General Rules 1, 2, 3, 4, 5, 9, 11, 14, 15, 19-A and 19-B for further details.

Sec. 6- Fig. 55 Rev.--10-1960)

TRUCK MOUNTED CRANE, 15,000 LBS. AND UNDER-FLAT OR GONDOLA CARS

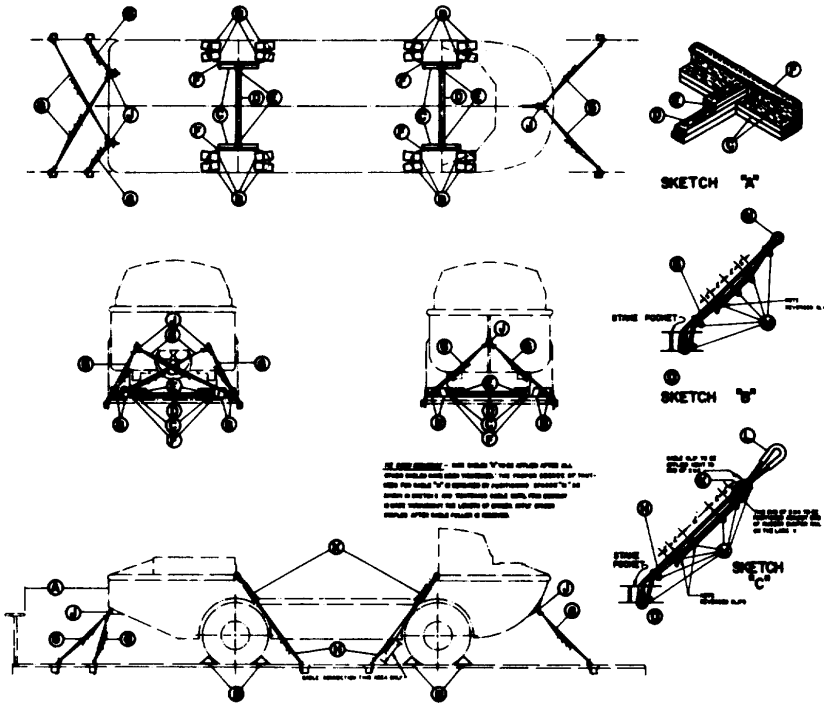


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	8 per unit.	Blocks, pattern 82. Locate 45 degree portion of block against front and rear of wheels. Secure each to floor with three 40-D nails.
C	As required.	Suitable material, such as waterproof paper, burlap, etc. Locate between Items "D" and tires.
D	4 per unit.	1 in x 4 in., length to suit. Locate against Items "B", as shown, and secure to each Item "B" with two 20-D nails.
E	4 per unit.	2 in. x 4 in., length to suit. Locate against Items "D", as shown, and secure eachto floor with five 30-D nails.
F	2 per unit.	2 in. thick, width and length to suit. Locate, as shown, between inside Items "B" and ends of Items "D", and secure each to floor with five 30-D nails.
G	4 ea. unit.	2 in. thick, 15 in. in length, width to suit. Locate, as shown, against outside Items "B" and ends of Items "D", and secure each to floor with four 30-D nails.
H	2 per unit.	6 in. wide, height sufficient to fill space between floor and frame of unit, length to suit. Locate, as shown, under frame of unit at each end, and secure each to floor with two % in. dia. bolts, or toe-nail with 40-D nails.
J	2 per unit.	4 in. x 6 in., length to suit. Use one bolt 2 in. dia. at each end to prevent splitting. Locate, as shown, over frame of unit. Secure each with two Y4 in. dia. rods passed through Item "J", floor and 4 in. x 4 in. x 18 in. cleat or /2 in. x 4 in. x 18 in. plate underneath floor, or through take pockets.
K	1 ea. unit.	Each to consist of two pieces of 2 in. x 8 in., length to suit. Locate, as shown, under boom of crane. Secure lower piece to floor with four 30-D nails and top piece to one below in like manner.
L	2 per unit.	2 in. x 8 in., length to suit. Locate against each side of boom on top of Item "K", as shown. Secure each to Item "K" with three 20-D nails.
M	1 ea. unit.	Six strands, No. 8 gage black annealed wire. Locate around boom, as shown, and secure to opposite stake pockets, or to 2 in. x 4 in. x 18 in. cleats secured to floor with five 30-D nails.

In event Item "J" does not fill space between counterweight of rotating portion and frame of unit, suitable filler must be-applied and secured to prevent displacement.
Lifting sheave and hook must be secured to prevent displacement.
Hand brakes must be set and levers wired or blocked.
See General Rules 4, 5, 9, 11, 14, 15, 19, 19-A and 19-B for further details.

Sec. 6-Fig. 56-A (New-10-1966)

VEHICLE, AMPHIBIAN, LARC 5-FLAT CARS

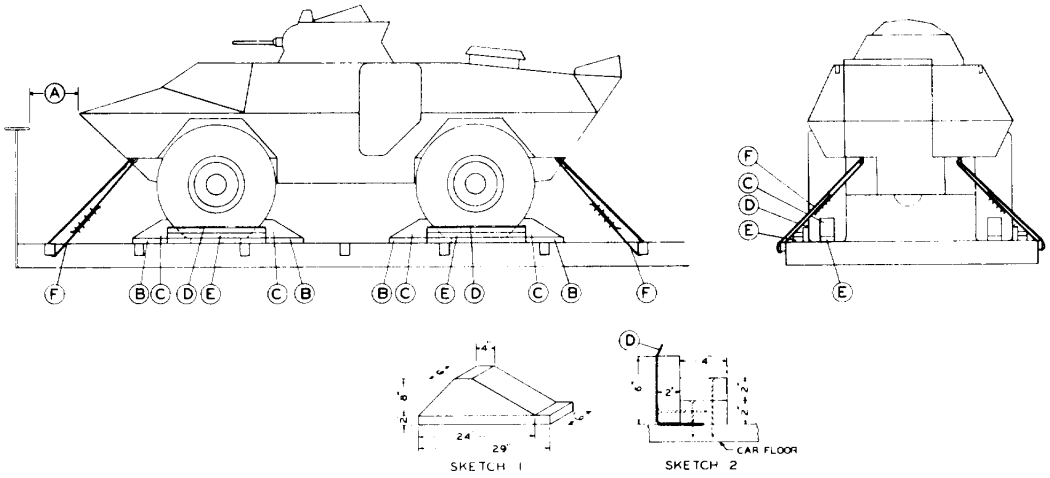


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	16	Blocks, pattern 15. Locate two in front and two in rear of each of the four wheels, and secure to floor with two 60-D nails in the heel of block and two 40-D nails in each side of block.
C	4	Rub rail assemblies; see Sketch A. Nail 2 in. x 8 in. x 36 in. vertical member to the lower piece of 2 in. x 4 in. x 36 in. with five 12-D nails. Position this assembly with 2 In. x 8 in. Against tire and secure to floor of car through 2 In. x 4 in. with five 20-D nails. Secure second 2 in. x 4 in. x 36 in. to the lower 2 in. x 4 in. with five 20-D nails.
D	2	Each to consist of two pieces of 2 in. x 4 In. lumber, length equal to distance between Items "C". Secure lower piece to floor with 20-D nails spaced 8 in. apart staggered. Nail top piece to lower piece in a like manner.
E	4	Each to consist of two pieces of 2 in. x 4 in. x 24 in. Nail to Items "C" and "D" using eight 20-D nails in each piece.
F	4	Suitable protective material between tires and rub rail assemblies.
G	6	Y In. diameter cable, 6 x 19 improved plow steel with independent wire rope core. Form complete loop with 14 in. overlap. See Sketch B for fittings.
H	4	- In. diameter cable, 6 x 19 improved plow steel with independent wire rope core. Form complete loop with 26 in. overlap. See Sketch C for fittings.
J	3	Shackles. For vehicles having a 1 1/16 in. diameter hole in the towing bracket, use a 1 in. Diameter pin with a 7/8 in. steel galvanized coated anchor shackle. For vehicles having a larger hole in the towing bracket use an appropriate size pin and shackle. Attach the shackle to the towing bracket and secure the pin with a cotter key.
K	4	2 in. x 4 in. x 14 1/2 in. wood protective spacer between cable and side of vehicle. Secure to cable with staples.
L	4	Rubber hose protective spacer, 15 in. long. See Sketch C.
M	64	5/8 in. cable clips, "U" type only.
N	6	5/8 In. closed thimble at load end of bow and stern cables.
0	10	5/8 in. open thimble at all stake pockets.

Note.-Tire Pressure must be reduced to 25 p.s.i., prior to applying cables, Items "G" and "H". After Items "O" and "H" are installed they are to be tightened with a come-a-long or other suitable tensioning device. See General Rules 3, 4, 5, 7, 9, 14, 15, 19-A, 19-B for further details.

Sec. 6-Fig. 57 (Rev.-9-1977)
(Drawing Redrawn 9-1977)

CAR, ARMORED, LIGHT, 4 X 4, XM706E1 AND XM706E2-FLAT CAR



Item	No. of Pcs.	Description
A		Brake Wheel Clearance. See Fig. 2, Sec. 1.
B	8	Blocks, Sketch 1. Apply one 2 in. x 6 in. x 29 in. piece of lumber in front and behind each wheel. Locate each piece against tire and nail to car floor with five 20-D nails.
C	8	Chock Blocks, Pattern No. 18. Locate on top of Items B with 45 degree portion against tires. Nail heel of blocks to Items B with three 40-D nails. Toenail sides of blocks to car floor through Items B with two 40-D nails on each side.
D	4	Suitable protective material such as waterproof paper or burlap, etc. Locate bottom portion under Items E and, between tires and Items E so as to extend 2 inches above Items E.
E	4	Side Blocking. Each to consist of one piece of 2 in. x 6 in. x 36 in. lumber and two pieces of 2 in. x 4 in. x 36 in. lumber. Nail 2 in. x 6 in. piece to edge of bottom 2 in. x 4 in. piece with five 12-D nails. Place against tire and nail to car floor with five 20-D nails in a staggered pattern. Nail second 2 in. x 4 in. piece through first piece to car floor with five 20-D nails in a like manner.
F	4	1/2 inch, 6 x 19, IWRC, wire rope, doubled. Apply from tiedown device on vehicle to stake pocket in a complete loop at approximately a 45 degree angle. Secure cable with four Y2 inch cable clips. 1/2 inch thimbles must be used at stake pockets and if necessary at vehicle tiedown points to protect wire rope. Secure thimbles to wire rope with one 1/2 inch cable clip.

Note:

1. Hand brakes must not be set.

See General Rules 1, 2, 3, 4, 5, 9, 14, 15, 19-A, 19-B and 19-C for further details.

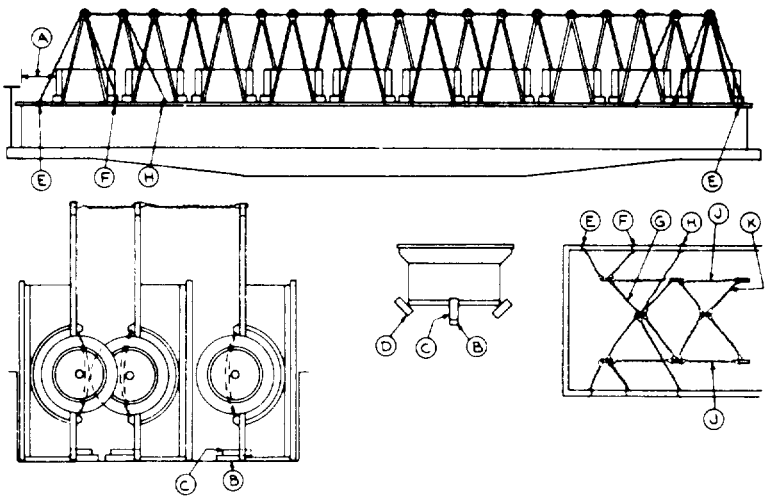
Section No. 6

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Sec. 6-Fig. 59

1/2 TON TRAILERS--GONDOLA CARS

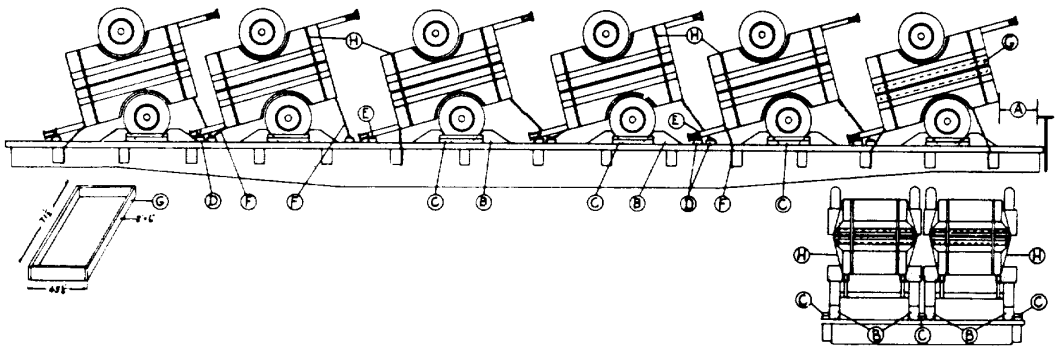


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	1 ea. unit.	2 in. x 4 in. x 12 in. Locate on floor, with one end against trailer. Secure to floor with three 20-D
C	1 ea. Item "B".	2 in. x 4 in. x 12 ill. Locate on top of Item "B", with one end against bottom of trailer, and secure to Item "B"' with three 20-D nails.
D	2 ea. unit.	2 in. x 4 in x 12 in locate on floor, at opposite corners of trailer and secure each to floor with three 20-D nails
E	1 ea. end unit.	Six strands No. 8 ga. black annealed wire. Pass upper end through lunette and lower end through top chord angle or car side.
F	1 ea. end unit.	Six strands No. 8 ga. black annealed wire. Pass upper end through lunette and lower end through top chord angle or car side.
G	As required.	Six strands No. 8 ga. black annealed wire. Pass through lunette of outside trailer, through lunette of trailer in center row and through lunette of opposite trailer in outside row.
H	As required.	Six strands No. 8 ga. black annealed wire. Attach to lunette of end trailer in center row and to car sides.
J	As required.	Six strands No. 8 ga. black annealed wire. Pass through and around lunettes of adjacent trailers.
K	As required.	Six strands No. 8 ga. black annealed wire. Pass through and around lunettes of outside and center trailers.

See General Rules 4, 5, 9, 11, 14 and 15 for further details.

Sec. 6-Fig. 60 (Rev.-4-1980)

1/4 TON TRAILER, LENGTHWISE SIDE BY SIDE, DOUBLE DECKED-FLAT CARS



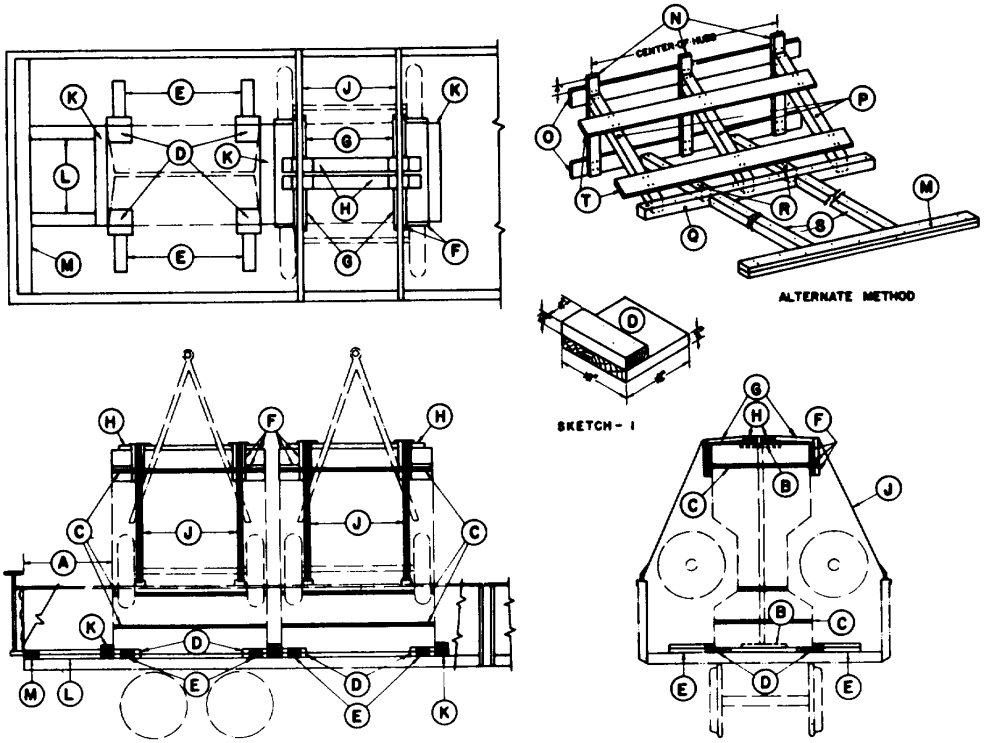
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. bottom unit.	Blocks, pattern 16. Locate 45 degree portion of block against front and rear of wheels. Secure heel of block to floor with three 40-D nails and toe-nail that portion under tire with two 40-D nails. Substitute, if desired, blocks, pattern 67 at each location.
C	As required.	Each to consist of two pieces of 2 in. x 4 in. x 24 in. Locate one against tires of outside wheels of units and one between tires of wheels on side by side units. Secure lower piece to floor with four 30-D nails and top piece to one below in like manner.
D	As required.	2 in. x 4 in. x 24 in. Locate one under tongue and one between units, as shown. Secure each to floor with five 30-D nails.
E	2 ea. bottom unit.	Each to consist of four strands No. 8 gage black annealed wire. Attach to tongue of unit on each side, as shown, and around Item "D".
F	4 ea. bottom unit.	Each to consist of four strands No. 8 gage black annealed wire. Attach to each corner of unit and through stake pockets, or underneath Items "D".
G	As required.	Frame, built up of two lengthwise and two crosswise 2 in. x 6 in., length and width to fully equal inside dimensions of body of unit. Locate inside of truck bodies between each top and bottom unit.
H	As required.	1 1/4 in. x .035 in. high tension bands. Locate two crosswise and one lengthwise, or one crosswise and two lengthwise, around bodies of each top and bottom unit.

Notes:

1. When widths of car decks are not wide enough to permit locating Items "C" against the tires on outside of outside wheels on side by side units, locate these items against the tires on inside of wheels at center of car.
2. Items "G" must be of sufficient height to extend at least two inches inside truck body of top unit.
3. Suitable cushioning material must be used between Items "C" and tires to prevent chafing.
4. When shipping trailers to ports of embarkation for further movement to overseas destinations, trailers should be banded together with trailer tongues facing in the same direction

See General Rules 1, 2, 3, 4, 5, 9, 11, 14, 15 and 19-B for further details.

TRAILERS, 3/4-TON CARGO-GONDOLA CARS WITH WOOD FLOORS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. pr. trailers.	Each to consist of one piece 1 1/4 in. x 1 3/4 in. x 17 1/2 in. lumber. Locate in corner stake pockets of trailers before they are banded together.
C	3 ea. pr. trailers.	Each to consist of 3/4 in. x .035 in. high tension bands to encircle inverted trailers as shown. Locate top band over Items "F" as shown.
D	4 ea. pr. trailers.	Each to consist of one piece of 2 in. x 12 In. x 12 in. and one piece of 2 in. x 4 in. x 12 in. lumber. Nail piece of 2 in. x 4 in. x 12 in. flush with end of piece 2 in. x 12 In. x 12 in. using four 20-D nails. See Sketch 1. Locate one block between car floor and tail gate end at each corner. Suitable protective material to be used between each trailer and blocks. Nail each block to car floor with four 20-D nails. All nails shall be cement coated.
E	4 ea. pr. trailers.	Each to consist of two pieces of 2 in. x 6 in. lumber 18 in. long. Locate against Item "D" as shown. Secure bottom piece to car floor with six 20-D nails, and top piece to one below in a like manner.
F	4 ea. pr. trailers.	Each to consist of two pieces of 2 in. x 8 in. x 11 in. lumber and one piece of 2 in. x 6 in. x 17 in. lumber. Locate the 2 In. x 8 in. x 11 in. piece between the trailer cross frame and under body flange, to prevent the flange from being damaged by the 2 in. x .050 in. banding, Item "J." Locate the 2 in. x 6 in. x 17 in. piece crosswise to the 2 in. x 8 in. pieces under the 2 inch banding of Item "J" and next to the trailer frame. Pieces to be secured with eight 10-D cement coated nails.
G	2 ea. trailer.	Each to consist of one piece of 2 in. x 6 in. lumber; length to suit. Cut to fit and locate between Items "F" and "H" as shown. Toenail with four 8-D cement coated nails to Items "F" and "H" at each end.

TRAILERS, 3/4 TON CARGO-GONDOLA CARS WITH WOOD FLOORS

Item	No. of Pcs.	Description
H	2 ea. pr. trailers.	Each to consist of one 2 in. x 6 in. x 68 in. lumber and two 1/2 in. x 6 in. x 10 In. plywood. Locate 2 in. x 6 in. piece under front flange of trailer body to support flange. Locate each piece of plywood under flange and on top of the 2 in. x 6 in. to support the 2 in. banding of Item "J". Nail plywood to 2 in. x 6 in. piece.
J	2 ea. pr. trailers.	2 in. x .050 in. high tension bands, length as required, looped over each pair of trailers and secured to the lading strap anchors on the side of the gondola. Locate over the 2 In. x 6 in. of Items "F" and "0" and over the plywood of Item "H."
K	As required.	Each to consist of three pieces of 2 In. x 6 in. x 44 In. long lumber. Locate at each end of the load and between each pair of trailers. Nail the first piece to the floor of the car with twelve 80-D nails and the other two pieces to the one below in a like manner with six 20-D nails each, evenly spaced.
L	2 ea. end of car.	Each to consist of two pieces of 2 in. x 6 in. lumber length to suit. Locate between Items "K" and "M." Secure bottom piece to the car floor with 20-D nails spaced 8 in. apart, minimum of four (4) nails, and top piece to the one below in a like manner.
M	1 ea. end of car.	Each to consist of two pieces of 2 in. x 8 in. length equal to width of car. Locate against the car end. Secure the bottom piece to the car floor with 20-D nails spaced 8 in. apart. Secure the top piece to the one below in a like manner.
		Alternate Method of End Securement For Lee Than Carload Shipments
M		Utilize Item "M" in the same manner described above.
N	3 ea. end.	2 in. x 4 in. x 48 in. lumber upright pieces. Locate one piece at the center of Items "O" and the two outside pieces at the center of wheel hubs. Secure to Items "O" with four 16-D nails at each Joint. See Sketch of alternate method.
O	2 ea. end.	2 in. x 8 in. x car width lumber. Used as headers against the load. Locate the bottom piece near the floor of the car. Locate the top piece so that It is centered against the wheel hubs.
P	3 ea. end.	4 in. x 4 In. lumber length to suit. Braces, bevel each end. Toenail to Items "N" and "Q" with four 16-D nails at each end.
Q	1 ea. end.	4 in. x 4 in. lumber car width Header. Secure to car floor with 60-D nails spaced 8 inches apart.
R	2 ea. end.	4 in. x 4 in. x length to suit lumber, Struts. Toenail to Items "O" and "Q" with three 16-D nails at each end and secure to car floor with three 60-D nails.
S	2 ea. end.	4 in. x 4 in. length to suit lumber, Struts. Toenail to Items "Q" and "M" with three 16-D nails at each end and secure to car floor with 60-D nails spaced 8 inches apart.
T	2 ea. end.	2 in. x 8 in. car width lumber, Crosstie. Secure to Items "P" with four 20-D nails at each Joint.

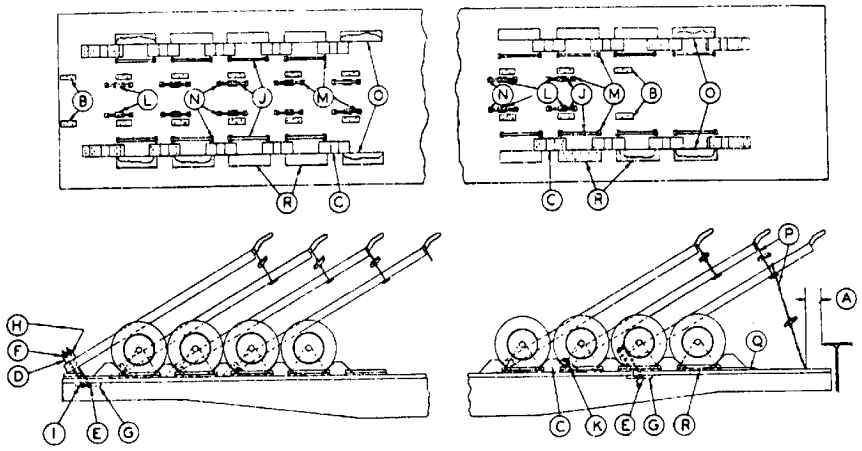
NOTES:

1. Suitable protective material shall be installed between all contact points of blocking with trailer surfaces, to prevent chafing of painted surfaces.
2. Trailers must be loaded from the center of the car towards each end. End blocking shown on the drawing must be the same at each end.
3. On partially loaded gondolas, additional blocking as required shall be used to block the load to the ends of the car. See alternate method shown on the drawing.
4. When necessary, removal of the trailer lunette will reduce the overall height of the load approximately one foot.
5. Canvas covers, trailer bows, side and end rails shall be adequately secured inside the trailer body for shipment.

See General Rules 4, 9, 9,11, 14 and 15 for further details.

Sec. 6--Fig. 62

TRAILERS, 1 1/2 TON TWO WHEELED CARGO CHASSIS - FLAT CARS

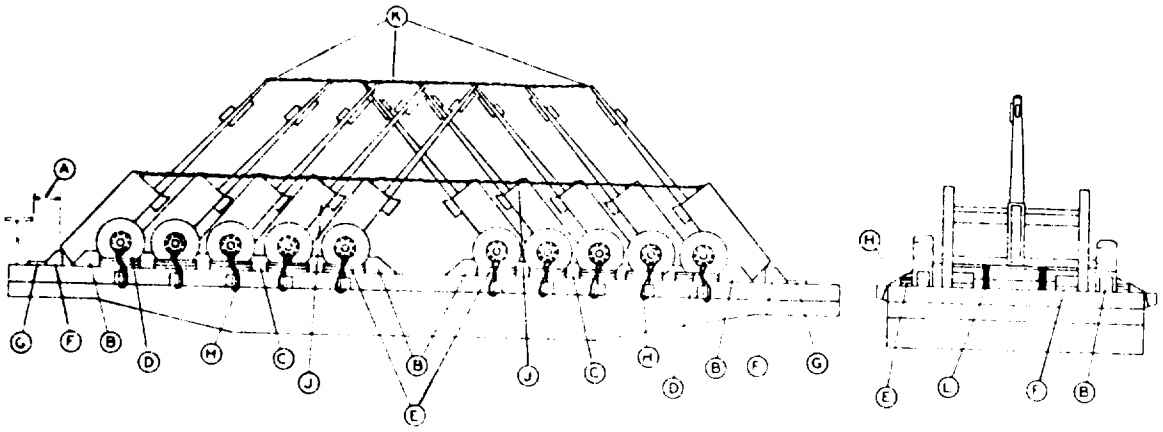


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2 ea. unit.	Each to consist of two pieces 2 in. x 4 In. x 12 In. Bottom piece nailed to car floor with three 40-D nails; top piece nailed to bottom piece in like manner Locate under rear cross frame member.
C	4 for first unit, 2 for ea. additional unit.	Block: 8 in. x 9g ½ in. x 24 in. Locate front and back of wheels. Toenail with 40-D nails in heel, three nails in each side.
D	1 ea. on first and last units.	Tie down block: 4 in. x 6 in., hardwood, length to suit. Locate across top of frame as shown. Use 1/2 in. dia. bolt, crosswise, with washers, at each end to prevent splitting.
E	2 ea. end Item "D".	7/8 in. dia. rods. Length to suit. Pass through Item "D" and floor.
F	2 ea. Item "E".	7/8 in. dia. nut, hexagon head.
G	2 ea. for first and last units.	Block: 2 in. x 4 in., length to cover not less than three floor boards.
H	2 ea. for first and last units.	Steel Plate:1/4 in. x 6 in, x length to suit. Each with two holes for Item "E".
I	1 ea. Item "E".	Nom. !-i in. dia. washer.
J	2 ea. unit; first and last: 4 ea. intermediate unit.	1 1/4 in. x .050 high tension band. Locate with item "L" over rear cross member on all Intermediate units; without Item "L" over axles of all units.
K	2ea.intermediate unit.	Block: 2 in. x 4 In. x 12 in. Locate as shown.
L	2ea.intermediate unit.	Stake pocket protector, radius to suit.
M	4 ea. unit; first and last; 8 ea. intermediate unit.	1 ,1 in. anchor plates, used with Item "J".
N	4 ea. Item "M".	Anchor plate nails.
O	2 ea. unit.	Burlap; locate under bottom block of Item "R"; to extend two in. above top block of Item “R".
P	2 ea. unit.	Wire, No. 8 gage, black annealed; six single strands, twist wire taut with bolt, pipe or wood, twister to)be securely fastened to prevent losing out. Encircle forward portion of first unit and either lading band anchor or stake pocket, also encircle successive units to each other as shown.
Q	2 ea. unit, first and last.	Back up block: 2 in. x 8 in. x 30 In., nailed to car floor with twelve 20-D common nails before adding Item “C”
R	2 ea. unit.	Side block: 2 in. x 8 in. x 30 in. Double; bottom piece nailed to car floor with six 20-D common nails, top piece nailed to bottom piece in like manner. Butt against and center between Items "C”

See General Rules 3, 4, 5, 7, 9, 14, 15 and 19-B for further details.

Sec. 6 - Fig. 62-A (Rev.-4-1980)

TRAILER, 1 1/2 AND 2 1/2 TON, POLE TYPE, UTILITY, 10 EACH PER 50 FEET-FLAT CARS

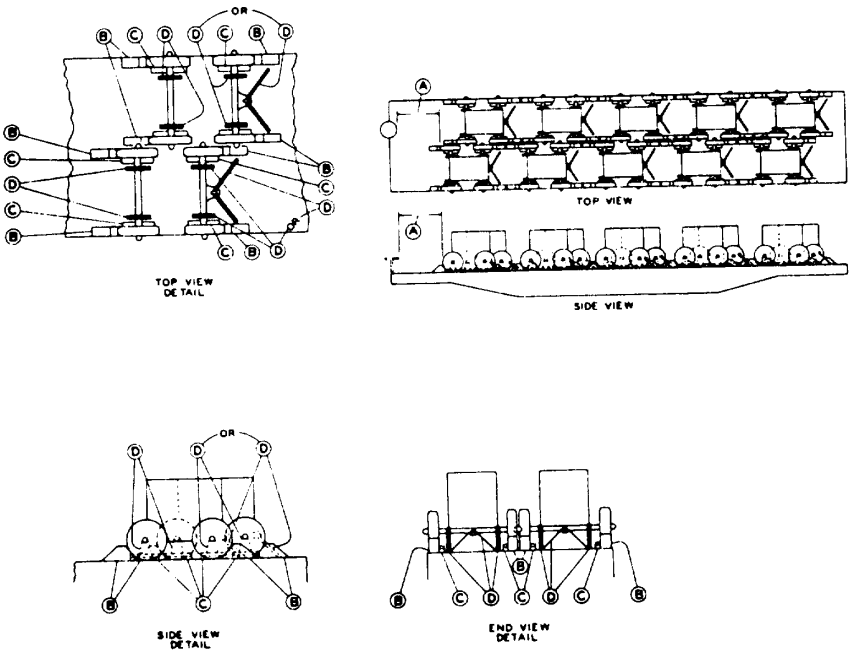


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	8	Blocks, pattern 16, locate 45 degree portion of block against each wheel of front and rear unit of each group. Secure heel of block to floor with three 40-D nails and toe-nail that portion under tire with two 40-D nails. Substitute, if desired, blocks, pattern 67 at each location.
C	16	Blocks, pattern 87. Locate between intermediate unit, of each group. Secure heel of block to floor with three 40-D nails and toe-nail that portion under tire with two 40-D nails. Secure blocks before loading each intermediate unit. Insure each wheel is snug against block.
D	2 ea. unit.	Suitable material, such as waterproof paper, burlap, etc. Locate bottom portion under Items "E", top portion to extend 2 in. above Items "E".
E	2 ea. unit.	Each to consist of two pieces of 2 in. x 4 in y 30 in. Locate against outside of tires and secure lower piece to floor with four 30-D n1ails and top piece to one below in like manner.
F	4	Blocks, pattern 68. Locate two against lower portion of each end unit and secure each to floor with four 40-D nails.
G	4	2 in. x 6 in. x 24 in. Locate one oil floor against each Item "F" and secure to floor with four 30-D nails.
H	2 ea. unit.	Each to consist of four strands No. 8 gage black annealed wire Pass through center holes in lower portion of disc wheels and through stack pockets. Twist taut.
J	2	Each to consist of tour strands No. 8 gage black annealed wire. Pass through and around front lifting lugs of each unit in sequence on each side of load.
K	As required.	Four strands No. 8 gage black annealed wire. Pass, through and around tongue lunette : of each adjacent trailer.
L	2 ea. Unit	2 in. X .050 in high tension bands with anchor plates, pattern 84. Locate over rear cross frame member of each end unit and secure to car floor with 8-hde anchor plates. Secure anchor plates to car floor with 20-D cement-coated nails.

See General Rules 3, 4, 5, 7, 9, 14, 15 and 19B for further details.

Sec. 6-Fig. 62-B (New-9-1963)

COMPRESSORS, 3,000 LBS. OR LESS, WITH PNEUMATIC TIRES LENCTIIWISE, SINGLE OR DOUBLE ROWS-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	1 ea. wheel.	Blocks, pattern 87. Locate against front of front wheels and rear of rear wheels, as shown. Secure heel of block to floor with five 40-D nails, toenail each side with two 40-D nails.
C	1 ea. wheel.	Each to consist of two pieces of 2 In. x 4 in. x 24 in. Locate either inside or outside of wheels and secure lower piece to floor with three 30-D nails and top piece to one below In like manner.
D	2 ea. axle, or 2 ea. front axle and 1 ea. rear pulling hook.	1 1/4 in. x .035 In. high tension bands with anchor plates, pattern 84. Locate two over axle at front of unit and two over axle at rear of unit, or two over axle at front of unit and one through pulling hook at rear of unit. Secure each plate to car floor with eight 20-D cement coated nails. Substitute, if desired, at each location, 4 strands No. 8 gage black annealed wire passed underneath and around a 2 in. x 4 in. x 18 in. block. Nail block to car floor with four 30-D nails and twist wire taut.

Hand brakes must be tightly set and levers wired or blocked.

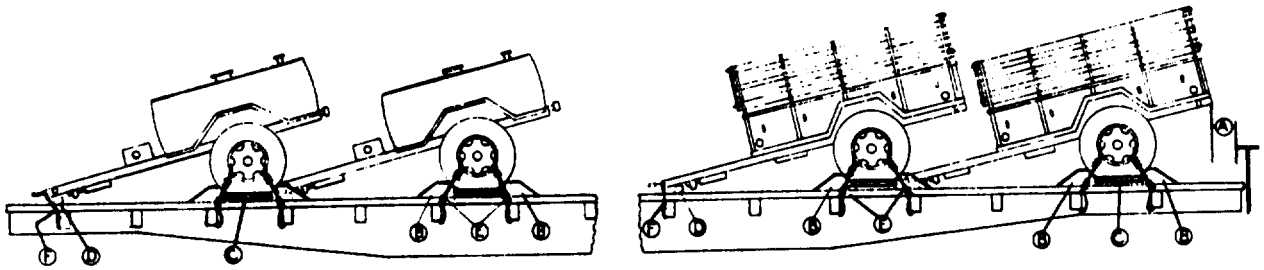
*See General Rules 4, 5, 9, 14, 15, 19-A and 19-B for further details.

Section No. 6

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Sec. 6-Fig. 63 (Rev.-10-1981)
(Drawing Redrawn 9-1977)

TRAILERS, 1 ½ TON CARGO, WATER TANK AND SIMILAR TYPES-FLAT CARS



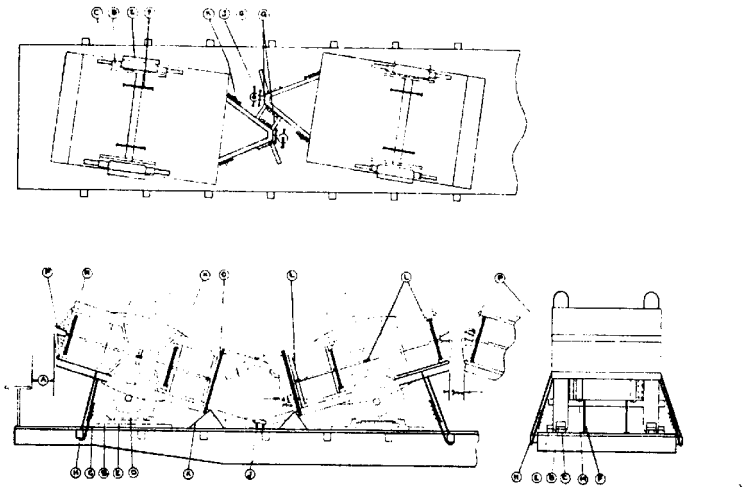
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. unit.	Blocks, pattern 16. Locate 45 degree portion of block against front and rear of wheels. Secure heel of block to floor with three 40-D nails and toe-nail that portion under tire with two 40-D nails. Substitute pattern 67 blocks if desired.
C	2 ea. unit.	Block pattern 88, Section No. 6 for side blocking of wheels. Use suitable protective material, such as waterproof paper or burlap, between tire and blocking. Locate bottom portion under Item "O", top portion to extend two inches above Item "O".
D	1 ea. unit.	4 in. x 4 in. x 18 in. Locate under tow bar of unit, as shown, and toe-nail to floor with four 40-D nails.
E	4 ea. unit.	Wire rope,3/8 in., 6 x 19 IWRC. Apply in single strand through holes in wheels to stake pockets. Secure each end of wire rope with three cable clips. Apply thimble at bottom of each stake pocket and secure to wire rope with cable clip. If wheel holes have sharp edges, use suitable filler material to prevent chafing or cutting of the wire rope.
F	2 ea. unit.	Each to consist of four strands No. 8 gauge black annealed wire, twisted, or one 3/8 in., 6 x 19 wire rope, doubled (complete loop), with three cable clips at the overlap. Secure through lunette of towbar and through stake pockets on opposite sides of car.

See General Rules 1, 2, 4, 5, 9, 14 , 15 and 19-B for further details.

Sec. 6-Fig. 64 (Rev.-9-1977)

(Drawing Redrawn 9-1977)

TRAILERS, 1 1/2 TON CARGO, DOUBLE DECKED-FLAT CARS

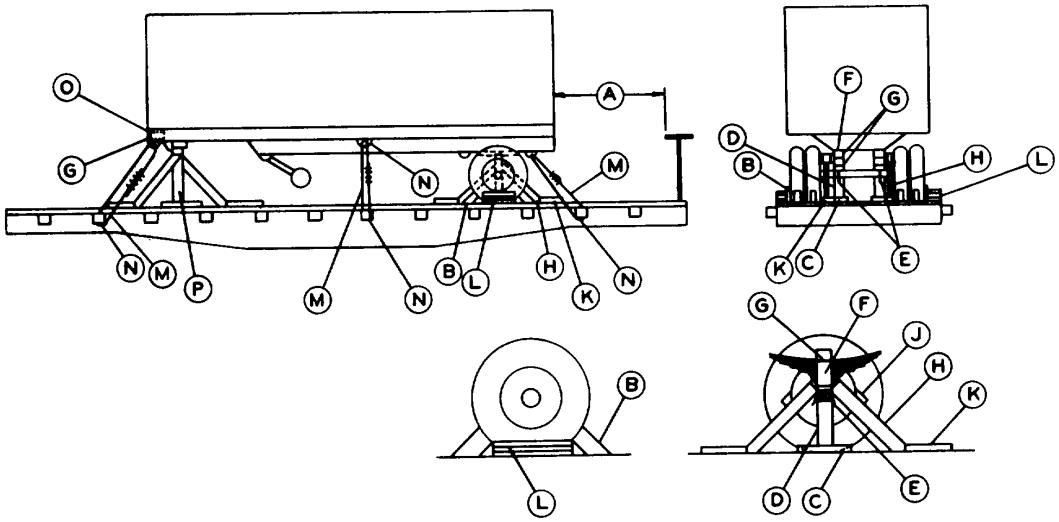


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	4 per unit.	Blocks, pattern 18. Locate against front and rear of wheels and secure each to floor with three 40-D nails. Substitute, if desired, at each location blocks, patterns 16 or 17.
C	4 per unit.	2 in. x 4 in. x 12 in. Locate against block, pattern 18, lengthwise of car, and secure to floorwith four 30-D nails. Not required when blocks, patterns 18 or 17 are used.
D	As required.	Suitable material, such as waterproof paper, burlap, etc. Locate bottom portion underneath Items "E", top portion to extend 2 in. above Items "E".
E	2 per unit.	Each to consist of two pieces of 2 in. x 4 in. x 86 in. and one piece 2 in. x 6 in. x 36 in. lumber. Nail the 2 in. x 6 In. piece to the edge of one of the 2 In. x 4 in. pieces with five 12-D nails. Place against tire with Item "D" In place and nail to car floor through the 2 in. x 4 in. piece to the lower one in like manner. (See pattern 88, page 8, section 6).
F	2 per unit.	1 1/4 in. x .050 In. high tension bands with anchor plates, pattern 84. Locate over axle at each side of unit and secure each plate to floor with eight 20-D cement-coated nails.
G	1 per unit.	Each to consist of two pieces of 2 in. x 4 in. x 18 in. Locate, as shown, against draw bar, and secure lower piece to floor with three 30-D nails andtop piece to one below in like manner.
H	2 per unit.	Wire rope, 3/8 inch, 6 x 19, IWRC, single strand. Attach one at each side of frame or to tiedown points at rear of trailer and to stake pockets on same side of rail car. Metal fillers or thimbles sufficient to provide a suitable radius must be used to protect wire rope at stake pockets and at vehicle tiedown points and must be applied so as to prevent dislodgment. Cable clips must be applied In accordance with General Rules 15d and 15n.
J	2 per unit.	1 1/4 in. x .050 in. high tension bands with anchor plates, pattern 84. Locate one over lunette and one through lunette eye, as shown, and secure each plate to floor with eight 0-D cement-coated nails.
K	2 per unit.	1 1/4 in. x .050 in. high tension bands with anchor plates, pattern 84. Locate, as shown, through front lifting lug on each side, and secure each plate to floor with eight 20-D cement-coated nails.
L	6 per unit.	1 3/4 in. x 1 5/8 in. x 7 3/4 in., hardwood. Locate in stake pockets of upper and lower units, as shown, and secure to prevent displacement.
M	2 per unit.	4 in. x 4 in. x 8 3/4 in., contoured at bottom to fit over axle. Locate, as shown, between body of lower unit and axle at each side, before top unit Is loaded, and secure In position with No. 8 gage black annealed wire.
N	4 per unit.	1 1/4 in. x .050 in. high tension bands. Locate, as shown, through outside stake pockets of upper and lower units.
O	2 per unit.	1 1/4 in. x .050 In. high tension bands. Locate one on each side, as shown, and pass through lifting lugs of units.
P	As required.	Two strands, No. 8 gage black annealed wire. Attach one at each side of tall gate and to body of unit.
Q	1 per unit.	Each to consist of two pieces of 2 in. x 4 in., length sufficient to provide 8 in. clearance between tow bars of units. Locate, as shown, and secure lower piece to floor with three 30-D nails and top piece to one below in like manner.

See General Rules 1, 2, 3, 4. 5, 9, 11, 14, 15 and 19-B for further details.

Sec. 6-Fig 65 (Rev.-11-1978)
(Drawing Redrawn 11-1978)

SEMI-TRAILERS-FLAT CARS



Item	No. of Pcs.	Description
A		Brake Wheel Clearance. See Fig. 2, Section No. 1.
B	2 each wheel.	Blocks, Pattern 47. Locate one against front and rear of each wheel. Secure heel of block to floor with three 60-D nails and toe-nail side faces, where accessible, to floor with one 60-D nail. Substitute, if desired, block pattern 16 or 17, using suitable size nails.
C	2	Axle Support Base, 2 in. x 4 in. x 16 in. lumber. Secure to Item "D" with three 30-D nails and to floor with eight 20-D nails each.
D	2	Vertical Axle Support, 4 in. x 4 in. x 15 1/4 in. lumber, height may vary. Locate under axle.
E	2	1 in. x No. 14 B.W. Gage Hot Rolled Steel Strap. Pass around top of axle and secure each end to side of Item "D" with two 8-D nails. CAUTION: If brake line tubing runs along top of axle, pass the steel strap between axle and tubing so that tubing is not flattened or damaged.
F	2	Vertical Axle Block, 4 in. x 4 in. lumber, length as required. Locate over axle and under sill of unit.
G	As required 4 locations.	No. 8 Gage Black Annealed Wire. Encircle Item "F" and spring housing. Use also for securement of Item "O" to front of trailer frame, both sides.
H	4	Diagonal Axle Blocks, 2 in. x 4 in. x 33 in. lumber. Locate against spring housing and secure each to floor with two 20-D nails. Apply after Items "D" and "F" are secured.
J	2	Crosstie, 2 in. x 4 in. x 43 in. lumber. Locate on top of Items "H" about % the distance from top and secure each end to Items "H" with two 20-D nails.
K	4	Cleat, 2 in. x 4 in. x 16 in. lumber. Locate against bottom of Items "H" and secure each to floor with six 20-D nails.
L	2	Wheel Side Blocking, Block Pattern 89, Section No. 6. Use suitable protective material, such as waterproof paper or burlap, between tire and blocking. Locate bottom portion of protective material under Item "L", top portion to extend two inches above Item "L".

Sec. 6-Fig. 65 (Rev.-11-1978) (Concluded)
(Drawing Redrawn 11-1978)

SEMI-TRAILERS-FLAT CARS

Item	No. of Pcs.	Description
M	6	1/2 in., 6 x 19 IWRO, wire rope doubled as a complete loop. On each side, pan wire rope through stake pocket at rear of trailer through rear spring shackle or tie-down eye, at center through center tie-down eye or over chassis frame, and at front through front tie-down provision, or over frame member, or around Item "O" as shown. Secure each loop with four 1/2 in. cable clips.
N	6 or more. As required.	Thimbles or other metal filler to protect Item "M" at stake pockets, and if required, at trailer attachment points.
O	1	4 In. x 4 in. x 81 In. lumber for attachment of Items "M" at forward end of trailer. Wedge crosswise between bngitudinal trailer frame members. Secure to frame with wire, Item "O".
P	1	Front Support, Block Pattern 90, Section No: 6. Length of upright support members and other components may be varied to suit trailer type and height.

Notes:

1. Items "0", "D", "H", "J" and "K" not required when built-up blocking, 6 in. wide, 18 in. long, height sufficient to fill space between axle and floor, is used under each side of unit secured to floor with two % in. diameter bolts.

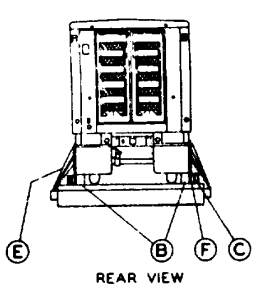
2. Item "O" not required if trailer is equipped with forward tie-down/lifting eyes or if Items "M" can be secured over front frame members.

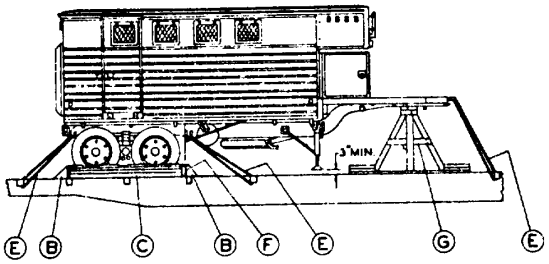
3. Units must be Jacked for application of Items "C", "D" and "F".

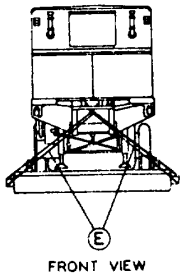
See General Rules 1, 2, 3, 4, 5, 7, 9, 14, 15 and 19-B for further details.

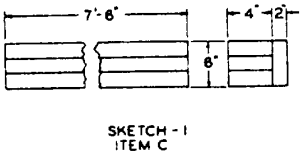
Sec. 6-Fig. 65-A (Rev.-10-1981)

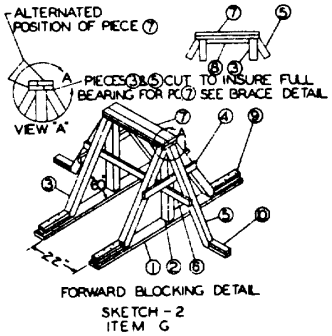
SEMI-TRAILER 12,000-15,000-18,000 LBS.-FLAT CARS

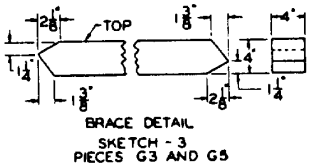












Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4	Blocks, pattern 16. Locate 45 degree portion in back of outside rear wheels and in front of outside front wheels. Secure heel of the block to car floor with three 40-D nails and toenail that portion under the tire to the car floor with two 40-D nails before Items "C" and "F" are applied.
C	2	Each to consist of one piece of 2 in. x 6 in. x 90 in., lumber and three pieces of 2 in. x 4 in. x 90 in., lumber. Sketch 1 nail one edge of the 2 in. x 6 in. x 90 in., piece to the bottom 2 in. x 4 in. x 90 in., piece with 12-D nails spaced eight inches apart. Then place against the tire and nail to the car floor through the 2 in. x 4 in., piece with six 30-D nails. Nail the other two pieces of 2 in. x 4 in. x 90 in., to the one below in the same manner.
D		Vacant.
E	6	Wire rope, 1/2 in. diameter, 6 x 19 IWRC located as shown. Installed at 45 degree maximum angle, in a complete loop from car stake pocket through the tie-down device on the trailer. Secure with four 1/2 inch cable clips on each A-ire rope. Thimble, 1/2 inch, must be used at the stake pocket to protect the wire rope and secured to the tire rope with one 1/2-inch cable clip.
F	1 ea. Item "C."	Suitable material such as waterproof paper, burlap, etc. Locate bottom portion under Item "C," the top portion to extend two inches above Item "C."
G	1 ea. unit.	Forward blocking detail, Piece numbers 1 to 10 inclusive. See Sketches 2 and 3.

Sec. 6-Fig. 65-A (Rev.-10-1981) (Concluded)

SEMI-TRAILER 12,000-15,000-18,000 LBS.-FLAT CARS

Forward Blocking Detail

Pc. Nos.		
1	2	2 in. x 6 in. x 92 in. Nail to car floor with one 30-D nail every 8 inches.
2	2	4 in. x 4 In., length to suit. Toenail to pc. 1 with four 16-D nails.
3	4	4 in. x 4 in., length to suit, per Sketch 3. Cut to insure full bearing for pc. 7. Toenail to pcs. 1 and 2 with two 16-D nails at each end.
4	2	2 In. x 4 in. x 30 in. Nail to pcs. 2 and 3 with three 12-D nails at each joint.
5	2	4 in. x 4 in., length to suit, per Sketch 3. Cut to insure full bearing for pc. 7. Toenail to pc. 2 and to car floor with two 16-D nails each end.
6	1	2 in. x 4 in. x 62 in. Nail to pcs. 2 and 5 with three 12-D nails at each joint.
7	2	Each to consist of one piece of 2 in. x 4 in. x 37 in., and one piece of 2 in. x 6 in. x 87 in. Nail lower pieces to pcs. 2, 3 and 5 with two 12-D nails at each joint. Offset vertical joints as shown in Sketch 2, view A and laminate top pieces to lower with six 12-D nails.
8	1	2 in. x 6 in. x 24 in. Nail to pc. 7 with six 12-D nails.
9	4	Each to consist of two pieces of 2 in. x 4 in. x 18 in. Nail first piece to pc. I with four 80-D nails, Nail second piece on top In a like manner.
10	2	Each to consist of two pieces of 2 in. x 4 in. x 12 in. Nail first piece to car floor, against pc.5. with three 30-D nails. Nail second piece on top of first piece in a like manner.

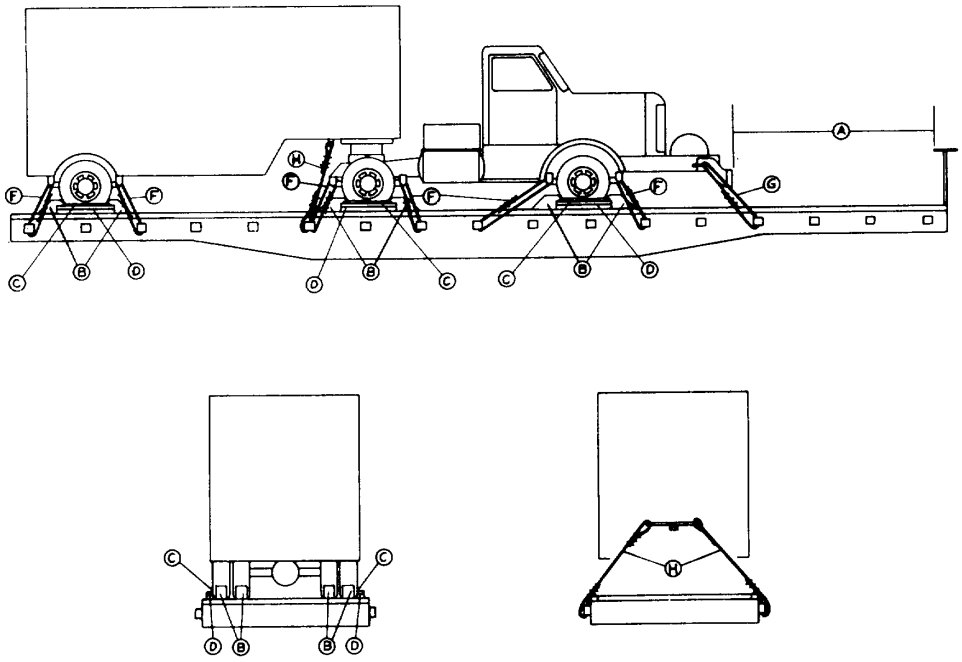
NOTES:

1. All nails shall be cement coated.
2. Wire rope tie-downs shall be tensioned sufficiently to cause slight vehicle body spring deflection.
3. Forward blocking Item "G" may be preassembled with the exception of pcs. 9 and 10. Position pc. 7 six inches behind king pin of trailer.

See General Rules 4, 5, 7, 9, 14, 15 and 19B for further details.

Sec. 6 -Fig. 66 (Rev.-11-1978)
(Drawing Redrawn 11-1978)

MOBILE, LIGHT WEIGHT SEMI-TRAILER, WITH TRACTOR-FLAT CARS

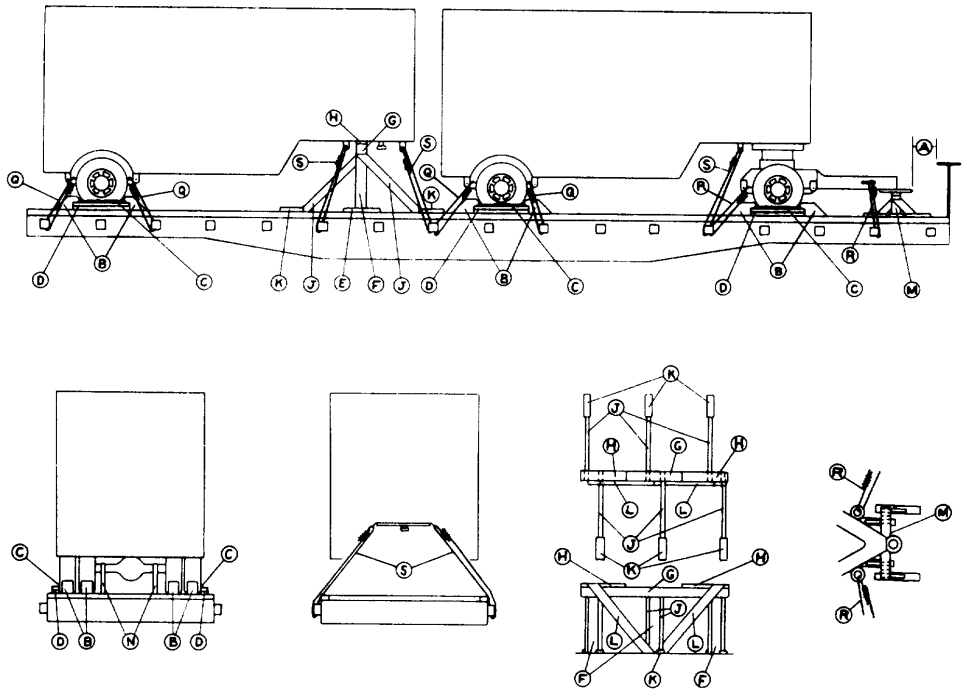


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	2 ea. wheel.	Blocks, pattern 16. Locate 45 degree portion of block against front and rear of wheels. Secure heel of block to floor with three 40-D nails and toe-nail that portion under tire to floor with two 40-D nails before Items "C" and "D" are applied.
C	1 ea. outside wheel.	Suitable material such as waterproof paper or burlap. Locate bottom portion under Items "D" and between tires and Items "D" so as to extend 2 inches above Items "D".
D	1 ea. outside wheel.	Side blocking. Each to consist of one piece of 2 in. x 6 in. x 36 in. lumber and two pieces of 2 in. x 4 in. x 36 in. lumber. Nail 2 in. x 6 in. piece to edge of bottom 2 in. x 4 in. piece with five 12-D nails. Place against tire and nail to car floor with five 20-D nails in a staggered pattern. Nail second 2 in. x 4 in. piece through first piece to car floor with five 20-D nails in a like manner.
E		Vacant.
F	12	3/8 in., 6 x 19, IWRC, wire rope, doubled. Attach to front and rear spring shackles of each set of wheels and to stake pockets. Secure wire rope with four 3/8 inch cable clips. 3/8 inch thimbles must be used at stake pockets and spring shackles if necessary to protect wire rope. Secure thimbles to wire rope with one 3/8 inch cable clip.
G	2	3/8 in., 6 x 19, IWRC, wire rope, doubled. Attach to pulling hook on each side of frame near front of tractor and to stake pocket. Secure wire rope with four 3/8 in. cable clips. 3/8 in. thimbles must be used at stake pockets and at vehicle tiedown points if necessary to protect wire rope. Secure thimbles to wire rope with one 3/8 in. cable clip.
H	2	3/8 in., 6 x 19, IWRC, wire rope, single strand. Attach to formed 1/3 in. bar with eye at ends, passed over top of fifth wheel plate and to stake pockets. Secure wire rope with three 3/8 in. cable clips at each end. Apply thimbles as outlined in Items F and G above.

See General Rules 1, 2, 4, 5, 7, 9, 14, 15, 19-A, 19-B, and 19-C for further details.

Sec. 6-Fig. 67 (Rev.-11-1978)
(Drawing Redrawn 11-1978)

MOBILE, LIGHT WEIGHT SEMI-TRAILERS, WITH OR WITHOUT DOLLY-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2 each wheel.	Blocks, pattern 16. Locate 45 degree portion of block against front and rear of wheels. Secure heel of block to floor with three 40-D nails and toenail that portion under tire to floor with two 40-D nails before Items "C" and "D" are applied.
C	1 each outside wheel.	Suitable protective material, such as waterproof paper or burlap, etc. Locate bottom portion under Item "D", the top portion to extend 2 Inches above Item "D".
D	1 each outside wheel.	Blocks, assembled per Pattern 89, Section No. 6. Locate against tire and nail to car floor with five 20-D nails.
E	3 each unit.	2 in. x 6 in. x 24 in. longitudinal floor blocks. Secure each to floor with eight 20-D nails.
F	3 each unit.	6 in. x 6 in. timber, length to suit. Center on and toenail to each Item "E" with eight 30-D nails.
G	1 each unit.	6 In. x 6 in. x 8 ft. timber. Locate at least 6 in. from king pin of unit and on top of Items "F" Toenail to each Item "F" with four 30-D nails.
H	2 each unit.	1 in. x 6 in. lumber, length to suit. Locate on top of Item "O" against center plate of unit on each side and secure each to Item "G" with three 10-D nails.
J	6 each unit.	2 in. x 4 in. lumber, length and cut to suit. Locate as shown and secure to top portion of Item "F" with three 30-D nails, and bottom portion to floor with two 30-D nails.
K	1 each Item "J".	2 in. 4 In. x 16 in. lumber. Locate, as shown, lengthwise against Item "J" and secure to floor with five 20-D nails.

Sec. 6-Fig. 67 (Rev.-11-1978)
(Drawing Redrawn 11-1978)

MOBILE, LIGHT WEIGHT SEMI-TRAILERS, WITH OR WITHOUT DOLLY-FLAT CARS

Item	No. of Pcs.	Description
L	2 each unit.	2 in. x 6 in. lumber, length to suit. Locate as shown and secure top portion to Item "G" and outside Item "F" with four 30-D nails and bottom portion to center Item "F" with four 30-D nails.
M	1 each unit.	Dolly lunette support built up of lumber, two double 2 in. x 6 in. uprights and crosspieces, 2 in. x 6 in. diagonal braces and 2 in. x 4 in. floor cleats. Locate as shown, suitably spaced under lunette of dolly.
N	2 each axle.	1 in. No. 14 B.W. gage hot rolled steel, with anchor plates, pattern 19, Section 6. Locate over axle springs or spring shackles and secure each plate to floor with eight 20-D cement coated nails.
O		Vacant.
P		Vacant.
Q	4 each unit.	Wire rope, 3/8 inch, 6 x 19, IWRC, doubled. Apply to front and rear spring shackles and stake pockets on each side of unit in complete loop. Secure wire rope with four 3/8 inch cable clips. A thimble is to be placed at the bottom of each stake pocket and secured to the wire rope with a cable clip.
R	4 each dolly unit, as required.	Wire rope, 3/8 inch, 6 x 19 IWRC, single strand. Attach to rear spring shackles and stake pockets and to safety chain eye or frame and stake pocket on each side of unit. Secure wire rope at each end with three 3/8 inch cable clips. A thimble is to be placed at the bottom of each stake pocket and secured to the wire rope with a cable clip.
S	4 each unit without dolly. 2 each unit with dolly.	Wire rope, 3/8 inch, 6 x 19 IWRC, doubled. Secure to formed 1/2 inch bars with eyes at ends and to stake pockets in complete loop on each side of unit. Secure wire rope with four 3/8 inch cable clips. A thimble is to be placed at the bottom of each stake pocket and secured to wire rope with a cable clip.

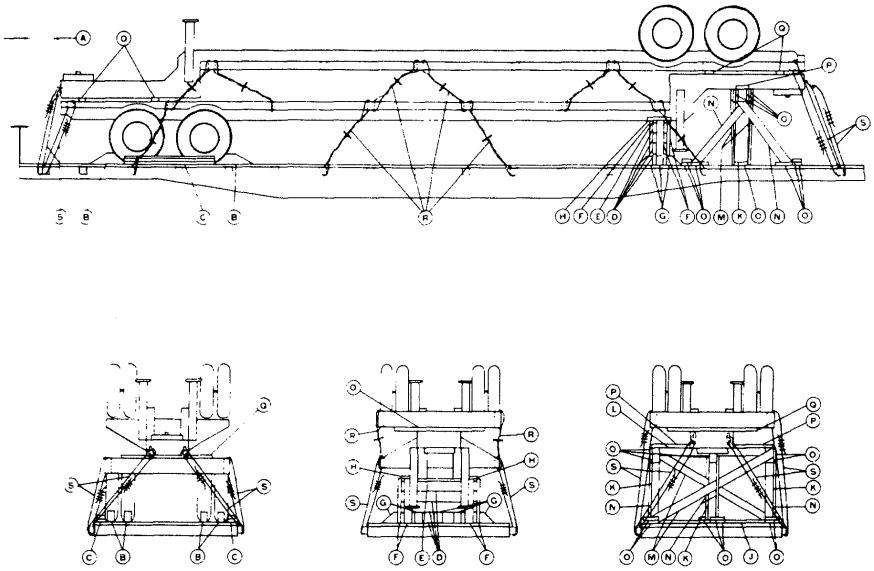
Notes:

1. Items "E", "F", "G", "H", "J", "K", and "L" not required when a dolly is applied under front of unit.
2. Item "M" required only on units equipped with dolly.

See General Rules 1, 2, 3, 4, 5, 7, 9, 14, 15, 19 and 19-B for further details.

Sec. 6-Fig. 8 (Rev.-9-1977)
(Drawing Redrawn 9-1977)

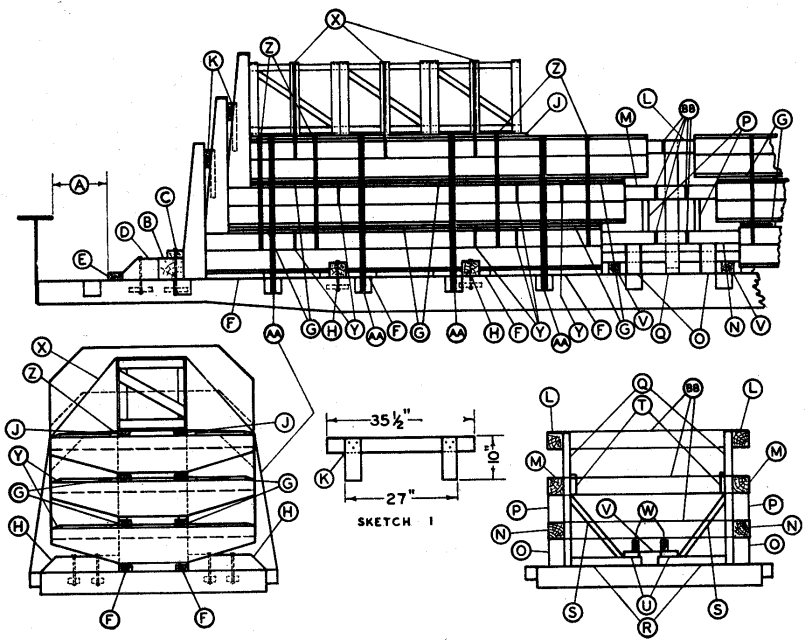
SEMI-TRAILERS, FLATBED WITH REGID GOOSE NECK AND DUAL WHEELS-DOUBLE DECKED-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	8	Blocks, Pattern 16. Locate the 45 degree portion of block against wheels as shown. Seure heel of block to floor with three 40-D nails, and toenail that portion under tire to floor with two 40-D nails.
C	2	Each to consist of three pieces of 2 in. x 4 in. x 72 in. lumber and one piece of 2 in. x 8 in. x 72 in. lumber. Nail the 2 in. x 6 in. piece to the edge of the bottom 2 in. x 4 in. piece with eight 12-D nails. Locate against tires with suitable protective material such as waterproof paper or burlap, etc., under the bottom 2 in. x 4 in. piece and between the tre and 2 in. x 6 in. piece. Protective material should extend 2 inches above 2 in. x 6 in. piece. Nail to car floor through the 2 in. x 4 in. piece with eight 20-D nails. Nail the other two pieces of 2 in. x 4 in. lumber to one below in same manner. See material chart, blocking figure 88, section 6.
D	4	6 in. x 8 in. x So in., held together by Item "F" and fixed in a vertical position by Item "G".
E	1	2 in. x 6 in. x 60 in., position on top of Item "D" and secure with six 30-D nails.
F	6	2 in. x 6 in. x 34 in. Locate at sides and ends of Item "D" with 30-D nails.
G	8	Blocks, Pattern 67. Position against Items "D" and "F", as shown. Secure to floor with 40-D nails.
H	2	2 in. x 6 in. x 12 in. Locate on top of Item "E" and against trailer frame. Secure with 30-D nails.
J	1	2 in. x 6 in. x 96 in. Secure to floor with 30-D nails. Locate 30 in. from king pin of trailer.
K	3	6 in. x 6 in. x 51 in. Center on and toenail to Item "J" with 30-D nails.
L	1	6 in. x 6 in. x 96 in. Locate on top of Items "K". Toenail to each Item "K" with 30-D nails.
M	2	2 in. x 6 in. x 112 in. Locate as shown, and secure to Items "K" and "L" with 30-D nails.
N	6	2 in. x 6 In. x 60 in. Locate as shown, and secure top portion to Item "K" and bottom portion to Item "O" at floor with 30-D nails.
O	28	2 in. x 6 in. x 12 in. Locate as shown and secure with 30-D nails.
P	2	2 in. x 6 in. x 30 in. Locate on top of Item "L" and against trailer frame. Secure with 30 D nails.
Q	4	2 in. x 6 in. x 72 in. Hardwood. Locate as shown.
R	20	Each to consist of eight strands of No. 8 gage block annealed wire. Twist wires taut with a rod, bolt or suitable length of 2 in. x 2 in. lumber and secure to prevent unwinding.
S	8	5/8 in. 6 x 19 IWRC wire rope, doubled. Attach at each corner of units, as shown, and pass through stake pockets.

See General Rules 1, 2, 3, 4, 5, 8,14,15 and 19-B for further details.

BODIES-STAKE-BRIDGE TRANSPORTING TRAILER-FLAT CARS-(Concluded)



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	2	6 in. x 6 in. x 38 in. Locate as shown.
C	2	2 in. x 4 in. x 38 in. Nail to Item "B" with six 20-D nails. Secure each with five 5/8 in. bolts equally spaced passed through Item "B." floor, with 4 in. plate washers under bolt heads and 1/2 in. x 4 in. x 18 in. plate or 4 in. x 4 in. x 18 in. cleat underneath floor.
D	4	6 in. x 6 in. x 15 in. blocks with ends beveled as shown. Secure each with 5/8 in. bolt, to car floor against Item "B." Use 4 in. plate washers under bolt heads and 1/2 in. x 4 in. x 18 in. plate or 4 in. x 4 in. x 18 in. cleat underneath floor.
E	2	2 in. x 4 in. x 38 in. Locate against the ends of Item "D" as shown. Secure each to floor with six 20-D nails.
F	16	2 in. x 4 in. x 24 in. Locate as shown, four under each wood sill at bottom of body. Secure each to floor with two 10-D nails.
G	24	4 in. x 4 in. x 24 in. Locate as shown, three under each wood sill at bottom of body.
H	8	6 in. x 6 in. x 46 in. Outer ends beveled. Locate as shown, two suitably spaced against each side of lower body. Secure each with 5/8 in. bolts to floor. Use 4 in. plate washers under bolt heads and 1/2 in. x 4 in. x 18 in. plate or 4 in. x 4 in. x 18 in. cleat underneath floor.
J	4	2 in. x 4 in. x 13 ft. Locate as shown on top of top trailer under stake crates and under Items "Y." "Z" and "AA" when location requires it. Nail crates to Item "J" with 20-D nails.
K	4	1 in. x 4 in. Pieces nailed together as shown in Sketch 1 and located as shown.
L	2	4 in. x 4 in. x length to suit. Locate as shown between bodies in upper tier.
M	2	4 in. x 4 in. x length to suit. Locate as shown between bodies in middle tier.
N	2	4 in. x 4 in. x length to suit. Locate as shown between bodies in bottom tier.
O	4	4 in. x 4 in. x length to suit. Locate as shown. Nail to car floor and Item "N" with 60-D nails.
P	4	2 in. x 4 in. x length to suit. Locate as shown. Nail to Items "M" and "N" with 20-D nails.

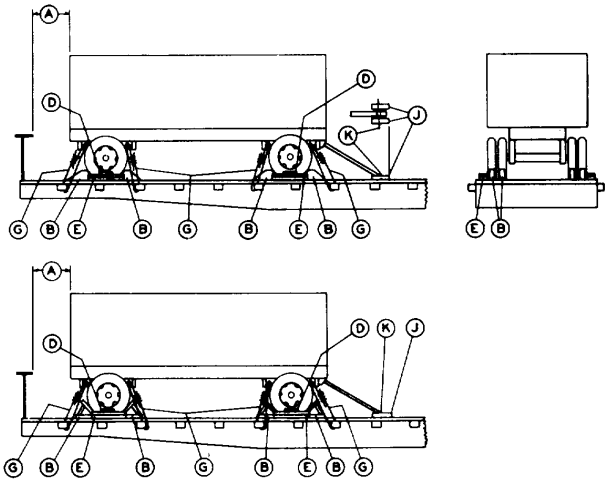
BODIES-STAKE-BRIDGE TRANSPORTING TRAILER-FLAT CARS-(Concluded)

Item	No. of Pcs.	Description
Q	2	2 in. x 4 in. x length to suit. Locate as shown. Nail to Items "L," "M" and "N" with 20-D nails.
R	2	2 in. x 4 in. x length to suit. Nail each to car floor with five 20-D nails, toe-nail to Item "Q" with two 20-D nails.
S	2	2 in. x 4 In. x length to suit. Nail upper end to Item "Q" with two 20-D nails and lower end to Item "R" with two 20-D nails.
T	2	2 in. x 4 in. x 6 in. Locate on top of Item "S" and nail to Item "Q" with two 20-D nails.
U	2	2 in. x 4 in. x 6 in. Locate on top of Items "R," against lower end of Item "S." Nail to Item "R" with two 20-D nails.
V	2	4 in. x 4 in. x 24 in. Locate on car floor under Item "W" as shown. Toe-nail each side to floor with four 50-D nails.
W	2	2 in. x 4 in. x length to suit. Locate as shown against tail boards of bottom bodies on top of Items "U" and "V." Toe-nail to Items "V" with two 20-D nails at each location.
X	1 per crate.	3/4 in. x .035 in. high tension band. Locate around crate and body of upper trailer as shown. Seal on top of crate with two crimp type seals.
Y	12	3/4 in. x .035 in. high tension bands. Locate around stake racks and bodies of bottom and middle tier. Seal with two crimp type seals at each location.
Z	8	1 1/4 in. x .035 in. high tension bands. Locate around all bodies in stack. Secure with two crimp type seals at each location.
AA	8	2 in. x .050 in. high tension bands. Pass over all bodies In each stack and through stake pockets on each side of car. Seal not less than 18 in. above stake pockets and on top of top body with two crimp type seals at each location.
BB	5	1 1/4 in. x .035 in. high tension bands. Pass one band around Items "L," and two bands around Items "M" and also Items "N" as shown. Seal with two crimp type seals at each location.

See General Rules 4, 5, 7, 9, 11, 14 and 15 for further details.

Sec. 6-Fig. 69 (Rev.-11-1978)
(Drawing Redrawn 11-1978)

TRAILER VANS-FLAT OR GONDOLA CARS WITH WOODEN FLOORS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Figure 2, Section 1.
B	2 ea. wheel.	Blocks, pattern 16. Locate 45 degree portion of block against front and rear of wheels. Secure heel of block to floor with three 40-D nails and toenail that portion under tire to floor with two 40-D nails before Items "C" and "D" are applied. Substitute, if desired, at each location, blocks pattern 17, or blocks, pattern 18.
C	2 ea. wheel.	2 in. x 4 in. x 12 in. lumber. Locate against block, pattern 18, lengthwise of car, and secure to floor with four 30-D nails. Not required when blocks, patterns 16 or 17, are used.
D	1 ea. outside wheel.	Suitable protective material, such as waterproof paper or burlap, etc. Locate bottom portion under Item "E" the top portion to extend 2 inches above Item "E".
E	1 ea. outside wheel.	Blocks, assembled per Pattern 89, Section No. 86. Locate against tire and nail to car floor with five 20-D nails.
F		Vacant.
G	2 ea. outside wheel.	Wire rope,3/8 in. 6 x 19, IWRC, doubled. Apply from spring shackles to stake pockets in a complete loop at approximately a 45 degree angle. Secure wire rope with four 3/8 in. thimbles must be used at stake pockets to protect wire rope. Secure thimbles to wire rope with 3/8 in. cable clip.
H	1 ea. Item "G"	2 in. x 4 in. x 18 in. lumber. Secure to floor, lengthwise of car, with four 30-D nails. Not required when units are loaded on flat cars.
J	2	2 in. x 4 in. x 12 in. lumber. Locate one each on each side of lunette and secure each to floor on top of Item "K" with four 30-D nails. On units equipped with coil springs, 2 each, 2 in x 6 in x 18 in. lumber doubled. Locate on each side of lunette, lengthwise. Nail lower piece to floor with five 30-D nails and upper piece to lower piece in like manner.
K	2	1 in. No. 14 B.W. gage hot rolled steel. Pass under Item "J" and through lunette. Secure each end to floor with two 30-D nails. Locate side by side across outer end of lunette and on top of Items "J". Nail with four 30-D nails at each location. Extend security chains, each side of lunette across Items "J", secure hooks to floor with 30-D nails.

Notes:

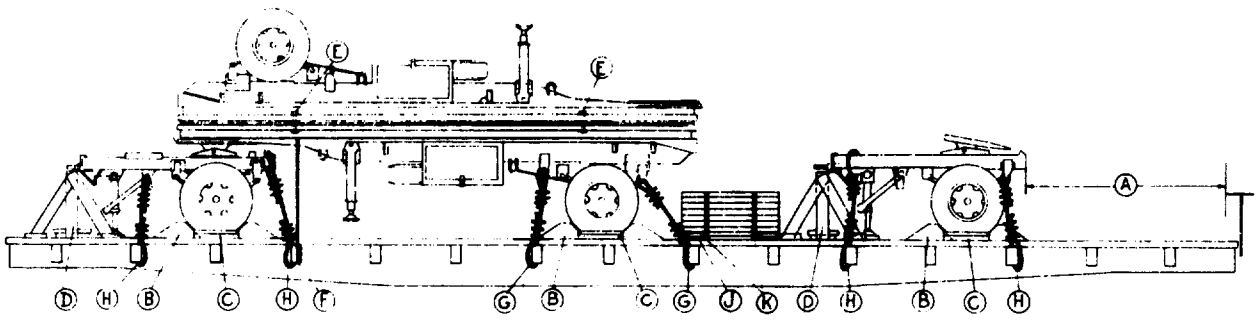
1. On units equipped with intermediate wheels, blocks, Items "B", not required at front of rear wheels and in back of intermediate wheels.

2. On units equipped with coil springs loaded on flat cars attach Items "G" to frame and secure one to stake pocket on same side of unit and one to stake pocket on opposite side of unit.

See General Rules 1, 2, 8, 4, 5, 9, 14, 15 and 19-B for further details.

Sec. 6-Fig. 70 (Rev.-9-1977)
(Drawing Redrawn 9-1977)

SEMI-TRAILERS, DOUBLE DECKED, WITH TWO WHEEL DOLLYS-FLAT CARS

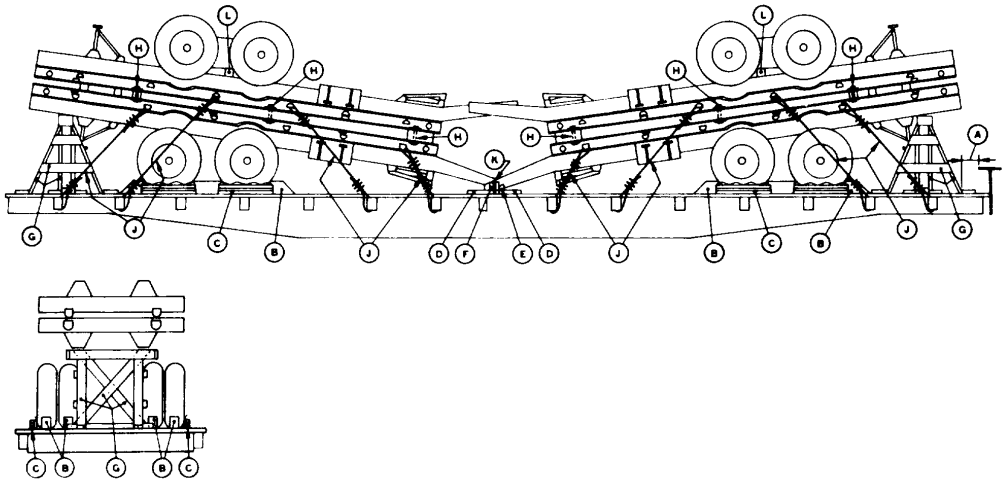


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	24	Blocks, pattern 16. Locate 45 degree portion of block in front and rear of each wheel. Secure heel of block to car floor with three 40-D nails and toenail that portion under tire with two 40-D nails on each side.
C	6	Each to consist of three pieces of 2 in. x 4 in. x 24 in. lumber and one piece of 2 in. x 6 in. x 24 in. lumber. Nail the 2 in. x 6 in. piece to the edge of one 2 in. x 4 in. piece with four 12-D nails. Place against the tire with suitable protective material, such as waterproof paper or burlap, etc. between the bottom 2 in. x 4 in. piece and between the tire and the 2 in. x 6 in. piece. Nail the bottom 2 in. x 4 in. piece to the car floor with four 20-D nails. Nail the other two 2 In. x 4 in. pieces to the one below in the same manner.
D	2	Supports, built up of two double 2 in. x 6 In. uprights and cross pieces, 2 in. x 6 in. braces and 2 in. x 4 in. floor cleats. Locate suitably under towing bar of dollies, as shown.
E	4	3/4 in. dia. bolts. Locate two on each side of units, as shown. Pass through 1/4 in. x 3 in. x 5 in. plate, stake pockets of top and bottom units and lower 1/4 in. x 3 in. x 5 in. plates.
F	1	2 in. x .050 in. high tension band. Pass over frame of front end of semi-trailer, as shown, and through opposite stake pockets.
G	4	Each to consist of 3/8 in., 6 x 19 IWRO wire rope, single strand. Attach to frame or spring shackles at rear of semi-trailer, as shown, and through stake pockets. Fasten each end of wire rope with three 3/8 in. cable clips. 3/8 in. thimbles must be used at each stake pocket to protect wire rope and secured to the wire rope with one 3/8 in. cable clip.
H	8	Each to consist of 3/8 in., 6 x 19. IWRO wire rope, single strand. Attach to frame or spring shackles of each dolly, as shown, and through stake pockets. Apply thimbles as outlined in Item "G", above.
J	4	Each to consist of two pieces of 2 in. x 4 in. x 18 in. lumber. Locate, as shown, at each of panels and secure lower piece to floor with three 30-D nails and top piece to one below in like manner.
K	4	1 1/4 in. x .035 high tension bands. Locate two lengthwise encircling panels, and two cross-wise, as shown.

See General Rules 1, 2, 3, 4, 5, 9, 14, 15 and 19-B for further details.

Sec. 6-Fig. 71 (Rev.-9-1977)
(Drawing Redrawn 9-1977)

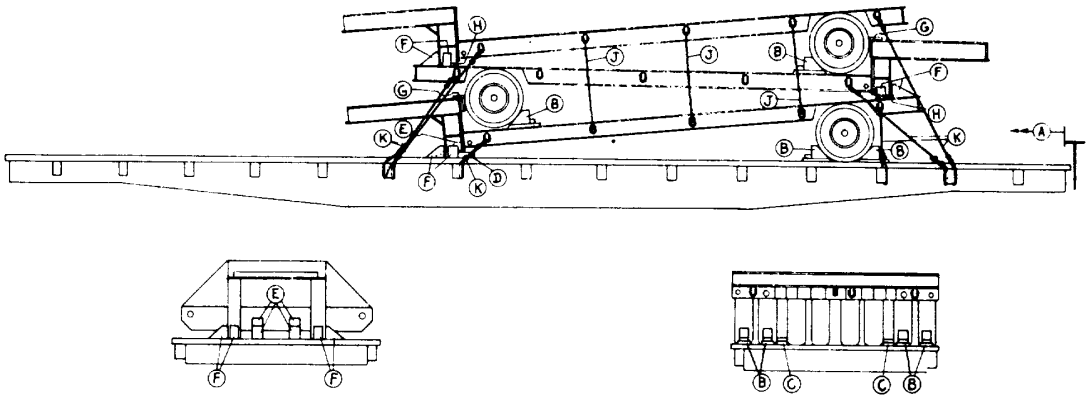
SEMI-TRAILER, 10 TON, WITH FOUR CENTER DUAL WHEELS, DOUBLE DECKED-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	24	Blocks, pattern 16. Locate 45 degree portion of block against front of each front dual wheel and at rear of each inside dual front wheel, and at rear of each rear dual wheeland at front of each outside dual rear wheel. Secure heel of block to floor with three 40-D nails and toe-nail that portion under tire with two 40-D nails.
C	8	Each to consist of one piece of 2 in. x 6 in. x 36 in. lumber and three pieces of 2 in. x 4 in. x 36 in. lumber. Nail the 2 in. x 6 in. x 36 in. piece to the edge of the bottom 2 in. x 4 in. x 36 in. piece with five 12-D nails. Place suitable protective materials, such as waterproof paper or burlap, etc., under the 2 in. x 4 in. piece and between the tire and the 2 in. x 6 in. piece, the top portion to extend 2 inches above the 2 in. x 6 in. piece. Nail 2 in. x 4 in. piece to car floor with four 20-D nails. Nail the other two pieces of 2 in. x 4 in. x 36 in. lumber to the one below in the same manner. See blocking pattern 89 Section 6 material chart.
D	2	2 in. x 6 in. x 36 in. Locate under tow bars of units, as shown, and secure to floor with three 30-D nails.
E	2	Blocks, pattern 68. Locate against outside of tow bars of units, as shown, and toe-nail each to floor with four 40-D nails.
F	2	2 in. x 6 in. x 12 in. Locate against Item "E", as shown, and secure each to floor with three 30-D nails.
G	2	Supports, built up of 6 in. x 6 in. uprights, and 4 in. x 6 in. cross pieces, 2 in. x 6 in. diagonals and braces, and 2 in. x 6 in. floor cleats. Locate under end of units at least 6 in. from king pin or landing gear.
H	12	3/4 in. dia. bolts. Locate three on each side of each unit. Pass through 1/4 in. x 3 in. x 6 in. plate, stake pockets of top and bottom units, suitable filler blocks between units, and plate underneath.
J	8 ea. unit.	Wire rope 1/2 in., 6 x 19, IWRO, single strand. Locate as shown from tiedown device on trailer to stake pocket. Apply wire rope at approximately 45 degree angle. Secure wire rope at each end with three 1/2 in. cable clips. Thimbles must be used at stake pockets to protect wire rope. Secure thimbles to wire rope with one 1/2 in. cable clip.
K	1	2 in. x .050 in. high tension band. Pass over tow bars of units and secure underneath Items "F", or to opposite stake pockets.
L	As required.	Blocks, width, thickness and length to suit. Locate between frame of top unit and springs on each side. Secure in position with two 1 1/4 in. x .035 in. high tension bands encircling both blocks at ends.

See General Rules 1, 2, 3, 4, 5, 7, 9, 11, 14, 15 and 19-B for further details.

SEMI-TRAILERS, 20 TON, TRIPLE DECKED-FLAT CARS

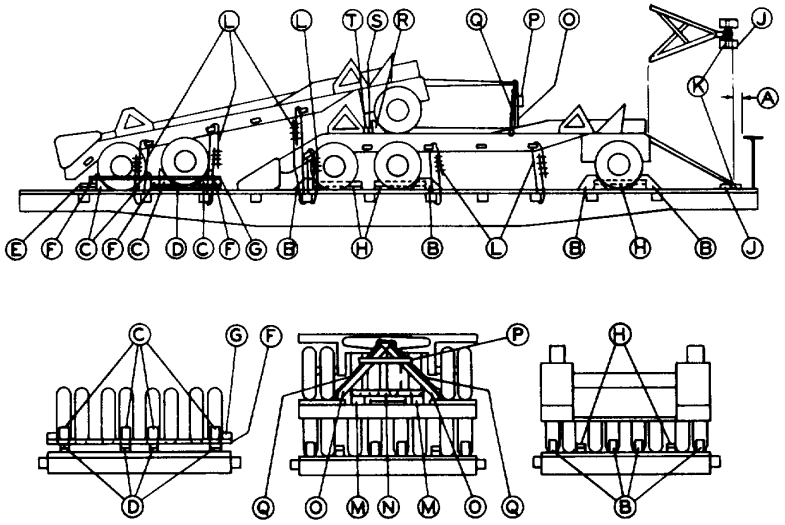


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	8 ea. bottom unit.	Blocks, pattern 65. Locate in front and rear of each outside pair of dual wheels. Secure each to floor with six 30-D nails.
	2 ea. top unit.	Blocks, pattern 65. Locate in front of each outside wheel. Secure each to unit below with six 30-D nails.
C	2 ea. unit.	Each to consist of two pieces of 2 in. x 4 in., length to suit. Locate between each inside pair of dual wheels. Secure lower piece to floor with four 30-D nails and top piece to one below in like manner.
D	2 ea. bottom unit.	4 in. x 4 in. x 18 in. Locate suitably spaced, as shown, under front end of unit. Toe-nail each to floor with four 40-D nails.
E	2 ea. Item "D".	Blocks, pattern 66. Locate one on top of each Item "D" against end of trailer, and one against Item "D", as shown. Secure each with four 40-D nails.
F	4 ea. unit.	Blocks, pattern 67. Locate two against ends and two against sides of front end of units, as shown. Secure each with four 40-D nails.
G	As required.	Each to consist of one piece 1 1/2 in. x 10 in. and one piece 1 1/2 in. x 6 in., length to suit. L-shaped, suitably nailed to each other. Locate between units, as shown, and secure each with four 20-D nails.
H	As-required.	2 in. x 6 in., length to suit. Locate between units, as shown, and secure with four 30-D nails.
J	6	Each to consist of eight strands No. 8 gage black annealed wire. Attach three on each side to side links of top and bottom units. Substitute, if desired, 7/8 in. dia. rods or 5/8 in. x 6 x 7 steel cable, doubled.
K	4 ea. unit.	5/8 in. x 6 x 7 steel cable, doubled. Attach at each corner of units, as shown, and pass through stake pockets.

See General Rules 4, 5, 7, 9, 11, 14, 15 and 19-B for further details.

Sec. 6-Fig. 74 (Rev.-9-1977)
(Drawing Redrawn 9-1977)

TRAILER, TRUCK, 45 TON TANK TRANSPORTER-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	16	Blocks, pattern 16. Locate 45 degree portion of block against front and rear of front wheels, front of intermediate and in back of rear wheels of front unit, as shown. Secure heel of block to floor with three 40-D nails, and toe-nail that portion under tire to floor with two 40-D nails.
C	12	Blocks, pattern 25. Locate on top of Item "D", or on floor, with 53 degree portion of block against front and rear of outside intermediate and rear wheels, against front of two intermediate wheels and against rear of two rear wheels nearest center of unit. Secure heel of block to Items "D", or floor, with three 40-D nails and toe-nail that portion under tire to Items "D", or floor, with two 40-D nails.
D	4	Each to consist of two pieces of 2 in. x 6 in. x 48 in. Locate under both outside and two center intermediate wheels, with one end against Item "C" located in front of rear wheels. Secure lower piece to floor, lengthwise of car, with six 30-D nails and top piece to one below in like manner.
E	4	Each to consist of two pieces of 2 in. x 4 in. x 12 in. Locate against Items "C" in back of rear wheels. Secure lower piece to floor with three 30-D nails and top piece to one below in like manner.
F	3	Lumber, 2 in. x 4 in., long enough to permit application of Items "G". Locate against Item "C" on top of Items "D" at front and back of intermediate wheels and against Items "0" on top of Items "E" at back of rear wheels. Secure to Items "D" and "E" with three 30-D nails at each location.
G	2	Lumber, 2 in. x 4 in., long enough to extend to outside face of outside Items "F". Locate on top of Items "F", against outside wheels and secure to each Item "F" with three 30-D nails.

TRAILER, TRUCK, 45 TON TANK TRANSPORTER-FLAT CARS

Item	No. of Pcs.	Description
H	6	Each to consist of two pieces of 2 in. x 4 in. x 36 in. lumber. Locage against inside of outside pair of front, intermediate and rear wheels on front unit. Secure lower piece to floor with four 30-D nails and top piece to one below in like manner.
J	2	Lumber, 2 in. x 4 in. x 12 in. Locate one on each side of lunette eye, on top of Item "K", and secure each to floor with three 30-D nails, one nail in each piece to pass through Item "K".
K	1	1 in. No. 14 BW. gage hot rolled steel. Locate under Items "J" and pass through lunette eye. Secure to floor with one 30-D nail in each end.
L	12	3/8 inch, 6 x 19, IWRO, wire rope, single strand. Attach to tiedown points on vehicles and to stake pockets on car near front, rear, and center of units. Metal fillers or thimbles sufficient to provide a suitable radius must be used to protect wire rope at stake pocket and vehicle tiedown points. Thimbles must be applied so as to prevent dislodgement. Cable clips must be applied in accordance with General Rule 15.
M	2	Lumber, 4 in. x 6 in. x 48 in. Locate under outside intermediate front wheels of rear unit.
N	2	Lumber, 2 In. x 6 in., long enough to extend to outside face of Items "M". Locate against front and back of wheels and secure to Items "M" with three 30-D nails in each end.
O	1	Draw bar support "A" frame. To consist of two pieces of 2 in. x 4 in. x 43 in. and one piece 2 in. x 4 in. x 20 in., Item "P". Locate frame in vertical position, under draw bar, with bottom ends resting inside of angles on frame of lower unit.
P	1	Lumber, 2 in. x 4 in. x 20 in. Locate against upper face of Items "O" and secure to each Item "O" with three 30-D nails clinched on back.
Q	1	2 strands, No. 8 gage black annealed wire. Pass through and around lunette eye and attach ends to frame of lower unit.
R	4	Blocks, pattern 25. Locate one against each rear portion of both outside front wheels of rear unit.
S	As required.	Lumber, 2 in. x 4 in. x 16 in., to fill space between Items "R" and "T". Secure to vertical surface of adjoining Items "R" and to each other with two 30-D nails at each location.
T	1	Lumber, 2 in. x 4 in. x 8 ft. Locate against steel choke frame and secure to Items "S" with three 30-D nails at each location.
U	1 ea. Item "B".	Lumber, 2 in. x 4 in. x 12 in. Locate against Item "B" and secure to floor with four 30-D nails Not required when blocks, pattern 16, are used.

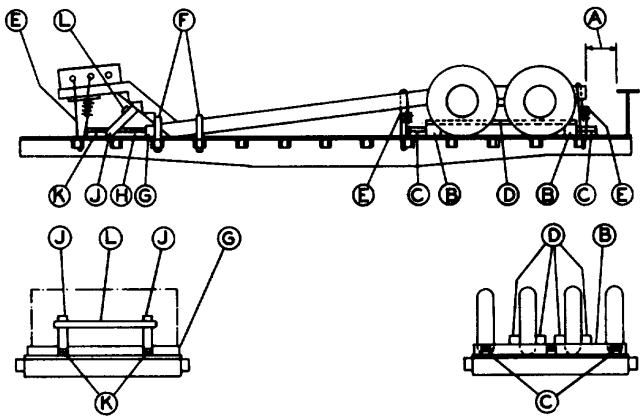
Note:

1. Hand brakes must be set and levers wired or blocked.

See General Rules 1, 2, 3, 4, 5, 9, 14, 15, 19-A and 19-B for further details.

Sec. 6-Fig. 75 (Rev.-9-1977)
(Drawing Redrawn 9-1977)

TRAILER PORTION, TANK RECOVERY UNIT-FLAT CARS



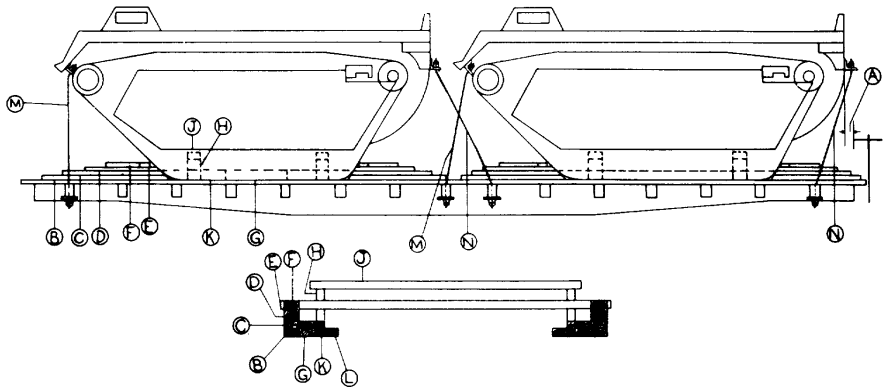
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2	Lumber, 6 in. x 8 in., length about equal to width of floor. Chamfer 2 in. at point of contact with tires. Locate against front of front tires and against back of rear tires and toenail each to floor with six 40-D nails.
C	3 ea.-Item "B".	Each to consist of lumber, two pieces, 2 in. x 4 in. Locate against Items "B", lengthwise of car, one near each end and one in the center. Secure lower piece to floor with three 30-D nails and top piece to one below in like manner.
D	4	Lumber, 2 in. x 4 in., long enough to extend to outside face of Items "B". Locate one against inside and outside of each intermediate wheel, on top of Items "B", and secure to each Item "B" with four 30-D nails at each end.
E	3 ea. side.	3/8 inch, 6 x 19, IWRO wire rope. Apply wire rope so as to form a complete loop between the tiedown points on the vehicle and the stake pockets. Ends of cable should overlap a minimum of 16 inches and be fastened with four 3/8 inch cable clips spaced approximately 2 inches apart. The angles of tiedown should approximate 45 degrees.
F	2 ea. side.	Stakes or green saplings.
G	1	6 in. x 6 in. timber, length equal to width of car floor. Locate against front of forward part of unit and toenail to floor with six 40-D nails.
H	2	Each to consist of two pieces of 2 in. x 4 in. lumber, length to suit. Bevel one end to 45 degrees and locate one near each side of unit against Item "G", lengthwise of car. Secure lower piece to floor with three 30-D nails and top piece to one below in like manner.
J	2	Lumber, 4 in. x 4 in., diagonal braces, length to suit. Out ends to fit and locate against the beveled ends of Items "H" on-a 45 degree angle between unit and floor. Secure to Items "H" and floor with three 30-D nails at each location.
K	2	Each to consist of two pieces of 2 in. x 4 in. x 12 in. lumber. Bevel one end of top pieces to 45 degrees. Locate against Items "J". Secure lower piece to floor with three 30-D nails and top pieces to one below in like manner.
L	1	2 in. x 4 in. lumber, long enough to extend to outside face of Items "J". Locate near top ends of, and secure to Items "J" with three 30-D nails at each end.

Notes:

1. Suitable fillers nailed to floor of car must be applied between sides of unit and side stakes, Items "F".
2. Hand brakes must be set and levers wired or blocked.

See General Rules 1, 2, 3, 4, 5, 9, 10, 14, 15, 19-A and 19-B for further details.

LANDING VEHICLES, AMPHIBIAN, 60,000 LBS. AND UNDER, TRACKED-FLAT OR GONDOLA CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. unit.	Blocks, pattern 49. Locate one on floor against each crawler tread and secure to floor with six 40-D nails.
C	4 ea. unit.	Blocks, pattern 50. Locate one on top of and secure to each Item "B" with five 40-D nails.
D	4 ea. unit.	Blocks, pattern 51. Locate one on top of and secure to each Item "C" with four 40-Dnails.
E	2 ea. unit.	3 in. x 6 in. x 10 ft. 5 in. Locate one against crawler treads on top of Items "D" and secure to Items "D" with three 40-D nails at each end.
F	4 ea. unit.	3 in. x 6 in. x 16 in. Locate on top of Item "D" with one end against Item "E" and secure to Item "D" with three 40-D nails.
G	2 ea. unit.	Each to consist of two pieces of 3 in. x 6 in. x 20 ft. Locate against crawler tread and secure lower piece to floor with 40-D nails spaced about 18 in. apart and top pieces to one below in like manner. May be made up of two or more pieces, 6 ft. minimum.
H	4 ea. unit.	3 in. x 6 in. x 16 in. Locate one against Items "G" at each side of unit about 30 in. from Item "E" and secure to Items "G" with two 40-D nails. Not required for units under 10,000 lbs.
J	2 ea. unit.	3 in. x 6 in. x 90 in. Locate on top of opposite Items "H" and secure to same with two 40-D nails in each. Not required for units under. 10,000 lbs.
K	8 ea. unit.	3 in. x 6 in. x 16 in. Locate one on each side of Item "H" and secure each to floor with three 40-D nails. Not required for units under 10,000 lbs.
L	4 ea. unit.	3 in. x 6 in. x 18 in. Locate on floor against Items "H" and "K" and secure to floor with three 40-D nails. Not required for units under 10,000 lbs.
M	2 ea. unit.	Tie rods as follows:

Weight of Vehicle	Size of Rods
Under 10,000 lbs.	3/4 in. dia.
Over 10,000 to 20,000 lbs.	7/8 in. dia.
Over 20,000 to 30,000 lbs.	1 in. dia.
Over 30,000 to 40,000 lbs.	1 1/8 in. dia.
Over 40,000 to 60,000 lbs.	1 1/4 in. dia.

Attach to unit at bow and pass through floor, or through stake pockets and 1/2 in. x 4 in. x 10 in. plates underneath stake pockets. Substitute, if desired, 5/i in. x 6 x 19 steel cable, doubled.

N	2 ea. unit.	Tie rods, same size as Item "M." Attach to unit at stern and pass through floor, or through stake pockets and 1/2 in. x 4 in. x 10 in. plates underneath stake pockets. Substitute if desired, 5/8 in. x 6 x 19 steel cable, doubled.

When necessary to extend floor for the application of Items "G" to units loaded on car floor, use method shown in Figure 1-C, Sec. 1.

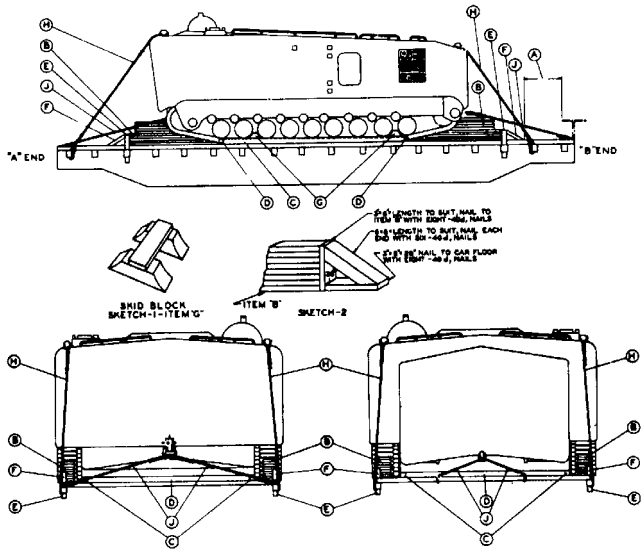
For loads superimposed above car floor, use method illustrated in Figure 81.

"NOTICE"

This figure, when applicable, may be used for the loading of vehicles being shipped under the provisions of ICC Special Permit No. 3498 during a National Emergency providing the gross weight per vehicle does not exceed 60,000 pounds and Item "M" tie rods are increased in size to compensate for the added weight. For vehicles having a gross weight exceeding 60,000 pounds each, use Figure 78-A, Sec. 6.

See General Rules 4, 5, 7, 9, 11, 14, 15 and 19-A for further details.

Sec. 6-Fig. 78-A (Rev.-10-1968)
LANDING VEHICLES, TRACKED, (LVT TANKS), WITH OR WITHOUT GUNS, OVER 60,000 TO 100,000 LBS. INCLUSIVE-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. unit.	Blocks, 3 in. x 6 in. length to suit, laminated. Secure lower pieces to floor with 40-D nails every 8 in., staggered. Secure upper pieces to ones below in like manner. Inner ends are to be beveled to fit contour of tracks. Height of complete blocks must be on a plane with the center line of the front and rear drive sprockets and compensating idler wheels.
C	2 ea. unit.	Each to consist of two pieces of 3 in. x 6 in., length to suit. Locate from a point beginning at the center of the first bogie wheel and extending longitudinally to a point at the center of the rear bogie wheel. Locate bottom pieces on floor against inside of treads, with 40-D nails every 18 in., staggered. Secure upper pieces to ones below in like manner. Position on car prior to lifting or driving vehicle in place.
D	4 ea. unit.	Each to consist of two pieces of 3 in. x 6 in., length to suit. Position transversely, one at each end between Item "C", and the remaining two evenly spaced between the two end pieces. Secure to floor with two 40-D nails for each piece. Fasten upper pieces to ones below in like manner. Position on car prior to lifting or driving vehicle in place. Substitute (in lieu of Items "C" and "D"), if available and desired, eight 1/4 in. stock mild steel cleats, per Pattern 75. Position two each corner inside of tracks, spaced 28 1/4 in. apart, center to center, one on each side of end bogie wheel.
E	4 ea. unit.	Hardwood stakes. Size to fit stake pocket. Position at ends to about a minimum of first five layers of Item "B" above car floor, and 4 in. below bottom of stake pocket. Drive nail into stakes, bend upward over edge of stake pocket. Substitute, if Item "E" cannot be used as shown, blocking method indicated in Sketch 2.
F	4 ea. unit.	Hardwood pieces same size as Item "E", length to fit from top of Item "E" to floor of car. Bevel each end and secure from Item "E" to floor of car with two 30-D nails each end. Position at a 30 degree angle. Not required when blocking per Sketch 2 is used for Item "E."
G	4 ea. unit.	Skid block assembly, Sketch 1. Each to consist of two pieces of 6 in. x 6 in. x 18 3/8 in. hardwood, cut to fit contour of bogie wheels, with one piece each of 3 In. x 6 in. x 20 1/2 in. hardwood fastened to tops of the two pieces with two 40-D nails each end. Locate on tracks as Indicated.
H	4 ea. unit.	Rods 1 1/4 in. dia., length to suit. Extend from front and rear mooring bits through stake pockets and 1/2 in. x 4 in. x 10 in. plate underneath stake pockets. Substitute, if desired, 5/8 in. dia. 6 x 19 IWRC wire rope, applied in a complete loop and secured with four 5/8 in. cable clips.
J	4 ea. unit.	Rods 1 1/4 in. dia. length to suit. Extend from front and rear towing eye or hooks through stake pockets (either side or end) and 2 in. x 4 in. x 10 in plates. Substitute, if desired, 5/8 in. dia. 6 x 19 IWRC wire rope, applied in a complete loop and secured with four 5/8 in. cable clips.

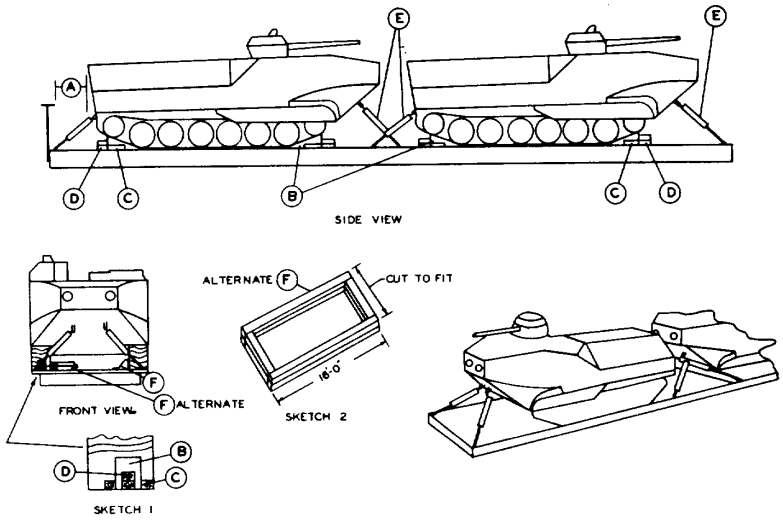
For loads superimposed above car floor, use method illustrated in Fig. 81, of Sec. 6.

"NOTICE"

This figure, when applicable, may be used for the loading of vehicles being shipped under the provisions of ICC Special Permit No. 3498 during a National Emergency providing the gross weight per vehicle does not exceed 100,000 pounds. For vehicles having a gross weight exceeding 100,000 pounds each, use Figure 81, Sec. 6.
See General Rules 3, 4, 5, 7, 9, 10, 14, 15 and 19-A for further details.

Sec. 6-Fig. 78-B (New-10-1973)

LANDING VEHICLE, AMPHIBIAN, (LVTP-7), 60,000 LBS. AND UNDER OR SIMILAR TYPE VEHICLES-HTTX TYPE OR SIMILAR TYPE FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 per vehicle.	Block pattern #31. Locate against front and rear of each tread.
C	8	Locate one 2 in. x 4 in. x 20 in. piece of lumber on each side of Items "B". Secure to car floor with four 30-d nails. (See Sketch 1).
D	4	Place two pieces of 2 in. x 4 in. x 18 in. lumber (doubled) against rear of Items "B". (See Sketch 1). Secure lower piece to floor with four 30-d nails and top piece to lower piece In like manner.
E	4 per vehicle.	1/2 inch alloy chain, proof test 27,500 lbs. Secure chains to tiedown shackles on vehicle. After tiedown chains are tensioned, they shall be hit sharply with a hammer to relieve ary binding and the tiedown chains retensioned, if necessary. There must be at least one full wrap of chain around the tensioning device drum. If turnbuckles are used as a tensioning device, they must be equipped with lock nuts to prevent loosening.
F	4 per vehicle.	Metal cleats, Pattern No. 75. Secure to the car deck against the inside edge of the treads. One on each side near front and one on each side near rear. Cleats should be secured to rail car floor prior to loading vehicle on car.
ALTERNATE		
F	1 per vehicle.	When metal cleats are not available, a frame-work of 2 in. x 6 in. lumber (doubled) shall be constructed between the tank treads (See Sketch 2). Frame-work shall consist of four pieces of lumber 2 in. x 6 in. x 16 ft. long. Locate lower pieces on car floor against inside edge of each crawler tread. Secure to car floor with twelve 30-d nails. Secure top piece to lower piece in like manner. Nails should be applied in a staggered pattern. Four pieces of 2in. x 6 in. lumber cut to fit shall be placed between the longitudinal pieces. Secure lower pieces to car floor with four 30-d nails. Secure top piece to lower piece in like thinner.

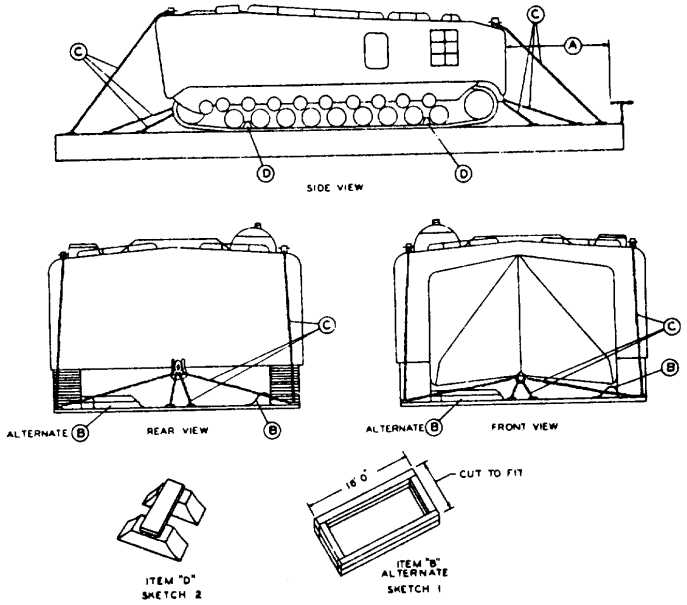
NOTES:

Vehicles may be loaded on rail cars facing in the same direction or in opposite directions.

See General Rules 1, 2, 3, 4, 5, 7, 9, 14, 15 and 19-A for further details.

Sec. 6-Fig. 78-C (New-10-1973)

LANDING VEHICLE, TRACKED, (LVTP-5), 60,000 LBS. TO 100,000 LBS. INCLUSIVE-HTTX TYPE OR SIMILAR TYPE FLAT CARS



Item	No. of Pcs.	Description
A		Brake Wheel clearance. See Fig. 2, Sec. 1.
B	4	Metal cleats, pattern 75. Position and secure one metal cleat on car floor at front and rear locations of inside edge of each crawler tread, prior to loading vehicle.
ALTERNATE		
B	2	In lieu of metal cleats, preposition two wood frames of 2 in. x 6 in. x 96 in. lumber (doubled) so as to fit against the inside edge of the crawler treads. (See Sketch I): Nail lower pieces to car floor with 30-d nails spaced every eight inches in a staggered pattern. Nail top pieces to lower pieces In like manner. Locate two pieces of 2 in. x 6 in. x length to fit between longitudinal members. Nail lower pieces to car floor with four 30-d nails and top pieces to lower pieces in like manner.
C	12	Chain tie-downs. 1/2 in. alloy chains with a minimum proof test of 27.500 lbs. Secure two outboard chains and two inboard chains to the towing shackle at each end of the vehicle. Secure one outboard chain to each mooring post at each end of the vehicle. After tie-down chains are tensioned, they shall be hit sharply with a hammer to relieve any binding and tie-down chains retensloned, if necessary. There must be at least one full wrap of chain around the tensioning device drum. If turnbuckles are used as tensioning devices, they must be equipped with lock nuts to prevent loosening.
D	4	Skid block assembly. (See Sketch 2). Each to consist of two pieces of 6 in. x 6 in. x 18 1/4 in. hardwood, cut to fit contour of bogie wheels. with one piece each of 3 in. x 6 in. x 20 1/2 in. hardwood fastened to the tops of the two pieces with two 40-d nails at each end. Locate as indicated.

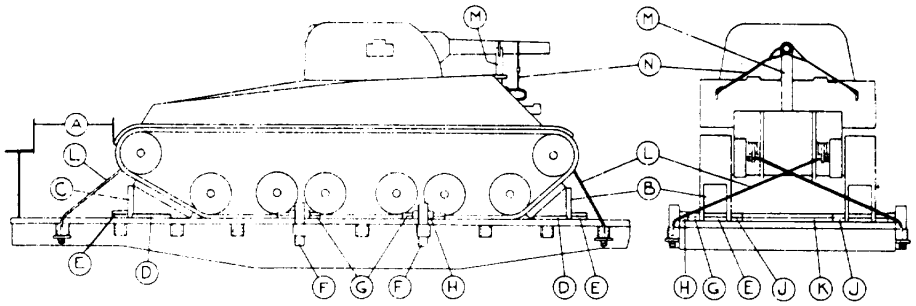
NOTES:

Only one vehicle can be loaded on a 60 foot HTTX car.

See General Rules 1, 2 3, 4, 5, 7, 9. 14, 15 and 19-A for further details.

Sec. 6-Fig. 79 (Rev.-9-1984)

TANKS AND SIMILAR UNITS, 60,000 LBS. AND UNDER-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2	Blocks, pattern 30. Locate one against each front crawler tread.
C	2	Blocks, pattern 31. Locate one against each rear crawler tread.
D	2 ea. Item "B" and "C".	2 in. x 4 in. x 20 in. Locate one on each side of Items "B" and "C" and secure each to floor with six 30-D nails.
E	1 ea. Item and "C". manner.	"B" Each to consist of two pieces of 2 in. x 4 in. x 12 in. Locate against ends of Items "B" and "C". Secure lower piece to floor with four 30-D nails and top piece to one below in like
F	2 ea. side of unit.	Side stakes. Must extend 2 in. below stake pocket and 8 in. above car floor. Locate one each In first stake pocket to the right of and to left of stake pocket nearest center of tank. Not required when Items "J" and "K" are used.
G	2 ea. side of unit.	Each to consist of two pieces of 2 in. x 4 in. x 24 in. Locate against crawler treads, with centers opposite Items "F". Secure lower piece to floor with six 30-D nails and top piece to one below in like manner. Not required when Items "J" and "K" are used.
H	As required.	2 in. x 6 in. x 12 in. Center on Items "F" and toe-nail each to floor With one 30-D nail In each end. Use sufficient pieces to completely fill space between Items "F" and "G". Not required when Items "J" and "K" are used.
J	2 ea. unit.	Each to consist of two pieces of 2 in. x 4 In. x 14 ft. Locate on floor against inside of each crawler tread and secure lower piece to floor with twelve 30-D nails and top piece to one below in like manner. Not required when Items "F", "G" and "H" are used.
K	3 ea. unit.	Each to consist of two pieces of 2 in. x 4 in., long enough to fill space between Items "J". Locate one near center and one near each end of Items "J". Secure lower piece to floor with four 30-D nails and top piece to one below in like manner. Not required when Items "F", "G" and "H" are used.
L	4 ea. unit.	Tie rods, same size as Item "M," Fig. 78. Attach to lifting lugs and pass through stake pockets and 1/2 in. x 4 in. x 10 in. plates underneath stake pockets on opposite sides of car. Substitute, if desired, 5/8 in. x 6 x 19 steel cable, doubled.
M	1 ea. unit.	2 in. x 6 in., length to suit. Apply to top of tank, under turret gun barrel, and secure with one piece of 3/4 in. high tension band over gun barrel and secured to each side of brace with two 6-D nails. Not required when gun is secured with built-in gun brace.
N	2 ea. unit.	3, in. steel cable, 6x19 IWRC. Apply two 38 in. cables in a complete loop securing gun barrel to unit at each side. Not required when unit is equipped with external built-in gun brace; however, if external gun brace is inoperative, cable will be used. Substitution of wire or banding is not authorized.

When necessary to extend floor for the application of Items "D" on units loaded on car floor, use method shown in Figure 1-C, Sec. 1.

For loads superimposed above the car floor follow method illustrated in Figure 81.

Turret gun should be in straightforward position, and turret lock handwheel and elevating mechanism handwheel must be wired to prevent rotating.

When tie-down rods are found slightly loose in transit, they need not be tightened.

Hand brakes must not be set.

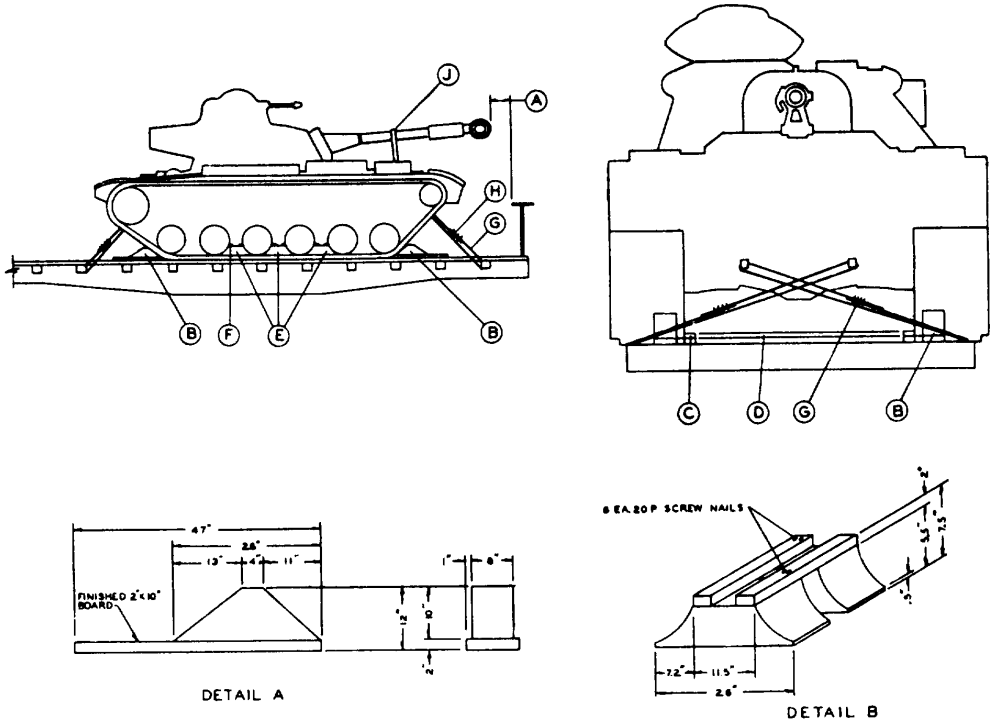
"NOTICE"

This figure, when applicable, may be used for the loading of vehicles being shipped under the provisions of ICC Special permit No. 3498 during a National Emergency providing the gross weight per vehicles does not exceed 60,000 pounds and Item "L" tie rods are increased in size as provided for in Item "M" of Figure 78 to compensate for the added weight. For vehicles having a gross weight exceeding 60,000 pounds each, use Figure 80, Sec. 6.

See General Rules 3, 4, 5, 9, 10, 14, 15, 19 and 19-A for further details.

Sec. 6-Fig. 80 (Rev.-10-1981)
(Drawing Redrawn 9-1977)

TANKS AND SIMILAR UNITS, OVER 60,000 TO 100,000 LBS., INCLUSIVE-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Figure 2, Section 1.
B	4	8 in. x 10 in. x 28 in. solid block. Cut blocks as shown in detail "A", 45 degrees on one end 35 degrees on the other end. Nail each block to a 2 in. x 10in. x 47 in. piece of lumber with eight 30-D nails so that two blocks have the 35 degree end forward and two blocks have 45 degree end forward. Place blocks against tank treads and nail to car floor with eight 30-D nails.
C	2 ea. unit.	Each to consist of two pieces of 2 in. x 4 in. x 14 feet. Locate on floor against inside of each crawler tread. Secure lower piece to car floor with twelve 30-D nails and top piece to lower piece in like manner. Substitute if desired tread side cleats, Pattern No. 75, Section 6. Apply three (3) to the inside of each crawler tread. Locate at ends and center and secure to car floor as specified under Pattern 75.
D	3 ea. unit.	Each to consists of two pieces 2 in. x 4 in. long enough to fill space between Items "C". Locate one near center and one near each end of Items "C". Secure lower piece to lower piece in like manner. Not required when tread side cleats, Pattern No. 75, Section No. 6, are substituted per Item "C".

Sec. 6-Fig. 80 (Rev.-10-1981) (Concluded)

(Drawing Redrawn 9-1977)

TANKS AND SIMILAR UNITS, OVER 60,000 TO 100,000 LBS., INCLUSIVE-FLAT CARS

Item	No. of Pcs.	Description
E	86	Each to consist of two pieces of 4 in. x 6 in. solid block lumber. Cut to fit contour of bogie wheels. Locate one piece between inner wheels, and one piece between outer wheels in the spaces between the four center bogie assemblies as shown above.
F	6	Each to consist of two pieces of 2 in. x 4 in. x 12 1/2 in. lumber. Locate against bogie wheels on top of Items "E" as shown in detail "B". Fasten to Item "E" with 20-D screw nails.
G	4	5/8 in., 6 x 19, IWRO, wire rope, In complete loop. Apply from tie-down points on front and rear of tank to stake pockets on opposite side of car. If wire ropes contact each other where they cross, suitable cushioning material must be applied to prevent chafing or wear of these Items. Thimbles must be placed at the bottom of each stake pocket and fastened to wire rope with one cable clip to prevent dislodgement. Wire rope should be overlapped at least 24 in. Substitute 1 1/4 in. diagonal rods if desired. Attached to lifting lugs and pass through stake pockets. A 1/2 in. x 4 in. x 10 in. steel plate must be placed at the bottom of the stake pocket to act as a washer.
H	20	Fasten each wire rope tie-down with four 5/8 in. cable clips spaced approximately 3 1/2 to 4 in. apart. See General Rule 15(d) and Rule 15(n), Note A.
J	2 ea. unit.	3/8 in. wire rope, 6 x 19, IWRC. Apply two 3/8 in. cables in a complete loop securing gun barrel to unit at each side. Not required when unit is equipped with external built-in gun brace; however, if external gun brace is Inoperative, cable will be used. Substitution of wire or banding is not authorized.

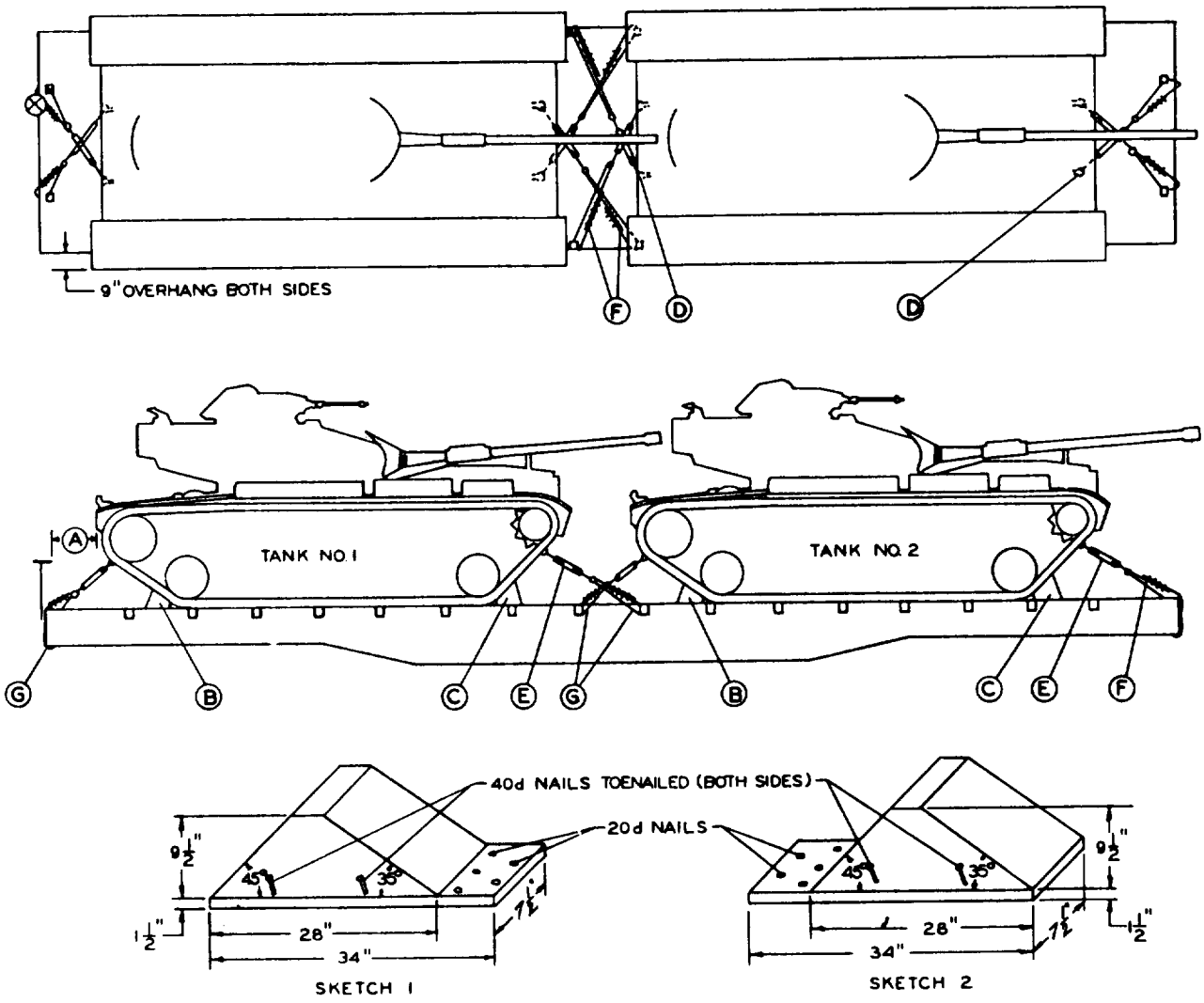
Notes:

1. For loads superimposed above car floor, use method illustrated In Figure 81.
2. Turret gun should be In a straight forward position. Turret lock handwheel and elevating mechanism handwheel must be wired to prevent rotating.
3. When tie-down rods are found slightly loose in transit, they need not be tightened.
4. Handbrakes must not be set.
5. This figure, when applicable, may be used for the loading of vehicles being shipped under the provisions of ICC Special Permit No. 3498 during a National Emergency providing the gross weight per vehicle does not exceed 100,000 lbs. For vehicles having a gross weight exceeding 100,000 lbs. each, use Figure 81, Section 6.

See General Rules 1, 2, 3, 4, 5, 7, 9, 11, 14, 15, 19, and 19-A for further details.

Sec. 6-Fig. 80-A (Rev.-9-1984)

TANKS AND SIMILAR UNITS MOVING IN CONTROLLED TRAIN SERVICE FOR UNIT MOVES AND/OR EMERGENCIES-FLAT CARS



E-104.1

Sec. 6-Fig. 80-A (Rev--9-1984) Concluded)

TANKS AND SIMILAR UNITS MOVING IN CONTROLLED TRAIN SERVICE FOR UNIT MOVES AND/OR EMERGENCIES--FLAT CARS

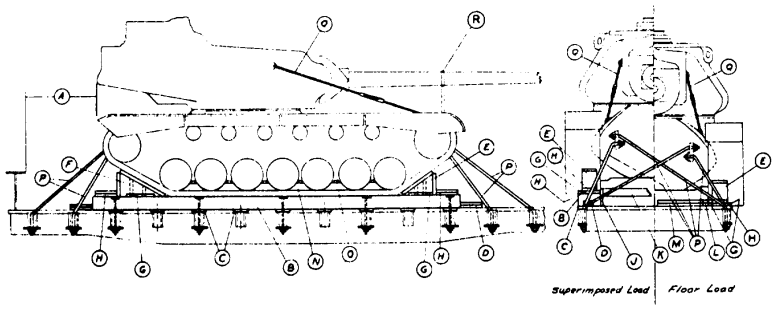
Item	No. of Pcs.	Description
A		Brakes wheel clearance. See Fig. 2, Sec. 1.
B	2	Metal chock blocks, Pattern 74. If metal chock blocks are not available, use wood block shown in Sketch 2, with 35° angle against tank tread. Place block approximately 5 inches in from side of flatcar. Secure to car floor.
C	2	Metal chock blocks, Pattern 76. If metal chock blocks are not available, use wood block shown in Sketch 1, with 45° angle against tank tread. Place block approximately 5 inches in from side of flatcar. Secure to car floor.
D	4	Shackles, anchor type with screw pin 1 1/4 inch, 1 3/8 inch pin diameter. Attach to tiedown fitting on tank. In lieu of shackle, use 5/ inch, IWRC wire rope in complete loop, secured with four 5a inch cable clips.
E	4	Turnbuckles. 1 1/4 inch x 18 inch, jaw and eye for use with tanks equipped with shackles. 1 1/4 inch x 18 inch eye and eye turnbuckles when wire rope is used in lieu of shackles. If turn-buckles are not equipped with lock nuts, they must be wire tied to prevent loosening. Items "E" and "F" should be applied crosswise from tank to railcar.
F	4	Wire rope, 5/8 inch, 6 x 19 IWRC, form complete loop from lower end of turnbuckle through stake pocket of railcar. Fasten wire rope with four 5/8 inch cable clips.
G	4	Thimbles. Apply at base of stake pocket for each Item "F".

GENERAL INSTRUCTIONS

1. Load two tanks on DODX 100-ton heavy duty flatcar. Tank No. 1 should be positioned sothat hub of the lead road wheel is approximately 72 inches from end of car. Place front chock blocks in position and nail in place using eight 0-D nails. Run tank up on front chock blocks and then position and nail rear chock blocks. Release brakes on tank and allow tank to settle in place.
2. Position tank No. 2 on car so that gun barrel of tank No. 1 is no closer than 4 inches to front of tank No. 2. Position and secure blocks in same manner as outlined above. Gun barrel of tank No. 2 should overhang end sill of car approximately 12 inches when properly placed.
3. General Rule 8 (c), Section 1, applies to overhang of gun barrel beyond end sill of car.
4. On 10’ 6” wide flatcar, the side overhang of the tank should be no greater than 9 inches on either side of the car.
5. Gun barrels must be placed in the tank gun brace and securely fastened. If gun brace is missing or broken, two 3/8 inch wire rope loops must be placed around the gun barrel, securing one loop to each side of the tank. Substitution of wire or banding is prohibited.
6. All nuts on cable clips must be sufficiently tightened so as to crimp wire rope.
7. Tank hand brakes must not be set.

See General Rules 1,2, 3, 4, 5, 7. 8, 9, 11, 15, 19 and 19-A for further details.

Sec. 6-Fig. 81 (Rev.-9-1984)
TANKS AND SIMILAR UNITS OVER 100,000 LBS.-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2	10 in. x 18 in. x 24 ft. Locate, as shown, along each side of car. Secure each to car with at least five 1 in. dia. bolts passed through Items "B" and "C", wood filler in stake pocket, and 1/2 in. x 4 In. x 10 in. plate underneath stake pocket. Not required for units loaded on floor of car.
C	As required.	Metal fillers, length, width and thickness to suit. Locate between Items "B" and top of stake pockets. Not required when units are loaded on floor of car.
D	4	Each to consist of two pieces of 2 in. x 6 in. x 18 in. Locate against Item "B" as shown. Secure lower piece to floor with four 30-D nails, and top piece to one below in like manner. Not required for units loaded on floor of car.
E	2	Blocks, pattern 30. Locate one against each front crawler tread.
F	2	Blocks, pattern 31. Locate one against each rear crawler tread.
G	2 ea. Item "E"	2 in. x 3 in. x 20 in. Locate, as shown, against each side of Items "E" and "F" and secure to and "F". floor or Item "B" with four 20-D nails in each.
H	4	Each to consist of two pieces of 2 in. x 12 in. x 18 in. Locate one against each Item "E" and "F". Secure lower piece to floor or Item "B" with five 30-D nails and top piece to one below in like manner. Substitute, if desired, patterns 81.
J	6	2 in. x 8 in. x 13 in. Locate, as shown, against Items "B" and crawler, one near each end of unit and one at center. Secure each to Item "B" with four 30-D nails, and to Item "K" with three 30-D nails. Not required for units loaded on floor of car, or when patterns 80 are used.
K	3	4 in. x 6 in., length equal to distance between Items "J". Not required for units loaded on floor of car. Substitute, if desired, patterns 80.
L	2	Each to consist of two pieces of 2 in. x 4 in. x 14 ft. Locate against inside of crawler treads. Secure lower piece to floor with 30-D nails spaced about 12 in. apart and top piece to one below in like manner. Required only when units are loaded on floor of car. Substitute,if desired, tread side cleats, Pattern No. 75, Section No. 6. Apply three (3) to the inside of each crawler tread. Locate at ends and center and secure to car floor as specified under Pattern No. 75.
M	3	Each to consist of two pieces of 2 in. x 4 in., length to suit, suitably spaced between Items "L". Secure lower piece to floor with 30-D nails spaced about 12 in. apart and top piece to one below in like manner. Required only when units are loaded on floor of car. Not required when tread side cleats, Pattern No. 75, Section No. 6, are substituted per Item "L".
N	As required.	Each to consist of two pieces of 6 in. x 6 in., length to suit, cut to fit contour of bogie wheels. Locate one piece between Inside and outside wheels of each bogie assembly.
O	1 ea. Item "N".	2 in. x 4 in., length to suit. Locate on top of Item "N", as shown, and secure with four 20-D nails.
P	8	1 1/4 in. dia. rods. Attach to lifting lugs and pass through stake pockets and 1/2 in. x 4 in. x 10 in. plates underneath stake pockets, as shown. Substitute, if desired, 5/8 in. x 6 x 7 steel cable, doubled. Substitute, if desired, 1 1/4 in. diameter rods, 4130 alloy steel with minimum yield strength of 100,000 lbs. psi per rod, attaching two per end to lifting lugs and stake pockets.
Q	2	3/8 in. steel cable, doubled. Locate, as shown, between gun turret and crawler structure.
*R	2 ea. unit.	3/8 in. steel cable, 6x19 IWRC. Apply two 3/8 in. cables in a complete loop securing gun barrel to unit at each side. Not required when unit is equipped with external built-in gun brace: however, if external gun brace is inoperative, cable will be used. Substitution of wire or

banding is not authorized.

*When necessary to extend floor for the application of Items "G" on units loaded on floor of car, use method shown in Figure 1-C, Sec. 1.

Turret gun should be In straightforward position, and turret lock handwheel and elevating mechanism handwheel must be wired to prevent rotation.

When tie-down rods are found slightly loose in transit, they need not be tightened.

Hand brakes must not be set.

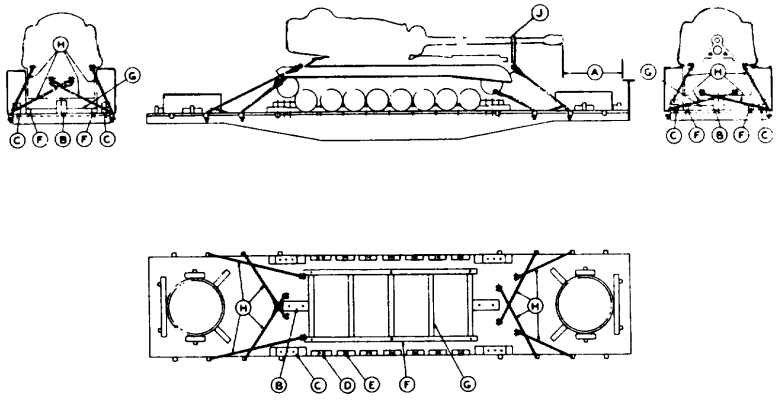
"NOTICE"

*This figure, when applicable, is to be used for the loading of vehicles being shipped under the provisions of ICC Special Permit No. 3498 during a National Emergency when the gross weight for each loaded vehicle is in excess of 100,000 pounds.

See General Rules 4, 5, 7, 9, 11, 14, 15, 19 and 19-A for further details.

Sec. 6-Fig. 82 (Rev.-9-1984)

TANKS AND SIMILAR UNITS OVER 100,000 LBS.-CRAWLERS REMOVED--FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2	12 1/4 in. x 16 1/2 in. · 33 in. Locate longitudinally at each end and under center of tank. Secure each to floor with two 3/4 in. dia. bolts.
C	4	Blocks, pattern 70. Locate at each corner of tank against outside bogie wheel. Secure each to floor with three 3/4 in. dia. bolts.
D	2	Blocks, pattern 71. Locate between the two front bogie wheels on each side. Secure each to floor with two 3/4 in. dia. bolts.
E	12	Blocks, pattern 72. Locate between all remaining bogie wheels on each side. Secure each to floor with one 5/8 in. dia. bolt.
F	2	6 in. x 6 in. guide rails, located against inside of bogie wheels, of sufficient length to contact all wheels, secured to floor with three 5/8 in. dia. bolts.
G	5	6 in. x 6 in. cross braces between guide rails equally spaced, securely nailed to floor.
H	2	1 1/2 in. dia. rods. Locate on each side of rear of tank at upper eye and pass forward to stake pocket on same side of car. Secure at upper eye with clevis and pin, and at bottom of stake pocket through a 1/2 in. x 4 in. x 10 in. plate.
	2	1 1/2 in. dia. rods. Locate on each side of rear of tank at lower eye, cross to nearest stake pocket on opposite side of car. Secure at lower eye with clevis and pin, and at bottom of stake pocket through 1/2 in. x 4 in. x 10 in. plate.
	2	1 1/2 in. dia. rods. Locate on each side of front of tank at lifting lug and pass forward to stake pocket on same side of car. Secure to lifting lug with clevis and pin, and at bottom of stake pocket through 1/2 in. x 4 in. x 10 in. plate.
	2	1 1/2 in. dia. rods. Locate on each side of front of tank at cable hook, cross to nearest stake pocket on opposite side of car. Secure at cable hook with ring permanently attached to tie rod, and at bottom of stake pocket through a 1/2 in. x 4 in. x 10 in. plate.
J	2 ea. unit.	3/8 in. steel cable, 6x19 IWRC. Apply two 3/8 in. cables in a complete loop securing gun barrel to unit at each side. Not required when unit is equipped with external built-in gun brace; however, if external gun brace is inoperative, cable will be used. Substitution of wire or banding is not authorized.

When necessary to elevate tanks to comply with "Railway Line Clearances" or to permit the application of Items "B", "C", "D" and "E", longitudinal timbers of suitable length, width and thickness may be applied underneath units secured as shown in Figure 81.

Longitudinal center line of tank must be directly over longitudinal center line of car.

Tank must be jacked 2 in. for application of Items "B".

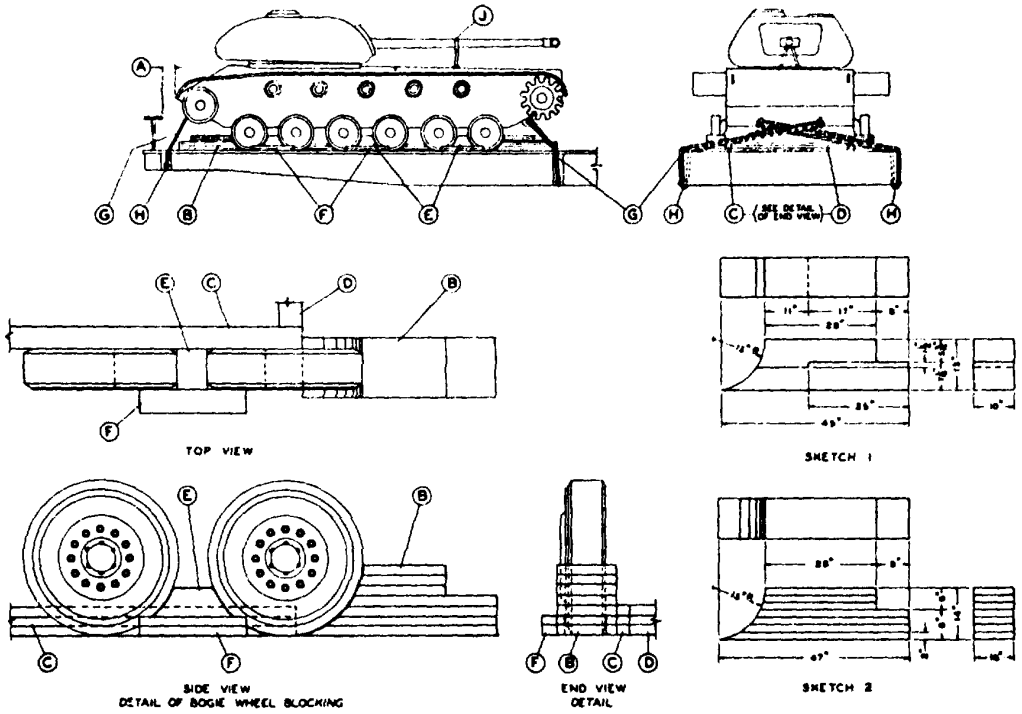
Turret gun should be in straight forward position and turret lock handwheel and elevating mechanism handwheel must be wired to prevent rotating.

Detached parts, (including crawlers), must be secured in such a manner as to prevent their movement on car in transit.

See General Rules 4, 5, 7, 9, 11, 14, 15, 19 and 19-A for further details.

Sec. 6-Fig. 82-A (Rev.-9-1984)

TANKS AND SIMILAR UNITS UNDER 100,000 LBS.-CRAWLERS REMOVED-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2 Sec. 1.
B	4 ea. unit.	Block, Sketch 1. Locate against end bogie wheels and secure each to floor with three 5/8 inch diameter bolts. Substitute, if desired, fabricated blocks of 2 in. x 10 in. lumber. Each block to consist of seven pieces. Four pieces 47 inches long and three pieces 28 Inches long, see Sketch 2. Nail the first piece, 47 inches long, to car floor with eight 30-D nails and the three succeeding pieces to one below in like manner. Nail the three 28 in. long to the 47 in. long pieces with six 30-D nails to each piece.
C	2 ea. unit.	Each to consist of three pieces of 2 in. x 8 in. x 14 ft. Locate against inside of bogie wheels and secure to floor with twelve 30-D nails and succeeding pieces to one below in a like manner.
D	3 ea. unit.	Each to consist of three pieces of 2 in. x 6 in. long enough to fill space between Items "C". Locate in line with end bogie wheels and one near the center. Secure lower piece to floor with 30-D nails spaced 8 inches apart and the succeeding pieces to one below in a like manner.
E	6 ea. unit.	Block, pattern 71. Locate three on each side between bogie wheels, as shown.
F	6 ea. unit.	Each to consist of two 2 in. x 4 in. x 18 in. lumber. Locate against Items "E" and secure lower piece to floor with three 20-D nails and top piece to one below in a like manner.
G	4 ea. unit.	5/8 inch steel cable, 6 x 19, flexible independent wire rope core. Cable to form a complete loop front stake pockets on car through lifting lugs on tank and buck to the stake pocket. Secure each cable with three 5/8 inch cable clips.
H	1 ea. Item "G".	5/8 inch thimble. Locate at stake pocket and secure to Item "G" with one 5/8 inch cable clip.
J	2 ea. unit.	3/8 in. steel cable, 8x19 IWRC. Apply two 3/8 in. cables In a complete loop securing gun barrel to unit at each side. Not required when unit is equipped with external built-in gun brace: however, if external gun brace is inoperative, cable will be used. Substitution of wire or banding is not authorized.

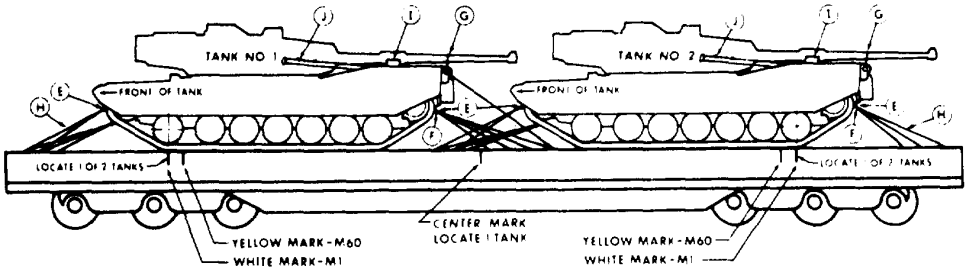
Turret gun should be In straight forward position and turret lock handwheel and elevating mechanism handwheel must be wired to prevent rotating.

Hand brakes must not be set.

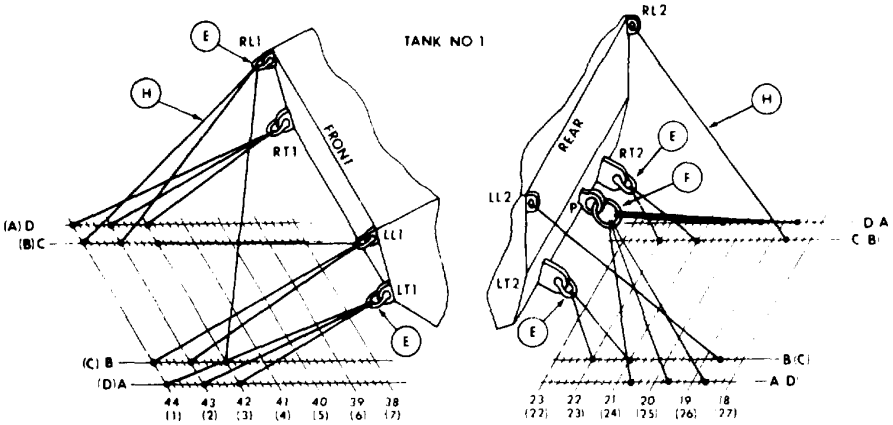
See General Rules 3, 4, 5, 7, 9, 14, 15, 19 and 19A for further details.

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SEC. 6 - FIG. 83
TANKS AND SIMILAR UNITS OVER 100,000 LBS
DODX 140-TON FLAT CARS WITH CHAIN TIE-DOWN ASSEMBLIES

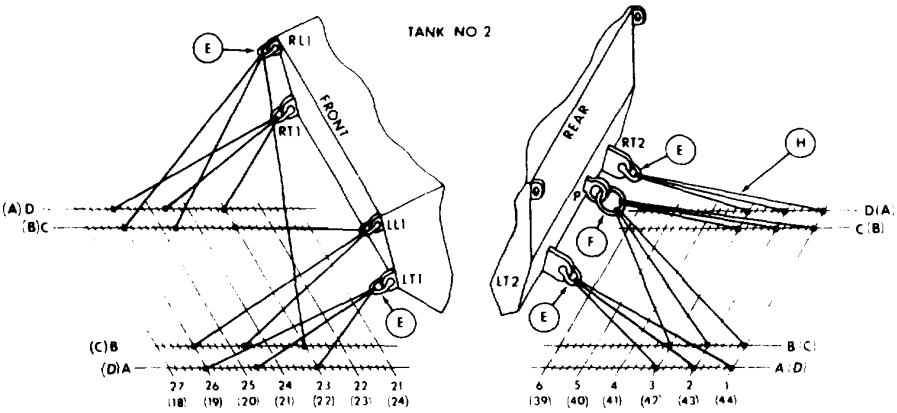


TWO M-1 TANKS



CHAIN ATTACHMENT POINTS FRONT OF TANK					
TANK	CAR DECK		TANK	CAR DECK	
LT1	A-42	(D-3)	RT1	D-42	(A-3)
LT1	A-43	(D-2)	RT1	D-43	(A-2)
LT1	A-44	(D-1)	RT1	D-44	(A-1)
LL1	C-42	(B-3)	RL1	B-42	(C-3)
LL1	B-43	(C-2)	RL1	C-43	(B-2)
LL1	B-44	(C-1)	RL1	C-44	(B-1)

CHAIN ATTACHMENT POINTS REAR OF TANK					
TANK	CAR DECK		TANK	CAR DECK	
LT2	B-22	(C-23)	RT2	C-22	(B-23)
LT2	B-21	(C-24)	RT2	C-21	(B-24)
LL2	B-18 3/5	(C-26 2/5)	RL2	C-18 3/5	(B-26 2/5)
P	A-20 3/5	(D-24 2/5)	P	D-20 3/5	(A-24 2/5)
P	A-19 3/5	(D-25 2/5)	P	D-19 3/5	(A-25 2/5)
P	A-18 3/5	(D-26 2/5)	P	D-18 3/5	(A-26 2/5)



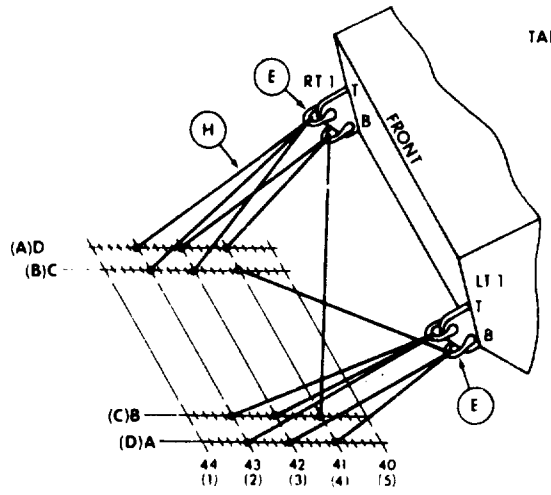
CHAIN ATTACHMENT POINTS FRONT OF TANK					
TANK	CAR DECK		TANK	CAR DECK	
LT1	A-23	(D-22)	RT1	D-23	(A-22)
LT1	A-24 3/5	(D-20 2/5)	RT1	D-24 3/5	(A-20 2/5)
LT1	A-26	(D-19)	RT1	D-26	(A-19)
LL1	C-23	(B-22)	RL1	B-23	(C-22)
LL1	B-24 3/5	(C-20 2/5)	RL1	C-24 3/5	(B-20 2/5)
LL1	B-26	(C-19)	RL1	C-26	(B-19)

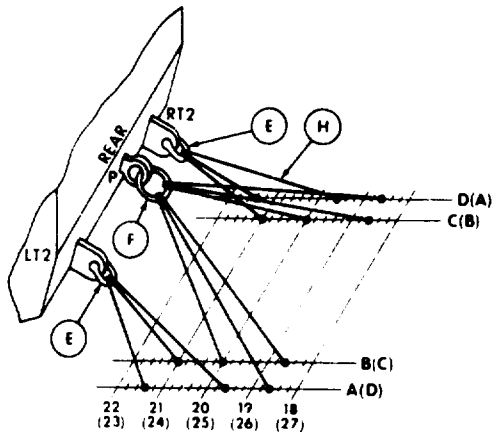
CHAIN ATTACHMENT POINTS REAR OF TANK					
TANK	CAR DECK		TANK	CAR DECK	
LT2	A-3	(D-42)	RT2	D-3	(A-42)
LT2	A-2	(D-43)	RT2	D-2	(A-43)
LT2	A-1	(D-44)	RT2	D-1	(A-44)
P	B-3	(C-42)	P	C-3	(B-42)
P	B-2	(C-43)	P	C-2	(B-43)
P	B-1	(C-44)	P	C-1	(B-44)

SEC. 6- FIG. 83
TANKS AND SIMILAR UNITS OVER 100,000 LBS.
DODX 140-TON FLAT CARS WITH CHAIN TIE-DOWN ASSEMBLIES

TWO M-60 TANKS

TANK NO 1

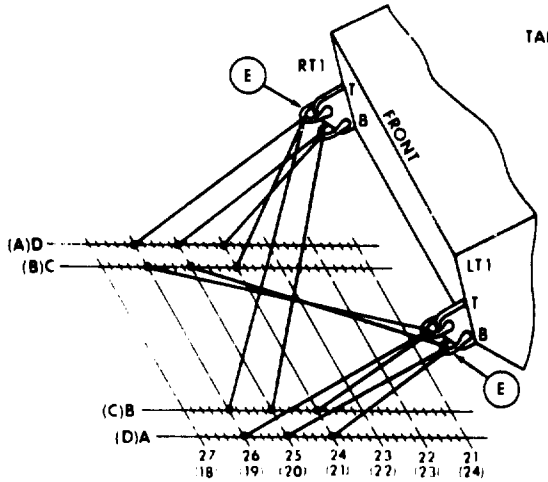


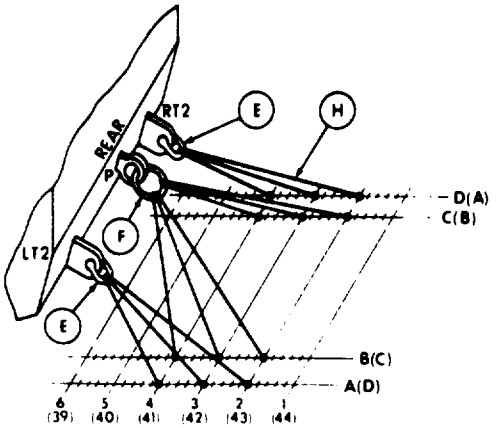


CHAIN ATTACHMENT POINTS FRONT OF TANK					
TANK	CAR DECK		TANK	CAR DECK	
LT1-B	C-41	(B-4)	RT1-B	B-41	(C-4)
LT1-B	A 41	(D 4)	RT1-B	D-41	(A-4)
LT1-B	A 42	(D 3)	RT1 B	D-42	(A-3)
LT1 T	B 42	(C-3)	RT1 T	C-42	(B-3)
LT1 T	B 43	(C 2)	RT1 T	C-43	(B 2)
LT1-T	A 43	(D 2)	RT1-T	D 43	(A-2)

CHAIN ATTACHMENT POINTS REAR OF TANK					
TANK	CAR DECK		TANK	CAR DECK	
LT2	A-21 2/5	(D-23 3/5)	RT2	D-21 2/5	(A-23 3/5)
LT2	A-19 3/5	(D-25 2/5)	RT2	D-19 3/5	(A 25 2/5)
LT2	B 21	(C-24)	RT2	C-21	(B-24)
P	B-20	(C-25)	P	C-20	(C-20)
P	B-18 3/5	(C-26 2/5)	P	C-18 3/5	(B-26 2/5)
P	A-18 3/5	(D-26 2/5)	P	D-18 3/5	(A-26 2/5)

TANK NO 2



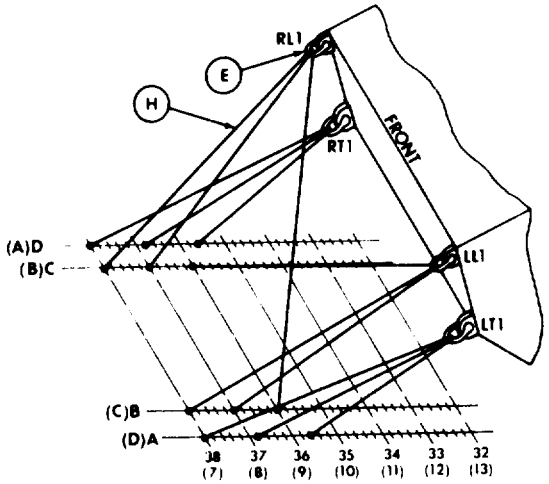


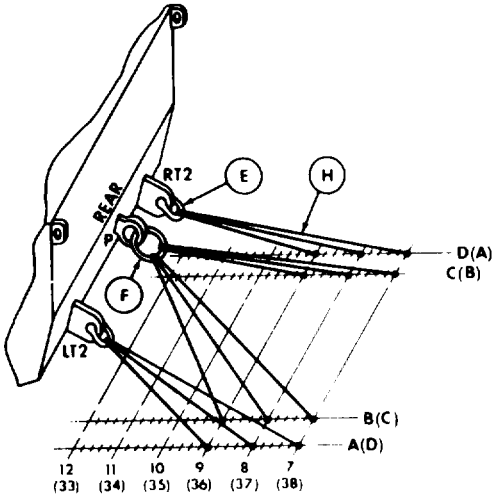
CHAIN ATTACHMENT POINTS FRONT OF TANK					
TANK	CAR DECK		TANK	CAR DECK	
LT1-B	A-24	(D-21)	RT1-B	D-24	(A-21)
LT1-B	A-25	(D-20)	RT1-B	D-25	(A-20)
LT1-B	C-25	(B-20)	RT1-B	B-25	(C-20)
LT1-T	A-26	(D-19)	RT1-T	D-26	(A-19)
LT1-T	B 24	(C-21)	RT1-T	C-24	(B-21)
LT1-T	C-26	(B-19)	RT1-T	B-26	(C-19)

CHAIN ATTACHMENT POINTS REAR OF TANK					
TANK	CAR DECK		TANK	CAR DECK	
LT2	A-4	(D-41)	RT2	D-4	(A-41)
LT2	A-3	(D-42)	RT2	D-3	(A-42)
LT2	A-2	(D-43)	RT2	D-2	(A 43)
P	B-4	(C-41)	P	C 4	(B-41)
P	B-3	(C-42)	P	C 3	(B-42)
P	B-2	(C-43)	P	C 2	(B-43)

SEC. 6 FIG. 83
TANKS AND SIMILAR UNITS OVER 100,000 LBS.
DODX 140-TON FLAT CARS WITH CHAIN TIE-DOWN ASSEMBLIES

ONE M1 TANK

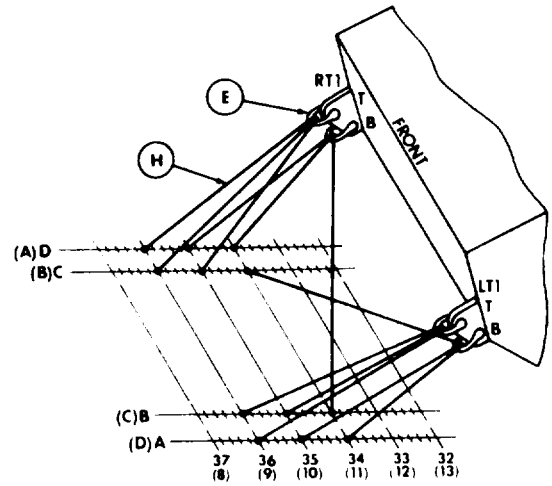


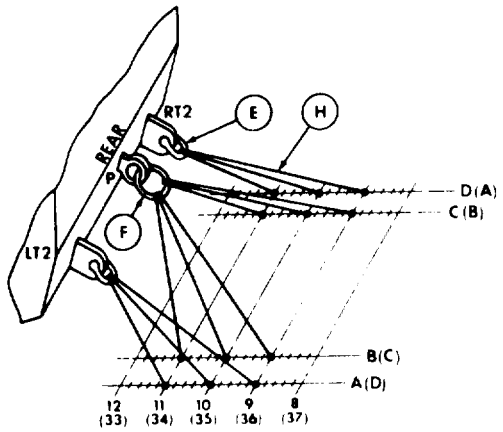


CHAIN ATTACHMENT POINTS FRONT OF TANK					
TANK	CAR DECK		TANK	CAR DECK	
LT1	A-35 3/5	(D-9 2/5)	RT1	D-35 3/5	(A-9 2/5)
LT1	A-36 4/5	(D-8 1/5)	RT1	D-36 4/5	(A-8 1/5)
LT1	A-38	(D-7)	RT1	D-38	(A-7)
LL1	C-36	(B-9)	RL1	B-36	(C-9)
LL1	B-37	(C-8)	RL1	C-37	(B-8)
LL1	B-38	(C-7)	RL1	C-38	(B-7)

CHAIN ATTACHMENT POINTS REAR OF TANK					
TANK	CAR DECK		TANK	CAR DECK	
LT2	A-9	(D-36)	RT2	D-9	(A-36)
LT2	A-8	(D-37)	RT2	D-8	(A-37)
LT2	A-7	(D-38)	RT2	D-7	(A-38)
P	B-9	(C-36)	P	C-9	(B-36)
P	B-8	(C-37)	P	C-8	(B-37)
P	B-7	(C-38)	P	C-7	(B-38)

ONE M-60 TANK





CHAIN ATTACHMENT POINTS FRONT OF TANK					
TANK	CAR DECK		TANK	CAR DECK	
LT1-B	C-34	(B-11)	RT1-B	B-34	(C-11)
LT1-B	A-34	(D-11)	RT1-B	D-34	(A-11)
LT1-B	A-35	(D-10)	RT1-B	D-35	(A-10)
LT1-T	B-35	(C-10)	RT1-T	C-35	(B-10)
LT1-T	B-36	(C-9)	RT1-T	C-36	(B-9)
LT1-T	A-36	(D-9)	RT1-T	D-36	(A-9)

CHAIN ATTACHMENT POINTS REAR OF TANK					
TANK	CAR DECK		TANK	CAR DECK	
LT2	A-11	(D-34)	RT2	D-11	(A-34)
LT2	A-10	(D-35)	RT2	D-10	(A-35)
LT2	A-9	(D-36)	RT2	D-9	(A-36)
P	B-11	(C-34)	P	C-11	(B-34)
P	B-10	(C-35)	P	C-10	(B-35)
P	B-9	(C-36)	P	C-9	(B-36)

Sec. 6-Fig. 83
TANKS AND SIMILAR UNITS OVER 100,000 POUNDS-DODX 140-TON FLAT CARS WITH CHAIN TIEDOWN ASSEMBLIES

Item	No. of Pcs.	Description
A		Brake wheel clearance, see General Instruction 1.
B through D		Intentionally not used.
E	6 per tank	Shackles, heat treated to 170.000 lbs. minimum breaking strength, 1-1/2 in. alloy steel, screw-pin anchor shackle (has 1-3/8 in. pin). *M1 Tank*, attach one shackle to each front tow lug and one shackle to the smaller hole in each lifting eye bracket. At rear of tank, attach one shackle to each tow lug. *M60 tank*, attach one shackle to both the upper and lower holes in each front tow lug. (Lifting eyes are not used.) At rear of tank, attach one shackle to each tow lug.
F	1 per tank	Link, 300,000 lbs, breaking strength, 1-3/4 in. alloy steel, 7 in. inside diameter, Attach to towing pintle at rear of tank.
G	2 per tank	Wire rope, 3/8-inch, 6x19 IWRC. Wrap gun tube with protective material in area between rear lifting eyes. Apply wire rope in two complete loops, one around the gun tube to left rear lifting eye, the other around the gun tube to right rear lifting eye. Tension the cable only enough to take slack out, and secure each loop with two 3/8-inch cable clips. (Not required if tank has operable external gun tube brace.)
H	24 per tank	Single chain tie-down assembly with 1/2 in. diameter special alloy steel chain, proof tested to 27,500 lbs. (13,700 lbs. working load limit). Apply chains between vehicle tie-down fittings and anchor locations identified on the deck of the car, as shown in the loading figure (see chain attachment points).
I	1 per tank	Saddle block. Fabricate gun tube rest from 6- x 6-inch lumber, contoured to fit tube, with metal banding over the tube and nailed to block. Not required when tank has an external travel lock (gun brace) or when gun tube is not installed in normal position on turret.
J	2 per tank	Wire rope, 3/8-inch, 6x19 IWRC. If gun tube is not installed in the turret, secure turret to hull with 3/8-inch wire rope to prevent turret rotation and secure each loop with two 3/8-inch cable clips.

GENERAL INSTRUCTIONS

1. The car is equipped with a hand brake lever at lower edge of side sill. Lading on car deck will not interfere with brake lever operation.
2. The shackles (item "E") and the link (item "F") are furnished as a part of the chain tie-down system on the railcar.
3. The loading figure (see chain attachment points) illustrates tie-down arrangements for one or two M1 or M60 tanks, but other tanks and similar tracked vehicles may be loaded. When loading other such units, the number and location of chain securements may vary from the arrangement shown, depending on the size and weight of the vehicle and location of the tie-down fittings. The originating carrier must approve the load before shipments are made.
4. When tanks are loaded facing in the opposite direction from that on the loading figures (see chain attachment points), the tie-down pattern will remain as shown but the numbered chain anchor location and channel letter would be transposed as shown in parenthesis "( )".
5. Vehicle brakes must not be set and transmission shall be in neutral.
6. Turret gun must be in the aft travel position and secured in a travel lock or with wire rope, item "G" For the M1 tank, the turret gun is lowered into a saddle block, item "I". Turret rotation and gun elevating controls must be engaged and wire tied. if feasible, to prevent movement of turret and gun.
7. The vertical painted stripes on the railcar side sills indicate tank placements. Yellow for M60 tank(s), white for M1 tank(s). When two M or M60-series tanks are loaded, the forward left-hand road wheel of tank No. 1 and the rear left-hand road wheel of tank No. 2 are centered over its respective colored stripe. When one M1 or M60-series tank is loaded, align as shown in relation to the center stripe on the side sill. The M60 shall be loaded so that the space between the third and fourth left-hand road wheels is centered over the center stripe on the side sill. Position one M1 tank with its fourth left-hand road wheel centered over the center stripe on the side sill 8. Tighten turnbuckles of front and rear chain tie-downs at the same time to prevent uneven tensioning. Tighten each chain until only 1/8-inch of rubber is visible between the metal rings of the compression unit attached to the turnbuckle. After tensioning, strike chain with a hammer or steel bar with enough force to eliminate any kinks in chain and retighten if necessary. Tighten jam nut against turnbuckle torque 15 to 25 foot pounds.
9. Unused chains must be secured to the deck or stowed in channels. See General Rules 4, 5, 7, 11, and 15(G) for further details.

Section No. 6

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Sec. 6
MAJOR CALIBRE GUN BARRELS
GENERAL INSTRUCTIONS

Cars used for transporting gun barrels must conform to the requirements of General Rule 21.

As shipments will in most cases require a minimum of two cars, the cars should be equipped as follows:

Each car should be fitted with a pivoted bolster In the center of the car. The bolster on one car should have a Fixed Center Plate, while the bolster on the other car should have a Movable Center Plate, see Fig. 5. The bolsters, if the property of a railroad, must accompany the cars in both the loaded and empty movement of the cars. Each end of each bolster should be equipped with permanent turnbuckle.

When cars move empty the bolsters should be securely fastened with the turnbuckle hooked to side stake pocket and made taut-on both sides of car. When cars are loaded, these turnbuckles must be unhooked and slid into the ends of the bolsters.

The shippers must provide themselves with blocks, securements and fastenings as shown In Figs. 84, 85 and 86 for shipments of 16 in. gun barrels.

For the shipment of other size gun barrels the same method of securement must be used and the details of same submitted to the originating carrier for approval before shipments are made.

Unless other arrangements are made locally, detail blocks securements and fastenings furnished by shipper, which are not a part of the equipment attached to the car or cars, should be returned to the point of origin, under revenue billing, after the gun barrel has been unloaded; on cars if they are to return to the point of origin, and In other equipment if the cars do not return to the point of origin. Method of securing gun barrel equipment after gun barrel has been unloaded is shown in Figure 86.

METHOD OF LOADING

Remove both turnbuckle hooks from each side of bolsters and slide them into ends of bolsters.

Place the "Movable Center Plate" flush with the edge of the bolster so that center plate is in the dead center of the bolster. (This is important to provide for necessary slack action in the cars.)

The breech end of the gun barrel must be placed on the bolster with the "Fixed Center Plate" and must always lead in the direction the car is moving.

The gun barrel must be so placed on both bolsters that the center of gravity of the barrel Is directly over the center line of car coupling, so that each car will carry approximately one-half the weight of the gun barrel.

Clamping blocks over gun barrel at each bolster must be placed through rods and drawn down tight to firmly secure barrel.

Center Clamp, Item "M", must be placed around gun barrel in position indicated on print over burlap and nuts on front and back rods drawn up tight.

Breech end of gun barrel must be covered with canvas and held in place by band, Item "N", and breech block, Item "O".

Nuts on rods through breech block, Item "O", and breech block plate, Item "P", must be tightened simultaneously so that the bolster is square with car when the rods are securely tightened.

Muzzle end of gun barrel must be covered with canvas held in place by band, Item "Q", and muzzle block, Item "R".

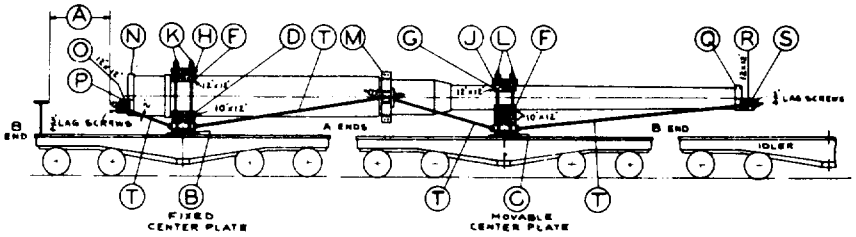
Tighten the nuts on the rods at muzzle block sufficient to take up slack, then move the cars forward and backward, measuring the distance the "Movable Center Plate" moves past the bolster edge on each side, add them together-divide by two, then set the bolster in this center of the "Movable Center Plate" and tighten up the muzzle rod nuts simultaneously so that the bolster is square with the car when the rods are securely tightened.

All rods must be double nutted.

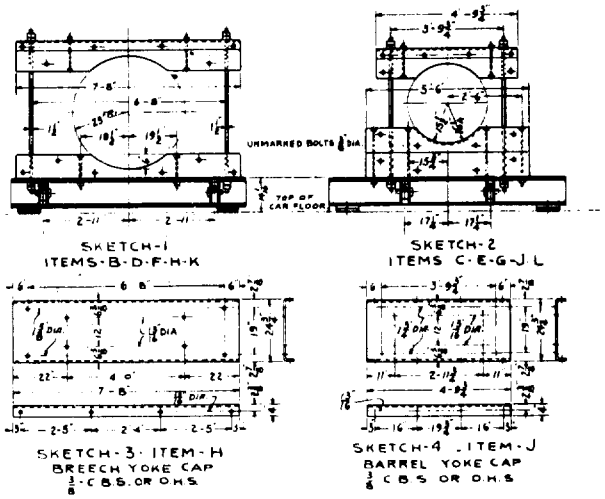
If necessary on account of length, to protect muzzle end of gun barrel, a fiat car of the required length should be used as an idler.

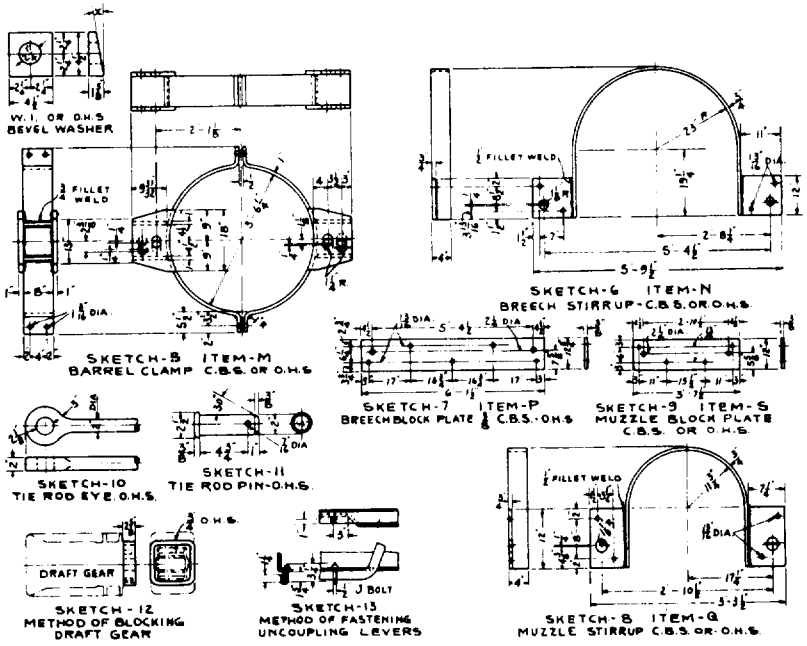
Cars carrying major calibre gun barrels should be placed on the head end of a train to avoid slack action and should move at a speed not to exceed 30 miles per hour with the end of the barrel always leading in the direction the train is moving while in road movement.

Sec. 6-Fig. 84
GUN BARRELS, 16 IN. 45 CALIBRE-FLAT CARS



DETAILS





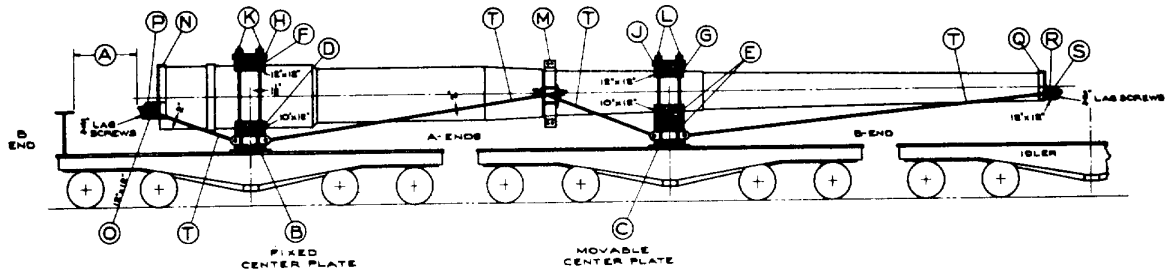
GUN BARRELS, 16 IN. 45 CALIBRE-FLAT CARS

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2 .
B	1	Fixed center plate and bolster. See Sketch 1.
C	1	Movable center plate and bolster. See Sketch 2.
D	2	Cradle, breech end. See Sketch 1.
E	4	Cradle, barrel end. See Sketch 2.
F	2	Timber clamp, breech end. See Sketch 1.
G	2	Timber clamp, barrel end. See Sketch 2.
H	1	Yoke cap, breech end. See Sketches I and 3.
J	1	Yoke cap, barrel end. See Sketches 2 and 4.
K	4	Timber clamp bolts, breech end. See Sketch 1.
L	4	Timber clamp, bolts, barrel end. See Sketch 2.
M	1	Clamp, barrel. See Sketch 5.
N	1	Stirrup, breech end. See Sketch 6.
O	1	Stirrup block, breech end.
P	1	Block plate, breech end. See Sketch 7.
Q	1	Stirrup, muzzle end. See Sketch 8.
R	1	Stirrup block, muzzle end.
S	1	Block plate, muzzle end. See Sketch 9.
T	8	Tie rods. See Sketches 10 and 11.

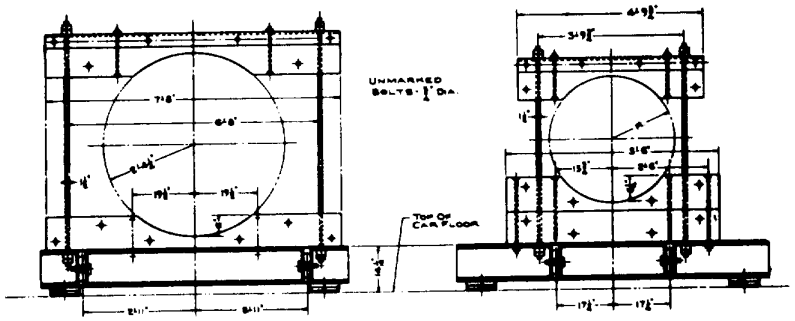
At A ends of cars, draft gears must be blocked and made inoperative, see Sketch 12 or Fig. 3. Uncoupling levers must be securely fastened to prevent operation of same in transit, see Sketch 13 or Fig. 4.

See General Rules 4, 5, 6, 7, 8, 9, 12, 15, 16 and 21 for further details.

GUN BARRELS, 16 IN. 50 CALIBRE-FLAT CARS

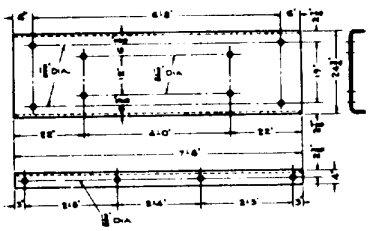


DETAILS

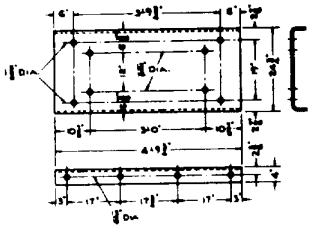


SKETCH-1 ITEMS-B-D-H-F-K

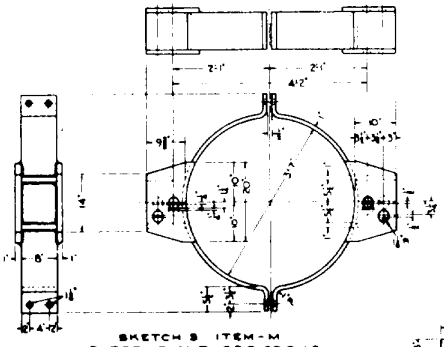
SKETCH-2 ITEMS C-E-G-L



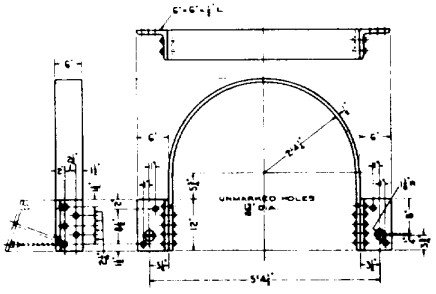
SKETCH-3 ITEM-H
BREECH YOKE CAP
1" C.B.S. OR O.H.S.



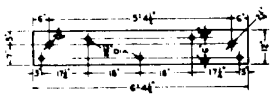
SKETCH-4 ITEM-J
BARREL YOKE CAP
1" C.B.S. OR O.H.S.
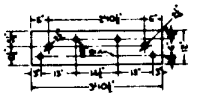


SKETCH-5 ITEM-M
BARREL CLAMP-C.B.S. OR O.H.S.



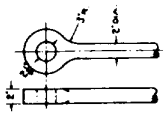
SKETCH-6 ITEM-N
BREECH STIRRUP-C.B.S. OR O.H.S.



SKETCH-7 ITEM-P
BREECH BLOCK PLATE
1" C.B.S. OR O.H.S.



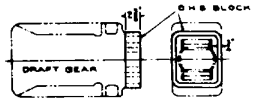
SKETCH-9 ITEM-R
MUZZLE BLOCK PLATE
1" C.B.S. OR O.H.S.



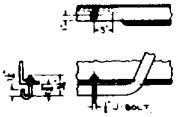
SKETCH-10
TIE ROD EYE-O.H.S.



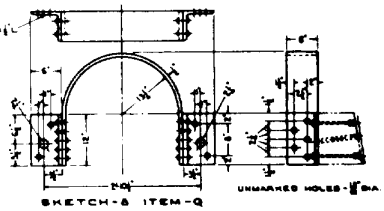
SKETCH-11
TIE ROD PIN-O.H.S.



SKETCH-12
METHOD OF BLOCKING
DRAFT GEAR



SKETCH-13
METHOD OF FASTENING
UNCOUPLING LEVERS



SKETCH-8 ITEM-Q
MUZZLE STIRRUP-C.B.S. OR O.H.S.

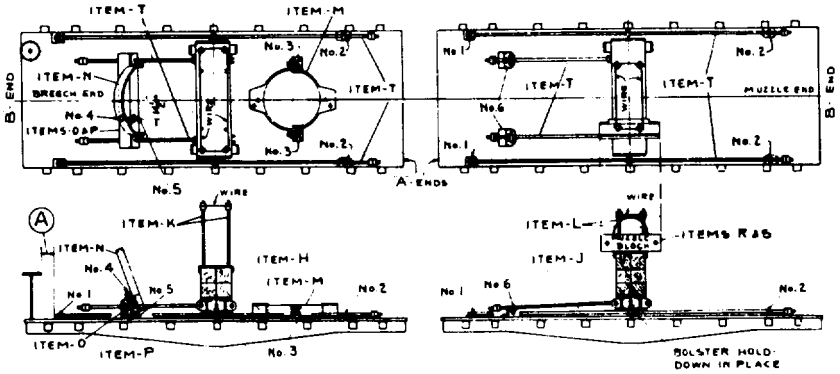
GUN BARRELS, 16 IN. 50 CALIBRE-FLAT CARS

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	1	Fixed center plate and bolster. See Sketch 1.
C	1	Movable center plate and bolster. See Sketch 2.
D	2	Cradle, breech end. See Sketch 1.
E	4	Cradle, barrel end. See Sketch 2.
F	2	Timber clamp, breech end. See Sketch 1.
G	2	Timber clamp, barrel end. See Sketch 2.
H	1	Yoke cap, breech end. See Sketches 1 and 3.
J	1	Yoke cap, barrel end. See Sketches 2 and 4.
K	4	Timber clamp bolts, breech end. See Sketch 1.
L	4	Timber clamp bolts, barrel end. See Sketch 2.
M	1	Clamp, barrel. See Sketch 5.
N	1	Stirrup, breech end. See Sketch 6.
O	1	Stirrup block, breech end.
P	1	Block plate, breech end. See Sketch 7.
Q	1	Stirrup, muzzle end. See Sketch 8.
R	1	Stirrup block, muzzle end.
S	1	Block plate muzzle end. See Sketch 9.
T	8	Tie rods. See Sketches 10 and 11.

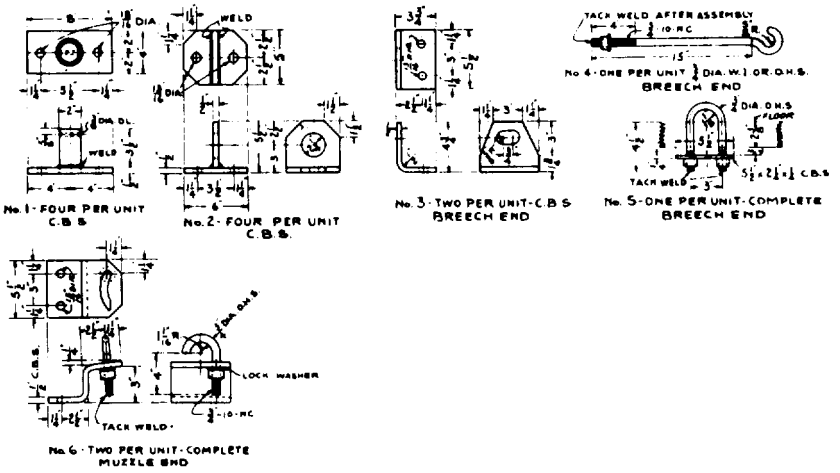
At A ends of cars, draft gears must be blocked and made inoperative, see Sketch 12 or Fig. 8. Uncoupling levers must be securely fastened to prevent operation of same in transit, see Sketch 13 or Fig. 4.

See General Rules 4, 5, 6, 7, 8, 9, 12, 15, 16 and 21 for further details.

METHOD OF SECURING GUN BARREL EQUIPMENT AFTER GUN BARREL HAS BEEN UNLOADED



DETAILS



The two carrying cars equipped with steel bolsters must remain coupled together. The steel bolster must always remain with its assigned car.

The bolsters must be securely fastened with turnbuckles, hooked to side stake pockets and made taut on both sides of car.

Unless otherwise provided for by special instructions, the shipper's securement and fastenings removed from the gun barrel should be returned with the cars to the shipper, secured to the cars as shown in Figure 86.

Place the breech block and plate, Items "0" and "P", and the band, Item "N" on floor, so that hook, No. 4 may be engaged with U-bolt No. 5 in floor and tighten nut on No. 4, clamping breech block, plate and band to floor.

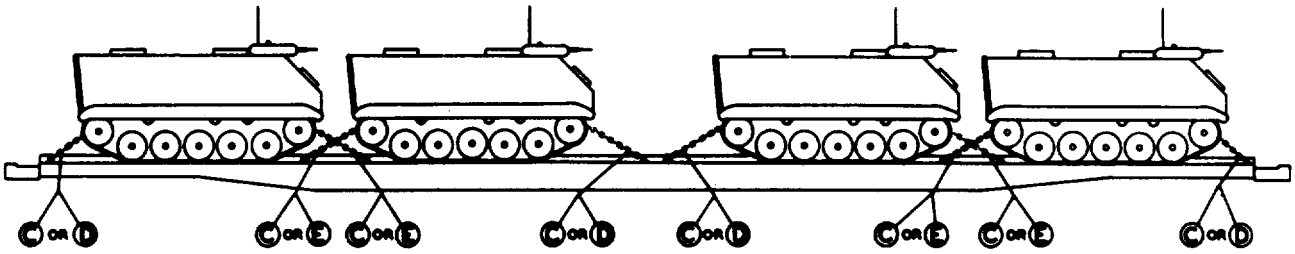
Place the center clamp, Item "M", on the floor of the fixed center plate bolster car, using clamping bolts in clamp, for securing clamp to anchors No. 3 on floor of car.

Place the fixed center plate bolster to center clamp rods, Item "T", and the movable center plate bolster to muzzle rods, Item "T", on floor each side of cars. The threaded end through hole in No. 2, and the eye over No. 1 secured with 3/8 in. x 3 in cotter pins in No. 1. The nuts then to be jammed together.

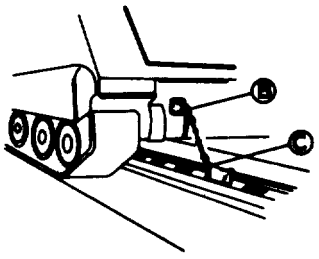
Place the rods from the center clamp to movable center plate bolster, Items "T", in J-bolt clamp, No. 6 on floor and tighten nuts on J-bolts, clamping the rods, and jam)the nuts on rods together.

Top bolster blocks to be placed on bottom blocks, and muzzle end blocks, plate and band, Items "Q", "R" and "S", to be placed on top of top bolster block on movable center plate bolster over the clamp rods, Items "L", on left side of car, and wire clamp rods, Items "K" and "L", (both bolsters) with sufficient tension to hold them taut. The nuts on clamp rods to be jammed with the wire between them.

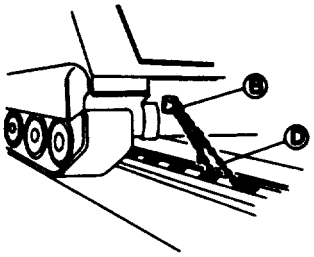
CARRIER, PERSONNEL, M113, OR SIMILAR TYPE VEHICLES, ON G-85 OR G-89 FLAT CARS EQUIPPED WITH CUSHIONED RUB-RAIL OR SIMILAR RAILROAD FLAT CARS



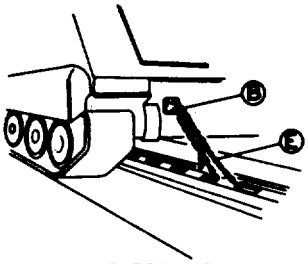
SIDE VIEW



SKETCH - 1
DETAIL OF TIE-DOWN DEVICE IN CUSHIONED RUB RAIL



SKETCH - 2
DETAIL OF CHAIN WITH TURN BUCKLE THRU CUSHIONED RUB RAIL SLOTS



SKETCH - 3
DETAIL OF CHAIN THRU CUSHIONED RUB RAIL SLOTS

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. unit.	Shackles. For vehicles having a 1 in. dia. hole in the towing bracket, use a 1 in. dia. pin with a 7/8 in. steel, galvanized coated anchor shackle. For vehicles having a larger hole in the towing bracket, use an appropriate size pin and shackle. Attach the shackle to the towing bracket and secure the pin with a cotter key.
C	4 ea. unit.	Brandon single chain tie-down device with 1/2 in, dia. Excelloy chain, or similar, proof-tested at 27,500 lbs. Attach to the vehicle tie-down bracket and to the rub-rail of the car as shown in Sketch 1. Substitute, if desired, Item "D" and "E" in lieu of Item "C".
D	2 ea. unit When required.	See Sketch 2. Attach to the vehicle tie-down bracket and to the rub-rail of the car, as shown in Sketch 2. See General Instructions following these, specifications for further details.
E	2 ea. unit when required.	See Sketch 3. Attach to the vehicle tie-down bracket and to the rub-rail of the car as shown in Sketch 3. See General Instructions following these specifications for further details.

General Instructions

(1) Shippers should specify cars equipped with tie-down devices in the quantity shown in Item "C" when ordering specialized railroad freight equipment. In the event conventional chain tie-downs are supplied in lieu of the tie-down devices specified, they must conform to the requirements of Items "D" and "E" and must be applied in the following manner:

(a) Attach the two chain tie-downs, as shown in Sketch 3, Item "E", to one end of the vehicle and to the car tie-down facility. Pull tight as possible by hand and attach the hook into an appropriately located link in the chain.

(b) Attach the two chain tie-downs with the adjustable turnbuckles, as shown in Sketch 2, Item "D", to the opposite end of the vehicle and to the car tie-down facility. All four chain tie-downs should be made taut by tightening the turnbuckles.

Note.

Load binders are not to be used in lieu of turnbuckles to tension tie-down chains.

CARRIER, PERSONNEL, M113, OR SIMILAR TYPE VEHICLES, ON G-85 OR G-89 FLAT CARS EQUIPPED WITH CUSHIONED RUB-RAIL OR SIMILAR RAILROAD FLAT CARS

(2) Vehicles must face in the same direction and be uniformly spaced along the length of the car to allow sufficient space at each end of the car and between the vehicles for securement. Apply tie-downs parallel to each other at the same end of the vehicle and down from the vehicle point of attachment to the car tie-down facility. The angle of the tie-down must not be greater than 45 degrees.

(3) Hand brakes on vehicles must not be set.

(4) Gear shift levers on tracked vehicles equipped with automatic transmissions, are to be placed in a neutral position. Vehicles equipped with standard transmissions must have the gear shift lever wire-tied in a neutral position.

(5) Open hooks must be secured with wire over the opening to prevent the hook from becoming disengaged from the chain link to which it is secured.

(6) Turnbuckles when used to tighten chains, must be wired or locked to prevent them from turning during transit unless the turnbuckles are equipped with self-locking devices.

(7) Method of loading as shown is applicable to other types of tracked vehicles weighing up to 25,000 lbs. each. The following vehicles in the quantities shown can be loaded on an 85 ft. or longer cushioned rub-rail equipped car or similar railroad flat car with center tie-down positions running the entire length of the car:

Type	Description	No. Per 85 ft. Car	No. Per 89 Ft. Car	Approximate Weight Per Vehicle - Pounds
M113	Carrier, Personnel	4	4	19,755
M114A1	Carrier, Command and Reconnaissance.	4	5	14,122
M106	Mortar, SP, 107MM.	4	4	19,755
M50A1	Rifle, Multiple, 106MM.	5	5	16,705
M577	Carrier, Command Post.	4	4	21,400
M132	Flame Thrower, Self-propelled.	4	4	21,038
XM548	Carrier, Cargo, Full-Track	3	4	15,000

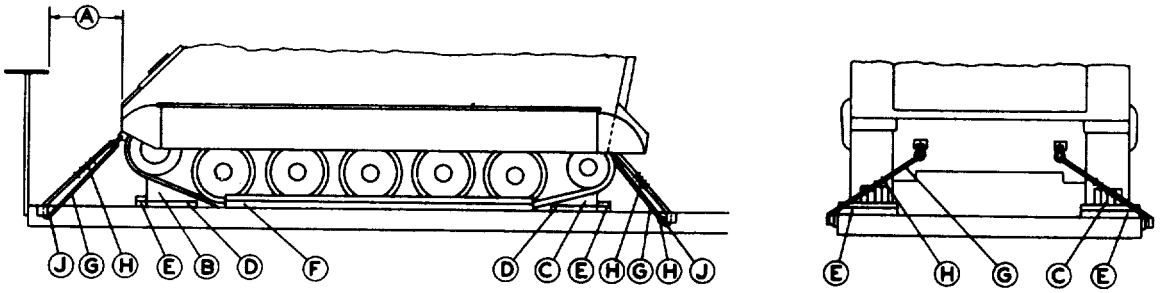
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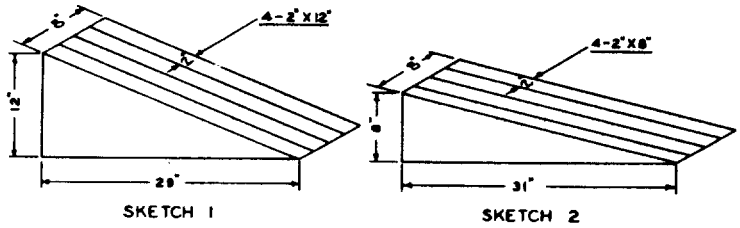
This figure, when applicable, may be used for the loading of vehicles being shipped under the provisions of ICO Special Permit No. 3498 during a National Emergency providing the gross weight per vehicle does not exceed 25,000 pounds. For vehicles having a gross weight exceeding 25,000 pounds each, general purpose flat cars must be utilized and loaded in accordance with Figure 79, Sec. 6.

See General Rules 4, 5, 7 and 19-A for further details.

Sec. 6-Fig. 87-A (New--8-1972)

CARRIER, PERSONNEL, M113 OR SIMILAR TYPE VEHICLES-FLAT CARS





Item	No. of Pcs.	Description
A		Brake wheel clearance. See Figure 2. Section 1.
B	2	Blocks. See Sketch 1. Each block to consist of four pieces of 2 in. x 12 in. x 29 in. lumber cut as shown in sketch. Nail the two Inside pieces together with three 12-D nails through each opposite side. Nail the two outside pieces to the inside pieces with four 12-D nails on each side. Locate each block against the front of each track as shown. Toe-nail the heel of each block through the two inside pieces to the car floor with two 30-D nails. Toenail each side of the block to the car floor with two 40-D nails.
C	2	Blocks. See Sketch 2. Each block to consist of four pieces of lumber 2 in. x 8 in. x 31 in. cut as shown in sketch. Construct and apply (to rear tracks) in same manner as Item B, above.
D	8	2 in. x 4 in. x 24 in. lumber. Locate one on each side of blocks B and C (flush with heel of block) and nail to car floor with four 20-D nails.
E	4	Each to consist of two pieces of 2 in. x 6 in. x 14 in. lumber. Center bottom pieces crosswise against heel of blocks B and C and nail to the car floor with four 30-D nails. Nail top piece to one below In like manner.
F	2	Each to consist of two pieces of 2 in. x 4 in. x 102 in. lumber. Locate the bottom pieces longitudinally against the outside of each track and nail to the car floor with 30-D nails spaced approximately every eight inches. Nail top pieces to lower pieces in like manner.
G	4	Steel wire rope, /2 in. 6x 19, IWRC. Cable is to form a complete loop from stake pockets through tie-down points on vehicles and back to stake pockets. Ends of cable should over-lap a minimum of 16 in. and be fastened with four M in. cable clips spaced approximately three inches apart. The angle of tie-down must not be greater than 45 degrees.
H	20	Cable clips. Apply as indicated in Item G and Item J.
J	4	Thimbles. Standard size M inch. Locate at each stake pocket and secure to Item G with one M inch cable clip.

CARRIER, PERSONNEL, M113 OR SIMILAR TYPE VEHICLES-FLAT CARS

GENERAL INSTRUCTIONS

1. Load, as shown, is based on a flat car with a minimum width of 9 ft. 2 in.

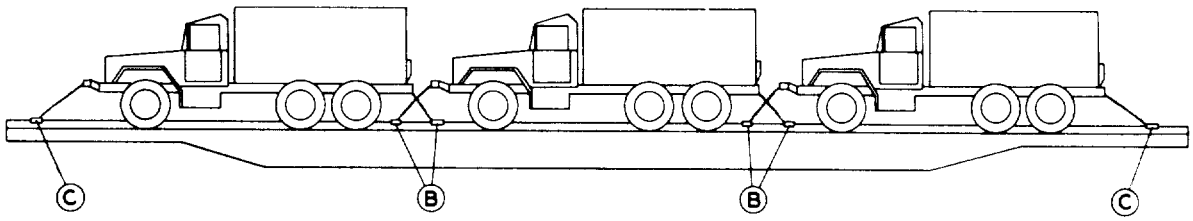
2. Hand brakes must not be set.

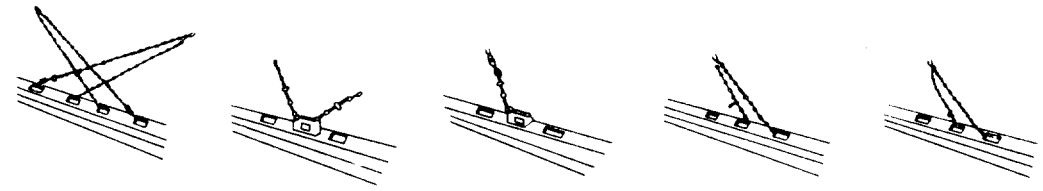
3. Method of loading is applicable to the following vehicles:

M113	M114	M106	M125	M577	M132	XM163
M113A1	M114A1	M106A1	M125A1	M577A1	M132A1	XM741

4. See General Rules 1, 2, 3, 4, 5, 9, 14, 15, 19-A and 19-C for further details.

TRUCK, 25,000 LBS. OR LESS, WITH OR WITHOUT WINCH, EMPTY, LOADED ON G-85 OR G-89 CUSHIONED RUB-RAIL FLAT CARS OR SIMILAR RAILROAD FLAT CARS.





SKETCH 1 SKETCH 2 SKETCH 3 SKETCH 4 SKETCH 5



FRONT VIEW REAR VIEW

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
		Vehicles over 8500 lbs. to 25,000 lbs. inclusive.
B	As required.	Double chain tie-down device with 1/2 inch dia. Excelloy chain or similar, proof tested to 27,500 lbs. Locate between the vehicles. Attach one chain through each of the front tie-down shackles of one vehicle and the other chains through each of the tie-down shackles located at the rear of the other vehicle. See Sketch #2. Substitute, if necessary, 1/2 inch dia. chain with grab hook and turnbuckle equipped with a safety lock device, proof tested at a minimum of 22,500 lbs. When length of the vehicles does not provide sufficient space to permit application of tie-downs at an angle not to exceed 45 degrees, use conventional chain tie-downs (Sketch 4 and 5) proof tested to a minimum of 22,500 lbs., crossed as shown in Sketch #1. Attach one end of the chain to the rub-rail of the car by looping the chain through the slots in the rub-rail. Attach the other end of the chain to the vehicles in the same manner as described above. Single Brandon tie-down device shown in Sketch #3 (applied in same manner as Sketch #4) may be substituted, if desired. See General Instructions following these specifications for further details.
C	4	Single chain tie-down device with 1/2 inch dia. Excelloy chain or similar, proof tested to a minimum of 27,500 lbs. (Sketch #3). Locate as shown. Attach one chain device through each of the two front tie-down shackles of the first vehicle and through each of the two tie-down shackles located at the rear of the last vehicle. Substitute, if desired, 1/2 inch dia. chain with grab hook and turnbuckle equipped with a safety lock device, proof tested to a minimum of 22,500 lbs. (Sketch #4). Attach one end of the chain through the slots in the rub-rail and the other end of the chain to the vehicles in the same manner as described above. See General Instructions following these specifications for further details.

TRUCK, 25,000 LBS. OR LESS, WITH OR WITHOUT WINCH, EMPTY, LOADED ON G-85 OR G-89 CUSHIONED RUB-RAIL FLAT CARS OR SIMILAR RAILROAD FLAT CARS.

Item	No. of Pcs.	Description
		Vehicles 8500 lbs. or less.
B	As required.	Vehicles weighing 8500 lbs. or less may be secured as outlined above with 3/8 inch dia. Excelloy or comparable chain, proof tested to a minimum of 13,200 lbs.
C	4	Vehicles weighing 8500 lbs. or less may be secured as outlined above with 3/8 inch dia. Excelloy or comparable chain, proof tested to a minimum of 13,200 lbs.

GENERAL INSTRUCTIONS

1. Shippers should specify cars equipped with tie-down devices In the quantity required for Items "B" and "C", see Sketches 2 and 3, when ordering specialized railroad freight equipment. In the event that conventional chain tie-downs are supplied In lieu of devices specified, two of the four tie-downs required for each vehicle must have an adjustable turnbuckle equipped with a safety lock device located in the chain for tensioning purposes. See Sketch 4. The chains must be applied in the following manner.

a. Attach the two chain tie-downs without the turnbuckle (See Sketch 5) to one end of the vehicle and to the car tie-down facility. Pull tight as possible by hand and attach the hook into the appropriate link of the chain.

b. Attach the two chains with the adjustable turnbuckles to the opposite end of the vehicle and to the car tie-down facility. All four chain tie-downs should then be made taut by tightening the turnbuckles.

Note.

Load binders are not to be used in lieu of turnbuckles to tension tie-down chains.

2. Vehicles must face in the same direction and be uniformly spaced along the length of the car to allow sufficient space at each end of the car and between the vehicles for securement. Apply tie-downs parallel to each other at the same end of the vehicle and down from the vehicle point of attachment to the tie-down facility. The angle of tie-down must not be greater than 45 degrees.

3. Tie-downs are not to be secured to axles of vehicles.

4. Hand brakes on vehicles must not be set.

5. Gear shift levers must be wire-tied in the neutral position.

6. Open hooks must be secured with wire over the opening to prevent the hook from becoming disengaged from the chain link to which it is secured.

7. Turnbuckles when used to tighten chains must be wired or locked to prevent them from turning during transit unless the turnbuckles are equipped with self-locking devices.

8. When conventional chains are tensioned, care should be taken to avoid tensioning to such an extent that rub-rail may start to rise. Tie-down devices, when attached to vehicle tie-down shackles, should not be tensioned beyond the point where the springs of the vehicle start to compress. After chains are tightened they should be struck with a hammer or bar to eliminate any possible misalignment of links. Further tightening may be required to take up any slack that develops due to link alignment.

9. Tie-down devices are not to be attached to the slots in the cushioned rub-rail adjacent to the position of the recessed trailer hitches. This is to preclude the flange edge of the device, which rests over the inner side of the car's center sill, from coming in contact with any portion of the trailer hitch when in recessed position and thereby restricting the action of the cushioned rub-rail. When placement of vehicles on cars determines that securement points to the car would fall in this area, conventional chain tie-downs (with or without turnbuckles) attached through the rub-rail slots will be used.

TRUCK, 25,000 LBS. OR LESS, WITH OR WITHOUT WINCH, EMPTY, LOADED ON G-85 OR G-89 CUSHIONED RUB-RAIL FLAT CARS OR SIMILAR RAILROAD FLAT CARS.

10. When vehicles are shipped In a loaded configuration, the gross weight of the vehicle and cargo combined must be determined in order to assure that the proper size and, or number of tie-downs are used to secure the vehicles to the rail car. The "approximate weight" column of the tables below may be used to determine the new restraint requirements imposed by the additional weight of the cargo.

11. Method of loading as shown is applicable to vehicles weighing up to 25,000 lbs. The following vehicles in the quantity shown can be loaded on an 85 ft. or longer cushioned rub-rail equipped car or similar railroad car with center sill tie-down positions running the entire length of the car.

8500 Lbs. and under
3/8" Dia. alloy chain, proof tested to 13,200 pounds

Type	Description	No. per 85-89 Ft. car	Approx. Weight
M56	Chassis, Truck, ¾ ton, 4x4, W/W, WO/W	4	5,450
M37B1	Truck, Cargo ¾ ton, 4x4, W/W, WO/W	4	5,800
M43B1	Truck, Ambulance, ¾ ton	4	6,900
M201	Truck, Maintenance, ¾ ton, 4x4, W/W	4	6,950
M561	Truck, Cargo, 1 ¼ ton, 6x6, W/W, WO/W	4	7,700

8500 lbs. to 25,000 lbs. Incl.
½" dia. alloy chain, proof tested to 22,500 pounds

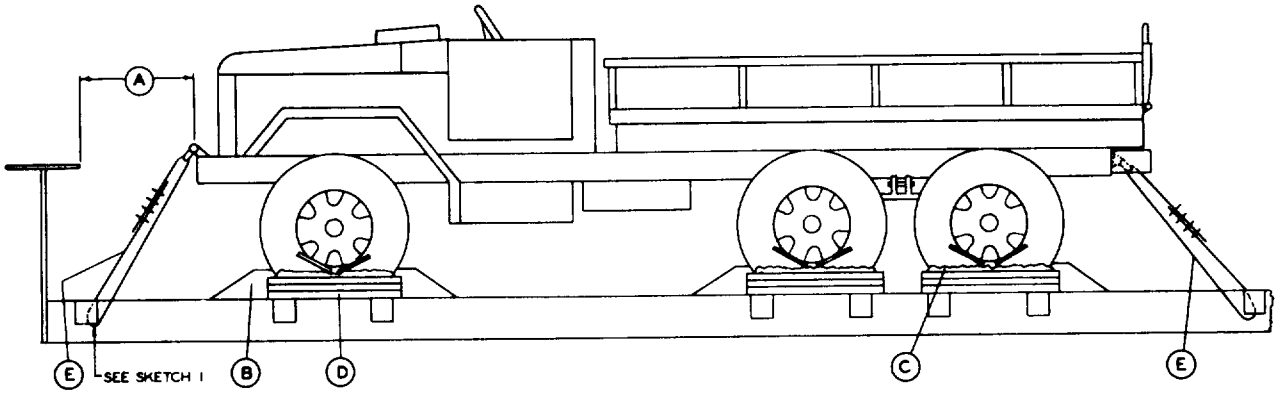
M45	Chassis, Truck, 2 ½ ton, 6x6, W/W	3	10,935
M207	Chassis, Truck, 2 ½ ton, 6x6, W/W, WO/W	3	11,585
M221	Truck, Tractor, 2 ½ ton, 6x6, W/W, WO/W	3	12,105
M211	Truck, Cargo, 2 ½ ton, 6x6, W/W, WO/W	3	13,280
M35A1	Truck, Cargo, 2 ½ ton, 6x6. W/W, WO/W	3	13,380
M217	Truck, Tank, Fuel, Serv., 2 ½ ton, 6x6, W/W, WO/W	3	14,340
	Truck, Chassis, 5 ton, 8x8, W/W, WO/W	2	14,500
M215	Truck, Dump, 21 " ton, 6x6, W/W, WO/W	3	14,870
M109	Truck, Van, 2 ½ ton, 6x6, W/W, WO/W	3	15,230
M757	Truck Tractor, 5 ton, 8x8, WO/W	3	15,500
M41	Truck, Cargo, 5 ton, 6x6, WO/W	(85'-2; 89'-3)	15,645
M656	Truck, Cargo, 5 ton, 8x8, W/W, WO/W	(85'-2; 89'-3)	17,300
M40	Chassis, Truck, 5 ton, 6x6, W/W, WO/W	(85'-2; 89'-3)	17,500
M39	Chassis, Truck, 5 ton, 6x6, W/W, WO/W	(85'-2; 89'-3)	17,540
M52	Truck, Tractor, 5 ton, 6x6, W/'W, WO/W	3	17,590
M61	Chassis, Truck, 5 ton, 6x6, W/W	3	18,045
M54	Truck, Cargo, 5 ton, 6x6, WO/W	(85'-2; 89'-3)	19,945
M51	Truck, Dump, 5 ton, 6x6, W/W, WO/W	3	21,980
M791	Truck, Van, 5 ton, WO,/W, 8x8	2	24,500

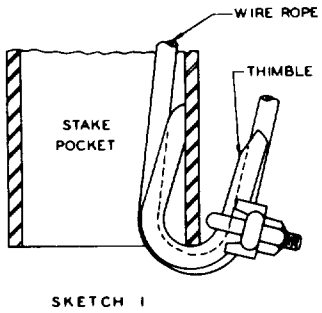
Note.
W/W-With Winch
WO/W-Without Winch

See General Rules 4, 5, 7, 15, 19-A, 19-B and 19-C for further details.

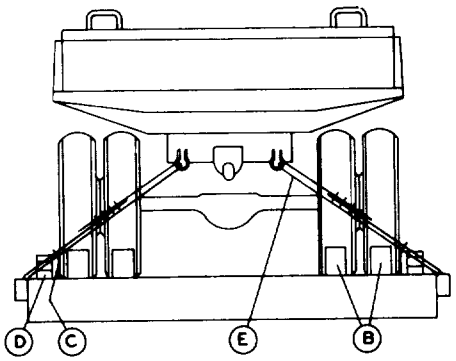
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FOUR OR SIX WHEEL TRUCKS (SINGLE OR DUAL WHEELS)-FLAT CARS WITH WOODEN FLOORS





SKETCH 1



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	8 or 12, as required.	Block, pattern 16, of Section No. 6. Locate 45 degree portion of block against front and rear of front wheels, in front of inner and outer intermediate wheels and in back of inner and outer rear wheels. Nail heel of the block to the car floor with three 40-D nails and toenail that portion of the block under the tire to the car floor with two 40-D nails before Items "C" and "D" are applied. Four wheel vehicles have blocks in front and rear of each wheel.
C	1 ea. Item "D".	Suitable protective material, such as waterproof paper or burlap, etc. Locate bottom portion under Item "D", the top portion to extend two inches above Item "D".
D	4 or 6 as required.	Blocks, pattern 89 of Sec. 6. Apply over Item "C" and locate against tire. See pattern 89 for securement details. May be omitted for the intermediate dual wheels on six-wheel vehicles weighing 16,000 lbs. or less.
E	4 ea. unit.	3/8 in. 6 x 19 IWRC wire rope, single strand, for vehicles weighing 8,500 lbs., or less. 3/8 in. 6 x 19 IWRC wire rope, doubled (complete loop), for vehicles weighing over 8,500 lbs. to 16,000 lbs., inclusive. ½ in., 6 x 10 IWRC wire rope, doubled (complete loop), for vehicles weighing over 16,000 lbs. to 25,000 lbs., inclusive. 5/8 in. 6 x 19 IWRC wire rope, doubled (complete loop), for vehicles weighing over 25,000 lbs. to 40,000 lbs., inclusive. Attach to tie-down shackles on each end of vehicle and to stake pockets on same side of flat car. Metal fillers or thimbles sufficient to provide a suitable radius must be used to protect wire rope at stake pockets and at vehicle tie-down shackles. Fillers or thimbles must be applied so as to prevent dislodgment. (See Sketch 1). Cable clips must be applied in accordance with General Rules 15 (d) and 15 (n).

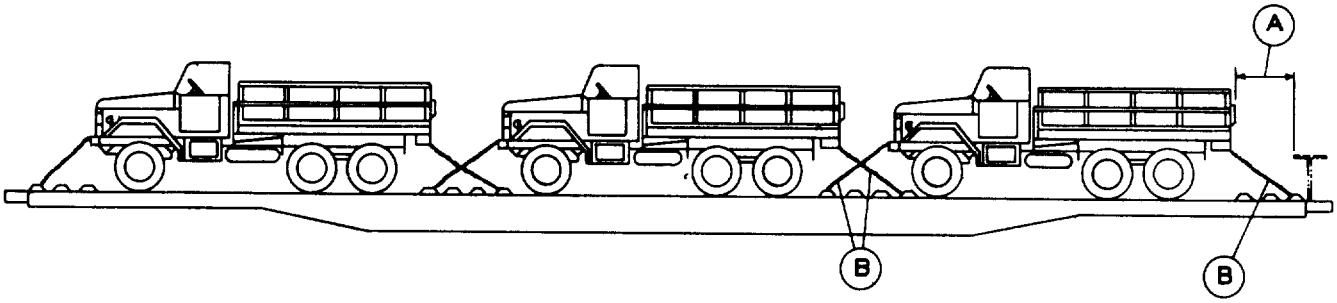
Notes:

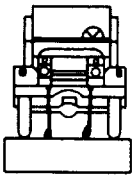
1. All hand brakes are to be set with hand levers wired or blocked.
2. Gearshift levers for automatic or conventional transmissions must be placed in neutral and wire tied.

See General Rules 1, 2, 3, 4, 5, 7, 9, 14, 15, 19-A and 19-B for additional information.

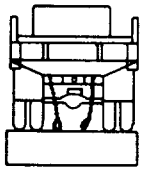
(Redrawn-8-1972)

MILITARY VEHICLES WEIGHING 4,000 LBS. AND UNDER, WITH OR WITHOUT WINCH, EMPTY, FLAT CARS EQUIPPED WITH CENTER TIE-DOWN RAILS.





FRONT VIEW



REAR VIEW

Item	No. of Pcs.	Description
A		Brake Wheel Clearance, see Fig. 2, Sec. 1.
B	4 ea. unit.	3/8 in. dia. alloy steel chain proof tested to minimum of 13,200 lbs., for vehicles 8,500 lbs. or less. 3/8 in. dia. alloy steel chain, extra strength, proof tested to minimum of 18,000 lbs., for vehicles over 8,500 lbs. to 16,000 lbs., inclusive. ½ in. dia. alloy steel chain proof tested to minimum of 22,500 lbs. for vehicles over 16,000 lbs. to 25,000 lbs., inclusive. ½ in. dia. alloy steel chain, extra strength, proof tested to minimum of 27,500 lbs. for vehicles over 25,000 lbs. to 40,000 lbs., inclusive.

GENERAL INSTRUCTIONS

(1) Shippers should specify cars equipped with tie-down devices in the quantity shown in Item "B" when ordering specialized railway equipment. When carriers furnishes cars that do not have built-in chains and tensioning devices, chains and turnbuckles of appropriate size and strength will be used in lieu thereof for securement of vehicles. Load binders are not to be used in lieu of turnbuckles to tension tie-down chains.

(2) Vehicles must face in the same direction and be uniformly spaced along the length of the car to allow sufficient space of each end of the car and between the vehicles for securement. Apply tie-downs parallel to each other at the same end of the vehicle and from the vehicle tie-down point to the car tie-down facility. The angle of the tie-down must be as close to 45° as possible. When length of vehicles, loaded on a 75 ft. car preclude facing all in the same direction, one vehicle may be reversed to ensure application of tie-down at a floor angle of 45°.

(3) Hand brakes must be set.

(4) Gear Shift levers on vehicles equipped with automatic or standard transmissions must' have the gear shift lever wire-tied in the neutral position.

(5) Open hooks must be secured with wire over the opening to prevent the hook form becoming disengaged from the chain link to which it is secured.

(6) Turnbuckles used to tighten chains must be wired or locked to prevent them from turning during transit unless the turnbuckles are equipped with self-locking devices.

(7) When vehicles are shipped in a loaded configuration, the gross weight of the vehicle and cargo combined must be determined in order to assure that the proper size and/or number of tie-downs are used to secure the vehicles to the rail car. The "approximate weight" column of the tables below, may be used to determine the new restraint requirements Imposed by the additional weight of the cargo.

MILITARY VEHICLES WEIGHING 40,000 LBS. AND UNDER, WITH OR WITHOUT WINCH, EMPTY, FLAT CARS EQUIPPED WITH CENTER TIE-DOWN RAILS

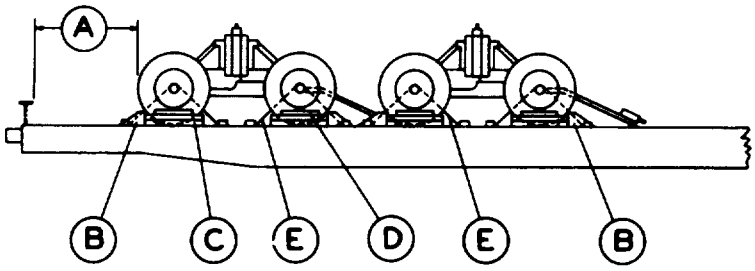
(8) Method of loading as shown is applicable to vehicles weighing up to 40,000 lbs. each. The following vehicles in the quantity shown can be loaded on 60 ft., 75 ft., 85 ft., and 89 ft. cars as Indicated below.

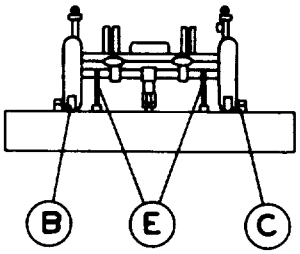
Type	Description	No. Per Car. 60 ft.	75 ft.	85 ft.	89 ft.	Apprx. Weight
	8,500 lbs. or less, 3/8 in. dia. alloy steel chain					
MM56	Chassis, Truck, 3/4 ton, 4x4, W/W, WO/W	3	4	4	4	5,450
M87B1	Truck, Cargo, 3/4 ton, 4x4, W/W, WO/W	3	4	4	5	5,800
M48B1	Truck, Ambulance, 3/4 ton	3	4	4	4	6,900
M201	Truck, Maintenance, 3/4 ton, 4x4, W/W	3	4	4	4	6,950
M561	Truck, Cargo, 1 1/4 ton, 6x6, W/W, WO/W	2	3	4	4	7,700
	Over 8,500 lbs. to 16,000 lbs., incl. 3/8 In. dia., extra strength alloy steel chain.					
M45	Chassis, Truck, 2 ½ ton, 6x6, W/W	2	3	2	3	10,985
M207	Chassis, Truck, 2 ½ ton, 6x6, W/W, WO/W	2	2	3	3	11,585
M221	Truck, Tractor, 2 ½ ton, 6x6, W/W, WO/W	2	3	4	4	12,105
M211	Truck, Cargo, 2 ½ ton, 6x6, W/W, WO/W	2	2	3	3	18,280
M85A1	Truck, Cargo, 2 ½ ton, 6x6, W/W, WO/W	2	2	3	3	18,880
M217	Truck, Tank, Fuel, Serv., 2 ½ ton, 6x6, W/W, WO/W	2	2	3	3	14,840
	Truck, Chassis, 5 ton, W/W, WO/W	2	2	3	3	14,500
M215	Truck, Dump, 2 ½ ton, 6x6, W/W, WO/W	2	3	3	4	14,870
M109	Truck, Van, Shop, 2 ½ ton, 6x6, W/W, WO/W	2	2	3	3	15,230
M757	Truck, Tractor, 5 ton, 8x8, WO/W	2	2	3	3	15,500
M41	Truck, Cargo, 5 ton, 6x6, WO/W	2	2	3	3	15,645
	Over 16,000 lbs. to 25,000 lbs. incl., 1/2 in. dia. alloy steel chain.					
M656	Truck, Cargo, 5 ton, 8x8, W/W, WO/W	2	2	3	3	17,800
M40	Chassis, Truck, 5 ton, 6x6, W/W, WO/W	2	2	3	3	17,500
M89	Chassis, Truck, 5 ton, 6x6, W/W, WO/W	2	2	3	3	17,540
M52	Truck, Tractor, 5 ton, 6x6, W/W, WO/W	2	3	3	3	17,590
M61	Chassis, Truck, 5 ton, 6x6, W/W	2	2	3	3	18,045
M54	Truck, Cargo, 5 ton, 6x6, W/W	2	2	3	3	19,945
M51	Truck, Dump, 5 ton, 6x6, W/W, WO/W	2	3	3	3	21,980
M791	Truck, Van, 5 ton, 8x8, WO/W	2	2	3	3	24,500
M813	Truck, Cargo, 5-Ton	2	2	3	3	22,126
M815	Truck, Bolster, 5-Ton	2	2	3	3	21,500
M817	Truck, Dump, 5-Ton	2	2	3	3	23,286
M818	Truck, Tractor, 5-Ton	2	3	3	3	19,790
	Over 25,000 lbs. to 40,000 lbs. Incl., ½ in. dia. extra strength alloy steel chain.					
M543A2	Truck, Wrecker, 5 ton, W/W	2	2	2	2	34,885
M814	Truck, Cargo, 5-Ton	1	2	2	2	25,174
M816	Truck, Wrecker, 5-Ton	1	2	2	2	84,940
M819	Truck, Wrecker, 5-Ton	1	2	2	2	34,490
M820	Van, Expansible, 5-Ton	1	2	2	2	29,280
M821	Truck, Stake, Bridge, 5-Ton	1	2	2	2	27,090

Note.
W/W-With Winch
WO/W-Without Winch

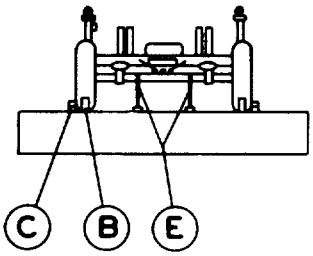
See General Rules 4, 5, 7, 15, 19-A, 19-B and 19-C for further details.

DOLLY SET, TRANSPORTABLE-FLAT OR GONDOLA CARS WITH WOOD FLOORS

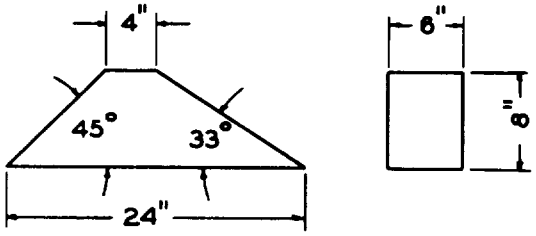




SKETCH 1



SKETCH 2



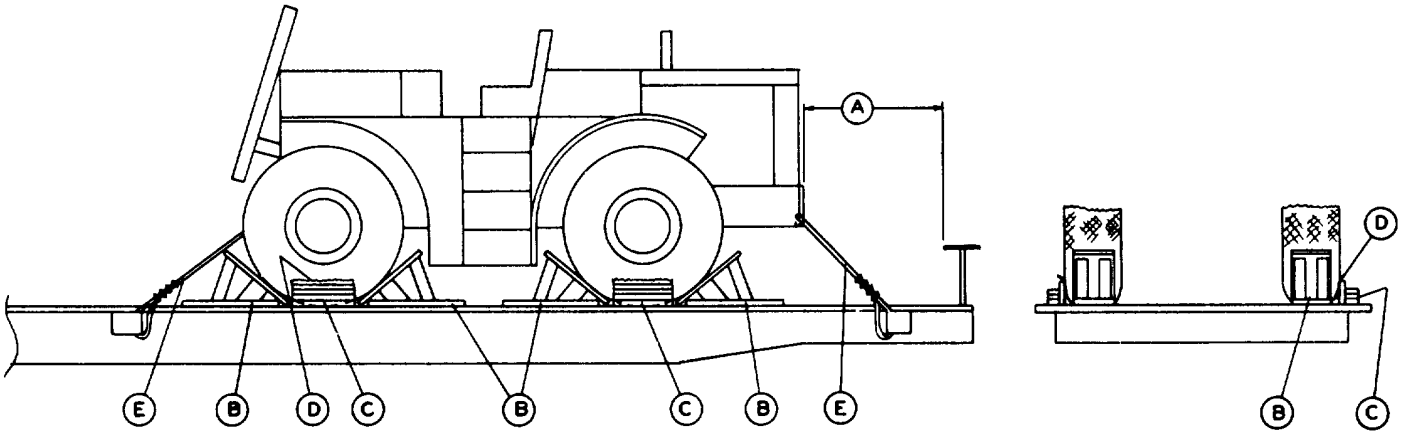
ITEM-B
SKETCH 3

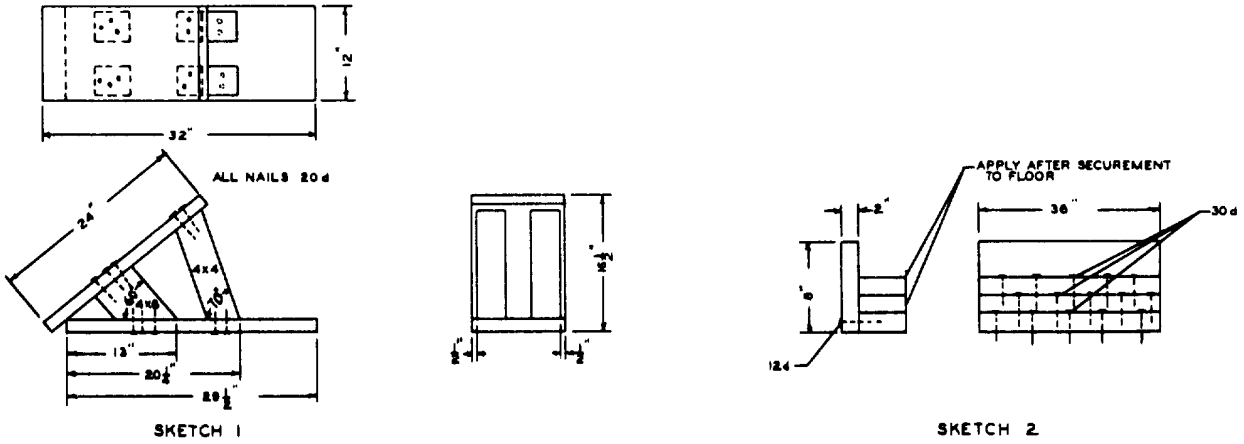
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. unit.	6 in. x 8 in. x 24 in. blocks, Sketch 3. Locate 45° portion of block against front of front wheels and rear of rear wheels. Nail heel of block to car floor with three 40-D nails and toe nail portion of block under tire to floor of car with two 40-D nails prior to Items "C" and "D" being applied.
C	4 ea. unit.	Wheel side blocking, pattern 89. Position Item "D" between tire and Item "C" before nailing Item "C" to car floor.
D	1 ea. Item "C".	Suitable material such as waterproof paper. Locate bottom portion under Item "C". Top portion to extend 2 inches above Item "C".
E	4 ea. unit.	High tension bands 2 in. x .050 in. x length to suit. Loop over both sides of front and rear axles, under hydraulic brake anchor plates. Nail anchor plate to floor of car with eight 20-D cement coated nails. See Sketches 1 and 2.

See General Rules 1, 2, 3, 4, 5, 9, 14, 15 and 19B for further details.

Sec. 6-Fig. 90 (New-11-1974)

TRACTOR M830 OR SIMILAR TYPE VEHICLE, 50,000 LBS. OR LESS-FLAT CAR



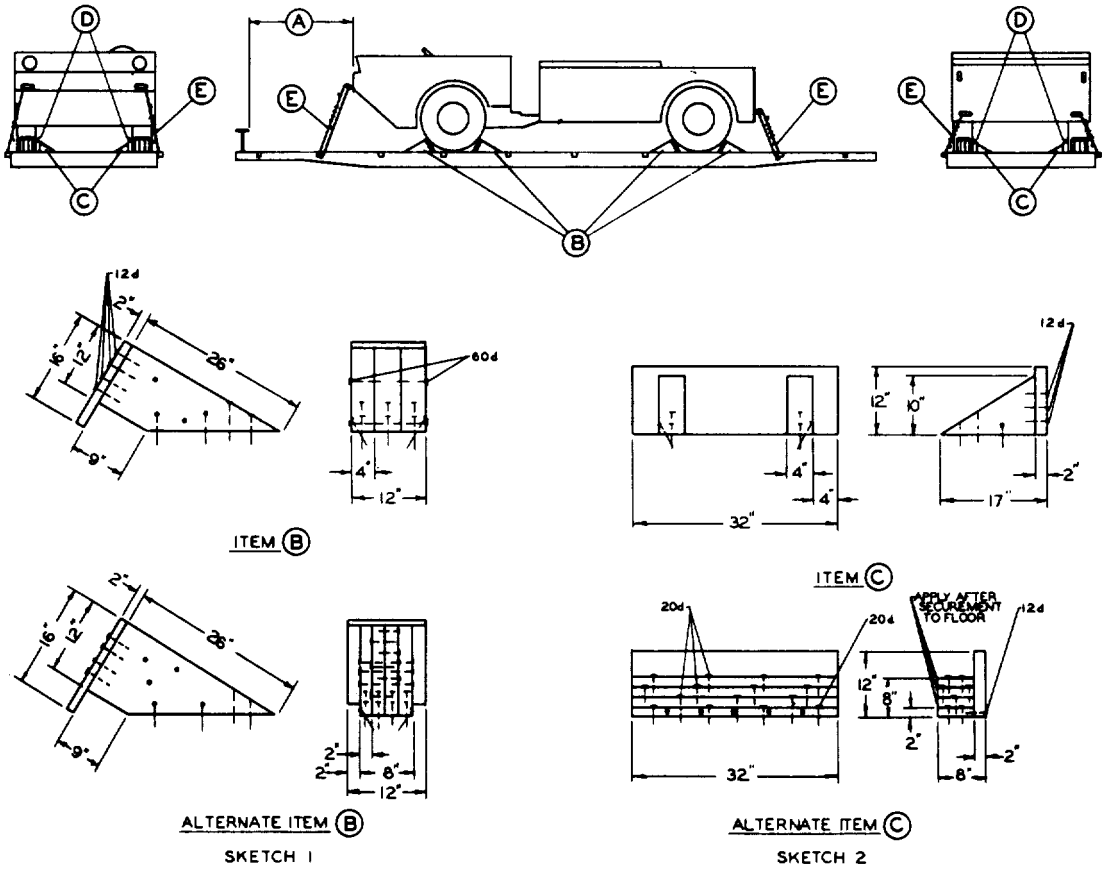


Item	No. of Pcs.	Description
A		Brake Wheel Clearance. See Fig. 2, Sec. 1.
B	8	Wood chock blocks, see Sketch 1. Locate blocks against front and rear of each wheel. Nail each block to car floor with five 30-D nails In heel and two 30-D nails in each side.
C	4	Wood blocks, see Sketch 2. Locate one block against side of each tire. Nail to car floor with five 30-D nails,
D	1 per ea. Item "C"	Suitable protective material to prevent chafing such as burlap, waterproof paper, etc. Locate bottom portion underneath Item "C" with top portion to extend two inches above Item "C".
E	4	5/8 in. 6 x 19 IWRC wire rope. Locate from tie-down device on vehicle to stake pocket in a complete loop at approximately a 45 degree angle. Secure cables with four 5/8 in. cable clips. 5/8 in. thimbles must be used at stake pockets to protect wire rope. Secure thimbles to wire rope with 5/8 in. cable clip.

See General Rules 1, 2, 3, 4, 5, 9, 14, 15, 19-A, 19-B, and 19-C for further details.

(Drawing Redrawn 9-1977)

TRUCK, 4 X 4 OR 6 X 6, ARTICULATED, GOER TYPE VEHICLES-25,000 TO 40,000 LBS.-FLAT CARS

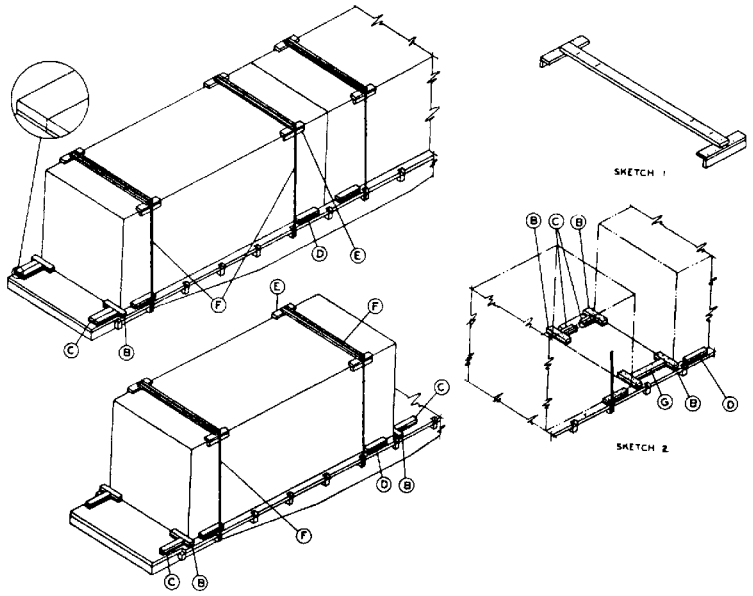


Item	No. of Pcs.	Description
A		Brake Wheel Clearance. See Fig. 2, Sec. 1.
B	8	Wood blocks, see Sketch 1. On 4x4 trucks, locate blocks against front and back of each wheel. On 6x6 trucks, locate blocks against front and back of front wheels and against front of intermediate wheels and back of rear wheels. Secure each to car floor with six 60-D nails through heel of block. Toe-nail each block to car floor with two 40-D nails through each side. Substitute if desired Alternate Item "B", per Sketch 1. Secure each Alternate Item "B" to car floor with eight 40-D nails through heel of block. Toe-nail each block to car floor with two 40-D nails through each side.
C	4 on 4x4 trucks 6 on 6x6 trucks	Wood blocks, see Sketch 2. Locate one block against inside of each wheel. Secure to car floor with two 60-D nails through heel of each block. Toe-nail each block to car floor with two 40-D nails through outside edge. Substitute if desired Alternate Item "C", per Sketch 2.
D	1 ea. Item "C"	Suitable protective material to prevent chafing such as burlap, waterproof paper, etc. Locate bottom portion underneath Item "C", with top portion to extend two inches above Item "C".
E	4	½ inch, 6 x 19 IWRO wire rope. Locate from tie-down device on vehicle to stake pocket in a complete loop at approximately a 45 degree angle. Secure wire rope with four M2 inch cable clips. A Y2 inch thimble must be used at each stake pocket and vehicle tie-down point. Secure thimbles to cable with one 1/2 inch cable clip.

See General Rules 1, 2, 8, 4, 5, 7, 9, 14, 15, 19, 19-A, and 19-B for further details.

Sec. 6-Fig. 175 (New-10-1981)

EMPTY 20 FT. INTERMODAL FREIGHT CONTAINERS, 6,000 LBS. OR LESS, SINGLE OR DOUBLE LOADED-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Section No. 1.
B	4, single or double loaded	End blocking, lumber, each one piece to consist of 1 in. x 6 in. x 24 in. and one piece 2 in. x 6 in. x 24 in. Position the 2 in. x 6 in. x 24 in. piece on top of the 1 in. x 6 in. x 24 in. piece, locating containers. against center of corner casting of the container. Secure both to car floor with six (6) 40-D nails. Apply other to opposite container corner casting in a like manner. Apply two to opposite end of (single or double) container(s), making same application.
C	1 per each Item "B" for single containers 2 per each Item "B" for double containers.	Back-up block, lumber, each to consist of one piece 1 in. x 6 in. x 24 in. and one piece 2 in. x 6 in. x 24 in. Position the 2 in. x 6 in. x 24 in. piece on top of the 1 in. x 6 in. x 24 in. piece. Locate at the center of Item "B" and secure both to car floor with six (6) 40-D nails.
D	2 each side of container.	Side blocking, lumber, each to consist of one piece 1 in. x 6 in. x 24 in. and one piece 2 in. x 6 in. x 24 in. Position the 2 in. x 6 in. x 24 in. piece on top of the 1 in. x 6 in. x 24 in. piece. Locate about ten (10) inches from each end of container each side and secure each to car floor with six (6) 40-D nails.
E	2 per each container.	Strap protective board per Sketch 1. Locate assembled edge and side pieces a minimum of eighteen (18) inches from each end of container. Center cross piece on edge and side pieces and secure with three (3) 8-D nails each end.
F	2 per container.	Tie down band, 2 in. x .050 in. high tension. Apply over Item "E", securing to opposite stake pockets and/or anchor lading devices. Secure band to Item "E" with staples or nails to prevent displacement. On chain equipped fiat cars, chain may be used if of sufficient length to pass through holes in corner fittings and back to chain for hook securement. Chain must be free of kinks and properly tensioned.
G	2	Center blocking, lumber, one piece I in. x 6 in. x length required and one piece 2 in. x 6 in. x length required. Place the 2 in. piece on top of the 1 in. piece, centering against Items "B" and secure with one (1) 40-D nail every 6 inches, with a minimum of six (6) nails used. When void between Items "B" is 60 inches or greater, Items "C" may be substituted. See Sketch 2.

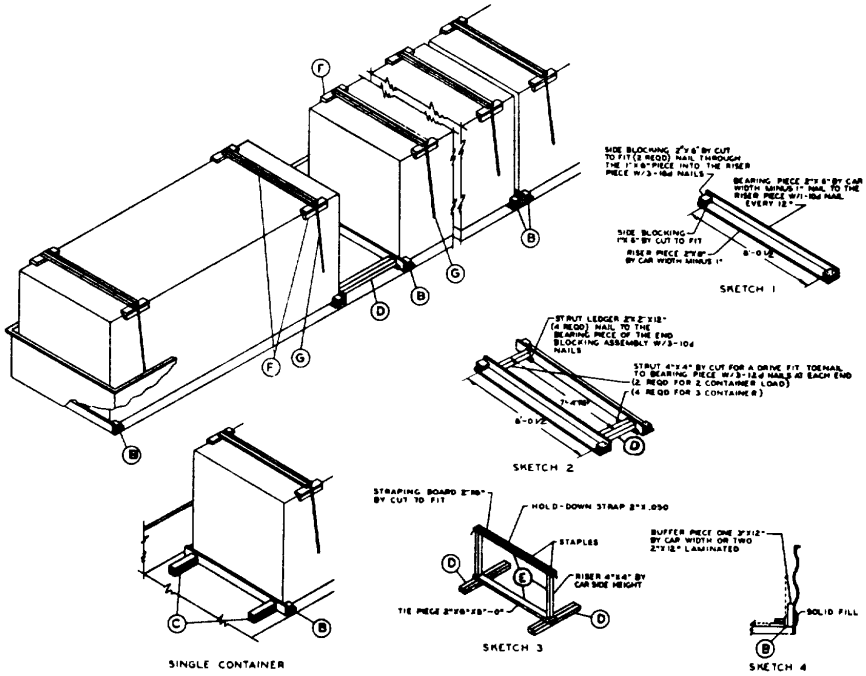
Notes:

1. Containers may be loaded directly against end of bulkhead fiat cars and securely blocked opposite end.

See General Rules 1, 2, 3, 4, 5, 9, 14, and 15 for further details.

Sec. 6-Fig. 176 (New-10-1981)

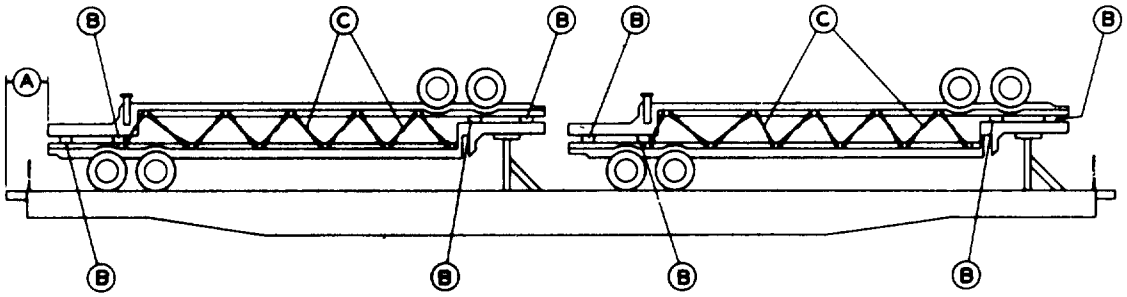
EMPTY 20 FT. INTERMIODAL FREIGHT CONTAINERS, 6,000 LBS. OR LESS, SINGLE, DOUBLE OR TRIPLE LOADED-GONDOLA CARS

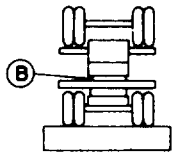


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Section No. 1.
B	1 each end	End blocking per detail. Locate one under container against car end and one under container at opposite end. Secure opposite end(s) with Items "C" to prevent displacement.
C	2 per each Item "B"	Back-up blocks, lumber, each to consist of 1 piece of 1 in. x 6 in. x 24 in. and 2 pieces of 2 in. x 6 in, x 24 in. Position one 2 in. x 6 in. piece on top of a 1 in. x 6 in. piece, locating both against Item "B" about 12 inches from end. Secure both to car floor with six (6) 40-D nails. Nail the remaining 2 in. x 6 in. piece on top in a like manner. Apply remaining pieces against opposite end of Item "B" in a like manner.
D	As required.	Center blocking assembly per Sketch 2. As required to block void between containers.
E	As required.	Center block assembly hold-down, per Sketch 3. Consists of one piece 2 in. x 6 in. x 8 ft. tie piece, two (2) 4 in. x 4 in. risers, height equal to car side and one strapping board, 2 in. x 6 in. x length required to fit. Secure tie-piece to Items "F" with three (3) 10-D nails each end. Locate 4 in. x 4 in. risers on tie piece in line with Items "F" and secure each to tie piece by toenailing, using four (4) 16-D nails. Locate strapping board on top of risers and secure with two (2) 12-D nails at each joint. Secure hold-down assembly to prevent displacement by applying one (1) 2 in. x .050 in. high tension band, over strapping board using a minimum of 5 staples and securing ends to anchor lading devices each side of car. Required only when Items "D" exceed 72 inches in length.
F	2 per each container.	Strap protective board per Sketch 1. Locate assembled edge and side pieces a minimum of eighteen (18) inches from each end of container. Center cross piece on edge and side pieces and secure with three (3) 8-D nails each end.
G	2 per each container.	Tie down band, 2 in. x .050 in. high tension. Apply over Item "F". securing to opposite anchor lading devices at sides of car. Secure band to Item "F" with staples or nails to prevent displacement.
H	As required.	End fill blocks. lumber. Required only when car is equipped with corrigated ends. Consists of one piece 3 in. x 12 in. x car width or two (2) pieces 2 in. x 12 in. x car width. Nail to solid fill. thickness and width as required, with one (1) 30-D nail spaced every 12 inches. If desired, may be substituted by Items "C", between Item "B". See Sketch 4.

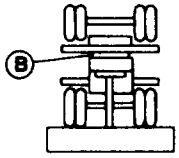
See General Rules 1, 2, 3, 4, 5, 9, 14, and 15 for further details.

SEMI-TRAILERS, FLATBED WITH RIGID GOOSENECK AND DUAL WHEELS, DOUBLE DECKED-FLAT CARS WITH RETRACTABLE HITCHES

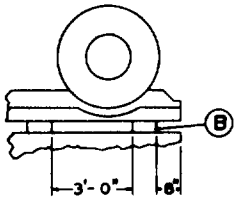




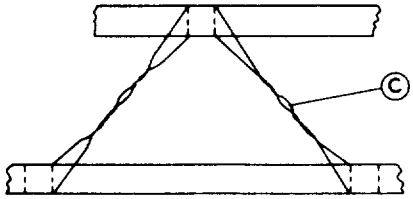
SKETCH 1



SKETCH 2



SKETCH 3



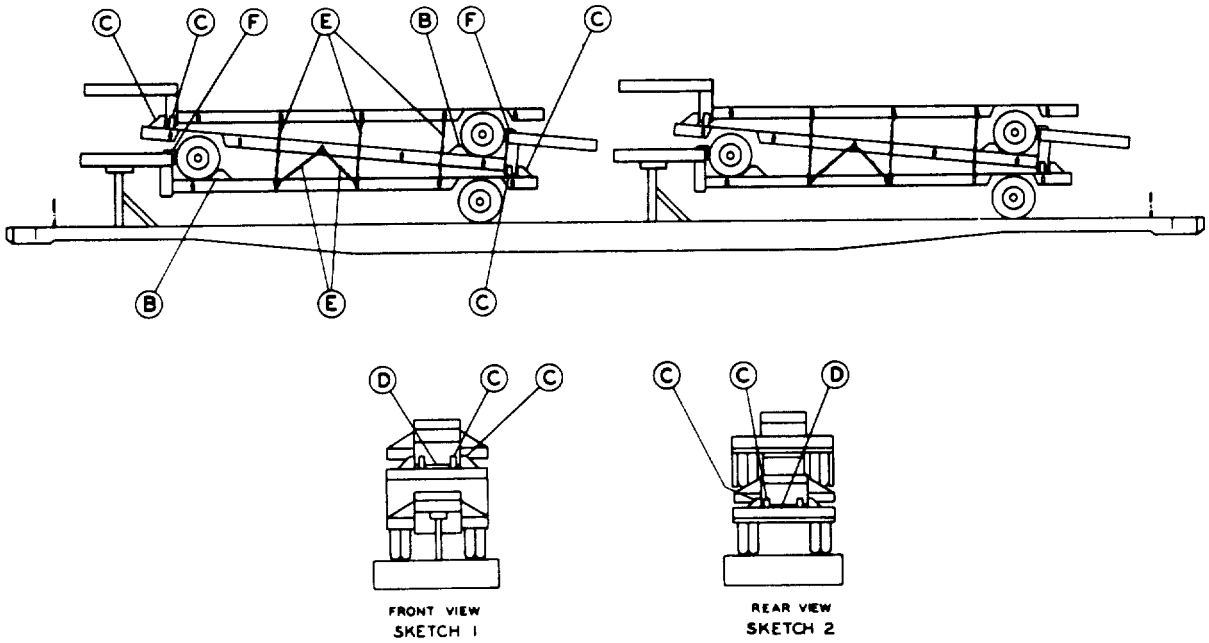
SKETCH 4

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. pair of double decked trailers.	Separators, 2 in. x 6 in. x length to suit, hardwood. Locate crosswise between the gooseneck and trailer body and space as shown in Sketches 1, 2 and 3. Secure to prevent dislodgment.
C	20 ea. pair of double decked trailers.	10 ties on each side of double decked trailers. Each to consist of eight strands No. 8 gage black annealed wire. Attach to side links of top and bottom trailers as shown in Sketch 4 and twist taut. Substitute, if desired, 5/8 in. dia. steel rods with washers and nuts on threaded ends, or wire rope 3/8 In. dia., independent wire rope core, in a complete loop and secure with three 3/8 in. cable clips.

See General Rules 3, 4, 5, 7, 9, 13 and 19-B for further details.

It has been the policy of the Rules and Figures Subcommittee to assign new figure numbers, as near as possible, to the same "family" of commodities. In this particular instance the loading involves a "TOFC" type car with retractable hitches and it was thought advisable to differentiate hereafter in the assignment of figure numbers as between this type car and the so-called conventional type flat car. Therefore, henceforth, all loading on "TOFC" flat cars equipped with retractable hitches will be grouped under Fig. Nos. 200 to 299 inclusive, and loads on multilevel cars will be grouped under Fig. Nos. 300 to 399 inclusive, this numbering arrangement to be applicable to Section Nos. 2 to 6 inclusive.

SEMI-TRAILERS, 20-TON, TRIPLE DECKED-FLAT CARS WITH RETRACTABLE HITCHES

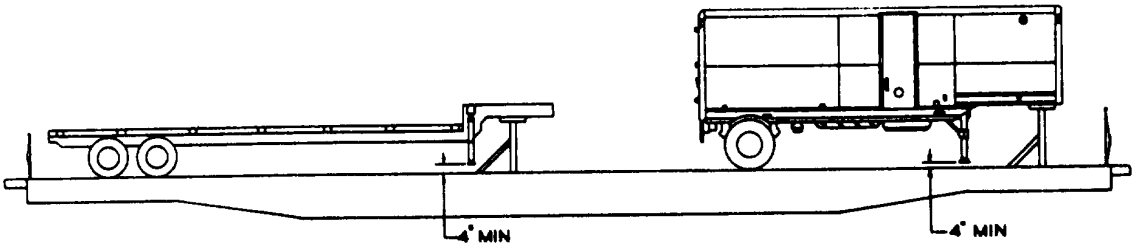


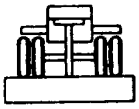
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 per ea. triple decked unit.	Block, pattern 87. Locate one in front of each outside wheel of the second and top units. Secure each block to unit below with three 40-D nails in the heel of block and two 20-D nails toe-nailed on each side of the block.
C	8 per ea. triple decked unit.	Block, pattern 67. Locate two against ends and two against sides of front ends of unit as shown in Sketches 1 and 2. Secure each block with three 40-D nails in the heel of block and two 20-D nails toe-nailed on each side of block.
D	As required.	2 in. x 6 in. x length to suit. Locate between bottom and second unit as shown and between second and top unit, as shown. Secure each to prevent dislodgment.
E	10 ea. triple decked unit.	Each to consist of eight strands, No. 8 gage black annealed wire. Attach three to each side of trailers utilizing side links of top and bottom units as shown and attach two to each side of the trailers utilizing side links of the middle and bottom units as shown. Twist all wire taut. Substitute, if desired, 5/8 in. dia. steel rods length to suit with washers and nuts on threaded ends or 3/8 in. steel cable, 6 x 19 independent wire rope core in a complete loop and secured with three 3/8 in. cable clips.
F	As required.	Each to consist of one piece 1 2 in. x 10 in. and one piece 1 ½ in. x 6 in. length to suit. L-shaped, 10 in. piece properly nailed to 6 in. piece. Locate between units as shown and secure each with four 20-D nails.

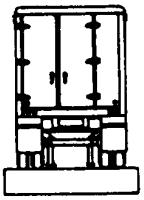
See General Rules 4, 5, 9, 14, 15 and 19B for further details.

Sec. 6-Fig. 202 (New-10-1968)

SEMI-TRAILERS, EMPTY, SINGLE AND DUAL WHEELS-FLAT CARS WITH RETRACTABLE HITCHES




FRONT VIEW


REAR VIEW

Item	Description
A	Brake wheel clearance. See Fig. 2, Sec. 1.

GENERAL INSTRUCTIONS

(1) Shippers should specify cars that are applicable to the length and width of the vehicles being loaded when ordering specialized railroad freight equipment.

(2) A thorough examination shall be made of all hitches and jaws prior to loading of trailers on cars.

(3) Loading of trailers may be by tractor, overhead crane or side loaders.

(4) Retractable hitches, insure that hitch is securely locked in "up" position. Securement of the trailer on the retractable hitch shall be in accordance with car owner's instructions. Check to Insure that trailer kingpin is locked in place on the hitch.

(5) Trailer landing gear shall be raised to provide a minimum of four inches of clearance between the landing gear and car.

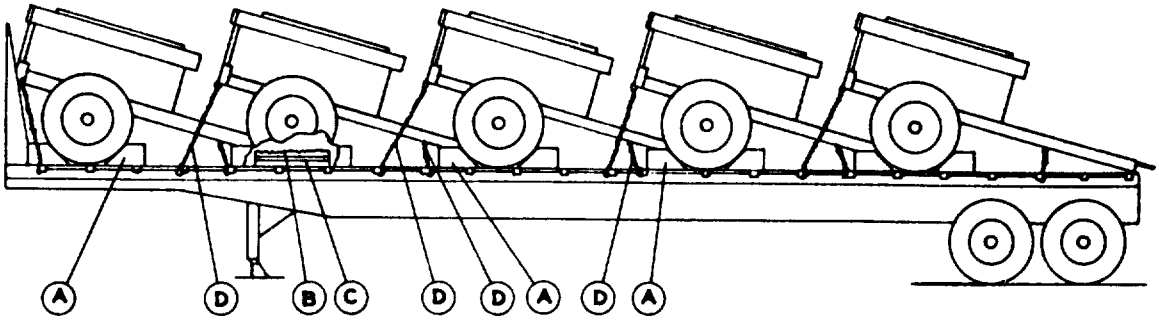
(6) Method of loading is applicable to other types of vehicles weighing up to 40,000 pounds providing that kingpin height is between 47 inches minimum and 52 inches maximum. The following vehicles in the quantity shown can be loaded on an 85 foot or longer car equipped with retractable hitches. Cars of shorter length may be used with a lesser quantity of vehicles.

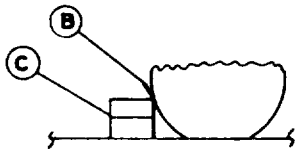
Type	Description			Length	Approx. Weight	Quantity
M117	Chassis, Semitrailer	6 Ton	2 Whl	270 in.	4,700	2
M117A1	Chassis, Semitrailer	6 Ton	2 Whl	270 in.	4.700	2
M118	Semitrailer, Stake	6 Ton	2 Whl	275 In.	7,200	2
M118A1	Semitrailer, Stake	6 Ton	2 Whl	275 In.	7,200	2
M126	Chassis, Semitrailer	12 Ton	4 Whl	344 in.	8,400	2
M126A1	Chassis, Semitrailer	12 Ton	4 Whl	345 in.	8.400	2
M127	Semitrailer, Cargo	12 Ton	4 Whl	344 in.	13,500	2
M128	Semitrailer, Van, Cargo	12 Ton	4 Whl	250 in.	15,000	2
M146	Semitrailer, Van, Shop	6 Ton	2 Whl	275 in.	7,000	2
M172	Semitrailer, Low Bed	25 Ton	4 Whl	406 In.	15,500	2
M172A1	Semitrailer. Low Bed	25 Ton	4 Whl	411 In.	16,500	2
M269	Semitrailer, Low Bed, Wrkr	12 Ton	4 Whl	409 In.	14,500	2
M270	Semitrailer. Low Bed, Wrkr	12 Ton	4 Whl	591 in.	17,500	1
M270A1	Semitrailer, Low Bed, Wrkr	12 Ton	4 Whl	597 in.	17,500	1
M313	Semitrailer. Van, Expans	6 Ton	4 Whl	323 in.	16,000	2
M348//348F	Semitrailer, Van, Elect	3/6 Ton	2 Whl	326 in.	9,500	2
M349	Semitrailer. Van, Refrig	7 ½ Ton	2 Whl	284 in.	8.600	2
M349A1	Semitrailer, Van, Refrig	7 ½ Ton	2 Whl	284 In.	8,600	2

See General Rules 5, 7 and 19B for further details.

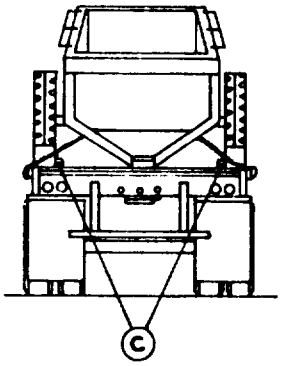
Sec. 6-Fig. 203 (New-9-1984)

TRAILERS, 1 ½ TON-TWO-WHEEL, LENGTHWISE, TOFC FLAT BED TRAILERS





SKETCH 1



Item	No. of Pcs.	Description
A	4 each unit	Blocks, pattern 16. Locate 45 degree portion of block against front and rear of wheels. Secure heel of block to floor with three 40-D nails and toe-nail that portion under tire with two 40D nails. Substitute, if desired, blocks, pattern 67, at each location.
B	2 each unit	Suitable protective material, such as waterproof paper, burlap, etc. Locate between Items "C" and tires. Secure bottom portion under Items "C", the top portion to extend 2 inches above Items "C".
C	2 each unit	Each to consist of two pieces of 2 in. x 4 in. x 30 in., lumber. Locate against inside face of tires, each side of unit. Secure lower piece to floor with four 30-D nails and top piece to one below in like manner.
D	4 each unit	Each to consist of four strands of No. 8 gage black annealed wire. Twist wires taut with a rod, bolt or suitable length of 2 in. x 2 in. lumber and secure to prevent untwisting. Substitute, If desired, 3/8 in. wire rope doubled or 3/8 in. binder chain. Both tie-downs of each pair must be of the same material. Attach rear tie-downs to each comer of trailer chassis or tie-down bracket and secure to flat bed stake pocket. Attach front tie-down to each side of trailer tongue and secure to flat bed stake pocket.

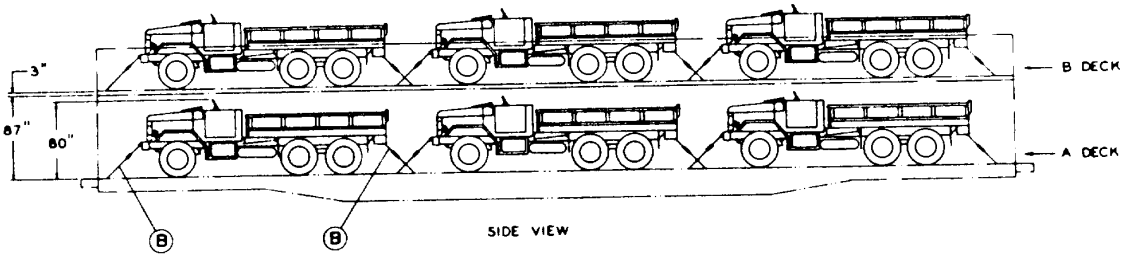
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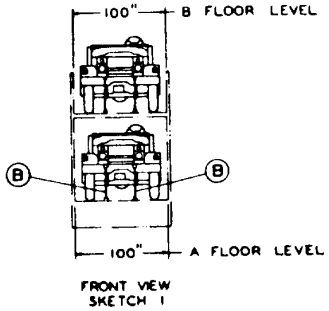
1. A minimum of 6 in. clearance must be maintained between trailers.
2. If equipped, hand brakes must be set and levers wired or blocked.

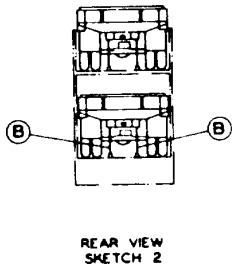
See General Rules 100, 101, 102, 103, 105, 107, 108 and 111-B in Section No. 7 for further details.

Sec. 6-Fig. 300 (New-10-1966)

2 ½ TON TRUCKS-85 FT. OR 89 FT., HEAVY DUTY, BI-LEVEL RACK CARS







Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. vehicle.	Chain tie-down device with a minimum proof test of 22,500 pounds. Attach one tie-down chain over and around each front and rear lifting shackle, and attach hook into an appropriately located link of each chain. See sketches 1 and 2. Care must be exercised to ensure that tie-downs are properly tensioned and that all slack is removed from the tie-down devices.

GENERAL INSTRUCTIONS

1. Shippers should specify cars with normal complement of tie-down chains when ordering rail equipment.
2. Load binders are not to be used as tensioning devices.
3. Vehicles must face in the same direction and be uniformly spaced along the length of the car to allow sufficient space at each end of the car and between the vehicles for securement. Apply chain tie-downs parallel to each other at the same end of the vehicle. The angle of tie-down shall not exceed 45 degrees.
4. Tie-downs when installed shall not come in contact with electrical wiring, vehicle controls and other appurtenances.
5. Hand and/or parking brakes on vehicles must be set in "ON" position.
6. Gear shift levers must be secured in a neutral position with a wire tie.
7. Open hooks must be secured with wire over the openings toprevent the hook from becoming disengaged from the chain link to which it is secured.
8. Turnbuckles when used to tighten chains must be of the same or higher proof test as the chains and must be wired or locked to prevent them from turning during transit unless the turnbuckles are equipped with self-locking devices.
9. "A" and "B" deck car floors must have a 100 in. clear span width, maintained to a height of 80 in. above "A" deck car floor.
10. Vehicles must be centered on car floors to maintain a 1 ½ in. minimum clearance between vehicle and rack framework.
11. On 85 ft. rail cars, three vehicles not exceeding 304 in. in length may be loaded on each deck. On 89 ft. rail car, three vehicles not exceeding 320 in. in length may be loaded on each deck.
12. Weight of vehicles loaded on either "A" or "B" deck shall not exceed 50,000 pounds or the load limit of the individual decks whichever is less.

Note.

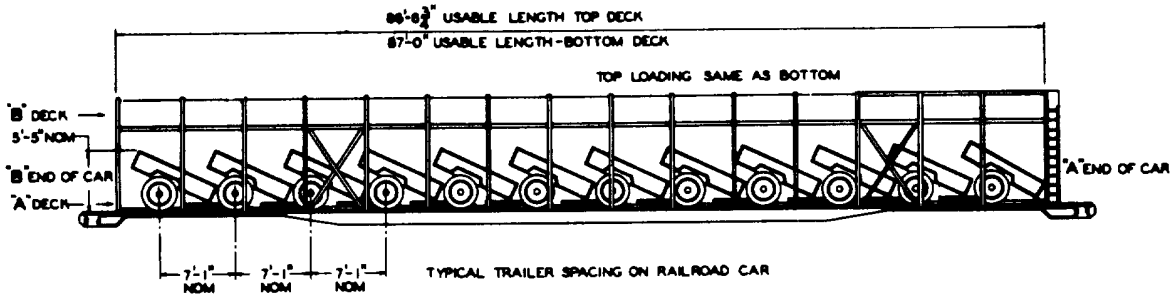
When car and rack are both equipped with cushioning devices, 18,000 pound proof test chain may be used to secure the vehicle.

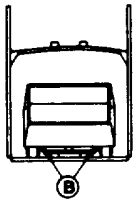
See General Rules 4, 5, 7, 15 and 19A for further details.

Section No. 6

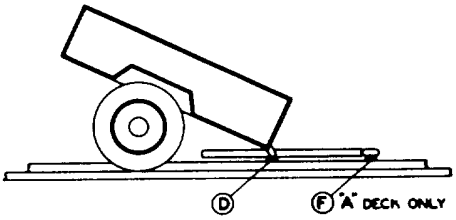
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TRAILER, CARGO, ¾ TON, M101A1-B1-LEVEL RACK CARS

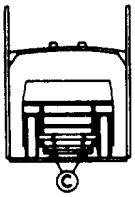




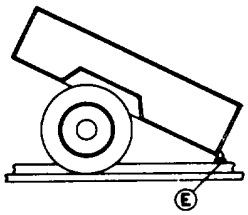
TYPICAL TIE FOR FRONT
SKETCH 1



SKETCH 3



TYPICAL TIE FOR REAR
SKETCH 2



DRAW BAR REMOVED TYPICAL TRAILERS NO. 11 OR 12, 22 OR 24
SKETCH 4

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2 ea. unit.	5/8 inch chain minimum proof test of 6,700 pounds, length to suit. Attach the chain in a complete loop, from the car tie-down facility through the lifting shackles on the front end of the trailer and back to the rack tie-down channel. Secure the chain with a 3/8 inch diameter bolt and nut, length to suit. See Sketch 1. Substitute, if desired, eight strands of No. 8 gage, black annealed wire. Pass the wire through the trailer tie-down point and through the rack tie-down channel to form four complete loops consisting of eight strands.
C	2 ea. unit.	Chain tie-down equipped with a tensioning device, minimum proof test of 6,700 pounds. Attach the chain tie-down over the top and around the rear axle as shown. See Sketch 2. Hand tension as tight as possible and attach hook into an appropriate located link of chain. All four chains Items "B" and "C" are then to be made taut by adjusting the tensioning device.
D	1 ea. unit.	Each to consist of one piece 2 in. x 4 in. x 44 in. lumber; located under draw bar assembly directly behind lifting shackles at front of vehicle. See Sketch 3.
E	1 ea. for units specified.	Each to consist of one piece 2 in. x 4 in. x 44 in. lumber; locate under vehicle lifting shackle bracket. Secure with two strands No. 8 gage, black annealed wire to lifting shackle either on trailer number 11 or 12, and 22 or 24, depending on rail car capacity. See Sketch 4.
F	1 ea. unit.	Each to consist of one piece 2 in. x 4 in. x 44 in. lumber, locate under eye of lunette. Secure with two strands of No. 8 gage, black annealed wire, passed through eye of lunette. See Sketch 3.

GENERAL INSTRUCTIONS

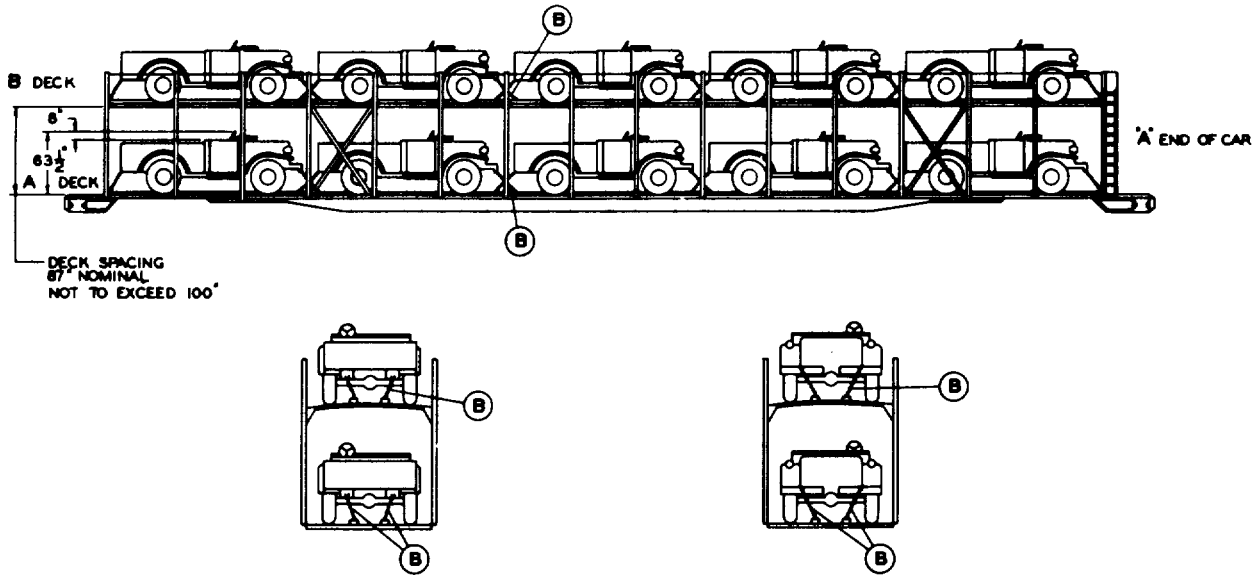
1. Shippers should specify cars equipped with normal complement tie-down chains when ordering rail equipment. Consignees shall ensure that all tie-down devices are with the car when released to the rail carrier after unloading.
2. Trailers must face in the same direction and be uniformly spaced along the length 'of the car to allow sufficient space at each end of the car and between the trailers for securement. To effect maximum loading the rear mount-

ing bolts should be removed from the tongue, allowing It to "Jack-knife" and lie on the floor of the car. Also, the tongue of front trailer on both levels should be removed and secured in the body of the trailer.

3. Apply chain tie-down parallel to each other at the same end of the vehicle and down from the trailer point of attachment to the rack tie-down channel at approximately a 45 degree angle. Care must be exercised to ensure that the tie-downs are properly tensioned, all slack is removed and tie-down devices locked.
4. Tie-downs when installed shall not come in contact with electrical wiring, vehicle controls and other appurtenances.
5. Hand brakes must be set on each trailer.
6. Open hooks must be secured with wire over the openings to prevent the hook from becoming disengaged from the chain link to which it is secured.
7. Turnbuckles when used to tighten chains must be wired or locked to prevent them from turning during transit unless the turnbuckles are equipped with self-locking devices.
8. Twenty-four trailers can be loaded on a bi-level car having an 87-foot long usable bottom deck and an 86-foot- 6 ¾ inch long usable top deck with continuous center tie-down positions running the entire length of both decks of the rack. Twenty-two trailers can be loaded on racks of shorter length than shown above, but in excess of 80 feet in length. For all loadings, trailer axles should be spaced approximately 7 ft. 1 in. apart.
9. The numbering sequence of units starts from "B" end of car, either deck.
10. When cars are equipped with racks designed to allow longitudinal movement between racks and car, precaution must be taken to provide for clearance of load and securement over fixed portion of car.

See General Rules 4, 5, 7, 9, 10, 15 and 19B for additional details.

TRUCK, 4 X 4, EMPTY OR LOADED, 8,500 LBS. AND UNDER-BI-LEVEL CUSHIONED FLAT CAR



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. unit.	Chain tie-down device with a minimum proof test of 6,700 lbs. Attach one chain tie-down over and around each front and rear vehicle lifting shackle. Attach hooks into an appropriately located link of each chain. Open hooks must be secured with wire over the openings to prevent hook from becoming disengaged from the chain link to which it is secured. Each chain is to be adjusted to the proper tension by use of tensioning device supplied with car.

GENERAL INSTRUCTIONS

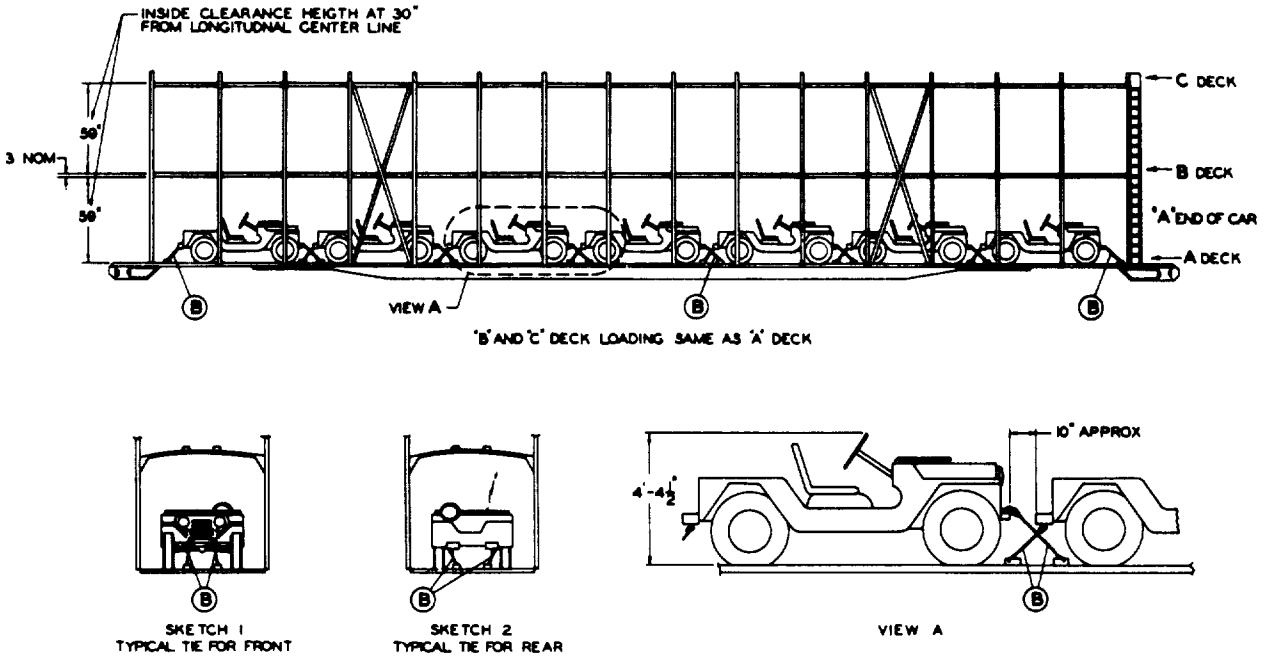
1. Shippers should specify cars equipped with tie-down devices in the quantities specified in Item "B," and with decks of sufficient capacities to withstand the total load of vehicles loaded thereon.
2. Load binders are not to be used as tensioning devices.
3. Vehicles must face in the same direction and be uniformly spaced along the length of the car to allow sufficient space at each end of the car and between the vehicles for securement. Apply tie-downs parallel to each other at the same end of the vehicle and down from the vehicle lifting shackles to the car tie-down facility. The angle of the tie-down must not be greater than 45 degrees.
4. Tie-down chains must be free from twisted or kinked links, prior to their application to the vehicles.
5. Hand brakes must be set.
6. Gear shift levers must be secured in a neutral position with wire tie.
7. Tie-downs must not be applied around axles.
8. The numbering sequence of units starts from the "B" end of the car, on any deck.
9. Method of loading, as shown, is applicable to other types of vehicles weighing up to 8,500 lbs. The following vehicles in the quantity shown can be loaded on an 85 ft. or longer railcar equipped with tie-down positions running the entire length of car located between the wheels of the vehicles:

Type	Description	No. Per Car
M37 & M37B1	Truck, Cargo, 4 x 4, ¾ Ton, W/W & W/OW	10
M201 & M201B1	Truck, Maint., 4 x 4, ¾ Ton, W/W & W/OW	8
M715	Truck, Cargo, 4 x 4, 1 ¼ Ton, W/W & W/OW	8

See General Rules 4, 5, 7, 15, 19-A and 19-B for further details.

Sec. 6-Fig. 303 (Rev.-8-1972)

¼ TON, 4 X 4, UTILITY TRUCKS, BI-LEVEL OR TRI-LEVEL CAR



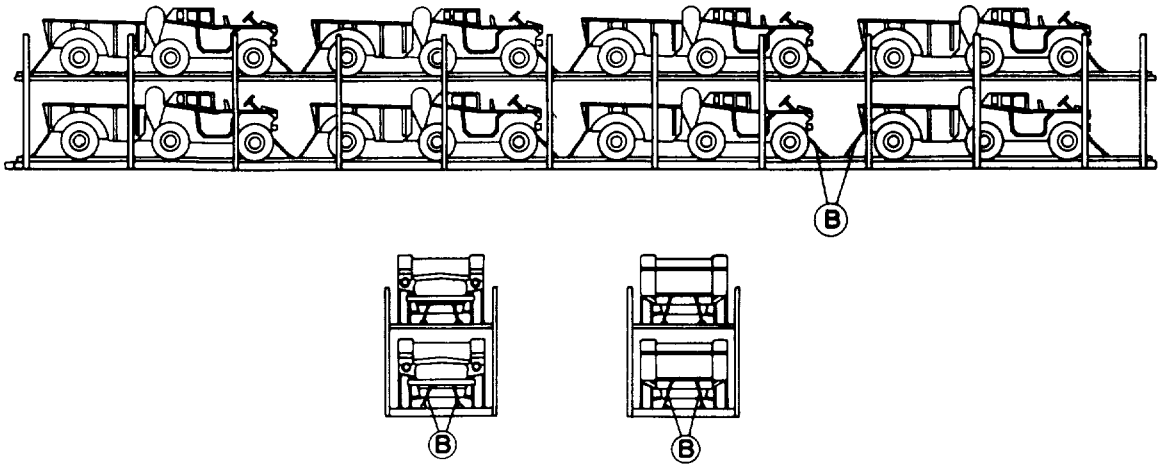
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. unit.	Chain tie-down and tensioning device with a minimum proof test of 6,700 lbs. Pass one chain through each clevis, attached to front bumper and rear of truck, under each bumperette. See Sketches 1 and 2. Hand tension, as tight as possible, each tie-down chain and attach grab hook into an appropriate link of the tie-down chain. Open hooks must be secured with wire over the openings to prevent hook from becoming disengaged from the chain link to which it is secured. Each chain is adjusted to the proper tension by use of the tensioning device supplied with car.

GENERAL INSTRUCTIONS

1. Shippers should specify cars equipped with tie-down devices in the quantities specified in Item "B," and with decks of sufficient capacities to withstand the total load of vehicles loaded thereon.
2. Trucks must face in the same direction and be uniformly spaced along the length of the rail car to allow sufficient space between the trucks and at each end of the rail car for proper securement.
3. Tie-down chains must be free from twisted or kinked links, prior to their application to the vehicles.
4. Tie-down chains shall be secured parallel to each other at the same end of the vehicle and so placed that the chain angles will be approximately 45 degrees outboard from the truck clevis to the tie-down device. After tie-down chains are tensioned, they shall be hit sharply with a hammer to relieve any binding and the tie-down chains retensioned, if necessary. There must be at least one full wrap of chain around the tensioning device drum with the ratchet locking device in position.
5. Truck transmission gear must be set in "neutral" position and hand brake firmly set before rail car is released for transit.
6. Tie-downs when installed shall not come in contact with electrical wiring, vehicle controls or other appurtenances.
7. Seven trucks can be loaded on each deck of an 85 ft., 87 ft. 4 in. or 89 ft. 1 in. bi-level or tri-level car which has two continuous parallel tie-down tracks or rails, running the entire length of each deck, located between the wheels of the vehicles. For all loadings, there should be approximately 10 inches between vehicles.
8. The numbering sequence of units starts from the "B" end of the car, on any deck.

See General Rules 4, 5, 7, 15, 19-A and 19-B for further details.

TRUCK, CARGO, ARTICULATED, 1 ¼ TON, 6X6, M561 WITH OR WITHOUT WINCH, BI-LEVEL CUSHIONED FLAT CARS



Item	No. of Pcs.	Description
*A		Brake Wheel Clearance. See Fig. 2, Sec. 1.
B	4 ea. unit	Chain tie-down device with 46 inch alloy chain with a minimum proof test of 8500 pounds. or Chain tie-down device with 3/ inch high test chain having a minimum proof test of 8500 pounds. Pass one chain tie-down through each of the vehicle tie-down shackles, front and rear. Attach hooks into an appropriately located link on each chain. Further tensioning should be accomplished by utilizing the tensioning device supplied with the car.

GENERAL INSTRUCTIONS

1. Tension each chain until a slight depression is noted in the vehicle suspension system. After chains have been tensioned, they should be hit sharply with a hammer to relieve any binding. Retention chains if required.
2. Shippers should specify cars equipped with tie-down devices in the quantities and with chain strengths specified in Item "B" and with decks of sufficient capacities to withstand the total load of vehicles loaded thereon.
3. Trucks must face in the same direction and be uniformly spaced along the length of the rail car to allow sufficient space between the trucks and at each end of the rail car for proper securement.
4. Tie-down chains must be free from twisted or kinked links, prior to their application to the vehicle.
5. Tie-down chains shall be secured parallel to each other at the same end of the vehicle and so placed that the chain angles will be approximately 45 degrees outboard from the truck clevis to the tie-down device. After the tie-down chains are tensioned, they shall be hit sharply with a hammer to relieve any binding and the tie-down chains retensioned, if necessary. There must be at least one full wrap of chain around the tensioning device drum with the ratchet locking device in position.
6. Truck transmission gear must be set in "neutral" position and "wire tied" and hand brake firmly set before rail car is released for transit.
7. Tie-downs when installed shall not come in contact with electrical wiring, vehicle controls or other appurtenances.

See General Rules 1, 4, 5, 7, 15, 19-A, 19-B and 19-C for further details.

*Not shown on drawing.

APPENDIX F
AAR LOADING RULES
SECTIONS 3 and 4

(The following information is extracted from the Association of American Railroads manual, *General Rules Governing the Loading of Commodities on Open Top Cars and Trailers*.)

SECTION No. 3

PART 1

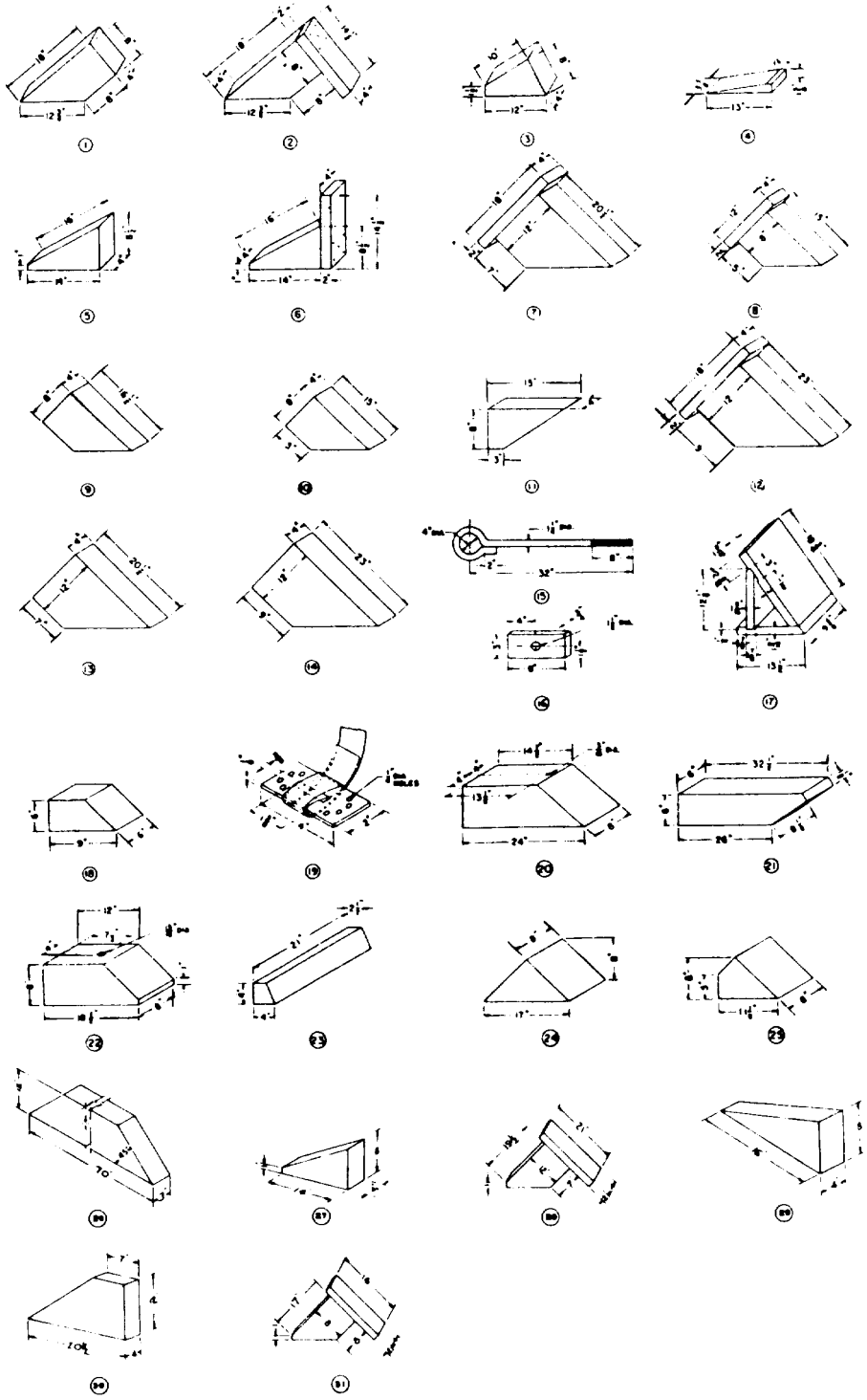
RULES GOVERNING

THE

Loading of Road Grading and Road Making Machinery On Open Top Cars

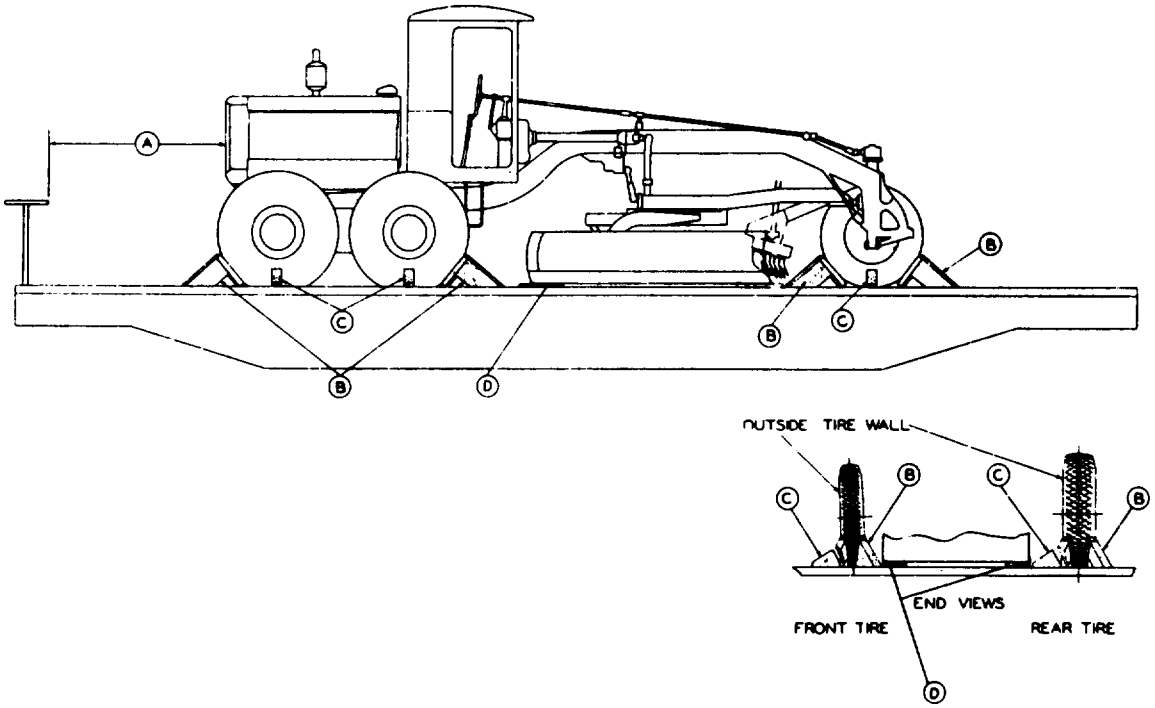
Part 1-Section No. 3 (Rev.-9-1983)

BLOCKING PATTERNS
ROAD GRADING AND ROAD MAKING MACHINERY



Sec. 3--Fig. 1 (Rev.-10-1968)

FOUR AND SIX WHEEL MOTOR GRADERS (WITH PNEUMATIC TIRES), LENGTHWISE-FLAT CARS

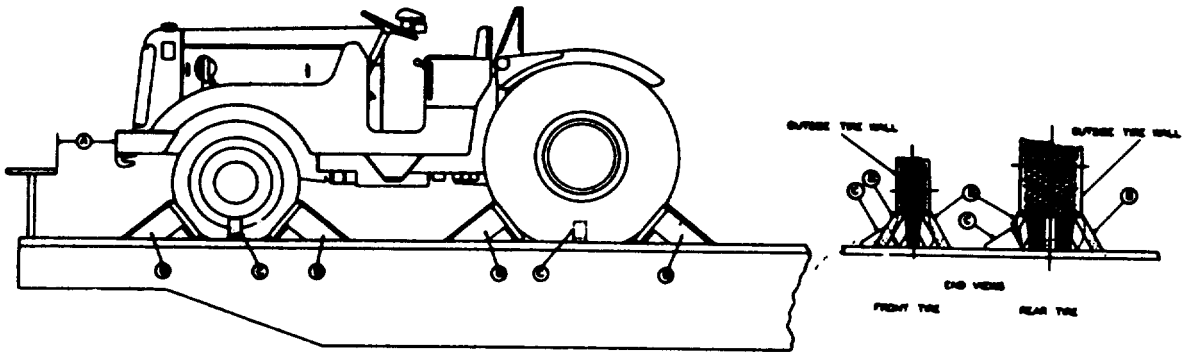


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	16 or 8	Blocks, pattern 2. Locate two against front and back of each front wheel, two in front of each intermediate wheel and two in back of each rear wheel. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.
		For six wheel units weighing 10,000 lbs. or less, and for all four wheel units, use one Item "B" at each location.
C	6	Blocks, pattern 3. Locate all against either inside or outside of each wheel and nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.
D	2	1 in. x 6 in. x 24 in. Locate longitudinally under blade of unit, suitably spaced as shown, and secure each to floor with three 10-D nails.
		*When the unit is shipped in a preserved condition, by or for the Department of Defense, the blade is to be elevated to maximum position and secured to the grader frame with 1/2 in. 6 x 19 preformed wire rope, length to suit, and two 1/2 in. cable clips. Mechanical or hydraulic blade controls must be placed in closed position and wired.

If so equipped, hand brakes must be tightly set and levers wired.

See General Rules 4, 5, 7, 9, 14, 19-A, 19-B and Fig. 1-B for further details.

FOUR WHEEL TRACTOR (WITH PNEUMATIC TIRES), LENGTHWISE-FLAT CARS



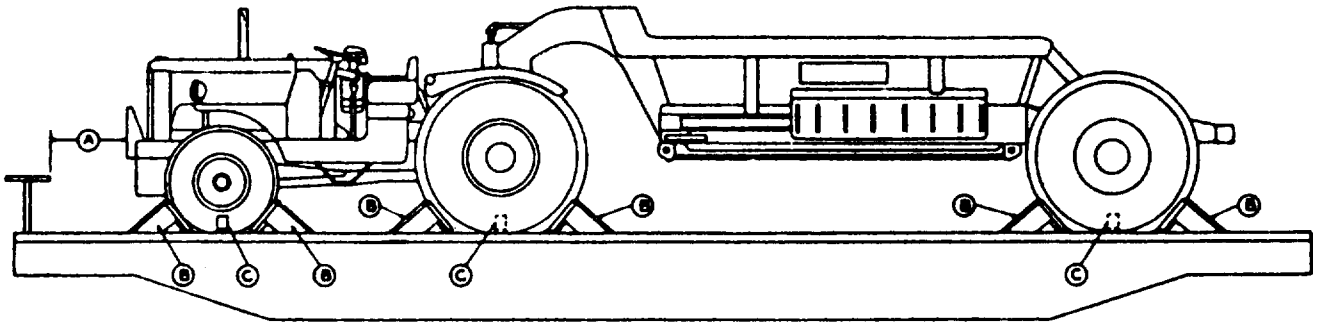
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	20	Blocks, pattern 2. Locate two against front and back of each front wheel and three against front and back of each rear wheel. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.
C	4	Blocks, pattern 3. Locate one against the outside of each front wheel and one against the inside of each rear wheel. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.

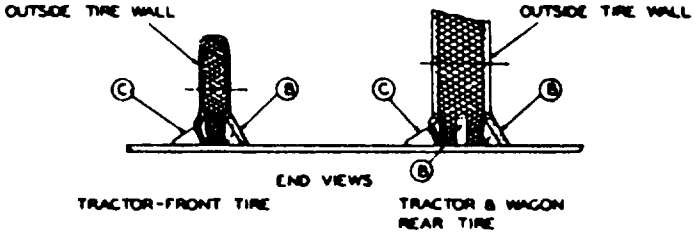
If so equipped, hand brakes must be tightly set and levers wired.

See General Rules 4, 5, 7, 9, 14, 19-A, 19-B and Fig. 1-B for further details.

Sec. 3--Fig. 3

COMBINATION FOUR WHEEL TRACTOR AND DUMP CART (WITH PNEUMATIC TIRES), LENGTHWISE-FLAT CARS





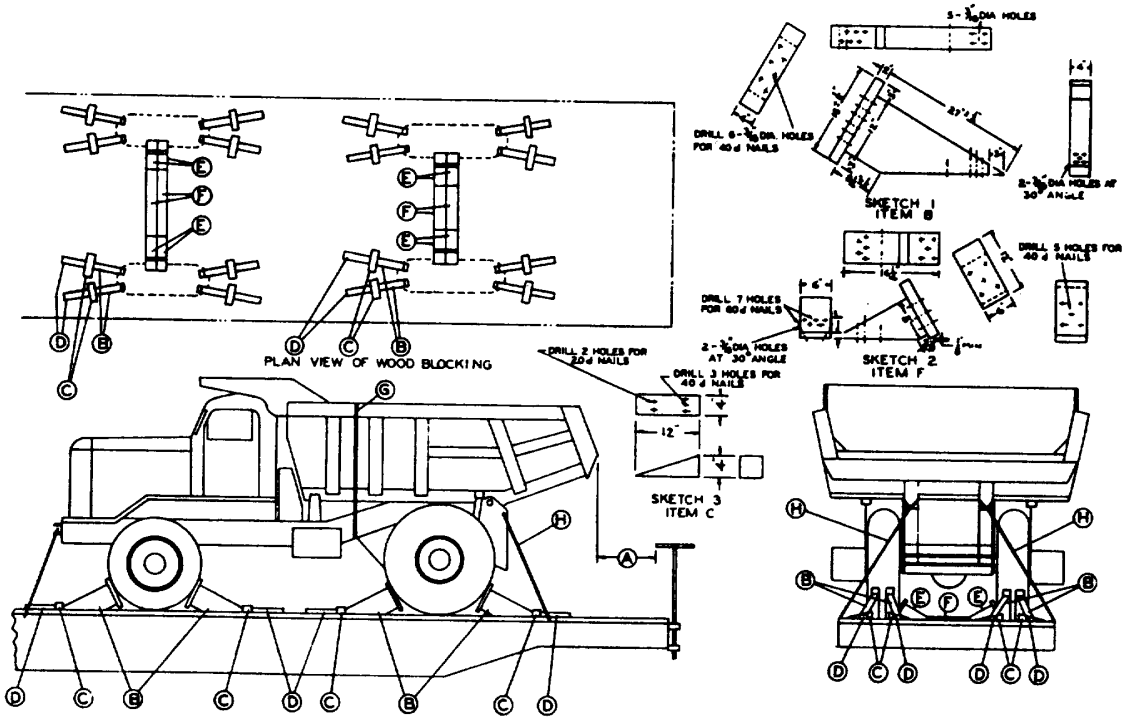
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	32	Blocks, pattern 2. Locate two against front and back of each front wheel of tractor, three against front and back of each rear wheel of tractor and against front and back of each cart wheel. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel of block and one 40-D nail in each side of block.
0	6	Blocks, pattern 3. Locate one against the outside of each front tractor wheel, against the inside of each rear wheel of tractor and against the inside of each cart wheel. Nail each to floor with two 60)-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.

If so equipped, hand brakes must be tightly set and levers wired.

See General Rules 4, 5, 7, 9, 14, 19-A, 19-B and Fig. 1-B for further details.

Sec. 3--Fig. 4 (Rev.-10-1981)

MOTOR VEHICLES, HAULING OR DUMPING, OFF-HIGHWAY TYPE (WITH PNEUMATIC TIRES) 90,000 LBS. OR LESS--FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Figure 2, Section No. 1.
B	16	Blocks, Sketch 1. Locate against front and back of each wheel. Secure to floor of car with five (5) 60-D nails through toe of block and one (1) 60-D nail through each side.
C	16	Blocks, Sketch 3. Locate crosswise of car, against Items "B". Secure to floor of car with three (3) 40-D nails and two (2) 20-D nails.
D	16	Blocks, 3 in. x 3 in. x 18 in. Locate against Items "C". Secure to car floor with six (6) 40-D nails.
E	8	Blocks, Sketch 2. Locate against inside wheels. Secure to car floor with seven (7) 60-D nails.
F	4	Blocks, 2 in. x 6 in., length to suit. Locate between Items "E". Secure each to car floor with five (5) 40-D nails.
G	1	1 1/4 in. x .035 in. high tension band. Encircle dump body and frame.
H	4	5/8 in. 6 x 19 IWRC wire rope, length to suit. Locate two (2) at each end of truck. Attach to axle, frame, or hitch and to stake pockets to provide a 45° angle to truck. When cable is attached to axle or frame, locate to form a criss-cross to stake pockets.

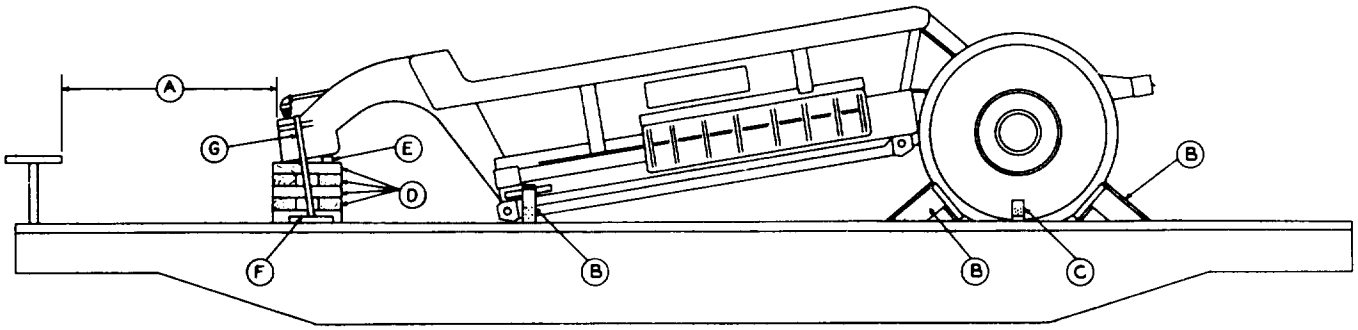
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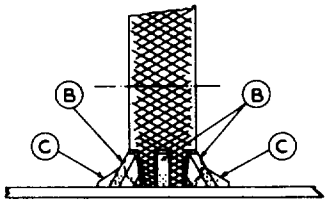
1. If so equipped, foot and hand brakes must be tightly set and levers wired.

See General Rules 1, 2, 3, 4, 5, 7, 9, 15, and 19-B for further details.

Sec. 3--Fig. 5

TWO WHEEL DUMP CART (WITH PNEUMATIC TIRES), LENGTHWISE-FLAT CARS



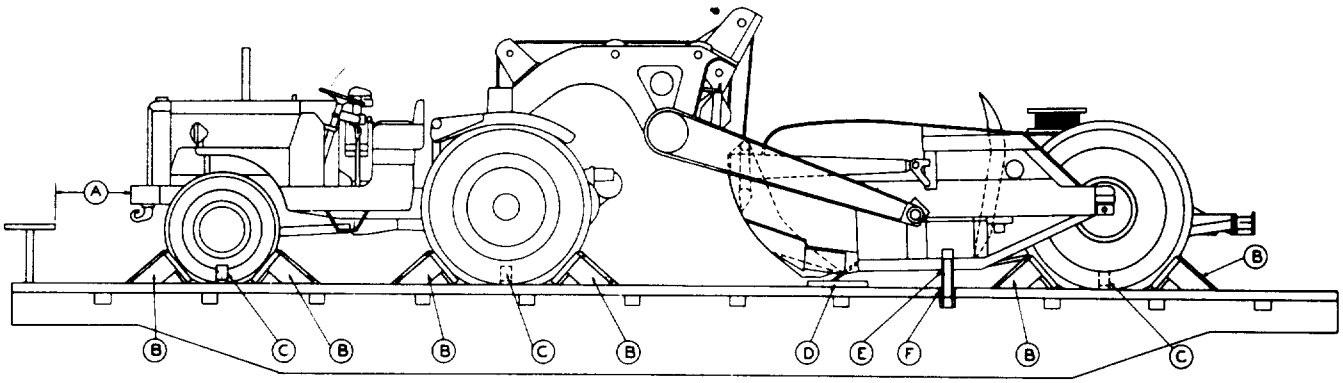


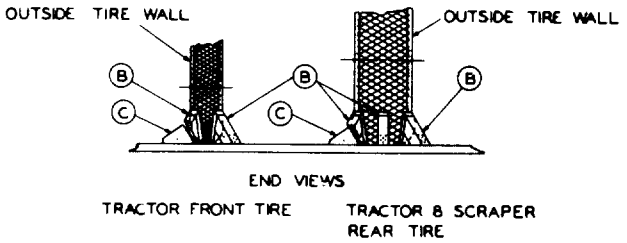
END VIEW OF TIRE

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2., Sec. 1.
B	14	Blocks, pattern 2. Locate three against front and back of each wheel and one against each side of frame. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel of block and one 40-D nail in each side of block.
C	4	Blocks, pattern 3. Locate one against the inside and outside of each wheel. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.
D	10	4 in. x 8 in. x 24 in. Alternate in tiers of two, lengthwise and crosswise, as shown under front end of cart. Nail lower pieces to floor with four 60-D nails and upper pieces to those below with four 60-D nails.
E	1	2 in. x 4 in. x 24 in. Locate on top of Items "D", under front end of cart, as shown.
F	2	2 in. x 6 in. x 16 in. Locate one against outside of each bottom outside Item "D" and nail to floor with five 40-D nails.
G	1	2 in. x .050 in. high tension band, length to suit. Pass over top of frame at front end, underneath and around Items "F" and nail to floor with two 40-D nails at each location.

See General Rules 4, 5, 7, 9, 14, 15, 19-B and Fig. 1-B for further details.

COMBINATION FOUR WHEEL, TRACTOR AND TWO WHEEL TRACTOR DRAWN SCRAPER (WITH PNEUMATIC TIRES), LENGTHWISE-FLAT CARS



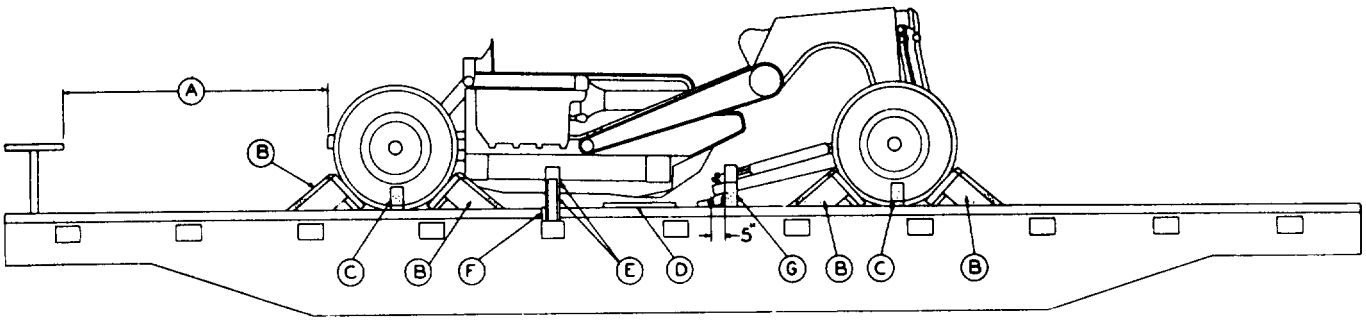


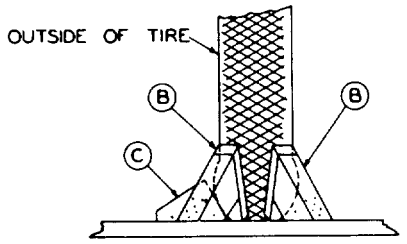
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	32	Blocks, pattern 2. Locate two in front and back of each front wheel of tractor, three in front and back of each rear wheel of tractor and three in front and back of each scraper wheel. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.
C	6	Blocks, pattern 3. Locate one against the outside of each front wheel of tractor, against inside of each rear wheel of tractor and against inside of each wheel of scraper. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.
D	2	2 in. x 6 in. x 24 in. Locate one under each side of blade of scraper to prevent contact with floor of car.
E	As required.	3 1/2 in. x 4 in. x 23 1/2 in. Locate in stake pocket on each side about at center of scraper. Drive a 40-D nail into stake directly below and with head even with outside of stake pocket, or into stake through hole in center of stake pocket.
F	As required.	Blocks, pattern 4. Locate in stake pockets on each side of Items "E" and drive down so as to retain Items "E" in place. Nail each to Item "E" with one 10-D nail.

If so equipped, hand brakes must be tightly set and levers wired.

See General Rules 4, 5, 7, 9, 10, 14, 19-A, 19-B and Fig. 1-B for further details.

FOUR WHEEL TRACTOR DRAWN SCRAPER (WITH PNEUMATIC TIRES), LENGTHWISE-FLAT CARS



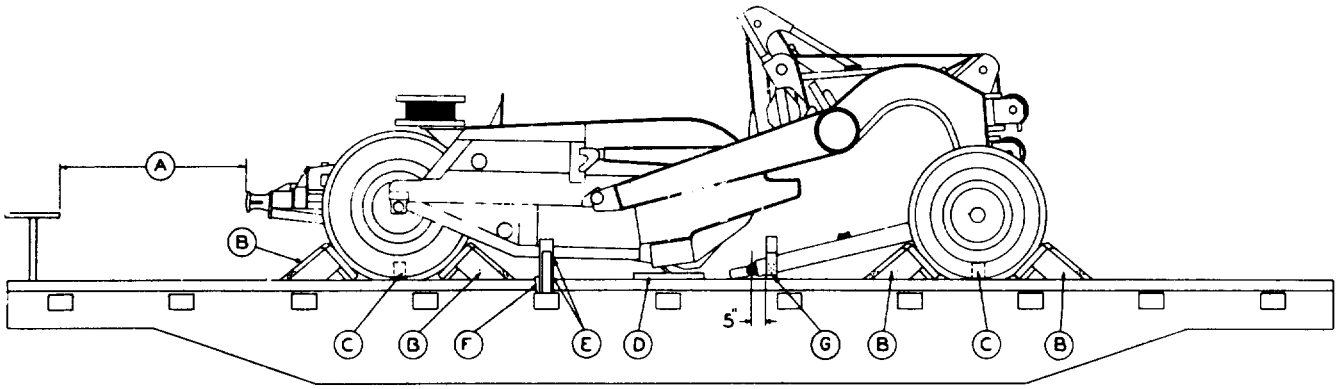


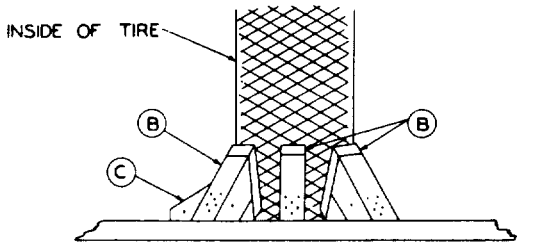
END VIEW OF TIRE BLOCKING
FRONT & REAR

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	16	Blocks, pattern 2. Locate two in front and back of each front and rear wheel. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.
C	4	Blocks, pattern 3. Locate one against the outside of each front and rear wheel. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.
D	2	2 in. x 6 in. x 24 in. Locate one under each side of blade of scraper to prevent contact with floor of car.
E	As required.	3 1/2 in. x 4 in. x 23 ½ in. Locate in stake pocket on each side about at center of scraper. Drive a 40-D nail into stake directly below and with head even with outside of stake pocket, or into stake through hole in center of stake pocket.
F	As required.	Blocks, pattern 4. Locate in stake pockets on each side of Items "E" and drive down so as to retain Items "E" in place. Nail each to Item "E" with one 10-D nail.
G	2	Blocks, pattern 6. Locate one against each side of tongue, as shown. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.

See General Rules, 4, 5, 7, 9, 10, 14, 19-A, 19-B and Fig. 1-B for further details.

FOUR WHEEL TRACTOR. DRAWN SCRAPER (WITH PNEUMATIC TIRES), LENGTHWISE--FLAT CARS



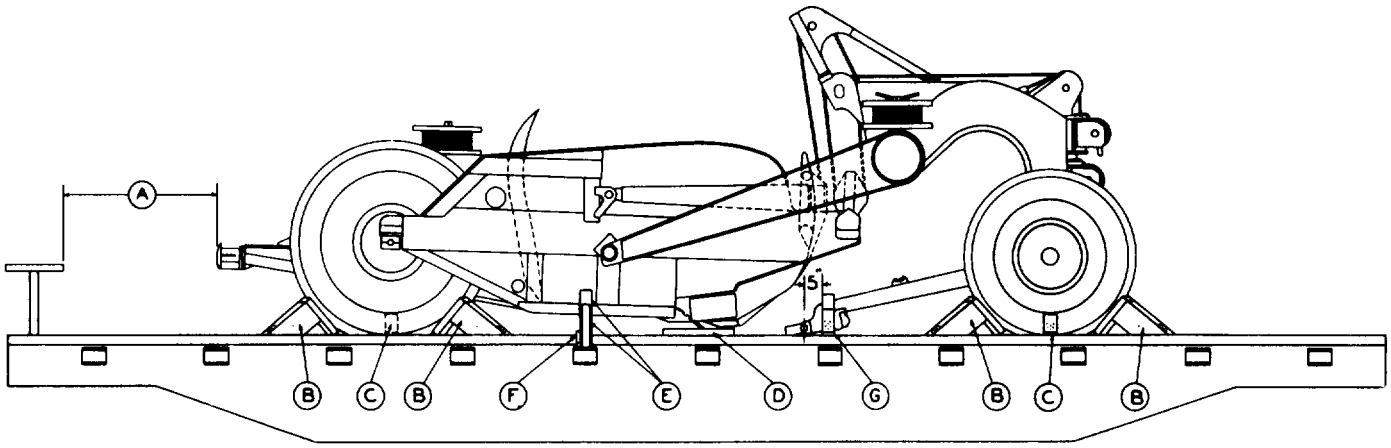


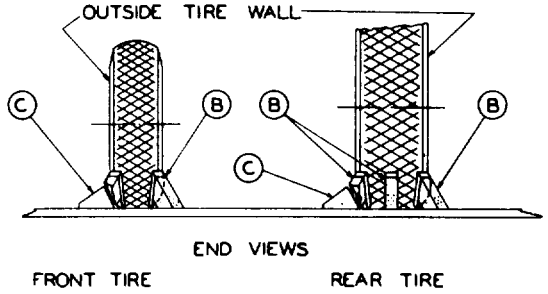
END VIEW OF TIRE BLOCKING
TIRE BLOCKING SAME FRONT & REAR

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	24	Blocks, pattern 2. Locate three in front and back of each front and rear wheel. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.
C	4	Blocks, pattern 3. Locate one against the inside of each front and rear wheel. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.
D	2	2 in. x 6 in. x 24 in. Locate one under each side of blade of scraper to prevent contact with floor of car.
E	As required.	3 1/2 in. x 4 in. x 23 ½ in. Locate in stake pocket on each side about at center of scraper. Drive a 4O-D nail into stake directly below and with head even with outside of stake pocket, or into stake through hole in center of stake pocket.
F	As required.	Blocks, pattern 4. Locate in stake pockets on each side of Items "E" and drive down so as to retain Items "E" in place. Nail each to Item "E" with one 10-D nail.
G	2	Blocks, pattern 6. Locate one against each side of tongue, as shown. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.

See General Rules 4, 5, 7, 9, 10, 14, 19-A, 19-B and Fig. 1-B for further details.

FOUR WHEEL TRACTOR DRAWN SCRAPER (WITH PNEUMATIC TIRES), LENGTHWISE-FLAT CARS

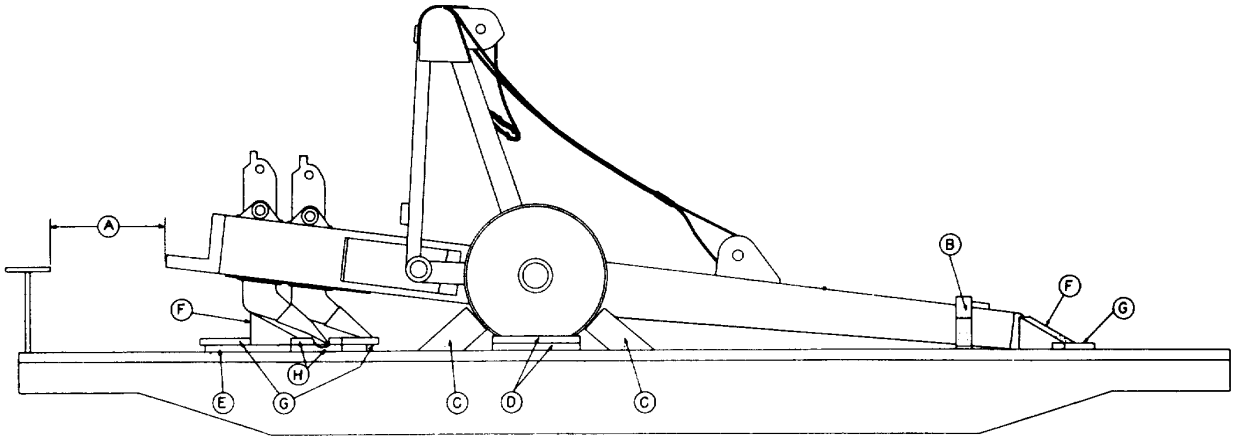


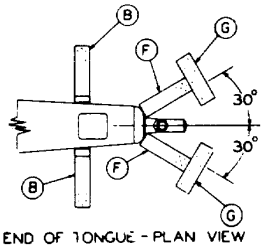


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	20	Blocks, pattern 2. Locate two in front and back of each front wheel and three in front and back of each rear wheel. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.
C	4	Blocks, pattern 3. Locate one against the outside of each front wheel and one against the inside of each rear wheel. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.
D	2	2 in. x 6 in. x 24 in. Locate one under each side of blade of scraper to prevent contact with floor of car.
E	As required.	3½ in. x 4 in. x 23½ in. Locate in stake pocket on each side about at center of scraper. Drive a 40-D nail into stake directly below and with head even with outside of stake pocket, or into stake through hole in center of stake pocket.
F	As required.	Blocks, pattern 4. Locate in stake pockets on each side of Items "E" and drive down so as to retain Items "E" in place. Nail each to Item "E" with one 10-D nail.
G	2	Blocks, pattern 6. Locate one against each side of tongue, as shown. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.

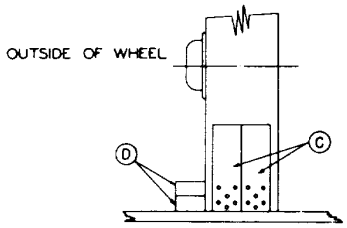
See General Rules 4, 5, 7, 9, 10, 14, 19-A, 19-B and Fig. 1-B for further details.

RIPPERS, ROOTERS AND SCARIFIERS, LENGTHWISE-FLAT CARS





END OF TONGUE - PLAN VIEW



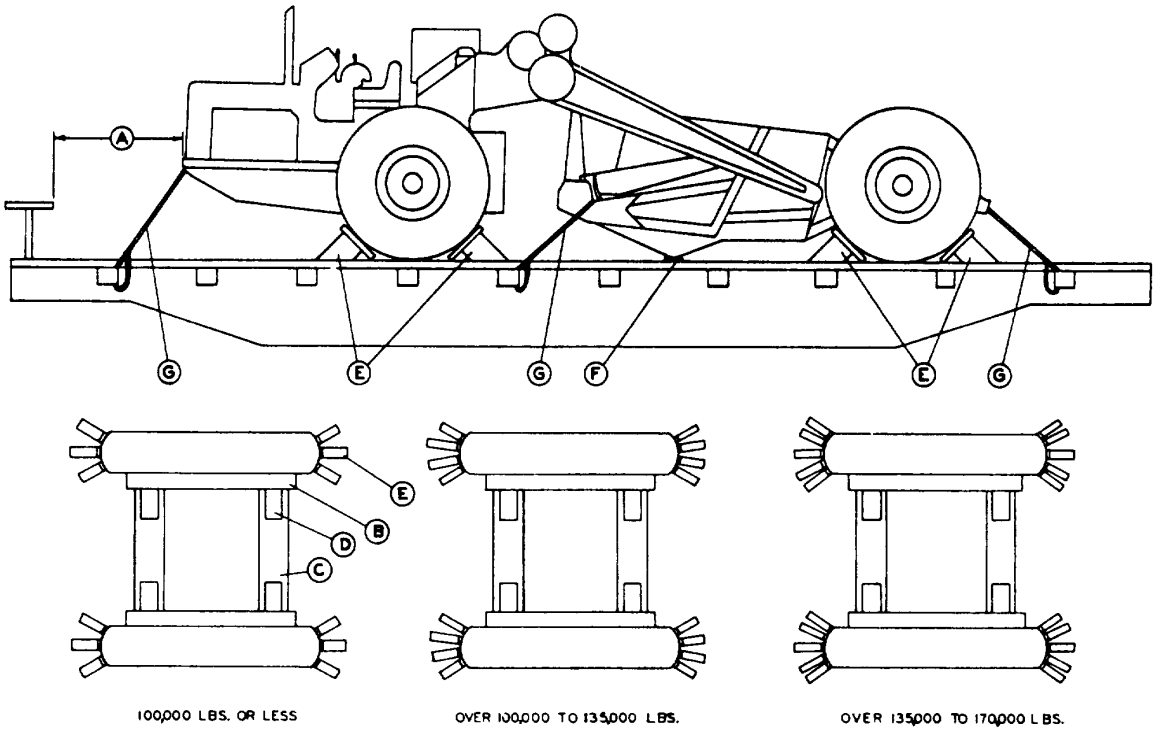
END VIEW OF WHEEL

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	2	Blocks, pattern 6. Locate one against each side of tongue, as shown. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of block.
0	8	Blocks, pattern 1. Locate two, side by side, in front and back of each wheel. Nail each to floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each sidefo block.
D	4	2 in. x 4 in. x 24 in. Locate two, lengthwise of car, against outside of each wheel. Nail lower pieces to floor with five 40-D nails in each and top pieces to the ones below with five 40-D nails in each.
E	2	2 in. x 6 in. x 44 in. Locate one under each outside Ripper tooth and nail to floor with six 40-D nails.
F	4	Blocks, pattern 8. Locate one under each outside Ripper tooth on top of Item "E" and one against each corner of tongue as shown. Nail each to Item "E" or floor with two 60-D, three 40-D and one 20-D nail in heel and one 40-D nail in each side of book.
G	8	2 in. x 4 in. x 14 in. Locate one on top of each Item "E" and on floor behind each Item "F" and one on top of each Item "E" in front of each outside Ripper tooth. Nail each with four 40-D nails.
H	2	Each to consist of two blocks. 2 in. x 4 in. x 14 in. Locate lower pieces on floor against the outside of Items "E". Nail lower piece to floor with four 40-D nails and top piece to the one below with four 40-D nails.

See General Rules 4, 5, 7, 9, 14 and Fig. 1-B for further details.

Sec. 3--Fig. 12 (Rev.-9-1983)

COMBINATION TWO WHEEL TRACTOR AND TRACTOR DRAWN SCRAPER (WITH PNEUMATIC TIRES) LENGTHWISE, 170,000 LBS. OR LESS-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. No. 1.
B	1 each wheel	Blocks, pattern 26. Locate one inside of each wheel.
C	2 each wheel set	Lumber, 2 In. x 6 in., length to suit. Locate between Items "B". Secure each to car floor with 40-D nails spaced 12 inches apart.
D	2 each Item "C"	Blocks, pattern 27. Locate on top of Items "C" and against Items "B" and secure to both with six (6) 40-D nails.
E	100,000 lbs. or less, 6 each wheel Over 100,000 lbs. to 135,000 lbs. inclusive 8 each wheel. Over 135,000 lbs. to 170,000 lbs. inclusive 10 each wheel.	Blocks, pattern 28. Locate in front and back of each wheel as shown. Secure each to car floor with five (5) 40-D nails in heel and one (1) 40-D nail in each side of block.
F	2	Lumber, 4 in. x 8 in. x 24 In. Locate under scraper blade, each side, and secure each to car floor with four (4) 40-D nails.
G	3	5/8 in. dia. 6 x 19 IWRC wire rope, length to suit. Locate from stake pocket, one side of car, through shackles front of tractor, front of scraper and rear of scraper. Secure to opposite stake pocket. On chain tie-down cars, chains may be used in lieu of cables.

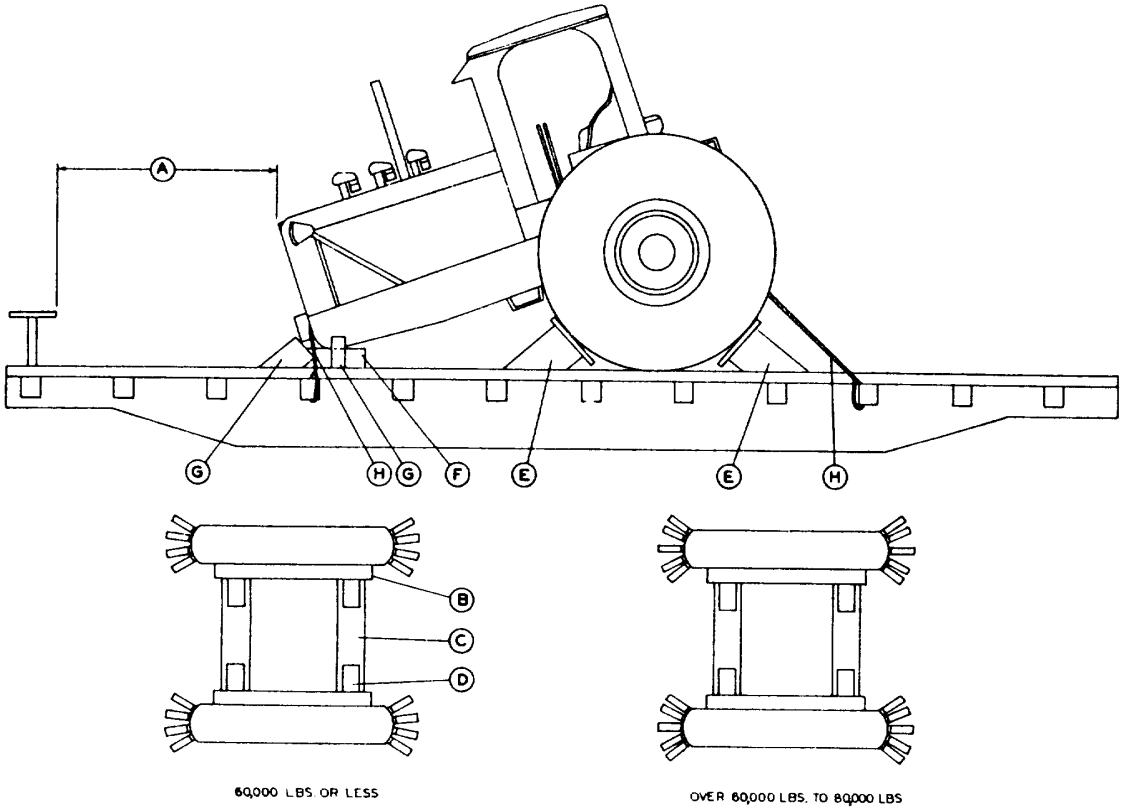
Note:

1. If so equipped, hand brakes must be tightly set and levers wired.

See General Rules 1, 2, 3, 4, 5, 7, 9, 14, 15, 19-A and 19-B for further details.

Sec. 3--Fig. 19 (Rev.--9-1983)

TWO WHEEL TRACTORS (WITH PNEUMATIC TIRES) LENGTHWISE, 80,000 LBS. OR LESS-FLAT CARS

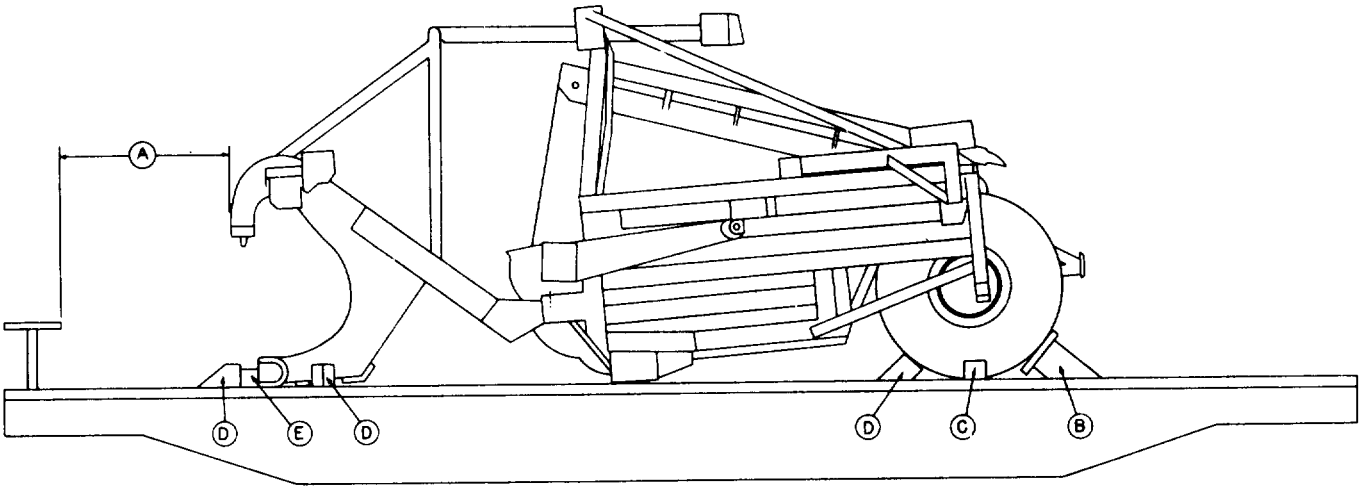


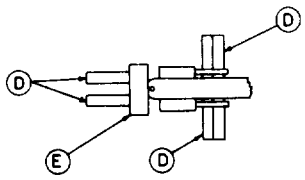
Item	No. of Pcs.	Description
A		Brake Wheel clearance. See Fig. 2, Sec. No. 1.
B	1 each wheel	Blocks, pattern 26. Locate one inside of each wheel.
C	2	Lumber, 2 in. x 6 In., length to suit. Locate between Items "B". Secure each to-car floor with 40-D nails spaced 12 inches apart.
D	2 each Item "C"	Blocks, pattern 27. Locate on top of Items "C" and against Items "B" and secure to both with six (6) 40-D nails.
E	60,000 lbs. or less 8 each wheel Over 60,000 lbs. to 80,000 lbs. inclusive 10 each wheel	Blocks, pattern 28. Locate in front and back of each wheel as shown. Secure each to car floor with five (5) 40-D nails in heel and one (1) 40-D nail in each side of block.
F	2	Blocks, 4 in. x 8 in. x 24 in. lumber. Locate at sides under front end of tractor and secure each with four (4) 40-D nails.
0	8	Blocks, pattern 28. Locate six (6) against front of tractor and one (1) each side at front of tractor. Secure each to car floor with five (5) 40-D nails in heel and one (1) 40-D nail in each side of block.
H	2	5/8 in. dia. 6 x 19 IWRC wire rope, length to suit. Locate from stake pocket, one side of car, through shackles, front and rear of tractor. Secure to opposite stake pocket. On chain tie-down cars, chains may be used in lieu of cables.

Notes:
1. If so equipped, hand brakes must be tightly set and levers wired.

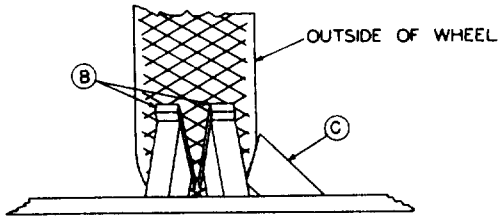
See General Rules 1,2, 3, 4, 5, 7, 9, 14, 15, 19-A and 19-B for further details.

TWO WHEEL TRACTOR DRAWN SCRAPER (WITH PNEUMATIC TIRES), LENGTHWISE-FLAT CARS





TOP VIEW OF FRONT END



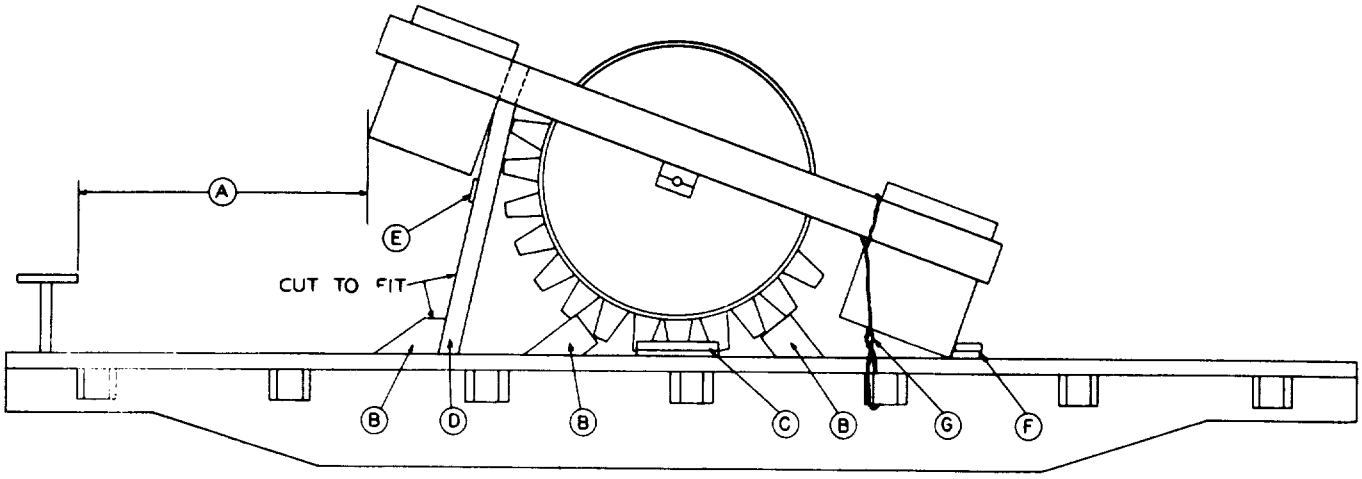
END VIEW

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	4	Blocks, pattern 7. Locate two in front of each wheel. Nail each to floor with five 40-D nails in heel and one 40-D nail in each side of block.
C	2	Blocks, pattern 9. Locate one against the outside of each wheel and nail each to floor with five 40-D nails in heel and one 40-D nail in each side of block.
D	10	Blocks, pattern 10. Locate two in rear of each wheel, two against Item "E" and two against each side of yoke frame. Nail each to floor with five 40-D nails in heel and one 40-D nail in each side of block.
E	1	6 in. x 6 in. x 18 in. Locate in front of yoke and toe-nail to floor with four 40-D nails.

See General Rules 4, 5, 7, 9, 14, 19-B and Fig. 1-B for further details.

Sec. 3-Fig. 21

SHEEPS FOOT ROLLER, LENGTHWISE--FLAT CARS

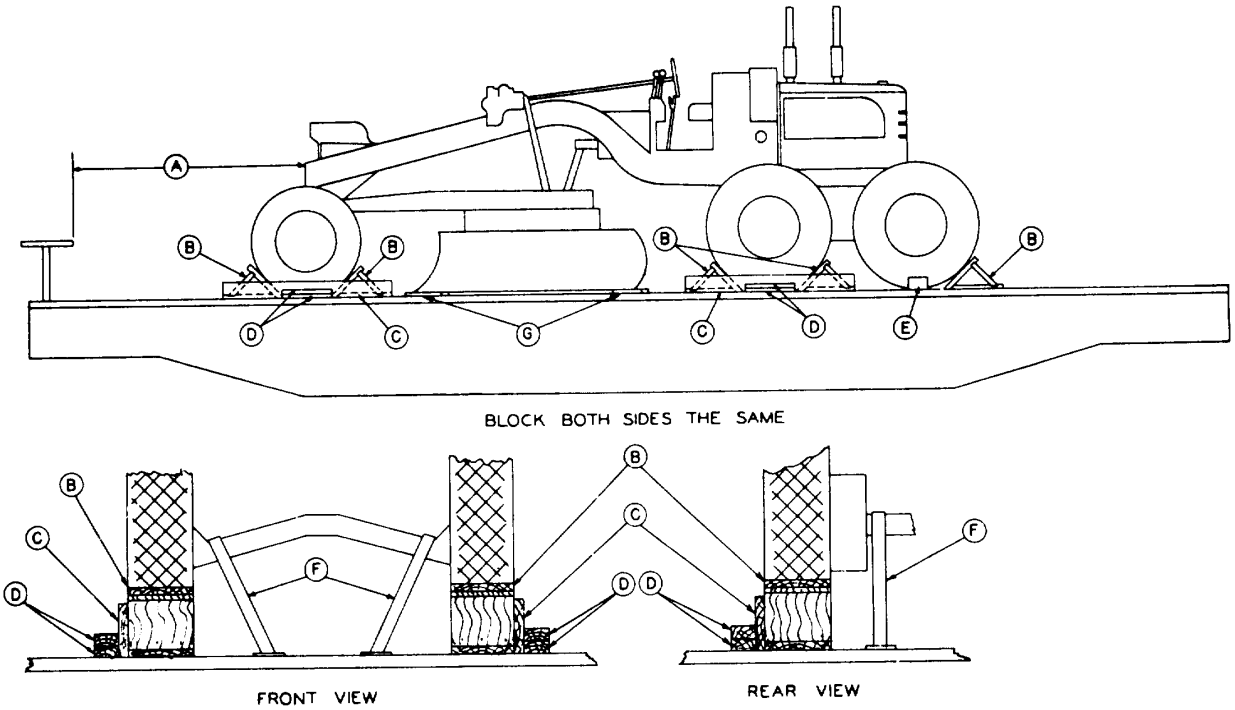


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	6	Blocks, pattern 10. Locate two in front and two in back of drum against feet and one in front of each Item "D". Nail each to floor with five 40-D nails in heel and one 40-D nail in each side of block.
0	4	2 in. x 4 in. x 18 in. Locate two against feet on each side of car. Nail lower piece to floor with three 40-D nails and top piece to the one below with three 40-D nails.
D	2	4 in. x 4 in. x 58 in. Locate one under frame between drum and box at each side of unit. Toenail each to Items "B" with four 40-D nails.
E	1	1 in. x 6 in. x 60 in. Locate about midway between top and bottom of Items "D" and nail to each Item "D" with three 20-D nails.
F	2	2 in. x 6 in. x 60 in. Locate on floor against boxes. Nail lower piece to floor with eight 40-D nails and top piece to the one below with eight 40-D nails.
O	2	Each to consist of six strands No. 7 gage wire. Locate, as shown, on each side of unit attached to frame and passed through stake pocket.

See General Rules 4, 5, 7, 9, 14, 15 and Fig. 1-B for further details.

Sec. 3-Fig. 24 (Rev.-10-1968)

SIX WHEEL MOTOR GRADERS (WITH PNEUMATIC TIRES), LENGTHWISE-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	10	Blocks, pattern 17. Locate one in front and back of each front wheel, one in front and back of each intermediate wheel and one in back of each rear wheel. Nail each to floor with five 30-D nails in heel and one 30-D nail in each side of block.
C	4	2 in. x 8 in. x 6 ft. Locate one against the outside of each front and each intermediate wheel. Nail to each Item "B" with five 30-D nails.
D	8	Each to consist of two blocks, 2 in. x 4 in. x 18 in. Locate one against center of each Item "C". Nail lower piece to floor with three 30-D nails and top piece to the one below with three 30-D nails.
E	2	Blocks, pattern 18. Locate one against the outside of each rear wheel. Nail each to floor with three 30-D nails in heel and one 30-D nail in each side of block.
F	6	1¼ in. x .035 in. high tension bands with twelve eight-hole anchor plates, pattern 19. Locate two over each end of each axle and nail each plate to floor with eight 30-D nails.
G	2	1 in. x 6 in. x 24 in. Locate longitudinally under blade of unit, suitably spaced as shown and secure each to floor with three 10-D nails.

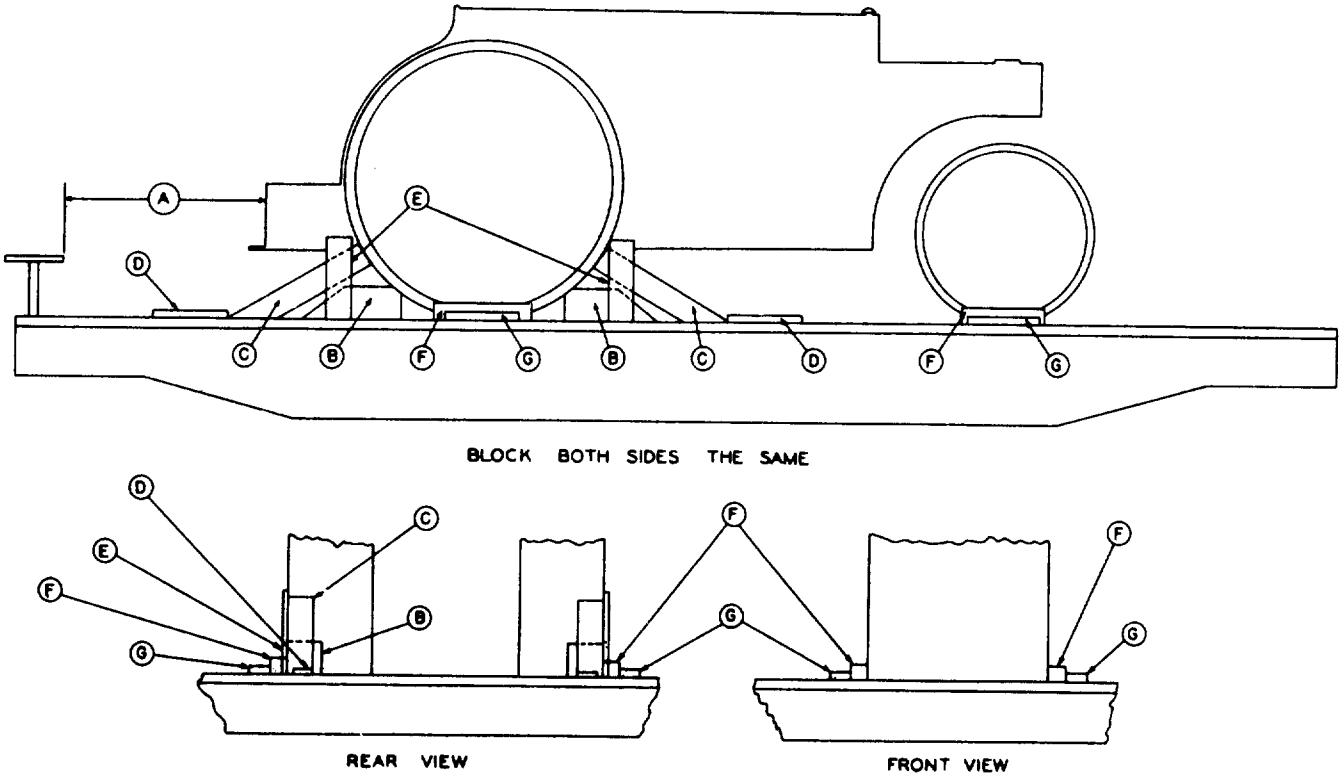
*When the unit is shipped in a preserved condition, by or for the Department of Defense, the blade is to be elevated to maximum position and secured to the grader frame with ½ in. 6 x 19 preformed wire rope, length to suit, and two ½ in. cable clips. Mechanical or hydraulic blade controls must be placed in closed position and wired.

If so equipped, hand brakes must be tightly set and levers wired.

See General Rules 4, 5, 7, 9, 14, 15, 19-A, 19-B and Fig. 1-B for further details.

Sec. 3--Fig. 25

THREE WHEEL ROAD ROLLERS, LENGTHWISE-FLAT CARS

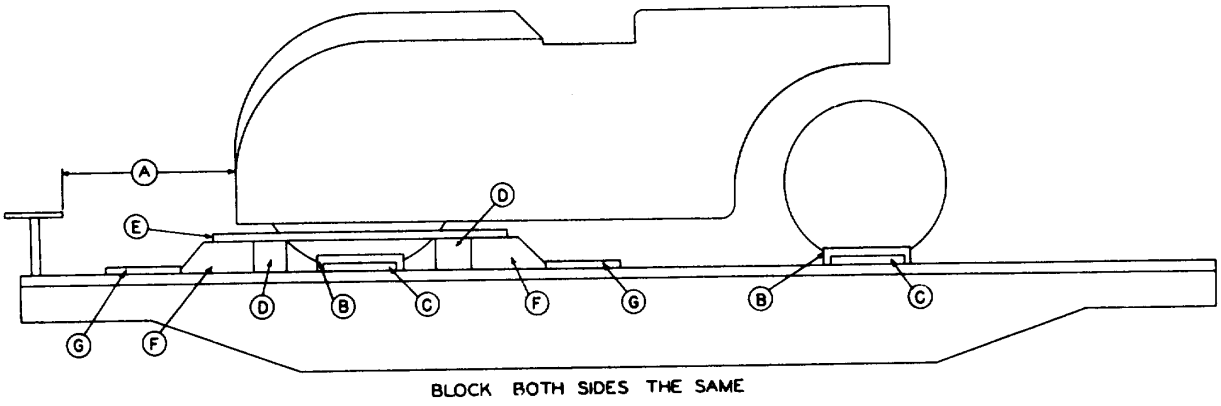


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4	Blocks, pattern 80. Locate one against front and back of each rear wheel. Bolt each to floor with one 7/8 in. dia. bolt passed through floor and 4 in. x 4 in. x 18 in. cleat or 1/2 in. x 4 in. x 18 in. plate under floor, and nail to floor with five 30-D nails in heel of block.
C	4	Blocks, pattern 21. Locate one against front and back of each rear wheel in back of Items "B". Nail each to floor with three 40-D nails in heel and one 30-D nail in each side of block.
D	4	2 in. x 6 in. x 18 in. Locate one on floor, against Item "C", and nail to floor with three 30-D nails.
E	4	Braces, 2 in. x 6 in. x 20 in. Locate one against side of each Item "B" and nail to Items "B" and "C" with two 30-D nails at each location.
F	4	Blocks, 4 in. x 4 in. x 23 in. Locate one against the outside of each rear wheel and against each side of front roller. Toe-nail each to floor with four 30-D nails.
G	4	Blocks, 2 in. x 6 in. x 18 in. Locate one against outside of each Item "F" and nail each to floor with three 30-D nails.

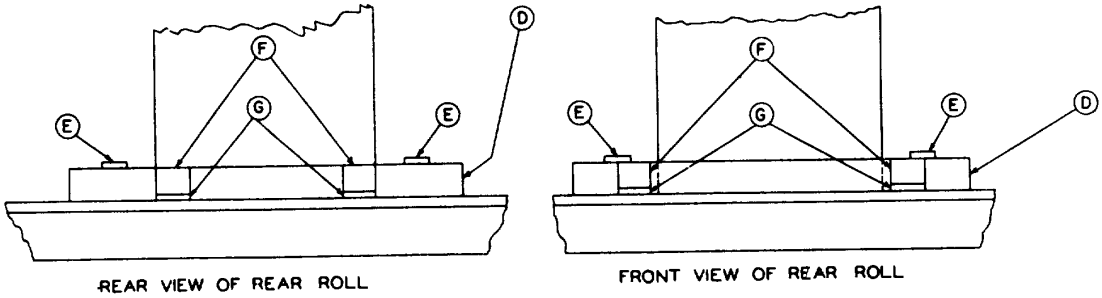
If so equipped, hand brakes must be tightly set and levers wired.

See General Rules 4, 5, 7, 9,14, 19-A and Fig. 1-B for further details.

TANDEM ROAD ROLLERS, LENGTHWISE-FLAT CARS



BLOCK BOTH SIDES THE SAME



REAR VIEW OF REAR ROLL

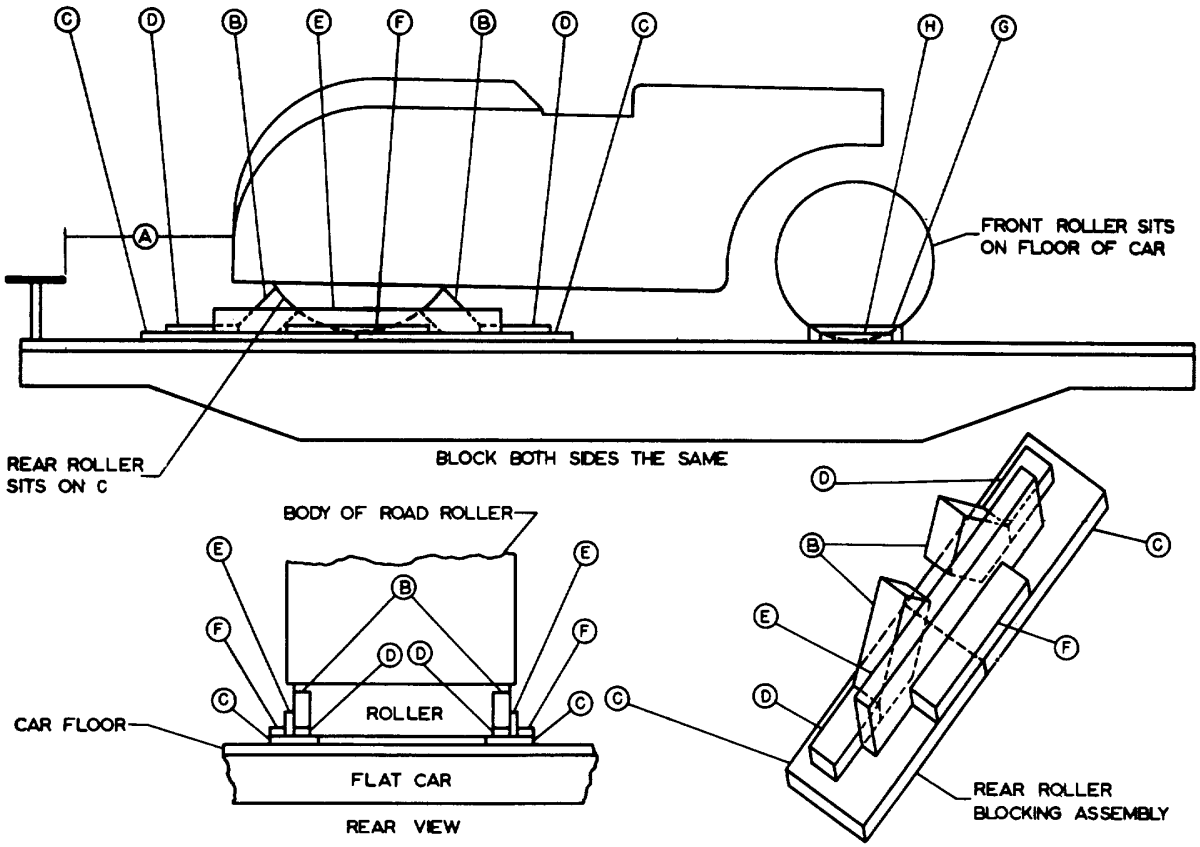
FRONT VIEW OF REAR ROLL

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	4	4 in. x 4 in. x 21 in. Locate one against each side of front and rear roll and toe-nail each to floor with four 30-D nails.
C	4	2 in. x 6 in. x 18 in. Locate one against outside of each Item "B" and nail each to floor with three 30-D nails.
D	2	8 in. x 8 in. x 8 ft. Locate one against front and back of rear roll. Toe-nail each side to floor with two 40-D nails in end and two 30-D nails in each side.
E	2	2 In. x 6 in. x 6 ft. Locate against each end of rear roller on top of Items "D" and nail each end to Items "D" with three 30-D nails at each location.
F	4	Blocks, pattern 22. Locate one against outside face of each Item "D", in line with each end of roller. Bolt each to floor with one 7/8 in. dia. bolt passed through floor and 4 in. x 4 in. x 18 in. cleat or 1/2 in. x 4 in. x 18 in. plate under floor, and nail to floor with three 40-D nails in heel of block.
G	4	2 in. x 6 in. x 18 in. Locate one on floor against each Item "F" and nail to floor with three 30-D nails.

If so equipped, hand brakes must be tightly set and levers wired.

See General Rules 4, 5, 7, 9, 14, 15, 19-A and Fig. 1-B for further details.

TANDEM AND THREE WHEEL ROAD ROLLERS, LENGTHWISE-FLAT CARS

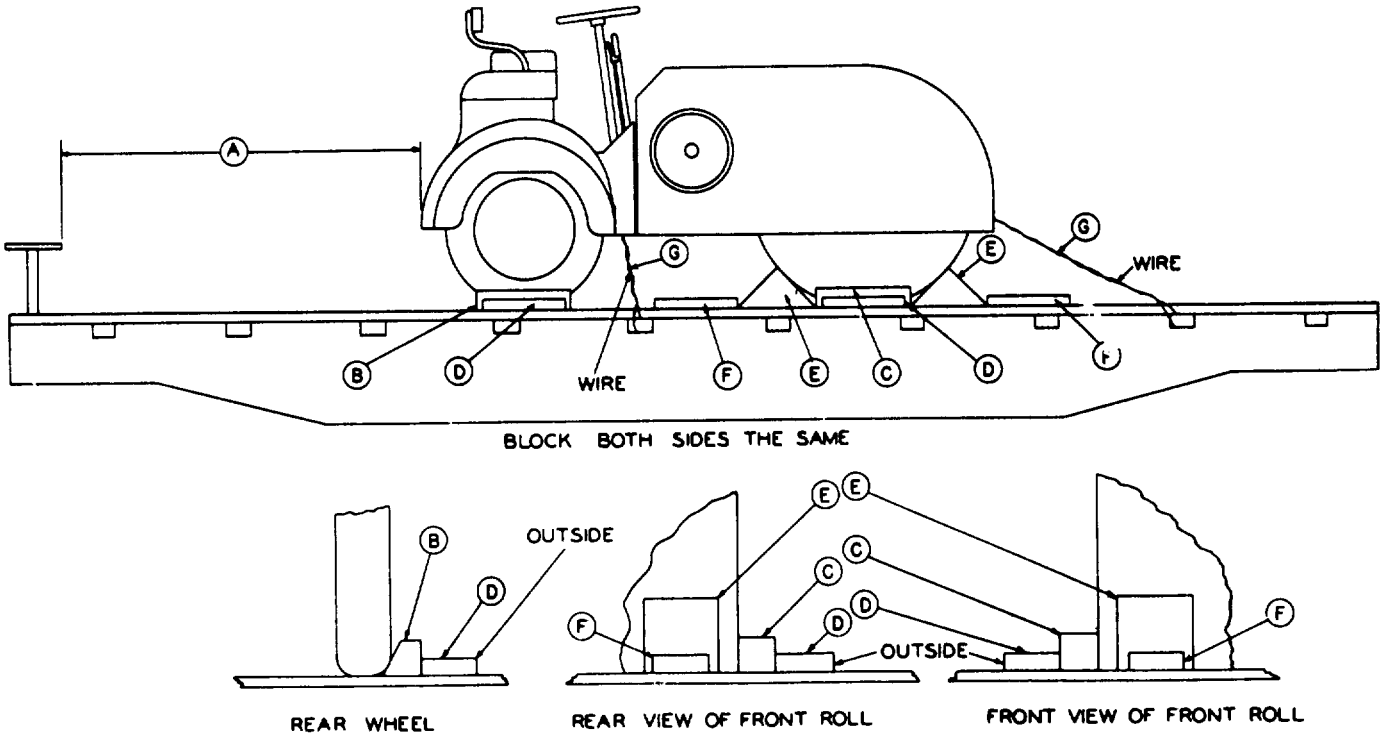


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	4 ea. unit.	Blocks, pattern 1, chamfered at toe to provide application of Item "D". Preassemble blocking, Items "B", "D" and "C". Secure "B" to "C" with nine 40-d nails, two through "C" from underneath, five in toe and one on each side of block. Locate preassembled blocking underneath and against front and back of each side of rear roller, as shown, or against front and back of each rear wheel, with Items "C" butted together.
C	4 ea. unit.	2 in. x 12 in. x 54 in. Locate as shown, under rear roller or rear wheels, and secure each to floor with eight 30-d nails.
D	1 ea. Item "B"	2 In. x 4 in. x 18 in. Locate against Item "B", as shown, and secure each to Item "C", with five 30-d nails.
E	2 ea. unit.	2 in. x 6 in. x 6 ft. Locate, as shown, after preassembled blocking is in place, against each side of roller and secure to each Item "B", with three 30-d nails.
F	2 ea. unit.	2 in. x 4 in. x 36 in. Locate one, as shown, against each Item "E", and secure each to Item "C" with six 30-d nails.
G	2 ea. unit.	4 in. x 4 in. x 23 in. Locate one against each side of front roller and toe-nail each to floor with four 30-d nails.
H	2 ea. unit.	2 in. x 6 in. x 18 in. Locate one against outside of each Item "G" and secure each to floor with four 30-d nails.

If so equipped, hand brakes must be tightly set and levers wired.

See General Rules 4, 5, 7, 9, 11, 14, 19-A and Figure 1-B for further details.

ROAD ROLLERS WITH ONE SOLID ROLL AND TWO PNEUMATIC TIRED WHEELS, LENGTHWISE-FLAT CARS

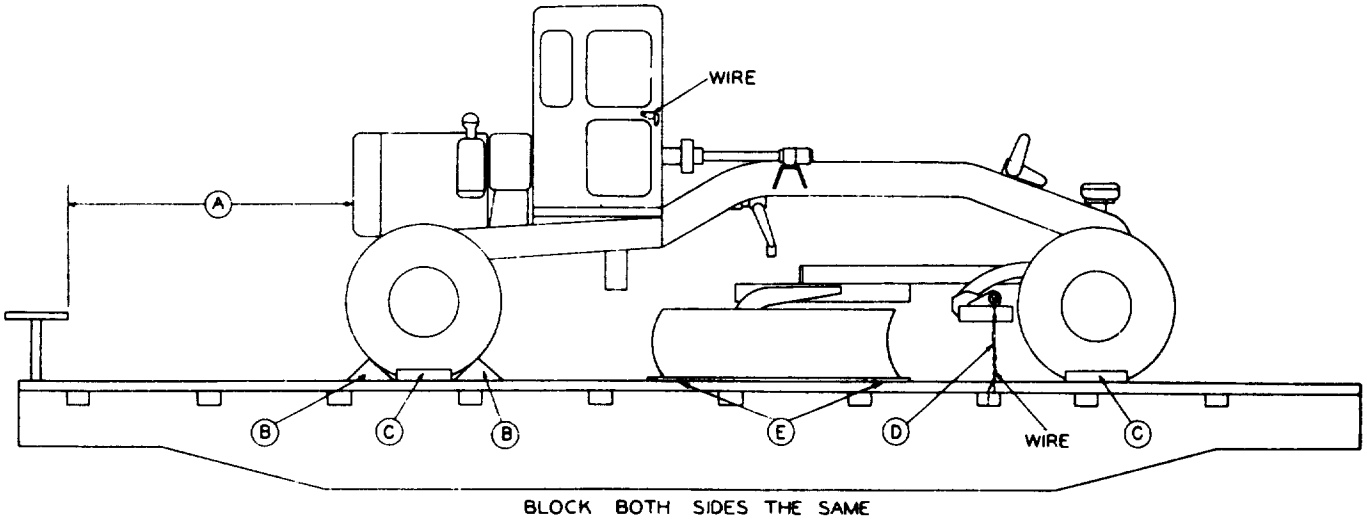


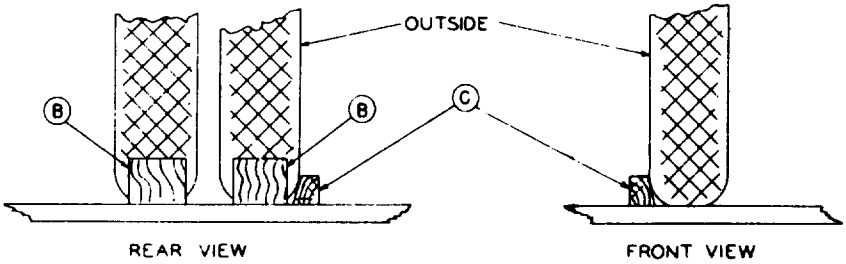
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2 ea. machine	Blocks, pattern 23 beveled to fit contour of tire. Locate one against outside of each front wheel and toe-nail to floor with four 30-D nails.
C	2 ea. machine	4 in. x 4 in. x 21 in. Locate one against each outside face of front roller and toe-nail to floor with four 30-D nails.
D	4 ea. machine	2 in. x 6 in. x 18 in. Locate one against each Item "B" and "C" and nail each to floor with three 30-D nails.
E	4 ea. machine	Blocks, pattern 24. Locate two against each end and in line withend of roller. Nail each to floor with five 40-D nails.
F	1 ea. Item "E"	2 in. x 6 in. x 18 in. Locate one on floor against each Item "E" and nail to floor with three 30-D nails.
G	4 ea. machine	Each to consist of eight strands of No. 9 gage wire. Pass four wires around frame and through stake pocket. Overlap ends of wire and twist taut with rod, bolt or pipe, secured to prevent working loose.

If so equipped, hand brakes must be tightly set and levers wired.

See General Rules 4, 5, 7, 9, 14, 15, 19-A, 19-B and Fig. 1-B for further details.

FOUR WHEEL MOTOR GRADERS (WITH PNEUMATIC TIRES), LENGTHWISE-FLAT CARS





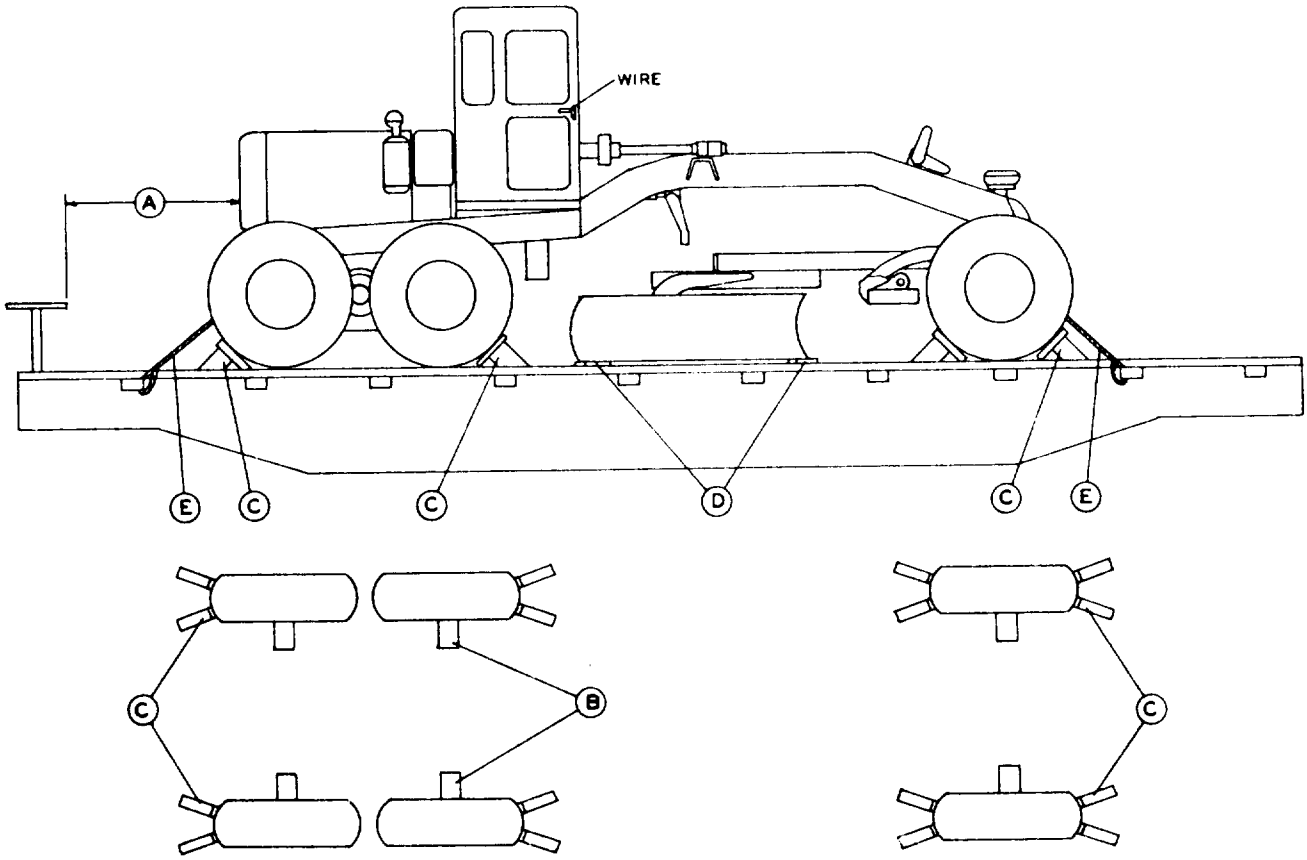
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	Single Wheels-4 Dual Wheels-8	Blocks, pattern 24. Locate one against the front and back of each rear wheel. Nail each to floor with five 40-D nails in heel and one 40-D nail in each side of block.
0	4	Blocks, pattern 23 beveled to fit contour of tires. Locate one against the outside of each outside wheel and nail to floor with four 40-D nails in each.
D	2	Each to consist of eight strands of No. 9 gage wire. Pass four wires around draw bar at each side of front of machine and through stake pockets. Overlap ends of wire and twist taut with rod, bolt or pipe, secured to prevent working loose.
E	2	1 in. x 6 in. x 24 in. Locate longitudinally under blade of unit, suitably spaced as shown and secure each to floor with three 10-D nails.
		*When the unit is shipped in a preserved condition, by or for the Department of Defense, the blade is to be elevated to maximum position and secured to the grader frame with 1/2 in. 6 x 19 preformed wire rope, length to suit, and two 1/2 in. cable clips. Mechanical or hydraulic blade controls must be placed in closed position and wired.

If so equipped, hand brakes must be tightly set and levers wired.

See General Rules 4, 5, 7, 9, 14, 15, 19-A, 19-B and Fig. 1-B for further details.

Sec. 3—Fig. 30 (Rev.—9-1983)

SIX WHEEL MOTOR GRADERS (WITH PNEUMATIC TIRES), LENGTHWISE, 40,000 LBS. OR LESS-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. No. 1.
B	1 each wheel	Blocks, pattern 29. Locate one (1) inside each wheel. Secure to car floor with five (5) 40-D nails in heel and one (1) 40-D nail in each side of block.
C	4 each front wheel	Block pattern 31. Locate front and back of wheels as shown. Secure each to car floor with 2 each rear wheel five (5) 40-D nails in heel and one (1) 40-D nail in each side of block.
D	2	Lumber, 4 in. x 4 in. x 12 in. Locate under scraper blade at each side. Secure each to car floor with three (3) 40-D nails.
E	2	5/8 in. dia. 6 x 19 IWRC wire rope, length to suit. Locate from stake pocket one side of car, through shackles at front and rear of grader and secure to opposite stake pocket. On chain tie-down cars, chains may be used in lieu of cables.

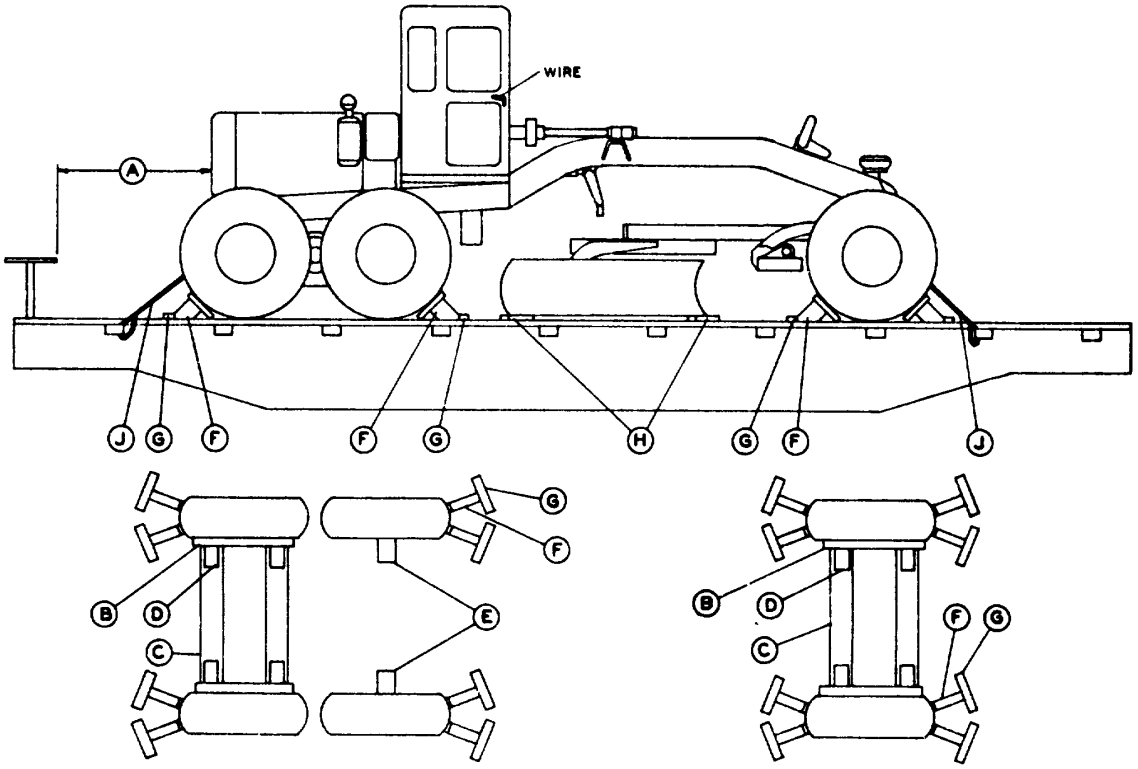
Note:

1. If so equipped, hand brakes must be tightly set and levers wired.

See General Rules 1, 2, 3, 4, 5, 7, 9, 14, 15, 19-A and 19-B for further details.

Sec. 3--Fig. 31 (New—9-1983)

SIX WHEEL MOTOR GRADERS (WITH PNEUMATIC TIRES), LENGTHWISE, OVER 40,000 LBS. TO 70,000 LBS. INCLUSIVE-FLAT CAR



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 1. Sec. No. 1.
B	1 each outer end Wheel	Lumber, pattern 26. Locate one inside each out end wheel.
C	2 each end wheel	Lumber, 2 in. x 6 in., length to suit. Locate between Items "B". Secure each to car door with set 40-D nails spaced 12 inches apart.
D	2 each Item "C"	Blocks, pattern 27. Locate on top of Items "C" against Items "B" and secure to both with six (6) 40-D nails.
E	2	Blocks, pattern 30. Locate inside and against intermediate wheels and secure to car floor with five (5) 40-D nails in heel and one (1) 40-D nail in each side of block.
F	16	Blocks, pattern 28. Locate two (2), front and rear of each front wheel and two (2) at front of each intermediate wheel and two (2) at rear of each rear wheel. Secure each with five (5) 40-D nails in heel and one (1) 40-D nail in each side of block.
G	1 each Item "F"	Lumber, 2 in. x 6 in. x 12 in. Locate at heel against each Item "F". Secure each to car floor with three (3) 40-D nails.
H	2	Lumber, 4 in. x 4 in. x 12 in. Locate under scraper blade at each side. Secure each to car floor with three (3) 40-D nails.
J	2	5/8 in. dia. 6 x 19 IWRC wire rope, length to suit. Locate from stake pocket, one side of car, through shackles at front and rear of grader and secure to opposite stake pocket. On chain tie-down cars, chains may be used in lieu of cables.

Note:

1. If so equipped, hand brakes must be tightly set and levers wired.

See General Rules 1,2, 8, 4, 5, 7, 9, 14, 15, 15, 19-A and 19-B for further details.

SECTION No. 3

PART 2

RULES GOVERNING

THE

Loading of Farm Equipment Machinery

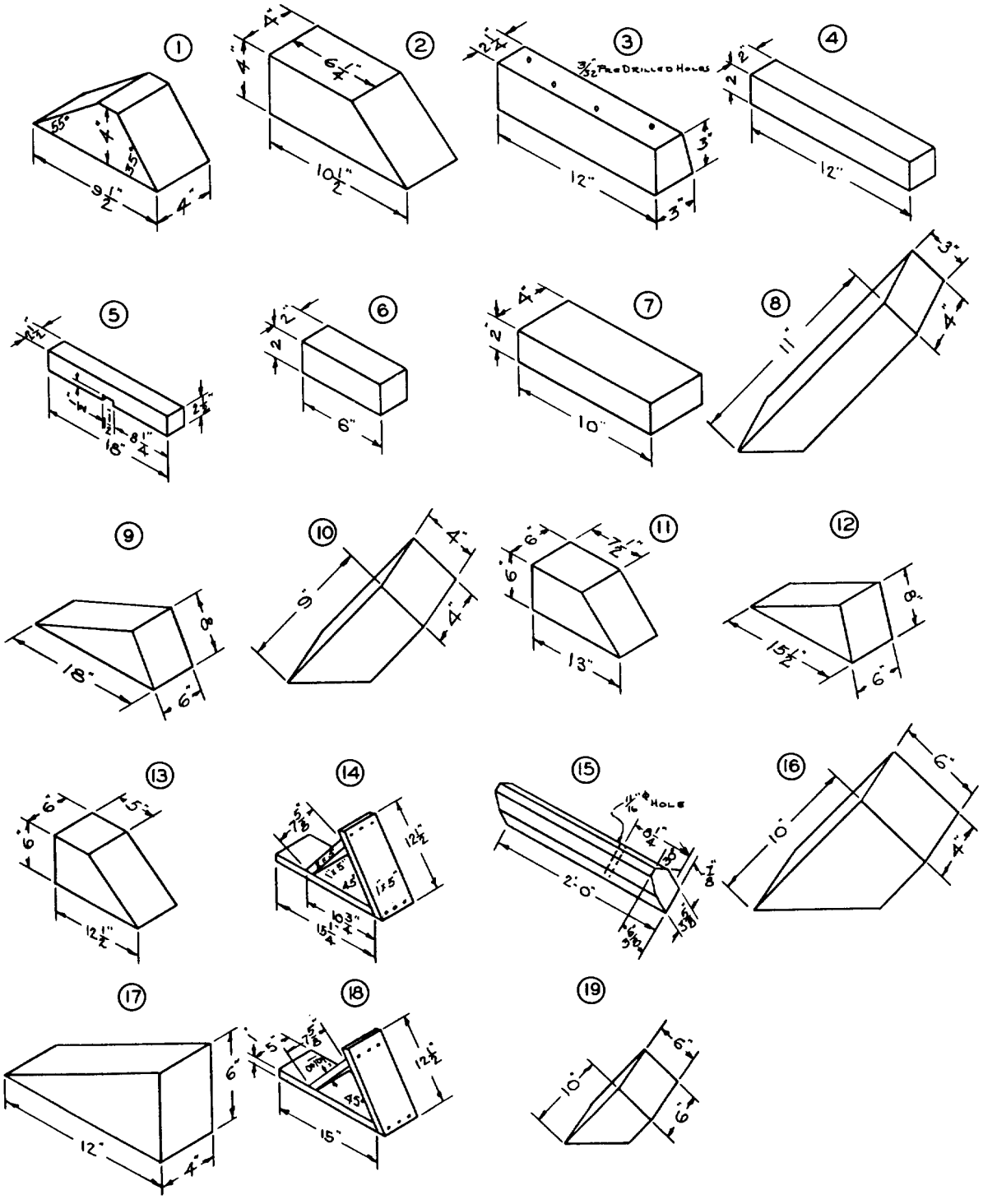
On Open Top Cars

Section No. 3

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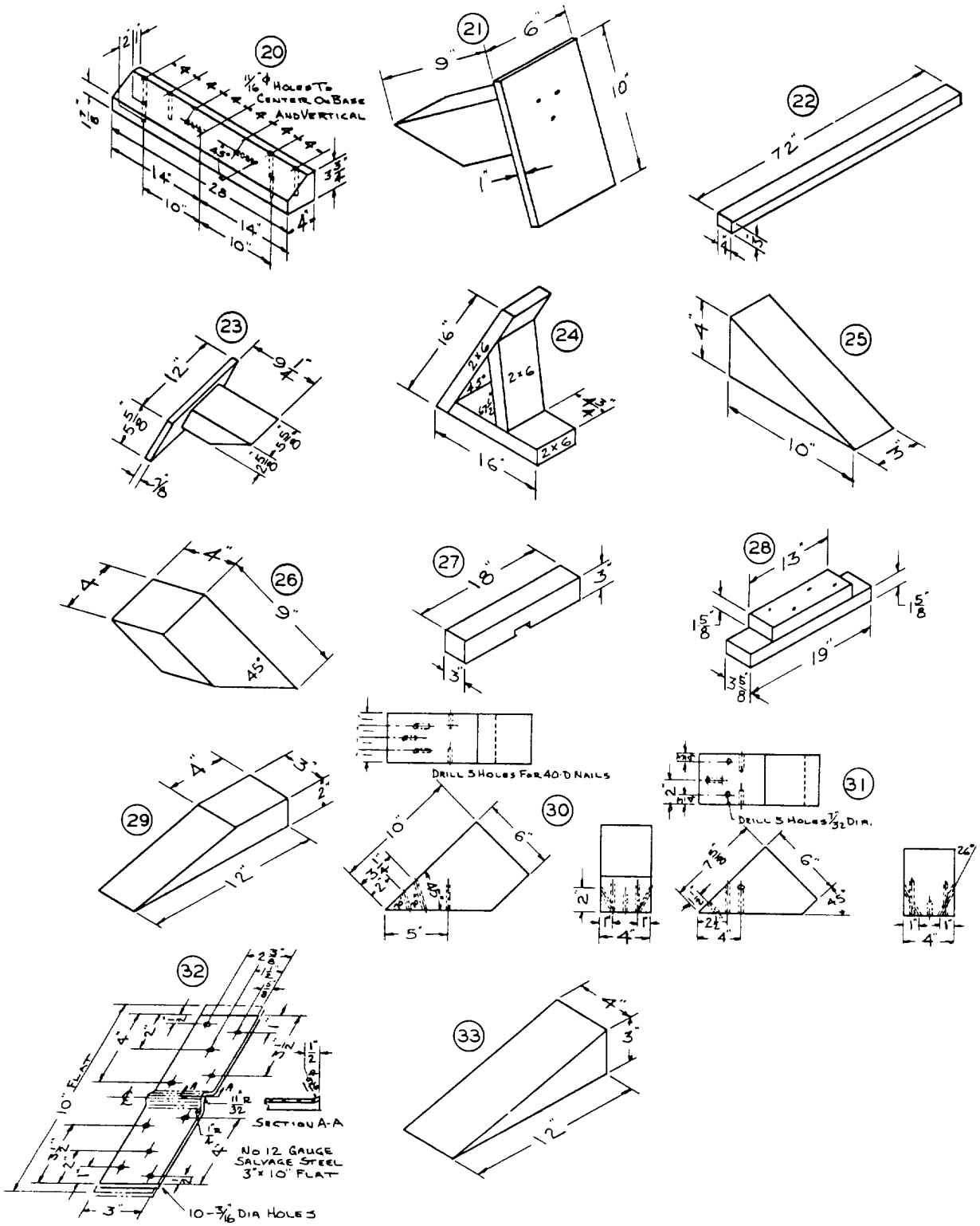
Sec. 3-Part 2 (Rev.--4-1980)

BLOCKING PATTERNS



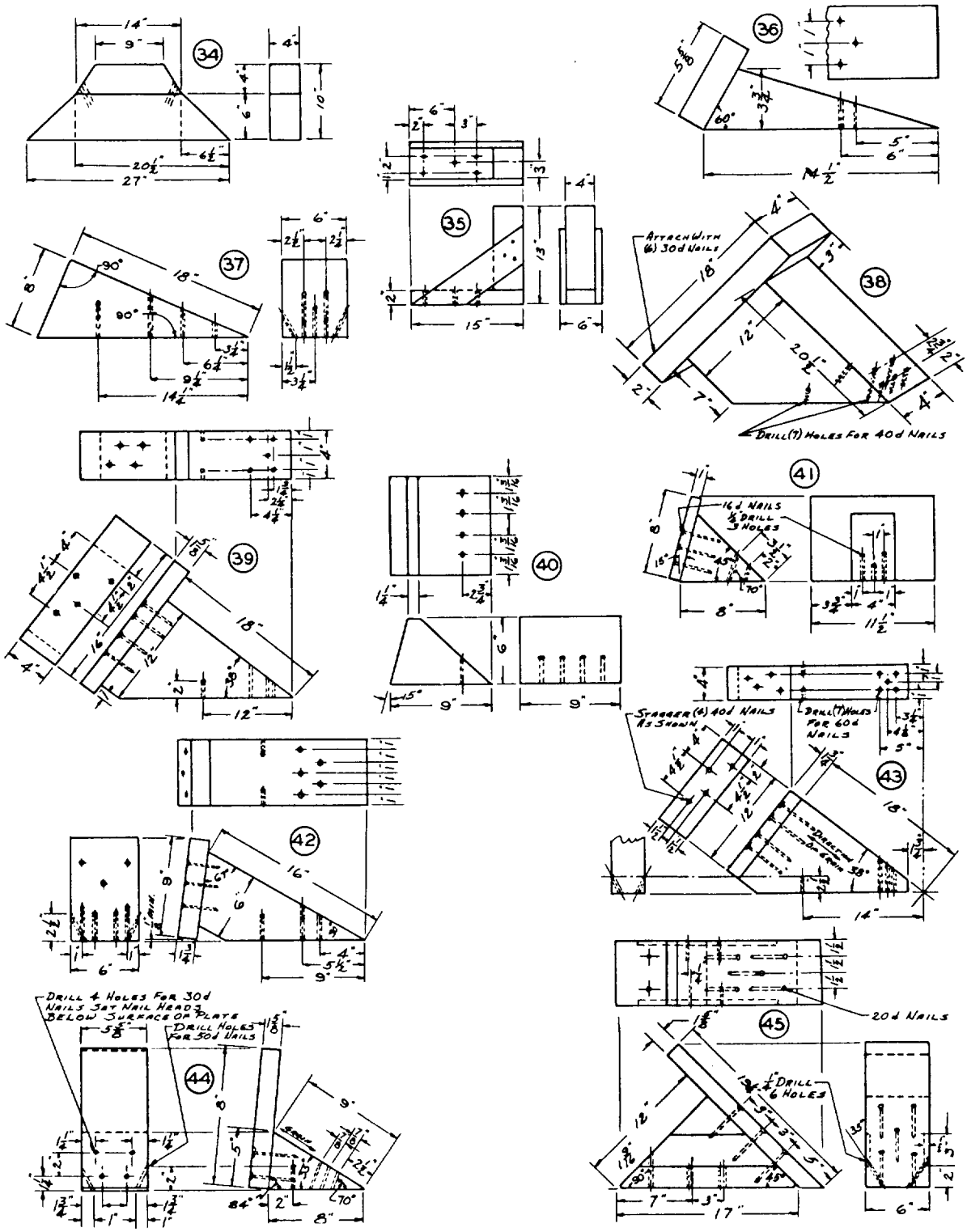
Sec. 3-Part 2 (Rev.-4-1980)

BLOCKING PATTERNS



Sec. 3-Part 2 (Rev.-4-1980)

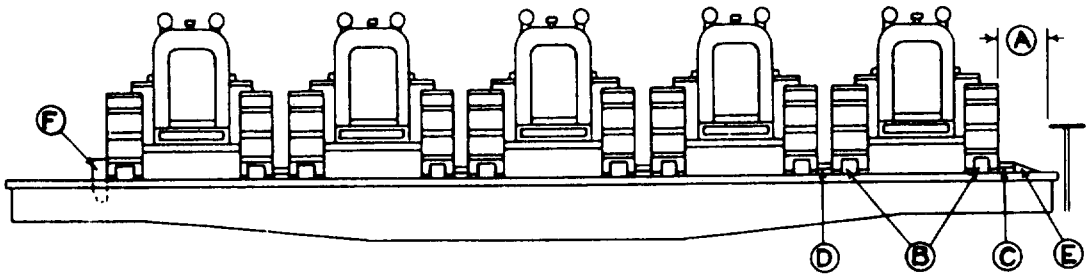
BLOCKING PATTERNS

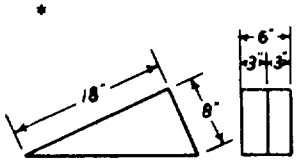


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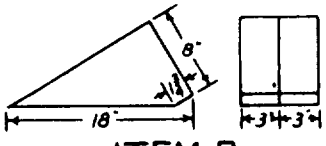
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TRACTORS, CRAWLER TYPE (WITH OR WITHOUT GROUSERS), CROSSWISE-FLAT CARS

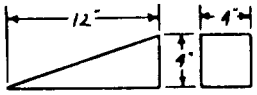




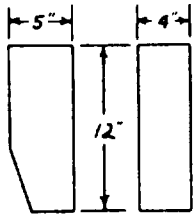
ITEM B



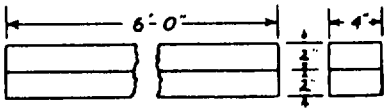
ITEM B



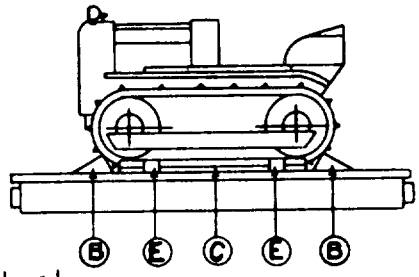
ITEM E



ITEM F



ITEMS C & D



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 each tractor.	Each Item "B" to consist of (A) One (1) Solid Wedge-shaped block 6 in. x 8 in. x 18 In. OR (B) Two (2) 3 in. x 8 in. x 18 in. wedge-shaped blocks, nailed together with five (5) 30-D nails to form one 6 in. x 8 in. x 18 in. 'Block Unit'. Locate each Item "B" (Solid Type, as described in (a) above, or 'Block-Unit' type, as described in (b) above), against each end of crawler treads and secure to floor with three 40-D nails, and two 60-D nails, driven through top of block, and two 40-D nails, toe-nailed through the sides of block one per each side.
*C	As required.	Each to consist of two pieces 2 in. x 4 in. x 72 In. Locate against outside face of crawler tread. Nail lower pieces to floor with 30-D nails spaced about 10 in. apart and top pieces to those below in similar manner. The use of three pieces in either top or bottom section, to obtain full length, is permissible. Substitute if desired, at each location, one piece 3 in. x 4 in. x 72 in. Nail to floor with ten 60-D nails equally spaced where practicable. Not required when Item "F" is used.
*D	As required.	Each to consist of two pieces 2 in. x 4 in. x 72 in. Locate between adjacent tractors. Nail lower pieces to floor with 30-D nails spaced about 10 in. apart and top pieces to those below in similar manner. The use of three pieces in either top or bottom section, to obtain full length, is permissible. Substitute, if desired, at each location, one piece 3 in. x 4 in. x 72 in. Nail to floor with ten 60-D nails equally spaced where practicable.
*E	3 ea. end tractor.	Wedge-shaped blocks 4 in. wide, 12 in. long, height equal to height of Item "C". Space equally, with ends against Item "C" and secure each to floor with five 30-D nails in each. Substitute, if desired: (A) Two 2 in. x 4 in. x 12 in. pieces at each location. Secure lower pieces to floor with five 20-D nails and top pieces to those below with five 30-D nails; OR (B) Solid blocks 3 in. x 4 In. x 12 In. at each location. Secure each block to car floor with four 60-D nails. Authorized only in conjunction with Item "C" of 3 in. x 4 in. x 72 in. dimension.
F	2 ea. end of load.	4 in. x 5 in. x 12 in., hardwood. Locate in end stake pockets, against crawler treads. Each must be securely wedged in pockets, or nailed to floor. Not required when Items "C" and "E" are used.

Where wedge shaped wheel or crawler blocking is used, such blocking may be chamfered at ends, provided suitable back-up blocks are used.

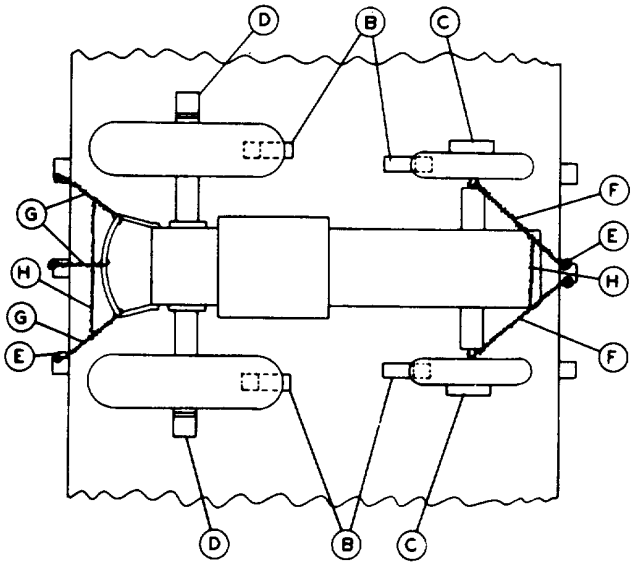
Detached parts, boxed material, etc., must be located as far from car sides and ends as practicable and secured to prevent displacement.

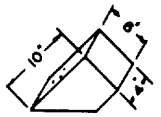
*If so equipped, mechanical brakes must be tightly set and levers wired.

See General Rules 4, 5, 9, 10, 14, 15 and 19-A for further details.

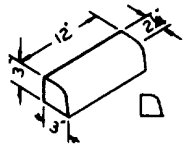
Sec. 3-Fig. 81 (Rev.-11-1978)

TRACTORS WITH PNEUMATIC TIRES, 5500 LBS. OR LESS INCLUSIVE-CROSSWISE FLAT CARS

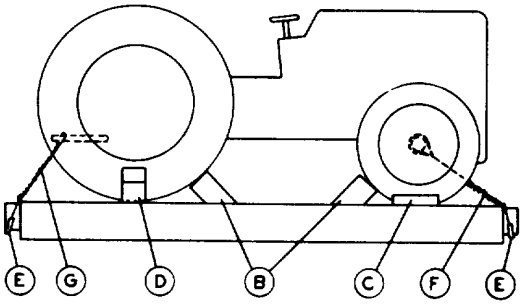


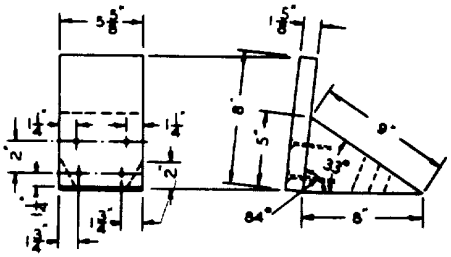


SKETCH 1



SKETCH 2





SKETCH 3

Item	No. of Pcs.	Description
A		Brake Wheel Clearance. See Fig. 2, Section No. 1.
B	1 ea. wheel	Chock block per Sketch 1. Locate centered with tread inward of front and rear wheels. Secure each to car floor with five (5) 50-D nails.
C	1 ea. front wheel.	Side block per Sketch 2. Locate against outside of front wheels. Secure each to car floor with four (4) 50-D nails.
D	1 ea. rear wheel.	Side block per Sketch 3. Locate against outside of rear wheels. Secure each to car floor with five (5) 50-D nails. For units weighing 2500 lbs. or less, side blocks per Item "0" may be used.
E	1 per each Item "F" & "G".	Rubber hose, 5/8 in. I.D., reinforced length to suit. Pass Item "F" and/or "G" through hose and locate to contact bottom of stake pockets.
F	2	Front tie-down wires, each to consist of 8 strands of No. 9 gage black annealed wire. Locate at approximately 45 degree angle, passing over front axle and through stake pockets. Overlap ends of wire and twist taut.
G	2 per units 2500 lbs. or less. 3 per units over 2500 lbs. to 5500 lbs. inclusive.	Rear tie-down wires, each to consist of 8 strands of No. 9 gage black annealed wire. Locate center one vertically with two outer wires positioned at a 45 degree angle where possible. Pass around draw bar and/or hitch assembly and throughstake pockets. Overlap ends of wires and twist taut. Center vertical tiedown not required if unit weighs, 2500 lbs. or less.
H	2 per unit.	Each to consist of 6 strands No. 9 gage black annealed wire. Pass one tie through Items "IF' twist loops. Overlap wire ends and twist taut. Pass one tie through Item "0"' twist loops Overlap wire ends and twist taut.

Notes:

1. All wire ties to be secured to stake pockets.
2. Protective material for tires, rims and product to be applied at discretion of shipper.
3. Four (4) inch clearance must be maintained between any portion of tractor except tires.
4. All tractors must have hand brakes set and locked.

See General Rules 1, 2, 3, 4, 5, 9, 14, 15, 19-A, 19-B and 19-C for further details.

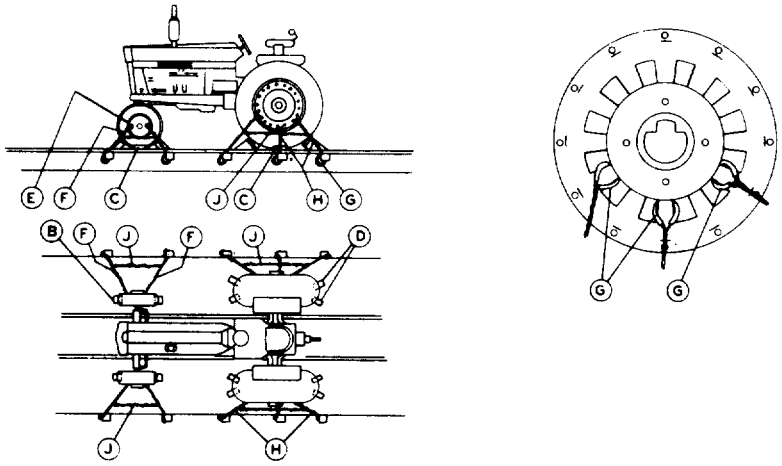
Section No. 3

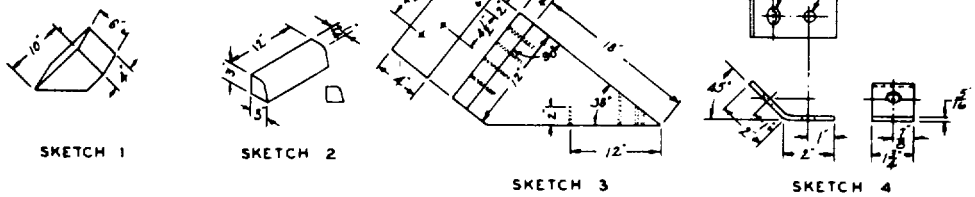
Note:
Figure No. 82 has been deleted at the request of the shipper.

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Sec. 3--Fig. 83 (Rev.--11-1978)

TRACTORS WITH PNEUMATIC TIRES, ROW CROP AND CONVENTIONAL LENGTHWISE, OVER 5,000 LBS. TO AND INCLUDING 15,000 LBS. FLAT CARS





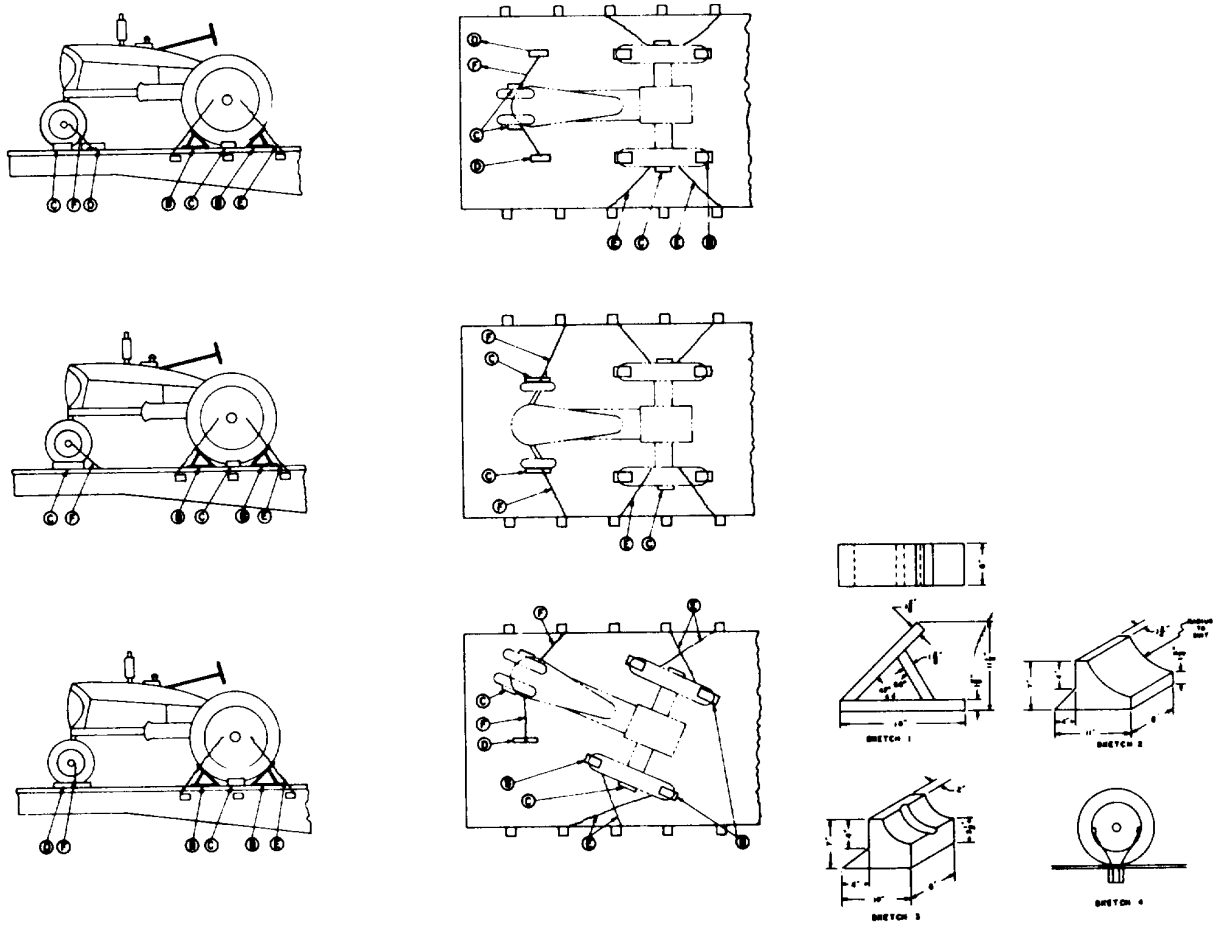
Item	No. of Pcs.	Description
A		Brake Wheel Clearance. See Fig. 2, Section No. 1.
B	4	Blocks, per Sketch 1. Locate one at front and rear of each front wheel. Secure each to car floor with five (5) 50-D nails.
C	4	Blocks, per Sketch 2. Locate on outside of rear wheels and outside or inside of front wheels. Secure each to car floor with four (4) 50-D nails.
D	4 ea. rear wheel.	Blocks, per Sketch 3. Locate two at front and rear of each rear wheel. Secure each to car floor with seven (7) 50-D nails.
E	3 ea. front wheel.	Steel bracket per Sketch 4. Secure to each front wheel with lug bolts % inch longer than original lug bolt.
F	3 ea. front wheel.	Wire tie-down, each to consist of 8 strands of No. 9 gage black annealed wire. Pass four wires through center Item "E" and through stake pocket in a vertical position. Overlap wire ends and twist taut. Pass four wires through the two outer Items "E" and through stake pockets each side so as to form an approximate 45 degree angle. Overlap wire ends and twist taut. Protect at stake pockets with Item "G".
G	1 per each Item "F" 2 per each Item "H".	Rubber Hose, 5/8 in. I.D., reinforced, length to suit. Pass Items "F" and "H" through hose and locate to contact wheel openings and stake pockets.
H	3 ea. rear wheel.	Wire tie-down, each to consist of 8 strands of No. 9 gage black annealed wire. Pass four wires through center opening on wheel and through stake pocket in a vertical position. Overlap wire ends and twist taut. Pass four wires through outer wheel openings each side of the one applied vertically, and through stake pockets so as to form an approximate 45 degree angle. Overlap wire ends and twist taut. Protect at wheel openings and stake pockets with Item "G".
J	1 per each front and rear wheel.	Safety tie, each to consist of six strands No. 9 gage black annealed wire. Pass through two loops of Items "F" and "H" at each wheel. Overlap ends of wires and twist taut.

Notes:

1. All wire ties are to be secured to stake pockets.
2. Protective material for tires, rims and product to be applied at discretion of the shipper.
3. Four (4) Inch clearance must be maintained between any portion of tractor and adjacent tractor and/or material, except tires. When nesting wide front tractors, a clearance of three (3) inches is to be maintained between mounting steps and front tires.
4. All tractors must have hand brakes set and locked.

See General Rules 1, 2, 3, 4, 5, 9, 14, 15, 19-A, 19-B and 19-C for further details.

TRACTORS (WITH OR WITHOUT PNEUMATIC TIRES), BOTH ROWCROP AND CONVENTIONAL, LENGTHWISE OR DIAGONALLY, OVER 4,000 LBS. TO AND INCLUDING 7,000 LBS.-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2 ea. rear wheel.	Blocks, per Sketches 1, 2, 3 or Pattern 30. Locate against tread and nail each to floor with five 40-D nails or seven 30-D nails.
C	1 ea. front and rear wheel	Blocks, per Pattern 3. Centrally locate each block outside of each front and rear wheel and nail to floor with four 50-D nails.
D	As required, front wheels.	Blocks, per Pattern 5. Nail to floor with six 50-D nails.
E	2 ea. rear wheel.	Each to consist of six strands No. 9 ga. black annealed wire. Pass three wires through holes in plate or around spokes of outside wheels and preferably through two stake pockets. When two stake pockets are not available, attach wires to one stake pocket, per Sketch 4. Overlap ends of wires and twist taut.
F	2 at front end of tractor.	Each to consist of six strands No. 9 ga. black annealed wire. Pass three wires through holes in plate, or spokes of wheels, or through holes in frame near front of machine and through stake pockets, or to blocks Item "D". Overlap ends of wires and twist taut.

Vertical holes, slightly smaller than the diameter of nails, must be drilled through blocks, Items "B", "C" and "D".

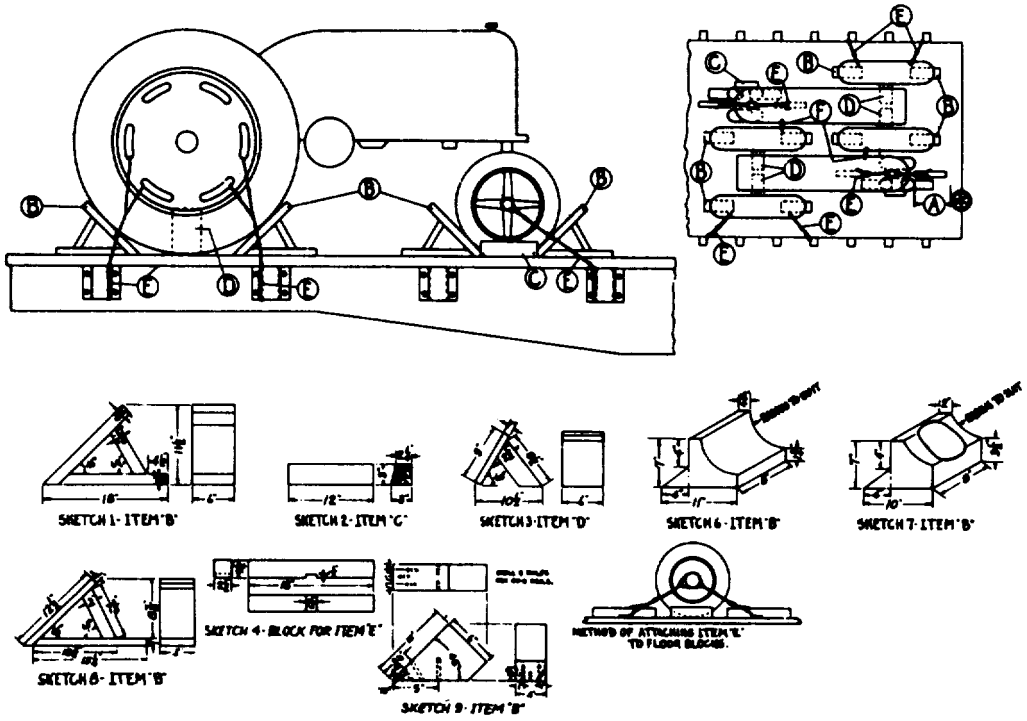
Detached parts, boxed material, etc., must be loaded as far from car sides and ends as practicable and secured to prevent displacement.

Tractor tires must be inflated as uniformly as possible to a minimum of 18 lbs. for two-ply and 27 lbs. for tires of four-ply or more.

If so equipped, mechanical brakes must be tightly set and levers wired.

See General Rules 4, 5, 14, 15, 19-A and 19-B for further details

TRACTORS (WITH OR WITHOUT PNEUMATIC TIRES), BOTH ROW-CROP AND CONVENTIONAL, LENGTHWISE OR DIAGONALLY, OVER 7,000 LBS.-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	Four wheel tractors, 8; Row-Crop tractors, 6.	Blocks, per Sketches 1, 6, 7 or 9. Locate one against front and rear of each wheel of four-wheel tractors; one against front and rear of each rear wheel and against front and rear of one front wheel of row-crop tractors. Nail each to floor with five 40-D or seven 30-D nails. Substitute, if desired, blocks, per Sketch 8, for tractors weighing 4,000 lbs. or less, and at front wheels only for machines weighing over 4,000 lbs. Nail each to floor with five 30-D nails.
C	1 ea. front wheel.	Blocks, per Sketch 2. Locate against outside of wheels and nail each to floor with four 50-D nails.
D	1 ea. rear wheel.	Blocks, per Sketch 3. Locate against wheel and nail each to floor with three 30-D nails.
E	1 ea. front wheel, or ea. pr. of dual wheels and two ea. outside rear wheel.	Each to consist of six strands No. 9 gage black annealed wire. Pass three wires through spokes, or holes in plates, of outside front wheels, or frame, and through stake pockets; through spokes, or holes in plates, of outside rear wheels, and through two stake pockets. When wires cannot be effectively applied to stake pockets, and for units with solid disc wheels, pass wires over axle, or through frame of machine and underneath blocks, per Sketch 4, or tiedown plates Pattern 32. Secure Sketch 4 blocks to floor with six 50-D nails and Pattern 32 plates with 10-D nails. Pass three wires through spokes, or holes in plates of outside rear wheels and through two stake pockets, or pass wires over axle and underneath blocks, per Sketch 4, nailed to floor with six 50-D nails in each, or tie-down plates Pattern 32 secured with ten 10-D nails. Overlap ends of wires and twist taut.
F	2 ea.pr.machines.	Each to consist of six strands, No. 9 ga. black annealed wire. Pass three wires around frame, spokes, or through holes in plate of wheels, or through a suitable bracket attached to each side by side machine with at least one 1/2 in. dia. bolt, so as to tie machines together at front and rear in the most effective manner. Overlap ends of wires and twist taut.

When single tractor is loaded separately, or with equipment other than that shown, the following securement must be used in lieu of Items "F":

Pass three wires, No. 9 gage black annealed, or 1 1/4 in. x .035 in. high tension band, through wheel, around axle or frame near front of the machine. Pass same wires through stake pocket, or underneath one block per Pattern 5 secured to car floor with five 50-D nails, or underneath plate per Pattern 32 secured to car floor with ten 10-D nails. Twist wire taut. High tension bands must be secured to car floor with plates per Pattern 8.

Vertical holes, slightly smaller than the diameter of nails, must be drilled through blocks, Items "B", "C" and "D", and those for Item "E" when used.

Detached parts, boxed material, etc., must be loaded as far from car sides and ends as practicable, and must be secured to prevent displacement.

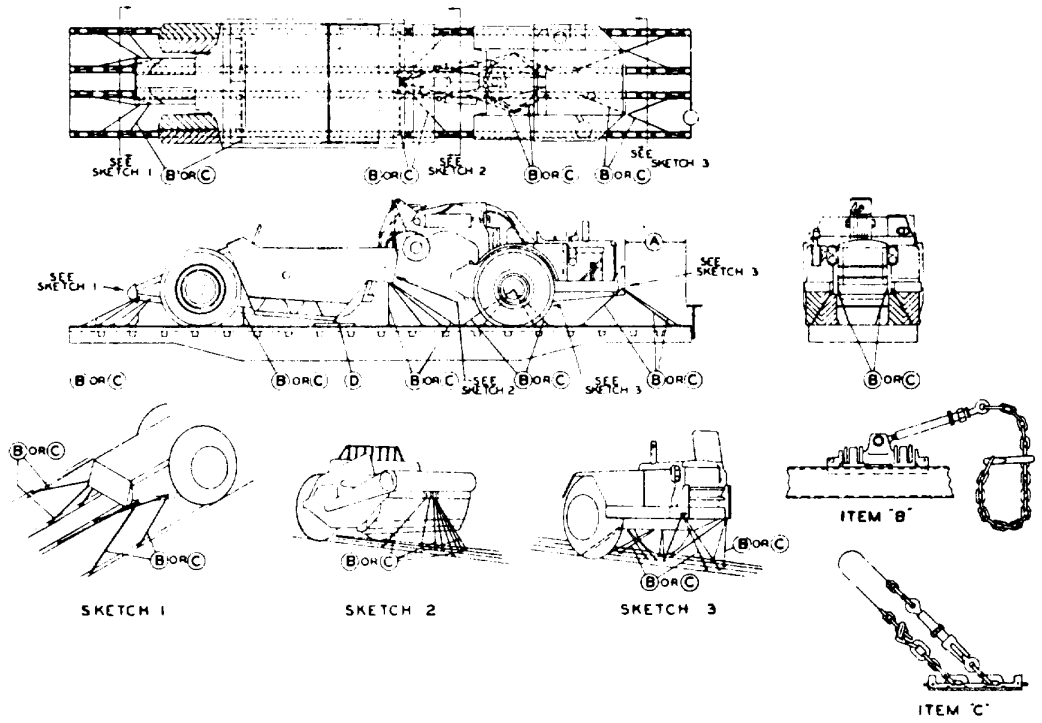
Tractor tires must be inflated as uniformly as possible to a minimum of 18 lbs. for two-ply tires and 27 lbs. for tires of four-ply or more.

*If so equipped, mechanical brakes must be tightly set and levers wired.

See General Rules 4, 5, 9, 14, 15, 19-A and 19-B for further details.

Sec. 3--Fig. 100 (New-12-1969)
(Heading Corrected 3-1971)

TRACTOR-SCRAPER C3MBINATION, (WITH PNEUMATIC TIRES), FLAT CARS WITH CHAIN TIE-DOWN ASSEMBLIES, TIE-DOWN CHANNELS AND SPECIAL CUSHIONING DEVICES



Item	No. of Pcs.			Description
A	Brake Wheel Clearance, See Fig. 2, Sec. 1.			
B	4 chains for units up to		15,000 lbs.	½ in. alloy tie-down chain assembly. Additional chains may be added for lateral stability.
	8 " " " "	over	15,000 to 30,000 lbs.	
	12 " " " "		30,000 to 45,000 "	
	16 " " " "		45,000 to 60,000 "	
	20 " " " "		60,000 to 75,000 "	
	24 " " " "		75,000 to 90,000 "	
	28 " " " "		90,000 to 105,000 "	
	32 " " " "		105,000 to 120,000 "	
	36 " " " "		120,000 to 135,000 "	
	40 " " " "		135,000 to 150,000 "	
C	4 chains for units up to		30,000 lbs.	½ in. alloy tie-down chain assembly. Additional chains may be added for lateral stability.
	8 " " " "	over	30,000 to 60,000 lbs.	
	12 " " " "		60,000 to 90,000 "	
	16 " " " "		90,000 to 120,000 "	
	20 " " " "		120,000 to 150,000 "	
D	2 per unit			8 in. wide x 30 in. long, thickness to suit, , lumber, space between car floor and scraper blade. Secure to floor by nailing.

GENERAL INSTRUCTIONS

Secure longitudinal chains to vehicle. Pull chains as tight as possible by hand and attach hook into an appropriate link in the chain. All chain tie-downs must be made taut by tightening the turnbuckles.

Tie-downs in the inboard channels are to be in line across the car and tiedowns in the outboard channels are to be in link in the same manner. The angle of the tie-downs must be as close to 45° as possible.

Gear shift levers are to be placed in a neutral position.

Turnbuckles not equipped with self-locking devices must be wired or locked to prevent loosening.

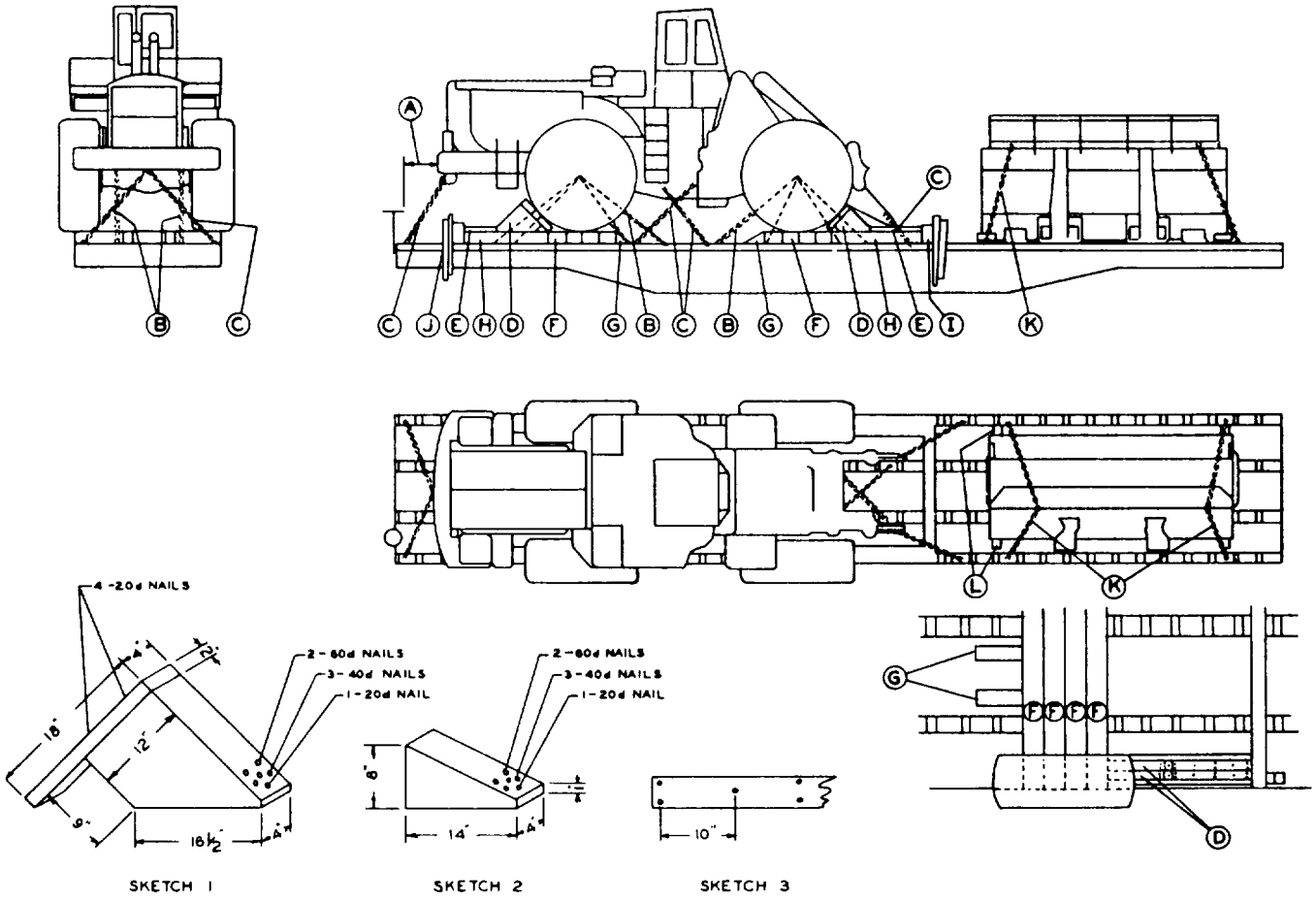
See General Rules 4, 5, 9, 14, 15, 19-A, 19-B and 19-C for further details.

Section No. 3

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Sec. 3--Fig. 104 (New--1-1976)

TRACTOR, FOUR WHEEL (PNEUMATIC TIRES), WITH OR WITHOUT BUCKETS, DOZERS, ETC., 130,000 LBS. OR LESS-FLAT CARS WITH CHAIN TIE-DOWN CHANNELS AND SPECIAL CUSHIONING DEVICES



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	8 ea. side	1/2 in. alloy tie-down chain assembly. Attach 8 inboard tie-down assemblies to each front and rear axle housing.
C	4 ea. side	1/2 in. alloy tie-down chain assembly. Attach two outboard tie-down assemblies at front and rear of tractor and two tie-down assemblies on each side at center of tractor.
D	2 per wheel	Wheel blocks. Locate two at front of each front wheel and 2 at rear of each rear wheel and nail to car floor and/or Item "H". See Sketch 1.
E	1 per ea. Item "D"	2 in. x 4 in. lumber, length equal to distance between Items "D" and "I". Secure to Item "H" or car floor with 40-D nails spaced 10 inches apart. See Sketch 3.
F	8 per unit	4 in. x 12 in. x 10 ft. 6 in. lumber. Locate four crosswise under front and rear wheels to build up car floor for clearance when more than half of tire extends beyond car floor over top of channel or when required to provide base for blocking beyond the edge of the car floor. Secure each plank to car floor with eight 60-D nails. Use optional.
G	4 per unit	Wedge blocks to be placed inside center of unit when Item "F" is used. Place blocks between inboard channels on rail car. Secure with two 60-D nails, three 40-D nails, one 20-D nail. See Sketch 2. Use optional.

Sec. 3--Fig. 104 (New--1-1976) (Continued)

TRACTOR, FOUR WHEEL (WITH PNEUMATIC TIRES), WITH OR WITHOUT BUCKETS, DOZERS, ETC., 130,00 LBS. OR LESS-FLAT CARS WITH CHAIN TIE-DOWN CHANNELS AND SPECIAL CUSHIONING DEVICES

Item	No. of Pcs.	Description
H	4 per unit	4 in. x 12 in. lumber, length equal to distance between Item "I" and Item "F", when Item "F" is used. Secure each piece to car floor with 60-D nails, spaced 10 inches apart. See Sketch 3.
I	2 per unit	4 in. x 8 in. x 10 ft. 6 in. lumber. Locate against stakes, Item "J" and nail to each Item "J" with three 60-D nails.
J	4 per unit	Stub stakes, 4 in. x 5 in. lumber, extending 10 inches above car deck.
K	2 ea. side	1/2 in. alloy chain tie-down assembly to secure bucket when detached. Secure to top of bucket or couple opposite chains together at ends of bucket. Cables must be used if chains are not available.
L	4	Block per Sketch 2, to secure bucket when detached. Locate two on each side. Add one block on each end of bucket near ends. Nail to car floor with two 00-D nails, three 40-D nails and one 20-D nail each block.

Notes.-Secure longitudinal chains to vehicle. Pull chains as tight as possible by hand and attach into an appropriate link in the chain. All chain tie-downs must be made taut by tightening the turnbuckles. After tensioning, chains must be struck with a hammer or steel bar with enough force to eliminate any kinks in chain and retightened if necessary.

Tie-downs in the inboard channels are to be in line across the car and tie-downs in the outboard channels are to be in line in the same manner. The angle of the tie-downs must be as close to 45 degrees as possible.

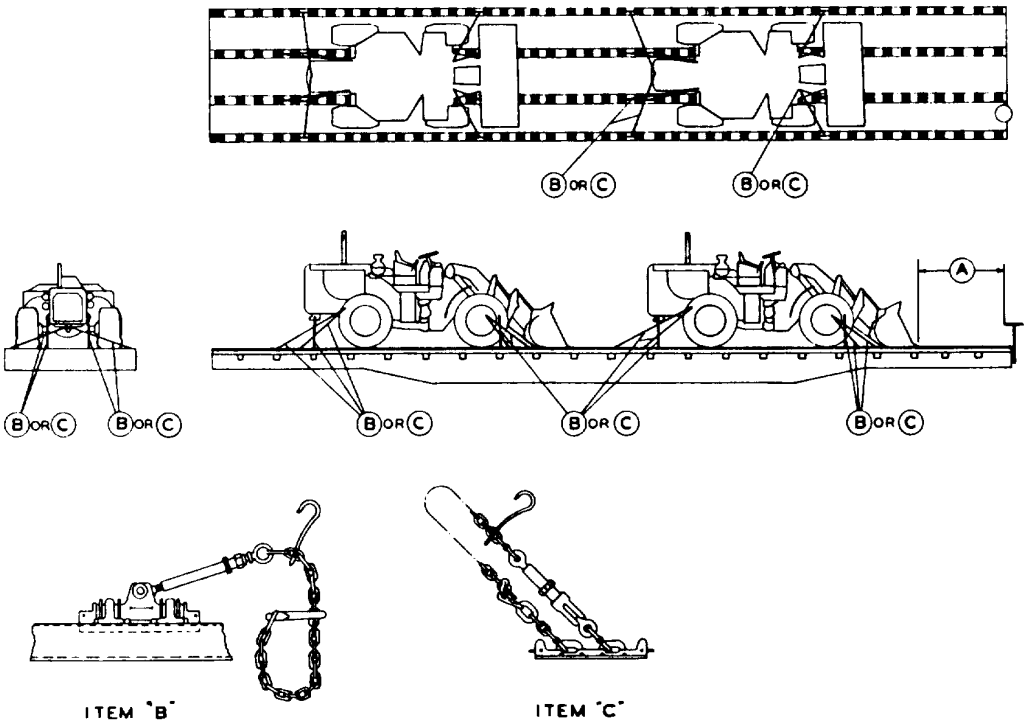
Gear shift levers are to be placed in a neutral position.

Turnbuckles not equipped with self-locking devices must be wired or locked to prevent loosening.

See General Rules 1, 2, 3, 4, 5, 7, 9, 10, 14, 15, 19, 19-A and 19-B for further details.

Sec. 3-Fig. 105 (New--10-1969)

TRACTOR, FOUR WHEEL (WITH PNEUMATIC TIRES), WITH OR WITHOUT BUCKETS, DOZERS, ETC.-FLAT CARS WITH CHAIN TIE-DOWN ASSEMBLIES, TIE-DOWN CHANNELS AND SPECIAL CUSHIONING DEVICES



ITEM "B"

ITEM "C"

Item	No. of Pcs.		Description
A		Brake Wheel Clearance, See Fig. 2, Sec. 1.	
B	4	chains for units up to 15,000 lbs.	1/2 in. alloy tie-own chain assembly. Additional chains may be added for lateral stability.
	8	" " " over 15,.000 to 30,000 lbs.	
	12	" " " " 30,000 to 45,000	"
	16	" " " " 45,000 to 60,000	"
	20	" " " " 60,000 to 75,000	"
	24	" " " " 75,000 to 90,000	"
C	4	chains for units up to 30,000 lbs.	1/2 in. alloy tie-down chain assembly. Additional chains may be added for lateral stability.
	8	" " " over 30,000 to 60,000 lbs.	
	12	" " " " 60,000 to 90,000	"
	16	" " " " 90,000 to 120,000 "	
	20	" " " " 120,ooo to 150,000	"

GENERAL INSTRUCTIONS

Secure longitudinal chains to vehicle. Pull chains as tight as possible by hand and attach hook into an appropriate link in the chain. All chain tie-downs must be made taut by tightening the turnbuckles.

Tie-downs in the inboard channels are to be in line across the car and tie-downs in the outboard channels are to be in line in the same manner. The angle of the tie-downs must be as close to 45° as possible.

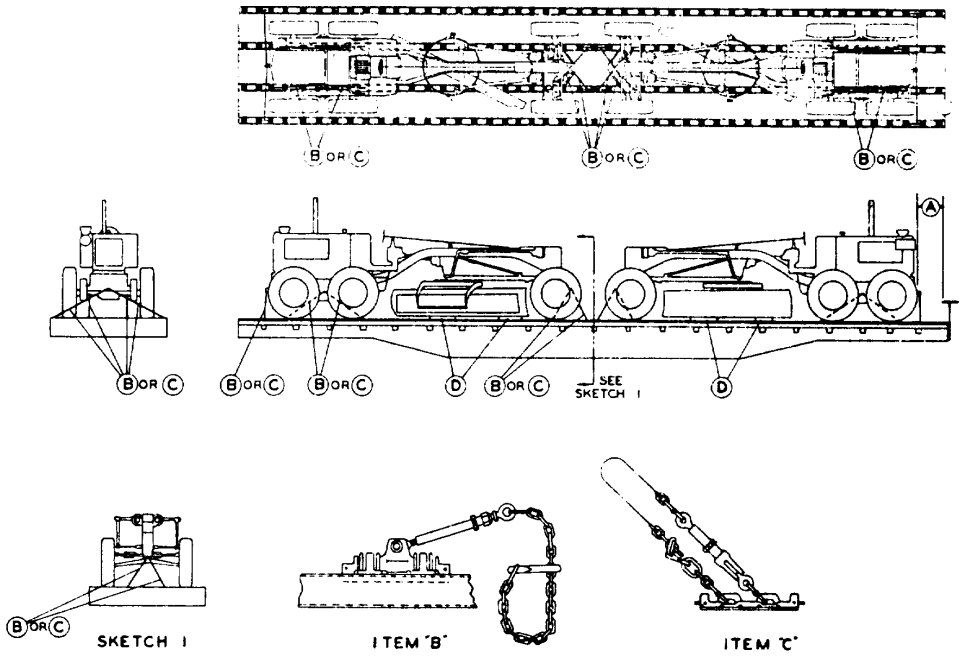
Gear shift levers are to be placed in a neutral position.

Turnbuckles not equipped with self-locking devices must be wired or locked to prevent loosening.

See General Rules 4, 5,14, 15, 19-A, 19-B and 19-C for further details.

Sec. 3--Fig. 110 (New--12-1969)

GRADER, MOTOR, SIX WHEEL (WITH PNEUMATIC TIRES). FLAT CARS WITH CHAIN TIE-DOWN ASSEMBLIES, TIE-DOWN CHANNELS AND SPECIAL CUSHIONING DEVICES



Item	No. of Pcs.	Description
A		Brake Wheel Clearance, See Fig. 2, Sec. 1.
B	4 chains for units up to 15,000 lbs. 8 " " " over 15,000 to 30,000 lbs. 12 " " " " 30,000 to 45,000 16 " " " " 45,000 to 60,000 20 " " " " 60,000 to 75,000	1/2 in. alloy tie-down chain assembly. Additional chains may be added for lateral stability. " " "
C	4 chains for units up to 30,000 lbs. 8 " " " over 30,000 to 60,000 lbs. 12 " " " " 60,000 to 90,000	1/2 in. alloy tie-down chain assembly. Additional chains may be added for lateral stability. "
D	2 per unit.	8 in. wide x 30 in. long, thickness to suit, lumber, space between car floor and scraper blade. Secure to floor by nailing.

GENERAL INSTRUCTIONS

Secure longitudinal chains to vehicle. Pull chains as tight as possible by hand and attach hook into an appropriate link in chain. All chain tie-downs must be made taut by tightening the turnbuckles.

Tie-down in the inboard channels are to be in line across the car and tie-down in the outboard channels are to be in line in the same manner. The angle of the tie-downs must be as close to 45° as possible.

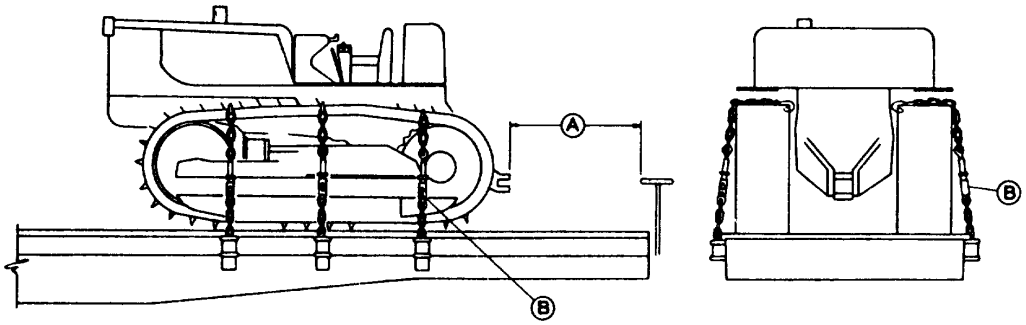
Gear shift levers are to be placed in a neutral position.

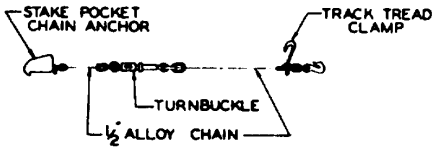
Turnbuckles not equipped with self-locking devices must be wired or locked to prevent loosening.

See General Rules 4, 5, 9, 14, 15, 19-A, 19-B and 19-0 for further details.

Sec. 3-Fig. 200 (Rev.--9-1983)

TRACTORS, CRAWLER TYPE WITH GROUSERS, FLAT CARS HAVING CHAIN TIE-DOWN ASSEMBLIES





STAKE POCKET ANCHOR AND CHAIN ASSEMBLEY

SKETCH 1

Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 each unit 35,000 lbs. or less 6 each unit over 35.000 lbs. to 90,000 lbs. 8 each unit over 90,000 lbs. to 123,000 lbs. inclusive.	Chain 1/2 in. alloy per Sketch 1. Place one directly forward of rear drive sprocket and one immediately behind front idler where track is parallel with floor. When six chains are required, locate additional chain midway between two outer chains. When eight chains are required, locate one directly over rear drive sprocket and one over front idler where track Is parallel with car floor. Space the two remaining chains equally between the two outer chains.

Notes:

1. Detached parts, boxed material, etc., must be located as far from sides and ends of car as practicable and secured to prevent displacement.

2. Brake must be tightly set and secured.

See General Rules 1, 2, 3, 4, 5, 9, 10, 15 and 19-A for further details.

SECTION No. 3

PART 3

RULES GOVERNING

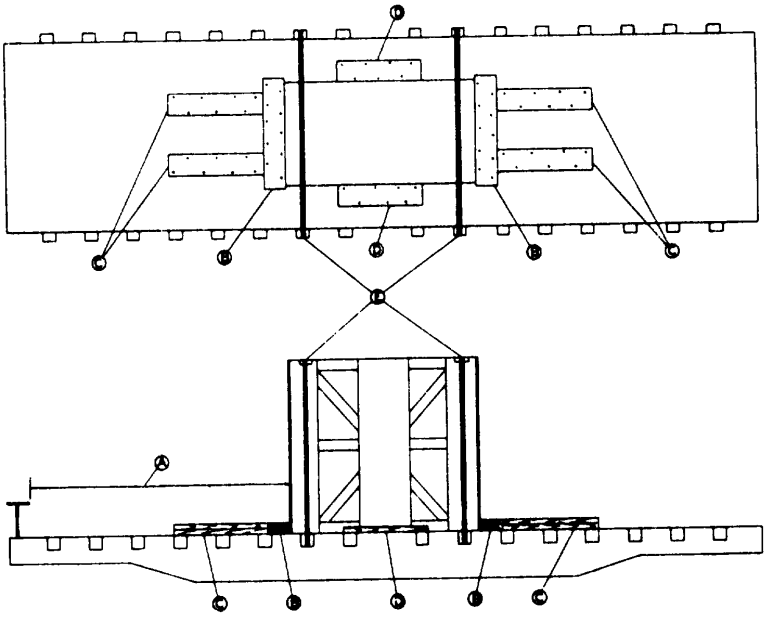
THE

Loading of Farm Equipment Machinery

On Chain Tie Down Open Top CARS

Sec. 4-Fig. 1-A (Rev.--10-1966)

TRANSFORMERS WEIGHING 21,000 LBS. OR LESS, 10 FT. HIGH OR LESS, BOXED, CRATED OR SKIDDED-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2 ea. unit.	Each to consist of two pieces of 2 in. x 6 in. hardwood, length full width of unit. Locate one at each end of unit, crosswise of car, flush against outside base of box, crate or skid. Nail lower piece to floor with ten 30-D nails and top piece to one below with ten 40-D nails.
C	2 ea. Item "B".	Each to consist of two pieces of 2 in. x 6 in. x 28 in. hardwood. Locate endwise of car flush against items "B", equally spaced. Nail lower piece to floor with seven 30-D nails and top piece to one below with seven 40-D nails.
D	2 ea. unit.	2 in. x 6 in. x 28 in. hardwood. Locate one at each side of each unit at the center outer base of box, crate or skid, endwise of car. Nail to floor, flush against base of box, crate or skid, with seven 30-D nails.
E	2 ea. unit.	2 in. x .050 in. high tension bands, passing over top of box, crate or transformer, spaced as near ends of each unit as possible, secured to opposite stake pockets.

Transformers boxed, crated or skidded, and loaded under this figure, must be secured to crate, box or skid, in such a manner that the transformer is an integral part of crate, box or skid. Crate or box must be constructed to contain transformer and be of sufficient strength to withstand securement by use of high tension bands.

When units are loaded in tandem, i.e. end to end, and total weight does not exceed 21,000 lbs., items "B" and "C" can be omitted between boxes or crates.

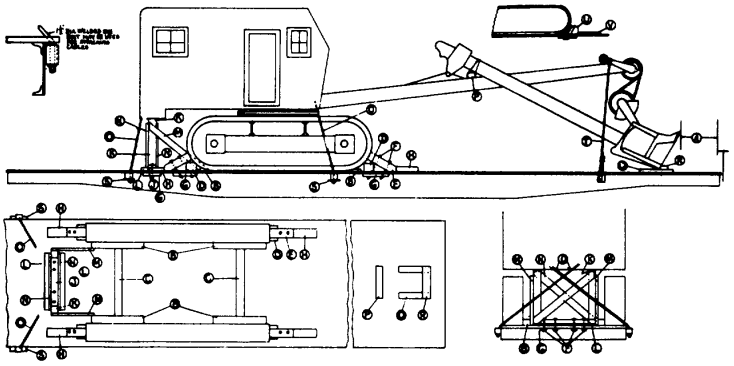
*When loaded in tandem and total weight exceeds 21,000 lbs., end blocking items "B" and "C" must be increased to 6 in. x 8 in. hardwood. Item "B" to be secured with not less than two 3/4 in. bolts passing through car floor and each backed up with four items "C", 6 in. x 8 in. x 24 in. hardwood, each secured with not less than two 3/4 in. bolts passing through car floor. For items "C", substitute if desired, four laminated pieces each to consist of two pieces 2 in. x 6 in. x 24 in. hardwood, lower piece to be secured to car floor with seven 30-D nails and top piece to one below with seven 40-D nails. Items "B" and "C" can be omitted between boxes, crates, or skids.

See General Rules 8, 4, 5, 7, 9, 14 and 15 for further details.

Section No. 4

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CRAWLER TYPE SHOVELS-ROTATING BODIES-BOOMS ATTACHED-FLAT CARS



Item	No. of Pcs.	Description
A	2	Brake wheel clearance. See Fig. 2, Sec. 1.
B	2	4 in. x 6 in., hardwood, length equal to that portion of crawler tread resting on floor. Locate on floor, against crawlers, and secure each with four 5/8 in. dia. bolts or eight 60-D nails. Substitute, if desired, four pieces 4 in. x 6 in. x 4 ft. Locate as shown and secure each with two 5/8 in. dia. bolts or four 60-D nails.
C	2	4 in. x 4 in., hardwood, long enough to fit between items "B". Secure each to floor with two 5/8 in. dia. bolts or four 60-D nails.
D	4	4 in. x 6 in. x 21 in., hardwood, for machines weighing 45,000 lbs. or less; 6 in. x 6 in. x 21 in., hardwood, for machines weighing over 45,000 lbs. Toe-nail each to floor with four 40-D nails. Not required when items "U" and "V" are used.
E	4	6 in. x 6 in., hardwood, length to suit. Locate on top of items "D", with one end against crawler and secure each with two 5/8 in. dia. bolts, items "F". Not required when items "U" and "V" are used.
F	8	5/8 in. dia. bolts, with nuts and washers, long enough to pass through items "E", "O" and floor.
G	As required.	4 in. x 4 in. x 18 in., hardwood cleats, or 1/2 in. x 4 in. x 18 in. plates.
H	4	2 in. x 4 in. x 18 in., hardwood. Locate on floor, with one end against item "E" and secure each with six 30-D nails.
J	1	4 in. x 6 in., hardwood, length to suit, for machines weighing 45,000 lbs. or less; 6 in. x 6 in., hardwood, for machines weighing over 45,000 lbs. Secure to floor with four 5/8 in. dia. bolts, with nuts and washers.
K	As required.	Two 4 in. x 6 in., hardwood, for machines weighing 45,000 lbs. or less; two 6 in. x 6 in., hardwood, for machines weighing over 45,000 lbs. to 120,000 lbs.; four 6 in. x 6 in., hardwood, for machines weighing over 120,000 lbs. They must be long enough to fit between item "J" and body of machine.
L	2	2 in. x 6 in., hardwood, length to suit. Locate against item "J" and secure each to floor with six 30-D nails.
M	8	2 in. x 6 in., hardwood, length to suit. Secure top ends to items "K" and bottom ends to items "B" with four 80-D nails at each location.
N	2	2 in x 6 in., hardwood, length to suit. Locate diagonally and secure ends to opposite items "K" with six 20-D nails at each location.
O	2	1 1/4 in. diameter rods. Attach two at front and two at rear of rotating portion and pass through opposite stake pockets and items "S". 1 in. diameter rods may be used for machines weighing 45,000 lbs. or less. Substitute, if desired, 1/2 in. x 6 x 7 steel cable, doubled, for 1 1/4 in. diameter rods, or 5/8 in. x 6 x 19 steel cable, doubled, for 1 in. diameter rods. Items "O" may be applied at front end of machines, crossed between rotating portion and crawler structure, or applied on same side of machines equipped with two brackets cast integral on both rotating and crawler structures.
P	1	6 in. x 6 in., hardwood, length to suit. Wire in position after weight of boom has been placed on same.
Q	2	6 in. x 6 in., hardwood, length to suit. Toe-nail each to floor with six 40-D nails.
R	1	1 in. x 8 in., length to suit. Locate on top of items "Q", ahead of bucket, and secure to each item "Q" with four 20-D nails.
S	1 ea. Item "O".	1/2 in. x 4 in. x 10 in. plates. Not required when items "O" consists of cable.
T	1	5/8 in. x 6 x 7 steel cable, doubled. Loop over and around boom near front end and through opposite stake pockets.
U	4	8 in. x 8 in. x 36 in., hardwood, cut to fit contour of crawler treads, for machines weighing 45,000 lbs. to 120,000 lbs. Secure each with three 3/4 in. dia. bolts through floor and item "G" 12 in. x 12 in. x 36 in., hardwood, cut to fit contour of crawler treads, for machines weighing over 120,000 lbs. Secure each with three 7/8 in. dia. bolts through floor and item "O" Not required when items "D" and "E" are used.
V	4	2 in. x 12 in. x 36 in., hardwood cleats, for machines weighing 45,000 to 120,000 lbs. 3 in. x 4 in. x 18 in., hardwood cleats, for machines weighing over 120,000 lbs. Locate on floor against items "U" and secure each to floor with six 30-D nails. Not required when items "D" and "E" are used.

Booms with buckets attached must not extend beyond end of carrying car.

Loading machines with treads extending beyond floor of car is permitted, provided machines are centrally located on car and not more than one-half of tread extends beyond outside face of side sill.

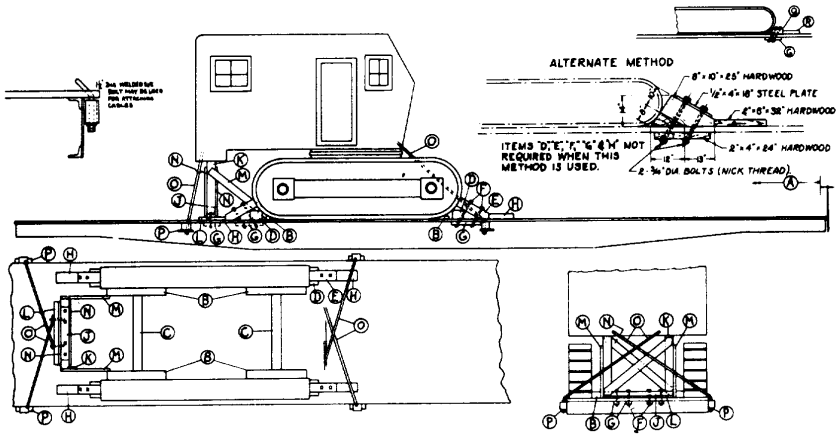
*Machines equipped with locking devices, including those with adjustable treads, should have such devices placed in locked position by shippers.

For proper location of load on car, see Fig. 34.

See General Rules 4, 5, 9, 14, 15, 19 and 19A for further details.

Sec. 4-Fig. 21 (Rev.--3-1965)

CRAWLER TYPE MACHINES-ROTATING BODIES-BOOMS DETACHED--FLAT CARS



Item	No. of Pcs.	Description
A	2	Brake wheel clearance. See Fig. 2, Sec. 1.
B	2	4 in. x 6 in., hardwood, length equal to that portion of crawler tread resting on floor. Locate on floor, against crawlers, and secure each with four 5/8 in. dia. bolts or eight 60-D nails. Substitute, if desired, four pieces, 4 in. x 6 in. x 4 ft. Locate as shown and secure each with two 5/8 in. dia. bolts or four 60-D nails.
C	2	4 in. x 4 in., hardwood, long enough to fit between items "B". Secure each to floor with two 5/8 in. dia. bolts or four 60-D nails.
D	4	4 in. x 6 in. x 21 in., hardwood, for machines weighing 45,000 lbs. or less; 6 in. x 6 in. x 21 in., hardwood, for machines weighing over 45,000 lbs. Toe-nail each to floor with four 40-D nails. Not required when items "P" and "Q" are used.
E	4	6 in. x 6 in., hardwood, length to suit. Locate on top of items "D", with one end against crawler and secure each with two 5/8 in. dia. bolts, items "F". Not required when items "P" and "Q" are used.
F	8	5/8 in. dia. bolts, with nuts and washers, long enough to pass through items "E", "G" and floor.
G	As required.	4 in. x 4 in. x 18 in., hardwood cleats, or 1/2 in. x 4 in. x 18 in. plates.
H	4	2 in. x 4 in. x 18 in., hardwood. Locate on floor with one end against item "E" and secure each with six 30-D nails.
J	1	4 in. x 6 in., hardwood, length to suit, for machines weighing 45,000 lbs. or less; 6 in. x 6 in., hardwood, for machines weighing over 45,000 lbs. Secure to floor with four 5/8 in. dia. bolts, with nuts and washers.
K	As required.	Two 4 in. x 6 in., hardwood, for machines weighing 45,000 lbs. or less; two 6 in. x 6 in., hardwood, for machines weighing over 45,000 lbs. to 120,000 lbs.; four 6 in. x 6 in., hardwood, for machines weighing over 120,000 lbs. They must be long enough to fit between item "J" and body of machine.
L	2	2 in. x 6 in., hardwood, length to suit. Locate against item "J" and secure each to floor with six 30-D nails.
M	2	2 in. x 6 in., hardwood, length to suit. Secure top ends to items "K" and bottom ends to items "B" with four 30-D nails at each location.
N	2	2 in. x 6 in., hardwood, length to suit. Locate diagonally and secure ends to opposite items "K" with six 20-D nails at each location.
O	4	1 1/4 in. diameter rods. Attach two at front and two at rear of rotating portion and pass through opposite stake pockets and items "P". 1 in. diameter rods may be used on machines weighing 45,000 lbs. or less. Substitute, if desired, 5/8 in. x 6 x 7 steel cable, doubled, for 14 in. diameter rods, or 1/2 in. x 6 x 19 steel cable, doubled, for 1 in. diameter rods. Items "O" may be applied at front end of machine, crossed between rotating portion and crawler structure, or applied on same side of machine equipped with two brackets cast integral on both rotating and crawler structures, providing two additional rods are applied attached to crawler structure and passed through opposite stake pockets and items "P" or through floor and items "G".
P	1 ea. Item "O"	1/2 in. x 4 in. x 10 in. plates. Not required when items "O" consists of cable.
Q	4	8 in. x 8 in. x 36 in., hardwood, cut to fit contour of crawler treads, for machines weighing 45,000 lbs. to 120,000 lbs. Secure each with three 3/4 in. dia. bolts through floor and item 12 in. x 12 in. x 36 in., hardwood, cut to fit contour of crawler treads, for machines weighing over 120,000 lbs. Secure each with three 7 8 in. dia. bolts through floor and item "G" Not required when items "D" and "E" are used.
R	42 in. x 12 in. x 36 in., hardwood cleats, for machines weighing 45,000 lbs. to 120,000 lbs. 3 in. x 4 in. x 18 in., hardwood cleats, for machines weighing over 120,000 lbs. Locate on floor against items "Q" and secure each to floor with six 30-D nails. Not required when items "D" and "E" are used.	

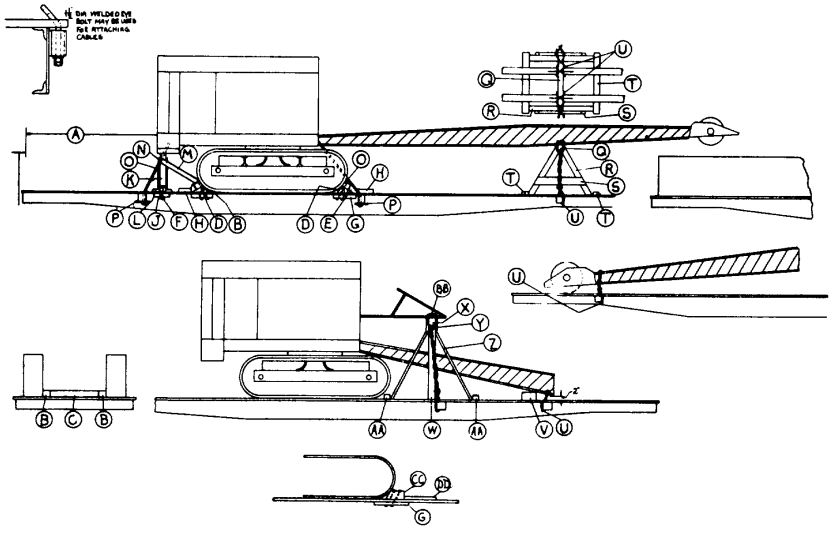
Loading machines with treads extending beyond floor of car is permitted, provided machines are centrally located on car and not more than one-half of tread extends beyond outside face of side sill.

Machines equipped with locking devices, including those with adjustable treads, should have such devices placed in locked position by shippers.

For proper location of load on car, See Fig. 34.

See General Rules 4, 5, 9, 14, 15, 19 and 19A for further details.

CRAWLER TYPE CRANES, DRAGLINES, ETC.-ROTATING BODIES-BOOMS ATTACHED-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	2	4 in. x 6 in., hardwood, length equal to that portion of crawler tread resting on floor. Locate on floor, against crawlers, and secure each with four 5/8 in. dia. bolts or eight 60-D nails. Substitute, if desired, four pieces 4 in. x 6 in. x 4 ft. Locate as shown and secure each with two 5/8 in. dia. bolts or four 60-D nails.
C	2	4 in. x 4 in., hardwood, long enough to fit between items "B". Secure each to floor with two 5/8 in. dia. bolts or four 60-D nails.
D	4	4 in. x 6 in. x 21 in., hardwood, for machines weighing 45,000 lbs. or less; 6 in. x 6 in. x 21 in., hardwood, for machines weighing over 45,000 lbs. Toe-nail each to floor with four 40-D nails. Not required when items "CC" and "DD" are used.
E	4	6 in. x 6 in., hardwood, length to suit. Locate on top of items "D", with one end against crawler and secure each with two 5/8 in. dia. bolts, Items "F". Not required when Items "CC" and "DD" are used.
F	8	5/8 in. dia. bolts, with nuts and washers, long enough to pass through Items "E", "G" and floor.
G	As required.	4 in. x 4 in. x 18 in., hardwood cleats, or 1/2 in. x 4 in. x 18 in. plates.
H	4	2 in. x 4 in. x 18 in., hardwood. Locate on floor, with one end against Item "E" and secure each with six 30-D nails.
J	1	4 in. x 6 in., hardwood, length to suit, for machines weighing 45,000 lbs. or less; 6 in. x 6 in., hardwood, for machines weighing over 45,000 lbs. Secure to floor with four 5/8 in. dia. bolts, with nuts and washers.
K	As required.	Two 4 in. x 6 in., hardwood, for machines weighing 45,000 lbs. or less; two 6 in. x 6 in., hardwood for machines weighing over 45,000 lbs. to 120,000 lbs.; four 6 in. x 6 in., hardwood, for machines weighing over 120,000 lbs. They must be long enough to fit between Item "J" and body of machine.

CRAWLER TYPE CRANES, DRAGLINES, ETC.--ROTATING BODIES-BOOMS ATTACHED-FLAT CARS

Item	No. of Pcs.	Description
L	2	2 in. x 6 in., hardwood, length to suit. Locate against Item "J" and secure each to floor with six 30-D nails.
M	2	2 in. x 6 in., hardwood, length to suit. Secure top ends to Items "K" and bottom ends to Items "B" with four 30-D nails at each location.
N	2	2 in. x 6 in., hardwood, length to suit. Locate diagonally and secure ends to opposite Items "K" with six 20-D nails at each location.
0	4	1 1/4 in. diameter rods. Attach two at front and two at rear of rotating portion and pass through opposite stake pockets and Items "P". 1 in. diameter rods may be used for machines weighing 45,000 lbs. or less. Substitute, if desired, 5/8 in. x 6 x 7 steel cable, doubled, for 1Y in. diameter rods, or 1/2 in. x 6 x 19 steel cable, doubled, for 1 in. diameter rods. Items "O" may be applied at front end of machines, crossed between rotating portion and crawler structure, or applied on same side of machines equipped with two brackets cast integral on both rotating and crawler structures.
P	1 ea. Item "O".	1/2 in. x 4 in. x 10 in. plates. Not required when Items "O" consists of cable.
Q	1	4 in. x 6 in., hardwood, long enough to extend 6 in. beyond each side of boom.
R	4	4 in. x 6 in., hardwood, length to suit. Secure each piece to Item "Q" with four 30-D nails and to floor with five 30-D nails. Items "R" must be long enough to keep boom at least six inches above top of sides and ends of idler car.
S	2	2 in. x 6 in., hardwood, length to suit. Secure to Items "R" with four 30-D nails in each end.
T	2	2 in. x 6 in., hardwood, long enough to extend beyond Items "R". Secure each to floor with six 30-D nails.
U	1	5/8 in. x 6 x 7 steel cable, doubled. Loop over and around boom, near front end, and through stake pockets on opposite sides of car.
V	1	6 in. x 6 in., hardwood, long enough to extend beyond each side of boom. Locate so as to maintain 2 in. clearance between end of boom and floor and toe-nail to floor with six 60-D nails in each side. Not required when sheave wheel rests on floor.
W	2	4 in. x 6 in., hardwood, length to suit.
X	1	4 in. x 6 in., hardwood, long enough to extend 6 in. beyond each side of gantry. Toe-nail to each Item "W" with four 30-D nails.
Y	4	2 in. x 6 in. x 12 in., hardwood. Locate one on front and one on back face of each Item "W" and secure each to Items "W" and "X" with six 20-D nails.
Z	4	2 in. x 6 in., hardwood, length to suit. Toe-nail bottom end of each to floor with two 80-D nails and top end of each to Item "W" with three 30-D nails.
AA	4	2 in. x 6 in. x 12 in., hardwood cleats. Locate one against each Item "Z" and secure each to floor with four 30-D nails.
BB	1	3/8 in. steel cable, doubled. Loop over and around gantry, and through opposite stake pockets.
CC	4	8 in. x 8 in. x 36 in., hardwood, cut to fit contour of crawler treads, for machines weighing 45,000 lbs. to 120,000 lbs. Secure each with three 3/4 in. dia. bolts through floor and Item 12 in. x 12 in. x 36 in., hardwood, cut to fit contour of crawler treads, for machines weighing over 120,000 lbs. Secure each with three 7/8 in. dia. bolts through floor and Item "G". Not required when Items "D" and "E" are used.
DD	4	2 in. x 12 in. x 36 in., hardwood cleats, for machines weighing 45,000 lbs. to 120,000 lbs. 3 in. x 4 in. x 18 in., hardwood cleats, for machines weighing over 120,000 lbs. Locate on floor against Items "CC" and secure each to floor with six 30-D nails. Not required when Items "D" and "E" are used.

Items "Q", "R", "S" and "T" not required when Items "V" are used, or vice versa.

Loading machines with treads extending beyond floor of car is permitted, provided machines are centrally located on car and not more than one-half of tread extends beyond outside face of side sill.

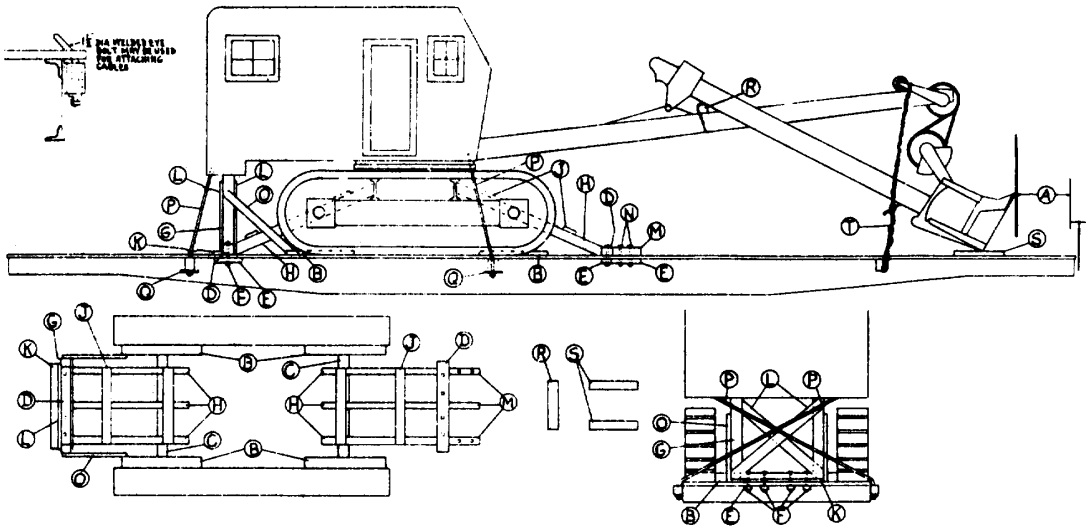
Machines equipped with locking devices, including those with adjustable treads, should have such devices placed in locked position by shippers.

For proper location of load on car, see Fig. 34.

See General Rules 4, 5, 8, 9, 14, 15, 19, 19A and 21 for further details.

Sec. 4--Fig. 22-A (Rev.--3-1965)

CRAWLER TYPE SHOVELS-ROTATING BODIES-BOOMS ATTACHED--FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2	4 in. x 6 in., hardwood, length equal to that portion of crawler tread resting on floor. Locate on floor, against crawlers, and secure each with four 5/8 in. dia. bolts or eight 60-D nails. Substitute, if desired, four pieces, 4 in. x 6 in. x 4 ft. Locate as shown and secure each with two 5/8 in. dia. bolts or four 60-D nails.
C	2	4 in. x 4 in., hardwood, long enough to fit between Items "B". Secure each to floor with two 5/8 in. dia. bolts or four 60-D nails.
D	2	4 in. x 6 in., hardwood, for machines weighing 45,000 lbs. or less; 6 in. x 6 in., hardwood for machines weighing over 45,000 lbs.; long enough to extend beyond Items "G" and "H". Secure each to floor with four 5/8 in. dia. bolts.
E	As Required.	2 in. x 4 in. x 18 in., hardwood cleats, or 1/2 in. x 4 in. x 18 in. plates.
F	8	2 in. dia. bolts, with nuts and washers, long enough to pass through Items "D", "E" and floor.
G	2	4 in. x 6 in., hardwood, for machines weighing 45,000 lbs. or less; 6 in. x 6 in., hardwood, for machines weighing over 45,000 lbs.; long enough to fit between Items "D" and body of machine.
H	4	4 in. x 6 in., hardwood, for machines weighing 112,000 lbs. or less.
	6	6 in. x 6 in., hardwood, for machines weighing over 112,000 lbs. They must be long enough to fit between Items "D" and base of machine.
J	4	2 in. x 6 in., hardwood, long enough to extend beyond outside Items "H". Secure to Items "H" with three 20-D nails at each location.
K	1	2 in. x 6 in., hardwood, length to suit. Locate against Item "D", and secure to floor with six 30-D nails. Not required when Items "M" are used at both ends.

Item	No. of Pcs.	Description
L	2	2 in. x 6 in., hardwood, length to suit. Locate diagonally and secure ends to opposite Items "G" with six 20-D nails at each location.
M	1 ea. Item "H".	4 in. x 6 in. x 18 in., hardwood. Locate against Items "D", opposite Items "H". Secure each outside Item "M" with two 58 in. dia. bolts, Items "N", and each intermediate Item "M" to floor with four 60-D nails. Not required when Items "K" are used at both ends.
N	2 ea. outside Item "M".	5/8 in. dia. bolts, with nuts and washers. Pass through Items "M", "E" and floor. Not required when Items "K" are used.
O	2	2 in. x 6 in., hardwood, length to suit. Secure top ends to Items "G" and bottom ends to Items "B" with four 30-D nails at each location.
P	4	1 1/4 in. diameter rods. Attach two at front and two at rear of rotating portion and pass through opposite stake pockets and Items "Q". 1 in. diameter rods may be used for machines weighing 45,000 lbs. or less. Substitute, if desired, 5/8 in. x 6 x 7 steel cable, double, for 1 1/4 in. diameter rods, of 1/2 in. x 6 x 19 steel cable, doubled, for 1 in. diameter rods. Items "P" may be applied at front end of machines, crossed between rotating portion and crawler structure, or applied on same side of machines equipped with two brackets cast integral on both rotating and crawler structures.
Q	1 ea. Item "P"	1/2 in. x 4 in. x 10 in. plates. Not required when Items "P" consists of cable.
R	1	6 in. x 6 in., hardwood, length to suit. Wire in position after weight of boom has been placed on same.
S	2	4 in. x 6 in. x 30 in., hardwood, for machines weighing 45,000 lbs. or less; 6 in. x 6 in., hardwood, for machines weighing over 45,000 lbs. Secure each to floor with two 5/8 in. dia. bolts, or six 60-D nails.
T	1	3/8 in. steel cable, doubled, for machines weighing 45,000 lbs. or less; 1/2 in. steel cable, doubled, for machines weighing over 45,000 lbs. Loop over and around boom near front end and through opposite stake pockets.

Booms with buckets attached must not extend beyond end of carrying car.

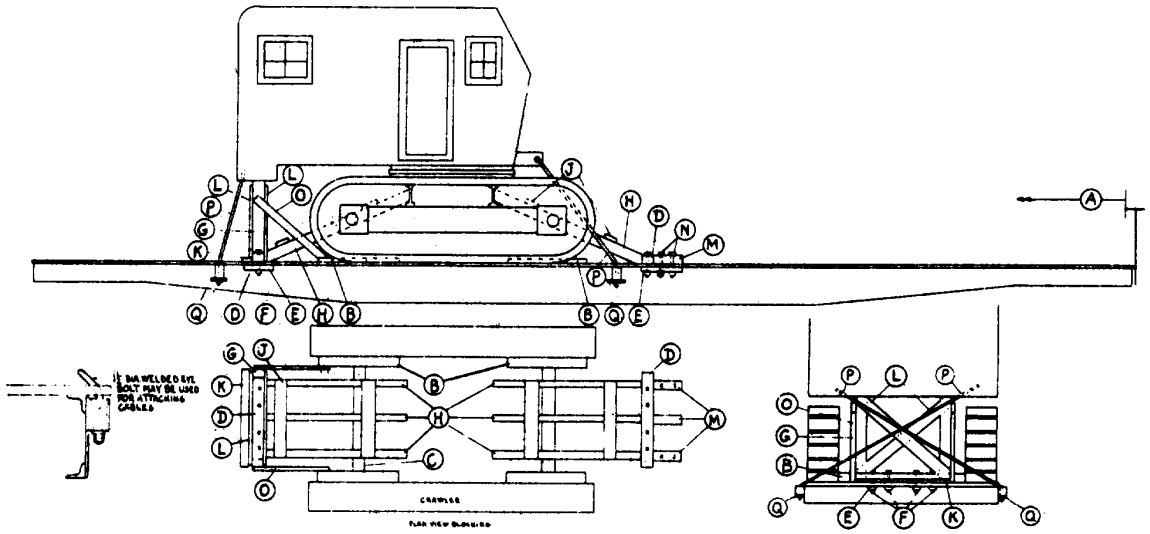
Loading machines with treads extending beyond floor of car is permitted, provided machines are centrally located on car and not more than one-half of tread extends beyond outside face of side sill.

Machines equipped with locking devices, including those with adjustable treads, should have such devices placed in locked position by shippers.

For proper location of load on car, see Fig. 34.

See General Rules 4, 5, 9, 14, 15, 19 and 19A for further details.

CRAWLER TYPE MACHINES-ROTATING BODIES-BOOM DETACHED-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2	4 in. x 6 in., hardwood, length equal to that portion of crawler tread resting on floor. Locate on floor, against crawlers, and secure each with four J5, in. dia. bolts or eight 60-D nails. Substitute, if desired, four pieces, 4 in. x 6 in. x 4 ft. Locate as shown and secure each with two 5/8 in. dia. bolts or four 60-D nails.
C	2	4 in. x 4 in., hardwood, long enough to fit between Items "B". Secure each to floor with two 5/8 in. dia. bolts or four 60-D nails.
D	2	4 in. x 6 in., hardwood, for machines weighing 45,000 lbs. or less; 6 in. x 6 in., hardwood, for machines weighing over 45,000 lbs.; long enough to extend beyond Items "G" and "H". Secure each to floor with four 5/8 in. dia. bolts.
E	As required.	2 in. x 4 in. x 18 in., hardwood cleats, or 1/2 in. x 4 in. x 18 in. plates.
F	8	5/8 in. dia. bolts, with nuts and washers, long enough to pass through Items "D", "E" and floor.
G	2	4 in. x 6 in., hardwood, for machines weighing 45,000 lbs. or less; 6 in. x 6 in., hardwood, for machines weighing over 45,000 lbs.; long enough to fit between Items "D" and body of machine.
H	8	4 in. x 6 in., hardwood, long enough to fit between Items "D" and base of machine. Four only required for machines weighing 112,000 lbs. or less.
J	4	2 in. x 6 in., hardwood, long enough to extend beyond outside Items "H". Secure to Items "H" with three 20-D nails at each location.
K	1	2 in. x 6 in., hardwood, length to suit. Locate against Item "D", and secure to floor with six 30-D nails. Not required when Items "M" are used at both ends.
L	2	2 in. x 6 in., hardwood, length to suit. Locate diagonally and secure ends to opposite Items "G" with six 20-D nails at each location.

Item	No. of Pcs.	Description
M	1 ea. Item "H".	4 in. x 6 in. x 18 in., hardwood. Locate against Items "D", opposite Items "H". Secure each outside Item "M" with two 5/8 in. dia. bolts, Items "N", and each intermediate Item "M" to floor with four 60-D nails. Not required when Items "K" are used at both ends.
N	2 ea. outside Item "M".	5/7 in. dia. bolts, with nuts and washers. Pass through Items "M", "E" and floor. Not required when Items "K" are used.
O	2	2 in. x 6 in., hardwood, length to suit. Secure top ends to Items "G" and bottom ends to Items "B" with four 30-D nails at each location.
P	4	1 1/4 in. diameter rods. Attach two at front and two at rear of rotating portion and pass through opposite stake pockets and Items "Q". 1 in. diameter rods may be used on machines weighing 45,000 lbs. or less. Substitute, if desired, 5/8 in. x 6 x 7 steel cable, doubled, for 1 1/4 in. diameter rods, or 1/2 in. x 6 x 19 steel cable, doubled, for 1 in. diameter rods. Items "P" may be applied at front end of machine, crossed between rotating portion and crawler structure, or applied on same side of machine equipped with two brackets cast integral on both rotating and crawler structures, providing two additional rods are applied attached to crawler structure and passed through opposite stake pockets and Items "Q", or through floor and Items "E".
Q	1 ea. Item "P".	1/2 in. x 4 in. x 10 in. plates. Not required when Items "P" consists of cable.

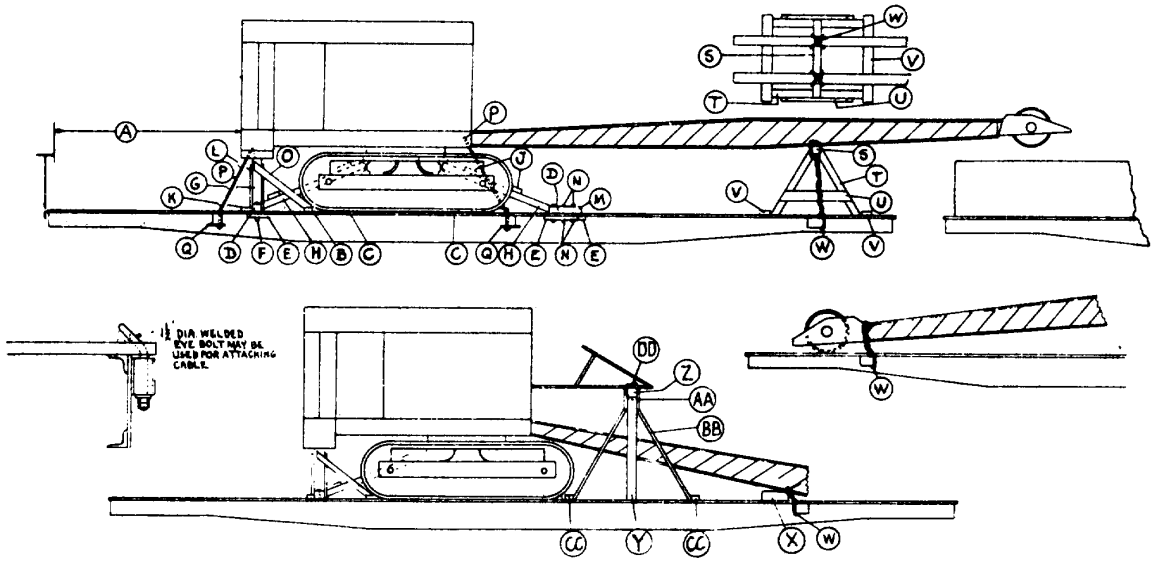
Loading machines with treads extending beyond floor of car is permitted, provided machines are centrally located on car and not more than one-half of tread extends beyond outside face of side sill.

Machines equipped with locking devices, including those with adjustable treads, should have such devices placed in locked position by shippers.

For proper location of load on car, see Fig. 34.

See General Rules 4, 5, 9, 14, 15, 19 and 19-A for further details.

CRAWLER TYPE CRANES, DRAGLINES, ETC.-ROTATING BODIES-BOOMS ATTACHED--FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2	4 in. x 6 in., hardwood, length equal to that portion of crawler tread resting on floor. Locate on floor, against crawlers, and secure each with four 5/8 in. dia. bolts or eight 60-D nails. Substitute, if desired, four pieces, 4 in. x 6 in. x 4 ft. Locate as shown and secure each with two 5/8 in. dia. bolts or four 60-D nails.
C	2	4 in. x 4 in., hardwood, long enough to fit between Items "B". Secure each to floor with two 5/8 in. dia. bolts or four 60-D nails.
D	2	4 in. x 6 in., hardwood, for machines weighing 45,000 lbs. or less; 6 in. x 6 in., hardwood, for machines weighing over 45,000 lbs.; long enough to extend beyond Items "G" and "H". Secure each to floor with four 5/8 in. dia. bolts.
E	As required.	2 in. x 4 in. x 18 in., hardwood cleats, or 1/2 in. x 4 in. x 18 in. plates.
F	As required.	5/8 in. dia. bolts, with nuts and washers, long enough to pass through Items "D", "E" and floor.
G	2	4 in. x 6 in., hardwood, for machines weighing 45,000 lbs. or less: 6 in. x 6 in., hardwood, for machines weighing over 45,000 lbs.; long enough to fit between Items "D" and body of machine.
H	6	4 in. x 6 in., hardwood, long enough to fit between Items "D" and base of machine. Four only required for machines weighing 112,000 lbs. or less.
J	4	2 in. x 6 in., hardwood, long enough to extend beyond outside Items "H". Secure to Items "H" with three 20-D nails at each location.
K	1	2 in. x 6 in., hardwood, length to suit. Locate against Item "D", and secure to floor with six 30-D nails. Not required when Items "M" are used at both ends.
L	2	2 in. x 6 in., hardwood, length to suit. Locate diagonally and secure ends to opposite Items "G" with six 20-D nails at each location.

Item	No. of Pcs.	Description
M	1 ea. Item "H"	1 in. x 6 in. x 18 in., hardwood. Locate against Items "D", opposite Items "H". Secure each outside Item "M" with two 5/8 in. dia. bolts, Items "N", and each intermediate Item "M" to floor with four 60-D nails. Not required when Items "K" are used at both ends.
N	2 ea. outside	5/8 dia. bolts, with nuts and washers. Pass through Items "M", "E" and floor. Not required Item "M". when Items "K" are used.
0	2	2 in. x 6 in., hardwood, length to suit. Secure top ends to Items "G" and bottom ends to Items "B" with four 30-D nails at each location.
P	4	1 1/4 in. diameter rods. Attach two at front and two at rear of rotating portion and pass through opposite stake pockets and Items "Q". 1 in. diameter rods may be used for machines weighing 45,000 lbs. or less. Substitute, if desired, 5/8 in. x 6 x 7 steel cable, doubled, for 1 1/4 in. diameter rods, or 1/2 in. x 6 x 19 steel cable, doubled, for 1 in. diameter rods. Items "P" may be applied at front end of machine, crossed between rotating portion and crawler structure, or applied on same side of machines equipped with two brackets cast integral on both rotating and crawler structures.
Q	1 ea. Item "P"	1/2 in. x 4 in. x 10 in. plates. Not required when Items "P" consists of cable.
R		VACANT.
S	1	4 in. x 6 in., hardwood, long enough to extend 6 in. beyond each side of boom.
T	4	4 in. x 6 in., hardwood, length to suit. Secure each piece to Item "S" with four 30-D nails and to floor with five 30-D nails. Items "T" must be long enough to keep boom at least 6 inches above top of sides and ends of idler car.
U	2	2 in. x 6 in., hardwood, length to suit. Secure to Items "T" with six 30-D nails.
V	2	2 in. x 6 in., hardwood, long enough to extend beyond Items "T". Secure each to floor with six 30-D nails.
W	1	3/8 in. steel cable, doubled. Loop over and around boom and through opposite stake pockets.
X	1	6 in. x 6 in., hardwood, long enough to extend beyond each side of boom. Locate so as to maintain 2 in. clearance between end of boom and floor and toe-nail to floor with six 60-D nails in each side. Not required when sheave wheel rests on floor.
Y	2	4 in. x 6 in., hardwood, length to suit.
Z	1	4 in. x 6 in., hardwood, long enough to extend 6 in. beyond each side gantry. Toe-nail to each Item "Y" with four 30-D nails.
AA	4	2 in. x 6 in. x 12 in., hardwood. Locate one on front and one on back face of each Item "Z" and secure each to Items "Y" and "Z" with six 20-D nails.
BB	4	2 in. x 6 in., hardwood, length to suit. Toe-nail bottom end of each to floor with two 30-D nails and top end of each to Item "Y" with three 30-D nails.
CC	4	2 in. x 6 in. x 12 in., hardwood cleats. Locate one against each Item "BB" and secure each to floor with four 30-D nails.
DD	1	3/8 in. steel cable, doubled. Loop over and around gantry and Item "Z".

Items "S", "T", "U", "V" and "W" are not required when Item "X" is used, or vice versa.

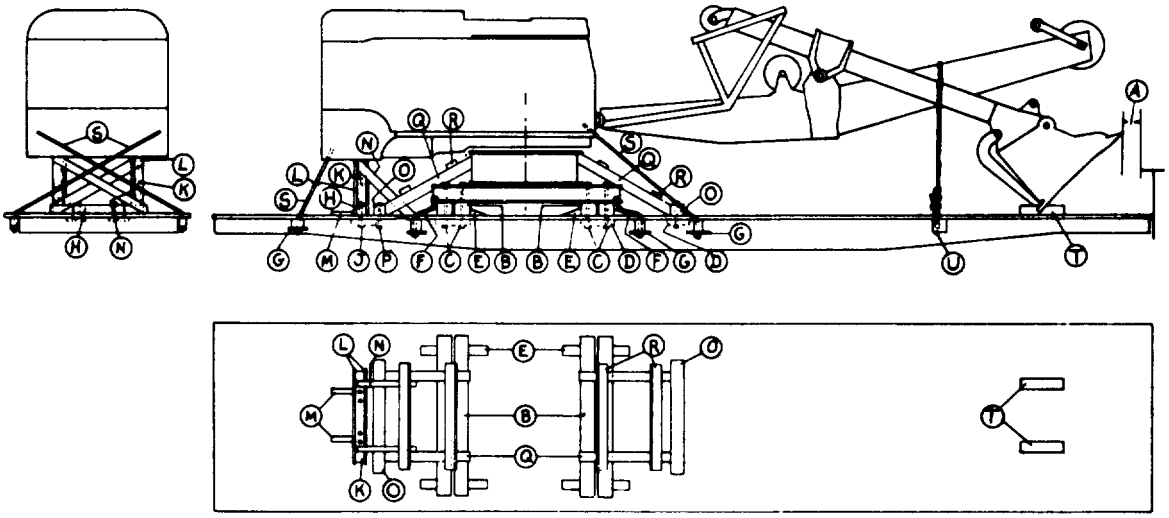
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Machines equipped with locking devices, including those with adjustable treads, should have such devices placed in locked position by shippers.

For proper location of load on car, see Fig. 34.

See General Rules 4, 5, 8, 9, 14, 15, 19, 19A and 21 for further details.

CRAWLER TYPE SHOVELS, CRAWLERS REMOVED, ROTATING BODIES, BOOMS AND BUCKETS ATTACHED- FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4	10 in. x 10 in., hardwood, length to suit, higher and wider if necessary. Locate under base of machine, near each end. Secure each to floor with four 5/8 in. dia. bolts.
C	16	5/8 in. dia. bolts, with nuts and washers, long enough to pass through Items "B", floor and Items "D".
D	As required.	4 in. x 4 in. x 18 in., hardwood, or 1/2 in. x 4 in. x 18 in. plates.
E	8	4 in. x 6 in. x 12 in., hardwood wedges. Nail two to floor against each Item "B" with four 30-D nails in each.
F	4	1 1/4 in. dia. rods. Attach to base of machine and pass through stake pockets and Items "G".
G	8	½ in. x 4 in. x'10 in. plates.
H	1	6 in. x 6 in., hardwood, length to suit. Secure to floor with four 5/8 in. dia. bolts.
J	4	5/8 in. dia. bolts, with nuts and washers, long enough to pass through Items "H", floor, and Items "D".
K	As required.	Two 6 in. x 6 in., hardwood, for machines weighing 120,000 lbs. or less; four 6 in. x 6 in., hardwood, for machines weighing over 120,000 lbs. They must be long enough to fit between Item "H" and body of machine. Toe-nail each to Item "H" with four 30-D nails.
L	2	2 in. x 6 in., hardwood, length to suit. Locate diagonally. Secure to Items "K" and, to Item "H" at bottom, with four 30-D nails at each location.
M	2	2 in. x 4 in. x 18 in., hardwood. Nail to floor against Item "H" with six 30-D nails in each.
N	2	2 in. x 6 in., length to suit. Secure top ends to Items "K" and bottom ends to Items "Q" with four 30-D nails at each location.
O	2	4 in. x 6 in., hardwood, length to suit. Secure to floor with four 5/8 in. dia. bolts. Use optional.
P	8	5/8 in. dia. bolts, with nuts and washers, long enough to pass through Items "O", floor, and Items "D".
Q	As required.	Four 6 in. x 6 in., hardwood, for machines weighing 120,000 lbs. or less; eight 6 in. x 6 in. hardwood, for machines weighing over 120,000 lbs. They must be long enough to fit between Items "O" and body of machine. Toe-nail to Items "O" with two 40-D nails. Use optional.
R	4	2 in. x 6 in., hardwood, long enough to extend beyond outside Items "Q". Secure to Items "Q" with three 20-D nails at each location. Use optional.
S	4	1 1/4 in. dia. rods, length to suit, for machines weighing 120,000 lbs. or less; 1 1/2 in. dia. rods for machines weighing more than 120,000 lbs. Attach to front and rear of rotating portion. Pass bottom ends through and secure underneath stake pockets and Items "G" on opposite sides of car. Substitute, if desired, 5/8 in. x 6 x 7 steel cable, doubled.
T	2	6 in. x 6 in. x 30 in. Secure each to floor with two 5 in. dia. bolts or six 60-D nails.
U	1	5/8 in. x 6 x 7 steel cable, doubled. Loop over and around boom, near front end and through opposite stake pockets.

Booms with buckets attached must not extend beyond end of carrying car.

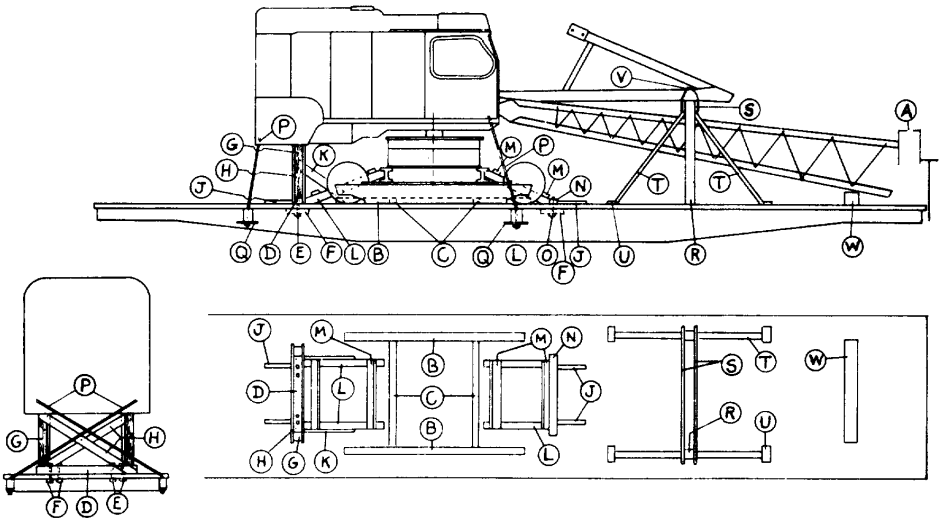
Detached parts must be loaded as far from car sides and ends as practicable and secured to prevent displacement.

Machines equipped with locking devices must have such devices placed in locked position by shippers.

For proper location of load on car, see Fig. 34.

See General Rules 4, 5, 7, 9, 14, 15, 19 and 19-A for further details.

Sec. 4--Fig. 25
CRAWLER TYPE CRANES, CRAWLERS REMOVED, ROTATING BODIES, BOOMS ATTACHED-FLAT CARS

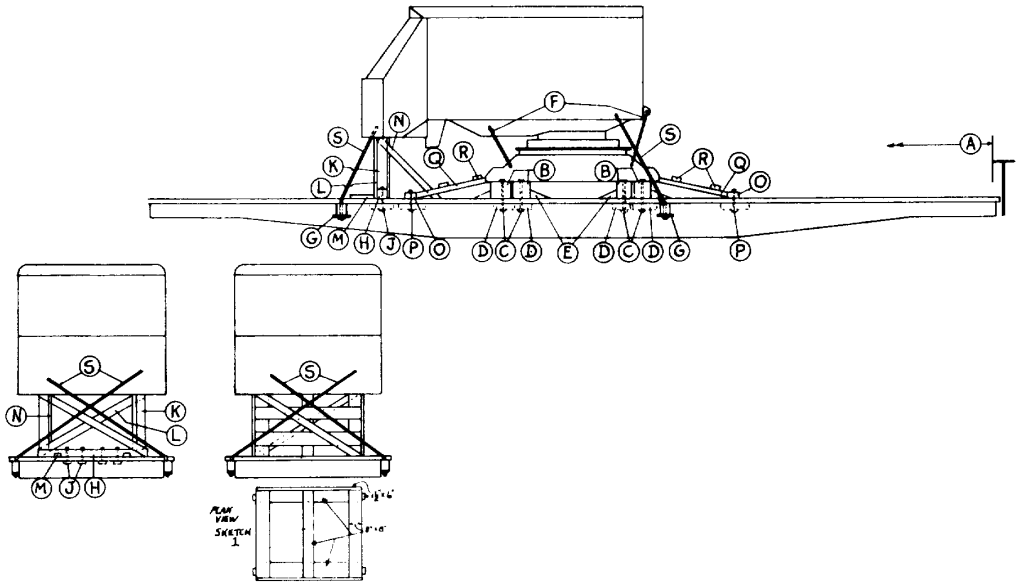


Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2,., Sec. 1.
B	2	4 in. x 6 in., hardwood, length equal to base of machine. Locate on floor, against crawler frame and secure each with four 5/8 in. dia. bolts, or eight 60-D nails. Substitute, if desired, four pieces 4 in. x 6 in. x 4 ft. Secure each with two 5/8 in. dia. bolts, or four 60-D nails.
C	2	4 in. x 4 in., hardwood, long enough to fit between Items "B". Secure each to floor with two % in. dia. bolts, or four 60-D nails.
D	1	6 in. x 6 in., hardwood, length to suit. Secure to floor with four 5/8 in. dia. bolts.
E	4	5/8 in. dia. bolts, with nuts and washers, long enough to pass through Items "D", floor, and Items "F".
F	As required.	4 in. x 4 in. x 18 in., hardwood, or 1/2 in. x 4 in. x 18 in. plates.
G	As required.	Two 6 in. x 6 in., hardwood, for machines weighing 120,000 lbs. or less; four 6 in. x 6 in., hardwood for machines weighing over 120,000 lbs. They must be long enough to fit between Items "D" and body of machine. Toe-nail each to Item "D" with four 30-D nails.
H	2	2 in. x 6 in., hardwood, length to suit. Locate diagonally. Secure to Items "G" and to Item "D" at bottom, with four 30-D nails at each location.
J	4	2 in. x 4 in. x 18 in., hardwood. Nail to floor against Items "D" and "N" with six 30-D nails in each.
K	2	2 in. x 6 in., hardwood, length to suit. Secure top ends to Items "G" and bottom ends to Items "L", with four 30-D nails at each location.
L	As required.	Four 6 in. x 6 in., hardwood, for machines weighing 120,000 lbs. or less; eight 6 in. x 6 in., hardwood, for machines weighing over 120,000 lbs. They must be long enough to fit between Item "D", "N", and base of machine. Toe-nail bottom end to Items "D" and "N" with four 30-D nails.
M	4	2 in. x 6 in., hardwood, long enough to extend beyond outside Items "L". Secure with three 20-D nails at each location.
N	1	4 in. x 6 in., hardwood, length to suit. Locate about six feet from base of machine. Secure to floor with four 5/8 in. dia. bolts.
0	4	5/8 in. dia. bolts, with nuts and washers, long enough to pass through Item "N", floor and Items "F".
P	4	1 1/4 in. dia. rods, length to suit, for machines weighing 120,000 lbs. or less; 1 1/2 in. dia. rods for machines weighing more than 120,000 lbs. Attach to front and rear of rotating portion. Pass bottom ends through and secure underneath stake pockets and Items "Q" on opposite sides of car. Substitute, if desired, %s in. x 6 x 7 steel cable, doubled.
Q	4	1/2 in. x 4 in. x 10 in. plates.
R	2	4 in. x 6 in., hardwood, length to suit. Toe-nail each to floor with four 30-D nails.
	2	2 in. x 6 in., hardwood, long enough to extend 6 in. beyond each side of gantry. Nail to Items "R" with four 30-D nails at each location.
T	4	2 in. x 6 in., hardwood, length to suit. Toe-nail top ends to Items "R" with three 30-D nails and bottom ends to floor with two 30-D nails.
U	4	2 in. x 4 in. x 12 in., hardwood. Locate one against each Item "T" and nail to floor with four 30-D nails.
V	1	Suitable wire or cable to prevent gantry from moving upward.
W	1	6 in. x 6 in., hardwood, long enough to extend 6 in. beyond each side of boom. Locate so as to maintain 2 in. clearance between boom and floor. Toe-nail to floor with six 60-D nails in each side. Not required when sheave wheel rests on floor.

Machines equipped with locking devices must have such devices placed in locked position by shippers.
Detached parts must be loaded as far from car sides and ends as practicable and secured to prevent displacement.
For proper location of load on car, see Fig. 34.
See Central Rules 4, 5, 7, 9, 14, 15, 19 and 19-A for further details.

Sec. 4--Fig. 26

CRAWLER TYPE SHOVELS, CRAWLERS REMOVED, ROTATING BODIES, BOOMS DETACHED-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4	10 in. x 10 in., hardwood, length to suit, higher and wider if necessary. Locate under base of machine, near each end. Secure each to floor with four 5/8 in. dia. bolts.
O	16	5/8 in. dia. bolts, with nuts and washers, long enough to pass through Items "B", floor and Items "D".
D	As required.	4 in. x 4 in. x 18 in., hardwood, or 1/2 in. x 4 in. x 18 in. plates.
E	8	4 in. x 6 in. x 12 in., hardwood wedges. Nail two to floor against each Item "B" with four 30-D nails in each.
F	4	1 1/4 in. dia. rods, length to suit. Attach two to front and two to rear of rotating portion and to opposite sides of crawler structure. Substitute, if desired, 5/8 in. x 6 x 7 steel cable, doubled, at each location. Where machines are equipped with two brackets cast integral on both rotating portion and crawler structure, Items "F", need not be crossed but may be applied to same side of machine.
G	As required.	1/2 in. x 4 in. x 10 in. plates.
H	1	6 in. x 6 in., hardwood, length to suit, for machines weighing 120,000 lbs. or less; 8 in. x 8 in., hardwood, for machines weighing more than 120,000 lbs. Secure to floor with four 5/8 in. dia. bolts.
J	4	5/8 in. dia. bolts, with nuts and washers, long enough to pass through Item "H", floor and Items "D".
K	As required.	Two 6 in. x 6 in., hardwood, for machines weighing 120,000 lbs. or less; four 8 in. x 8 in., hardwood, for machines weighing more than 120,000 lbs. They must be long enough to fit between Item "H" and body of machine. Toe-nail each to Item "H" with four 30-D nails.
L	2	2 in. x 6 in., hardwood, length to suit. Locate diagonally. Secure to Items "K" and to Item "H" at bottom, with four 30-D nails at each location.
M	2	2 in. x 4 in. x 18 in., hardwood. Nail to floor against Item "H" with six 30-D nails in each.
N	2	2 in. x 6 in., length to suit. Secure top ends to Items "K" and bottom ends to Items "Q" with four 30-D nails at each location.
O	2	4 in. x 6 in., hardwood, length to suit. Secure to floor with four 5/8 in. dia. bolts.
P	8	5/8 in. dia. bolts, with nuts and washers, long enough to pass through Items "O", floor, and Items "D".
Q	As required.	Four 6 in. x 6 in., hardwood, for machines weighing 120,000 lbs. or less; eight 6 in. x 6 in., hardwood, for machines weighing more than 120,000 lbs. They must be long enough to fit between Items "O" and body of machine. Toe-nail to Items "O" with four 30-D nails.
R	4	2 in. x 6 in., hardwood, long enough to extend beyond outside Items "Q". Secure to Items "Q" with three 20-D nails at each location.
S	4	1 1/4 in. dia. rods, length to suit, for machines weighing 120,000 lbs. or less; 1 1/2 in. dia. rods for machines weighing more than 120,000 lbs. Attach to front and rear of rotating portion. Pass bottom ends through and secure underneath stake pockets and Items "G" on opposite sides of car. Substitute, if desired, 5/8 in. x 6 x 7 steel cable, doubled.

Cribbed blocking, per Sketch 1, may be substituted for Items "H", "J", "K", "L", "M" and "N".

Detached parts must be loaded as far from car sides and ends as practicable and secured to prevent displacement

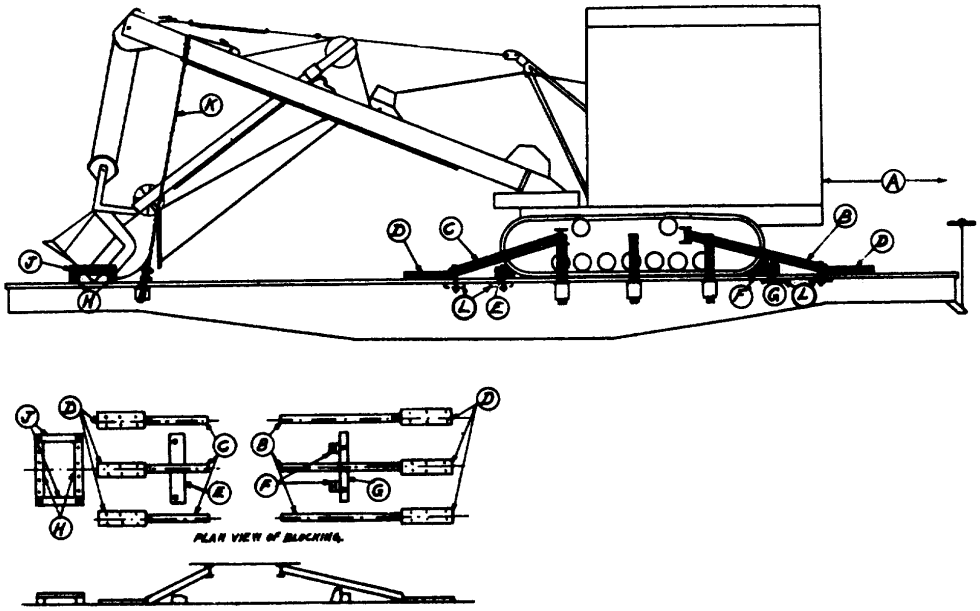
Machines equipped with locking devices must have such devices placed in locked position by shippers.

For proper location of load on car, see Fig. 34.

See General Rules 4, 5, 7, 9, 14, 15, 19 and 19-A for further details.

Sec. 4--Fig. 27 (Rev.--3-1965)

MACHINES ON WHICH BOOM ONLY ROTATES-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	3	4 in. x 4 in., length to suit, outside braces bolted, center braces nailed.
C	3	4 in. x 4 in., length to suit, outside braces bolted, center braces nailed.
D	6	3 in. x 8 in., nailed to floor with six, 60-D nails.
E	1	5 in. x 8 in. x 30 in., secured to floor with two 1/2 in. bolts.
F	2	5 in. x 5 in. x 8 in., against crawler portion, nailed with three 60-D nails.
G	1	5 in. x 5 in. x 30 in., secured to floor with two 1/2 in. bolts.
H	2	4 in. x 4 in. x 36 in., nailed to floor with four 60-D nails.
J	2	2 in. x 4 in. x 24 in., secured with two 2 in. bolts passing through Items "H" and floor.
K	1	3/8 in. x 6 x 19 steel cable, doubled. Attach to front of boom and body of car. Substitute, if desired, 5/8 in. dia. rods or 8 strands No. 11 gage wire.
L	8	4 in. x 4 in. x 18 in., hardwood cleat, or 1/2 in. x 4 in. x 18 in. plate.

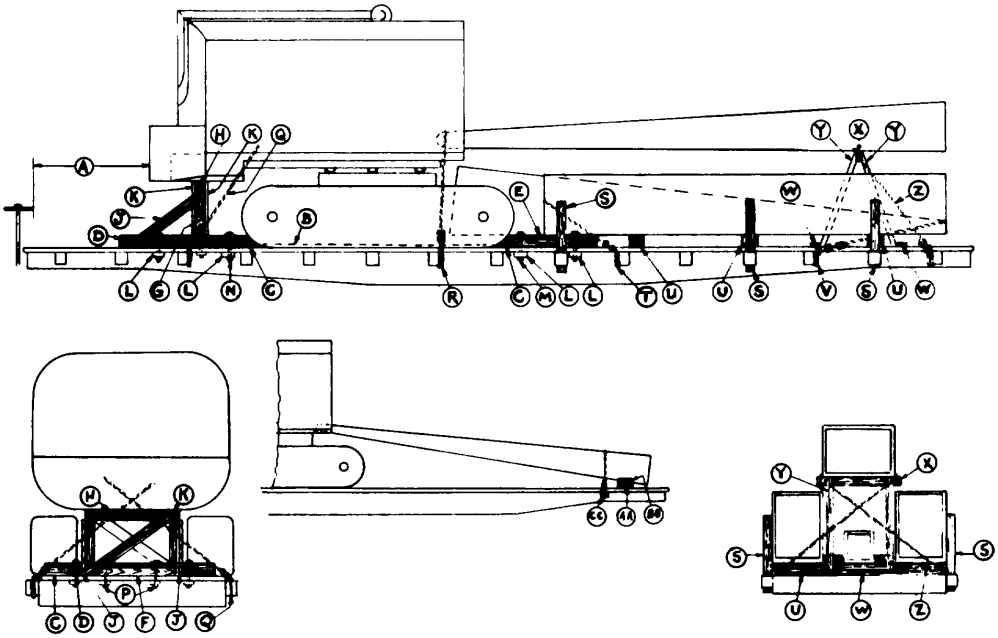
Other suitable blocking may be used in cases where the design of the machine does not permit the use of the blocking specified.

For proper location of load on car, see Fig. 34.

*Machines equipped with locking devices, including those with adjustable treads, must have such devices placed in locked position by shippers.

See General Rules 4, 5, 9, 10, 14, 15, 19 and 19A for further details.

MACHINE WITH BOOM ATTACHED AND NOT EXTENDING BEYOND END OF CAR-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2	2 in. x 6 in., length of crawler, inside or outside, nailed to floor with 20-D nails.
C	2	8 in. x 8 in. x 9 ft., cut to fit contour of crawler treads. Secure each to floor with two 5/8 in. dia., bolts with nuts and washers.
D	2	8 in. x 8in. x 6ft. 6in.
E	2	8 in. x 8 in. x 4 ft. 6 in.
F	1	6 in. x 6 in., length to suit.
G	2	6 in. x 6 in., length to suit, nailed to Items "F" and "H".
H	1	6 in. x 6 in., length to suit, nailed to Items "G".
J	2	2 in. x 6 in., length to suit, nailed to Items "D" and "G".
K	2	2 in. x 6 in., length to suit, nailed to Items "F", "G" and "H".
L	8	4 in. x 4 in. x 18 in., hardwood cleat, or 1 , in. x 4 in. x 18 in. plate.
M	4	Bolts, 5/8 in. dia., with nuts and washers, through Items "E", "L" and floor.
N	8	Bolts, 5/8 in. dia., with nuts and washers, through Item "C", "D", "L" and floor.
O		VACANT.
P	2	Bolts, 5/8 in. dia., with nuts and washers, through Items "F", "L" and floor.
Q	2	5/8 in. x 6 x 7 steel cable, doubled. Attach to rotating portion of machine, near rear end, and to opposite stake pockets.
R	2	5/8 in. x 6 x 7 steel cable, doubled. Attach to rotating portion of machine, near front end, and to opposite stake pockets.
S	6	Stakes, extending 30 in. above floor.
T	1	5/8 in. x 6 x 7 steel cable. Pass through lattice work of three lower sections of boom and secure to stake pockets.
U	3	8 in. x 8 in. x 9 ft. Toe-nail to floor with 20-D nails.
V	1	5/8 in. x 6 x 7 steel cable. Pass through lattice work of three lower sections of boom nearest end of car, and secure to stake pockets.
W	2	2 in. x 6 in., length to suit, nailed to floor and Items "Y" with 20-D nails.
X	1	4 in. x 6 in., hardwood, length to suit.
Y	4	4 in. x 4 in., hardwood, length to suit, nailed to Item "X" and floor with 40-D nails.
Z	1	5/8 in. x 6 x 7 steel cable. Pass through lattice work of boom above Item "X" and secure to stake pockets.
AA	1	4 in. x 4 in., hardwood, length to suit, toe-nailed to floor with 20-D nails.
BB	2	4 in. x 4 in. x 12 in., hardwood. Secure each to Item "AA" with one 5/8 in. dia. bolt, long enough to pass through Item "AA" and floor.
CC	1	5/8 in. x 6 x 7 steel cable. Pass over top of boom and secure to stake pockets.

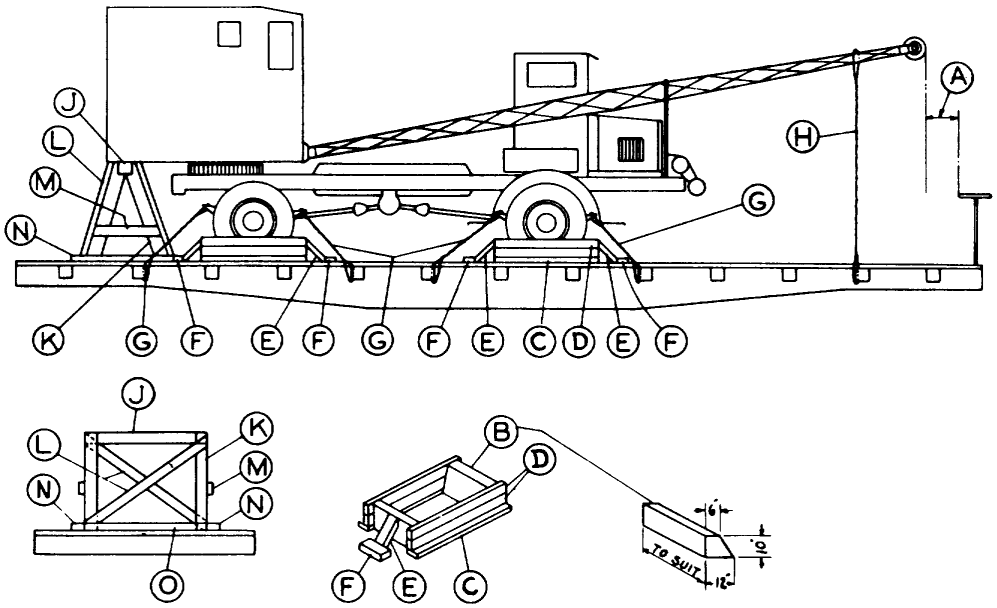
Items "AA", "BB" and "CC" required only when boom rests on floor.

For proper location of load on car, see Fig. 34.

*Machines equipped with locking devices, including those with adjustable treads, must have such devices placed in locked position by shippers.

See General Rules 4, 5, 9, 10, 14, 15, 19, 19-A and 19-B for further details.

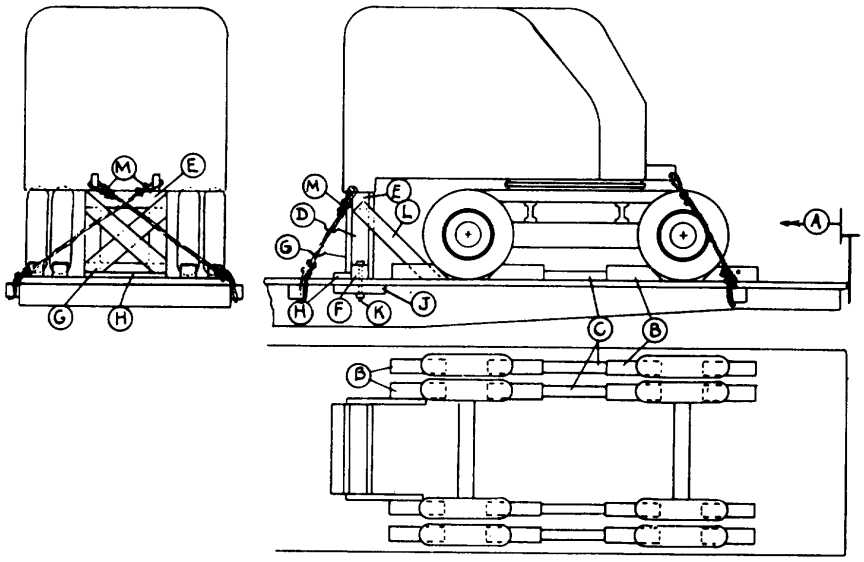
Sec. 4--Fig. 29
ROTATING SHOVEL, (TRUCK CHASSIS) HAVING PNEUMARIC TIRES-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2 ea. front wheel. 2 ea. pr. dual wheels.	6 in. x 10 in. x 12 in., hardwood, length to suit. Locate against wheels and toe-nail each to floor with three 40-D nails.
C	2 ea. pr. Items "B".	2 in. x 4 in., hardwood, long enough to extend 1 in. beyond Items "B". Locate on inside and outside of wheels and nail each to floor with six 30-D nails.
D	4 ea. pr. Items "B".	2 in. x 4 in., hardwood, long enough to extend 1 in. beyond Items "B". Locate above Items "C" and nail 4 in. face to each Item "B" with three 30-D nails.
E	1 ea. Item "B".	2 in. x 4 in., hardwood, length to suit. Toe-nail to Items "B" and floor with two 30-D nails at each end.
F	1 ea. Item "E".	2 in. x 4 in. x 12 in., hardwood. Locate against each Item "E" and nail to floor with four 30-D nails.
G	8	Each to consist of six strands, No. 7 gage wire, (cable shaped). Securely attach one end to spring shackle of machine and opposite end to stake pocket so as to provide effective angularity. Twist taut.
H	1	To consist of six strands, No. 7 gage wire, (cable shaped). Loop around near end of and pass through boom and securely attach ends to opposite stake pockets. Twist taut.
J	1	6 in. x 6 in., hardwood, length equal to width of and cut to fit projections underneath cab.
K	4	4 in. x 5 in., hardwood, length to suit, notched to fit under and against Items "J". Nail to Item "J" and toe-nail to floor with three 30-D nails at each end.
L	2	2 in. x 4 in., hardwood, length to suit. Nail each end to Items "K" with three 30-D nails.
M	2	2 in. x 4 in., hardwood, length to suit. Locate about 18 in. above floor and nail each end to Item "K" with three 30-D nails.
N	2	1 1/2 in. x 3 in., hardwood, long enough to extend to outside face of Items "O". Locate against Items "K" and nail each end to floor with six 30-D nails.
O	2	1 1/2 in. x 3 in., hardwood, length equal to distance between inside face of Item "N". Locate against Items "K" and nail each to floor with six 30-D nails.

For proper location of load on car, see Fig. 34.
Machines equipped with locking devices must have such devices placed in locked position by shippers.
See General Rules 4, 5, 9, 14, 15, 19, 19-A and 19-B for further details.

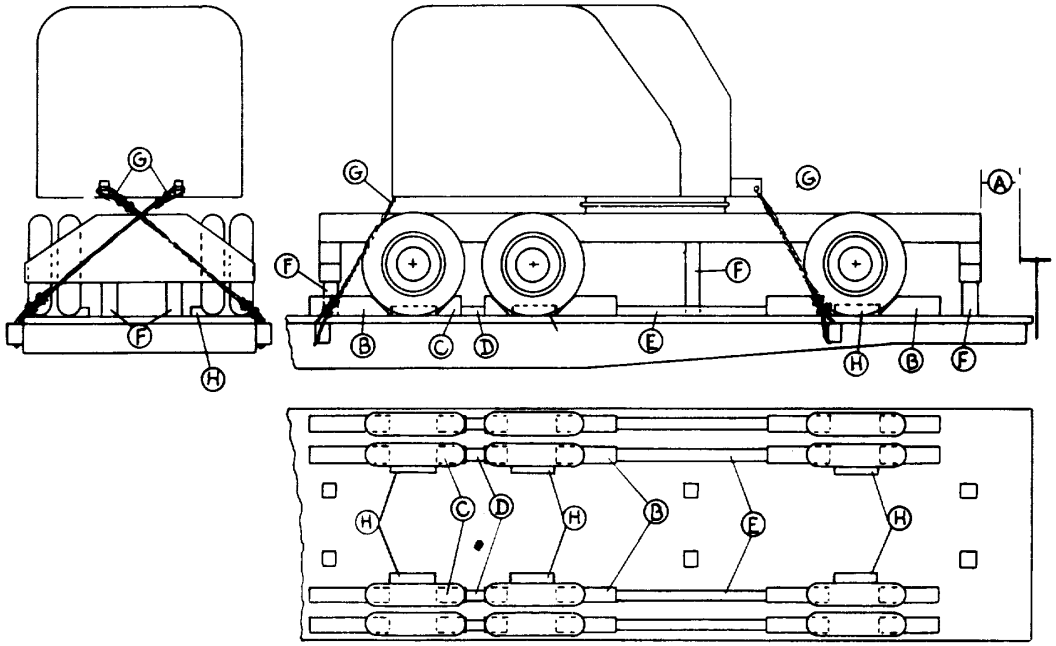
ROTATING CRANES, HAVING PNEUMATIC TIRES, BOOM DETACHED-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2., Sec. 1.
B	16	8 in. x 8 in. x 36 in., hardwood. Locate on floor, against tires and secure each with four 3/4 in. dia. bolts, with nuts and washers.
C	4	3 1/2 in. x 5 1/2 in., hardwood, long enough to fit between Items "B". Nail! each to floor with four 60-D nails.
D	2	6 in. x 6 in., hardwood, long enough to fit between Items "E" and "F".
E	1	6 in. x 6 in. x 30 in., hardwood. Locate on top of Items "D".
F	1	6 in. x 6 in., hardwood, length to suit. Secure to floor, under Items "D", with four Items "K".
G	2	2 in. x 6 in., hardwood, length to suit. Locate diagonally and secure to Items "E', "F" and to opposite Items "D".
H	1	2 in. x 6 in., hardwood, length to suit. Locate against Item "F" and nail to floor with six 30-D nails.
J	As required.	4 in. x 4 in. x 18 in., cleats or 1/2 in. x 4 in. x 18 in. plates.
K	4	3/4 in. dia. bolts, with nuts and washers, long enough to pass through Items "F", "J" and floor.
L	2	2 in. x 6 in., hardwood, length to suit. Nail top ends to Items "D" and bottom ends to Items "B" with four 30-D nails at each location.
M	4	1 1/4 in. dia. rods, with threaded ends, length to suit. Attach two to boom connection brackets and two to counterweight. Pass bottom ends through stake pockets and 1/2 in. x 4 in. x 10 in. plates underneath stake pockets on opposite sides of ear. 1 in. dia. rods may be used on machines weighing 45,000 lbs. or less. Substitute, if desired, 5/8 in. x 6 x 7 steel cable, doubled.
N	4	Each to consist of two pieces 2 in. x 4 in. x 18 in. Locate one against each front and each rear wheel. Nail lower pieces to floor with four 20-D nails in each and top pieces to those below in like manner.

For proper location of load on car, see Fig. 34.
Machines equipped with locking devices must have such devices placed in locked position by shippers.
See General Rules 4, 5, 9, 14, 15, 19, 19-A and 19-B for further details.

ROTATING CRANE, HAVING PNEUMATIC TIRES, BOOM DETACHED-FLAT CARS



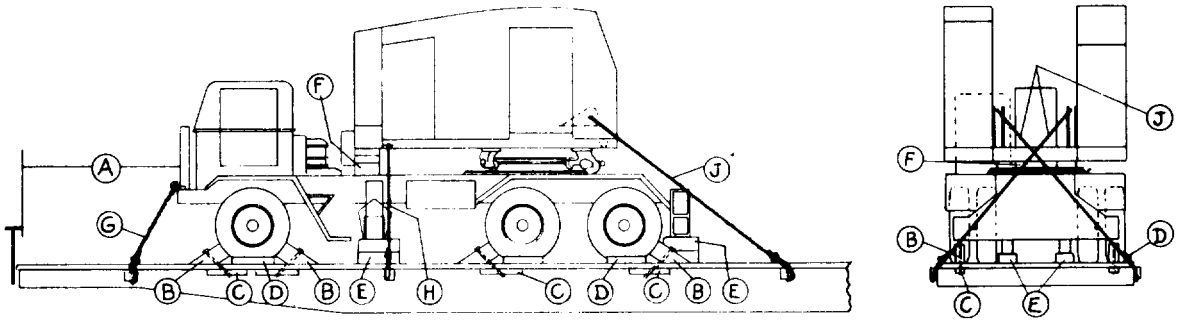
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	16	8 in. x 8 in. x 36 in., hardwood. Locate on floor against tires and secure each with 3/4 in. dia. bolts with nuts and washers.
C	8	8 in. x 8 in. x 8 in., hardwood. Locate on floor against tires and secure each with two 3/4 in. dia. bolts.
D	4	3 1/2 in. x 5 in., hardwood, long enough to fit between Items "C". Nail each to floor with four 60-D nails.
E	4	3 1/2 in. x 5 in., hardwood, long enough to fit between Items "B". Nail each to floor with eight 60-D nails.
F	6	8 in. x 8 in., hardwood, length to suit. Locate under front center and rear of crane and toenail each to floor with four 60-D nails.
G	4	1 1/4 in. dia. rods, with threaded ends, length to suit. Attach two to boom connection brackets and two to counterweight. Pass bottom ends through stake pockets and 1/2 in. x 4 in. x 10 in. plates underneath stake pockets on opposite sides of car. 1 in. dia. rods may be used on machines weighing 45,000 lbs. or less. Substitute, if desired, 5/8 in. x 6 x 7 steel cable, doubled.
H	4	Each to consist of two pieces 2 in. x 4 in. x 18 in. Locate one against each front and each rear wheel. Nail lower pieces to floor with four 20-D nails and top pieces to those below in like manner.

For proper location of load on car, see Fig. 34.

Machines equipped with locking devices must have such devices placed in locked position by shippers.

See General Rules 4, 5, 9, 14, 15, 19, 19-A and 19-B for further details.

ROTATING CRANE, HAVING PNEUMATIC TIRES, BOOM DETACHED--FLAT CARS



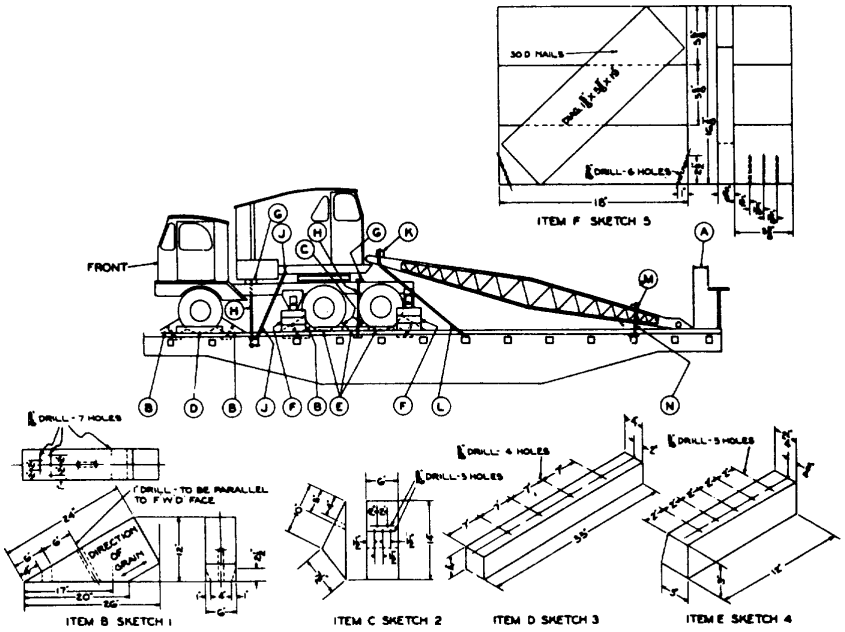
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	8	8 in. x 8 in. x 21 1/2 in., hardwood. Locate one in front and at rear of each front wheel, one in front of each intermediate wheel, and one behind each rear wheel. Secure each with one 3/4 in. dia. rod, with nuts. Pass rod through plate washer, Item "B", floor and Item "C". Use bevel washer under Item "C".
0	8	4 in. x 4 in. x 18 in., hardwood, or 1/2 in. x 4 in. x 18 in. plates. Locate under floor as required.
D	6	4 in. x 4 in. x 28 in., hardwood. Locate one against outside of each wheel. Nail each to floor with six 40-D nails.
E	4	Each to consist of two pieces, 6 in. x 8 in. x 18 in., hardwood. Locate under each side at center and rear of chassis. Toe-nail lower piece to floor with six 40-D nails and top piece to the one below with four 40-D nails.
F	2	6 in. x 6 in. x 15 in., hardwood. Locate between Rotating and body portion of unit. Secure to prevent displacement.
G	2	1/2 in. dia. steel cable, doubled. Attach one to each side of body of unit, at front, and to stake pocket.
H	2	1/2 in. dia. steel cable, doubled. Attach one to each side of rotating portion of unit and to opposite stake pocket.
J	2	1/2 in. dia. steel cable, doubled. Attach one to each side of rotating portion of unit and to opposite stake pocket.

For proper location of load on car, see Fig. 34.

Machines equipped with locking devices must have such devices placed in locked position by shippers.

See General Rules 4, 5, 7, 9, 14, 15, 19, 19-A and 19-B for further details.

ROTATING CRANES, HAVING PNEUMATIC TIRES-FLAT CARS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	8	Blocks, 6 in. x 10 in. x 24 in., Sketch 1. Locate one in front and one in rear of each front wheel, one in front of each intermediate wheel and one in rear of each rear wheel. Secure each to floor with one 3/4 in. dia. x 22 in. rod passed through floor and 2 in. x 4 in. x 12 in. cleat under floor, five 60-D nails in heel of block and toe-nail each side of block with one 60-D nail.
0	4	Blocks, 6 in. x 7 1/2 in. x 10 in., Sketch 2. Locate one in front of each rear wheel and one in rear of each intermediate wheel. Nail each to floor with five 60-D nails.
D	4	Blocks, 4 in. x 4 in. x 35 in., Sketch 3. Locate one against inside and outside of each front wheel. Nail each to floor with four 60-D nails.
E	4	Blocks, 3 in. x 3 in. x 12 in., Sketch 4. Locate one against outside of each rear and intermediate wheel. Nail each to floor with five 60-D nails.
F	4	Blocks, each to consist of three pieces 5 5/8a in. x 5 5/8 in. x 18 in. and one piece 1 5/8 in. x 5 3/8 in. x 19 in., Sketch 5. Locate one under each outrigger on each side of unit. Toe-nail each to floor with six 60-D nails.
G	2	4 in. x 6 in. x 62 in. Locate on top of frame of unit, secure with Items "H".
H	4	3/4 in. dia. rods. Pass through each end of Items "G" and through 1/2 in. x 4 in. x 10 in. plates under stake pockets or 4 in. x 4 in. x 18 in. hardwood cleats, or 1/2 in. x 4 in. x 18 in. plates under floor.
J	2	1 1/4 in. dia. rods, with threaded ends, length to suit. Attach two to front of rotating portion and pass bottom ends through stake pockets and 1/2 in. x 4 in. x 10 in. plates underneath stake pockets on opposite sides of car, or through floor and 4 in. x 4 in. x 18 in. cleats, or 1/2 in. x 4 in. x 18 in. plates under floor on opposite sides of car. 1 in. dia. rods may be used on machines weighing 45,000 lbs. or less. Substitute, if desired, 5/8 in. x 6 x 7 steel cable, doubled.
K	1	4 in. x 4 in. x 4 ft. Locate on top of boom and secure with Item "L".
L	2	1 1/4 in. dia. rods, with threaded ends, length to suit. Pass through Items "K" and 1/2 in x 4 in. x 10 in. plates underneath stake pockets on opposite sides of car. 1 in. dia. rods may be used on machines weighing 45,000 lbs. or less. Substitute, if desired, 5/8 in. x 6 x 7 steel cable, doubled. When boom is detached, attach rods to boom connection bracket.
M	1	2 in. x 4 in., long enough to extend beyond sides of boom. Secure with two Items "N".
N	2	3/4 in. dia. rods. Pass through each end of Item "M" and through floor and 4 in. x 4 in. 18 in. cleat, or 1/2 in. x 4 in. x 18 in. plate under floor.

Items "K", "M" and "N" not required when boom is detached.

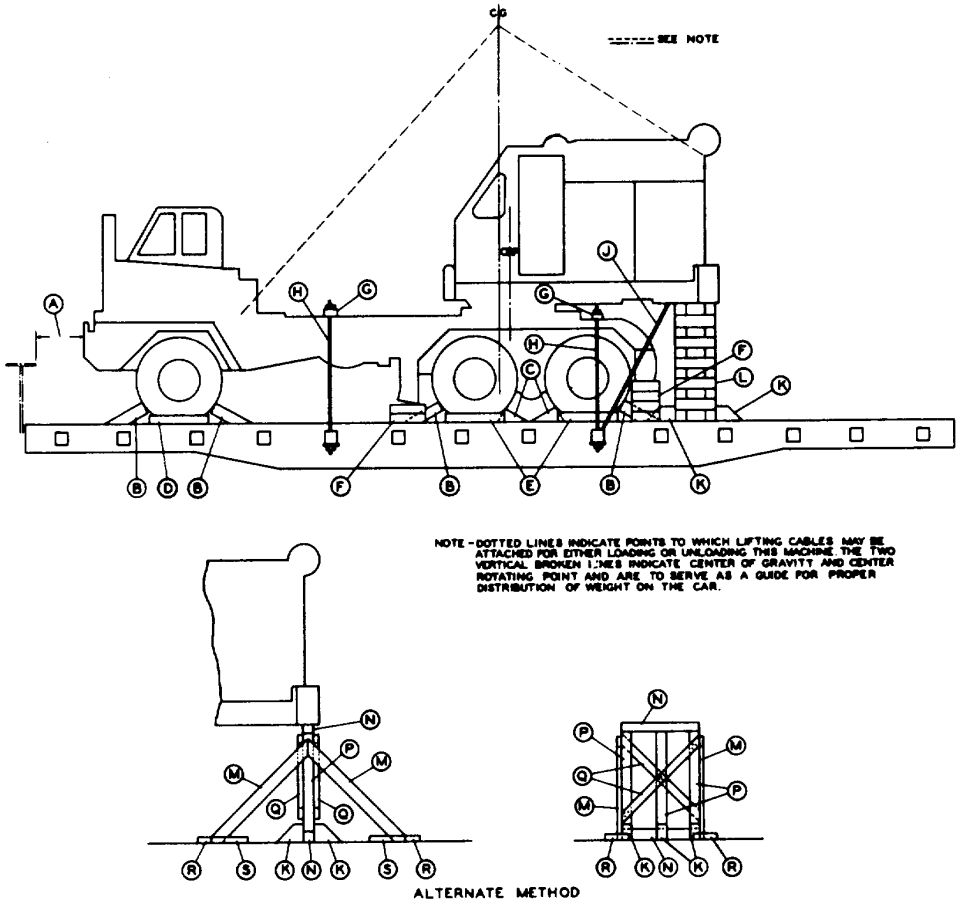
On units where counterweight of rotary portion extends beyond rear of frame, overhanging portion must be supported by suitable built-up frame.

Machines equipped with locking devices must have such devices placed in locked position by shippers.

For proper location of load on car, see Fig. 34.

See General Rules 4, 5, 9, 14, 15, 19, 19-A and 19-B for further details.

ROTATING CRANES HAVING PNEUMATIC TIRES-FLAT CARS



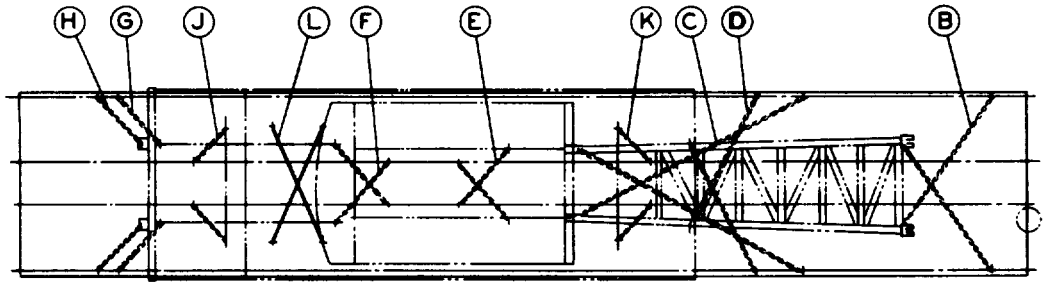
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	8	Blocks, pattern 55, Sec. 6. Locate one in front and one in rear of each front wheel, one in front of each intermediate wheel, and one in rear of each rear wheel. Secure each to floor with one 3/4 in. dia. bolt, five 60-D nails in heel of block, and toe-nail each side of block with one 60-D nail.
C	4	Blocks, pattern 56, Sec. 6. Locate one in front of each rear wheel, and one in rear of each intermediate wheel. Secure each to floor with five 60-D nails.
D	4	Blocks, pattern 57, Sec. 6. Locate one against inside and outside of each front wheel. Secure each to floor with four 60-D nails.
E	4	Blocks, pattern 58, Sec. 6. Locate one against outside of each rear and intermediate wheel. Secure each to floor with five 60-D nails.

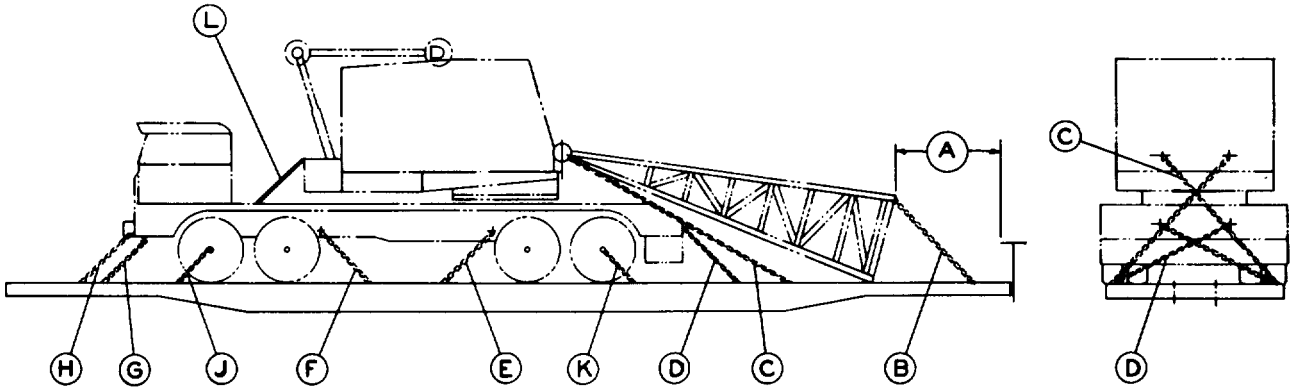
ROTATING CRANES HAVING PNEUMATIC TIRES-FLAT CARS

Item	No. of Pcs.	Description
F	4	Blocks, pattern 59, Sec. 6. Locate one under each outrigger on each side of unit. Toe-nail each to floor with six 60-D nails.
G	2	4 in. x 6 in. x 62 in. Locate on top of frame of unit and secure with Items "H".
H	4	3/4 in. dia. rods. Pass through each end of Items "G" and through 1/2 in. x 4 in. x 10 in. plates underneath stake pockets or through floor.
J	2	1 1/4 in. dia. rods. Attach two behind rotating portion and pass bottom ends through stake pockets and 1/2 in. x 4 in. x 10 in. plates underneath stake pockets on opposite sides of car, or through floor on opposite sides of car. 1 in. dia. rods may be used on machines weighing 45,000 lbs. or less. Substitute, if desired, 5/8 in. x 6 x 7 steel cable. doubled.
K	6	Blocks, pattern 67, Sec. 6. Locate 3 in front and 8 in back of sill, Item "N". Secure each to car floor with three 60-D nails.
L	12	6 in. x 6 in. x 54 in.
	10	6 in. x 6 in. x 24 in. Alternate in tiers of two, lengthwise and crosswise, as shown under crane counterweight. Secure lower pieces to floor with eight 60-D nails, and upper pieces to those below with one 60-D nail front and one 60-D nail rear. Alternate Method
M	4	2 in. x 6 in. x 80 in., braces. Secure to top of Item "P" with six 20-D nails and to Item "S" with three 20-D nails.
N	2	6 in. x 6 in. x 54 in., used as header and sill. Toe-nail sill to floor of car with eight 60-D nails and secure header to Item "P" with twelve 20-D nails.
P	8	6 in. x 6 in. x length to suit. Secure to bottom Item "N" with twelve 20-D nails, as shown.
Q	2	2 in. x 6 in. x 87 in., diagonal braces. Secure to opposite sides of Item "P" with nine 20-D nails in each piece.
R	4	2 in. x 6 in. x 9 in. Locate one in front of each Item "M". Secure to floor of car with two 40-D nails.
S	8	2 in. x 6 in. x 24 in. Locate one on each side of Item "M". Secure to floor with four 40-D nails in each piece.

See General Rules 3, 4, 5, 7, 9, 14, 15, 19 and 19-B for further details.

ROTATING CRANES, MAXIMUM WEIGHT, 125,000 LBS., HAVING PNEUMATIC TIRES, FLAT CARS WITH CHAIN TIE-DOWNS ASSEMBLIES AND TIE-DOWN CHANNELS





Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2 ea. boom	1/2 in. alloy chain tie-down. Attach from boom end connections to opposite outside tie-down channels.
C	2 ea. boom	1/2 in. alloy chain tie-down. Attach from boom feet to opposite outside tie-down channels.
D	2	1/2 in. alloy chain tie-down. Attach from tow hooks at rear of carrier to opposite outside tiedown channels.
E	2	1/2 in. alloy chain tie-down. Attach from tie-down holes in bottom flange plate on truck frame to opposite inside tie-down channels.
F	2	1/2 in. alloy chain tie down. Attach from lifting lugs on outriggers to opposite inside tie-down channels.
G	2	1/2 in. alloy chain tie-down. Attach from tow hooks at front of carrier to outside tie-down channels.
H	2	1/2 in. alloy chain tie-down. Attach from front carrier counterweight brackets to outside tie-down channels.
J	2	1/2 in. alloy chain tie-down. Attach from front axle to inside tie-down channels.
K	2	1/2 in. alloy chain tie-down. Attach from rear axle to inside tie-down channels.
L	2	1 1/4 in. diameter rod. Attach from rotating crane base to carrier base to prevent rotating while in transit.

NOTES:

1. Gantry must be telescoped to lowest position for shipping and locked in place to prevent displacement while in transit.
2. Positive swing lock must be activated to lock rotator positively to base.

ROTATING CRANES, MAXIMUM WEIGHT, 125,000 LBS., HAVING PNEUMATIC TIRES, FLAT CARS WITH CHAIN TIE-DOWN ASSEMBLIES AND TIE-DOWN CHANNELS

NOTES:

3. Secure longitudinal chains to vehicle. Pull chains as tight as possible by hand and attach hook into an appropriate link in the chain. All chain tie-downs must be made taut by tightening the turnbuckles. After tensioning, chains must be struck with a hammer or steel bar with enough force to eliminate any kinks in chain and retightened if necessary.

4. Tie-downs in the inboard channels are to be in line across the car and tie-downs in the outboard channels are to be in line in the same manner. The angle of the tie-downs must be as close to 45 degrees as possible.

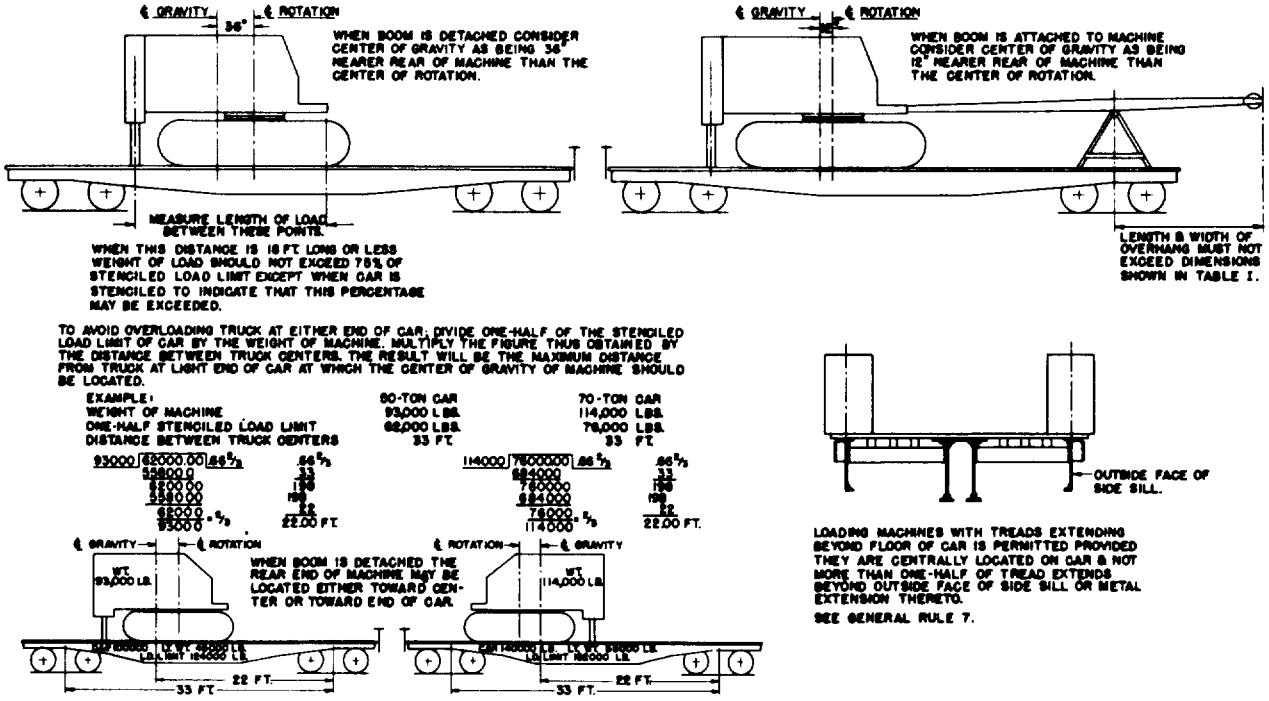
5. Gear shift levers are to be placed in a neutral position and all brakes set.

6. Turnbuckles not equipped with self-locking devices must be wired or locked to prevent loosening.

7. When crane boom is carried in boom cradle located on top of carrier cab and secured to prevent displacement, Items "B", "C" and "L" are not required.

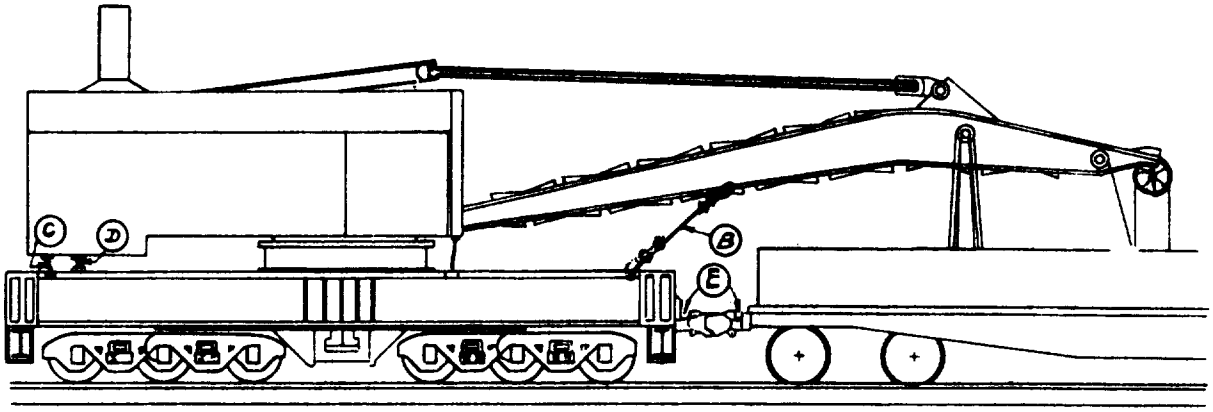
See General Rules 1, 2, 4, 5, 7, 15, 19, 19-A and 19-B for further details.

Sec. 4-Fig. 34 (Rev.-3-1965)



Note.-The above formula applies to both crawler and pneumatic tired types of cranes.

WRECKING CRANES SHIPPED WITH BOOMS SUPPORTED EXCLUSIVELY BY THEIR CABLES



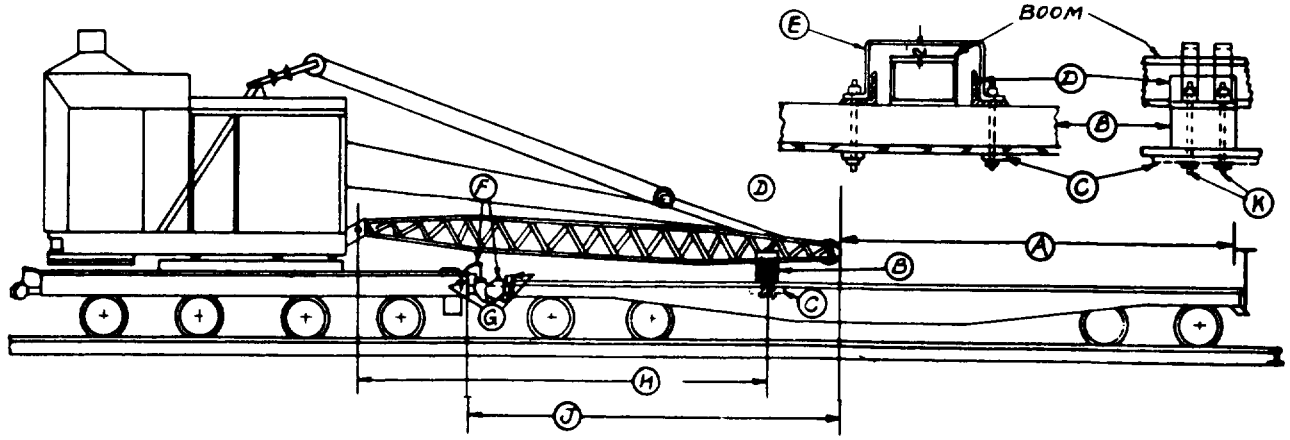
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2	1 in. steel cables 6 x 9, secured with two "U"- bolt cable clips at each end. Sharp turns must be protected with thimbles. Permanent anchors acceptable as substitutes.
C	2	1 1/4 in. rods, length to suit, or anchors equivalent in strength. Parts to which anchors are secured must be equally as strong as the anchors. Rods with hooked ends must not be used.
D		Rear jacks must be screwed tight to eliminate vertical motion.
E		Uncoupling mechanism must be made inoperative.

Cable blocks may be detached, pulled up to boom head, or lay loose on idler car with cables sufficiently slack to negotiate curves.

Boom end of crane must trail.

See General Rules 4, 5, 15, 16, 19, 19A and 21 for further details.

DERRICKS, CRANES, ETC., ON THEIR OWN WHEELS, WITH BOOMS ATTACHED, WHEN LENGTH OF BOOM DOES NOT EXCEED 30 FT. BEYOND END SILL OF THE CAR ON WHICH THE MACHINE IS MOUNTED



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	1	Hardwood 10 in. wide, high enough to keep Boom 4 in. from floor. Secure to floor with four 3/4 in. bolts.
C	4	4 in. x 4 in. x 18 in., hardwood cleats, or plates 1/2 in. x 4 in. x 18 in.
D	2	6 in. x 6 in. x 3/8 in. x 10 in. angles, or 8 in. x 8 in. x 24 in., hardwood blocks. Clearance between boom and angles, or boom and blocks, must be at least 3 in.
E	2	Straps, wrought iron, 1/2 in. x 2 in., formed to suit.
F		Uncoupling mechanism must be made inoperative.
G		Spacing blocks to be applied after draft gears have been fully compressed and slack taken out by jacking cars apart.
H		Item "B" must be located not more than 25 ft. from point where boom Is attached to body of derrick.
J		When this distance exceeds 30 ft., be governed by Fig. 37.
K	2 ea. Item "D".	34 in. dia. bolts, through Items "B", "C", "D", and "E".

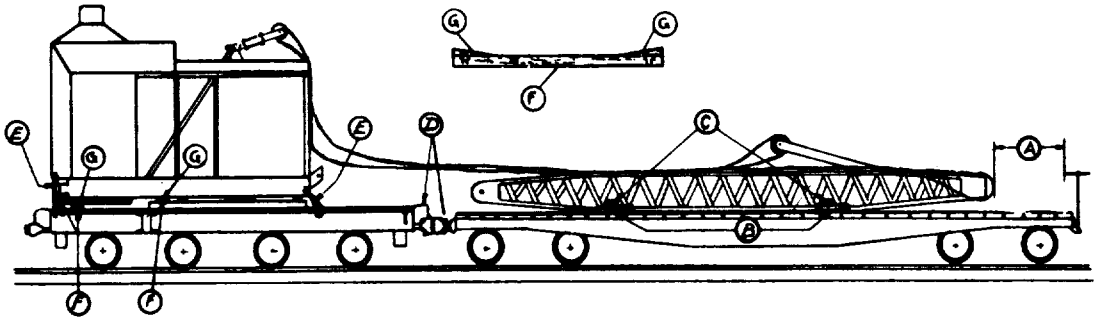
Rotating portion of derrick must be free to swing without any impediment.

All coal must be removed from bunkers. Water, must be removed from boiler and reservoir.

Boom end of crane must trail.

See General Rules 4, 5, 9, 14, 15, 16, 19, 19A and 21 for further details.

DERRICKS, CRANES, ETC., ON THEIR OWN WHEELS, WITH BOOMS, DETACHED, CABLES NOT REMOVED



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4	4 in. wide, 18 in. long, high enough to permit application of Items "0", nailed to floor against boom.
C	2	2 in. x 4 in., long enough to extend beyond Items "B", nailed to Items "B".
D		Uncoupling mechanism must be made inoperative.
E	4	1 1/4 in. rods with nuts and washers, for machines weighing 150,000 lbs. or less. For machines weighing more than 150,000 lbs. use 1 1/2 in. rods. Threads must be riveted over or nuts secured with lock nuts or nut locks. Permanent anchor devices with which the crane is usually equipped are acceptable substitutes. Anchors must be attached to extreme front and rear of rotating portion. If construction of machine will not permit application to extreme rear, they must be placed as close to rear as construction will permit. Rods with hooked ends must not be used.
F	2 ea. machine.	Hardwood, 6 in. wide, long enough to extend beyond rotating portion. Thickness 2 in. less than distance between rotating portion and carriage. Secure to floor with one 3/4 in. dia. bolt at each end with head countersunk.
G	2 ea. Item F.	2 1/2 in. x 4 in. x 12 in., hardwood, driven between Items "F" and machine. Nail to Items "F" with 40-D nails.

Items "F" and "G" not required at center, unless machine has two piece bed casting, nor at rear end of machine equipped with jacks.

Pivoted machines equipped with Jacks must have jacks screwed tight to prevent vertical motion of rotating portion.

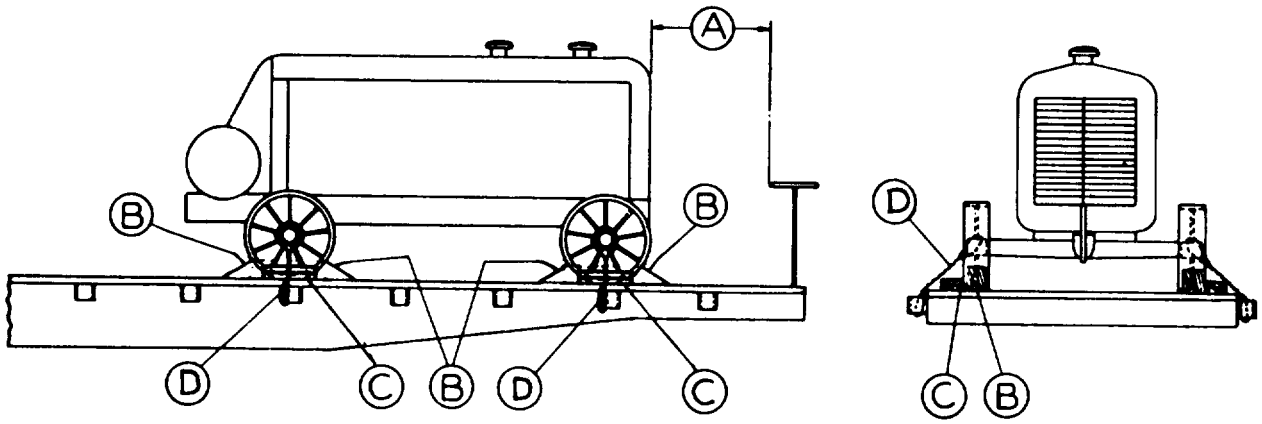
Jacks must not be used to apply Items "F" and "G".

All coal must be removed from bunkers. Water must be removed from boiler and reservoir.

Remove key or nut from center pin of truck at end opposite to the counterbalance.

See General Rules 4, 5, 9, 14, 15, 19, 19A and 21 for further details.

COMPRESSORS, WITH OR WITHOUT PNEUMATIC TIRES-FLAT CARS



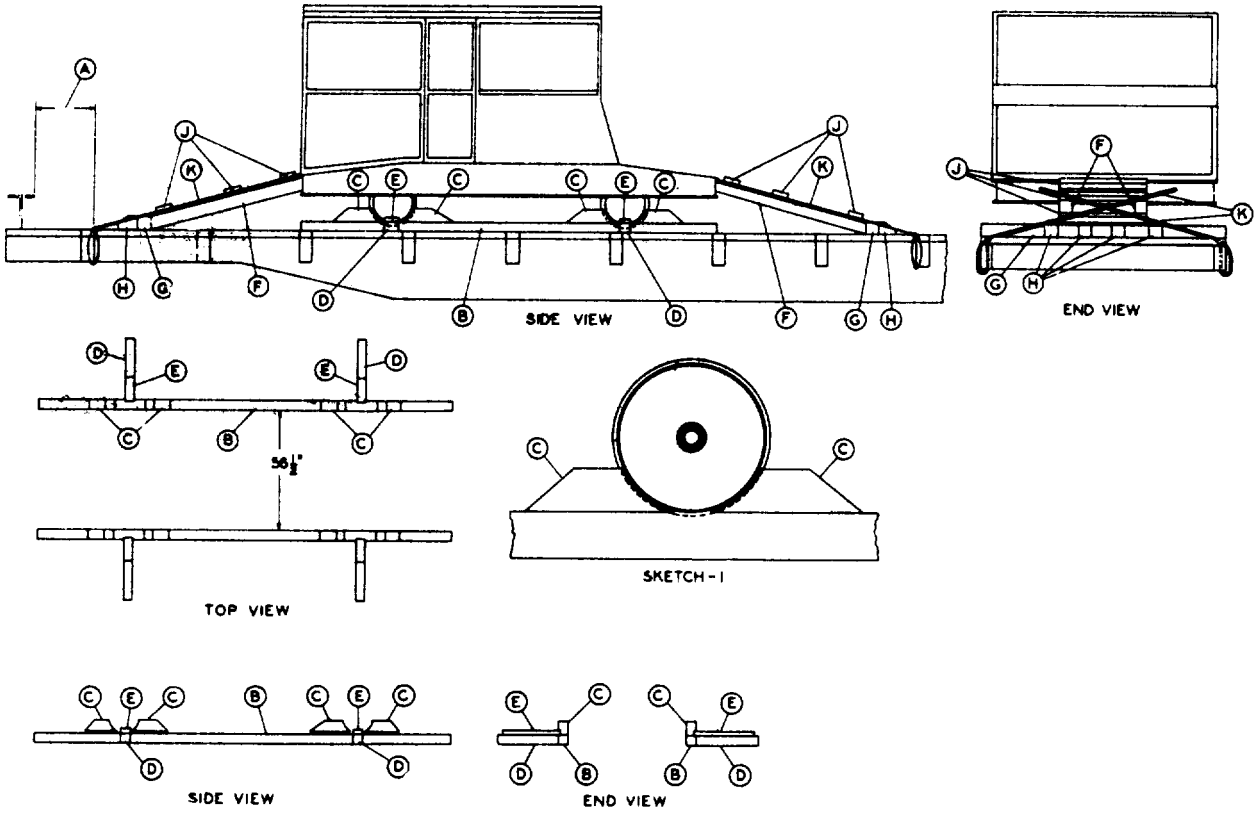
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2., Sec. 1.
B	2 ea. wheel.	6 in. x 8 in. x 24 in. blocks. Nail heel of block to floor with five 40-D nails.
C	1 ea. wheel.	2 in. x 4 in: x 24 in., each to consist of two pieces. Nail lower piece to floor with three 40-D nails and nail top piece to the one below with three 40-D nails. Locate either inside or outside of wheels.
D	1 ea. wheel.	6 strands, No. 11 ga. wire. Pass around spokes on top of hub and through stake pocket directly below and twist taut with bolt or rod. If stake pocket is not located directly below hub of wheel, each end of wire must be attached to adjoining stake pockets and twisted taut with bolt or rod.

Brake and clutch must be tightly set.

See General Rules 4, 5, 9, 14 and 15 for further details.

Sec. 4--Fig. 38-A (New-1-1962)

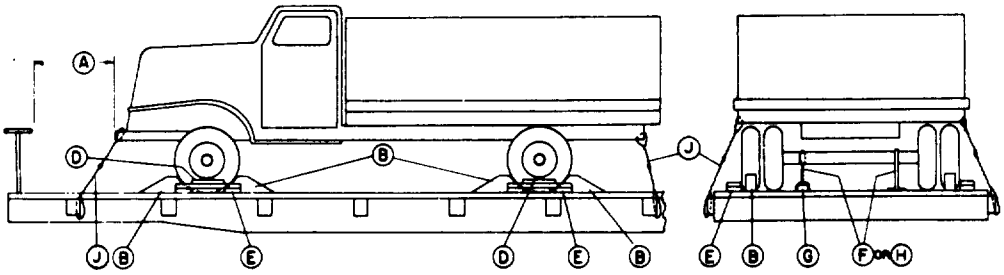
TAMPING MACHINE-RAILWAY PNEUMATIC-WITH STEEL CAR WHEELS-FLAT CARS

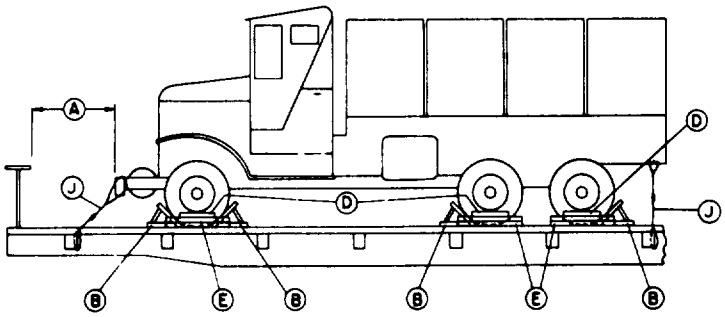


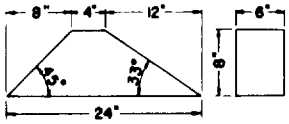
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	2	Each 4 in. x 5 in. x length equal to base of unit, hardwood. Locate on car floor, each equal distance on each side of center line of car and gaged to railroad track gage of 561/2 in. Nail to floor with one 60-D cement coated nail every 12 in.
C	8	Blocks, hardwood. See sketch 1. Length, width and height to suit. Locateon Item "B" against flange and tread of wheels as shown. Nail heel to Item "B" with two 60-D and three 40-D cement coated nails, toe-nail each side with two 40-D cement coated nails. Toe of blocks must be cut to fit contour of wheels.
D	4	Each 4 in. x 4 in. x 24 in. hardwood. Locate on floor as shown, inner ends against Items "B". Nail to floor with four SO-D cement coated nails.
E	4	Each 2 in. x 4 in. x 24 in. hardwood. Locate on top of Item "D" against wheels as shown. Nail to Item "D" with four 40-D cement coated nails.
F	4	Each 6 in. x 6 in. x 60 in. hardwood. Position diagonally as shown. Upper ends single bevel, lower ends double bevel, sides toe-nailed to floor with two 40-D cement coated nails.
G	2	Each 6 in. x 6 in. x length to suit, hardwood. Locate on floor against ends of Items "F" as shown. Secure to floor with one 3/4 in. bolt in each end. Use 4 in. x 4 in. plate washers under bolt heads and wooden blocks underneath car floor.
H	8	Blocks, hardwood, pattern 68, Sec. 6. Locate 4 each on floor equally spaced against each Item "G". Nail to floor with six 60-D cement coated nails.
J	6	2 in. x 4 in. x length to suit, hardwood. Locate on top of Items "F" equally spaced as shown. Nail to Items "F" with two 20-D cement coated nails at each location.
K	4	Steel cable 5/8 in. dia. x 6 x 19 flexible independent wife rope core doubled. Extend between points of attachment on frame of unit and stake pockets, on opposite sides of car. Secure lapped ends with two 5/8 in. cable clips midway between points of attachment.

See General Rules 4, 5, 7, 9, 14, 15 and 19 for further details.

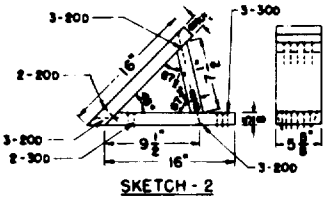
FOUR OR SIX WHEEL TRUCKS AND OTHER MOTOR VEHICLES (SINGLE OR DUAL WHEELS)-FLAT CARS AND GONDOLA CARS WITH WOODEN FLOORS



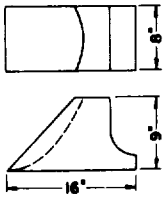




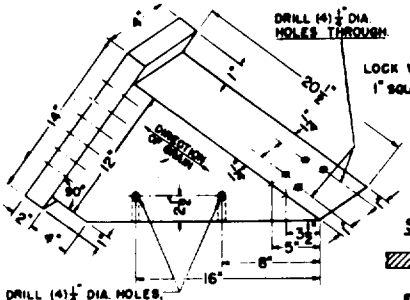
SKETCH - 1



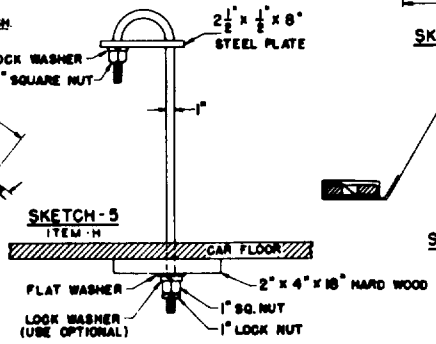
SKETCH - 2



SKETCH - 3



SKETCH-6



SKETCH-5
ITEM - H



SKETCH-4
ITEM - F

Sec. 4-Fig. 39 (Rev.-12-1969)
FOUR OR SIX WHEEL TRUCKS AND OTHER MOTOR VEHICLES (SINGLE OR DUAL WHEELS)-FLAT CARS AND GONDOLA CARS WITH WOODEN FLOORS

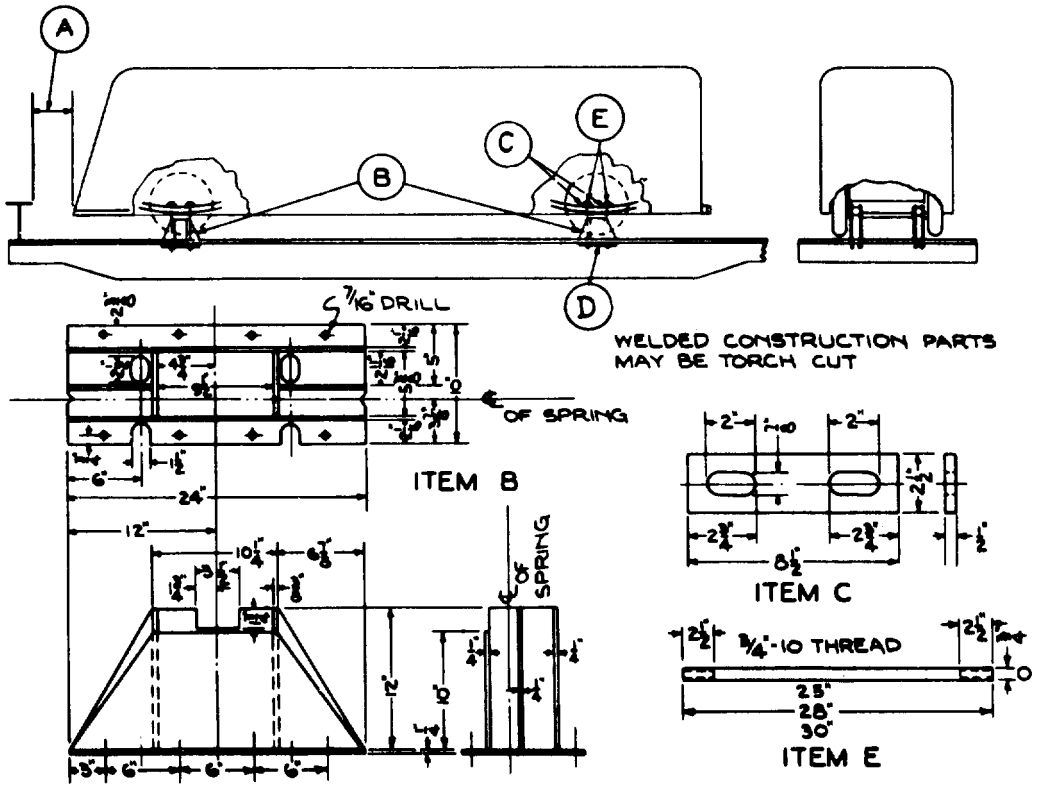
Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	8 for four wheel trucks and 8 or 12 for six wheel trucks.	6 in. x 8 in. x 24 in. blocks, Sketch 1. Locate 45 degree portion of block against front and rear of front wheels, in front of outside intermediate wheels and in back of outside rear wheels for units weighing 8,000 lbs. or less, and against front and rear of front wheels, front of intermediate wheels and in back of rear wheels for units weighing over 8,000 lbs. Nail heel of block to floor with three 40-D nails and toe-nail that portion under tire to floor with two 40-D nails before Items "D" and "E" are applied. Substitute, if desired, at each location, blocks, Sketch 2, or blocks, Sketch 3, each secured to floor with four 30-D nails. Substitute, if desired, two -1/2 in. x 3 1/2, in. lag screws and one 20-D nail for the four O-D nails in block, Sketch 3. Vertical holes, slightly smaller than the diameter of the lag screws, must be drilled through all such blocks. They must be screwed, and not driven into position. For military vehicles, substitute if desired, at each location, blocks Sketch 6, each secured to floor with eight 60-D nails. Secure facing piece to block with six 30-D nails.
C	8	2 in. x 4 in. x 12 in. cleats. Locate one end against block, Sketch 3, lengthwise of car, and nail to floor with four 20-D nails. Not required when blocks, Sketches 1 or 2, are used with Items "H".
*D	1 ea.	Item "E". Suitable material, such as waterproof paper, burlap, etc. Locate bottom portion under Items "E", top portion to extend 2 in. above Items "E". Use optional.
E	4 for four wheel trucks and 6 for six wheel trucks.	Each to consist of two pieces of 2 in. x 4 in. x 36 in. Nail lower piece to floor with four 20-D nails and top piece to the one below with four 20-D nails. Substitute, if desired, at each location, one 3 in. x 3 in. x 12 in. hardwood block, beveled at top to prevent chafing. Secure to floor with four 50-D nails in each. Vertical holes, slightly smaller than the diameter of the 50-D nails, must be drilled through blocks.
*F	2 ea. axle, or 1 ea. spring or spring shackle.	1 in. No. 14 B. W. gage hot rolled steel, with anchor plates, Sketch 4. Locate over axle, spring or spring shackle, and secure each plate to floor with eight 20-D cement-coated nails. Substitute, if desired, at each location, 4 strands, No. 9 gage wire, passed over axle, spring or spring shackle, underneath and around Item "G", twisted taut. Not required when Items "H" or "K" are used.
*G	1 ea. Item "F".	2 in. x 4 in. x 18 in. cleats. Bolt to floor, lengthwise of car, with two 3/8 in. bolts, with washers under floor. Not required when steel straps, Items "F", or when Items "H" or "K" are used.
*H	2 ea. axle or 1 ea. spring or spring shackle for four wheel trucks, and for six wheel trucks weighing 22,000 lbs. or less; 2 ea. on 2 axles, or 1 ea. spring or spring shackle. Units weighing over 22,000 lbs.; 2 on each axle, or 1 on each front spring or spring shackle and 2 on each rear spring or spring shackle.	"J" bolt, Sketch 5. Apply, as shown, to axle, spring or spring shackle. Not required when Items "F" or "K" are used.
J	4 ea. unit.	Four strands No. 8 gage wire. Attach to each corner of unit and to stake pockets of car. Twist taut. Substitute. if desired, 1/2 in. steel cable, doubled. Not required for units loaded in gondola cars.
**K	4 or 6 as required.	Four strands No. 8 gage black annealed wire. Pass through spokes or holes in disc wheels and through stake pockets, twist taut with a rod or bolt. Not required when Items "F", "G" or "H" are used.

Items "F", "G" and "H" not required on fiat cars provided two additional 4 strand No. 8 gage wire ties or two 1/2 in. steel cables, doubled, are applied, suitably located on each side of unit, attached to frame and stake pockets of car.

*This figure is not to be used for military vehicles. For military vehicles see Fig. 88-A, Sec. 6.

**Not shown in drawing.

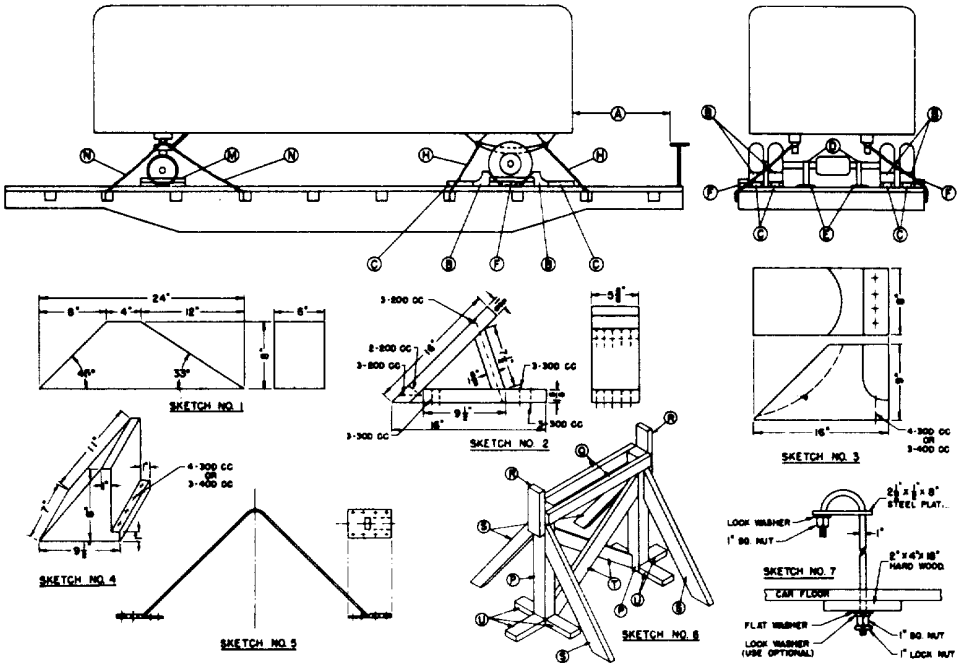
FOUR WHEEL TRACKLESS TROLLEYS AND OTHER MOTOR VEHICLES-FLAT CARS WITH WOODEN FLOORS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2, Sec. 1.
B	4 ea. machine.	Steel cradles of welded construction. Locate under each end of axle inside of wheel and secure each to floor with eight 3/8 in. x 2 in. lag screws.
C	2 ea. Item "B".	1/2 in. x 2 1/2 in. x 8 1/2 in. plate. Locate over springs on each side of axle.
D	2 ea. Item "B".	1/2 in. x 4 in. x 18 in. plate or 4 in. x 4 in. x 18 in. hardwood cleat. Not required where bolts pass through under frame member.
E	4 ea. Item "B".	Bolts 3/4 in. dia., with double nuts and washers. Pass two through Item "C" on each side of axle, and through Items "B", floor and Item "D".

See General Rules 4, 5, 9 and 15 for further details.

Sec. 4-Fig. 41 (Rev.-9-1963)
TRUCK TRAILERS, ALL TYPES-FLAT OR GONDOLA CARS WITH WOODEN FLOORS



Item	No. of Pcs.	Description
A		Brake wheel clearance. See Fig. 2.
B	2 ea. wheel.	6 in. x 8 in. x 24 in. blocks, Sketch 1. Locate 45 degree portion of block against front and rear of wheels. Nail-heel of block to floor with three 40-D nails and toe-nail that portion under tire to car floor with two 40-D nails before Items "C" and "'G" are applied. Substitute, if desired, at each location, blocks, Sketch 2 or blocks, Sketches 8 or 4, secured to floor, as shown.
C	2 ea. wheel.	B in. x 4 in. x 12 in. Locate one end against Item "B" Sketch 3, and nail each to floor, length-wise of car, with four 20-D nails. Not required when Items "B", Sketches 1, 2 or 4, are used.
D	2 ea. axle.	1 in. No. 14 B. W. gage hot rolled steel, with anchor plates. Sketch 5. Locate over axles and secure each plate to floor with eight 20-D cement-coated nails. Substitute, if desired, at each location, 4 strands, No. 9 gage wire, or wires of equivalent strength. Pass over axle, underneath and around Item "E" and twist taut after Item "E" has been nailed in place. Not required when Items ' are used.
E	2 ea. Item "D".	2 in. x 4 in. x 18 in. Nail each to floor, lengthwise of car, with four 20-D nails. Not required when Items "D", Sketch 5, are used.
F	1 ea. outside wheel.	Each to consist of two pieces of 2 in. x 4 in. x 36 in. Nail lower piece to floor with four 20-D nails and top piece to the one below with four 20-D nails.
G		VACANT.
H	1 ea. spring shackle.	4 strands, No. 9 gage wire, or wires of equivalent strength. Attach to spring shackles and to stake pockets on flat cars and underneath and around Item "J" in gondola cars and twist taut with rod or bolt, after Item "J" has been nailed in place.
J	1 ea. Item "H".	2 in. x 4 in. x 18 in. Nail to floor, lengthwise of car, with four 20-D nails. Not required for flat cars.
K		VACANT.
L		VACANT.
M	2 each outside front support wheel.	2 in. x 4 in. 18 in. long. Locate against outside face of front support wheel lengthwise of car. Secure lower pieces to floor with three 20-D nails and top pieces to those below with three80-D nails in each.
N	2 ea. support leg.	Each to consist of 4 strands, No. 9 gage wire, or wires of equivalent strength. Attach to support leg and to two stake pockets on flat cars and under and around Item "O" in gondola cars and twist taut with rod or bolt, after Item "O" has been nailed in place.
O	2 ea. Item "N".	2 in. x 4 in. x 18 in. Nail each to floor, lengthwise of car, with four 20-D nails. Not required for flat cars.
P	2	4 in. x 4 in. vertical body blocks, length to suit. Locate one at each outside edge of trailer and toe-nail to floor with four 30-D nails in each.
Q	2	2 in. x 4 in. cross ties, length to suit. Locate flush with top of and nail to each Item "P" with three 20-D nails.
R	2	2 in. x 4 in. x 12 in. cleats. Locate top portion against body or frame of trailer and nail lower portion of each to outside face of Items "P" with four 20-D nails.
S	4	2 in. x 4 in. diagonal braces, length to suit. Locate diagonally and nail each top end to Item "P" with three 20-D nails and toe-nail each bottom end to floor with three 20-D nails.
T	4	2 in. x 4 in. diagonal braces, length to suit. Locate diagonally and nail each end to top and bottom of opposite Items "P" with three 20-D nails.
U	8 ea. Item "P".	2 in. x 4 in. x 12 in. longitudinal floor blocks. Locate one ahead of, behind and outside of each Item "P' and nail each to floor with four 20-D nails.
V	2 ea. axle.	"J" bolt, Sketch 7. Apply, as shown, to axle. Not required when Items "D" are used.

Items "P" to "U", inclusive, not required for trailers with positive locking front supports.
For four wheel trailers use Items "B" to "H" inclusive at both ends and omit Items "M" to "U" inclusive.
Item "M" not required when Items "P" to "U" are used, or vice versa, provided Items "N" are used at all times.
See General Rules 4, , 9, 14, 15 and 19-B for further details.

APPENDIX G

SPECIAL-PURPOSE RAILCARS

LISTING OF TRAILER TRAIN EQUIPMENT SHOWING LENGTH, WIDTH, HEIGHT, LIGHT WEIGHT, LOAD LIMIT AND TYPE OF DRAFT GEAR. ALSO "REMARKS" PERTAINING TO THE OVERALL CONFIGURATION, SPECIAL TIEDOWN DEVICES, AND SPECIFIC PURPOSE OF EACH TYPE OF CAR.

(The following information is extracted from Trailer Train Company Equipment .Brochure.)

Type	Length over end sills	Width	Height	Lt. weight	Load limit	Draft gear	Remarks
TTX	49'-4 ¾"	8'-2"	3'-5 1/8"	57,000	153,000(F30D) *112,000(F30G)	Conv.	1
TTX	75'-0"	8'-2"	3'-5 5/8"	76,300 to 82,000	*'128,000 to 133,700	Conv.	2
TITX	85'-0"	8"-2	3'-5 ½"	67,500 to 92,000	*135,000	Conv.	3
TTX	89'-0"	8'-2" to 9'-0"	3'-3" to 3'-5 1/2"	63,000 to 82,500	135,000	Conv.	4
ATTX	75'-0"	8'- 10 1/2'	3'-5 5/8"	72,000 to 78,000	**132,000 to 137,700	Conv.	4
BTTX	89'-0"	8'-2" to 9'-0'	2'-7' ½" to 3'-5 1/2"	54,000 to 82,500	**116,000 to 135,000	Conv. & Hydr.	6
CTTX	85'-0"	8'-2"	3'-5 1/2"	67,500 to 92,000	*135,000	Conv.	7
CTTX	89'-0"	8'-2" to 9'-0"	2'-7 1/2" to 3'-5 1/2"	54,000 to 82,500	'*116,500 to 135,000	Conv.&Hydr.	7
ETTX	Same as CTTX, above.						8
FTTX	60'-0"	10'-6"	3'-6" & 3'-8 3/8	59,000 & 67,000	151,000& 153,000	Hydr.	9
FTTX	89'-0"	8'-2" to 9'-0"	3'-3" to 3'-5 ½"	63,000 to 82,500	135,000	Conv. & Hydr.	10
FTTX	89'-4"	9'-0"	3'-6"	65,000 apprx.	130,000	Hydr.	11
GTTX	85'-0"	8'-4"	3'-1 1/2"	68,400	135,000	Conv.	12
GTTX	89'-4"	8-8"	3'-1 1/2"	70,600	135,000	Conv.	13
HTTX	60'-0"	10'-6"	3'-8 3/8"	70,000	150,000	Hydr.	14
ITTX	89'-0"	8'-6"	3'-5 1/2"	74,800	135,000	Hydr.	15
ITTX	89'-0"	8'-6"	3'-3 1/2"	82,500	135,000	Hydr.	15
ITTX	89'-0"	8'-6"	3-3"	72,800	135,000	Hydr.	15

See remark number 7.
**Load limits vary depending upon Light Weight of car.

Type	Length over end sills	Width	Height	Lt. weight	Load limit	Draft gear	Remarks
ITTX	89'-4"	8'-6"	3'-6"		130,000	Hydr.	16
JTTX	89'-0"	8'-2" to 9'-0"	3'-3 ½" to 3'-5 ½"	63,000 to 82,500	135,000	Conv.& Hydr.	17
JTTX	89'-0"	8'-2" to 9'-0"	2'-7 1/2"	54,000 to 62,500	**118,000 to 137,000	Conv. & Hydr.	17
KTTX	89'-0"	Same as JTTX				Hydr.	18
LTTX	89'-0"	8'-2"	2'-7 1/2"	54,000 to 62,500	**118,000 to 137,700	Conv.	19
MTTX	60'-0"	10'-6"	3-8 3/8"	67,000 & 70,000	153,000 & 150,000	Hydr.	20
MTTX	85'-0"	8'-2"	3'-5 ½"	67,500 to 70,500	135,00	Conv.	20
OTTX	60'-0"	10'-6"	3'-8 3/8"	69,000 to 71,000	**149,000 151,000	Hydr.	#21
PTTX	60'-0"	10'-6"	3'-8 3/8"	75,000	145,000	Hydr.	#22
RTTX	89'-0"	Same as JTTX					#23
STTX	85'-0"	Same as JTTX					#24
XTTX	89'-0"	*8'-2"	3'-5 ½"	73,300	135,000	Conv.	#25
XTTX	89'-0"	8'-8"	3'-1 ½"	70,600	*135,000	Conv.	#26
ZTTX	85'-0"	8'- 2"	3'-5 1/5"	67,500 to 70,500	*135,000	Conv.	#27
TTAX	89'-4"	9'-0"	3'- 5 ½"	68,500	151,000	Hydr.	8
TTBX	89'-4"	8'-6"	3'-6"	....	130,000	Hydr.	9
TTCX	89'-4"	9'-0"	3'-5 1/2"	64,500	155,500	Hydr.	0
TTDX	89'-4"	8'-6"	3'-6"	....	130,000	Hydr.	1
TTDX	89'-0"	8'-6"	3'-5 1/2"	74,800	135,000	Hydr.	1
TTHX	60'-0"	10'-6"	3'-8 3/8"	69,000	151,000	Hydr.	2

Type	Length over end sills	Width	Height	Lt. weight	Load limit	Draft gear	Remark
TTKX	89'-4"	8'-6"	3'-6"	.....	130,000	Hydr.	3
TTRX	89 - 4"	8'-6"	3'-6"	.....	130,000	Hydr.	4
TTX-101	89'- 0"	9-0"	3'-5 ½"	.....	130,000	Hydr.	35
TTX-102	89'-0"	9-1"	3'-6"	.....	130,000	Conv.	36
TTX-103	89'-0"'	9'-0"	3'-5 ½"	.....	130,000	Conv.	37
TTX-104	89'-0"	9'-0"	3'-5 ½"	.....	130,000	Conv.	38

REMARKS

1. (TTX) These cars are equipped with one hitch for the transportation of one trailer up to 43 feet in length. The underframe is cast steel with a wooden floor. Conventional draft gears are used for end-of-car cushioning. Cars marked F30CG have a "Starred Load Limit."
2. (TTX) The underframe on the majority of 75 foot cars is an all welded steel structure with a small percentage of cars (F39B) having a cast steel underframe. The welded steel and cast steel underframes have a fish belly center sill. Class F39, F39A, and F39C have a wood deck with an exposed steel center sill top cover plate extending the full length of the car. Class F39B has an all wood deck. Conventional friction draft gears are used for end-of-car cushioning. The Lightweight varies from 76,000 to 82,000 pounds depending upon the car used. The Load Limit varies from 128,000 pounds to 133,700 pounds accordingly. These cars are equipped with two hitches for the transportation of two trailers up to 35 feet in length.
3. (TTX) These cars are equipped with two hitches for the transportation of two trailers up to 40 feet in length. The underframe is an all welded steel structure with a fish belly center sill. Two types of floors are used, an all steel floor and a combination wood and steel floor. A conventional draft gear is used for end-of-car cushioning. The side sills are utilized as outside trailer guide rails, and extend 8 inches above the deck of the car. The side sills are also stress carrying members of the underframe. Classes F85D, F85E, and F85F are equipped with auxiliary guide rails which when removed, increase the width between the guide rails to 8 feet 6 inches. All cars have (*)'Starred Load Limit except F85M which has a Load Limit of 128,000 lbs.
4. (TTX) Standard deck cars in trailer service equipped with two hitches for the transportation of two trailers, one up to 45 feet in length and one up to 40 feet in length. These cars consist of two basically different types of flat cars, a standard deck and a low deck car. The underframe of these cars is an all welded steel structure with a fish belly center sill and all steel floor. Eighty-nine feet cars in trailer service (cars equipped with hitches use conventional draft gears for end-of-car cushioning. Eighty-nine feet cars equipped with auto racks, or equipped for saddleback service, military service or autoframe service use hydraulic draft gears for end-of-car cushioning. Hitches and container supports are cushioned when used on cars having friction type gears. F9OHS and F9OPHS are equipped with hydraulic sliding sills. The letter "H" in class denotes car equipped with hydraulic draft gears.
5. (ATTX) These cars are equipped with continuous tiedown loops at the center of the car and tiedown rails at the sides, for the transportation of small vehicles such as army trucks, jeeps, mail trucks, and other general commodities. The underframe on the majority of 75 foot cars is an all welded steel structure with a small percentage of cars (F39B) having a cast steel underframe. The welded steel and cast steel underframes have a fish belly center sill. Class F39, F39A, and F39C have a wood deck with an exposed steel center pill top cover plate extending the full length of the car. Class F39B has an all wood deck. Conventional friction draft gears are used for end-of-car cushioning.
6. (BTTX) Standard or low deck cars equipped with bilevel auto racks. 89-foot cars equipped with auto racks or equipped for saddleback service, military service or autoframe service use hydraulic draft gears for end-of-car cushioning. Hitches and container supports are cushioned when used on cars having a friction type gear. F89OHS and F89PHS classes are equipped with hydraulic sliding sills. These cars consist basically of two different types of flatcars, a standard deck and a low deck car. The underframe of these cars is an all welded steel structure with a fish belly center sill and all steel floor.
7. (CTTX) These cars are equipped with special devices for the transportation of two 40 foot containers. The underframe is an all welded steel structure with a fish belly center sill. Two types of floor are used, an all steel floor and a combination wood and steel floor. A conventional draft gear is used for end-of-car cushioning. The side sills are utilized as outside trailer guide rails, which extend 8 inches above the deck of the car. The side sills are also stress carrying members of the underframe. Note, all cars listed in tables have (*) Starred Load Limit except the F85M which has a Load Limit of 128,000 pounds.
8. (ETTX) Standard or low deck car equipped with elevating trilevel auto racks. The underframe is an all welded steel structure with a fish belly center sill and all steel floor. Eighty-nine foot cars equipped with auto racks use hydraulic draft gears for end-of-car cushioning.
9. (FTTX) Auto Frame Cars. Same basic car as described in Remark number 20, but supplied with special tiedown equipment for the transportation of automobile frames. The underframe is all welded steel structure with a fish belly center sill. Wood deck is treated oak. Hydraulic draft gears are used for end-of-car cushioning.
10. (FTTX) Standard flush deck car equipped with special tiedown equipment for transportation of automobile frames. Eighty-nine foot cars used for saddleback service, military service or autoframe service use Hydraulic draft gears for end-of-car cushioning. The underframe of this car is an all welded steel structure with a fish belly center sill and all steel floor.
11. (FTTX) 89 foot 4 inch flush deck car equipped with special tiedown equipment for the transportation of automobile frames. The underframe is an all welded steel structure with an all welded steel floor. Cars equipped for autoframe service use hydraulic draft gears for end-of-car cushioning. This car provides a clear loading area 9 feet 0 inch wide by 89 feet 4 inches long.
12. (GTTX) 85 foot and 89 foot cars which are equipped with two hitches for the transportation of two trailers up to 40 feet in length. These cars have a center sill which extends 8 inches above the deck. Attached to the center sill on each side is a cushioned rub rail which acts as an inner guide rail. The underframe consists of a fish belly center sill with cross members. No side sills are used on the car. The floor is a steel box section, one section on each side of the center sill with longitudinal floor stringers enclosed.
13. (GTTX) Same as Remark number 12.
14. (HTTX) This car is the same basic car as described in Remark number 20, except that this car is equipped with special heavy duty tiedown anchors and chain assemblies contained in channels along the sides of the car and adjacent to the center sill on each side. Each outboard channel contains nine tiedown anchors while each inboard channel contains ten tiedown anchors. The movable and retractable tiedown anchors are equipped with chain assemblies having a load binder, heavy duty compression unit, adjustable grab hook and 1/2 inch alloy chain with a working load limit of 11,250 lbs (proof test 27,500 lbs). This type of car, HTTX, replaces type TTHX as the 60 foot heavy duty tiedown car.
15. (ITTX) Standard deck cars equipped with special foldaway pedestals and sixty-two movable ratchet type winches with 3/8 inch alloy chains having a working load limit of 6,600 lbs (proof test 18,000 lbs), contained in channels. These cars are used in the transportation of trailer tractors loaded "saddleback" style. The underframe is an all welded steel structure with a fish belly center sill and all steel floor. Hydraulic draft gears are used for end-of-car cushioning and hydraulic sliding sills.
16. (ITTX) Eighty-nine feet 4 inches flush deck cars equipped with special adjustable and foldaway pedestals 2 feet 0 inch high and 2 feet 0 inch long Tiedown equipment consists of sixty-two movable ratchet type winches with 3/8 inch x 10 feet long alloy chains having a working load of 6,600 lbs (proof test 18,000 lbs) contained in channels. These cars are used in the transportation of trailer tractors loaded “saddleback" style.
17. (JTTX) These cars consist of two basically different types of flat cars. The underframes of these cars are an all welded steel structure with

a fish belly center sill and all steel floor. Miscellaneous devices are applied by members for special services. Cars in trailer service use conventional draft gears. Cars equipped with auto racks, or equipped for saddleback service, military service or autoframe service use hydraulic draft gears for end-of-car cushioning.
18. (KTTX) Same as Remark number 4. These cars are standard or low deck cars with hinged end and trilevel auto racks.
19. (LTTX) These cars are low deck cars in trailer service equipped with two hitches for the transportation of two trailers up to 40 feet in length. Conventional draft gears for end-of-car cushioning.
20. (MTTX) (60 feet) The underframe is an all welded steel structure with a fish belly center sill. The wood deck is treated oak. Hydraulic draft gears are used for end-of-car cushioning. The basic car is the General Purpose Car. This car has side and end stake pockets, lading stray anchor along the side of the car, and on each side near the longitudinal center line of the car. The securements to the underframe of the sid angles and longitudinal steel members adjacent to the center sills are so designed that these members can be lowered for the installation of special tiedown channels for the Agriculture and Heavy Duty Equipment Cars. 85 foot cars are equipped with special devices, side stake pockets, sixteen per car, and used for the transportation of up to 80 foot lengths of pipe. Conventional draft gears are used on these cars for end-of-car cushioning.
21. (OTRX) Agricultural Equipment Flat Car. Same basic car as described in Remark number 20, except car is equipped with special tiedown channels along the sides of the car and adjacent to the center sill on each side. Each outboard channel contains twenty winches, while each inboard channel has twelve winches. The movable and retractable ratchet winches are equipped with chain tiedown assemblies with 3/8 inch alloy chain having a working load limit of 6,600 pounds (proof test 18,000 lbs).
22. (PTTX) Bulkhead Flat Cars. This is the same basic car as described in remark number 20, (60 foot), but with a bulkhead applied near each end of the car for the transportation of wallboard, plywood, etc. In addition these cars have special lading strap anchors.
23. (RTTX) Basically the same car as in remark number 4. These are standard or low cars equipped with trilevel auto racks.
24. (STTX) These cars are equipped with hitches and assigned to Freight Forwarders. The underframe is all welded steel structure with a fish belly center sill. Two types of floors are used, an all steel floor and a combination wood and steel floor. Conventional draft gears are used for end-of-car cushioning. The side sills are utilized as outside trailer guide rails, which extend 8 feet above the deck of the car. The side sills are also stress carrying members of the underframe.
25. (XTTX) Standard deck cars equipped with four hitches for the transportation of 28 foot trailers or two trailers, one up to 45 feet and one up to 40 foot in length. Conventional draft gears are used for end-of-car cushioning. The underframe of these cars is an all welded steel structure with a fish belly center sill and all steel floor.
26. (XTTX) The G-89 (89 feet) is equipped with four hitches for the transportation of three 27 foot 7 inch trailers or two trailers up to 40 foot in length. These cars have a center sill which extends 8 inches above the deck. Attached to the center sill, on each side, is a cushioned rub rail which acts as an inner guide rail. The underframe consists of a fish belly center sill with crossmembers. No side sills are used on this car. The floor is a steel box section, one section on each side of the center sill, with longitudinal floor stringers enclosed.
27. (ZTT,X) These cars are equipped with special side stake pockets, thirty per car, and used for the transportation of long poles. Conventional draft gears are used for end-of-car cushioning. The underframe is all welded steel structure with fish belly center sill. Two types of floor are used, on all steel floor and a combination wood and steel floor.
28. (TTAX) These cars are equipped with knock-down hitches, center rub rails, bridge plates, movable container pedestals and hydraul draft gears. They may be loaded with two trailers, one up to 45 feet and one up to 40 feet in length or combination of various length containers from 20 feet to 40 feet. A combination of a trailer up to 40 foot long and a container up to 40 foot long may also be loaded. The underframe is an all welded steel structure with an all welded steel floor. The car provides a clear loading area 9 feet 0 inch by 89 feet 4 inches.
29. (TTEX) Car has a flush deck equipped with bilevel auto racks. Hydraulic draft gears are used for end-of-car cushioning. All welded steel underframe with an all welded steel floor.
30. (TTCS) Flush deck cars equipped with movable container pedestals for the transportation of various combinations of containers from 20 feet to 40 feet. Hydraulic draft gears are used for end-of-car cushioning. All welded steel underframe with all welded steel floor.
31. (TTDX) Flush deck car equipped with sixteen movable screw type winches with 1/2-inch x 9 feet long alloy chain having a working load limit of 11,250 lbs. (proof test 22,500 pounds. For the transportation of military vehicles loaded in a semi-saddleback style. Hydraulic draft gears are used for end-of-car cushioning. All welded steel underframe with all welded steel floor.
32. (TTHX) Same basic car as described in Remark number 20, but equipped with eighteen heavy duty chain assemblies with 1/2 inch alloy chain having a working load limit of 11,250 pounds (proof test 27,500 pounds). These chain assemblies are attached to castings which are retained in the side stake pockets of the car. There are nine per side, three at the center of the car and three over each truck. This type of car is still in service but has been replaced by the HTTX. See Remark number 14.
33. (TTKX) Hinged End Trilevel Auto Rack on 89 foot 4 inch car equipped with hydraulic draft gears for end-of-car cushioning.
34. (TTRX) Trilevel Auto Rack on 89 foot 4 inch car equipped with hydraulic draft gears for end-of-car cushioning.
35. (TTX-101) This car has special hydraulic draft gear with 13 3/8 inches hydraulic travel and 1 5/8 inches rubber travel for car cushioning. Container and hitch cushioning from hydraulic draft gears. Handles 20 feet, 24 feet, 35 feet and 40 feet on adjustable pedestals. Contains hitches, guide rails and bridge plates for piggyback handling.
36. (TTX-102) Standard friction draft gears for end-of-car cushioning. Container cushioning consists of single rubber-pad-in-shear per pedestal. Fore and aft pedestals work in unison through a tie-rod (travel 14 inches). Hitch cushioning is accomplished by rubber pads in shear. Handles 20 foot and 40 foot containers on fixed pedestals. Car has hitches, guide rails, and bridge plates for piggyback handling.
37.-(TTX-103) This car has standard friction draft gears for end-of-car cushioning. Container cushioning is obtained from two rubber pads in series per pedestal and acting in shear. All pedestals act independently (travel 20 inches). Hitch cushioning is through rubber pads in shear. Handles 40 foot containers only on fixed pedestals. Hitches, guide rails, and bridge plates are available for piggyback handling.
38. (TTX-104) Standard friction draft gears for end-of-car cushioning. Container cushioning is obtained from rub-rails connected to rubberpads-in-shear having 14 inch travel. Hitch cushioning is through rubber pad in shear. Handles all lengths of containers on adjustable transverse bolsters. Hitches, guide rails and bridge plates are available for piggyback handling.

APPENDIX H

DODX EQUIPMENT

(The following information is extracted from The Official Railway Equipment Register.)

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DEPARTMENT OF DEFENSE,
MILITARY TRAFFIC MANAGEMENT COMMAND-WASHINGTON, D.C. 20315.

7-85

Reporting Marks and ACI Nos.—DODX - 1 158

GENERAL OFFICES: Headquarters, Military Traffic Management Command, Eastern Area, Attn: MTE-INR-M, Military Ocean Terminal, Bayonne, NJ 07002 (201)823-6411-6412-6413

FREIGHT EQUIPMENT

Cars are marked "DODX" and are numbered and classified as follows:

Line No.	A.A.R. Mech. Desig.	DESCRIPTION (See Explanation Pages for Abbreviations & Symbols)	A.A.R. Car Type Code	NUMBERS (▶Change from Previous Issue)	DIMENSIONS: INSIDE Length ft. in.	INSIDE Width ft. in.	INSIDE Height ft. in.	OUTSIDE Length ft. in.	OUTSIDE Width: At Eaves or Top of Sides or Platform ft. in.	OUTSIDE Width: Extreme ft. in.	OUTSIDE Height from Rail: To Extreme Width ft. in.	OUTSIDE Height from Rail: To Eaves or Top of Sides or Platform ft. in.	OUTSIDE Height from Rail: To Extreme Height ft. in.	DOORS Side: Width of Open'g ft. in.	DOORS Side: Height of Open'g ft. in.	CAPACITY: Cubic Feet Level Full	CAPACITY: Lbs. (000)	No. of Cars
		DODX																
1	NE	Caboose	N100	▶ 13	50 6	9 1	7 4	57	.....	10 4	14	.....	14	2 8	6 8	.....	110	1
2	NE	Caboose	N100	▶ 15	50 6	9 1	7 4	57	.....	10 4	14	.....	14	2 8	6 8	.....	110	1
3	NE	Caboose	N100	▶ 17	50 6	9 1	7 4	57	.....	10 4	14	.....	14	2 8	6 8	.....	110	1
4	NE	Caboose	N100	▶ 56	50 6	9 1	7 4	57	.....	10 4	14	.....	14	2 8	6 8	.....	110	1
5	NE	Caboose	N100	▶ 59	50 6	9 1	7 4	57	.....	10 4	14	.....	14	2 8	6 8	.....	110	1
6	NE	Caboose	N100	▶ 900-905	30	8 8	6 11	41 8	.....	10 8	13 6	.....	15 4	.....	.....	.....	110	6
7	XP	Box, End Doors: Width 8'2" & Height 10'2", Removable Shipping Containers, (Heat Exchangers)	A101	▶ 27480-27491	40 6	9 2	10 6	44 4	9 4	10 6	13 10	14 5	15	8	9 10	3903	100	12
8	XP	Box, End Doors: Width 9'6" & Height 8'6", Removable Shipping Containers, (Heat Exchangers)	A606	▶ 29010-29024	59 9	9 5	9 9	65 6	9 11	10 8	12 1	14	14 9	27	8 6	5487	164	15
9	XP	Box, End Doors: Width 9'6" & Height 8'6", Removable Shipping Containers, (Heat Exchangers), 15" Freightmaster End of Car Cushioning	A606	▶ 29300-29314	59 9	9 5	9 9	67 10	9 11	10 8	12 1	14	14 9	27	8 6	5487	161	15
10	FMS	Flat, Stl., Load Limit at Center of Car, (Navy Gun Mounts)	F211	▶ 32002	40	10 6	.....	46 2	.....	10 6	5 8	3 11	5 8	.....	.....	.....	140	1
11	FMS	Flat, Stl., Load Limit at Center of Car, (Navy Gun Mounts)	F211	▶ 32003-32007	40	9 1	.....	43 2	.....	10 2	3 8	3 8	5	.....	.....	.....	140	5
12	FM	Flat, Heavy Duty	F502	▶ 38016-38064	54	10 6	.....	57 4	.....	10 7	4 2	4 2	4 2	.....	.....	.....	200	543
		DODX																
1	FM	Flat, (Diesel Locomotives)	F502	▶ 38063, 38429, 38434, 38488, 38617	54	10 6	.....	56 6	.....	10 7	4 2	4 2	4 2	.....	.....	.....	200	5
2	FM	Flat, (Navy Gun Mounts)	F502	▶ 38148, 38178, 38190, 38221, 38223, 38272, 38313, 38424, 38445, 38458, 38463, 38522, 38524, 38540, 38562, 38638, 38661	54	10 5	.....	57 4	.....	10 7	4 2	4 2	4 2	.....	.....	.....	200	17
3	LF	Flat, Heavy Duty, Demountable Container	L007	▶ 38170, 38187, 38200, 38280, 38311, 38566	54	10 6	.....	57 4	.....	10 7	4 2	4 2	4 2	.....	.....	.....	200	6
4	FW	Flat, Well, Four 4-Wheel Trucks, (Steam Generators), Axle Spac. 5'10", Truck Ctrs. 34'6"	F361	▶ 38851-38854	46 8	9	10	51 9	.....	10 1	3 10	4 1	4 2	.....	.....	.....	177	2
5	FW	Flat	F361	▶ 38852, 38854	46 8	9	10	51 9	.....	10 1	3 10	4 1	4 2	.....	.....	.....	180	2
6	FW	Flat, Well, Four 4-Wheel Trucks, Axle Spac. 5', Truck Ctrs. 34'6" F+ Note 1	F362	▶ 38864	53 6	10 6	1 8	58 6	10 6	10 6	15 1	4	15 1	.....	.....	.....	160	1
7	FW	Flat, Well, Four 4-Wheel Trucks, (Steam Generators), Axle Spac. 5', Truck Ctrs. 40'4"	F461	▶ 38865-38867	46 4	9 4	1 8	69 5	.....	10 8	8 3	4 2	8 3	.....	.....	.....	400	3
8	FM	Flat	F502	▶ 39095-39199	54	10 4	.....	57 2	.....	10 4	4 5	4 5	4 5	.....	.....	.....	200	100
9	FM	Flat	F301	▶ 39500-39649	50	10 3	.....	53 3	.....	10 3	3 8	3 8	3 8	.....	.....	.....	160	73
10	FMS	Flat, Chain Tie-Downs	F311	▶ 39503, 39531-39533, 39544, 39552, 39560, 39563-39566, 39571-39573, 39575-39577, 39584, 39586, 39590-39592, 39595, 39597, 39602-39604, 39606, 39608, 39610-39611, 39617-39620, 39624-39625, 39627, 39629-39630, 39632, 39634-39635, 39645, 39647-39649	50	10 3	.....	53 3	.....	10 8	3 2	3 9	3 9	.....	.....	.....	160	47
11	FM	Flat, (Navy Gun Mounts)	F301	▶ 39519, 39558, 39569, 39582, 39623, 39626, 39639	50	10 3	.....	53 3	.....	10 3	3 8	3 8	3 9	.....	.....	.....	160	7
12	LF	Flat Note 2	L007	▶ 39524, 39599, 39637	50	10 3	.....	53 3	.....	10 3	3 8	3 8	3 8	.....	.....	.....	160	3
13	LF	Flat Note 3	L007	▶ 39535, 39546, 39551, 39559, 39579, 39587-39588, 39596, 39609, 39612, 39616, 39640	50	10 3	.....	53 3	.....	10 3	3 8	3 8	3 9	.....	.....	.....	160	12
14	FD	Flat Note 4	F433	▶ 39800-39809	72 6	10 2	2 6	79 6	.....	10 2	4 11	4 11	8 4	.....	.....	.....	300	10
15	FD	Flat C Note 5	F432	▶ 39810-39832	58	9	2 1	62 10	.....	10	4 1	4 3	15 4	.....	.....	.....	300	10
16	FD	Flat C Note 6	F432	▶ 39812, 39813, 39820-39821, 39824-39825	58	9	2 1	62 10	.....	10	4 1	4 3	13 10	.....	.....	.....	300	6
17	FD	Flat	F432	▶ 39826, 39827-39832	58	9	2 1	62 10	.....	10	4 1	4 3	13 10	.....	.....	.....	300	7
18	FD	Flat, Well, Depressed Center C	F433	▶ 39833-39847	71 8	9 2	2	77 1	.....	9 2	4 11	4 11	15 4	.....	.....	.....	315	5
19	FD	Flat, Well, Depressed Center C Note 7	F433	▶ 39833, 39838, 39840	71 8	9 2	2	77	.....	9 2	4 11	4 11	15 4	.....	.....	.....	315	3
20	FD	Flat, Well, Depressed Center Note 8	F433	▶ 39839, 39843, 39847	71 8	9 2	2	77 1	.....	9 2	4 11	4 11	8 4	.....	.....	.....	315	3
21	FD	Flat	F433	▶ 39842	71 8	9 2	2	77	.....	9 2	4 11	4 11	15 1	.....	.....	.....	315	1
22	FD	Flat	F433	▶ 39844	71 8	9 2	2	77 1	.....	9 2	4 11	4 11	7 2	.....	.....	.....	315	1
23	FD	Flat	F433	▶ 39845, 39846	71 8	9 2	2	77 1	.....	9 2	4 11	4 11	15 1	.....	.....	.....	315	2
24	FMS	Flat Note 9	F411	▶ 39900	44	9 2	13 8	47 7	6	9 10	4 2	4 2	13 8	.....	.....	.....	375	1
25	FMS	Flat Note 10	F411	▶ 39901-39907	44	9 2	.....	47 7	.....	9 10	4 2	4 2	4 2	.....	.....	.....	375	7
26	FMS	Flat Note 11	F421	▶ 39911	40	10 8	.....	70 8	.....	10 8	4 3	4 3	7 5	.....	.....	.....	621	1
27	FMS	Flat Note 12	F421	▶ 39912-39913	50	10 8	.....	70 8	.....	10 8	4 3	4 3	7 5	.....	.....	.....	616	2
28	FMS	Flat, Axle Spac. 4'6", Truck Ctrs. 33'	F421	▶ 39914-39917	50	10 8	.....	70 6	.....	10 8	4 3	4 3	4 3	.....	.....	.....	600	4
29	FMS	Flat, Stl., Axle Spac. 5'6", Truck Ctrs. 46'3"	F423	▶ 40000-40100	68	10 3	.....	72 10	.....	10 6	3 9	4	4 1	.....	.....	.....	299	101
30	FMS	Flat	F423	▶ 40101-40244	68	10 5	.....	72 10	.....	10 5	4 1	4 1	4 1	.....	.....	.....	299	144
31	FMS	Flat	F423	▶ 40245-40418	68	10 5	.....	72 10	.....	10 5	4 1	4 1	4 1	.....	.....	.....	300	174
32	FMS	Flat	F311	▶ 597001-597003	47 6	10 6	.....	55	.....	10 6	3 7	3 9	5 4	.....	.....	.....	197	3
33	FMS	Flat	F311	▶ 597005	47 6	10 6	.....	55	.....	10 6	3 7	3 9	5 4	.....	.....	.....	197	1
34	FMS	Flat	F311	▶ 597008	47 6	10 6	.....	55	.....	10 6	3 7	3 9	5 4	.....	.....	.....	197	1
		Total																1367

DEPARTMENT OF DEFENSE,
MILITARY TRAFFIC MANAGEMENT COMMAND-WASHINGTON, D.C. 20315.—Continued

TANK EQUIPMENT

Cars are marked "DODX" and are numbered and classified as follows:

Line No.	A.A.R. Mech. Desig.	CLASS	DESCRIPTION *See Explanation Pages for Abbreviations & Symbols*	A.A.R. Car Type Code	NUMBERS ▶*Change from Previous Issue*	CAPACITY Rated Gals. (00)	CAPACITY Lbs. (000)	No. of Cars
			DODX					
1	T	.....	Tank	*T103*	▶ *6000-6109*	...	*110*	*119*
2	T	.....	Tank	T563	▶ 9813-9824	...	134	12
3	T	.....	Tank	T103	▶ 9200-9401	...	110	177
4	T	.....	Tank, Insulated, Steam Coils	T103	▶ 9435-9488	...	154	50
5	T	.....	Tank	T103	▶ 9508-9517	...	110	1
6	T	.....	Tank, Steam Coils	T103	▶ 11635-11650	...	110	15
7	T	.....	Tank	T103	▶ 11690-12373	...	110	409
8	T	.....	Tank, Steam Coils	T103	▶ 12600-12699	...	110	63
9	T	.....	Tank	T105	▶ 14000-14199	...	248	120
10	T	.....	Tank, (Sulfuric Acid)	T055	▶14000, 14003, ▶14008-14010, 14012-14014 14020, ▶14025-14026, 14029, 14039, ▶14046-14047, 14049, 14051-14052, ▶14056, 14069-14070, 14077, ▶14079-14080, 14083, 14086-14087, ▶14089, 14093, 14098-14100, 14105, ▶14107, 14111, 14113, 14118, 14122, ▶14125, 14129, 14131-14132, 14135, ▶14139-14140, 14148, 14150-14151, ▶14153, 14155, 14159-14161, 14165, ▶14167-14168, 14172, 14175, 14181, ▶14184, 14191, 14198	...	248	62
1	T	.....	Tank	T105	▶ 14200-14361	...	200	161
2	T	.....	Tank	T103	▶ 15004-15187	...	110	5
3	T	.....	Tank	T563	▶ 16041-16054	...	136	4
4	T	.....	Tank	T563	▶ 16045	...	137	1
5	T	.....	Tank	T563	▶ 16053	...	134	1
6	T	.....	Tank, (Phosphorus)	T102	▶ 16330-16344	...	154	13
7	T	.....	Tank	T103	▶ 16414-16453	...	110	34
8	T	.....	Tank	T021	▶ 17040-17081	...	88	32
9	T	.....	Tank	T021	▶ 17091	...	88	1
10	T	.....	Tank	T191	▶ 17302	...	154	1
11	T	.....	Tank	T191	▶ 17305	...	154	1
12	T	.....	Tank	T103	▶ 17399-17448	...	154	10
13	T	.....	Tank	T103	▶ 17448	...	151	1
			Total					1293
			Grand Total					2660

DEPARTMENT OF DEFENSE,
MILITARY TRAFFIC MANAGEMENT COMMAND-WASHINGTON, D.C. 20315.—Continued

Note 1—Car is equipped with permanently applied container and framework as an enclosure for radioactive material. Container: empty 139, 914 lbs., cooling unit 18,000 lbs., accessories 1,057 lbs., loaded 271,000 lbs. Railcar: lt. wt. 120,000 lbs.

Note 2—Cars are equipped with permanently applied framework. Framework: length 23 ft. 8 in., width 5 ft. 8 in., and maximum height above rail 5 ft. 3 in. Framework & car are weighted as a unit: 65,600 lbs.

Note 3—Cars are equipped with permanently mounted container and framework. Container & framework: length 22 ft. 4 in., width 10 ft., and maximum height above rail 12 ft. 6 in. Railcar, container & framework are weighted as a unit: 185,000 lbs. loaded & 122,000 lbs. empty.

Note 4—Depressed center flatcars having four 4-wheel trucks with spac. between truck ctrs. 53 ft. & between axles 5 ft., length of depressed section 30 ft., height from rail to top of depressed section 2 ft. 6 in. These cars have 2 3/8" wood flooring each end & stl. flooring in depressed section. Load may equal ld. lmt. cap. if supported on two cross bearers each side of center line of car. Lt. wt. 170,000 lbs.

Note 5—Depressed center flatcars having two 6-wheel trucks with spac. between truck ctrs. 40 ft. & between axles 5 ft. Cars are equipped with permanently mounted container & framework as an enclosure for radioactive material. Container & framework: length 18 ft., width 9 ft., maximum height above rail 15 ft. 6 in., weight 231,000 lbs. loaded & 218,000 lbs. empty. Railcar: lt. wt. 130,000 lbs.

Note 6—Depressed center railcars having two 6-wheel trucks with spac. between truck ctrs. 40 ft. & between axles 5 ft. Cars are equipped with permanently mounted container & framework: length 31 ft., width 10 ft. 8 in., maximum height above rail 13 ft., 10 in., weight 250,000 lbs. loaded & 96,000 lbs. empty. Railcar: lt. wt. 130,000 lbs.

Note 7—Depressed center flatcars having four 4-wheel trucks with spac. between truck ctrs. 47 ft. & between axles 5 ft. 4 in. Cars are equipped with permanently mounted container & framework as an enclosure for radioactive material. Container & framework: length 18 ft., width 9 ft., maximum height above rail 15 ft. 6 in., weight 231,000 lbs. loaded & 218,000 lbs. empty. Railcar: lt. wt. 122,200 lbs.

Note 8—Depressed center flatcars having four 4-wheel trucks with spac. between truck ctrs. 47 ft. & between axles 5 ft. 4 in. Lt. wt. 122,200 lbs.

Note 9—Heavy duty flatcar having four 4-wheel trucks with spac. between truck ctrs., 26 ft. & between axles 5 ft. Car is equipped with stl. loading deck & may be loaded to ld. lmt. cap. if supported on two cross bearers each side of centerline of car or provided load is distributed not less than 7 ft. on each side of centerline of car & distributed over the full width of car. Car is equipped with permanently mounted container & framework as an enclosure for radioactive material. Container & framework: length 19 ft. 8 in., width 9 ft. 6 in., maximum height above rail 13 ft. 8 in., weight 333,000 lbs. loaded & 245,000 lbs. empty. Railcar: Lt. wt. 107,000 lbs.

Note 10—Heavy duty flatcars having four 4-wheel trucks with spac. between truck ctrs. 26 ft. & between axles 5 ft. Car is equipped with stl. loading deck & may be loaded to ld. lmt. cap. if supported on two cross bearers each side of centerline of car or provided load is distributed not less than 7 ft. on each side of centerline of car & distributed over the full width of car. Lt. wt. 107,000 lbs.

Note 11—Heavy duty flatcar having four 6-wheel trucks with spac. between truck ctrs. 33 ft. & between axles 4 ft. 6 in. Lt. wt. 167,200 lbs.

Note 12—Heavy duty flatcars having four 6-wheel trucks with spac. between truck ctrs. 33 ft. & between axles 4 ft. 6 in. Cars are equipped with permanently mounted container & framework: length 35 ft. 11 in., width 10 ft. 8 in., maximum height above rail 15 ft. 1 in., weight 425,800 lbs. loaded & 225,800 lbs. empty. Railcar: lt. wt. 172,300 lbs.

Report car movements, estray cars, mileage earnings and junction reports to HQ, MTMCEA Attn: MTE-INR-O, Bayonne, NJ 07002 (DOD/HQ, MTMCEA owner-shipper).

Pay mileage earnings by check drawn in favor of "Treasurer of the United States" and forward to HQ, MTMCEA, Attn: MTE-FMF, Bayonne, NJ 07002 (DOD/HQ, MTMCEA owner-shipper).

Report cars bad ordered, damaged, destroyed or requiring materials for repair to HQ, MTMCEA, Attn: MTE-INR-M, Bayonne, NJ 07002. Phone: (201)823-6411-6412-6413.

All cars initialed "DAFX", "USA" and "USAX" and not listed above are in intraplant service and are subject to movement in interchange as a result of transfer between government installations. Repair to these cars will be billed direct to: Commander, U.S. Army Troop Support & Aviation Materiel *Readiness Command, Attn: DRSTS-MPB, 4300 Goodfellow Blvd., St. Louis, MO 63120* in accordance with Rule 112, A.A.R. Interchange Rules.

All cars initialed "USNX" or "USN" and not listed above are in intraplant service. Repairs should be billed to the installation requesting repairs to the cars. If installation information is not available, send bills to Commanding Officer, Naval Construction Battalion Center, Attn: Code 15, Port Hueneme, CA 93043.

All railroad cars bills should contain the following: (A) USNX or USN Registration No.: (B) Activity name, address, personnel name & telephone number requesting railcar repair services; (C) Railcar description, repairs made and cost of repairs; (D) Date railcar received for repair & date railcar repairs completed & released back to the installation.

For Billing: HQ, MTMCEA, Attn: MTE-FMF-CA, Military Ocean Terminal, Bayonne, NJ 07002.

Home Point(s)—

APPENDIX I

ORDERING, LOADING, AND UNLOADING RAIL EQUIPMENT

(The following information is extracted from AR 55-355 Military Traffic Management Regulation.)

1. *Ordering Carriers' Equipment*. The Official Railway Equipment Register contains information regarding size, capacity, and type of all interchange equipment owned by rail carriers and private car companies. In addition, some technical military publications specify the number of units or quantity of freight which may be loaded in or on a freight car. These guides provide a general basis for determining what equipment is available, and the load requirements of different types and sizes of equipment. Carload shipments should be planned so that carriers' equipment will be loaded to full visible capacity or maximum load limits, when practicable.

2. *Placing Orders with Carriers*. The proper ordering of cars to suit the needs or the shipment is extremely important. Cars should not be too large for the shipment, nor so small that two cars will be required where one larger car would have been sufficient. Orders for cars should specify type and size of equipment required, when and where it should be placed for loading, commodity and weight to be shipped, oversize dimensions (if any), destination, and proposed routing, if available.

3. *Acceptance of Carriers' Equipment*.

a. Suitable Equipment. Transportation officers should insure that equipment placed by carriers is suitable for the material to be shipped. Rail cars which are not suitable in every respect, as determined by visual inspection should not be accepted for loading.

b. Size of Rail Car. When the minimum weight for a particular shipment is based on the size of the car ordered, the MTMC routing instructions will so advise and, in this instance, a longer car than ordered may be accepted if offered by the carrier. In such case the annotation furnished in the routing instruction to cover this situation will be placed in the Description of Articles Block of the bill of lading to protect the minimum weight of the size of car ordered.

4. *Difficulty in Obtaining Equipment Required*. Any difficulty experienced in obtaining the size, quality, or quantity of rail equipment for movement of commodities other than class A explosives should be reported promptly to the proper MTMC routing authority, so that the assistance of the local office of the Association of American Railroads may be requested. Notifications of this nature pertaining to proposed shipments that have been assigned a MTMC route order or release number (except Standing or Consolidated Standing Route Orders) will make reference to such number; on all other shipments, the notification will contain the following information:

a. Name of carrier.
b. Type, size and quantity of rail cars required.
c. Commodity to be shipped.
d. Shipping schedule.
e. Name of shipper.
f. Actual point of loading.
g. Name of consignee.
h. Destination of the shipment.
i. Name of alternate higher-cost carrier to whom lading is to be transferred or diverted, if applicable.

5. *Loading of Freight*.

a. Responsibility of Transportation Officer. Transportation officers will exercise care to see that all shipments are properly loaded, blocked, braced and secured to prevent damage to the lading and carriers' equipment and facilities while in transit. Freight that is to be unloaded at a point intermediate to final destination should be loaded in such a manner as to be readily accessible for unloading at the stop-off-point. Transportation shall observe as minimum requirements the methods for loading, blocking, and bracing shipments in or on railroad cars as set forth in appropriate loading rules of the Association of American Railroads.

b. Car Notice. When military shipments are loaded by or under the supervision of the military services on open-top rail equipment in accordance with drawings approved by the AAR, Mechanical Division, but which have not been published in the Open Top Carloading Manual, a locally reproduced 5- x 7-inch notice (water repellent or otherwise protected from the elements) as fellows, will be prominently affixed to the car:

NOTICE

The Method of Loading
Lading In or On This Car
Has Been Approved By The

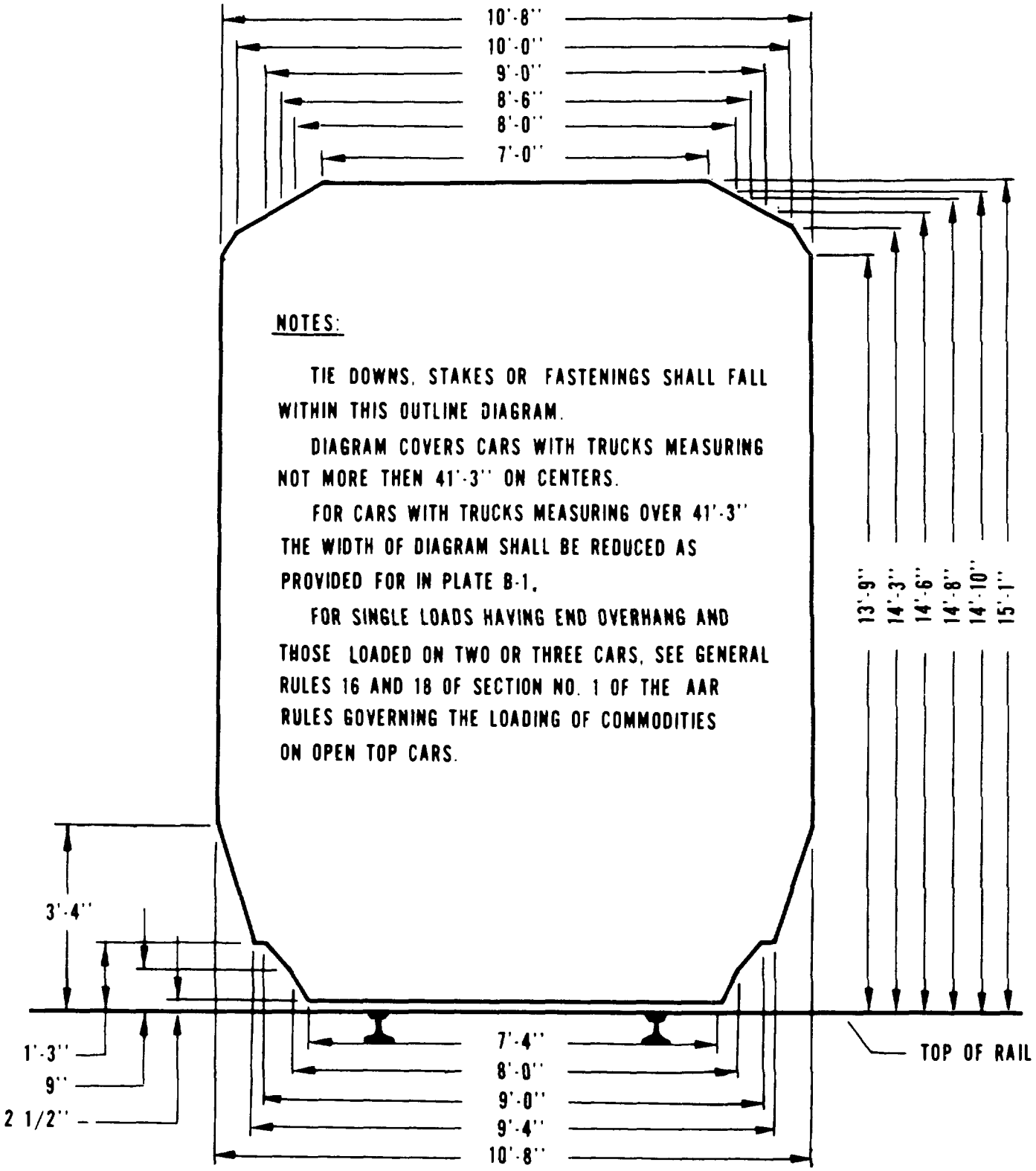
Association of American Railroads
Authority: _____
Signed: _____
(Transportation Officer or Designee)

The "authority" space on the notice will be completed by entering therein the drawing number or, if not available, the letter reference of the Mechanical Division, AAR.

APPENDIX J

CLEARANCE DIAGRAM

-OUTLINE DIAGRAM FOR SINGLE LOADS, WITHOUT END OVERHANG, ON OPEN TOP CARS



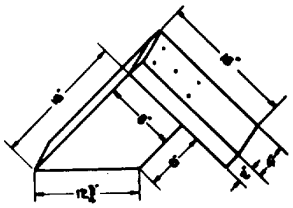
APPENDIX K

BLOCKING DETAILS

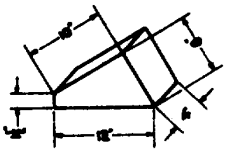
(The following information is extracted from the Association of American Railroads manual, General Rules Governing the Loading of Commodities on Open Top Cars and Trailers, section 6.)

Section No. 6

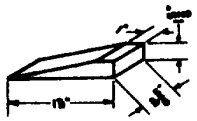
MATERIAL CHART.



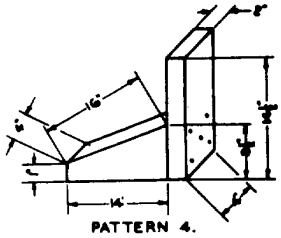
PATTERN 1.



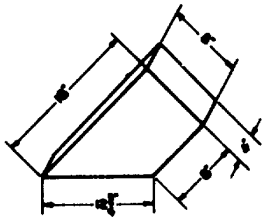
PATTERN 2.



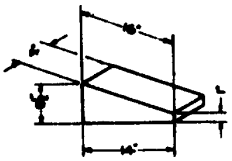
PATTERN 3.



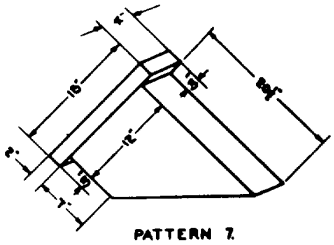
PATTERN 4.



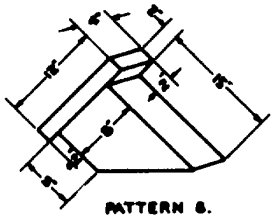
PATTERN 5.



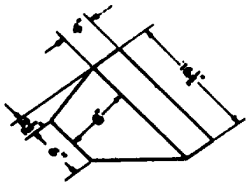
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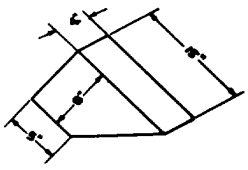
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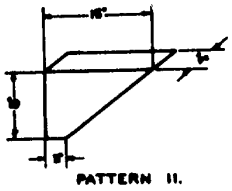
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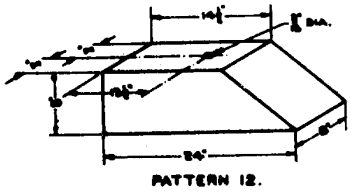
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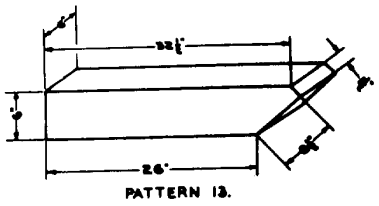
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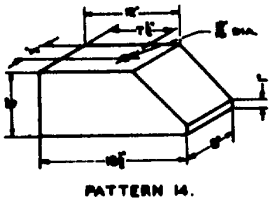
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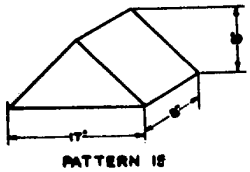
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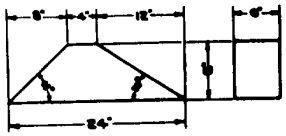
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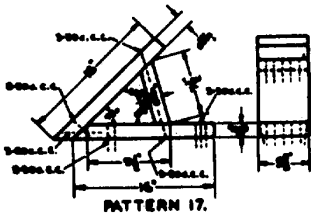
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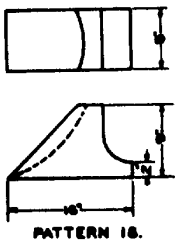
PATTERN 15



PATTERN 16.



PATTERN 17.

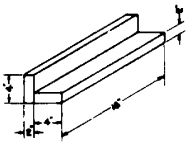


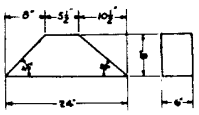
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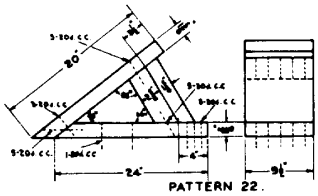
Section No. 6

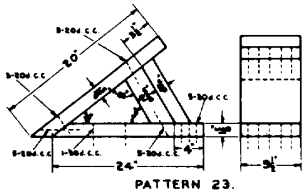
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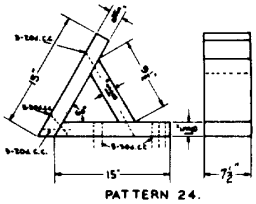

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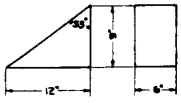

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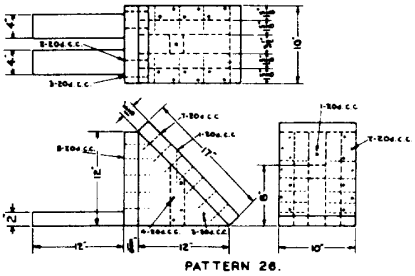

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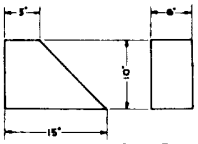

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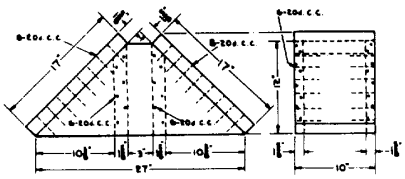

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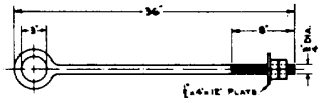

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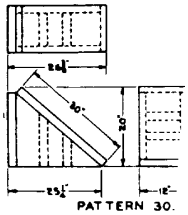

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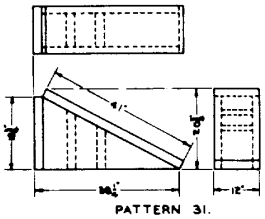

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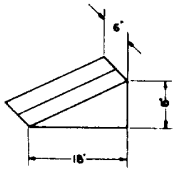

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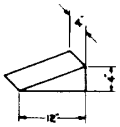

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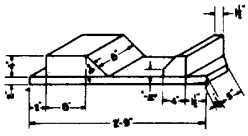

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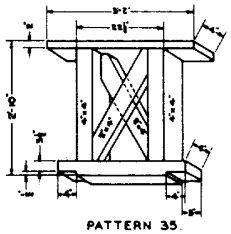

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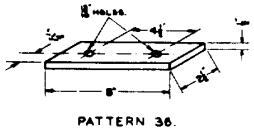

PATTERN 31.


PATTERN 32.


PATTERN 33.

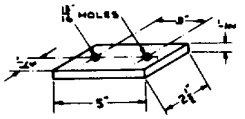

PATTERN 34.


PATTERN 35.

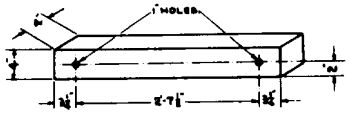

PATTERN 36.

Section No. 6

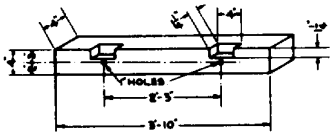
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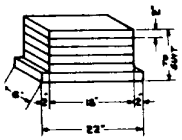
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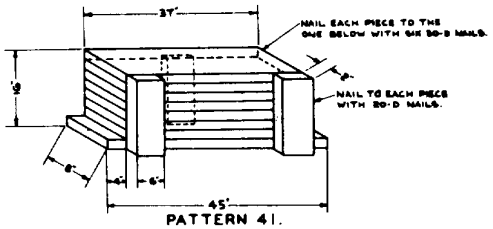
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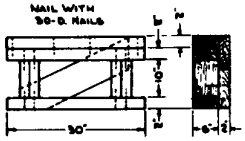
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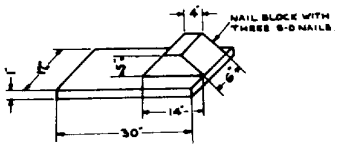
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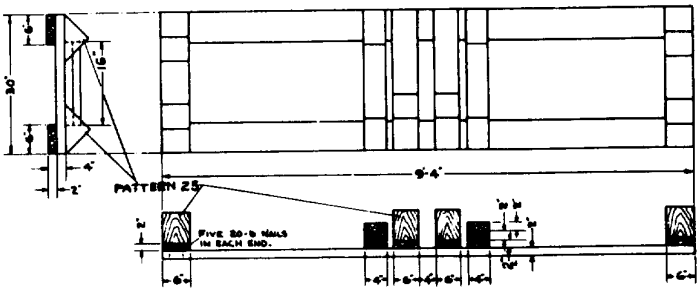
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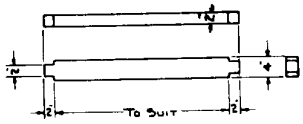
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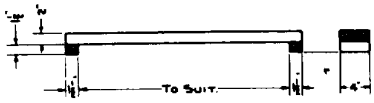
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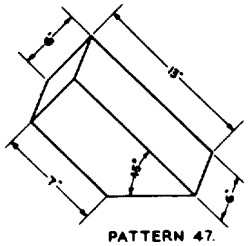
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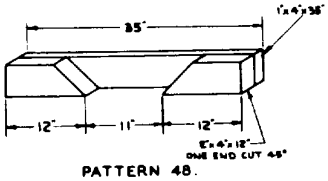
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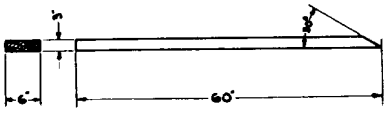
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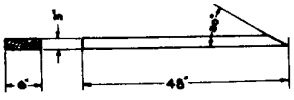
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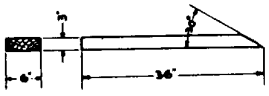
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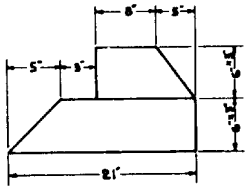
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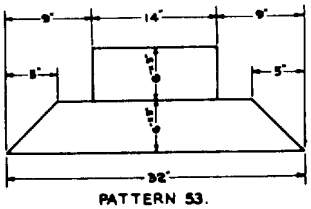
PATTERN 50.



PATTERN 51.



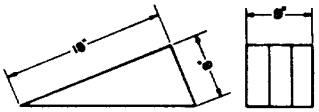
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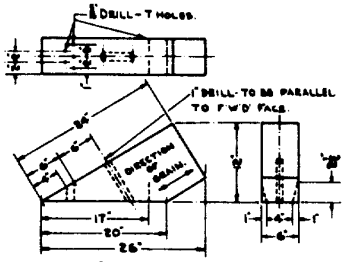
PATTERN 53.

MATERIAL CHART.

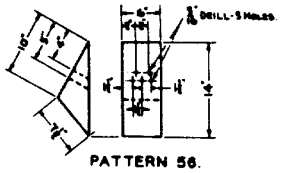
MATERIAL CHART.



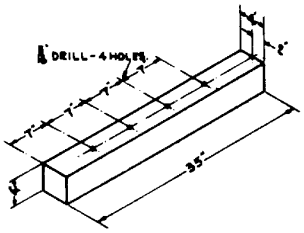
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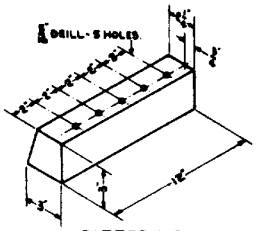
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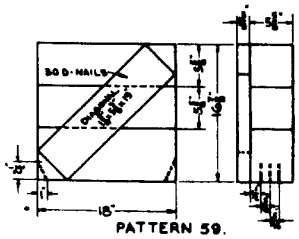
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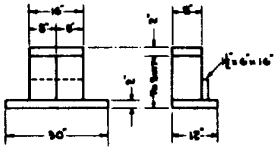
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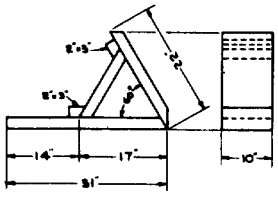
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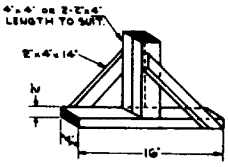
PATTERN 59.



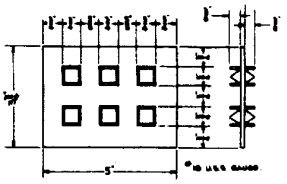
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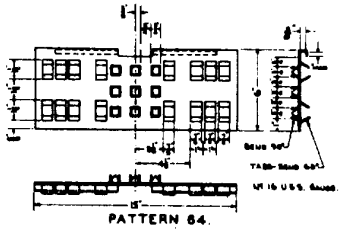
PATTERN 61.



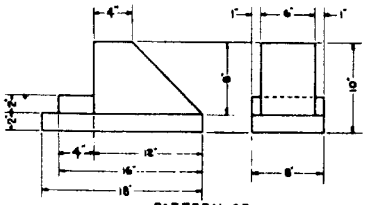
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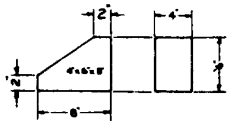
PATTERN 63.



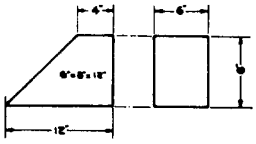
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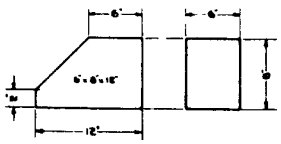
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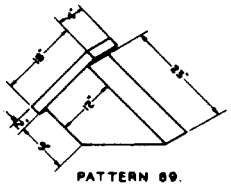
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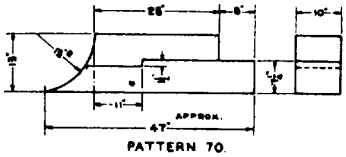
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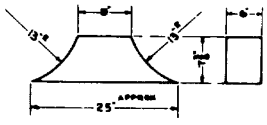
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PATTERN 69.

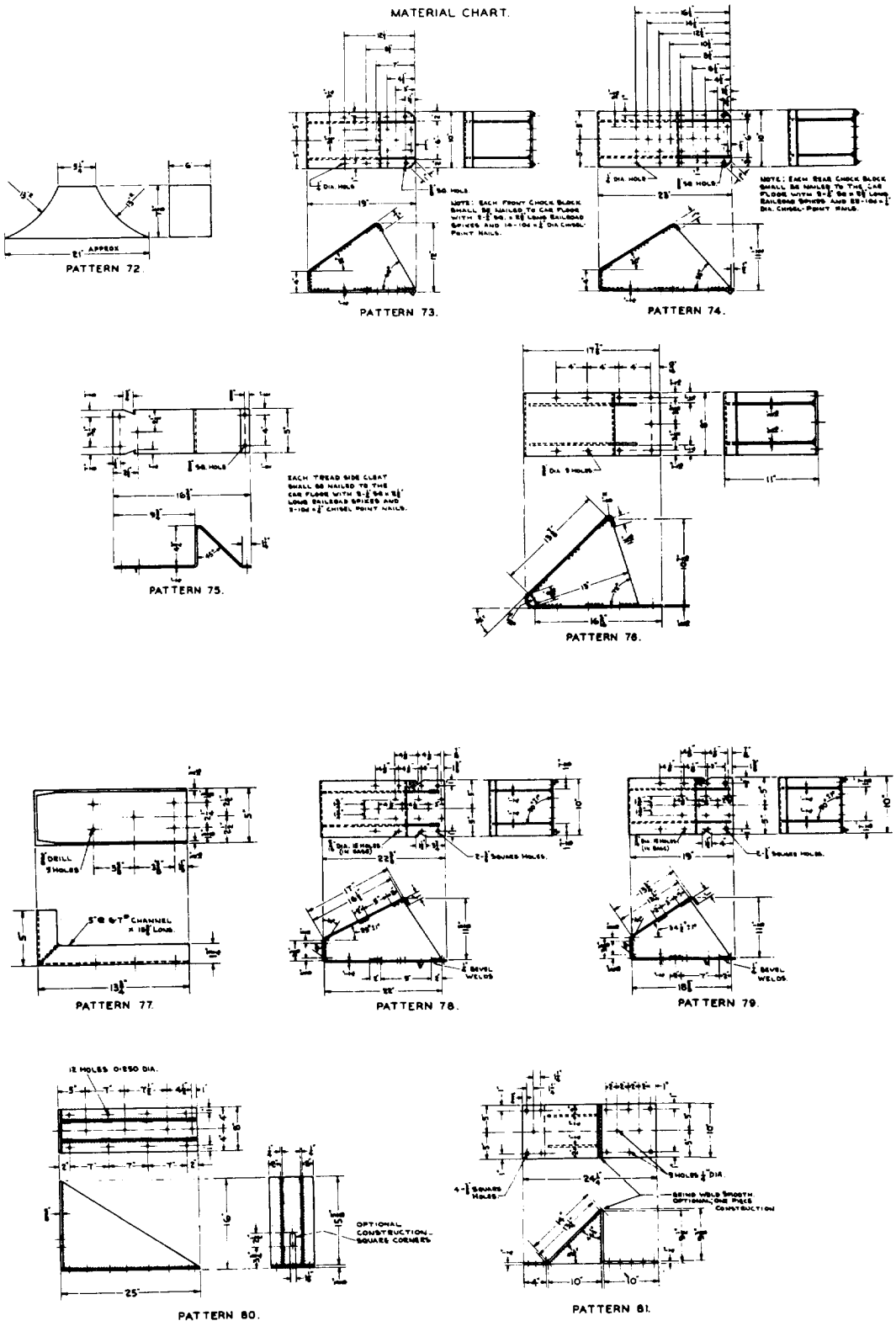


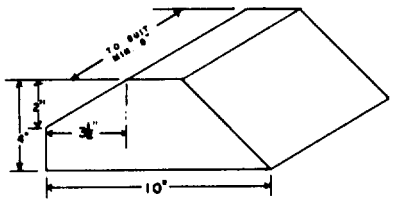
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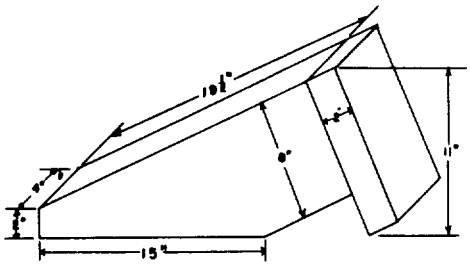
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MATERIAL CHART

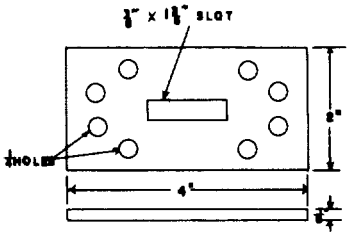




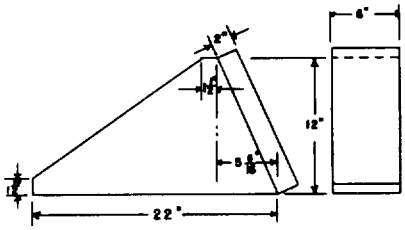
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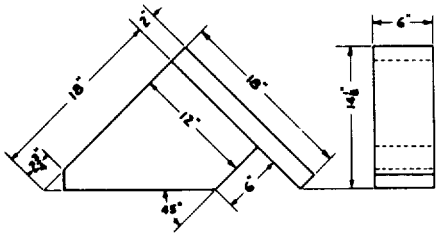
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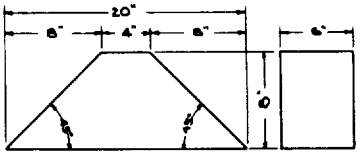
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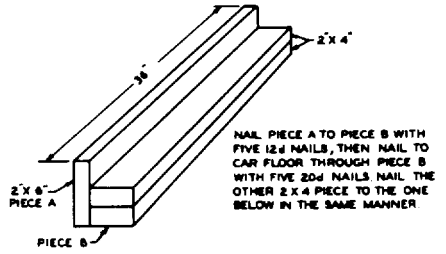
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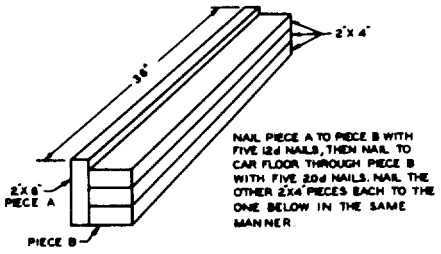
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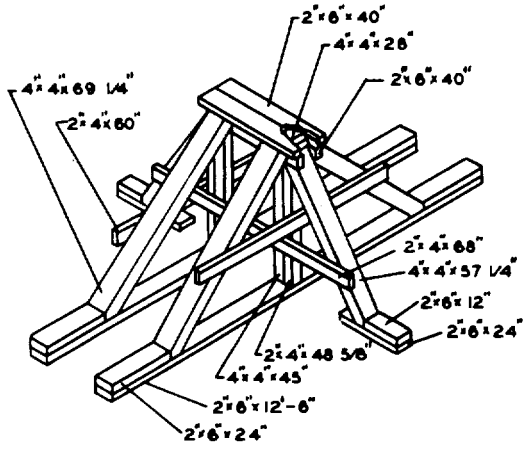
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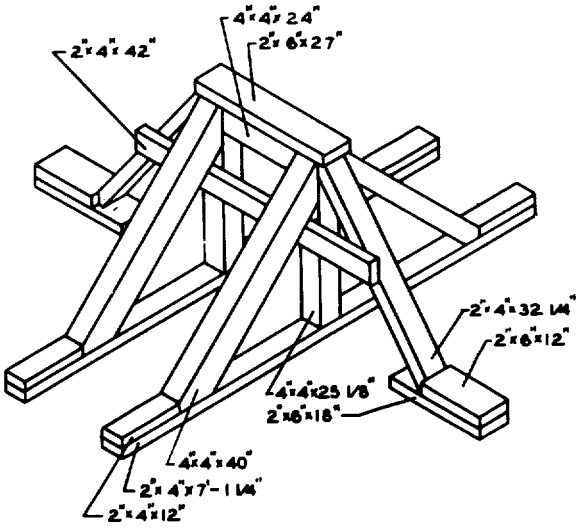
PATTERN 88



PATTERN 89



PATTERN 90



PATTERN 91

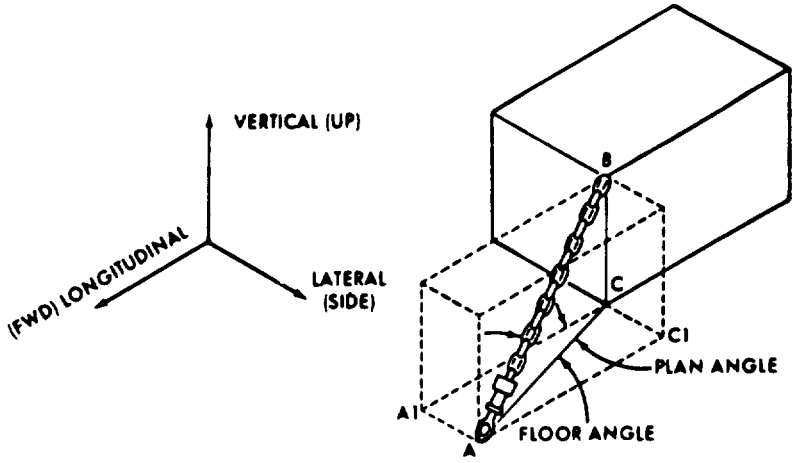
APPENDIX L

VERTICAL, LATERAL, AND LONGITUDINAL ANGLES OF RESTRAINTS

(Extracted from USAF Manual T. O. 1C- 141A-9, *Loading Instructions*)

TAKE OF PERCENTAGES OF VERTICAL. LONGITUDINAL. AND LATERAL RESTRAINT AT VAIIOUS ANGLES

(Angles across the top are those formed between the tiedown device and the cargo floor.)
(Angles down the side are those formed between the tiedown device and the Longitudinal axis of the aircraft.)



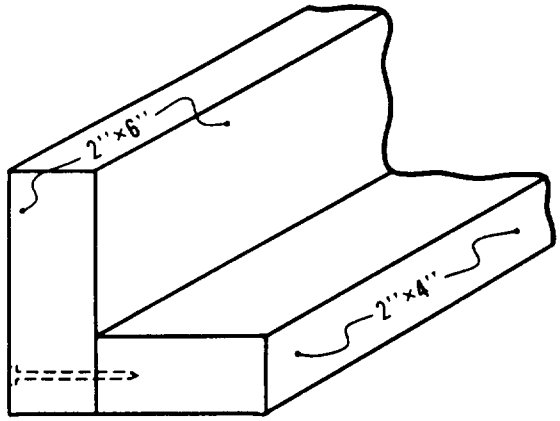
FLOOR ANGLE

PLAN ANGLE	RESTRAINT	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°
	VERTICAL*	8.7	17.4	25.9	34.2	42.3	50.0	57.4	64.3	70.7	76.6	81.9	86.6	90.6	93.9	96.6	98.5	99.6
5°	LONG.	99.2	98.1	96.2	93.6	90.2	86.3	81.6	76.3	70.4	64.0	57.2	49.8	42.1	34.1	25.8	17.3	8.7
	LAT.	8.7	8.6	8.4	8.2	7.9	7.5	7.1	6.7	6.2	5.6	4.9	4.4	3.7	2.9	2.3	1.5	0.8
10°	LONG.	98.1	97.0	95.2	92.6	89.2	85.3	80.7	75.5	69.6	63.3	56.5	49.3	41.7	33.7	25.5	17.1	8.6
	LAT.	17.3	17.1	16.8	16.6	15.8	15.1	14.3	13.3	12.3	11.2	9.9	8.7	7.4	5.9	4.5	3.0	1.5
15°	LONG.	96.2	95.2	93.3	90.8	87.5	83.7	79.1	73.9	68.3	62.1	55.4	48.3	40.9	33.0	25.0	16.8	8.4
	LAT.	25.8	25.5	25.0	24.3	23.5	22.4	21.2	19.8	18.3	16.7	14.9	12.9	10.9	8.9	6.7	4.5	2.3
20°	LONG.	93.6	92.6	90.8	88.4	85.2	81.4	76.9	72.0	66.5	60.4	53.9	47.0	39.8	32.1	24.3	16.6	8.2
	LAT.	34.1	33.7	33.0	32.1	30.9	29.6	28.0	26.2	24.2	21.9	19.6	17.1	14.5	11.7	8.9	5.9	2.9
25°	LONG.	90.2	89.2	87.5	85.2	82.1	78.5	74.2	69.4	64.1	58.3	52.0	45.3	38.3	30.9	23.5	15.8	7.9
	LAT.	42.1	41.7	40.9	39.8	38.3	36.6	34.6	32.4	29.9	27.2	24.3	21.2	17.9	14.5	10.9	7.4	3.7
30°	LONG.	86.3	85.3	83.7	81.4	78.5	74.9**	70.9	66.3	61.2	55.7	49.7	43.3	36.6	29.6	22.4	15.1	7.5
	LAT.	49.3	49.3	48.3	47.0	45.3	43.3	40.9	38.3	35.4	32.2	28.7	25.0	21.2	17.1	12.9	8.7	4.4
35°	LONG.	81.6	80.7	79.1	76.9	74.2	70.9	67.1	62.7	57.9	52.7	47.0	40.9	34.6	28.0	21.2	14.3	7.1
	LAT.	57.2	56.5	55.4	53.9	52.0	49.7	47.0	43.9	40.6	36.9	32.9	28.7	24.3	19.6	14.9	9.9	4.9
40°	LONG.	76.3	75.5	73.9	72.0	69.4	66.3	62.7	58.7	54.2	49.3	43.9	38.3	32.4	26.2	19.8	13.3	6.7
	LAT.	64.0	63.3	62.1	60.4	58.3	55.7	52.7	49.3	45.5	41.3	36.9	32.2	27.2	21.9	16.7	11.2	5.6
45°	LONG.	70.4	69.6	68.3	66.5	64.1	61.2	57.9	54.2	49.9	45.5	40.6	35.4	29.9	24.2	18.3	12.3	6.2
	LAT.	70.4	69.6	68.3	66.5	64.1	61.2	57.9	54.2	49.9	45.5	40.6	35.4	29.9	24.2	18.3	12.3	6.2
50°	LONG.	64.0	63.3	62.1	60.4	58.3	55.7	52.7	49.3	45.5	41.3	36.9	32.2	27.2	21.9	16.7	11.2	5.6
	LAT.	76.3	75.5	73.9	72.0	69.4	66.3	62.7	58.7	54.2	49.3	43.9	38.3	32.4	26.2	19.8	13.3	6.7
55°	LONG.	57.2	56.5	55.4	53.9	52.0	49.7	47.0	43.9	40.6	36.9	32.9	28.7	24.3	19.6	14.9	9.9	4.9
	LAT.	81.6	80.7	79.1	76.9	74.2	70.9	67.1	62.7	57.9	52.7	47.0	40.9	34.6	28.0	21.2	14.3	7.1
60°	LONG.	49.8	49.3	48.3	47.0	45.3	43.3	40.9	38.3	35.4	32.2	28.7	25.0	21.2	17.1	12.9	8.7	4.4
	LAT.	86.3	85.3	83.7	81.4	78.5	74.9	70.9	66.3	61.2	55.7	49.7	43.3	36.6	29.6	22.4	15.1	7.5
65°	LONG.	42.1	41.7	40.9	39.8	38.3	36.6	34.6	32.4	29.9	27.2	24.3	21.2	17.9	14.5	10.9	7.4	3.7
	LAT.	90.2	89.2	87.5	85.2	82.1	78.5	74.2	69.4	64.1	58.3	52.0	45.3	38.3	30.9	23.5	15.8	7.9
70°	LONG.	34.1	33.7	33.0	32.1	30.9	29.6	28.0	26.2	24.2	21.9	19.6	17.1	14.5	11.7	8.9	5.9	2.9
	LAT.	93.6	92.6	90.8	88.4	85.2	81.4	76.9	72.0	66.5	60.4	53.9	47.0	39.8	32.1	24.3	16.6	8.2
75°	LONG.	25.8	25.5	25.0	24.3	23.5	22.4	21.2	19.8	18.3	16.7	14.9	12.9	10.9	8.9	6.7	4.5	2.3
	LAT.	96.2	95.2	93.3	90.8	87.5	83.7	79.1	73.9	68.3	62.1	55.4	48.3	40.9	33.0	25.0	16.8	8.4
80°	LONG.	17.3	17.1	16.8	16.6	15.8	15.1	14.3	13.3	12.3	11.2	9.9	8.7	7.4	5.9	4.5	3.0	1.5
	LAT.	98.1	97.0	95.2	92.6	89.2	85.3	80.7	75.5	69.6	63.3	56.5	49.3	41.7	33.7	25.5	17.1	8.6
85°	LONG.	8.7	8.6	8.4	8.2	7.9	7.5	7.1	6.7	6.2	5.6	4.9	4.4	3.7	2.9	2.3	1.5	0.8
	LAT.	99.2	98.1	96.2	93.6	90.2	86.3	81.6	76.3	70.4	64.0	57.2	49.8	42.1	34.1	25.8	17.3	8.7

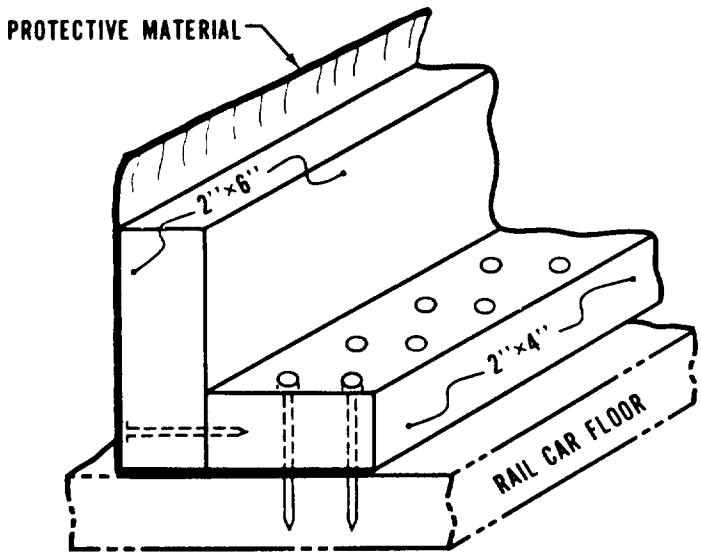
* VERTICAL RESTRAINT IS RELATED ONLY TO FLOOR ANGLE.
** THE TONED AREA INDICATES THE BEST COMPROMISE POSITION – BOTH PLAN AND FLOOR ANGLE OF 30°.

APPENDIX M

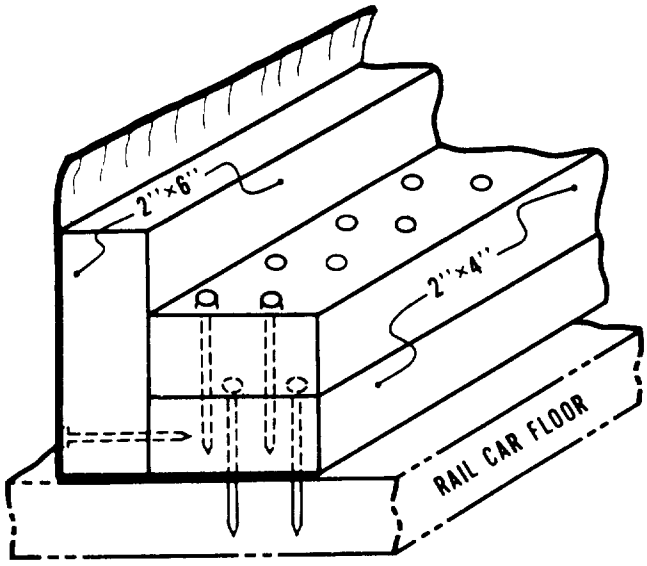
PROCEDURES FOR PREPARING SIDE BLOCKING



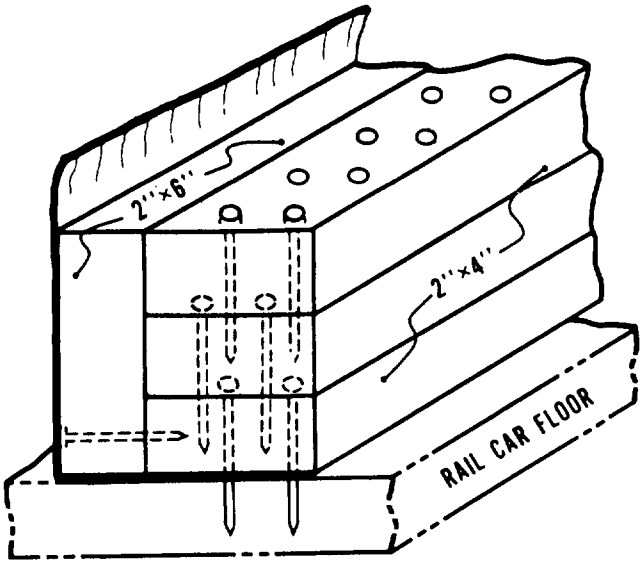
STEP 1



STEP 2



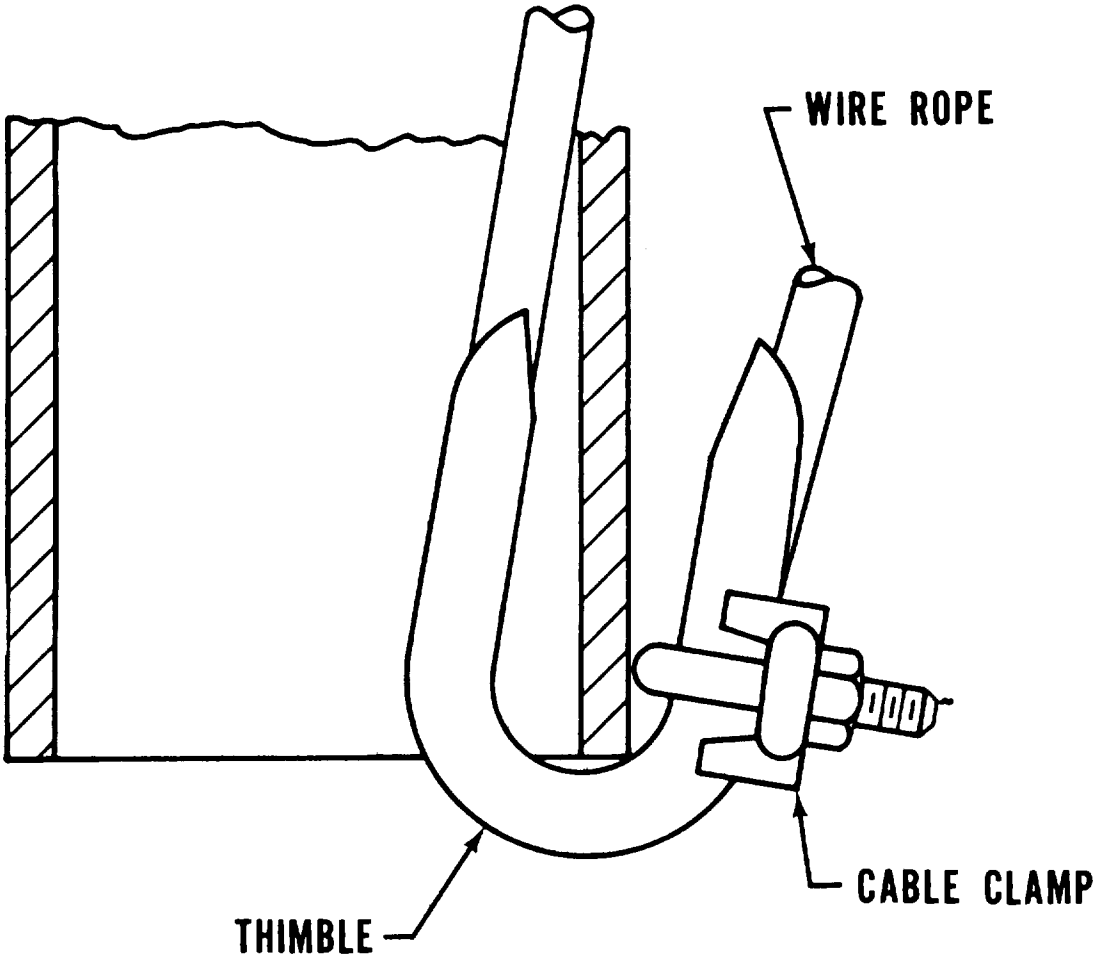
STEP 3



STEP 4

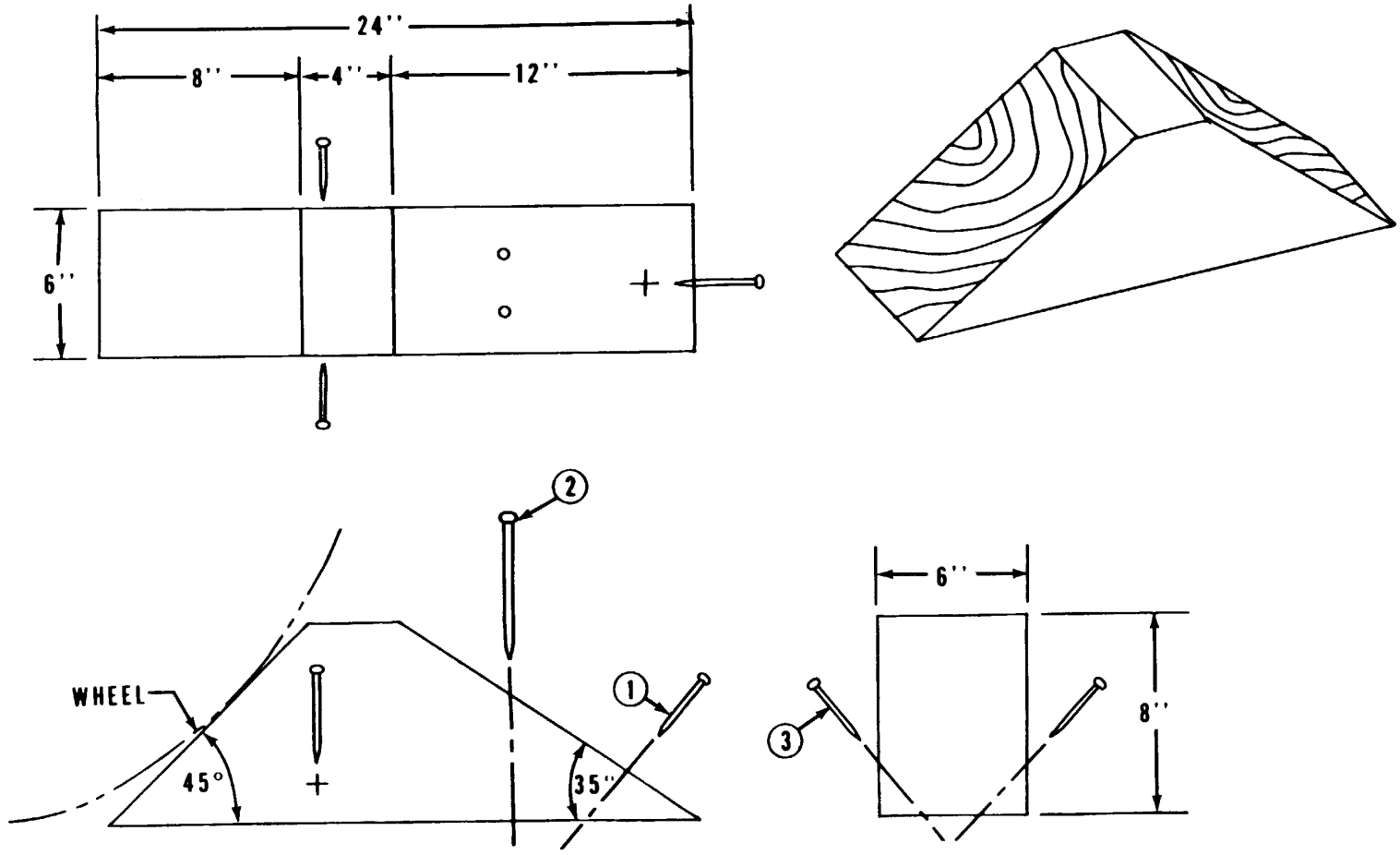
APPENDIX N

PROCEDURES FOR APPLYING THIMBLE TO STAKE POCKET


WIRE ROPE
CABLE CLAMP
THIMBLE

APPENDIX O

APPLICATION OF CHOCK BLOCK



CHOCK BLOCK

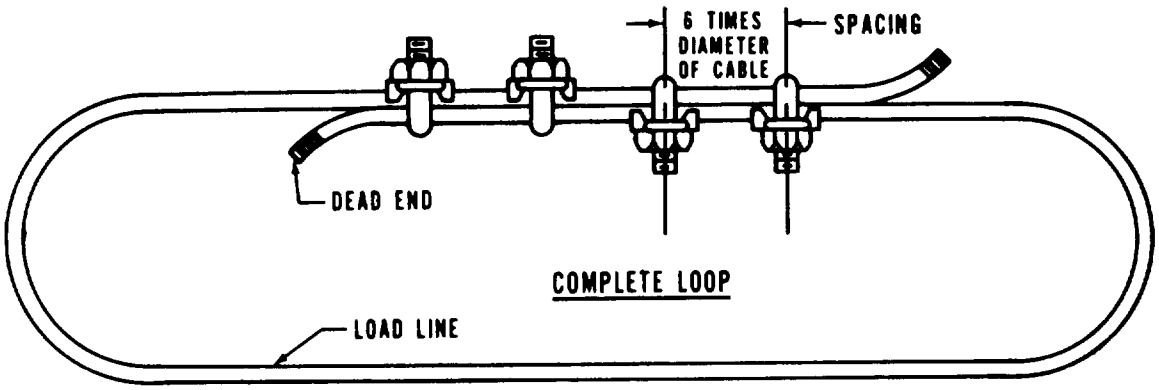
(1) DIAGONALLY DRIVEN FOR CHOCK PLACEMENT

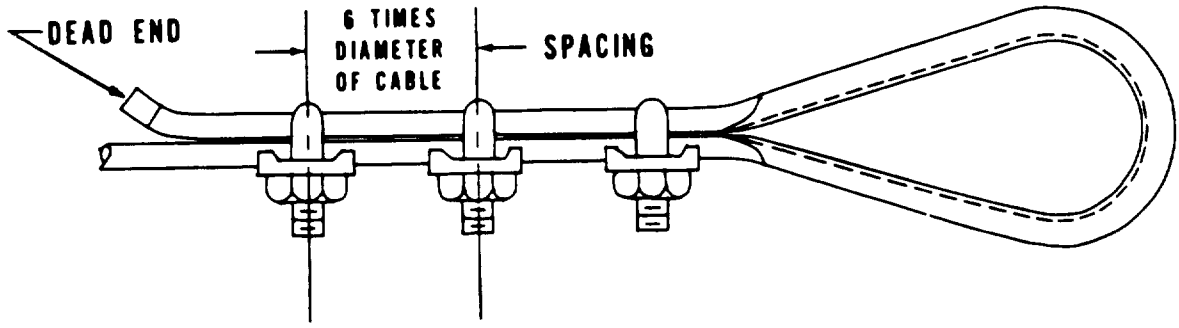
(2) VERTICALLY DRIVEN FOR LATERAL RESISTANCE

(3) TOENAILED THESE NAILS ALSO PROVIDE SOME LATERAL RESISTANCE TOWARDS LONGITUDINAL FORCES

APPENDIX P

APPLICATION OF CABLE CLIPS

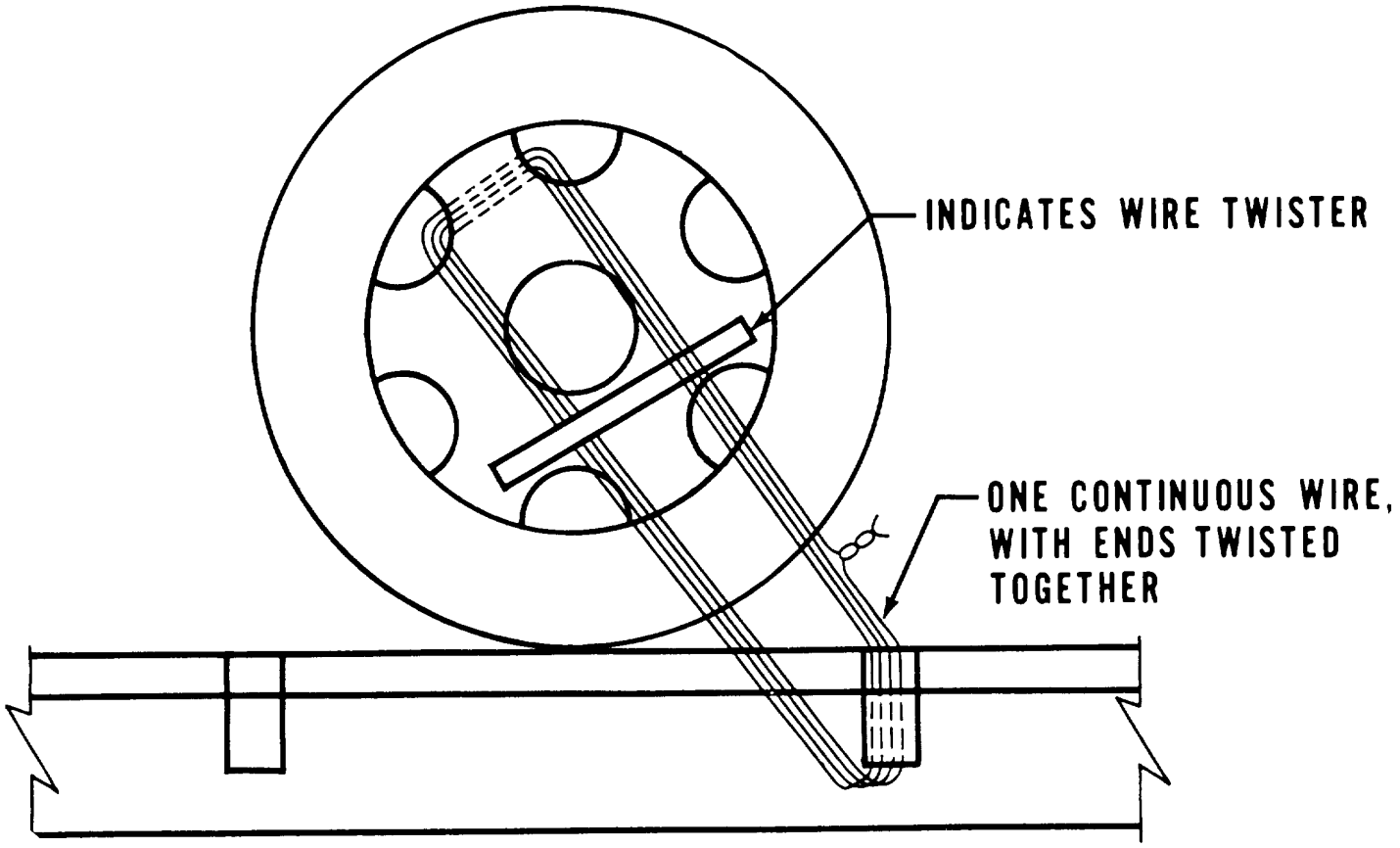




SINGLE STRAND

APPENDIX Q

PROCEDURES FOR APPLYING WHEEL TIES

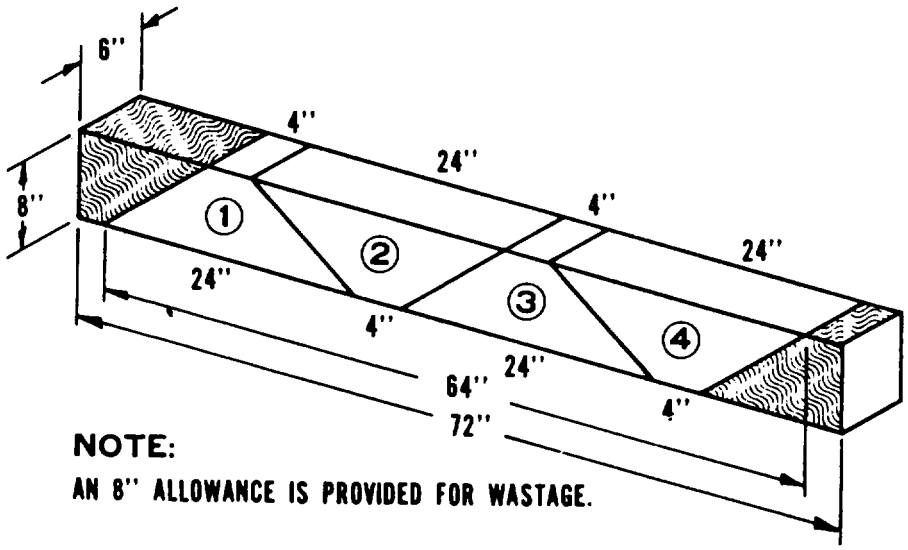


WHEEL SECUREMENT

AN EIGHT-STRAND INSTALLATION
OF NO. 8 GAGE BLACK ANNEALED WIRE

APPENDIX R

PROCEDURES FOR CUTTING CHOCK BLOCK NO. 16



NOTE:

AN 8" ALLOWANCE IS PROVIDED FOR WASTAGE.

APPENDIX S
PROCEDURES FOR PROCESSING LOADING DRAWINGS AND SPECIFICATIONS

(The following information is extracted from AR 55-355 Military Traffic Management Regulation.)

1. *Responsibility*. The Commander, MTMC as the single manager for land transportation, is responsible for the review and processing of military loading drawings and documents as well as technical traffic matters involving the movement of Department of Defense material on open top railcars. This function has been delegated to the Commander, Military Traffic Management Command Transportation Engineering Agency (MTMCTEA) who acts as the single point of contact between military services and civilian regulatory agencies on loading matters. Department of Defense agencies desiring reviews and processing of loading drawings should forward them to the Commander, MTMCTEA, ATTN: MTT-TRC, PO Box 6276, Newport News, Virginia 23606.

2. *Research and Development (R&D)*. When practicable, shippers should develop appropriate loading procedures during research and development (R&D) stages, and furnish pertinent data in according with paragraph 213009b, AR 55-355. Such advance information will be reviewed by MTMCTEA for adequacy and will help expedite action during the subsequent test loading phase.

3. *Drawings, Specifications, and Photographs*. In order to have loading figures included in the Open Top Carloading Manual the following must be submitted to MTMCTEA:

a. Twelve copies of a drawing depicting the loading method. The drawing must clearly show the plan, end, and side views of the load with all items of securement identified by capital letters. The letter "A" will be used to identify the brake wheel clearance. The letter "I" will not be used due to its similarity to the numeral "1." The vertical dimension of the drawing will be 17 inches and the horizontal dimension, 22 inches. A title box will not be shown on the drawing.

b. Twenty-two sets of specifications, which must list the items of securement by the capital letters shown on the drawing. Beside each capital letter, the specification will include the required number of pieces, their description, and the manner in which they are secured to the car, other items of securement, or the lading. The vertical dimension of the specifications will be 101/2 inches and the horizontal dimension, 8 inches. Reference to figures in the Open Top Carloading Manual will provide further guidance as to the required format.

c. Two sets of photographs, 8 x 10 inches, showing each side and each end of the load, as depicted by the drawings and specifications.

4. *Military Loading Drawings for Inert Missile Components or Ground Support Equipment Not requiring Figures in the Open Top Carloading Manual*. Loading methods for inert missile components or ground support equipment that require approval of AAR, but will result in military loading drawings in lieu of loading figures in the Open Top Carloading Manual, require submittal of the following:

a. One master tracing and 11 print copies of a size compatible to the logistic requirements of the military service but not smaller than 17 x 22 inches, depicting the load. An approval box 2 x 3 inches, will be shown in the upper right corner within the border of the drawing as follows:

b. Separate specifications and photographs are not required; however, the Bill of Material, Material Specifications, General Notes, and Key Numbers must be included in the drawing. The items of securement may be identified by either capital letters or numerals, which must be listed under the Key Numbers. The General Notes must make reference to applicable rules contained in the Association of American Railroads "General Rules Governing the Loading of Commodities on Open Top Cars." Also, General Notes may include other pertinent information, such as dimensions, weight, methods of tensioning cable, tiedown angles, and car lengths and widths. Material specifications must meet the requirements outlined in the general rules of the Open Top Carloading Manual.

5. *Military Loading Drawings for Explosives and Other Dangerous Articles*. Loading methods, for explosives and other hazardous materials, which will require approval of both the Bureau of Explosives and Open Top Carloading Committee, AAR, will require submittal of the following:

a. One master tracing and two print copies not smaller than 17 x 22 inches. An approval box 2 x 3 inches will be shown in the upper right-
hand corner within the border of the drawing as follows:

APPROVED BY
BUREAU OF EXPLOSIVES LETTER
SIGNED _____
SUPERVISOR MILITARY & INTERMODAL SERVICES
DATE _____
CHICAGO, ILLINOIS 60605

b. The provisions of 4b apply except that additional information that may be necessary to comply with ICC Regulations for Transportation of Explosives and Other Dangerous Articles for either rail or highway movement, as appropriate, will be referred to in the General Notes in lieu of applicable rules of the Open Top Carloading Manual as indicated in referenced paragraph.

APPENDIX T

TEST LOADINGS AND TEST SHIPMENTS

(The following information is extracted from AR 55-355 Military Traffic Management Regulations.)

T-1. Test Loadings and Test Shipments.
Purpose and Scope. This paragraph contains procedures concerning test shipments and test loadings when such tests are required by the military service owning the material, carrier associations, and/or federal regulatory bodies. These tests are conducted to determine the adequacy of shipping containers, packages, loading arrangements, or securement provided by blocking, bracing, and tiedown methods on carrier equipment and not specifically provided for in carriers' classifications, tariffs, loading rules or other authoritative publications. These are transportation tests conducted to develop new or revised loading figures, rules, and packaging specifications. They do not involve research and development or engineering evaluation tests required in the development of an item of materiel. Transportation impact tests, when required, may be conducted simultaneously with other forms of testing, provided they are conducted under the supervision of the test activity, to satisfy requirements of the military service, carrier association or regulatory body concerned and in accordance with the procedural requirements outlined in appendix D.

T-2. Testing Procedures (Rail Impact Tests.
(Rail impact tests, performed for the purpose of obtaining approval of rail loading methods, will be conducted under the supervision of a test activity to satisfy requirements of the carrier association or regulatory body concerned and in accordance with the AAR procedural requirements.

T-3. Prior Approval of Commander MTMCTEA
Military activities desiring to conduct test loadings or test shipments will furnish all pertinent information of the proposed tests, including the proposed site of the test, tentative dates, specifications, and drawings and/or photographs, through appropriate channels to the Commander, MTMCTEA, for prior approval, at least 30 days in advance of the tentative dates of the proposed tests.

T-4. Coordination and Notice
Upon receipt of information regarding a proposed test the Commander, MTMCTEA, will determine the propriety of conducting the test. If it is considered that the test should be conducted, the Commander, MTMCTEA, will effect coordination with the Loading Rules Committee of the AAR, other carriers either individually or through their associations, and interested military agencies to make the necessary arrangements for participation in the test and to determine who will attend. The Commander, MTMCTEA, will inform all military departments of the details.

T-5. Conclusions and Recommendations
Based upon the conclusions and recommendations resulting from the tests, the Commander, MTMCTEA, will, on behalf of the sponsor of the test, negotiate with the AAR for formulation of new or revised loading rules and regulations to reflect the loading requirements developed by the tests.

T-6. Proposed Changes to Loading Rules
Proposed changes, exceptions or additions to existing loading rules, plans and specifications will be sent to the Commander, MTMCTEA, for coordination with all military departments.

APPENDIX U

PIGGYBACK SERVICE

PURPOSE. This section governs the use of piggyback service.

1. *Piggyback service or trailer-on-flatcar service (TOFC)*. Service conducted under the seven plans described below. In most instances, trailers moving in piggyback service are transported in scheduled fast freight trains. Unlike regular rail freight that is readily accepted for interchange by all railroads within the United States, piggyback freight is limited to movement under working agreements between specific rail systems. Within the last few years, however, the arrangements have been expanded to include service between many widely-separated areas. Several types of piggyback flatcars have been adopted by the railroads, some of which require the use of loading ramps while others can be loaded at truck-bed level.

a. Plan I - Motor common carrier trailers. Rail carriage of motor common carrier trailers at a flat charge per trailer based on weight and distance regardless of the commodity. The motor carrier solicits and bills the freight at truck rates, takes trailers to and picks them up from a railroad piggyback terminal, and performs any required road haul before or after the rail movement. The governing motor tariffs specify that motor carriers may substitute piggyback service for highway line-haul movement at their convenience.

b. Plan II - Railroad-ouwned trailers. Rail carriers perform the complete transaction of handling freight in trailers or demountable trailer bodies furnished by the railroads, from shippers dock, platform or facility at origin to consignee's dock, platform or facility at destination.

c. Plan II 1/4 Railroad-owned trailers. Rail carriers carry their own trailers as under Plan II, and provide for either pick-up or delivery service, but not both.

d. Plan II 1/2 Railroad-owned trailers. Rail carriers handle freight, in trailers or demountable trailer bodies furnished by the railroad, from carrier's origin ramp location to carrier's destination ramp location. Terminal services at origin and destination must be performed by the consignor and consignee, respectively, or their agent at their expense.

e. Plan III Shipper-owned trailers and railroad owned cars. Carriers handle shipper-owned trailers from carrier's origin ramp location to carrier's destination ramp location. Terminal services at origin and destination must be performed by the consignor, consignee or their agent at their expense.

f. Plan IV Shipper-owned trailers and cars. Line-haul transportation of trailers on flatcars, both of which are owned or leased by the shipper, from carrier's origin ramp location to carrier's destination ramp location. Terminal service at origin and destination must be performed by the consignor, consignee or their agent at their expense.

g. Plan V Railroad or motor carrier trailers joint rates. Joint motor-rail or rail-motor transportation with trailers furnished by either motor carrier or rail carrier. Carriers perform the complete transaction of handling freight in trailers from shipper's dock, platform or facility at origin, to consignee's dock, platform or facility at destination.

2. *Routing of Piggyback Traffic*. Area commanders will route piggyback traffic in accordance with the procedures prescribed below.

a. Plan I. Motor carriers will be allowed free choice in determining whether intercity movements will be made by highway or rail, except where use of piggyback service is precluded for valid reasons such as sensitivity of shipments to shock or, in the case of ammunition and explosives, the absence of specific piggyback operation. When the use of piggyback service is precluded, area commanders will remind shippers to annotate bills of lading with a statement that piggyback service is not to be used.

b. Plan II. This plan will be given full consideration as a competitive method of transportation except when its use is precluded by reasons as outlined for plan I.

c. Plan II 1/4. This plan should be used when advantageous, provided the origin or destination installation has equipment to handle.

d. Plan II 1/2. This plan should be used when advantageous, provided the origin and destination installations have the equipment to handle.

e. Plan III. Approval for use of this plan must be obtained from HQ MTMC. When Plan III provides definite service advantages or is more economical

than regular line-haul service despite additional terminal or equipment cost, substantiating data for each such case will be forwarded for handling to Commander, MTMC, ATTN: MTMC-INO, with the appropriate military service at department level. This requirement does not apply to DOD trailers which:

(1) Are used in roll-on/roll-off service.

(2) By and in themselves, constitute the freight shipped.

f. Plan IV. Approval for use of this plan must be obtained from HQ MTMC. When Plan IV provides definite service advantages and its use appears desirable, substantiating data for each such case will be forwarded to Commander, MTMC, ATTN: MTMC-INO, for handling with the appropriate military service at the departmental level.

g. Plan V. This plan will be given full consideration as a competitive method of transportation, except when its use is precluded by reasons as outlined for Plan I.

h. Ammunition and explosives. Consideration of movement of ammunition and explosives via piggyback service should be included in the cost and service evaluation for routing purposes. This applies particularly to traffic to and from installations which have restrictions against shipment and receipt of these commodities in rail cars. The requirements of the publications listed below must be observed.

3. *References*.

a. Department of Transportation (DOT) regulations (49 CFR 174 et seq.) published as Agent R. M. Graziano's Tariff, subpart A Loading, Unloading, Placarding and Handling Cars and Loading Packages into Cars; paragraph 174.525(C)(3) Certified Car and Car Certificates; paragraph 174.526(C) (1), (2), (3), and (4) Class A and B Explosives, when appropriate; paragraph 174.529(C) Class B Explosives; and paragraph 174.530(B) Class C Explosives.

b. US Army Materiel Command Drawing 19-48-D-ORDJU-2440 entitles "Special Bulkhead Braces for Open Top and Closed Vans and Flat-bed Trailers Hauling Ammunition and/or components, Explosives and Other Dangerous Articles via Traileron-Flat-Car (TOFC)" prescribes approved methods of modifying vehicles to meet military requirements in this area.

c. Bureau of explosives Pamphlet No. 6C entitled "Illustrating Methods for Loading and Bracing Trailers and Less Than Trailer Shipments of Explosives and Other Dangerous Articles via Trailer-on-Flat-Car (TOFC) or Container-on-Flat-Car (COFC)."

APPENDIX V
COMPUTERIZED MOVEMENT PLANNING AND STATUS SYSTEM (COMPASS) RAIL BLOCKING AND BRACING MATERIAL DATA

(The following information is extracted from FORSCOM Pamphlet No. 55-2 Transportation and Travel Rail Blocking and Bracing Material Data.)

COMPUTERIZED MOVEMENT PLANNING AND STATUS SYSTEM (COMPASS)
RAIL BLOCKING AND BRACING MATERIAL DETAIL LIST

PREPARED FOR: BBM DATA EXAMPLE
APPLIES TO

VEHICLE LIN	DESCRIPTION	QTY	EMPTY WT(LB)	AAR REFERENCE	OTHER REF	DA REFERENCE
D06108	Car, Armored, Light 4x4	1	13,220	SEC 6, FIG 57	VAR	NONE

ENTRY NO	MATERIAL DESCRIPTION, AAR RULES AND REMARKS	QUANTITY (Each)	LENGTH (IN) (Each)	WEIGHT(LB) (Each)
01	Rule No. 2, Sec. 1, AAR			
02	Sketch No. 1			
03	Lumber, 2 x 6 In.	8	29	
04	Nail, 20D	40		
05	Block Pat No. 16, Sec. 6	8		
06	Lumber, 6 x 8 In.	2	72	
07	Nail, 40D	40		
08	Cushioning Material, Paper	4		2
09	Cushioning Material, Burlap (Substitute Item for Entry No. 08)	4		2
10	Block Pat No. 88, Sec. 6 (In Lieu of Side Block)	4		
11	Lumber, 2x6 In.	4	36	
12	Lumber, 2 x 4 In.	8	36	
13	Nail, 12D	20		
14	Nail, 20D	40		
15	Wire Rope, IWRC 1/2 In. (NSN 4010-00-975-2522)	4	132	
16	Clamp, Wire Rope 1/2 In. (NSN 4030-00-243-4440)	20		
17	Thimble, Wire Rope 1/2 In. (NSN 4030-00-956-6138)	4		

APPENDIX W
DETAILED BILL OF MATERIAL

(The following information is extracted from FORSCOM Pamphlet No. 55-2 *Transportation and Travel Rail Blocking and Bracing Material Data*)

BBM DETAIL LIST **AAR SEC. 6 - FIG. 57**

ENTRY NO	MATERIAL DESCRIPTION, AAR RULES AND REMARKS	ITEM	NO OF PCS	DESCRIPTION
01	RULES NO. 2, SEC. 1, AAR	A		BRAKE WHEEL CLEARANCE
02	SKETCHNO. 1	B		
03	LUMBER, 2 X 6 IN.	B	8	BLOCKS, SKETCH 1.
04	NAIL, 20D	B	40	NAIL TO FLOOR WITH FIVE 20 D NAILS
05	BLOCK PAT NO. 16, SEC. 6	C	8	CHOCK BLOCKS, PATTERN 16.
06	LUMBER, 6 X 8 IN. (Reference APP R)	C	2	PATTERN 16.
07	NAIL, 40D	C	40	NAIL HEEL OF BLOCKS TO ITEM B WITH THREE 40D NAILS. TOE-NAIL...WITH TWO 40D NAILS ON EACH SIDE.
08	CUSHIONING MATERIAL, PAPER	D	4	SUITABLE PROTECTIVE MATERIAL SUCH AS WATERPROOF PAPER OR BURLAP, ETC.
09	CUSHIONING MATERIAL, BURLAP (Substitute Item for Entry 8)	D	4	SUITABLE PROTECTIVE MATERIAL SUCH AS WATERPROOF PAPER OR BURLAP, ETC.
10	BLOCK PAT NO. 88, SEC. 6	E	4	
11	LUMBER, 2 X 6 In.	E	4	SIDE BLOCKING.
12	LUMBER, 2 X 4 In.	E	8	SIDE BLOCKING.
13	NAIL, 12D	E	20	SIDE BLOCKING.
14	NAIL, 20D	E	40	SIDE BLOCKING.
15	WIRE ROPE, 1/2-IN., 6 X 19 IWRC (NSN 4010-00-975-2532)	F	4	
16	CLAMP, 1/2-IN. (NSN 4030-00-243-4440)	F	20	SECURE THIMBLES TO WIRE ROPE WITH ONE CABLE CLIP.
17	THIMBLE, 1/2-IN. (NSN 4030-00-956-6138)	F	4	USE PROTECTIVE THIMBLES AT BOTTOM OF EACH STAKE POCKET.

APPENDIX X
RAIL BLOCKING AND BRACING MATERIAL SUMMARY

(The following information is extracted from FORSCOM Pamphlet No. 55-2 *Transportation and Travel Rail Blocking and Bracing Material Data.*)

COMPUTERIZED MOVEMENT PLANNING AND STATUS SYSTEM (COMPASS)
RAIL BLOCKING AND BRACING MATERIAL SUMMARY

MATERIAL DESCRIPTION	TOTAL QUANTITY	TOTAL LINEAR FT	TOTAL BOARD FT	TOTAL WEIGHT(LB)	(COMPUTED BY PURCHASING AGENT) COST/ BD FT	COST/ LB	COST/ ITEM	SUBTOTAL COST
BLOCK PAT NO. 16, SEC6	8							
BLOCK PAT NO. 88, SEC6	4							
SKETCH NO. 1								
LUMBER, 2 X 4IN.	8		16					
LUMBER, 2 X 6IN.	12		32					
LUMBER, 6 X 8IN.	2		48					
NAIL, 12D	20			1				
NAIL, 20D	80			3				
NAIL, 40D	40			3				
CUSHIONING MATERIAL, PAPER	4			2				
RULE NO. 2, SEC 1, AAR								
WIRE ROPE, 6 X 19, IWRC, 1/2-IN	4	44						
CLAMPS, 1/2-IN.	20							
THIMBLES, 1/2-IN.	4							

APPENDIX Y
PROCEDURES FOR SECURING UNUSED TIEDOWN DEVICES-140-TON DODX FLATCAR

(The following information is extracted from TM 55-2200-058-14 *Transportability Guidance Transport of Cargo on the Railway Car, Flat 140-Ton-Capacity.*)

Y-1. Unused chains, shackles, and rings must be secured to the flatcar so that they will not become free, endangering material or persons along the railroad right-of-way.

Y-2. Unused chains, shackles, and rings may be secured by using the method described below (for securing unused chains after transporting two M1 tanks facing Position No. 44) or a similar method.

a. Locate chain anchors (fig Y-1) at A6, A1, A2, B1, B2, B3, C1, C2, C3, D6, D1, and D2.

b. Stretch chains lengthwise on car deck between the channels.

c. Form two crossover chains by moving the load-bearing hook end of chains in chain anchors A6 and D6 across the flatcar deck. Secure one ring and two shackles to the crossover chains by sliding the ring onto chains and by attaching the shackles to chains with shackle pins. Attach the grab hook on the chain of chain anchor in A6 to the chain of chain anchor in D6; attach the grab hook on the chain of chain anchor in D6 to chain of chain anchor in A6. Insert the open hooks and any excess chain into the channels on the flatcar.

d. Pull the open hook at the end of each chain of chain anchors in A1, A2, B1, B2, B3, C1, C2, C3,D1, and D2 over crossover chains A6 and D6, then insert the hook and any excess chain into one of the channels on the flatcar.

e. Repeat above procedures for unused chains on the opposite end of the flatcar by using chains of chain anchors in A39 and D39 to form crossover chains. Attach four shackles to crossover chains in A39 and D39.

f. Secure unused chains in the center section of the flatcar in this same manner: use the crossover chains of chain anchors in A14 and D14 to secure chains attached to chain anchors in A19-3/5, A20-3/5, B18-315, B21, B22, C18-3/5, C21, C22, D19-3/5, and D20-3/5; use the crossover chains of chain anchors in A31 and D31 to secure chains attached to chain anchors in A23, A24-3/5, B23, B24-315, B26, C23, C24-3/5, C26, D23, and D24-3/5.

g. Secure one ring and two shackles to crossover chains of chain anchors in A14 and D14. Attach four shackles to crossover chains in A31 and D31.

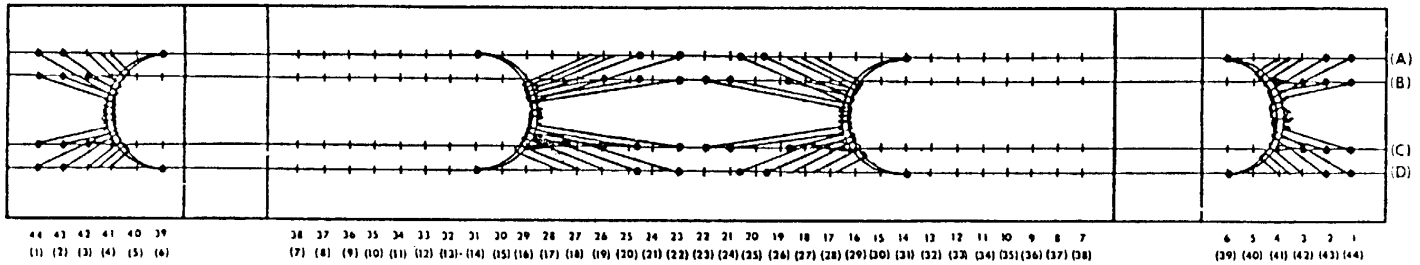


Figure Y-1 Diagram for applying the necklace method to secure tiedown chains and hardware of 140-ton DODX flatcar without load.

APPENDIX Z

STANAG 2152

NATO STANDARDIZATION AGREEMENT (STANAG)

LOADING RAMPS

Annexes : A. Materials and Tools Required to Erect a Ramp
B. Assembly of the Ramp
C. Use or the Ramp
D. Mobile Loading Ramps
E. Loading and Unloading by Bridging Equipment

Related documents: None

AIM

1. The aim of this agreement is to standardize means of the method for erecting ramps with railway sleepers for loading and unloading of all types of military vehicles onto and from flat wagons - to list the various mobile loading ramps in service and to describe the loading and unloading process by means of bridging equipment.

AGREEMENT

2. Participating nations agree upon the following method for erecting loading ramps with railway sleepers and using them to load and unload all types of military vehicles onto and from flat wagons.

DETAILS OF THE AGREEMENT

3. a. The RM (1) ramp enables all types of wheeled and tracked military vehicles to be loaded onto and unloaded from flat wagons.

b. It consists of an assembly of a number of wooden sleepers (see Annex A). Its assembly can be carried out, under certain circumstances, in less than one hour (see Annex B, which includes drawings 1-15).

c. The use of the ramp and the precautions to be taken during loading and unloading operations are described in Annex C.

Note (1): RM = initials of the inventor

4. Conditions of Employment and Choice of Site

a. Because the RU ramp can be used under a variety of conditions, it oilers complete freedom as regards the choice of sites for loading and unloading; it can be used:

(1) In railway stations which have no static facilities.

(2) In railway stations with inadequate static facilities for heavy loads.

(3) On the open track when it is not possible to unload in a railway station.

(4) To increase the effective handling capacity of a railway station to a maximum compatible with the operation of the railway system.

b. It is recommended that the ramp be erected on a site where the rail is flush with a hard surface (cobbledgoods yard, near a level crossing etc.). If this is impossible, an access platform must be constructed to enable the vehicles to take up s position in line with the axis of the wagon and avoid damage to the rails or vehicles. This platform consists of wooden sleepers laid parallel to the rails; it should be at least twice as long as the vehicles to be loaded/unloaded.

5. Description

a. Head of the ramp. The end of the ramp against which the train to be loaded will be brought to rest.

b. Foot of the ramp. The end of the ramp opposite to the head.

c. Ramp erected on a track where the rails are flush with a hard surface The ramp consists of 9 layers of sleepers laid out as described in Drawings 3 to 11 and a flooring (see Drawing 12).

d. Ramp erected on a track where the rails are not flush with a hard surface

(1) The site for the ramp and the access platform should be level with the upper part of the sleepers on the railroad track. The first layer (see Drawing 3) is doubled with sleepers placed in the same way but sleepers No 103 and 214 are not included.

(2) An access platform (see Drawing .13) is built at the foot of the ramp so that the base of the flooring rests on the end of the platform.

(3) When the ramp is erected near a level crossing, it should never hinder road traffic; the hard surface can only be used to facilitate the manoevering of the vehicles and to avoid having to construct an access platform.

e. Wider Ramp

(1) When heavy tracked vehicles are to be loaded, and circumstances permit, a wider ramp may be used which is built on the same principle as that laid down in paragraph 5.d.(2) and (3) above.

(2) Drawing 14 shows the disposition of the first layer of a wider ramp.

(3) The characteristics of the wider ramp is that the tracks of the heavy armoured vehicles have a gangway formed by three sleepers laid side by side instead of two.

6. Strengthening in the Event or Permanent Use.

a. When a ramp is assembled for permanent use, it is necessary to verify its assembly and the stability of the sleepers and, if necessary, to correct their alignment, before and during use.

b. The assembly can also be strengthened by appropriate lashing; the use of timber dogs has proved unnecessary, as the resilience of the wood and the pressure exerted on them inevitably cause them to be forced out. In order that the ramp may retain all its elastic properties, whilst preventing lateral collapse, the lashing may be carried out as illustrated in Drawing 15:

(1) (a) Each of the sleepers of the outside rows of the odd layers has one end lashed to the sleeper of the layer immediately below and the other end lashed to the sleeper of the later immediately above.

(b) The sleepers of the intermediate rows of these odd layers have their centres lashed to a sleeper of the layer immediately above.

(c) The ramp is stabilised by lashing two by two the transverse sleepers of even layers.

(d) The sleepers of all layers forming on either side of the flooring a type ox stairway, are lashed two by two.

(e) However, the sleepers of the 9th layer and the flooring (Drawings 11 and 12) are lashed by their extremities to the sleepers supporting them.

(2) The lashing shall be effected in such a way that the tracks of the armoured vehicles do not harm the wire.

(3) Only flexible wire will be used.

7. General notes.

a. For the construction of such an auxiliary rasp, the preliminary agreement of the railway network is to be obtained in every case.

b. Wooden sleepers necessary for the construction of auxiliary loading ramps will be made available, if possible, by the railway networks. Such sleepers should be drawn, transported and positioned by military personnel.

c. The sleepers forming the bottom layer should be firmly secured by means of wooden blocks (planks or wedges) so as to prevent then from tilting. The upper surface of the additional layer used when the rails are not flush with a hard surface should not be below the tread level of the rails.

d. As the dimensions of the sleepers can vary according to the railway network, the number of pieces forming the 9th layer and the flooring is only given as an example. If necessary a gap with a width less than that of a sleeper can be left in the ramp's axis without prejudice to the movement of the vehicles.

e. When sleepers with a thickness considerably less than 13 cm or more than 14 cm are used, it may be necessary to add or to take off two layers or to increase or decrease the length of the flooring by one length of a sleeper, the method of construction of any additional layer being, of course, similar to that of the other layers.

f. The choice of site is to be made in agreement with the responsible railway network to ensure that the required safety precautions have been taken as regards train traffic on the adjacent track and that the local conditions are suitable for the erection of an auxiliary ramp.

IMPLEMENTATION OF THE AGREEMENT

8. This STANAG is implemented when the necessary orders have been issued to the forces concerned.

NATO UNCLASSIFIED

ANNEX A TO
STANAG 2152
(Edition 5)

MATERIALS AND TOOLS REQUIRED TO ERECT A RANP

SLEEPERS

1. Number of Sleepers Required

a. Ramp erected on a track where the rails are flush with a hard surface: 211.

b. Ramp erected on a track where the rails are not flush with a hard surface: 273.

c. Notes:

(1) When a wider ramp is used, it is necessary to provide respectively for 26 and 30 additional sleepers.

(2) The number of sleepers used to form the 9th layer and the flooring can vary according to their length and width ratio. It necessary, a gap with a width less than that of a sleeper can be left in the ramp axis.

ADDITIONAL MATERIALS

2. According to the depth of the rails, the use of bearing or sole plates beneath the rails, and the dimensions of the sleepers which may be different from one railway to another, and even from one track to another, additional materials (planks, wedges, etc.) will be required to firmly secure the lower layers of sleepers.

TOOLS

3. 2 sledgehammers, 2 levers (claw-bars) and at least 6 shovels are required on the site for leveling the ground on which the ramp is to be erected and for positioning and wedging the sleepers; carpenter tools must also be provided for the preparation of the wedges.

NATO UNCLASSIFIED

ANNEX B TO
STANAG 2152
(Edition 5)

ASSEMBLY OF THE RAMP

PERSONNEL REQUIRED

1. a. One supervisor.

   b. Two, or, if possible, three teams (A, B and C), each consisting of a team leader and ten men.

TASKS ASSIGNED TO THE PERSONNEL

2. The supervisor:

   a. Coordinates the work or the teams, ensuring that each layer of sleepers is complete before continuing with the next.

   b. Personally directs the laying of the flooring (see Drawing 12).

   c. Makes a final inspection after the assembling of the ramp.

3. Tasks or the Teams during the First Stage or Construction

   a. Teams A and B bring or unload the sleepers near the site chosen for the assembling or the ramp, leaving, it possible, an empty space of 4 metres between the sleepers and the track for the preparation of the site and to enable members or the teams to move about without hindering each other.

   b. If the ramp is erected on a double track line, the sleepers are stacked on the side of the track selected (Drawing 1). The space between the two tracks must remain completely free. It the ramp is erected on a single track line, the sleepers are stacked in equal quantities on each side of the track (Drawing 2).

   c. Team C is only required when the ramp is erected on a track where the rails are not flush with a hard surface. In that case, Team C, equipped with shovels, levels the site on which the ramp and the access platform are to be erected to bring the ground or ballast flush with the upper surface or the sleepers or the track.

4. Tasks or the Teams during the Second Stage of Construction

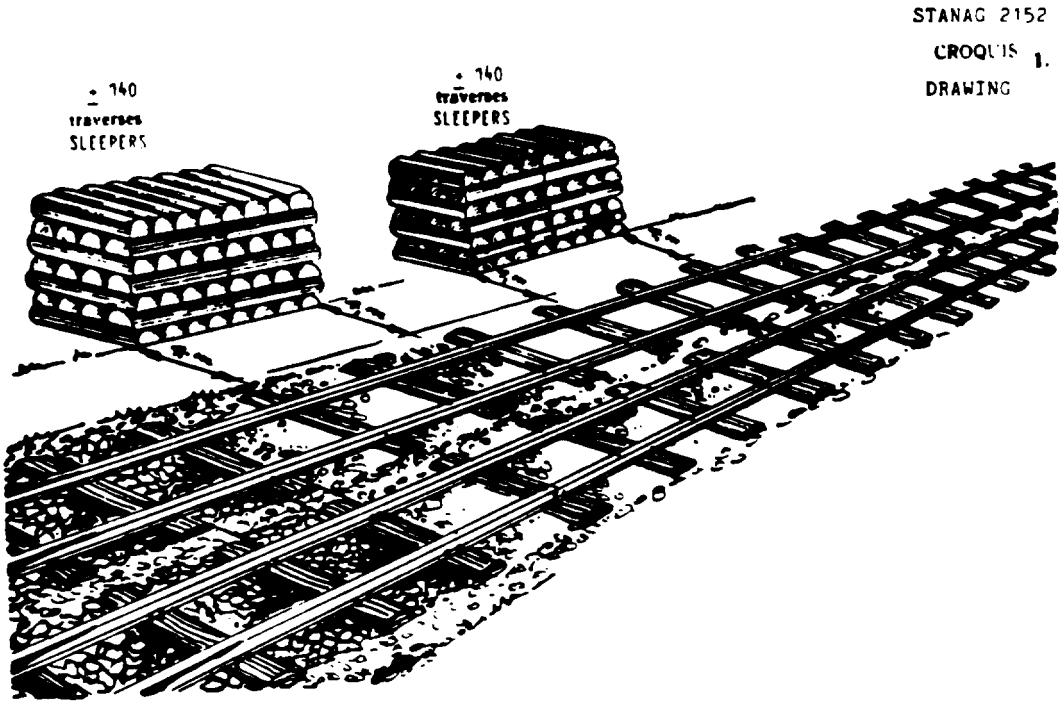
   a. Team A is responsible for the positioning of the sleepers numbered from 101 up as in Drawings 3 to 13, starting with the access platform and the additional layer it the rails are not flush with the surface. For each layer, the sleepers are to be positioned in the numerical order shown on the drawings.

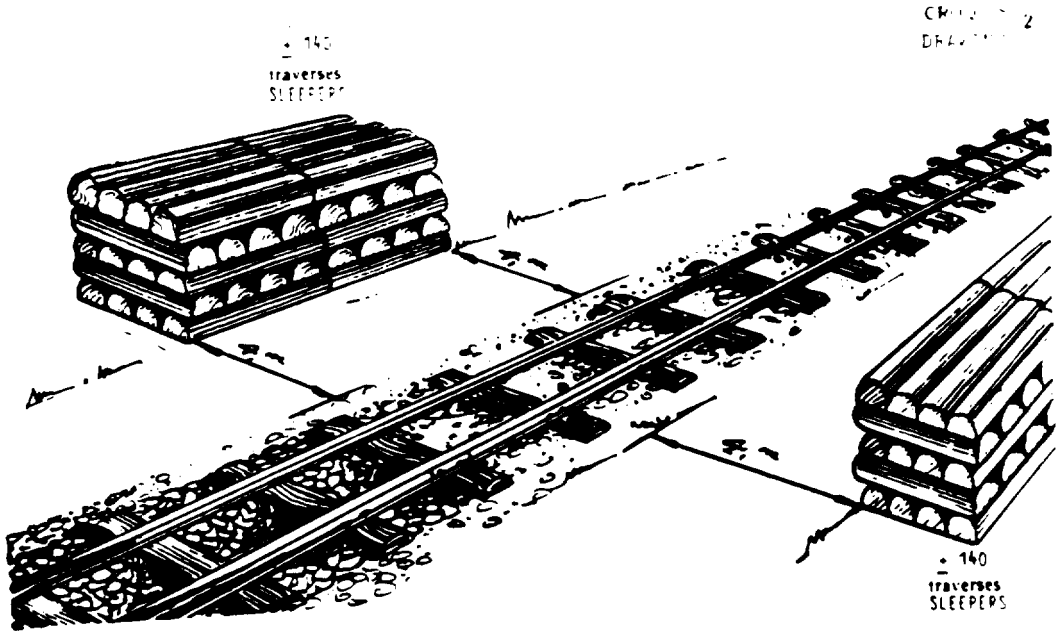
b. Team b carries out the same operations as Team A, but with the sleepers numbered from 201 up as in Drawings 3 to 13.

c. Team C is only needed it the sleepers cannot be stacked near the site (see 3.a. above). In that case, it feeds Teams A and B with sleepers.

5. The assembly time, which is 45-50 minutes for a normal ramp, is considerably longer when lashing enters into the construction of the ramp.

OTAN SANS CLASSTFICATION
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B-3

OTAN SANS CLASSIFICATION
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OTAN SANS CLASSIFICATION
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STANAG 2152

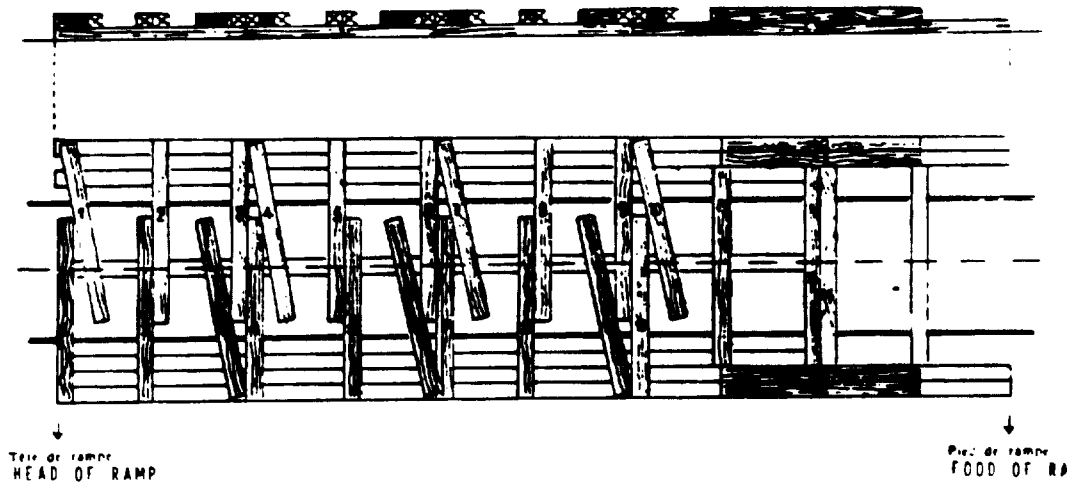
CROQUIS 3.
DRAWING

PREMIERE COUCHE.
FIRST LAYER
26 traverses — 26 SLEEPERS



CROQUIS 4.
DRAWING

DEUXIEME COUCHE.
SECOND LAYER
27 traverses — 27 SLEEPERS

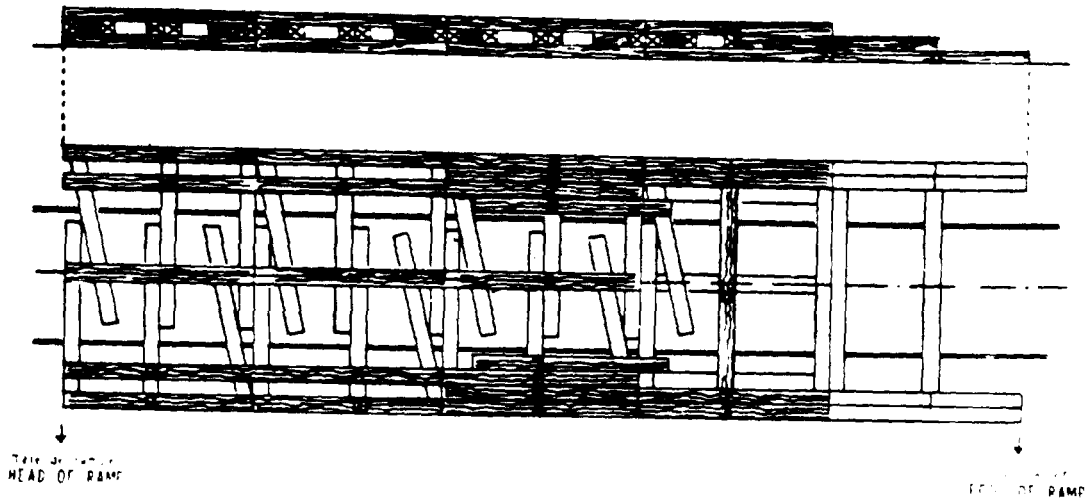


STANAG 2152

CROQUIS 5.
DRAWING

TROISIEME COUCHE.
THIRD LAYER

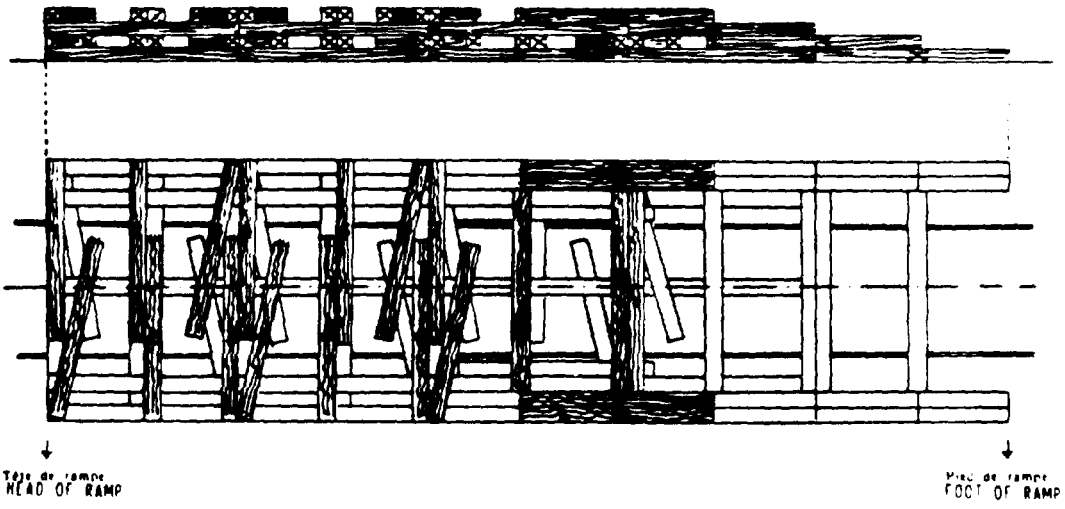
24 traverses — 24 SLEEPERS



6.

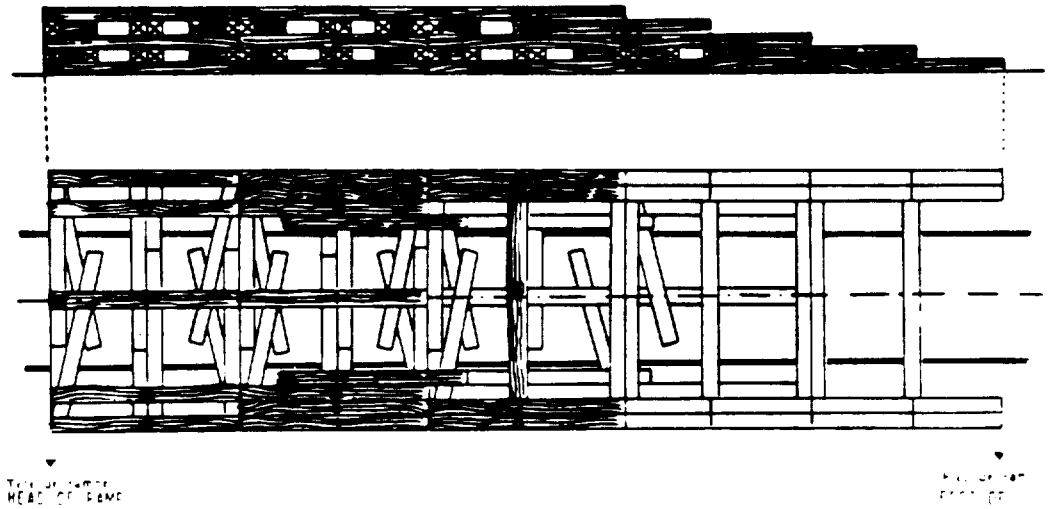
QUATRIEME COUCHE.
FOURTH LAYER

21 traverses — 21 SLEEPERS



STANAG 21
CROQUIS 7.
DRAWING

CINQUIEME COUCHE.
FIFTH LAYER
19 traverses — 19 SLEEPERS

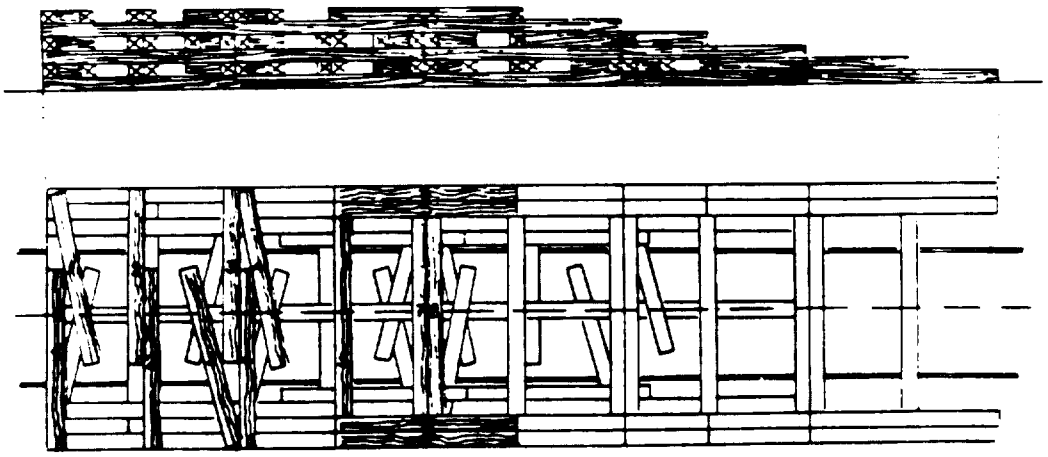


Tête de rampe
HEAD OF RAMP

Pied de rampe
FOOT OF

CROQUIS 8.

SIXIEME COUCHE.
SIXTH LAYER
15 traverses — 15 SLEEPERS



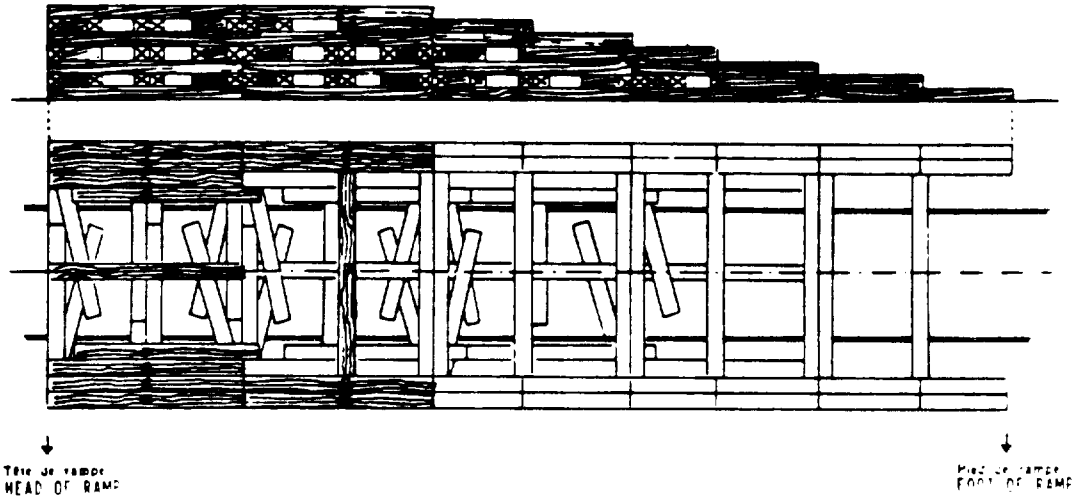
Tête de rampe
HEAD OF RAMP

Pied de rampe
FOOT OF RAMP

OTAN SANS CLASSIFICATION
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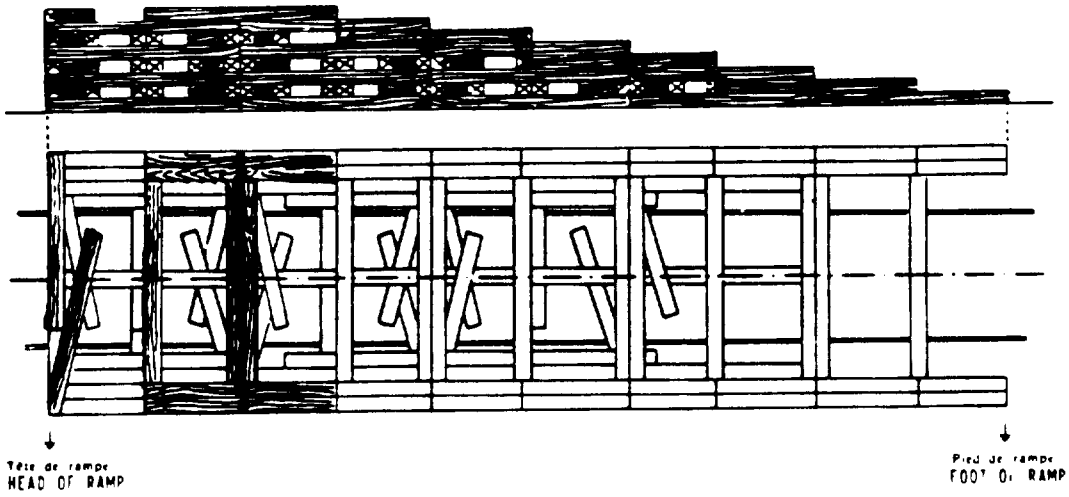
STANAG 2152
CROQUIS 9.
DRAWING

SEPTIEME COUCHE.
SEVENTH LAYER
14 traverses — 14 SLEEPERS



10.

HUITIEME COUCHE.
EIGHTH LAYER
9 traverses — 9 SLEEPERS

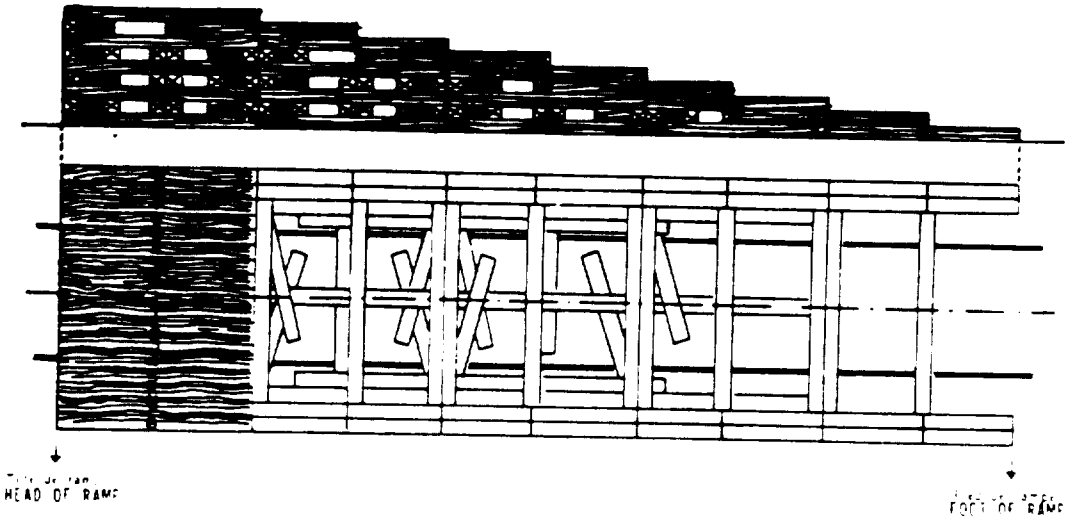


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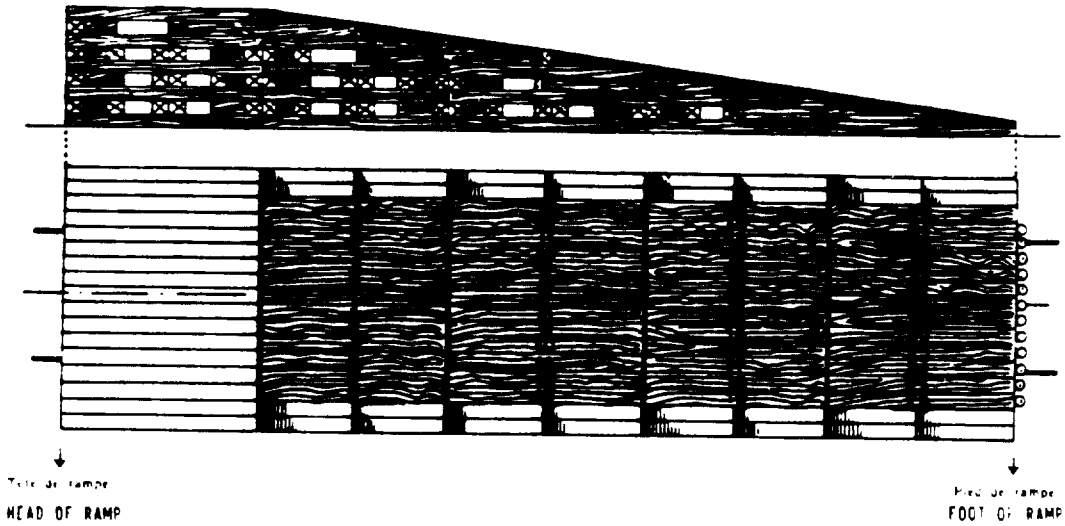
STANAG 2152
CROQUIS 11.
DRAWING

NEUVIEME COUCHE.
NINTH LAYER
± 14 traverses — 14 SLEEPERS



12.

POSE DU PLATELAGE
FLOOR LASHING
± 40 traverses — 40 SLEEPERS

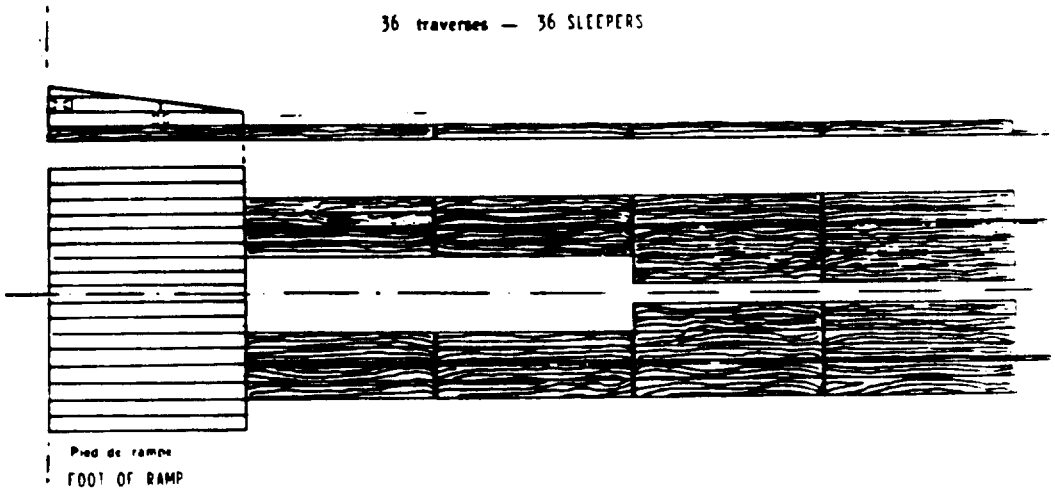


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STANAG 2152
CROQUIS 13.
DRAWING

PLATE-FORME D'ACCES.
ACCESS PLATFORM

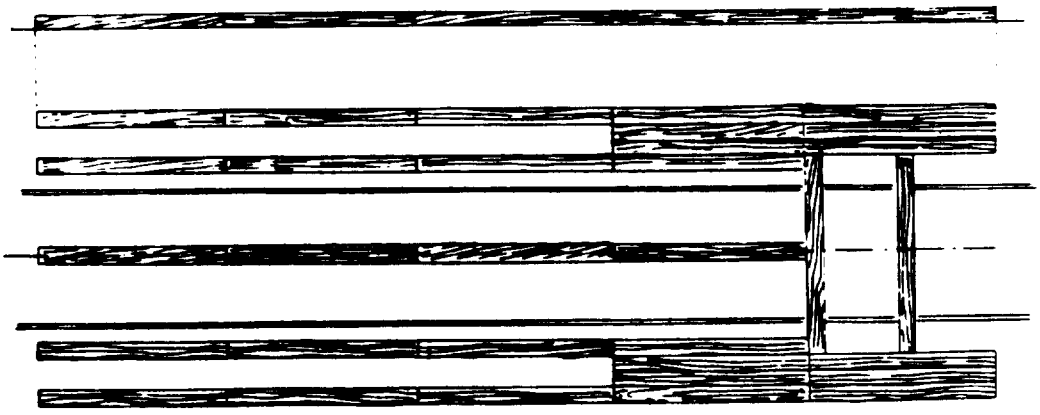
36 traverses — 36 SLEEPERS



14.

PREMIERE COUCHE DE LA RAMPE ELARGIE.
FIRST LAYER OF WIDENED RAMP

32 traverses — 32 SLEEPERS



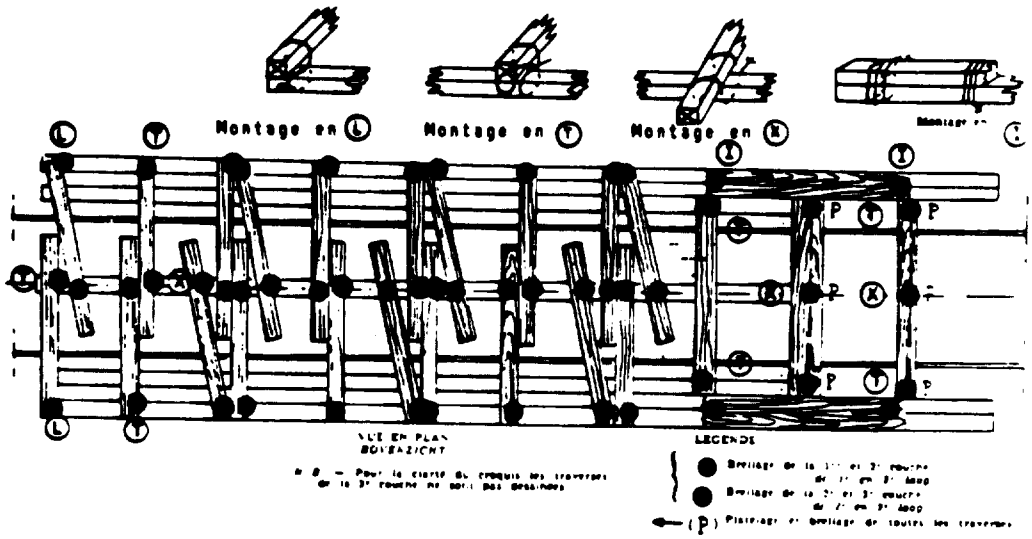
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STANAG 2152

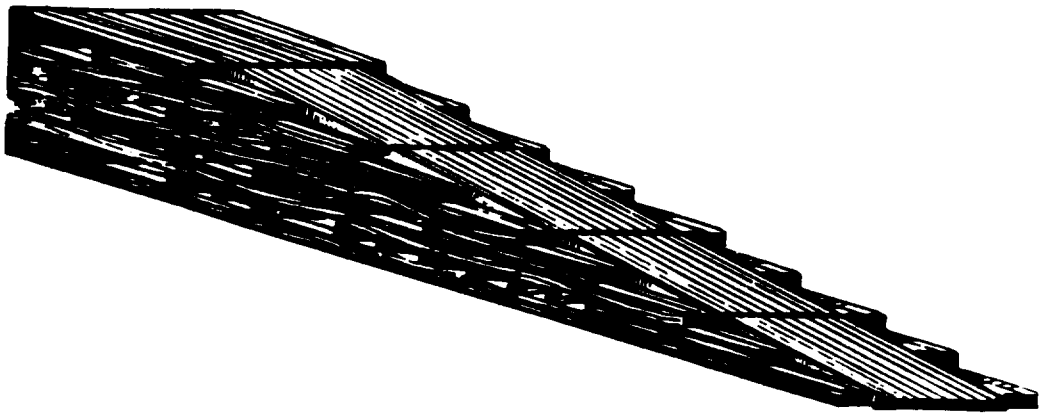
CROQUIS 15.
DRAWING

RAMPE BRELLEE.
LASHED RAMP
A titre d'exemple : 1re et 2e couche
LASHING OF 1'AND 2'LAYERS

DETAILS
Key



VUE D'ENSEMBLE.
GENERAL VIEW



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ANNEX C TO
STANAG 2152
(Edition 5)

USE OF THE RAHP

PRECAUTIONS TO BE TAKEN DURING LOADING AND UNLOADING OPERATIONS

1. Vehicles entry or exit over the access platform should be such as to form as small an angle as possible with the track axis to avoid deterioration of the rails, wheels or tracks.

2. During loading or unloading operations, the officer in charge of the ramps should order teams A and B to stand on either side of the ramp to watch out for any tilting of the sleepers and, if necessary, to move them back into position after each vehicle has passed. They have to keep an eye not only on the external sleepers, but also on the inside of the construction through the lateral spaces between the sleepers.

3. During the loading/unloading of heavy tracked vehicles, a locomotive must be coupled to the train with all brakes applied. For light vehicles, it will suffice to block the wheels of the wagons with the ordinary stop blocks used by the railways. When the length or the wagons overhang makes it necessary, the ends of the wagons will have to be supported by jacks, or failing this, by stacks of sleepers.

4. When using the ramp, drivers of vehicles, especially in the case of vehicles fitted with metal tracks, should avoid braking suddenly which might result in skids.

5. To prevent damage to the buffers, metal bridge plates should be used, or failing these, wooden sleepers resting both on the wagon and on the head of the ramp. However, this is not essential when all the vehicles to be loaded/unloaded are tracked.

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ANNEX D TO
STANAG 2152
(Edition 5)

MOBILE LOADING RAMPS

Appendices:
1. Type 3300/52 S loading ramp (BE and NL forces)
2. Dismountable end-on loading ramp (Q.D.F.) 1952 Model (FR forces)
3. Inventory of GE Mobile Ramps
4. Loading Ramps (UK forces)
5. Discountable end - on loading ramps "TRANSFER" and "TYCE" (SP forces)

The load carrying capacity and the technical data of the existing ramps are given in Appendices 1 to 5 to Annex D to the STANAG. The US forces in Europe do not own mobile loading ramps and the other forces, such as United Kingdom and Norway, only use ramp wagons.

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APPENDIX 1 TO
ANNEX D TO
STANAG 2152
(Edition 5)

TYPE 3300/52 S LOADING RAMP (BE AND NL FORCES)

1. The ramp used by the BE and NL forces is an end-on loading ramp (Type 3300/52 S) for flat wagons with a floor height from 1240 to 1355 am. The complete ramp system consists of an aluminum base-plate, 2 ramp plates and coupling bar.

a. Maximum permissible load

(1) Tracked vehicles HLC 60.

(2) Wheeled vehicles NLC 40.

b. Permissible eccentricity when using the ramp

(1) Wheeled vehicles. 50 mm off centre for vehicles with a maximum distance of 2850 mm between the extreme tyre sides. The maximum distance between the outer tyre wall and the outer edge of the ramp plate is 240 mm.

(2) Tracked vehicles. 50 mm off centre.

c. (1) The construction of the ramp will be such as to prevent wagons being damaged when using it.

(2) The independent components of the ramp are fitted with the necessary attachments for a simple and speedy assembly.

(3) With a 1300 mm high wagon, the slope of the ramp is of 18 degrees. The ribs of the gangways prevent the vehicles to be loaded or unloaded from skidding.

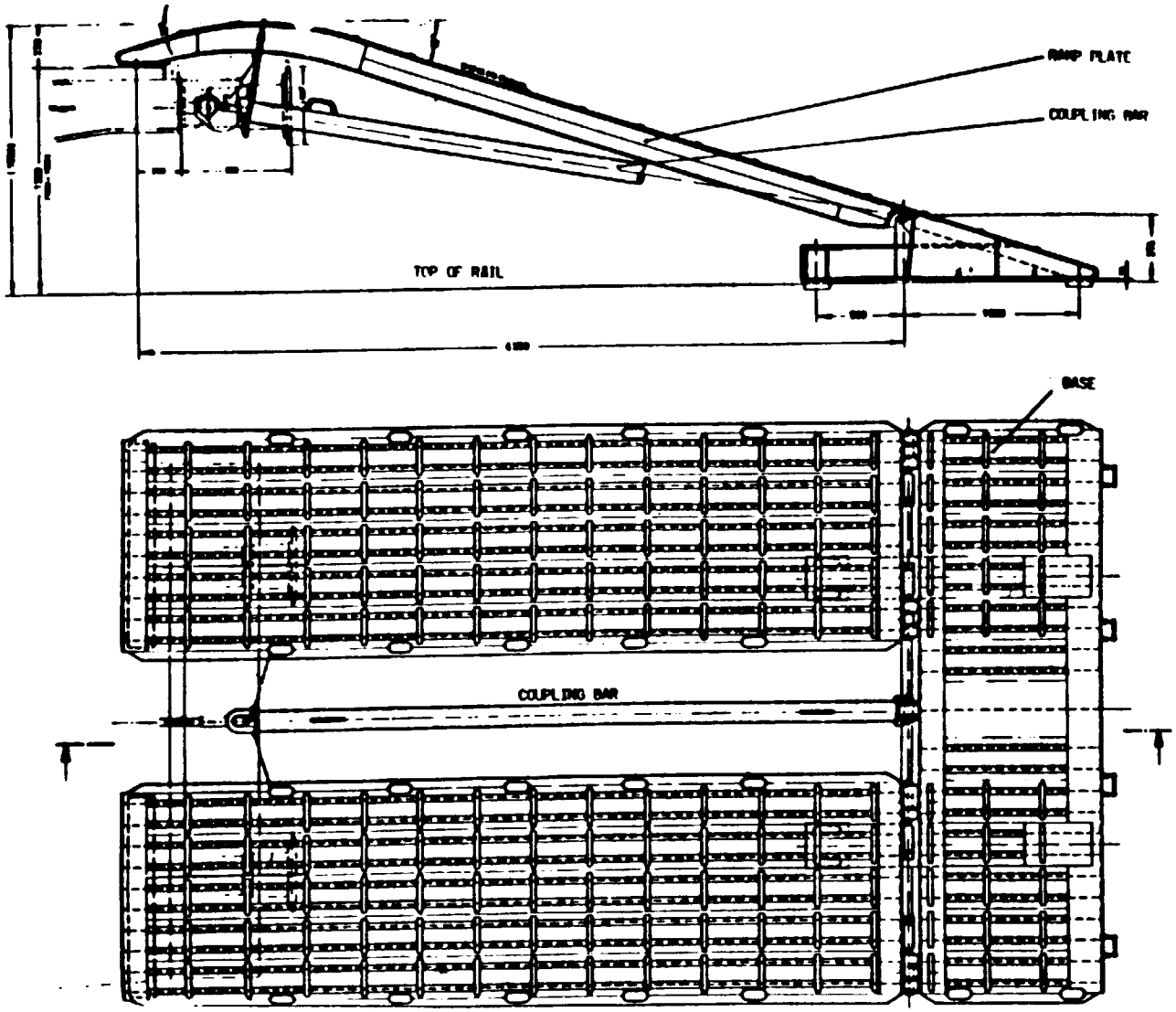
d. The dimensions of the ramp are such as, when dismounted, it can be carried on a wagon transporting two Leopards 1 KBT.

2. Use. No additional equipment is needed for on/oil loading the ramp. It can be handled by a team of 8 to 10 men (40 kg per man). The team can set up the ramp in about 20 minutes. The ramp needs little maintenance apart iron some occasional grease on the hinges.

3. Assembly. Adhere to the order or assembly as given. It the wagon is fitted with jacks, these must be used.

4. Vehicle speed on ramp. Drive all vehicles at a slow walking pace on the ramp. Do not change direction or make turns on the ramp. Drive tracked vehicles as slowly as possible over the curved top end.

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RAMP, COMPLET
D-1-2

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APPENDIX 2 TO
ANNEX D TO
STANAG 2152
(Edition 5)

DISNOUNTALE END-ON LOADING RAMP (Q.D.F) 1952 NODEL (FR FORCES)

Weight :4000 Kg.

Load carrying capacity : 55 T

It consists of 36 pieces and includes primarily:

- A frame of 3 wind-braced pieces.
- A flooring for 12 ramp girders.
- A bridge plate.
- An attachment fitting to the rail with six fastening grips.
- A stopping device for the wagons.

The heaviest load, that is the show-plate, weighs 285 Kg and may be carried by 6 men.

TRANSPORT

a. By railway

It may be transported on a covered wagon, an open goods wagon or a flat wagon.

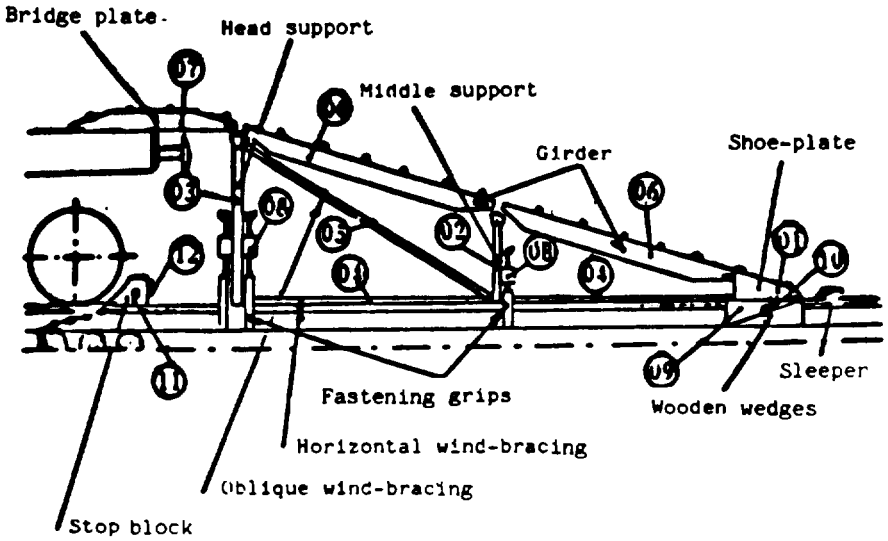
A wagon can serve for the transport or 2 dismountable end-on loading romps, but without the sleeper lot.

b. By road

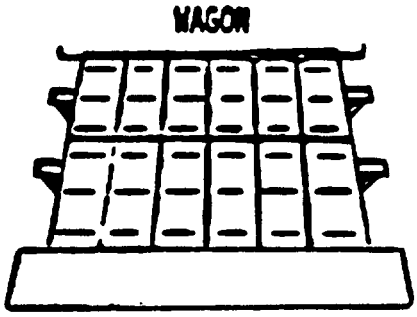
2 lorries of 2.5 T to 3 T.

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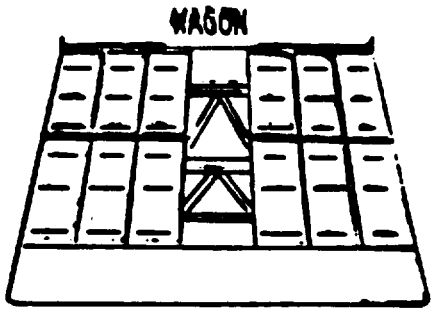
DISMOUNTABLE END-ON
LOADING RAMP
O.D.F. 1952 MODEL



DESCRIPTION



Narrow-gauge vehicle



Broad-gauge vehicle

FLOORING

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APPENDIX 3 TO
ANNEX D TO
STANAG 2152
(Edition 5)

INVENTORY OF GE MOBILE RAMPS

1. The Federal Armed Forces have at their disposal fifty four (54) dismountable end-loading ramps made of steel or light metal, respectively. They are part of the equipment of the Movement Headquarters and are employed by the Movement Headquarters where the load carrying capacity of fixed ramps is inadequate.

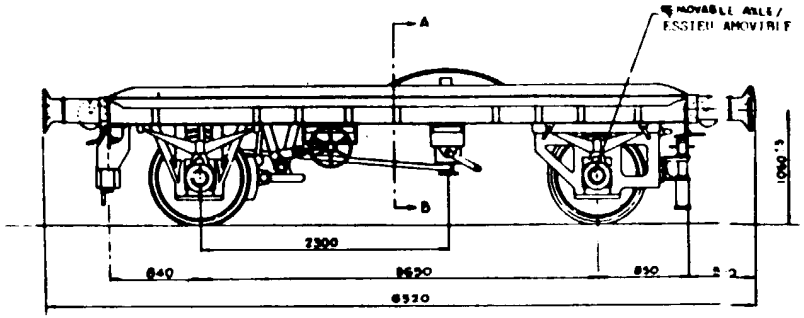
2. An access platform; forms part of each ramp giving it the capacity of being deployed on the open track.

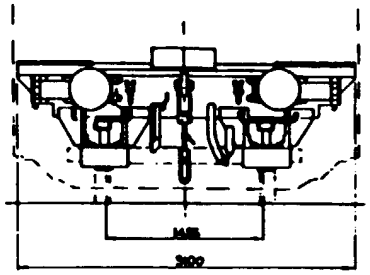
3. In peacetime, the installation and transport of dismountable end-on loading rasps ere to be accomplished by the loading unit. In wartime, military personnel and vehicles of the Movement Headquarters will be available for that purpose.

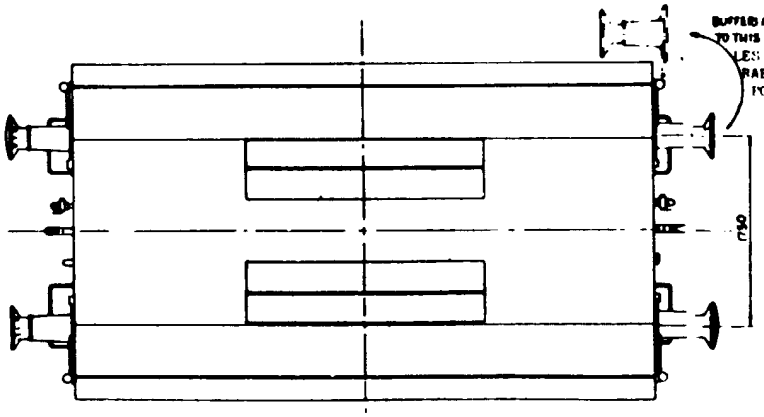
4. Technical data

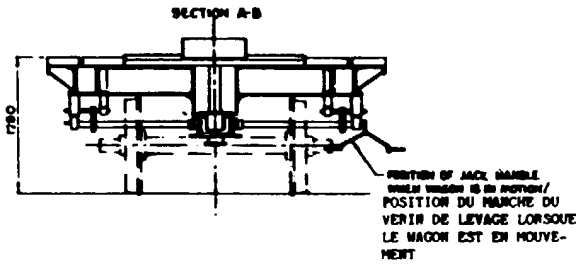
	Metal ramp	Light metal ramp
Weight	14.4 t	11.2 t
Number of vehicles required for the transport.	2 x 5 t truck or 3 x 3.5 t truck	3 x 7 t truck
Number of wagons required for the transport.	1 x Rm	1 x Rm
Personnel required for the installation, including access platform, by a trained team.	9 men/1 hour	9 men/1 hour
Personnel required for the installation, including access platform, by an untrained team.	9 men/a minimum of 3 hours	9 men/a minimum of 3 hours

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Tare weight/Poids sous tare - 11.2 Tons/Tonnes
Laden weight/Poids en charge - 12.1 Tons/Tonnes
Axle bearing capacity/ - 12.8 Tons/Tonnes
Force portante par essieu

REME TECH SERVICES - 70 RAILWAY SQUADRON RCT

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APPENDIX 4 TO
ANNEX D TO
STANAC 2152
(Edition 5)

LOADING RAMPS (UK FORCES)

1. In West Germany, the UK Forces have six (6) ramp wagons with the following specifications:

a.	Overall length	:	6.50 m
b.	Floor length	:	5.35 m
c.	Floor width	:	3.10 m
d.	Load carrying capacity	:	
	(1) In traffic	:	12 T
	(2) As a ramp	:	50 T

2. Six (6) new ramp wagons, using the same construction principles as the old ones, are expected to be put into service in August 1985. Their main characteristics will be:

a.	Overall length	:	14 m
b.	Width	:	3.150 m
c.	Height (top or rail to load deck surface)	:	1.270 m
d.	Speed (unladen)	:	100 km/hr
e.	Load carrying capacity	:	
	(1) In traffic	:	12 T
	(2) As a ramp	:	65 T

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APPENDIX 5 TO
ANNEX D TO
STANAG 2152
(Edition 5)

DISMOUNTABLE END-ON LOADING RAMPS "TRANSFER" AND "TYCE:

END-ON LOADING RAMP "TRANSFER"

1. It is a metallic, pliable, launching ramp transported by a flat car that in deployed on over the track to allow the loading and unloading of wheeled or tacked vehicles.

2. It consists of a 16 degrees sloped ramp and a horizontal plate resting on the rail tracks with lateral flaps to protect them. The assembly is launched hydraulically or by hand sliding over the carrier surface until it is fixed down to the track.

3. Vehicles negotiate the flaps at an angle of 45 degrees to the main axis of the platform, turn and get on the flat car. Once the vehicles are loaded the ramp is recovered.

4. Only small adjustments are required in a normal flat car to prepare it for carrying the TRANSFER. This is kept permanently fixed so transport by lorry is not considered. Launching is performed by a hydraulic operator and two helpers in 10 minutes.

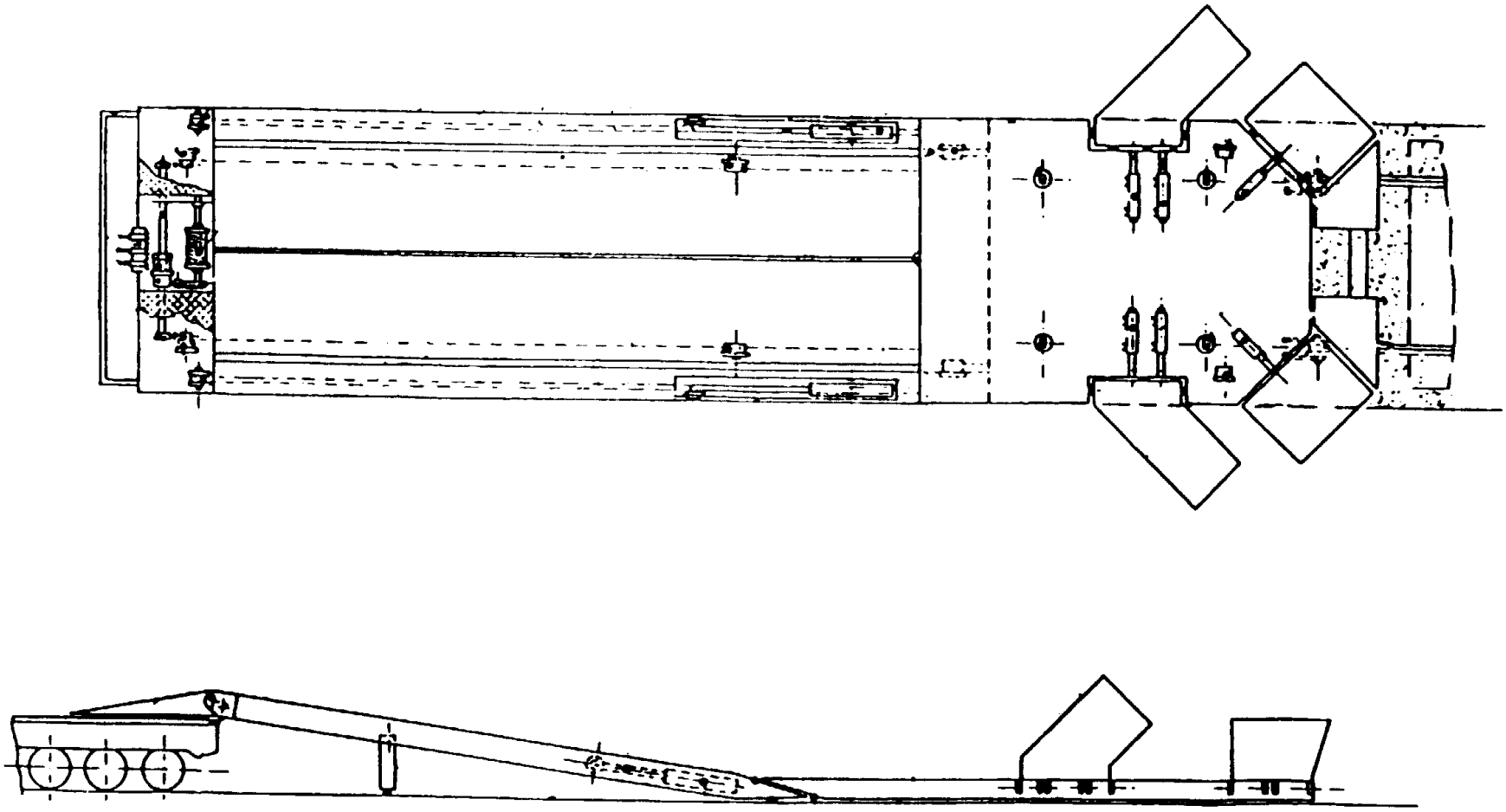
5. Technical data:

Maximum payload	:	60 MT.
Ramp length	:	9,42 m.
Width	:	3,12 m.
Horizontal platform length	:	8,50 m.

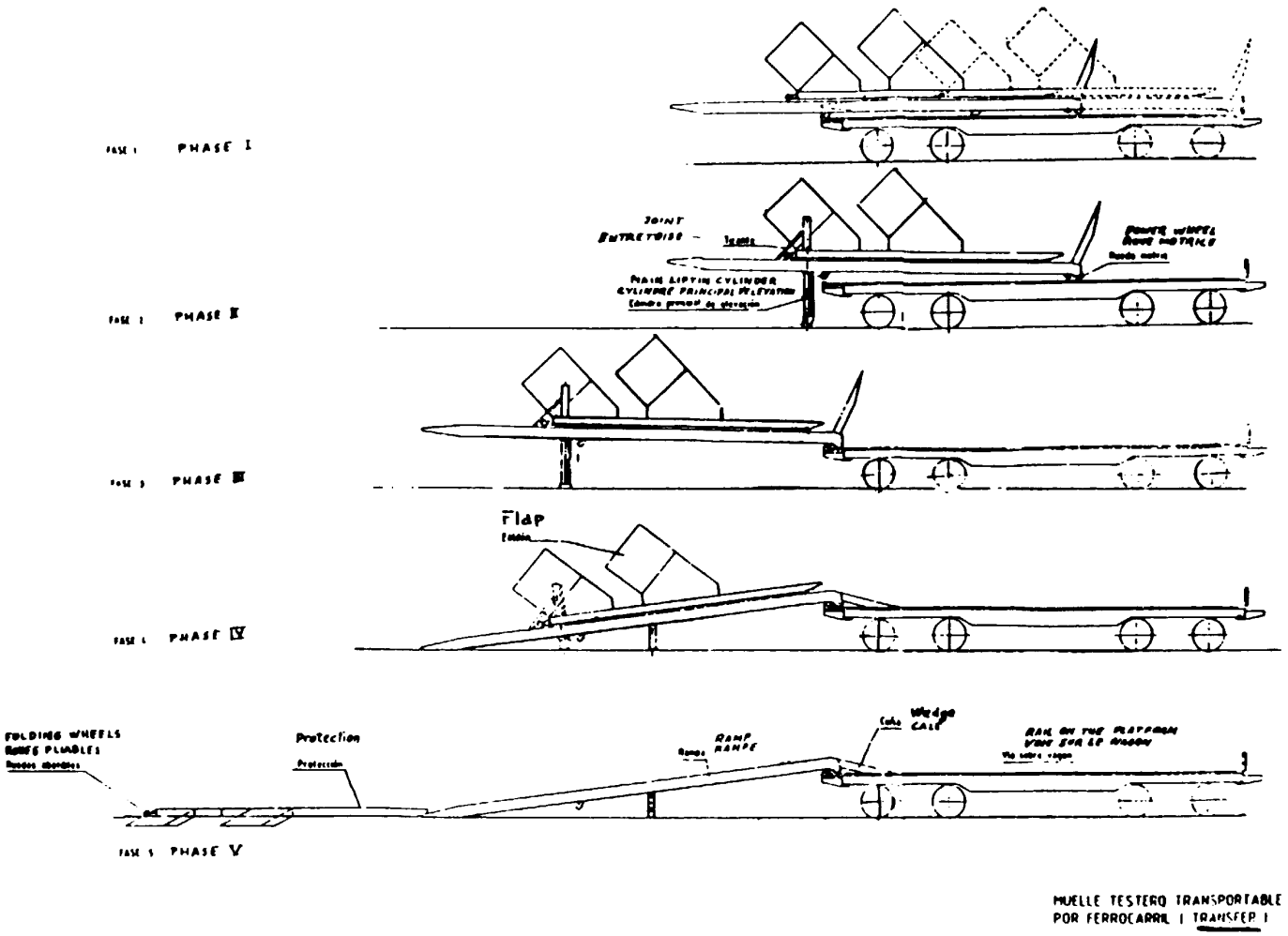
DISMOUNTABLE END LOADING RAMP "TYCE" MODEL

The "TYCE" is composed of 447 pieces pertaining to the Engineers' Bailey bridge. It has three sections of 4.5 m. supported by three column and the far end on the track. The spans are formed by metal beams and timber planks with corresponding blocking, fastening and connecting pieces.

Usable width: 4.19 m.
Max. payload: 63,5 MT.
Weight: 11.96 MT.
Vehicles required to transport: 2-3 lorries or 2 railcars.
Mounting time: 6 hours by trained personnel.
Personnel: 1 Officer, 1 NCO and 12 soldiers.

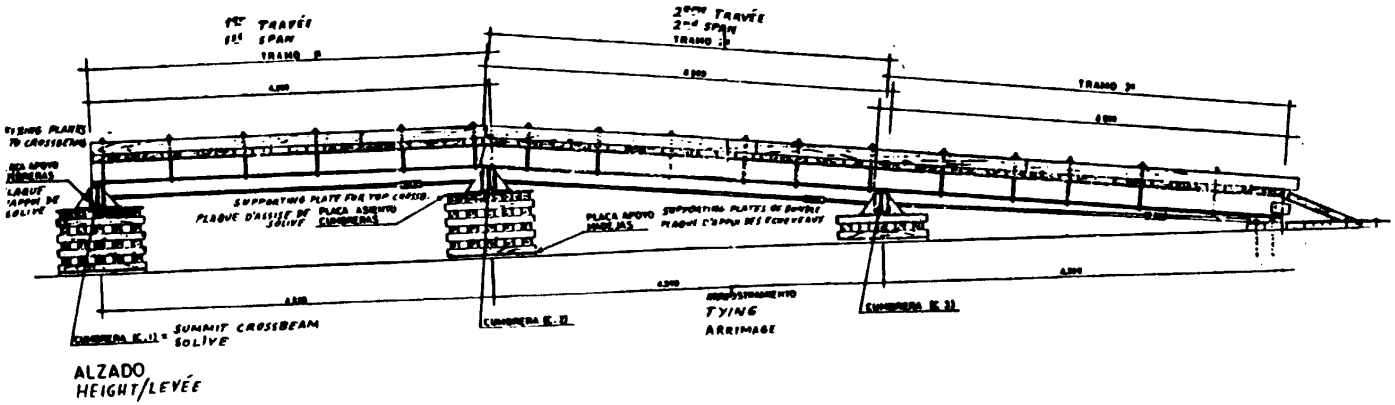


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MUELLE TESTERO TRANSPORTABLE
POR FERROCARRIL (TRANSFER)

NATO UNCLASSIFIED



"TYCE" MODEL

D-5-4

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ANNEX E TO
STANAC 2152
(Edition 5)

LOADING AND UNLOADING BY MEANS OF BRIDGING EQUIPKENT

Appendices:
1. Fixed bridge, short
2. M 48 armoured-vehicle-launched bridge
3. Biber armoured-vehicle-launched bridge

1. The following equipment is suitable for use as auxiliary end ramp for loading and unloading:

- the fixed bridge, short (Appendix 1), for wheeled vehicles track construction, MLC 24/30 is sufficient, while for cracked vehicles solid construction, WLC 30/5b is required; placement below the contact wire is possible, if safety regulations are observed;

- the M 48 armoured-vehicle-launched bridge (Appendix 2) on lines without a contact wire, but not for vehicles with a small wheel base (e.g. truck utility 0.25t or truck 0.5 t Iltis);

- the Biber armoured-vehicle-launched-bridge (Appendix 3), placement below the contact wire is possible, if safety regulations are observed.

2. The bridges are only to be placed on flat wagons that have supports. In doing so:

- the wagons are to be chocked in place,

- the bridges are to be secured to the flat wagon on which they rest by means of two tiedown chains, thus preventing them from falling oft; this is to be accomplished by means of tiedown chains which are suited for the heaviest of vehicle to be loaded,

- the supports at both ends of the wagons on which the bridges rest are to be lowered to approximately 40 m above the upper edges of the rails,

- the bridges must not be propped on buffers or buffer disks. This can be avoided by placing sufficiently strong and solid square timbers underneath.

It the bridges are placed directly on the rail wagon without using any square timbers or footboards respectively, there is a danger of damaging the bridging equipment and the rail wagons when passing over the bridge. It the bridge-laying tank must pass over the tracks when placing armoured-vehicle-launched bridges the rail boltings in the course of the chain tracks must be protected by means of footboards.

Suitable approaches to the auxiliary romps are:

- level crossings,
- dead and tracks with paved approaches and areas,
- flange groove tracks in the area of paved roads,
- crushed stones piled in the tracks, covered with auxiliary road cover (hexagon slabs) (Appendix 1).

3. In accordance with Appendix 1 the fixed bridge, short is to be mounted on both sides of the ramp (from the fishplate-thrust anchorage) by means of two tiedown chains (of the heaviest vehicle) with shackles, size 4, and is to be secured at the external slinging eyes or the screw coupling, of the rail wagon to avoid falling off. The tiedown chains are to be tightened only loosely in order to enable motion compensation between bridge and rail wagon when vehicles pass over the bridge. That is why the floor is not secured in position; it must, however, be plain in order to ensure a safe distribution of the load. Wooden railway sleepers or solid square timbers not smaller then 18x18x400 cm are to be placed underneath as footboards and for the distribution of the load at the point at which the bridge rests on the wagon. The fixed bridge, short can be constructed manually in solid construction, without any mechanical lifting devices, by one team within one hour.

4. In accordance with Appendix 2 the procedure for the M 48 armoured-vehicle-launched bridge is the same as the Biber armoured-vehicle-launched bridge.

M 48 armoured-vehicle-launched bridge is tied to the rail wagon by means or two tiedown chains (of the heaviest vehicle).

- from the slinging eyes on both sides, outside or inside, to the screw coupling of the rail wagon or

  as cords around the front plate of the bridge to the screw coupling of the rail wagon.

5. In accordance with Appendix 3 the Biber armoured-vehicle-launched bridge is to be placed on the wagon in such a manner that the bearing surface is protected by a timber not smaller than 20x20x400 cm, placed underneath; in the case or wheeled vehicles, however, the timber must not be smaller that 18x18x400 cm. At the bottom the end of the bridge must rest in its entire width on a plain surface.

The armoured-vehicle-launched bridge (Biber) is fastened to the rail wagon by means of two tiedown chains (of the heaviest vehicle) from the second shackle mounting on the inside to the screw coupling of the rail wagon.

6. Before loading by the bridge an observer is to be detailed whose task is to halt loading if:

- shifts occur; in that case he will arrange for realignment;
- the bridge is badly fouled and there is an increased danger of clipping; in that case he will have the bridge cleaned by the ramp cleaning personnel detailed in advance.

In addition, a marshaller is to be detailed for every vehicle, who must act in accordance with safety regulations.

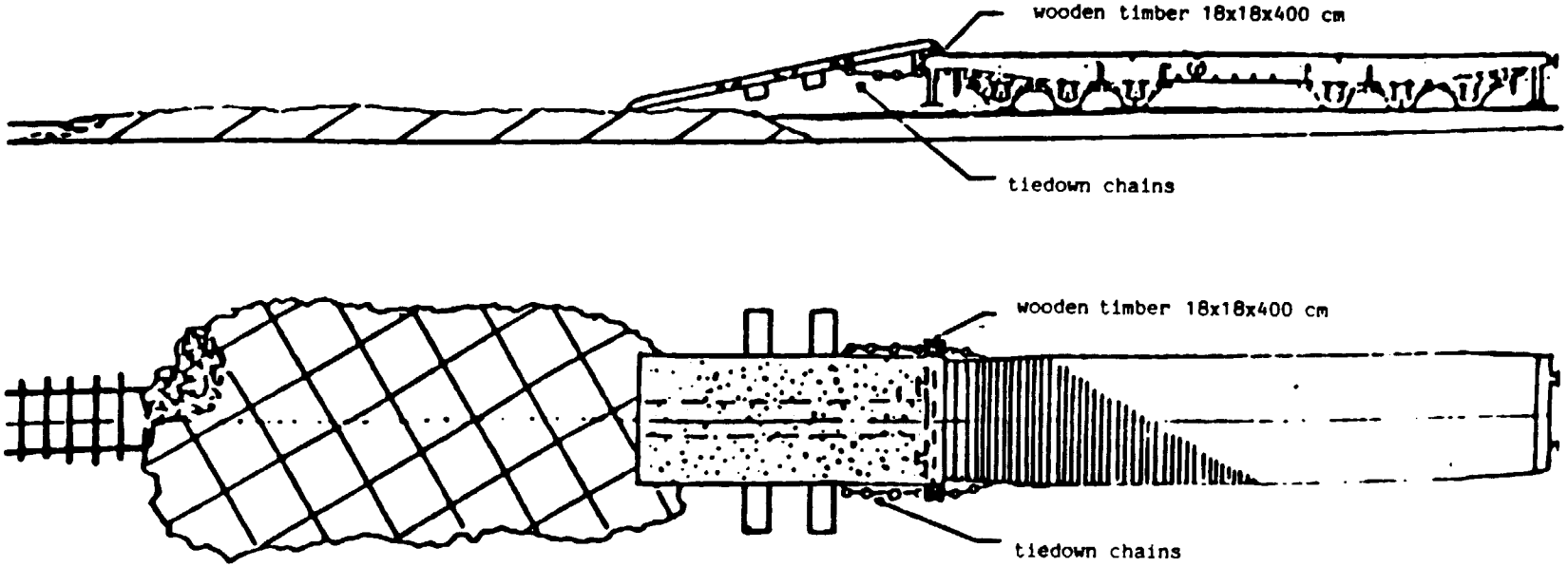
When loading and unloading the bridges mounted as end ramps ore to be crossed slowly but smoothly at a walking pace. Turning and jerky movements are prohibited, braking is to be avoided.

7. The planned employment of the bridging equipment in Germany is to be passed to the Movement Headquarters. The equipment may only be used at railroad stations or at places which are agreed upon between the Movement Headquarters - Railway Section and the German Railways and are assigned to the user.

Fixed bridge, short

Approach
(e.g. railway crossing
crushed stone with hexagon slads)

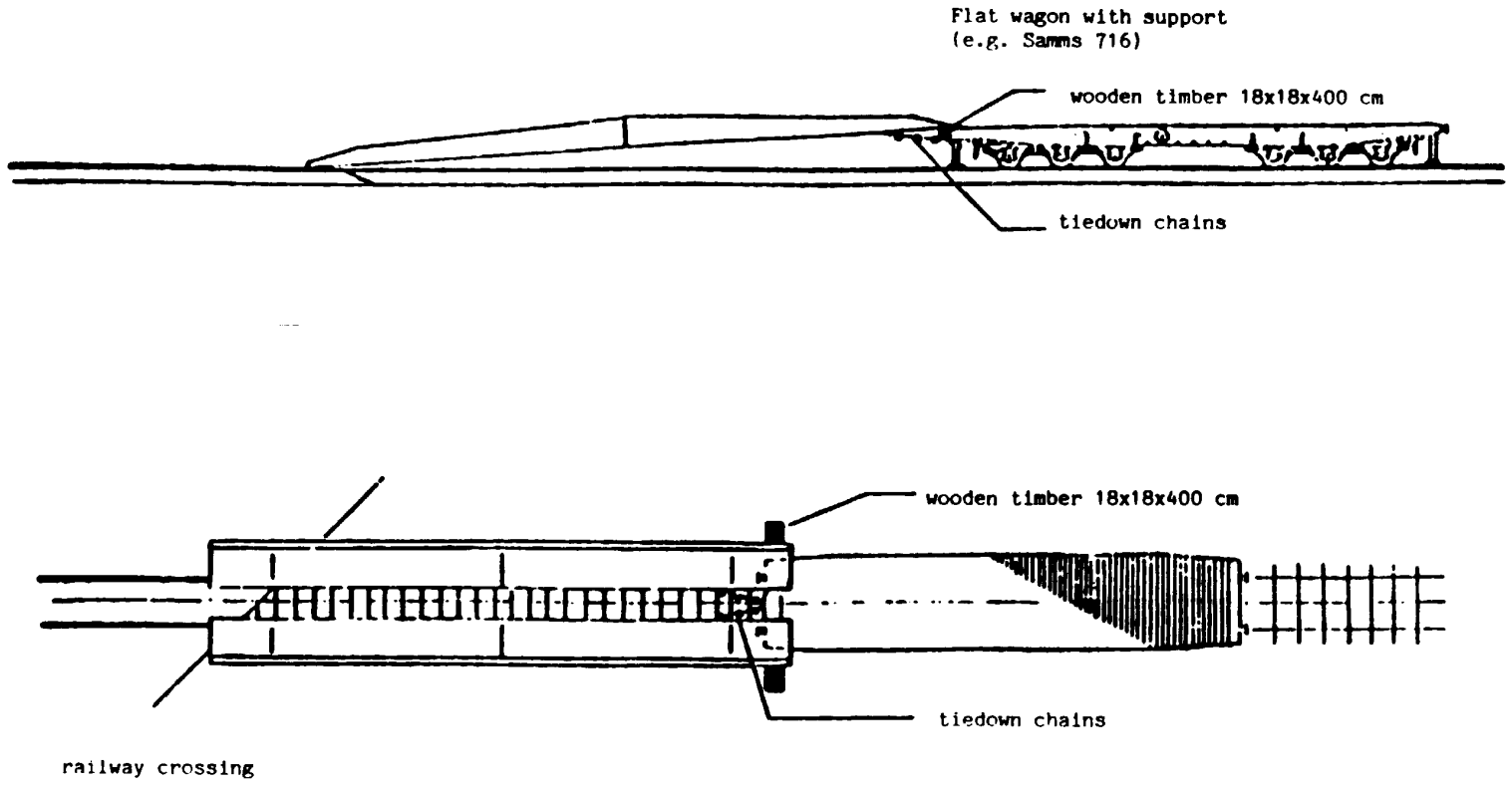
Flat wagon with support
(e.g. Samms 710)



M 48 Armoured vehicle launched bridge

Approach
(e.g. railway crossing)

Flat wagon with support
(e.g. Samms 716)

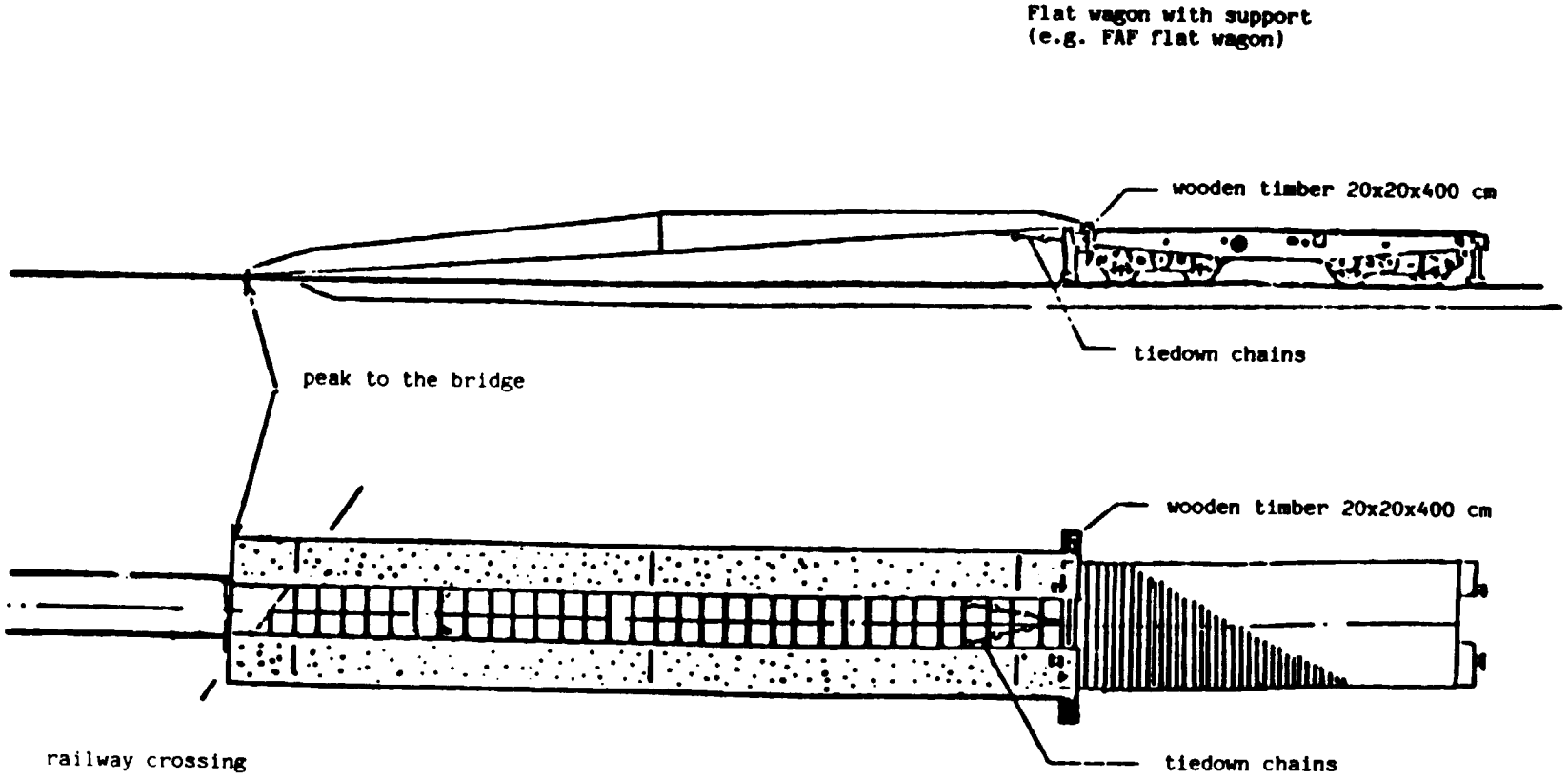


M 48 Armoured vehicle launched bridge

Approach

(e.g. railway crossing
crushed stone with hexagon slads)

Flat wagon with support
(e.g. FAF flat wagon



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STANAG 2152
(Edition 5)

RATIFICATION AND IMPLEMENTATION DETAILS
STADE DE RATIFICATION ET DE MISE EN APPLICATION

NA-TION	NATIONAL RATIFICATION REFERENCE DE LA RATIFICATION NATIONALE	NATIONAL IMPLEMENTING DOCUMENT NATIONAL DE MISE EN APPLICATION	IMPLEMENTATION/MISE EN APPLICATION					
			FORECAST DATE PREVUE			ACUTAL DATE DATE REELLE		
			NAVY MER	ARMY TERRE	AIR	NAVY MER	ARMY TERRE	AIR
BE	CMTpT/3/10794 of/du 7.10.86	IF 23				10.86	10.86	10.86
CA	2441-2152 (DTRP 2-4-5) of/du 3.6.86	C-90-116-000/MS.000 CFP 303 (10) Port 2					1.87	
DA	M.204.66/S.2152/MAS AR,Y-13425 of/du 26.5.86	HRN 512-2				10.87	10.87	10.87
FR	NHR 217/EMA/DIV LOG/SOU/TRT/CCF of/du 26.8.86	STANAG 2152				10.86	10.86	10.86
GE								
GR	F.069.175/13/298766/DN 166 of/du 19.2.86						4.87	
IT	SME/4558/102.7121 of/du 14.10.86	STANAG 2152					4.87	4.87
LU	CMTpT/3/10794 of/du 7.10.86	IF 23					10.86	
NL	NAS.84/749/8487/NU of/du 20.2.86	VS 55-20 Ontwerp richtlijnen bel. Goderenwagens bij goederen verkeer				4.87	4.87	4.87
NO	MAS/1379/85.MST/TRENIN SP/MTH/HCW/SS of/du 2.1.86	STANAG 2152				6.86	6.86	6.86
PO	RRN 018/86/DD of/du 20.2.86	STANAG 2152						
SP								
TU	Gn.P.P.:2307-293-86/AND.D. MAS.S.(2152) (1461) of/du 21.5.86						1.87	
UK	D/D MOV (A) 54/1/16 Q MOV 1 of/du 3.6.86	RCT Training Vol. 4 Rail Transport				11.87	11.87	11.87
US	AMSAC-MC/S of/du 11.7.86	TM 55-601		9.90	9.90			

APPENDIX AA
STANAG 2173

NATO STANDARDIZATION AGREEMENTS (STANAG)

REGULATIONS FOR THE SECURING OF MILITARY TRACKED AND WHEELED VEHICLES ON RAILWAY WAGONS

Annexes

A. Definitions
B. Uniform text for the certificate of confirmation to enter into the freight warrant
C. Summary of regulations concerning the securing of military equipment

Related documents:

STANAG 4062 MB - Attachment for Lifting Vehicles and Heavy Military Equipment by Land and Sea
AC/15-D/286 - PBEIST document "Agreement on the Securing of Military Tracked and Wheeled Vehicles on Railway wagons in International Traffic"

AIM

1. The aim of this agreement is to standardize within NATO Forces the regulations concerning the securing of military tracked and wheeled vehicles on railway wagons in frontier crossing exchange traffic between the Railway NETWORKS concerned. The provisions of Annex II (Loading Regulations) to the agreement on the reciprocal use of wagons in international traffic (RIV) will apply, supplemented by special provisions making allowance for certain specific features related to the movement of military equipments.

AGREEMENT

2. Participating nations agree to apply the methods described herein for securing and wedging tracked and wheeled military vehicles transported by rail.

DETAILS OF THE AGREEMENT

3. These regulations apply to international exchange traffic between the Railway NETWORK of BELGIUM, DENMARK, FRANCE, THE FEDERAL REPUBLIC OF GERMANY, ITALY, LUXEMBOURG and THE NETHERLANDS.

4. It is understood that loading and securing operations will be carried out in agreement with, and under the supervision of the Railway NETWORK

5. In compliance with RIV Loading Regulations, the following is to be adhered to:

a. Vehicles must be chocked and lashed to the wagon (for exceptions see sub-paragraphs 9.o.(3 and sub-paragraphs 9.a. to 9.c. .

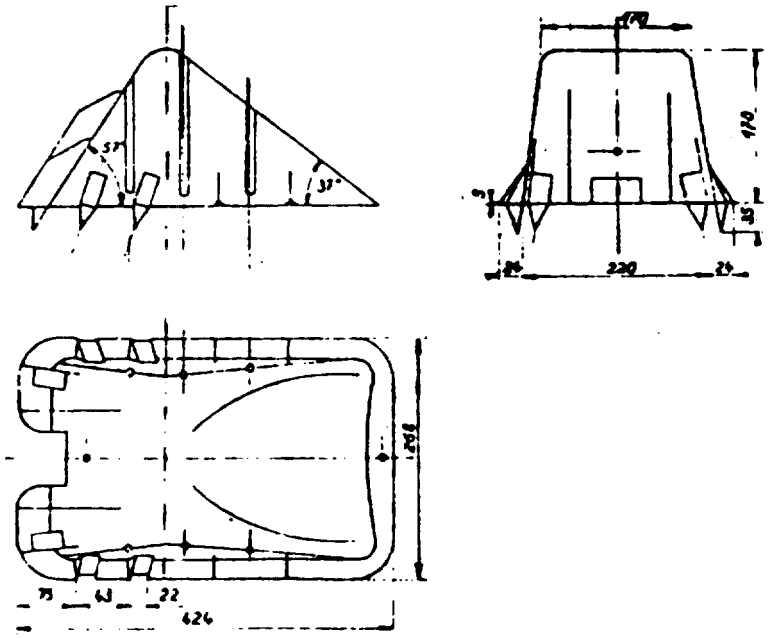
5. b. Self-propelled vehicles are to be immobilized by the loader either by applying the hand brake or by engaging the first gear, if this is mechanically possible. Furthermore, the loader is to ensure that the engine cannot start itself.
   c. Vehicles which are not self-propelled are to be immobilized by applying the hand brake, if fitted.
   d. Lifting gear, gun turret, jibe, counter weights and other traversing or projecting parts are to be locked or secured
   by suitable means to prevent vertical or lateral movement.
   e. Gun barrels are to be secured in their traveling position.
   f. The loader is responsible for ensuring that snow and ice are removed from the wagon before loading.
   g. The consignor, or his deputy, responsible for loading confirms, as established by the railway NETWORK, that the above provisions have been complied with (see the uniform text at Annex B).

6. Securing appliances

   a. General. For securing vehicles on railway wagons lengthwise and crosswise in accordance with one of the two methods - Type I or Type II - laid down in paragraphs 8a. to 8.e. only the following securing appliances are approved.
   b. Chocks and Wedging Timber

      (1) For securing tracked and wheeled vehicles lengthwise in accordance with the Type I tie-down arrangement (see paragraphs 8.b. and 8.d.) only the chocks illustrated in Figures 1 to 3 are to be used.

Figure 1
Steel-spiked chock (measurements in mm)



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Figure 2
Wooden chock secured by timber board.

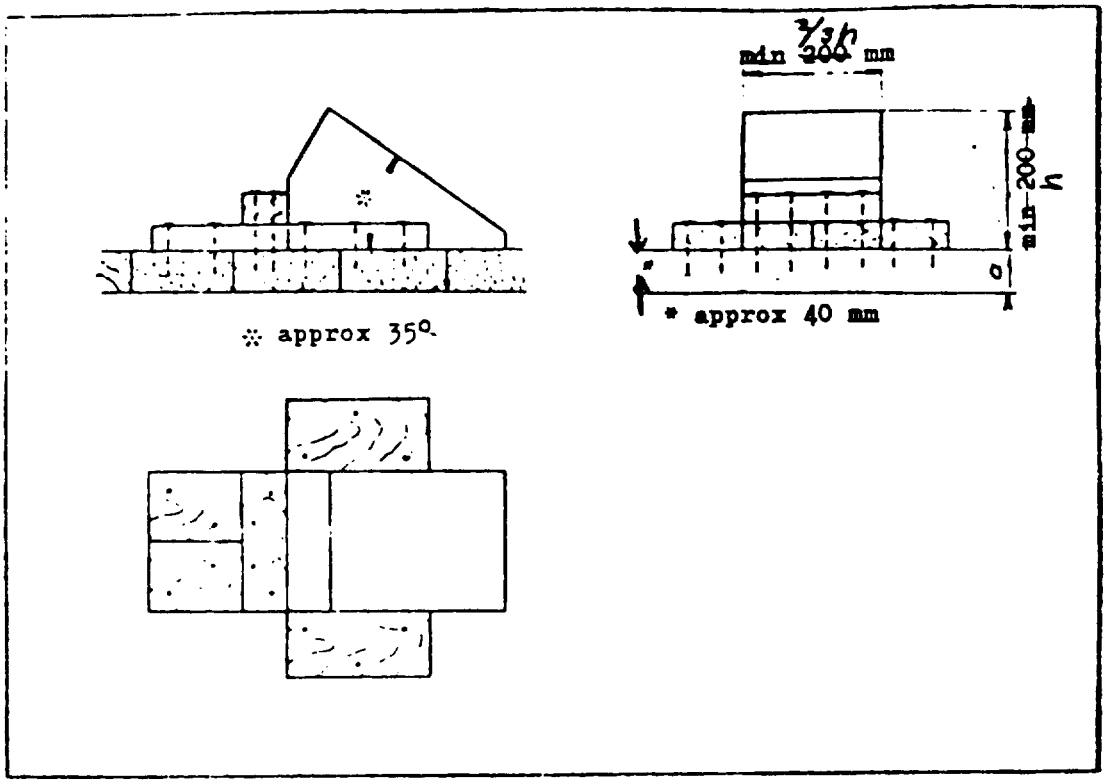
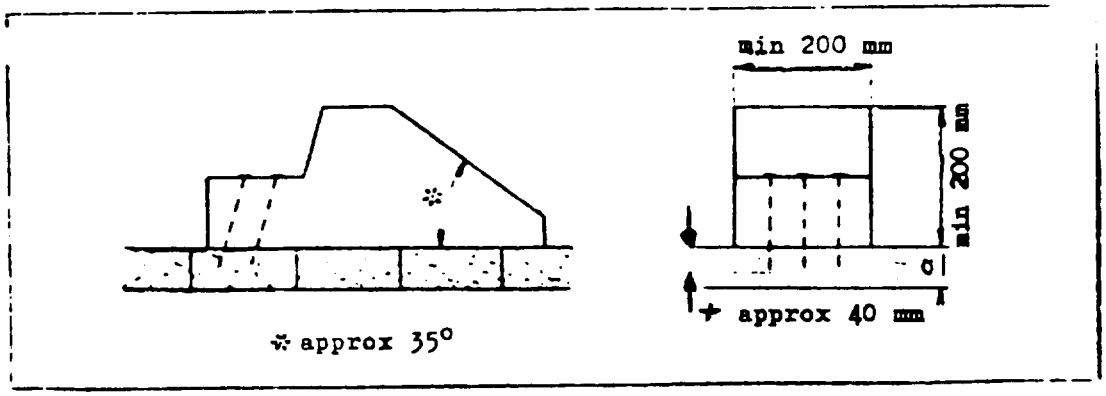


Figure 3

Wooden chock with nailing shoulder



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6. b. (2) For securing in accordance with the Type II tie-down arrangement (see paragraphs 8.o. and 8.e.) a distinction must be made between :

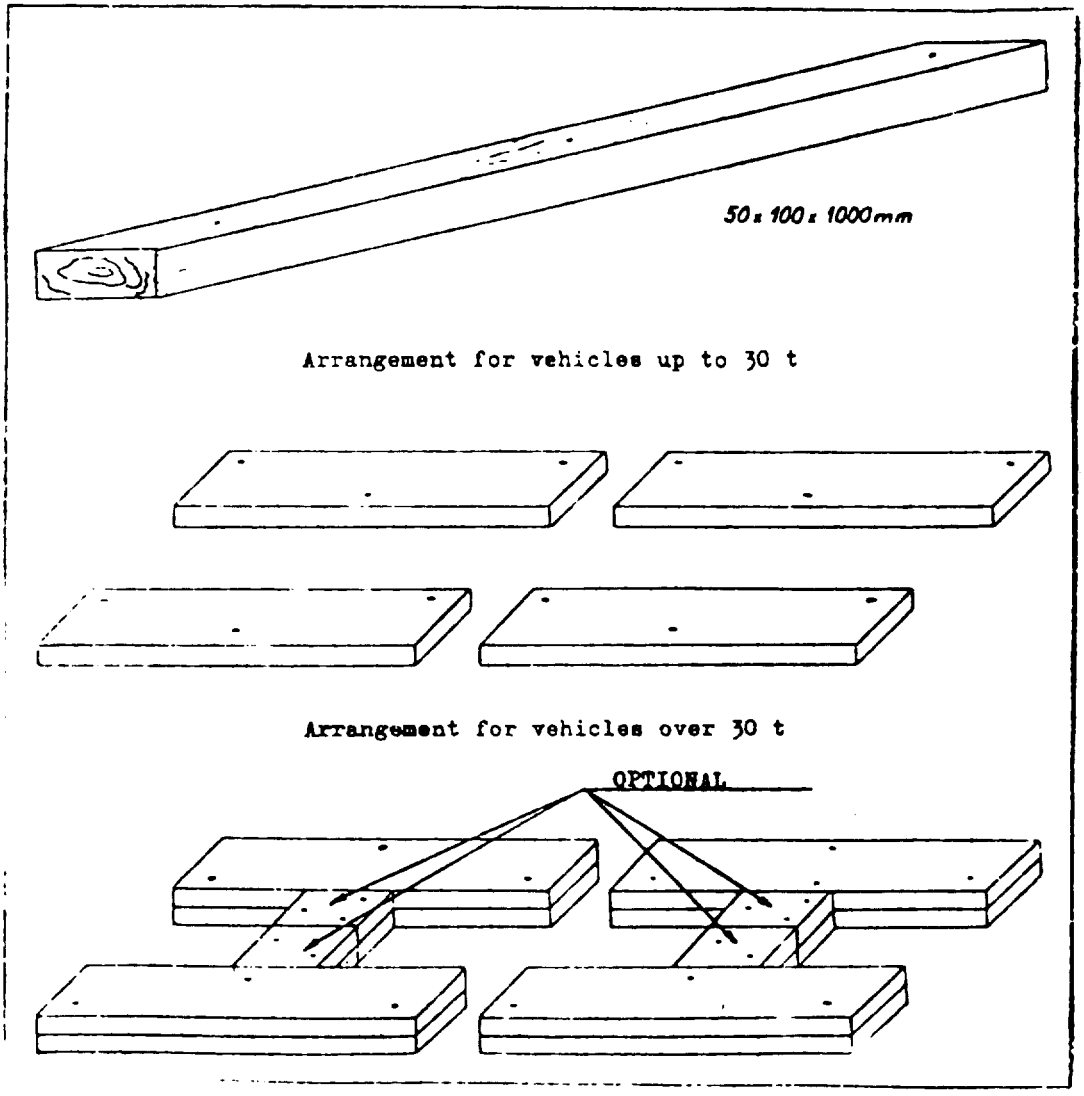
(a) Tracked vehicles (see paragraph 8.c.) for:

i. the lengthwise securing of which only the chocks illustrated in Figures 1 to 3, are to be used;

ii. the crosswise securing of which only the lateral wedging timber illustrated in Figure 4, are to be used.

Figure 4

Lateral wedging timber

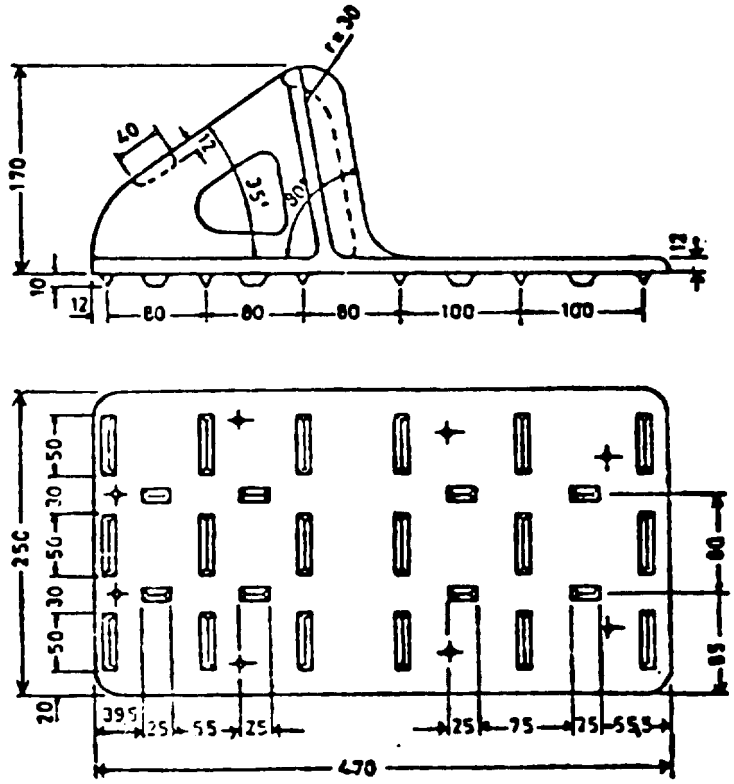


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6. b. (2) (a) As an alternative to lateral wedging timber, special securing appliances of steel or nodular east iron construction are approved which must guarantee equal effectiveness in crosswise securing. However, this includes the NS special securing appliance of modular cast iron (see Figure 5).

Figure 5

NS special securing appliance (measurements in mm)



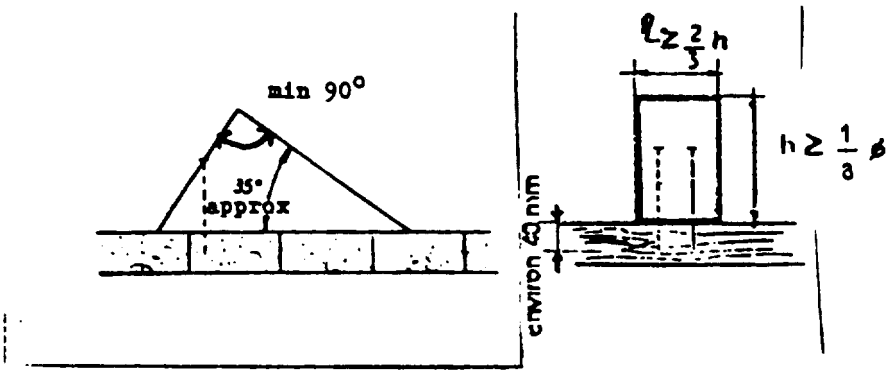
(b) Wheeled vehicles (see paragraph 5.e.) for which chocks and blocks for lengthwise and crosswise securing as well as their tie-down arrangements, must conform with the provisions laid down in Annex II to RIV. Special types of steel chocked (Figure 1) are recommended for securing lengthwise wheeled vehicles or more than ten tons.

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6. b. (2) (b) i The chocks used for lengthwise and crosswise securing must be of one of the patterns shown in Figures 1 to 3 and 6, and must, depending on the weight of the vehicle, have the dimensions shown in the following table.

Figure 6

Wooden chock



Weight of Vehicle (1)	Diameter of wheels (f)	Minimum Height of Chocks (h)	Minimum Width of Chocks (1)	Minimum Number of nails per chock
Up to 5 t	Up to 1 m	12 cm	8 cm	2
Over 5 t	Up to 1, 20 m	15 cm	10 cm	4
Up to 10 t	Over 1, 20 m	18 cm	12 cm	4
Over 10 t	Over 1, 20 m	20 cm	20 cm	6
(1) All tonnages shown are metric (2200 lbs)				

ii The chocks are to be securely fired. The nails used for securing must be driven vertically into the floor and penetrate its thickness to a depth as illustrated in Figures 2 and 3.

7. b. For the Type II tie-down arrangement (see para 8.o. and 8.e.) the cross sections of the tie-down material, depending upon the weight of the vehicle, must be in accordance with the following table:

Type of tie-down	Weight of vehicle	Minimum cross section per tie-down	Minimum diameter per tie-down	
Wire Chains	Up to 10 t	7 mm^2 per t of vehicle weight (1)	(2)	
	Up to 10 t		10 mm	Diameter of chain link of commercial steel (3)
	Over 10 t Up to 15 t		13 mm	
	Over 15 t Up to 20 t		16 mm	
	Over 20 t		18 mm	
Wire ropes	Up to 5 t		8 mm	
	Over 5 t Up to 10 t		12 mm	
	Over 10 t Up to 15 t		14 mm	
	Over 15 t Up to 20 t		16 mm	
	Over 20 t		18 mm	
Hemp ropes	Up to 2 t		25 mm	

NOTES

(1) The number of wires is to be rounded off to the next even number so that the individual wires can be properly twisted.

(2) Wire of 3 mm diameter has a cross section of approximately 7 mm^2
Wire of 4 mm diameter has a cross section of approximately 12.5 mm^2
Wire of 5 mm diameter has a cross section of approximately 20 mm^2

(3) Chains having a smaller diameter of round bar steel may be used if they are made of high-tensile material and afford an equal degree of safety.

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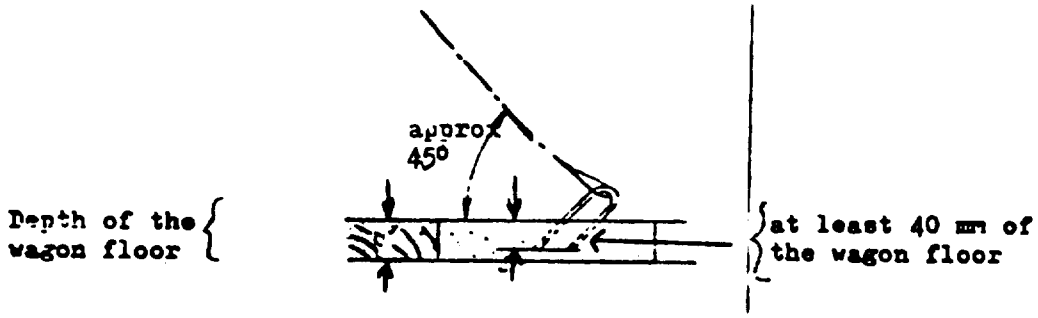
7. c. Fastening of Tie-down Materials to the Railway Wagon:

(1) For tying down the load, the rings, eyelets or hooks (of round steel of at least 16 m diameter) provided for that purpose on the railway wagon or, when these are not provided, appropriate parts of the chassis or body of the wagon should be used wherever possible. The tie-downs must neither pass underneath the bogie nor be attached to the springs, suspension or the bogie of the railway wagon. The tie-down materials must not interfere with the traction or braking equipment, etc. of the railway wagon.

(2) The tarpaulin fixing rings of the railway wagon can be used for securing the loads only when larger diameter rings are not available for this purpose.

(3) When staples are used to hold down the tie-down, they must penetrate the wagon floor at least 40 mm of its thickness, as shown in Figure 7.

Figure 7



d. Requirements for tie-down with wire rode. When tie-down is accomplished by means of a wire rope, it is recommended that heart-shaped thimbles, wire rope clips and shackles be attached at both ends of the wire rope and a tensioning device approximately in the middle of the wire rope, in order to enable simple and safe fastening of the tie-down material to the railway wagon and the vehicle. Figure 8 gives an example of that type of tie-down arrangement.

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Legend

A - Tensioning device.

B - Heart-shaped thimble.

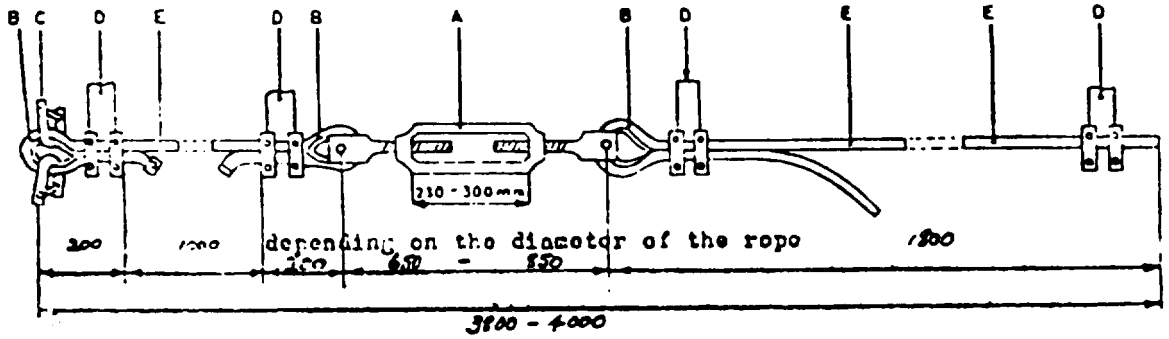
C - Shackles.

D - Wire rope clips.

E - Wire rope.

All dimensions are given in millimeters.

Figure 8



7. e. Requirements for tie-down with wire. Securing the vehicles with wire must comply with the following requirements:

(1) The ends of the wires used for binding must not project.

(2) The number of wires must be even. Wires will be looped through the fastening points (see Figures 9, 10, 11).

(3) The wires must be tightened at one or more points by twisting, using only the method illustrated in Figure 12. Wire which has been twisted by machines may not be used for this purpose.

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Fig. 9

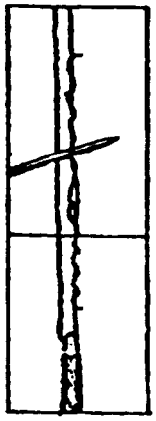


Fig. 10

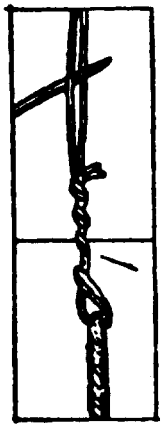


Fig. 11

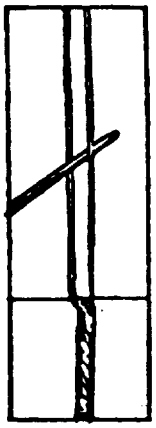


Fig. 12



8. Methods of securing

a. Two types of tie-down arrangements each are approved for securing tracked and wheeled vehicles on railway wagons. Those types of tie-down arrangements, and their use are summarized in the table at Annex C.

b. Securing of Tracked Vehicles by Type I Arrangement:

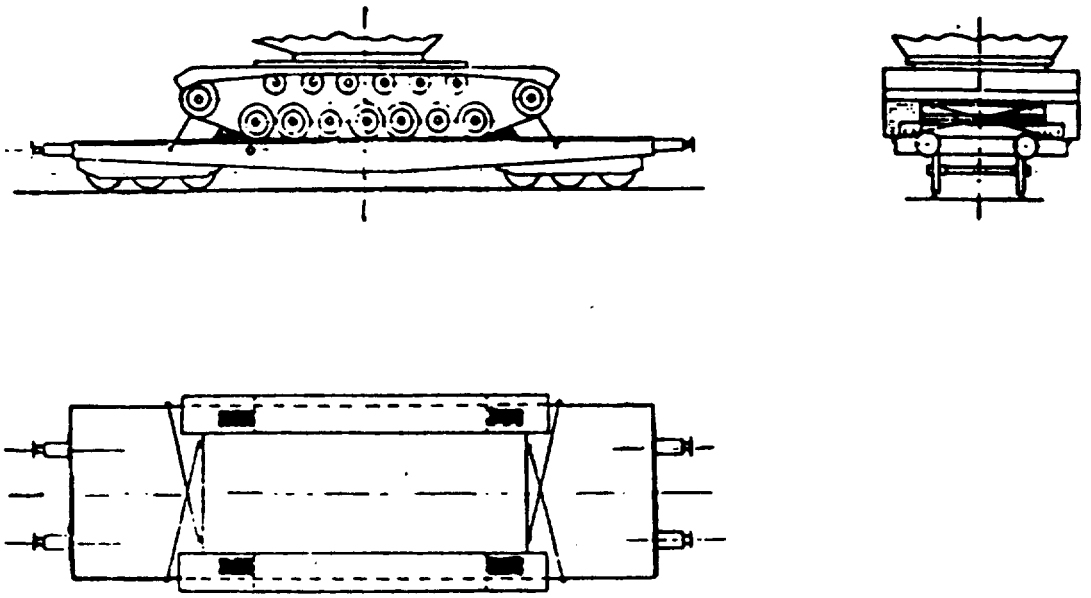
(1) A chock as described in Figures 1, 2 and 5 is to be placed at the front and rear of each track in such a manner that the tracked vehicle rests firmly between the four chocks, as if in a cradle mounting.

(2) Two tie-down as described in sub-para 7.a. are to be attached at either end of each tracked vehicle. As far as possible, these tie-down are to be arranged crosswise and transverse to the direction of travel; they should be only moderately tensioned.

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8. b. (3) Figure 13 illustrates the complete tie-down arrangement.

Figure 13



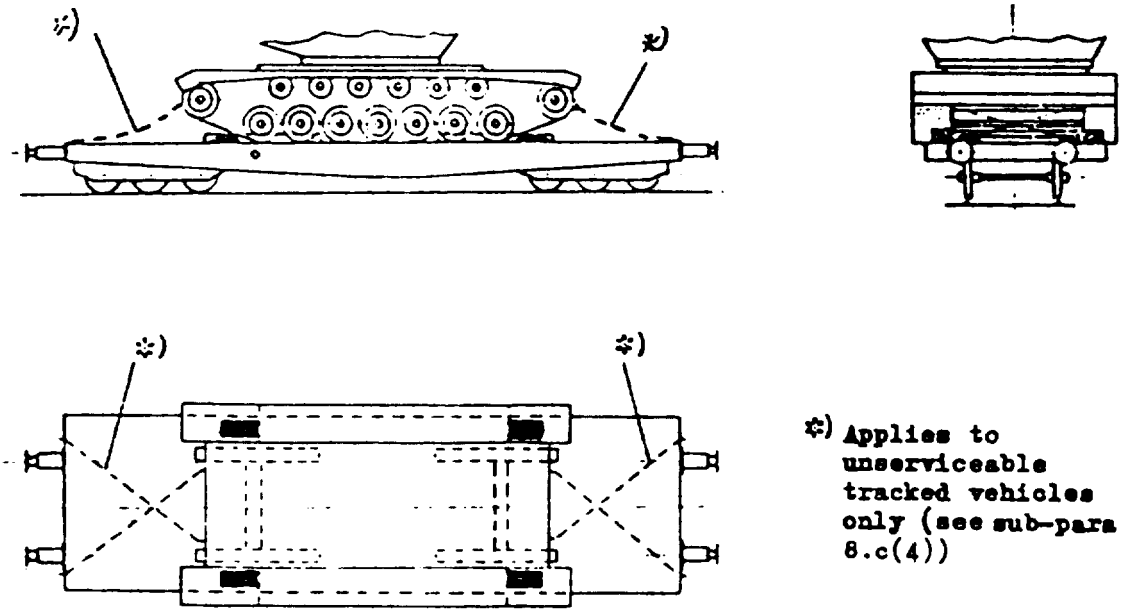
c. Securing of Tracked Vehicles by Type II Arrangements

(1) A chock as described in Figures 1, 2 and 3 is to be placed at the front and rear of each track in such a manner that the tracked vehicle rests firmly between the four chocks, as if in a cradle mounting.
(2) In addition, lateral wedging timber as illustrated in Figure 4 are to be nailed to the wagon floor alongside the outside or inside of the tracks, fore and aft.
(3) In normal cases no tie-down are required (for exceptions see sub-para 8.c.(4)).
(4) 1'here tracked vehicles cannot be immobilized by applying the hand brake or engaging the first gear (i.e. unserviceable tracked vehicles), two tie-down are to be attached at either end of the vehicle concerned as described in sub-para 7.b The tie-down should be only moderately tensioned.

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8. c. (5) Figure 14 illustrates the complete tie-down arrangement.

Figure 14



d. Securing of Wheeled Vehicles by Type I Arrangement:

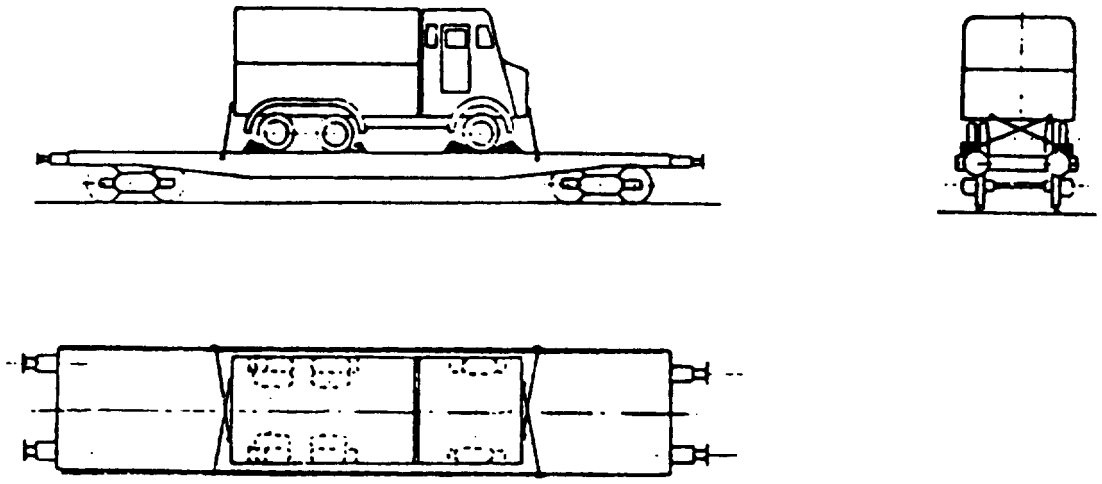
(1) A chock as described in Figures 1, 2 and 3 is to be placed at the front and rear of each wheel except for double-axle assemblies where chocks are placed only at the outside and for twin-wheel assemblies where chocks are placed only at one wheel in such a manner that the wheeled vehicle rests between the chocks as if in a cradle mounting.

(2) Two tie-down 3s described in sub-para 7.a. are to be attached at either end of each wheeled vehicle. As far as possible, these tie-down are to be arranged crosswise and transverse to the direction of travel; they should be only moderately tensioned.

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(5) Figure 15 illustrates the complete tie-down arrangement.

Figure 15



e. Securing of Wheeled Vehicles by Type II Arrangement:

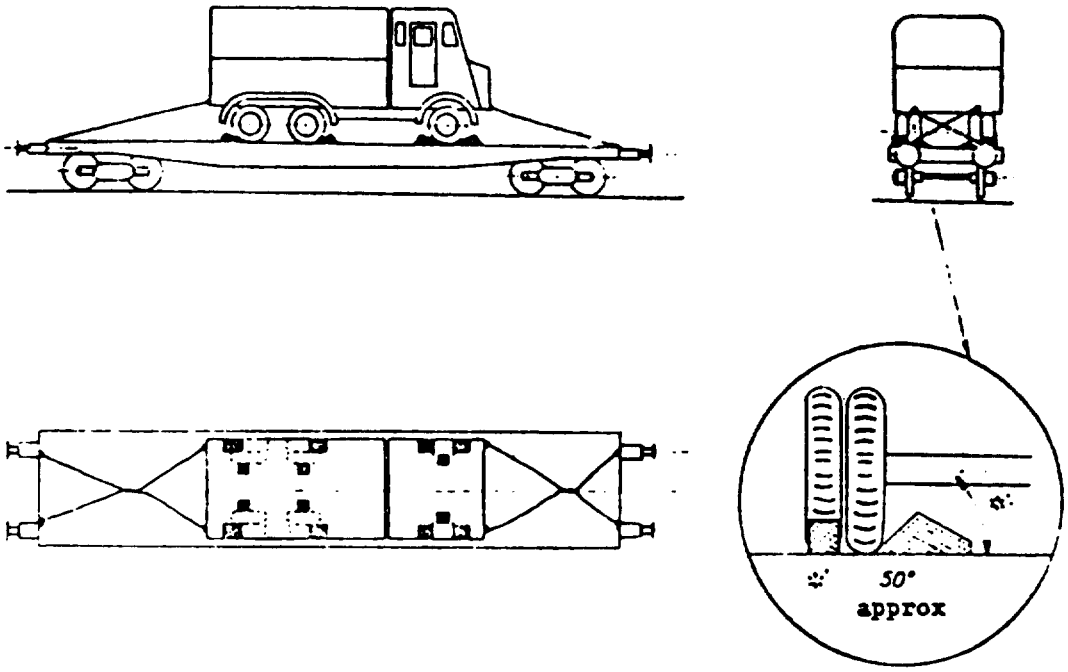
(1) A chock as described in sub-para 6.b.(2)(b) is to be placed at the front and rear of each wheel except for double-axle assemblies where chocks are placed only at the outside and for twin-wheel assemblies where chocks are placed at one wheel in such a manner that the wheeled vehicle rests between the chocks as if in a cradle mounting.

(2) In accordance with Annex II to RIV, additional chocks are to be nailed to the wagon floor at an angle of 50' against the outside or inside flanks of all wheels of vehicles over 1,500 kg in weight, single-axle trailers and semi-trailers, irrespective of their weight (see Figure 16, in circle)

(3) In addition, two tie-down as described in sub-para 7.b. are to be attached at either end of each wheeled vehicle. These tie-down should be only moderately tensioned.

8. e. (4) Figure 16 illustrates the complete tie-down arrangement.

Figure 16



9. Special regulations for transportation by block trains

a. Regulations are less stringent for the transportation of military tracked vehicles, up to 20 t total weight and of military wheeled vehicle, if transportation is carried out by block trains from the point of loading to the point of unloading without any intermediate shunting operations. These vehicles, without exception, are to be loaded on flats fitted with side and end walls, which are to be in upright position and appropriately secured.

b. Tracked vehicles us to 20 t total weight:

(1) The vehicles are to be secured on the railway wagon:

(a) Lengthwise by means of chocks as described in Figures 1, 2and 3.

(b) Crosswise by means of lateral wedging timber, the dimensions of which are to be at least 50 x 100 x 500 mm and which are to be nailed to the wagon floor alongside the inside or outside of the tracks, fore and aft.

9. b. (2) In normal cases no tie-down is required (for exceptions see sub-para. 9.b.(3)).
(3) Where vehicles cannot be immobilized either by applying the hand brake or by engaging the first gear, they are to be lashed down in accordance with sub-para 8.c.(4).

c. Wheeled Vehicles:

(1) The vehicles are to be secured on the railway wagon:

(a) Lengthwise by means of chocks as described in Figures 1, 2 and 3 or sub-para 6.b.(2)(b).
(b) Crosswise by means of chocks against the wheel flanks as described in sub-para 8.e.(2).

Crosswise securing may be dispensed with for vehicles up to 1,500 kg total weight, including all passenger cars and military jeeps irrespective of certain differences in weight.

(2) In normal cases no tie-downs required (for exceptions see sub-para 9.c.(3)).
(3) Where vehicles cannot be immobilized either by applying the hand brake or by engaging the first gear, they are to be tied down in accordance with sub-para. 8.d.(2) or sub-para 8.e.(3).

10. Releasing of Individual Wagons. If for any reason a railway wagon is released from a block train, the provisions as laid down in paras 8.a. to 8.e. for tracked or wheeled vehicles are to be applied prior to its onward routing as an individual wagon.

DEFINITIONS

11. The terms and definitions at Annex A are used for the purpose of this agreement.

IMPLEMENTATION OF THE AGREEMENT

12. This STANAG is implemented when the necessary orders/instructions to adopt the methods described in this agreement have been issued to the forces concerned.

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ANNEX A TO
STANAG 2173
(Edition 3)

DEFINITIONS

The following terms and definitions are used for the purpose of this agreement:

1. Securing. All technical measures to be taken for securing a tracked or wheeled vehicle on a wagon in such a manner that it will not be able to change its position during transport. The most important measures for securing tracked and wheeled vehicles are chocking and tie-down completed in some cases by rigging.
2. Chocking. Securing a tracked or wheeled vehicle by means of chocks, blocks, or pieces of hardwood which are fixed to the wagon floor. A distinction must be made between lengthwise chocking where the vehicle is secured in line with the longitudinal axis of the railway wagon, and crosswise chocking where it is secured in a right angle to the longitudinal axis.
3. Tie-down. Securing of a tracked or wheeled vehicle with tie-down materials (chains, wire, wire-ropes and, cordage), which are fastened both to the vehicle and to the wagon. A distinction must be made between lengthwise and crosswise tie-down.
4. Rigging. Connection established with ropes, wire, cables or chains between:

    a. Moveable parts of a piece of equipment without blocking or locking system, with adjacent fixed parts in order to obtain a rigid assembly.
    b. Light vehicles loaded on the same platform on each other or one within another.

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ANNEX B TO
STANAG 2173
(Edition 3)

UNIFORM TEXT FOR THE CERTIFICATION OF CONFIRMATION TO ENTER INTO THE FREIGHT WARRANT (AS SPECIFIED IN PARAGRAPH 5.g.)

Preliminary remark

This Annex has come into effect on 1 January 1979.

1. For the certificate of confirmation stating that the provisions of paragraphs 5.a to 5.f of the “Regulations for the Securing of Military Tracked and Wheeled Vehicles on Railway Wagons in International Traffic” have been complied with a uniform text will be used agreed upon by the railway NETWORK concerned.
2. The version of the certificate of confirmation will be entered into the freight warrant of the international military consignment, either written by hand, typed or printed and certified after proper loading by the consignor or his deputy responsible for loading indicating name, address, rank or function in the firm.
3. The certificate of confirmation to be given refers to the loading regulations of the respective originating administration into which paragraphs 5.a to 5.f of these "Regulations have been incorporated; the loading regulations of the originating NETWORK are as follows:

   on Luxemburg Railways (CFL):

   tarif marchandises, fascicule I, partie II, ohapitre II, article 14, paragraphe 12

   on German Federal Railway (DB);

   DEMT paragraph 61 (4)

   on Danish State Railways (DSB):

   RIV, bilag 2, afsnit V

   on Italian State Railways (FS):

   RIT, allegato II, punto 30

   on Dutch Railways (NS):

   VBG, Deel IT, Hoofdstuk II

   on Belgian Railways (SNCB):

   RIV, Annexe II, go. 30

   on French Railways (SBCF):

   Prescriptions de Chargement SNCF paragraphe 704.8

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4. The certificate of confirmation will be made out in the national language of the originating administration and entered into the freight warrant. In accordance with the loading regulations of the originating NETWORK the French, German, Danish, Italian and Dutch version of the certificate of confirmation has been agreed upon as follows:

CLF
Je certifie que les dispositions du tarif marhandises, fascicule I, des CFL relatives à l'arrimage de matériels militaires remis a l'échange sont bien respectesr.

....
(Signature, nom, adresse, grade ou fonction dans la firme)

SNCB
Je certifie que les dispositions du RIV, Annexe II, No. 50 de la SNCB relatives à l'arrimage des matériels militaires remis à l'échange sont bien reepectées.

....
(Signature, nom, adresse, grade ou fonction dans la firme)

Ik verklaar dat de bopalingen betreffende het vastzetten van militaire wiel - en rupsvoertuigen, vermeld in RIV, Annex II,
No. 30 van de NMBS nauwkeurig in acht zijn genomen.

....
(Naam, rang en adres of functie in de firma)

SNCF
Je certifie que les dispositions du paragraphe 704.8 prescriptions dechargement SNCF relatives a l'arrimage des materiels militaires remis a l'echange sont bien respectées.

....
(Signature, nom, adresse, grade ou fonction dans la firme)

DB
Ich bestätige, dass die Bestimungen der DB germäse DEMT paragraph 61 (4) für das Befestigen von militärischen Fahrzeugen richtig eingehalten sind.

....
(Unterschrift, Adresee, Dienstgrad oder Funktion bei der Firma)

DSB
Jeg bekraefter, at DSBs bestemmelser for sikring af militaere keretøjer, RIV bilag 2 afsnit V, er rigtig overholdt.

.....
(Navn, stilling, adresse)

FS
Certifico che le prescrizioni di cui al punto 30 dell'allegato II al R.I.V., relative all'assicurazions dei materiali militari presentati allo scambio, sono rispettate.

.....
(Firma, nome, indirizzo, grado o funzione nella societá)

NS
Ik verklaar dat de bepalingen betreffende het vastzetten van militaire wiel - en rupsvoertuigen, vermeld in de "Voorschriften voor het beladen van Goederenwagens" van de N.V. Nederlandse Spoorweeen (VBG, Deel IV, Hoofdstuk II), nauwkeurig in acht zijn genomen.

.....
(Naam, rang en adres of functie in de firma)

The English version is as follows (only for translation purposes):
"I confirm that the provisions of the ..... (originating administration) according to ..... (loading regulations of the originating administration, paragraph, item) for the securing of military vehicles have well been complied with."

.....
(Name, Address, Rank or function in the firm)

5. In international traffic (entrance, transit) the railway administrations concerned recognize the certificate of confirmation given to the originating administration in accordance with paragraph A above. If such certificates of confirmation should be missing in the freight warrant they may subsequently be obtained from the transferee railway at the border.

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ANNEX C TO STANAG 2173 (Edition 3)

SUMMARY OF REGULATIONS CONCERNING THE SECURING OF MILITARY EQUIPMENT

CHARACTERISTICS OF TRANSPORT				References	CHOCKING							TIE-DOWN (moderately tensioned)		
					LONGITUDINAL				LATERAL					
				RIV Annex II		Fig. 15.2a.	Fig. 15.1i.	Fig. 15.1h.			Fig. 30.2a.		30.3.4.	
				AC/15 D/288	Fig. 1	Fig. 2	Fig. 3	Fig. 9 (in circle)	Fig. 4	Fig. 5	Fig. 9 (in circle)	Table 4.3.1	Table 4.3.2	Hand brake applied 1st gear engaged
				STANAG 2173	Fig. 1	Fig. 2	Fig. 3	Fig. (in circle)	Fig. 4	Fig. 5	Fig. 16 (in circle)	Table 7.a.	Table 7.b.	
				Securing material used	Steel spiked chock	Wooden chock secured by timber	Wooden chock with nailing shoulder	Normal Wooden chock	Wedging timber 50X100X 1000mm	NS special securing appliance of modular cast iron	Normal wooden chock	Chains and wire ropes rope	Wire, wire ropes, chains, hemp	
TYPE OF TRANSPORT	INDIVIDUAL BLOCK	WAGON TRAIN (4)	TYPE I	Tracked		X	or X	or X					X	X
				Wheeled		X	or X	or X					X	X
			TYPE II	Tracked		X	or X	or X		X	or X		X (2)	X
				Wheeled		X	or X	or X	or X			X (3)		X	X
			Tracked up to 20			X	or X	or X	or	X (5)				X (2)	X
			Wheeled			X	or X	or X	or X			X (3)	X (2)	X (2)	X

See notes overleaf.

NOTES:
(1) The use of steel spiked chocks is recommended for wheeled vehicles of more than 10 t.
(2) When vehicles cannot be immobilized by applying the hand brake or by engaging the transmission in first gear (inoperative vehicles).
(3) Only for vehicles of more than 1500 kg, 25 for trailers and semi-trailers with one axle, whatever their weight.
(4) If, for any reason, a wagon is detached from a block train, its load must be secured in accordance with Type I or Type II conditions for individual wagons before onward routing.
(5) Wedging timber 50 x 100 x 500 mm.

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RESERVATIONS

US: US Forces in Europe will comply with approved drawings or publications to conform with existing European procedures governed by STANAG 2173. However, US Forces in CONUS must comply with established standards which meet or exceed standards contained in STANAG 2173.

RESERVES

US: Les forces des Etats-Unis en Europe se conformeront aux schémas ou documents approuvés pour se plier aux procédures européennes en vigeur prescrites par le STANAG 2173. Toutefois, dans la zone coninentale des Etats-Unis, elles sont tenues de se conformer à des normes établies dont la sécurité est égale ou superieure à celles du STANAG 2173.

NA-TION	NATIONAL RATIFICATION REFERENCE DE LA RATIFICATION NATIONALE	NATIONAL IMPLEMENTING DOCUMENT NATIONAL DE MISE EN APPLICATION	IMPLEMENTATION/MISE EN APPLICATION					
			FORECAST DATE PREVUE			ACUTAL DATE DATE REELLE		
			NAVY MER	ARMY TERRE	AIR	NAVY MER	ARMY TERRE	AIR
BE	CMTpt/3/103900 of/du 30.100.83					4.84	4.84	4.84
CA	2441-2173 (DTRP 2-2-2) of/du 30.9.81	CFP 303 (10) Part 2				12.86		
DA	M.204.66/S 2173/MAS ARMY of/du 3.11.81	HRN 974-1 HRN 719-1				9.83	9.83	9.83
FR	646/DEF/EMAT/DIV/LOG/SOV of/du 26.2.800	Reglements SNCF et de la Commission militaire des chemins de fer				3.85	3.85	3.85
GE	BMVg-Fü S IV 1-Az 003-51-35 of/du 9.11.81	ZDv 42/200	4.87	4.87	4.87			
GR	F.69/15/449813 SN.304 of/du 300.3.84						5.84	
IT	SMD n.143/0019054/452. 2173 of/du 21.8.81					9.83	9.83	9.83
LU	CMTpt/3/10390 of/du 30.10.83						4.84	
NL	NAS: 22.498/1043/NU of/du 21.8.81					9.83	9.83	9.83
NO	MAS/0633/86/B/HST/TRENI NSP HTK/HCW/SS/ST 2173 of/du 22.05.86					9.86	9.86	9.86
PO	RRN 020/86/DD of/du 27.02.86					3.86	3.86	3.86
TU	Gn.P.P.: 2307-121-84/And. D.MAS.S. (2173) (783) 5 of/du 8.3.84					4.84	4.84	4.84
UK	D/D MOV (a) 54/1/31 Q (Mov) 1 of/du8.3.84	JSP 71				8.86	8.86	8.86
US *	DRCIRD-I of/du 24.9.81					9.83	9.83	

* See reservation overleaf/
Voir réserve au verso

AMENDMENT/AMENDMENT 1

APPENDIX BB
STANAG 2175

NATO STANDARDIZATION AGREEMENT
(STANAG)

CLASSIFICATION AND DESIGNATION OF FLAT WAGONS SUITABLE FOR TRANSPORTING MILITARY EQUIPMENT

Annexes:

A. Classification of Flat Wagons
B. Marking of Flat Wagons
C. Marking of Italian Flat Wagons
D. Classification of Ordinary Military Equipment
E. International Loading Gauge (GIC)
F. Envelope A
G. Envelope B

Related Documents:

STANAG 2158 VF	-	Identification of Military Trains
STANAG 2171 VF	-	Procedures for Military Trains Crossing Frontiers
STANAG 2173 VF	-	Regulations for the Securing of Military Tracked and Wheeled Vehicles on Railway Wagons
STANAG 2832 VF	-	Restrictions for the Transport of Military Equipment by Rail on European Railways

AIM

1. The aim of this agreement is to facilitate the preparation and execution of military transport bv means of:

   a. The classification and marking of wagons.
   b. The parallel classification of ordinary transport military equipment.
   c. The unified sketchbook for exceptional transport military equipment.

AGREEMENT

2. Participating nations agree to:

   a. Adopt the classification and marking of flat wagons as established by European railways and defined at Annexes A, B and C; in accordance with the same provisions, classify and mark the flat wagons they own privately, in agreement with the railways who have registered the wagons.
   b. Classify in parallel their ordinary transport military equipment, in accordance with the above classification.

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c. Declare the unified sketchbook binding on their various formations as a basis for any provisions to bt taken. The unified sketchbook is to be kept up-to-date by the Railways in co-operation with the Armed Forces, who should inform the Railway concerned of the entry into service, withdrawal or change of any military equipment involving an exceptional transport.

DEFINITIONS

3. The following terms and definitions are used for the purpose of this agreement:

a. Ordinary Flat Wagons. Axle fitted flat wagons whose characteristics are those of one of the categories 0 to 3 listed in Annex A and which are suitable for the carriage of ordinary transport military equipment (Note (1)).
b. Special Flat Wagons. Bogie fitted flat wagons whose characteristics are those of one of the categories 4 to 10 listed in Annex A and which are suitable for the carriage of exceptional transport military equipment.
c. Ordinary Transport Military Equipment (Note (2)). Wheeled vehicles, tracked vehicles and equipment which present all of the following characteristics:

(1) Indivisible weight not exceeding 20 tonnes.
(2) Length not exceeding 12.5 metres.
(3) Load distribution: 16.5 tonnes maximum over a length of 2.5 metres minimum.
(4) Requires no lowering of the carrying wagon's drop-sides.
(5) The wagon/equipment unit conforms to the international loading gauge (GIC), with a loading tolerance (15 mm per semi-width).

Notes:

(1) Some equipment which is considered as exceptional transport because of its size may be loaded on ordinary flat wagons.
(2) Designated hereafter as ordinary equipment.

d. Exceptional Transport Military Equipment (Note (3)). The exceptional transport military equipment referred to in this document includes wheeled vehicles, tracked vehicles, and equipment which presents at least one of the following characteristics:

(1) Indivisible weight over 20 tonnes.
(2) Length over 12.5 m.
(3) Load distribution: more than 16.5 tonnes over a length of 2.5 m.
(4) Requires lowering of wagon drop-sides.
(5) The wagon/equipment unit is not in conformity with the international loading gauge (GIC).

GENERAL

4. The transport by rail of military equipment (Note (4)) presents difficulties because of the variety of its characteristics and the need to meet the GIC. Particular attention has therefore to be paid to the correct choice of the type of flat wagon corresponding to each case.

5. Railway Networks have at their disposal various types of flat wagons. Studies have shown that these wagons could be categorized, which simplified the finding of the appropriate one. This classification is the subject of paragraph 8.c.

6. Studies initiated at PBEIST with the aim of simplifying the finding and designating methods of flat wagons suitable for military transport enabled these wagons to be classified into a number of well defined categories. This classification is the subject no paragraph 8.c. On the other hand, it has not been possible to establish a classification of all types of military equipment similar to that used for flat wagons, because of their variety.

DETAILS OF THE AGREEMENT

7. Loading and Traffic Studies

a. All transport of military equipment requires a loading study and, if it comes within the terms of paragraph 7.c. below, a traffic study.

Notes:

(3) Designated hereafter as exceptional equipment.
(4) The word equipment for the purpose of this text includes all vehicles, materiel or equipment of the Armed Forces.

b. The purpose of the loading study is to:

(1) Find and designate flat wagons suitable for transporting the equipment to be loaded (several wagon/load combinations are generally possible for the same item of equipment).
(2) Define the specific loading conditions (location on the wagons, number of items which can be loaded, partial dismantling, etc.).
(3) Check the compatibility with the loading gauge.

c. A traffic study of the carrying wagon/load unit is necessary to determine the suitable route and the traffic constraints on that route when the loading study concludes that:

(1) The GIC is exceeded (Note (5)).
(2) The load limits of the normal category of the railway lines are exceeded (Note (6)).

8. Classification and Marking of Flat Wagons

a. Aim and Applicability

(1) The classification of wagons is to facilitate:

(a) The designation of flat wagons required.
(b) The control of loading.
(c) The monitoring of special flat wagons by the Central European Clearing Office.

(2) The classification applies to most of the flat wagons of the European Railways and to the wagons belonging to the Armed Forces and registered as privately owned ones, which are stationed in Allied Command Europe.

b. Basis for the Classification of Wagons

(1) Although it is based on the uniform marking adopted by the Union Internationale des Chemins de Fer (UIC), the European classification system for flat wagons refers to those minimum characteristics presented by the equipment on hand in the railways rolling stock which give a better definition of their ability of transporting military equipment, namely:

(a) Usable floor length.

Notes:

(5) For traffic over SNCF lines. On the other railways, the traffic study will be carried out in the event of incompatibility with the loading gauge of the railway concerned.
(6) In accordance with UIC leaflet 700 - Line Classification.

(b) Usable floor width (with drop-sides raised where they are fitted).
(c) Wheel base (distance between axles or bogie pins).
(d) Height of loading surfaces above the rails unladen and new. Upper and lower limits are required in order to:

(i) Prevent the equipment loaded on ordinary flat wagons from encroaching the gauge.

(ii) Prevent, when the floor is lowered by the load, the risk of contact with the platforms and the lower parts of the gauge, particularly when the load exceeds the usable width of the wagon.

(e) Permissible wagon load.
(f) Permissible concentrated load. The characteristics are shown either by means of a precise value, or one or two limiting values.

(2) As far as possible, similar principles have been followed in categorizing ordinary and special flat wagons.

c. Classification

(1) Flat wagons are broken down into eleven categories:

(a) Four for ordinary flat wagons (0, 1, 2, 3).
(b) Seven for special flat wagons (4, 5, 6, 7, 8, 9 and 10).

The table listing these classifications is at Annex A.

(2) In order to be classified within a given category, a type of wagon must meet all characteristics of this category.
(3) Minimum characteristics established for a category of wagons correspond to those of the type of wagon classified into this category which offers the characteristics least favourable for military transport. As a consequence, a load which does not exceed these characteristics can he loaded on any wagon of that category.
(4) Ordinary flat wagons have been broken down into progressive categories (see Annex D). Therefore, all ordinary flat wagons in one category can be replaced by another in a higher category. This principle is not valid for special flat wagons. The replacement of these wagons can only take place after consulting the unified sketchbook.

d. Classification Marking on Flat Wagons:

(1) Purpose of the Marking. The purpose of marking the flat wagons is to simplify their identification when writing a request for military transport by rail.

(2) Execution. The marking reproduces the number of the category to which the wagon belongs: the shapes, dimensions, colours and positions of the markings on the wagons are defined at Annex B, and at Annex C for the Italian wagons.

(3) Unclassified Wagons Suitable for Military Transports. Some special wagons which are particularly suitable for certain transports (low bed, and some UK armed forces wagons) have not been classified into numbered categories (Note (7)). In order not to miss the opportunity to use them, they are designated by the marking UIC (alphabetic lettering and 11 digit numbers in the documents, and particularly in the sketchbook). Only the UK armed forces wagons have received the marking shown at Annex B, but the number is replaced by the letters UK.

9. Designation of the Ordinary Flat Wagons Used for Transporting Ordinary Equipment

a. Parallel Classification. A large number of ordinary equipment, which does only require a loading study in advance, can be transported on the four categories of ordinary flat wagons listed at Annex D. This has permitted the establishment of a parallel system of classification based on a comparison of the characteristics of ordinary equipment and those of ordinary flat wagons.

b. Classification Criteria of Ordinary Equipment. The classification of ordinary equipment is based on the following considerations:

(1) Maximum weight of equipment, combat ready (excluding personnel).

(2) Weight distribution, which is calculated as a function of the length of the bearing surface (tracks, skids...) or the wheelbase (wheeled equipment).

(3) Maximum length, which must not exceed the usable length of the wagon taking into account the Regulations of the RIV Annex II, and a loading tolerance of + 100 mm.

Note:

(7) Characteristics of the relevant British flat wagons:

a.	Usable floor length	:	12.2 m
b.	Usable width	:	3.09 m
c.	Wheel base	:	9.15 m
d.	Height of floor unladen	:	1.355 m
e.	Permissible load	:	40 to 58 metric tonnes
f.	Concentrated load	:	51 metric tonnes/3.5 m.

(4) Maximum width, determined as follows:

(a) Between the ground and 0.600 m in height, equal at most to the width between the drop-sides, less 15 mm per half-width (loading tolerance).
(b) Beyond 0.600 m in height, compatible with the GIC, less 15 mm per half-width (loading tolerance).

c. Determination of Categories of Ordinary Equipment

(1) For the classification of ordinary equipment into a given category, all the characteristics of that equipment must be compatible with those of the lowest wagon category suitable for transporting it.
(2) In order to reduce the number of wagons required for a transport, the possibility should be considered to group several items equipment on the same wagon. In this case no progression is applicable.
(3) Although it is generally feasible, it is not advisable to replace ordinary flat wagons by special flat wagons except with the agreement of the Railway.
(4) Certain Armed Forces have drawn up documents setting out the parallel classification of their equipment and the ordinary flat wagons. The category of wagons on which it can be loaded is shown opposite its designation. The choice of the suitable wagon occurs at once.

10. Designation of Flat Wagons Used for Transporting Exceptional Equipment.

The designation of flat wagons suitable for transporting exceptional equipment is complex since the loading problems interfere with the traffic problems, as covered by STANAG 2832.

a. Need to Facilitate the Traffic Studies Related to Exceptional Transports:

(1) The limited dimensions of the GIC (Annex E) impose a number of constraints on the transportation of exceptional equipment by rail.
(2) In order to utilize to the best advantage the railway infrastructure, two progressive overall envelopes named "A" (Annex F) and "B" (Annex G) have been defined, permitting the classification into two groups of a major part of exceptional military transports:

(a) Envelope A exceeds the GIC as far as height is concerned.
(b) Envelope B exceeds the GIC as far as height and width are both concerned.

Both envelopes are vertically symmetrical and their contours above 3.370 m from the top of the rail are similar.

(3) The inventory of the railway network lines of NATO countries which allow free passage of the carrying wagon/load units fitting into one or the other of these envelopes resulted in the drawing up of two maps:

(a) one for the lines capable of accepting envelope A;
(b) one for the lines capable of accepting envelope B.

b. Impracticability of Establishing a Parallel Classification of Exceptional Equipment and Flat Wagons Suitable for Transporting them

(1) Exceptional equipment is normally loaded on special flat wagons of categories 4 to 10 and if required on ordinary flat wagons of categories O to 3 and on non-classified special wagons which are designated by means of their UIC serial number or by the letters "UK".

(2) All wagon/load units which are deemed suitable after the loading study conducted for each exceptional equipment do not generally fit into the same envelope. As a result, the traffic conditions could be different according to the type of wagon utilized. Since these conditions can only be determined after considering the point of departure and arrival, the classification a "a priori" of category (or series) of wagons best adapted to the transport of an exceptional equipment, is in most cases not feasible. Furthermore, since the progression has not been made between categories of special flat wagons, a parallel classification similar to the one used for ordinary equipment, which would be workable everywhere and under all conditions, cannot be established between exceptional equipment and special flat wagons.

c. Unified Sketchbook for Exceptional Military Transport. In order to make possible the designation within a proper timescale of the flat wagons suitable for transporting exceptional equipment, the PBEIST Rail Transport Sub-Committee has prepared a unified sketchbook which includes for each relevant equipment the results of the loading studies as well as the static data required for the traffic studies.

(1) This document includes a variable number of sheets. Each exceptional equipment appears on a sheet which bears a four digit number. The numbering system has been established to prevent an equipment used by several armies from being designated by different numbers called code numbers (Note (8)). Each sheet provides the following information:

Note:

(8) STANAG 2832, Part 4 - Gives all guidance about the unified sketchbook.

(a) Sketch of the equipment.
(b) Wagons suitable for exceptional equipment are designated by:
(i) The number of the category when all wagons included in it can be utilized.
(ii) The number of the category and the international UIC number or the number of the category and the initials of the owner network when only one series of wagons classified in this category is suitable.
(iii) The UIC number when wagons are not classified.
(c) Envelope prepared for each wagon/load unit.
(d) If required, special loading conditions (partial dismantling to be carried out, displacement of axis, etc.).

(2) The designation of category of wagons suitable for transporting an exceptional equipment between two given points is carried out by the consigning railway network, which will compare the data contained in the unified sketchbook and the traffic maps. It will also take into account the availability of special flat wagons close to the loading point. Consequently, the consignor of exceptional equipment will only have to indicate:
(a) The departure and arrival points.
(b) The number of equipment to be transported.
(c) The number of sheets related to this equipment.

11. Marking of Military Equipment. The Armed Forces may deem it advisable to mark their equipment with the number of the appropriate wagon category. This permits them to quickly determine if a load is "exceptional" or "ordinary" and to establish the compatibility of the loads to be transported.

IMPLEMENTATION OF THE AGREEMENT

12. This STANAG is implemented when the necessary orders/instructions have been issued directing the forces concerned to put the content of this agreement into effect.

NATO UNCLASSIFIED/OTAN SANS CLASSIFICATION

ANNEX A TO/ANNEXE A AU
STANAG 2175
(Edition 3)

CLASSIFICATION OF FLAT WAGONS/CLASSIFICATION DES WAGONS PLATS
CHARACTERISTICS OF THE CATEGORIES OF ORDINARY AND SPECIAL WAGONS/
CHARACTERISTIQUES DES CATEGORIES OF WAGONS ORDINAIRES ET SPECIAUX

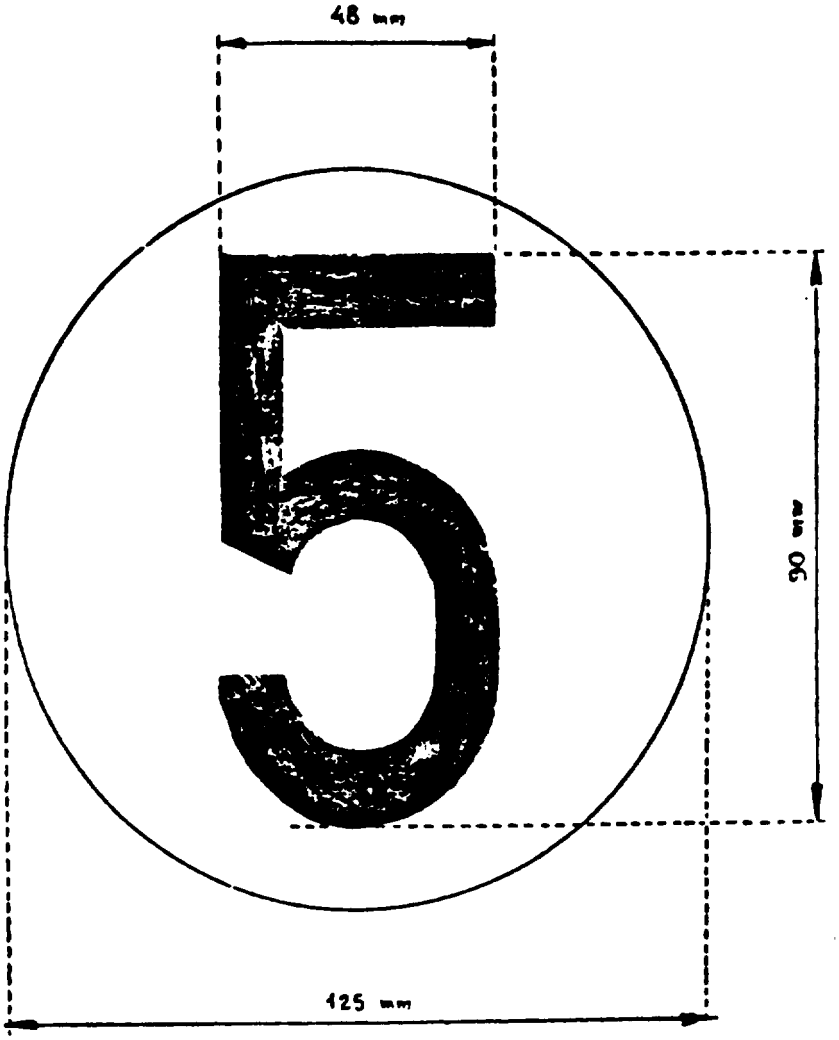
CATEGORY/ CATE-GORIE	USABLE FLOOR LENGTH/ LONGUEUR UTILE DU PLANCHER FLOOR LENGTH/ LONGUEUR DU PLANCHER	FLOOR WIDTH - LARGEUR		WHEEL BASE/ EMPATTEMENT	HEIGHT OF LOADING SURFACES UNLADEN AND NOW/HAUTEUR DU PLAN DE CHARGEMENT SOUS TARE ET A L'ETAT NEUF	MINIMUM LOAD WHICH THE WAGON MUST BE ABLE TO CARRY/ CHARGE MINIMALE QUE LE WAGON DOIT POUVOIR SUPPORTER	MINIMUM LOAD FOR A GIVEN BEARING LENGTH/CHARGE MINIMALE SUPPORTEE EN FONCTION DE LA LONGUEUR D'APPUI	REMARKS/ OBSERVATIO
		USABLE/UTILE	BAND SPAN/ PASSAGE EN BOUT 2.1 e Ope 27					
(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
0	L ⩾ 9m	⩾ 2,470m	⩾ 2,470m	7,320 m ⩽ a ⩽ 8,000 m	1,235m ⩽ h ⩽ 1,300m	15t ⩽ c ⩽ 20t	⩾ 5t/2,5m	
1	7m ⩽ L ⩽ 12m	⩾ 2,470m	⩾ 2,470m	4,100 m ⩽ a ⩽ 4,500 m	1,220m ⩽ h ⩽ 1,250m	⩾ 20t	⩾ 10t/2,5m	
2	9m ⩽ L ⩽ 12m	⩾ 2,560m	⩾ 2,560m	6,700 m ⩽ a ⩽ 8,000 m	1,220m ⩽ h ⩽ 1,250m	⩾ 20t	⩾ 10t/2,5m	
3	L ⩾ 12,500m	⩾ 2,770m	⩾ 2,770m	a = 8,000 m	1,220m ⩽ h ⩽ 1,250m	⩾ 20t	⩾ 16,5t/2,5m	
4	L ⩾ 12,500m	⩾ 2,770 m	⩾ 2,770 m	8,500m ⩽ a ⩽ 9,000m	1,220m ⩽ h ⩽ 1,270m	⩾ 40t	⩾ 54t/3,5m	
5	11,260m ⩽ L ⩽ 13,100m	⩾ 2,850 m	-	7,260m ⩽ a ⩽ 9,300m	1,220m ⩽ h ⩽ 1,310m	⩾ 50t	⩾ 46t/3,5m	
6	8,800m ⩽ L ⩽ 9,950m	3,110 ⩽ l ⩽ 3,150m	-	5,800m ⩽ a ⩽ 6,150m	1,240m ⩽ h ⩽ 1,310m	⩾ 52 t	⩾ 50t/3,5m	
7	L ⩽ 15m	3,080m ⩽ l ⩽ 3,140m	-	8,460m ⩽ a ⩽ 9,150m	1,240m ⩽ h ⩽ 1,300m	⩾ 89t	⩾ 62t/4m	
8	L ⩽ 11,200m	⩾ 3,150m	-	= 7,200m	1,260m ⩽ h ⩽ 1,310m	⩾ 80t	⩾ 76t/4m	
9	L ⩾ 18,500m	⩾ 2,740m	⩾ 2,740m	13,000m ⩽ a ⩽ 14,860m	1,235m ⩽ h ⩽ 1,305m	⩾ 40t	⩾ 27t/3m	Without dropsides/ Sans bords latéraux rabattables
10	L = 18,500m	⩾ 2,640m	⩾ 2,640m	a = 14,460m	h = 1,235m	⩾ 40t	⩾ 32t/2m	With dropsides/ Avec bords latéraux rabattables

ANNEX B TO/ANNEXE B AU
STANAG 2175
(Edition 3)

MARKING OF FLAT WAGONS
MARQUAGE DES WAGONS PLATS

Figures 0 to 10
in accordance with
the category/

suivant la categorie



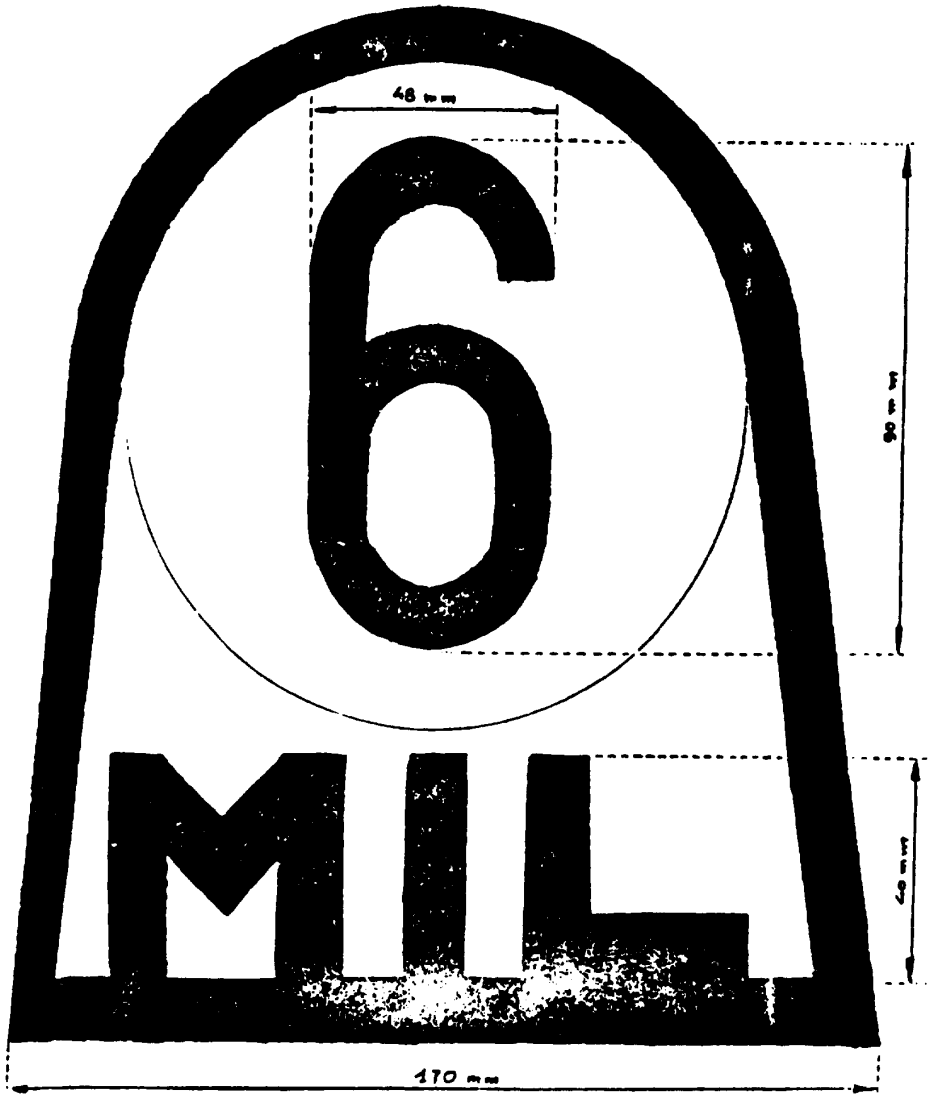
Position : - On both sides of the body or side member (sole-bar), on the right when facing the wagon.
Colour : - Dark figure on white background.
Position : - Sur les deyx faces laterales de la caisse ou du longeron du en regardant le wagon.
Coulour : - Chiffre fonce sur fond blanc.

ANNEX C TO/ANNEXE C AU

STANAG 2175
(Edition 3)

MARKING OF ITALIAN FLAT WAGONS
MARQUAGE DES WAGONS PLATS ITALIENS

Figures 0 to 10 in accordance with the category.



Position : On both sides of the body or side member (sole-bar), on the right when facing the wagon.
Colour : Dark figure on white background
Position : Sur les deyx faces laterales de la caisse ou du longeron du chassis, a droite in regardant le wagon
Couleur : Chiffre fonce sur fond blanc.

NATO UNCLASSIFIED

ANNEX D TO
STANAG 2175
(Edition 3)
(1st Draft

CLASSIFICATION OF ORDINARY MILITARY EQUIPMENT AND CATEGORIES OF ORDINARY FLAT WAGONS SUITABLE FOR THEIR TRANSPORTATION

Characteristics of equipment								Category of ordinary flat wagons suitable for transport (2)
Category	Maximum total load	Maximum authorized concentrated load	Maximum length at different heights in relation to the ground (1)			Maximum width at different heights in relation to the ground (2)		
			0 < h < 600	600 < h < 900	h < 900	0 < h < 600	h > 600	
0	15 tonnes	$\frac{5}{2,50}$	7,00 m	7,40 m	7,80 m	2,47 m - 0,03 m	Conditions of inscription in the GIC (Annex II to RIV)	0 - 1 - 2 - 3
1	20 tonnes	$\frac{10}{2,50}$						1 - 2 - 3
2	20 tonnes	$\frac{10}{2,50}$	9,00 m	9,40 m	9,80 m	2,56 m - 0,03 m		2 - 3
3	20 tonnes	$\frac{16,5}{2,50}$	12,50 m	12,90 m	13,30 m	2,77 m - 0,03 m		3

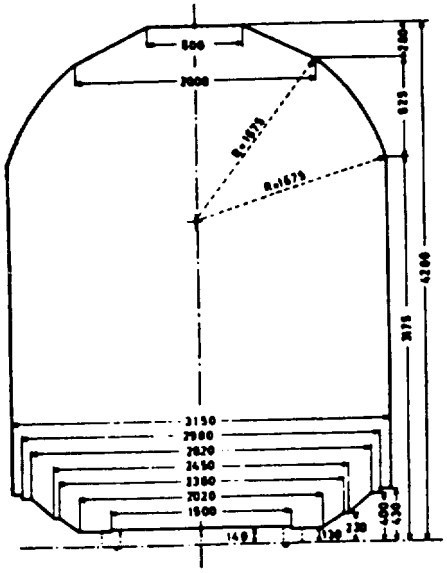
(1) These lengths make allowance for a possible overhang at both ends of the wagon, in accordance with Annex II of RIV, and a longitudinal loading tolerance of 100 mm in accordance with para.6.2.3. or Chapter 6 of AC/15-6PPIWP 357

(2) $0,03_m$- Loading tolerance

ANNEX E TO/ANNEXE E AU
STANAG 2175
(Edition 3)

INTERNATIONAL LOADING GAUGE/GABARIT INTERNATIONAL DE CHARGEMENT

Dimensions are shown in millimetres.
Les dimensions sont indiquees en millimetres.



Rail level/Plan de roulement

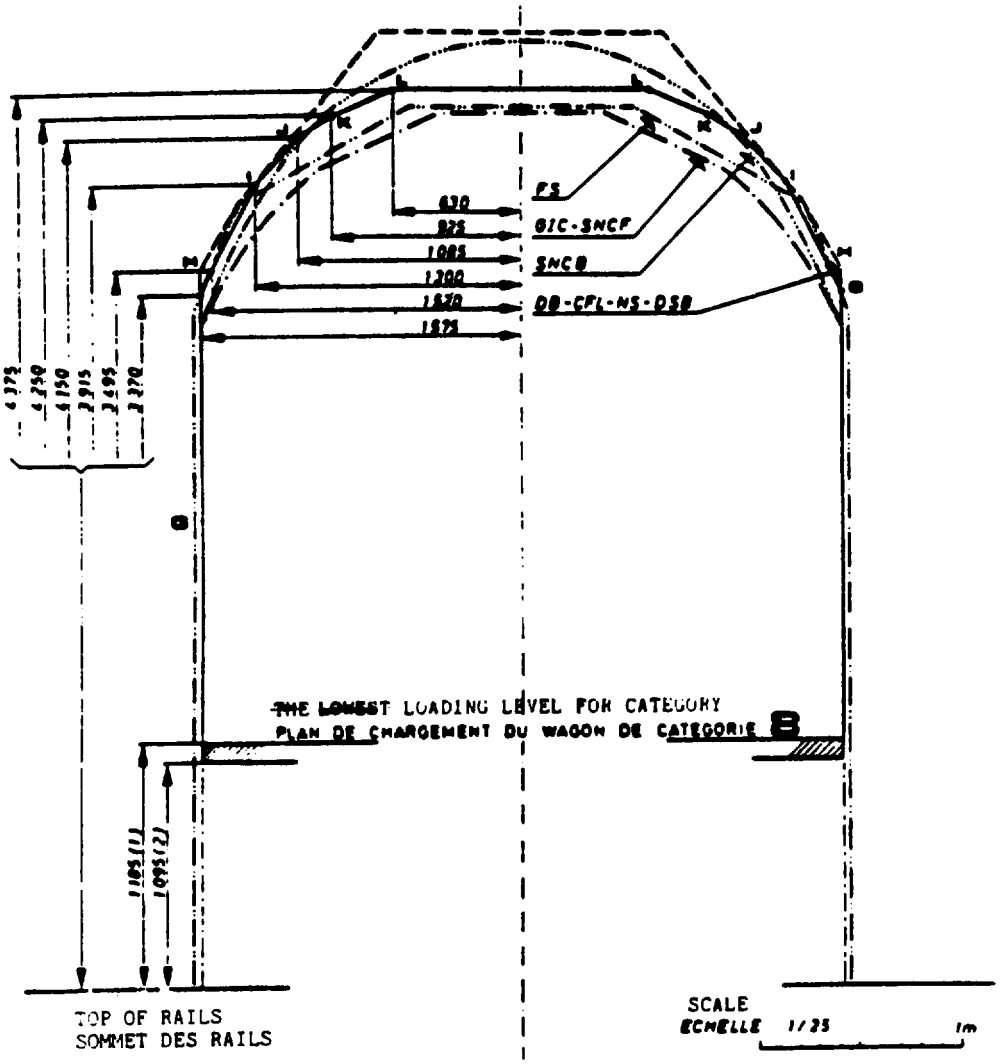
NATO UNCLASSIFIED

ANNEX F TO/ANNEXE F AU
STANAG 2175
(Edition 3)

ENVELOPE A
ENVELOPPE A

ENVELOPE A/ENVELOPPE A (1)
ENVELOPE A/ENVELOPPE A (2)

STRAIGHT STRETCH CONFIGURATION
ENVELOPPE EN ALIGNMENT



Notes:

(1) 1185 = Minimum static load height for consignments passed for line traffic and on tracks running alongside SNCF- type platforms for goods trains (Highest loading level for the wagons included in category 1.310 m with static deflection of 125 mm).

(2) 1095 = Minimum static load height for consignments passed for line traffic, but not admitted on tracks running alongside SNCF type platforms for goods trains (Lowest loading level for the wagons included in category 1.220 m with static deflection or 125 mm).

Notes:

(1) 1185 Hauteur minimale sous charge statique pour les transportsautorises a circuler en ligne et sur les voies borddes de quais a marchandises type SNCF (plan de chargement des wagons leas plus hauts repris en categorie 1,310 m et prisentant un affaissement statique de 125 mm).

(2) 1095 Hauteur minimale sous charge statique pour lea transportsautorisis a circuler en ligne, mais interdits sur les voies bordies de quais a marchandises type SNCF. (Plan de chargement des wagons les plus basrepris en catigorie 1,220 m et presentant un arfaissement statique de 125 mm.)

NATO UNCLASSIFIED

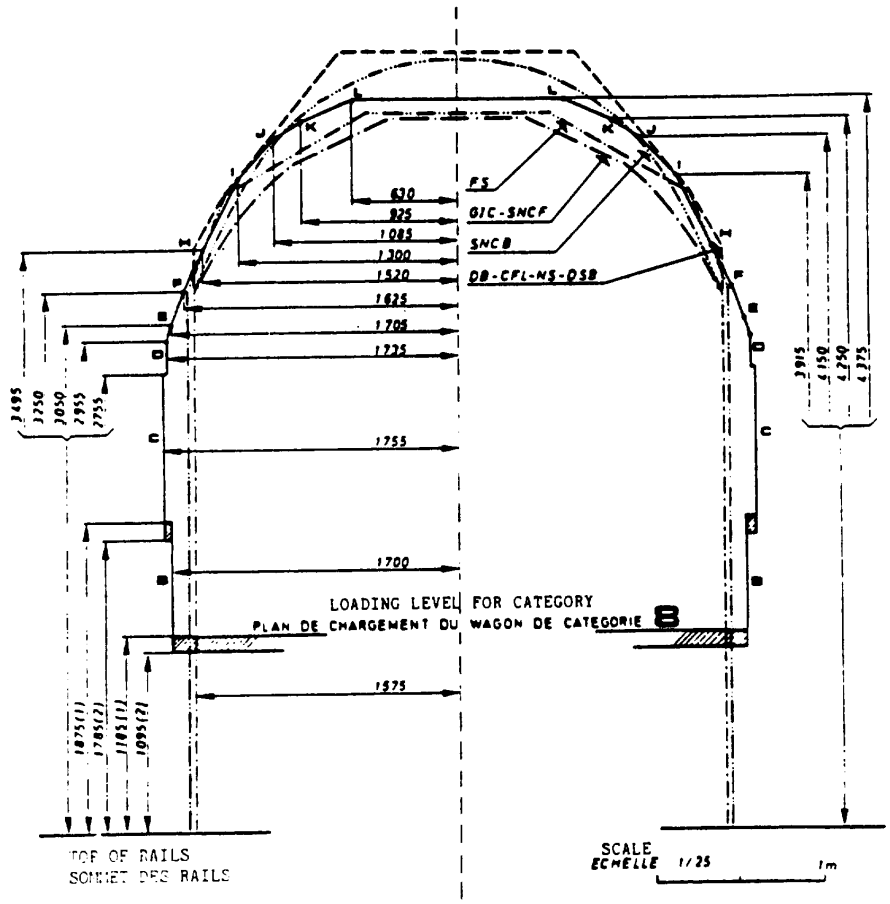
ANNEX G TO/ANNEXE G AU
STANAG 2175
(Edition 3)

ENVELOPE B
ENVELOPPE B

ENVELOPE B/ENVELOPPE B:
Lower limit exceeding GIC/
Limite inferieure de depasse-
ment du GIC: 1185-1875 (1)

ENVELOPE B/ENVELOPPE B:
Lower limit exceeding GIC/
Limite inferieure de depasse-
ment du GIC: 1095-1785 (2)

STRAIGHT STRETCH CONFIGURATION
ENVELOPPE EN ALIGNEMENT



Notes:

(1) 1185) Minimum static load height for consignments passed for line traffic and on tracks running alongside SNCF
1875) type platforms for goods trains. (Highest loading level for the wagons included in category 1.310 m. with static deflection of 125 mm).

(2) 1095) Minimum static load height for consignments passed for line traffic, but not admitted on tracks running
1785) alongside SNCF type platforms for goods trains. (Lowest loading level for the wagons included in category 1.220 m with static deflection of 125 mm).

Notes:

(1) 1185) Hauteur minimale sous charge statique pour les transportsautorises 1875) a circuler en ligne et sur les voies 1875) bordees de quais i marchandises type SNCF (plan de chargement des wagons les plushaut repris en categorie 1,310 m et presentant un affaissement statique de 125 mm).

(2) 1095) Hauteur minimale sous charge statique pour les transportsautorises 1785) a circuler en ligne, mais interdits 1785) sur les voies bordees de quais a marchandises type SNCF. (Plan de chargement des wagons les plus bas repris en categorie 1,220 m et presentant un affaissement statique de 125 mm.)

NATO UNCLASSIFIED

STANAG 2175
(Edition 3)

RATIFICATION AND IMPLEMENTATION DETAILS
STADE DE RATIFICATION ET DE MISE EN APPLICATION

NATION	NATIONAL RATIFICATION REFERENCE DE LA RATIFICATION NATIONALE	NATIONAL IMPLEMENTING DOCUMENT NATIONAL DE MISE EN APPLICATION	IMPLEMENTATION/MISE EN APPLICATION					
			FORECAST DATE DATE PREVUE			ACTUAL DATE DATE REELLE		
			NAVY MER	ARMY TERRE	AIR	NAVY MER	ARMY TERRE	AIR
BE	CMTpt/3/03971 of/du 04.04.86	IF 23				4.87	4.87	4.87
CA	2441.2175 (DTRP 2-4-5) of/du 25.04.86	B.GL.303-010 FP.002 Vol. 10		12.86				
DA	M.204.66.S.2175/MAS ARMY 10453 of/du 21.04.86	HRN 717-1				10.87	10.87	10.87
FR	217/DEF/EMAT/DIV LOG/JOV/ TRT/CCF of/du 27.08.86							
GE								
GR	F.069.17/7/298941/D171/ 19/2/86 HAGS/DPPD of/du 19.02.86	STANAG 2175					4.87	
IT								
LU	CMTpt/3/03971 of/du 04.04.86	IF23					4.87	
NL	NAS 83276/51267/NU of/du 24.06.86	VS 55-20				4.87	4.87	4.87
NO	MAS/1376/86/HST/TRENINSP/ HTU/HCW/SS/STANAG 2175 of/du 31.12.85					6.86	6.86	6.86
PO	RRN 069/86/DD of/du 09.06.86						10.86	
TU	Gn.P.P.:2307.240.86/AND.D. MAS.S(2175)(1227) of/du 09.04.86							
UK	D/D Mor(A) 54/1/32 Q(Mov)1 of/du 04.03.86	JSP 71	-	8.86	8.86			
US	AMSMC-MC/S of/du 20.06.86	FM 55-20				10.86	10.86	10.86

pt OTAN SANS CLASSIFICATION

N O R T H A T L A N T I C T R E A T Y O R G A N I Z A T I O N
O R G A N I S A T I O N D U T R A I T E D E L' A T L A N T I Q U E N O R D

MILITARY AGENCY FOR STANDARDIZATION (MAS)
BUREAU MILITAIRE DE STANDARDISATION (BMS)

1110 BRUSSELS
TEL: 241.00.40- 241.44.00 - 241.44.90

NATO UNCLASSIFIED

Ext. 3676

ARMY BOARD

MAS(ARMY)2175(77)489

19 September 1977

Original English/French translation

To: See distribution on page 2

Subject: STANAG 2175(VF)(EDITION NO. 2)(AMENDMENT NO. 1) - CLASSIFICATION AND DESIGNATION OF FLAT WAGONS SUITABLE FOR TRANSPORTING MILITARY VEHICLES AND EQUIPMENT

Reference: MAS(ARMY)2175(77)084 dated 9 March 1977

Enclosure: Amendment No. 1 to STANAG 2175 (Edition No. 2)

1. The subject STANAG was promulgated under cover of reference a.. Addressees are requested to:

a. Amend the STANAG in accordance with the enclosure.

b. Amend AAP-4(R) to reflect the latest status of this STANAG.

2. The Army Board MAS consider this is an editorial amendment to the STANAG; previous ratifying references and implementation details are deemed to be valid.

(R. LAWSON)
Major-General, RNLA,
Chairman MAS

ea

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DISTRIBUTION/DIFFUSION :

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ENCLOSURE TO
MAS (ARMY)2175(77)489

AMENDMENT NO. 1 TO STANAG 2175(VF)(EDITION NO. 2) -
CLASSICATION AND DESIGNATION OF FLAT WAGON8 SUITABLE
FOR TRANSPORTING MILITARY VEHICLES AND EQUIPMENT

1. Applies only to French version.

2. Applies only to French version.

3. Applies only to French version.

4. Applies only to French version.

5. English and French texts - Annex A - Page A.1.

Category 3 - Column (i) : instead of > 18.5 t / 2,5 m
read > 16.5 t / 2,5 m

Category 6 - column (c) : instead of 8,800 m L 9,950 m
read 8,800 m < L < 9,950 m

Category 6 - column (f) : instead of 5,800 m < a < 8,150 m
read 5,800 m < a < 6,150 m

Category 7 - column (d) : instead of - 3,110 m
read = 3,110 m

Category 7 - column (f) : instead of - 8,400 m
read = 8,400 m

Category 8 - column (d) : instead of - 3,150 m
read = 3,150 m

Category 8 - column (f) : instead of - 7,200 m
read - 7,200 m

Category 9 - column (f) : instead of a - 13,000 m
read a = 13,000 m

Category 9 - column (g) : instead of h - 1,305 m
read h = 1,305 m

6. English and French text. - Annex D - Page D.1.

Category 0 - column (e) : instead of 1m = 2,47 m
read 1m = 2,47m + d - 0,10 m

Category 1 - column (e) : - idem -

Category 2 - column (e) : instead of 1m - 2,56 m
read 1m = 2,56 m + d - 0,10 m

Category 3 - column (e) : instead of 1m - 2,77 m
read 1m = 2,77 m + d - 0,10 m

7. Applies only to French version.

APPENDIX CC
STANAG 2832

NATO STANDARDIZATION AGREDEIT (STANAG)

RESTRICTIONS FOR THE TRANSPORT OF MILITARY EQUIPMENT BY RAIL ON EUROPEAN RAILWAYS

Annexes : A. Passe - Partout International (PPI) Gauge.
B. Diagram of Envelope A.
C. Diagram of Envelope B.
D. Specimen page of Sketchbook.
E. Construction Gauges (to be Issued later).
F. Definitions (to be Issued later).

Related documents : STANAG 2158 - Identification of Military Trains.
STANAG 2163 - Vehicle Weight and Dimension Card.
STANAG 2171 - Procedures for Military Trains Crossing Frontiers.
STANAG 2173 - Regulations for the Securing of Military Tracked and Wheeled Vehicles on Railway Wagons.
STALAG 2175 - Classification and Designation of Flat Wagons suitable for Transporting Military Vehicle and Equipment.

AIM

1. The aim of this agreement is to facilitate the movement of trains carrying military equipment on the railway network of Belgium, Denmark, Prance, Federal Republic of Germany, Italy, Luxemburg and the Netherlands, by means of:

a. The use of Envelopes A and B (which are both greater than PPI).
b. Setting gauges for the construction of military equipment to be transported by rail.
c. The establishment and updating of a unified sketchbook for the transport of equipment classified as "Exceptional".

AGREEMENT

2. The participating nations agree to adopt the methods and procedures stipulated in this agreement as a basis for the movement of trains carrying military equipment, the construction of their military equipment and the establishment of a unified sketchbook.

GENERAL

3. This Agreement is divided into four parts as follows:

PART 1 : DIFFICULTIES ENCOUNTERED AS REGARDS THE TRANSPORT OF MILITARY EQUIPMENT BY RAIL

A. Statement of the Problem

4. The military equipment to be transported by rail is generally heavy and bulky. Furthermore, the possibilities of the existing rail infrastructure and rolling stock are limited. Clearance difficulties are due to the maximum gauges of lines or line sections.

5. a. The difficulties inherent in wagons are due to:

(1) Floor height.
(2) Load capacity.
(3) Wheel base.
(4) Overhang.

b. This problem is dealt with in STANAC 2175.

B. Conclusions

6. The weight and dimensions of wagons carrying military equipment therefore generally exceed the normal technical possibilities of the existing infrastructure and rolling stock. Consequently either it is impossible to transport military equipment by rail or restrictions have to be imposed on its loading, movement or construction.

7. In order to permit planning, the speedy transport of military equipment and the crossing of frontiers, the following arrangements have been made in agreement with the Railway Administrations:

a. Definition of maximum size envelopes and movement conditions.
b. Establishment of construction standards for military equipment to ensure that it does not exceed either the PPI gauge or the maximum envelope.
c. Establishment of a unified sketchbook.

PART 2 : MAXIMUM SIZE ENVELOPES : ENVELOPES A AND B

A. Concept and Practical Determination of Envelopes A and B

8. Envelopes A and B are designed to facilitate the wartime planning and movement of flat wagons carrying military vehicles and equipment classified as "exceptional transport". The envelopes allow maximum flexibility of movement on European railway systems, because the gauges are generally greater than the PPI gauges.

B. General Characteristics of these Envelopes

9. Bearing in mind the current amount of military equipment to be transported, the Group of Experts on the Transport of Out-of-Gauge Equipment considered two envelopes (Envelopes A and B).

a. Both having a vertical axis of symmetry.
b. Having the same contours in the upper portions (from 3.370 m above the rails).
c. One outside, and the other within the PPI gauge width.

10. The polygonal contours of the envelopes (in particular the portion above 3.370 m, which is identical for both) were determined taking into account every possible route network and in such a way as to avoid any large-scale operating constraints. These envelopes will be found in the attached Annexes B (Envelope A) and C (Envelope B). Envelope B allows for a loading tolerance of ± 15 mm in width.

C. Establishment of Traffic Maps for Envelopes A and B on European Rail Systems

11. Envelopes A and B and their circulation conditions having been defined, each network will prepare circulation boards for each line section showing the operating constraints on its lines.

By assembling these, each network will be able to prepare its own A and B envelope circulation maps.

12. To obtain overall maps of A and B envelope circulation on the networks mentioned in Para.1, by simply juxtaposing the maps for each member country, it is essential that lines should be shown on the national maps on the basis of the standard key described below:

13. a. Single track lines:

———— = Clear way or minor movement constraints (e.g. local reductions in speed).

•••••••••••••• = Circulation possible with certain major constraints (e.g. no circulation or shunting on a neighbouring line).

XXXXXXXX = Circulation impossible.

b. Twin or Multiple-Track Lines. Circulation conditions are indicated for each track, e.g.:

XXXXXXXXXX A = Circulation impossible on track A.

———————— B = Clear way on track B.

14. These maps also show the category of each line according to the permissible weight per linear metre and the axle loading. These categories are defined as follows:

Category	Axle loading	Weight per metre
A	16 m. tons	4.8 m. tons/metre
B1	18 m. tons	5.0 m. tons/metre
B2	18 m. tons	6.4 m. tons/metre
C2	20 m. tons	6.4 m. tons/metre
C3	20 m. tons	7.2 m. tons/metre
C4	20 m. tons	8 m. tons/metre

D. Remarks

15. A vehicle loaded on a NATO Category 8 wagon (the wagon taken into consideration when establishing the envelopes) and contained within Envelope A or B /Annexes B or C) can circulate on the lines shown on the relevant traffic map. On the other hand, a study, which can be undertaken only by the Railway Administrations, is necessary to determine whether a vehicle loaded on a wagon other that a category 8 wagon will fit into Envelopes A and B (which must be reduced to take account, interalia, of the difference in wheel base). Such studies are made whenever a sketchbook sheet for a vehicle is prepared (see Part 4).

16. National traffic maps are drawn without taking account of the existence of temporary obstacles, which will be removed in accordance with special instructions to be issued in due course by the appropriate Railway Administrations, so that advantage can be taken of the studies made.

17. In the case of unforeseen obstacles, the Railway Administrations must make an actual check (and not merely a study) to ascertain that there is sufficient room for loaded wagons to pass.

18. Owing to the special problems arising from traffic between France and Italy within the Envelopes A and B, special conditions have been laid down in bilateral agreements between the FS (Italian State Railways) and the SNCF (French State Railways), to which reference should be made in connection with all transport studies involving these two nations.

E. Use of Traffic Maps by the Military Authorities

19. Although the use of these maps is not normally envisaged in peacetime, they will enable military staffs:

- To undertake planning studies.

- To exclude any prohibited routes from these studies.

The attention of military staffs is drawn to the fact that, for all transports inside Envelopes A or B (as indicated in the "group" column of the corresponding sketchbook sheet see Part 4) and relating to a given itinerary, they must ensure that:

a. The lines to be used are suitable for the appropriate envelope.
b. These lines belong to a category which is compatible with the weight per metre and the axle loading of the transport (as shown in columns 9 and 10 of the appropriate sheet in the sketchbook - see Part 4).

F. Updating and Distribution of Traffic Maps

20. Updating is performed annually by the Railway Administrations in co-operation with the NATO International Staff. The latter is responsible for distributing the maps and amendments to the NATO Military Authorities and Agencies.

PART 3 : CONSTRUCTION STANDARDS FOR MILITARY EQUIPMENT

21. The study of construction (manufacturing) gauges relating to military equipment that is to be capable of being transported by rail in Europe within PPI gauge, Envelope A, or Envelope B, is contained at Annex E (to be issued later). This Annex is intended for the guidance of engineers and designers of military equipment and sets out the limits of physical shape of such equipment.

PART 4 : THE UNIFIED SKETCHBOOK

A. Introduction

22. To facilitate the movement of equipment classified as exceptional, a unified sketchbook has been adopted in which sheets show all vehicles and exceptional equipment in service in the Armed Forces of Belgium, Canada, Denmark, France, the Federal Republic of Germany, Italy, Luxembourg, the Netherlands, the United Kingdom and the United States. The sheets prepared by the Railway Administrations are grouped into a single "sketchbook" of which the Deutsche Bundesbahn (DB = German Federal Railways) is the custodian.

B. Preparation of Sheets

23. The Armed Forces inform their Railway Administration of the overall external dimensions and weight of the equipment to be used by them on national or foreign territory.

24. Using this information, the Railway Administration carries out loading studies, defines the movement conditions, prepares the appropriate sheet(s) and forwards it(them) to the DB.

25. Sheets for equipment used by the United Kingdom and United States Forces stationed in Germany are prepared by the DB.

26. The DB is responsible for numbering new sketches, the adoption, where appropriate, of a single sketch when the same equipment exists in several armies, and the establishment of an envelope sketch for several variants of the same equipment.

27. Exceptionally, the SNCF has certain numbers at its disposal for sheets relating to equipment in use in the French Forces. After preparing and numbering a sheet, the SNCF forwards a block to the DB. Should the equipment concerned be already covered by a sheet prepared by another Administration, the DB numbers the single sheet.

28. When the DB has allocated a number to a new sheet, the Administration which prepared it prints the number of copies needed for its own use and sends a block to the other Administrations, which complete it as required, translate the text and have copies printed and distributed as necessary.

29. If the Armed Forces wish to modify an item of material or equipment, thus altering, its characteristics (size or weight), they must notify their national Railway Administration. The latter must treat the modified equipment as new equipment and prepare a new sheet.

C. Classification of Equipment and Numbering of Sheets

30. Military equipment has been classified into FOUR main groups, each of which is sub-divided into NINE sub-groups.

31. The basic numbering system provides for a FOUR-figure number for each sheet.

a. The first figure on the left denotes the main group into which the equipment is classified:

1 = Wheeled vehicles.
2 = Semi-tracked vehicles.
3 - Tracked vehicles.
4 = Trailers and semi-trailers.

b. The second figure from the left denotes the sub-group into which the equipment is classified within the main group. Examples: armored fighting vehicles, utility vehicles, special vehicles, tankers, tanks, tractors, etc. A detailed list of these sub-groups is given in the sketchbook.

c. The last two figures are simply a serial number for the equipment within each sub-group. The SNCF has been allocated the numbers 00 to 29 and the numbers 30 to 99 have been assigned to the DB, which is responsible for allocating a number to any sheets forwarded by the other Railway Administrations.

32. Additional Numbering of Sheets. If several methods of loading are possible for the same equipment, a sheet is prepared for each one. In this case, the basic four-figure sheet number is supplemented by a new two-figure number to the right of, and separated by, a full stop from the previous one.

a. The first figure on the left indicates the number of loading methods possible:

"0" - Only one method of loading possible.
"1" - First of two or more methods of loading.
"2" - Second method of loading.

b. The second figure indicates the number of vehicles which can be loaded onto a single wagon:

"0" - Only one vehicle can be loaded.
"1" - One vehicle can be loaded onto a wagon but other equipment can also be loaded.
"2" - Two vehicles per wagon.
Etc.

D. General Layout of Sheets

33. Each sheet comprises (see example at Annex D):

a. Front:

(1) The sheet number.
(2) The designation of the vehicle to be transported.
(3) The weight of the load.
(4) An end-on diagram, 1/25th scale, of the vehicle, indicating, where appropriate, the critical points outside the PPI gauge.

(5) A longitudinal diagram, 1/100 scale, of the vehicle when loaded.

(6) The position of the vehicle on the wagon, the orientation required (where appropriate) and any special loading instructions (e.g. dismantling).

(a) Generally speaking, vehicles must be loaded in the middle of the wagon, both lengthwise and sideways. Unless otherwise stated, it is assumed in the sketches that this condition has been fulfilled, apart from an authorized tolerance of 15 mm per half-width. In certain special cases, where this tolerance does not exist, the fact is mentioned under heading 19.

(b) The transverse position of the load is indicated as follows:

- Centred loading: by an asterisk to the left of the 1/25 sketch.

- Off-centred loading: by one asterisk to the left and two asterisks to the right of the 1/25 sketch.

(c) The specific longitudinal loading position is indicated on each sheet (longitudinal 1/100 sketch) by means of dimension figures which locate the load either in relation to the transverse axis of the wagon floor or in relation to its ends. This applies particularly if several vehicles are loaded on one wagon.

(d) For all transport which encroaches on the gauge, and where "orientation" is necessary, heading 30 of the sheet designates the critical point by a reference letter (A, B, C, etc.) shown on the 1/25th diagram. This is always mentioned on the exceptional transport authorization.

b. Back:

(1) The wagons to be used, designated either by their NATO category or by their serial number and UIC code letter (column 2).

(2) The wagon characteristics (columns 3 to 10), especially for UK wagons. However, as regards NATO category 4 to 9 wagons, the least favourable characteristics of the various series of wagons in these categories are indicated in column 15.

(3) The location of the critical points outside the PPI gauge.

(4) The permissible weight per metre and the maximum axle loading of the rail wagon (i.e. tare plus load divided by the number of axles).

(5) Information on Circulation Possibilities for the Load within Envelope Graphs A and B According to the Type or Category of Wagon shown in Column (2). One of the following five symbols will appear in the "Group" column:

(a) "-" Sign (minus). The out-of-gauge load comes within the PPI gauge. (The load is only exceptional because of its weight). The SNCP is the only Railway Administration to prepare a loading sketch whenever a load has any special features.

(b) Letter "A". The exceptional load is outside the PPI gauge heightwise only, but comes within Envelope A.

(c) Letter "B". The exceptional load is outside the PPI gauge widthwise, and possibly heightwise, but comes within Envelope B with a lower limit of 1.185 m.

(d) Letter "B*". The exceptional load is outside the PPI gauge widthwise, and possible heightwise but comes within Envelope B with a lower limit of 1.185 m.

(e) + Sign (plus). The exceptional load is not compatible with Envelope B.

E. Procedure for Cancelling Sheets

34. In order to limit the size of the sketchbooks, outdated vehicle sheets must be withdrawn. As, however, certain vehicles may be used by several countries, it is first essential to ensure that the vehicle is no longer in service with any of the Armed Forces.

35. For this purpose, the Military Authorities will forward to their Railway Administration, by 1 January each year, a list of the numbers of the sheets which they wish to delete. These lists will be notified to the DB, which will prepare an up to date list and forward this to all Administrations for agreement. The DB will then notify the Administrations of the numbers of the sheets which it has been unanimously agreed to delete in the form of a corrigendum to the list of vehicles and other equipment for which a sheet is included in the unified sketchbook.

F. Periodical Updating of Wagon Strength in Service in each Category or Series

36. Side by side with the updating of the vehicles classified as "exceptional" mentioned above, the wagon strength is periodically revised normally every two years (on 1 January of even years), by the Railway Authorities of each country in co-operation with the NATO International Staff.

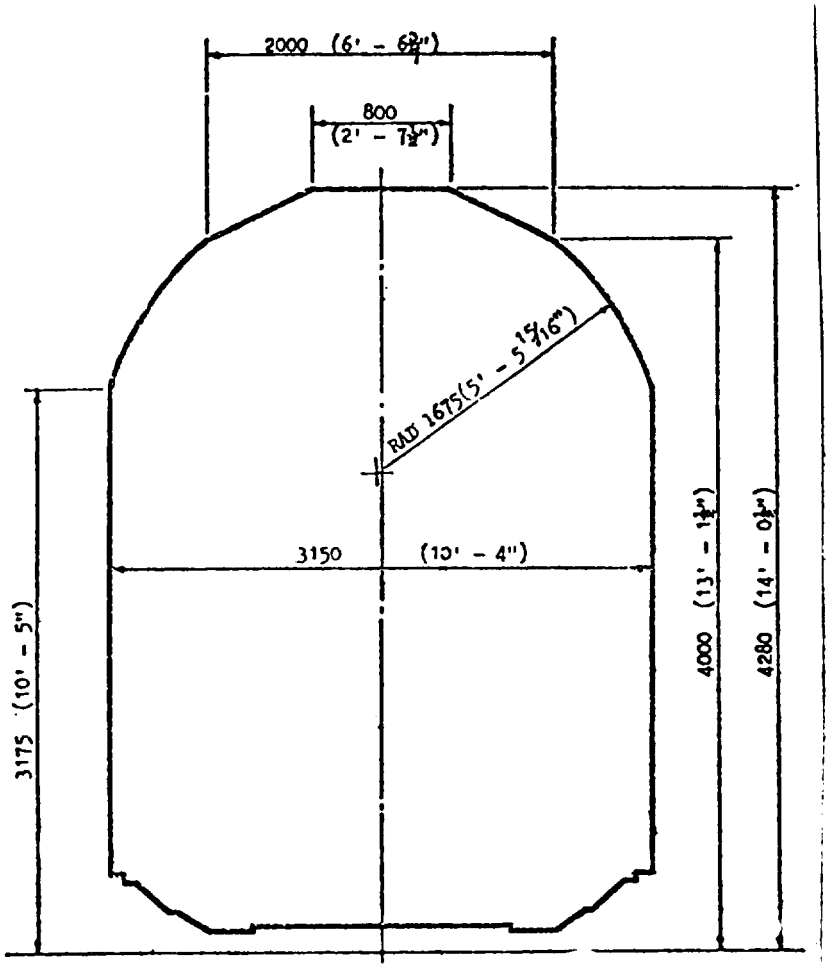
IMPLEMENTATION OF THE AGREEMENT

37. This STANAG is considered to be implemented when a nation has issued the necessary orders/instructions to the forces concerned, putting the procedures detailed in this agreement into effect.

ANNEX A TO STANAG 2832
ANNEXE A AU STANAG 2832

PPI (PASSE-PARTOUT INTERNATIONAL) GAUGES/GABARIT PPI

Dimensions shown thus: millimetres (feet-inches)
Les dimensions sont indiquees comme suit: millimetres (feet-inches)

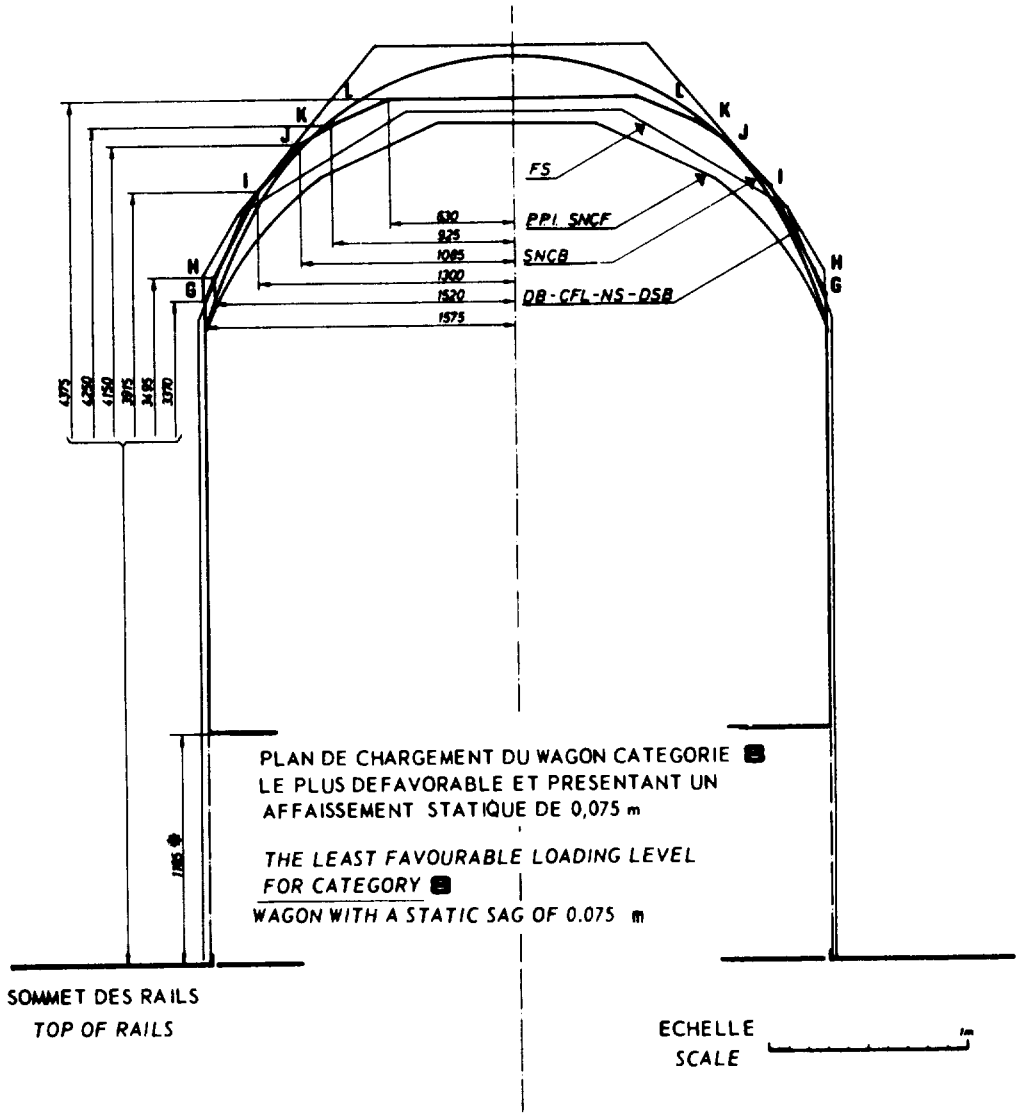


Rail level/Plan de roulement

NATO SANS CLASSIFICATION

ENVELOPPE A
ENVELOPPE EN ALIGNEMENT
ENVELOPE A
STRAIGHT STRETCH CONFIGURATION

ANNEX B to
STANAG 2832



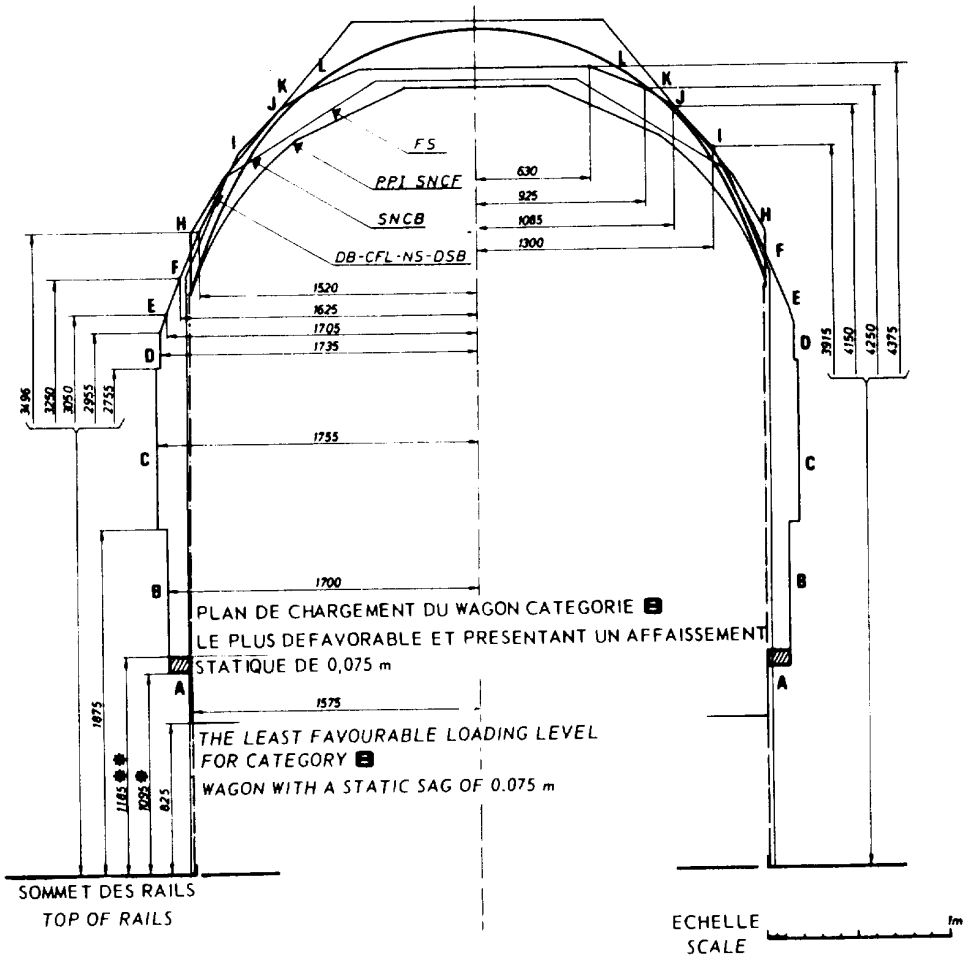
HAUTEUR MINIMALE SOUS CHARGE STATIQUE
MINIMUM STATIC LOAD HEIGHT

NATO SANS CLASSIFICATION

ANNEX C to
STANAG 2832

ENVELOPPE B
ENVELOPPE EN ALIGNEMENT
ENVELOPE B
STRAIGHT STRETCH CONFIGURATION

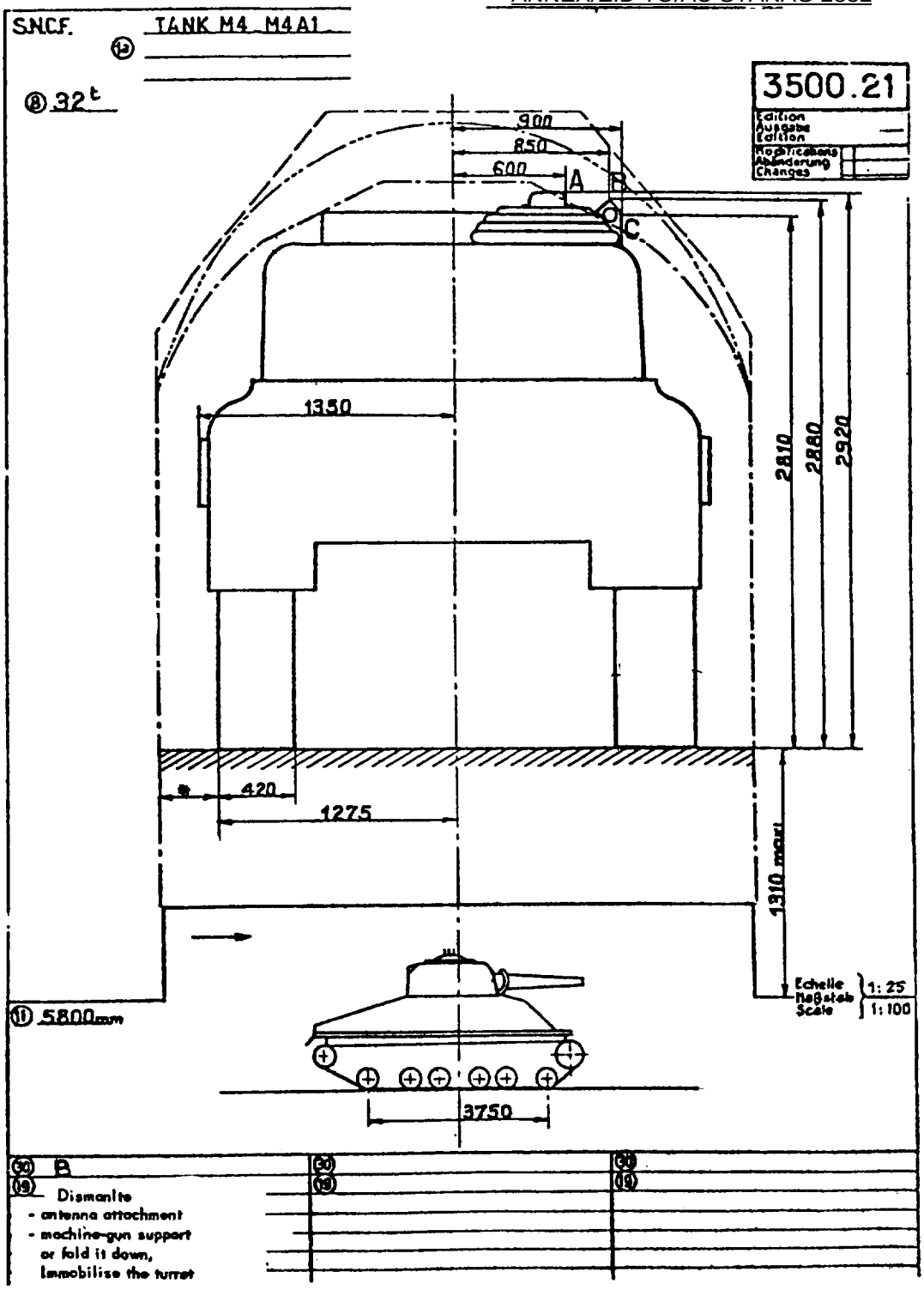
ENVELOPPE B - ENVELOPE B**
LIMITE INFERIEURE : 1185
LOWER LIMIT 1185
ENVELOPPE B - ENVELOPE B*
LIMITE INFERIEURE : 1095
LOWER LIMIT : 1095



** 1185 = HAUTEUR MINIMALE SOUS CHARGE STATIQUE POUR LES TRANSPORTS AUTORISES A CIRCULER EN LIGNE ET SUR LES VOIES BORDEES DE QUAIS TYPE SNCF. MINIMUM STATIC LOAD HEIGHT FOR CONSIGNMENTS PASSED FOR LINE TRAFFIC AND ON TRACKS RUNNING ALONGSIDE SNCF TYPE PLATFORMS.

* 1095 = HAUTEUR MINIMALE SOUS CHARGE STATIQUE POUR LES TRANSPORTS AUTORISES A CIRCULER EN LIGNE, MAIS INTERDITS SUR LES VOIES BORDEES DE QUAIS TYPE SNCF. MINIMUM STATIC LOAD HEIGHT FOR CONSIGNMENTS PASSED FOR LINE TRAFFIC, BUT NOT ADMITTED ON TRACKS RUNNING ALONGSIDE SNCF TYPE PLATFORMS

NATO UNCLASSIFIED
SPECIMEN PAGE OF SKETCHBOOK
PAGE SPECIMEN DU CARNET DE SILHOUETTES
ANNEX/E.D TO/AU STANAG 2832



3500.21

Groupe Umriß Group	②	③	④	⑤	⑥	⑦	⑨	⑩	Points critiques du dépassement du gabarit Kritische Punkte der Lademaßüberschreitung Critical points of the load outline which are in conflict with the clearance limits: Point Punkt Point	⑫a	⑫b	⑬	⑭	⑮	⑯	⑰ ∞	⑰ 250	⑱ ∞	⑱ 250
On wagons figuring in parallel category																			
A	⑤	9300	2000	4	14300	22	4	13,5	A	—	600	4230	4650	—					
									B	—	850	4190	4650	—					
									C	—	900	4120	4650	—					
A	⑥	6150	2000	4	10800	19	4,7	12,8	A	—	600	4230	3075	—					
									B	—	850	4190	3075	—					
									C	—	900	4120	3075	—					
A	⑦	8400	1700.2	6	16400	31	3,8	10,5	A	—	600	4230	4200	—					
									B	—	850	4190	4200	—					
									C	—	900	4120	4200	—					
A	⑧	7200	1500.2	6	13200	22,3	4,1	9,1	A	—	600	4230	3600	—					
									B	—	850	4190	3600	—					
									C	—	900	4120	3600	—					

NATO UNCLASSIFIED

STANAG 2832

NATIONAL RATIFYING REFEREIICES AND DETAILS OF IMPLEMENTATION
REFERENCES DES RATIFICATIONS NATIONALES ET DETAILS SUR LA MISE EN APPLICATION

NATION	NATIONAL RATIFYING REFERENCE DE LA RATIFICATION NATIONALE	IMPLEMENTATION/MISE EN APPLICATION		
		FORECAST DATE PREVUE	ACTUAL DATE REELLE	SERVICES/ ARMEES
BE	JS Tpt/3/760758 of/du 2.6.76		1.75 1.75 1.75	NAVY/MER ARMY/TERRE AIR
CA				
DA	M.204.66/S 2173 MAS ARMY 019996 of/du 17.9.76			NAVY/MER ARMY/TERRE AIR
FR	5568/DEF/EMAT/SOU/TRT/I/CCF of/du 1.12.76		4.77 4.77 4.77	NAVY/MER ARMY/TERRE AIR
GE				
GR	F 066/49/33[illegible]19/Draft 583/ HAC/Research Branch of/du 6.9.76	4.78		ARMY
IT	SMD n .143/012770/4522.2832 of/du 6.10.76		10.77 10.77 10.77	NAVY/MER ARMY/TERRE AIR
LU	JS Tpt/3/760758 of/du 2.6.78		1.75	ARMY
NL	MAS 1782/10/NU of/du 9.8.76		5.78 5.78 5.78	NAVY/MER ARMY/TERRE AIR
NO				
PO				
TU	Gn. P.P. 2307-538-77 AND.D. MAS S/3832/441 of/du 24.2.77	Will not implement/ ne mettra pas en application		
UK	D/DASD/22/163 (ASD 1b) of/du 10.8.76	4.78 4.78 4.78		NAVY/MER ARMY/TERRE AIR
US	DRCIRD letter of/du 27.10.76		4.77 4.77 4.77	NAVY/MER ARMY/TERRE AIR

APPENDIX DD
STANAG 2890

STANDARDIZATION AGREEMENT
(STANAG)

REGULATIONS FOR SAFETY IN THE TRANSPORT
OF MILITARY AMMUNITION AND EXPLOSIVES BY RAIL

Related Documents :	STANAG 2158 VF	- Identification or Military Trains
	AC/258-D/291	- Manuel on NATO Safety Principles for the Conveyance of Military Ammunition and Explosives in Rail Transport
	AC/15-D/390	- Report on the Movement of Ammunition and General Military Supplies by Railroad in Times of Crisis and War
	UIC 431.2 Code leaflet	- Applicable Provisions for the Transport or Dangerous Goods in International Traffic

AIM

1. The aim or this agreement is to standardize the procedures and regulations for safety in the transport or military ammunition and explosives by rail in peacetime and wartime.

AGREEMENT

2. Participating nations agree to adopt the following procedures/regulations.

3. The stipulations contained in this STANAG only apply to military ammunition trains as defined below. Transport in isolated wagons and separate consignments are therefore not covered in this STANAG.

4. This STANAG does not deal with nuclear or toxic hazards or their classification.

5. For all aspects other than those mentioned in paragraphs below (e.g., for the description, listing and other transport operations such as packing, labeling, contents of consignments notes, etc.) the international conventions (CIM-RID) and national laws and regulations governing the carriage of dangerous goods by rail continue to apply.

DEFINITIONS

6. The following terms and definitions are used for the purpose or this agreement:

a. Military Ammunition Train

A special train composed exclusively or:

NATO UNCLASSIFIED

(1) Wagons loaded with military ammunition and/or explosives has been allocated an "international Identification code" in accordance with STANG 2158;

(2) Isolating wagons;

(3) Carriages or wagons for escort (see paragraph 13.a.).

Unless it is stipulated to the contrary in bilateral conventions the maximum length o: military trains in which ammunition may be transported has been fixed at 600 m and gross maximum weight at 1300 including carriages for escort and isolating wagons, but excluding the locomotive.

b. Ammunition

(1) A device charged with explosives, propellants, pyrotechnics, initiating composition or nuclear, biological or chemical material for use in connection with defence or offence, including demolitions. Certain ammunition can be used for training, ceremonial or non-operational purposes (AAP-6).

(2) The term “ammunition" is restricted to conventional ammunition and the conventional explosive components of nuclear ammunition or ammunition containing toxic chemical agents.

c. Explosive

Any substance manufactured with a view to producing a practical effect by explosion or pyrotechnic effect. An explosive atmosphere of gas, vapor, or dust is not considered as an explosive.

d. Wagon Loaded with Ammunition

Any wagon labeled with ammunition as defined above or loaded with vehicles containing ammunition under the conditions at paragraphs 7 to 12 below. Such a wagon is marked with hazard labels No. 1.

e. Isolating Wagon

Any wagon not marked with hazard labels can be considered as isolating wagon to the exclusion of wagons eventually affected to the transport of an escort.

DETAILS OF THE AGREEMENT

7. Characteristics of Wagon Construction

Wagons must be in good condition and equipped with:

a. Roller bearin6 axle bores;
b. Adjustable releasing brakes;
c. Spark shields which must not be fastened directly to the wagon floor.

8. Composition of Wagon Trains

a. In peacetime, the number of isolating wagons will be fixed in compliance with the regulations issued by the networks authorities involved on the route followed by the train.

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(1) Wagons loaded, with military ammunition and/or explosives which has been allocated an "international Identification code" in accordance with STANAG 2158;

(2) Isolating wagons;

(3) Carriages or wagons for escort (see paragraph 13.a.).

Unless it is stipulated to the contrary in bilateral conventions the maximum length of military trains in which ammunition may be transported has been fixed at 600 m and gross maximum weight at 1300 including carriages for escort and isolating wagons, but excluding the locomotive.

b. Ammunition

(1) A device charged with explosives, propellants, pyrotechnics, initiating composition or nuclear, biological or chemical material for use in connection with defence or offence, including demolitions. Certain ammunition can be used or training, ceremonial or non-operational purposes (AAP-6).

(2) The term. "ammunition" is restricted to conventional ammunition and the conventional explosive components of nuclear ammunition or ammunition containing toxic chemical agents.

c. Explosive

Any substance manufactured with a view to producing a practical effect by explosion or pyrotechnic effect. An explosive atmosphere of gas, vapor, or dust is not considered as an explosive.

d. Wagon Loaded with Ammunition

Any Wagon loaded with ammunition as defined above or loaded with vehicles containing ammunition under the conditions at paragraphs 7 to 12 below. Such a wagon is marked with hazard labels No. 1.

e. Isolating Wagon

Any wagon not marked with hazard labels can be considered a, isolating wagon to the exclusion of wagons eventually affected to the transport of, an escort.

DETAILS OF THE AGREEMENT

7. Characteristics or Wagon Construction

Wagons must be in good condition and equipped with:

a. Roller bearing axle boxes;
b. Adjustable releasing braces;
c. Spark shield which must not be fastened directly to the wagon floor.

8. Composition- of Trains

a. In peacetime, the number or isolating wagons will be fixed in compliance with the regulations issued by the networks authorities involved on the route followed by the train.

b. In time or crisis or war, in trains crossing the borders the number of isolating wagons required shall be four, of which:

(1) two must be located at the front;
(2) two at the rear of the train.

9. Special Loading Requirements

a. Ammunition and explosives are to be loaded in covered wagons except as stated in paragraphs 10 to 12 below.

b. Ammunition and explosives when loaded must be stowed and secured in such a way as to prevent movement of the load under normal conditions of transport.

c. Before loading, the wagon must be cleared of remnants of the previous loads, nails sticking out, etc.

d. The doors and flaps of covered wagons should be closed, secured and sealed.

10. Ammunition which cannot be Loaded on Covered Wagons[1])

Ammunition which cannot be loaded on to covered wagons because of their size or weight will be carried on open wagons and covered with a strongly secured awning unless packed in hermetically sealed boxes or carried in closed containers.

11. Military Vehicles Loaded with Ammunition

The RID does not provide for the transport of military vehicles loaded with ammunition on open wagons. However some countries accept this type of loading. In such cases the military vehicles must be equipped with a protective tarpaulin covering their load or have properly closed-in bodywork.

12. Containers

The carriage of ammunition in containers is permitted subject to the same regulations as when in covered wagons. Large capacity containers loaded with ammunition which are carried by rail in intermodal transport must also conform to the applicable conventions as far as their construction, loading and marking is concerned.

---

1) These provision only apply to "ammunition" to the exclusion of "explosives".

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13. Special Measures

a. Control of operations

(1) All loading and unloading operations must be supervised by the military authorities of the owner country or their authorised representatives. This is to be done in the presence of an authorised representativeg nominated by the host country. However, this requirement may be waived by the host nation.

(2) A military escort may be appointed by the commander, specially when ammunition and explosives:

(a) are loaded on open wagons;

(b) are "security classified";

(c) require special protection.

The escort must be appointed as far as required by the regulations of the host country.

b. Protection against risks of fire and/or explosion

(1) Using a naked light or smoking is prohibited within 20 m of both the place where loading or unloading is being carried out and from the loaded wagons themselves.

(2) Steam locomotives still in use should be kept at least 10 m from where loading/unloading is taking place.

d. No mixed loads

Ammunition of different types may not be loaded together in wagons except it the RID, the exceptions provided in it, and/or national laws allow for it.

IMPLEMENTATION OF THE AGREEMENT

14.This STANAG is implemented when the necessary orders/instructions to comply with the prescriptions therein are issued to the forces concerned.

---

2) An "authorized representative" is a qualified person who is responsible to an appropriate authority, to ensure that the technical requirements of a specified task are fully complied with. This includes the tasks of responsible personnel involved in the conveyance of ammunition as well as those solely responsible for the (un)loading, verification, receipt and dispatch of ammunition or other any specific duty.

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STANAG 2890
(Edition 1)

RATIFICATION AND IMPLEMENTATION DETAILS
STADE DE RATIFICATION ET DE MISE EN APPLICATION

NATION	NATIONAL RATIFICATION REFERENCE DE LA RATIFICATION NATIONALE	NATIONAL IMPLEMENTING DOCUMENT NATIONAL DE MISE EN APPLICATION	IMPLEMENTATION/MISE EN APPLICATION					
			FORECAST DATE / DATE PREVUE			ACTUAL DATE / DATE REELLE		
			NAVY / MER	ARMY / TERRE	AIR	NAVY / MER	ARMY / TERRE	AIR
BE	CMTpt/3/C8581 of/du 5.8.87	IF 23				1.88	1.88	1.88
CA								
DA	M.204.66-S 2890/MAS ARMY - 20017 of/du 18.8.87	HRN 717-1 SMK BST 641-1				DOP + 6M	DOP + 6M	DOP + 6M
FR								
GE								
GR	HAGS GRM 101/2890/255/A of/du 24.7.87							
IT	SMD 143/018092/4522 2890 of/du 6.7.87						DOP + 6M	
LU								
NL	NAS 95.345/54.911/NU of/du 3.7.87	STANAG 2890				1.88	1.88	1.88
NO	MAS-0313/87/TRENINSP/HTK/ HCW/SL STANAG 2890 of/du 24.8.87					9.87	9.87	9.87
PO*	RRN 051/87/DD of/du 19.5.87							
TU	Gn.P.P.:2307-432-87/AND.D. MAS.S.(2890):938 of/du 27.5.87		12.90	12.90	12.90			
UK	MOD UK D/D Mov(A)54/1/50 Mov 1(A) of/du 11.5.87	BAOR Standing Instructions for Movements	DOP +12M	DOP +12M	DOP +12M			
US								

*See reservation overleaf/Voir réserves au verso

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RESERVATION

PO : Para. 6.A.: For the time being, for technical reasons, the maximum length in Portugal should not exceed 500 m.

RESERVE

PO : Para. 6.A.: Actuellement pour des motits techniques, la longueur maximale ne depassera pas 500 m.

APPENDIX EE
STANAG 2943

NATO STAND&IRIZATIRN AGREEKENT
(STANAG)

GECULATIONS FOR THE LATERAL OR END-ON LOADING AND UNLOADING OF WHELEID OR TBACKED MILITARY EQUIPMENT TRANSPORTED ON RAILWAY WAGONS

Annexes :

A. Characteristics of category 4 special flat vagons (later)
B. Characteristice of category 5 special flat wagons (later)
C. Characteristics of category 6 special flat wagone (later)
D. Characteristics of category 7 special flat wagons (later)
E. Characteristics of category 8 special flat wagons (later)
P. Characteristics of category 9 special flat wagons (later)
C. Characteristics of category 10 special flat wagons (later)
E. Special marking on German Railways (DB) special flat wagons

Reference documents :

STANAG 2173 VP	-	Regulations for the Securing of Military Tracked and Wheeled Vehicles on Railway Wagone
STANAC 2175 VP	-	Classification and Designation of Flat Wagons Sitable for Transporting Military Vehicles and Equipment
STANAG 2832 VP	-	Restrictions for the Transport of Military Equipment by Rail on European Railways
AC/15-D/383	-	End-on Loading or Unloading of Military Vehicles and Equipment on or off Wagons
AC/15-D/357	-	Movement of Military Equipment by Rail - Instructions for the Book of Sketches

AIM

1. The aim of this agreement is to standardize, for the NATO forces, the regulations governing lateral or end-on loading or unloading of wheeled or tracked military equipment transported on railway wagons.

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AGREEMENT

2. Participating nations agree to follow the regulations stated below when loading and unloading their wheeled or tracked equipment on or from the appropriate wagons of railway system.

DEPINITIONS

3. The following terms and definitions are used for the purpose of this agreement :

a. End-on loading/unloading. The loading or unloading of wheeled or tracked military equipment on er fr wagons is said to be "end-on" when it takes place from the end of the wagon in a direction parallel to the longitudinal axis of the wagon. If several wagons are to be loaded or unloaded, the equipment passes from one wagon to the other, the wagon farthest from the platform or ramp being loaded first or unloaded last as the case may be. The heaviest equipment must be loaded on the appropriate wagons located near the loading rap or platform.

b. Lateral platform loading/unloading. A lateral platform is a flat surface at a higher level then the rails, by means of which the equipment cam be loaded or unloaded via the side of the wagons.

CENERAL

4. This STANAG shall apply:

a. to the loading and unloading of wagons traveling on the railway systems of the European countries of the Alliance ;

b. to all the Alliance forces liable to use the networks of the countries mentioned in paragraph 4.&. above ;

c. in time of peace, crisis or war.

DETAILS OF THE AGREEMENT

5. Situations. Two situations can be envisaged ;

a. the loading or unloading of wheeled equipment ;

b. the loading or unloading of 'racked equipment.

In the case of 5.a., the move of wheeled equipment from the ramp (or platform) to the wagon and vice versa, or from one wagon to the next, shall take place after the dropping of the tail-gates or drop-sides, if necessary by putting loading bridges into place.

In the came of 5.b., the tail-gates o, drop-side, if any, are dropped and the equipment moves from the ramp (or platform) to the wagon or from one wagon to the next without additional aide.

6. End-on loading and unloading

a. Permissible load

(1) Wheeled or tracked military equipment must only be loaded and transported within the load limits marked on the wagons over which the load passes and on those which will transport it, i.e. either :

(a) the maximum permissible load ;

(b) the permissible concentrated load ;

(c) maximum gross weight.

(2) Rules to follow :

(a) Wheeled military equipment. The wagon floor and tail-gates can bear a load corresponding to the transit of wheeled equipment weighing up to 10 metric tons per axle. If the axle weight of the wheeled equipment is over 10 metric tons, such equipment must only be moved with a loading bridge in place between contiguous wagons or between the ramp and the wagon next to it and, Lf required, load spreaders (gouttilres)(*) shall be placed on the wagon floor to remain within the load limits stated in 6.a.(1) above.

(b) The tail-gates of all classified wagons equipped with them can withstand the transit of all tracked equipment at present in service.

(3) In addition, the following conditions must be met z

(a) The axle or bogie farthest from the loading or unloading point must not be discharged of its deadweight, or the suspension mechanisms may be damaged.

(b) The bearing capacity of the wagon overhang must be calculated for each type of wagon. The permissible stress for the overhanging steel sections is 230 N/mm2 for metal with a tensile strength equivalent to or more than 370 N/mm2.

(*) Gouttiere : Ballrace rigid metal plating used for load spreading of a wheel over several elements.

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(c) In addition, every care shall be taken to ensure that the springs of the bogie or axle nearest the loading or unloading point are not fully compressed (this requirement is not obligatory).

(d) In summary, only the lowest of the values given under (a), (b) and (c) is to be used.

(4) The following practical information is given in Annexes H and L to R of document AC/15-D/357 for each type of flat wagons in the categories 3 to 10:

(a) The maximum load per axle for wheeled equipment that can be loaded without buttressing the wagon overhang. The overhang length is the overhang of the wagon chassis, buffers excluded.

(b) The maximum load per metre of bearing track length of tracked equipment. The overhang length is the wagon chassis overhang, buffers included.

(c) Military equipment whose load per axle (or per metre of bearing track length) is equivalent to or less than those in the columns mentioned above may pass from one wagon to another, or from the ramp (or platform) to the wagon, or vice versa, without buttressing the wagon everhang.

(d) If the weight per axle (or per metre of bearing track length) is greeter than those mentioned above, while being less than the permissible load for the wagon, end-on loading or unloading may only be carried out after buttressing the wagon overhang.

NOTE

Remarks on wheeled equipment with concentrated group of axles (*):

End loading and unload and unloading of such an equipment, without buttressing the wagon overhang, is only allowed if the resultant of the axle group unit load does not generate a moment more adverse on the wagon overhang than the moment generated by the permissible load for a single isolated axle in accordance with column "w", Annexes H and L to R of AC/15-D/357.

If some exceptional equipment exceeds the authorized limit according to column owe, Annexes H and L to R of AC/15-D/357, the railway system when drafting the sheet book of sketches will indicate under heading 19 that the equipment must not be loaded without buttressing, in one wagon category, either on all wagons of all railways system or on wagons particular to the railway system(s) concerned.

(*) Concentrated group of axles: Assembly or et least two axles, whose total load must not exceed the reference single axle load.

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b. Immobilization of a train for loading or unloading. A train of wagons to be end-on loaded or unloaded must be immobilized as follows :

(1) Before loading or unloading begins, a check must be made to ensure that all the wagons are securely coupled together, with the couplings screwed tight enough for all the buffers to be in contact.

(2) In the event of loading or unloading from a fixed or demountable end platform, the train in contact with the platform must first be immobilized by one of the following methods s (a) by using the built-in-platform coupling hook, if any ; (b) by placing a sufficient number of chocks to block the wheels of the first wagon, on the platform side, and by applying the handbrakes of all wagons so equipped ; (c) by positioning a locomotive, with its brake on, at the end of the train to hold it against the end platform with buffers compressed.

(3) When the whole train has been loaded or unloaded, a check must be made to ensure: (a) that the first wagon is no longer attached to the platform coupling hook ; (b) that the chocks have been removed and that all handbrakes have been released.

7. Lateral platform loading and unloading

a. Preliminary comments

(1) The method of loading or unloading wheeled or tracked military equipment by means of a lateral platform :

(a) can only be used in exceptional circumstances, when there is no other possibility ; (b) is only accepted by the railways in the case of military equipment weighing a maximum of 16 tonne.

(2) Types of wagon used. The wagons are flat wagons with or without drop sides. For normal loads, the wagon category must be equivalent to or higher than the category of the equipment to be loaded. For exceptional loads, the wagons must be in the category or of the type specified by the corresponding page in the book of sketches (*).

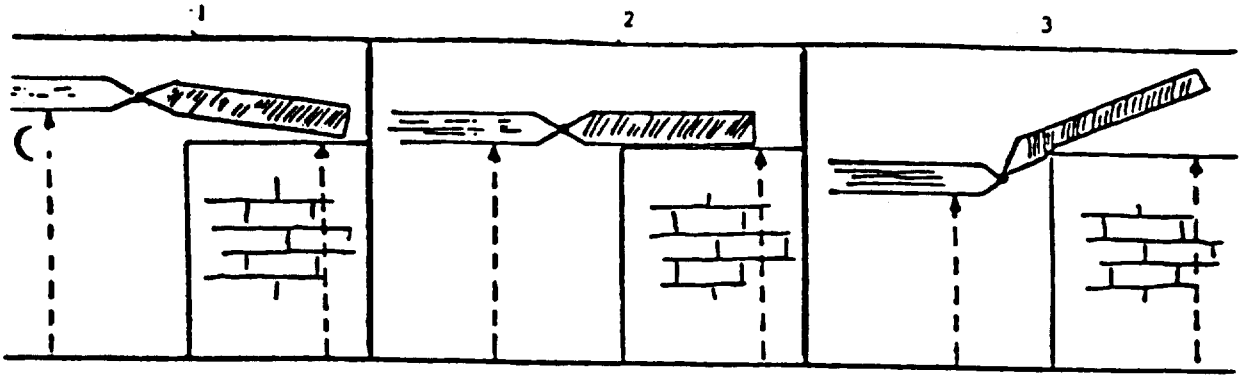
(*) These terms are defined in STANAG 2175.

NATO UNCLASSIFIED

b. Rules to follow

(1) Position of the drop elides

(a) There are three possibilities, a follows



(b) When the drop sides can be placed as shown in sketch 1, they can be used as a loading bridge as long as they do not reach the position as depicted in sketch 3 during loading because of the settling of the wagon.

(c) When the drop sides are as depicted in sketches 2 or 3, they cannot be used as a loading bridge and must first be lowered.

(2) Lateral platform loading or unloading. For lateral platform loading or unloading with drop sides lowered, loading bridges can be used. In this case, however, the space between the edge of the wagon and the edge of the platform does not necessitate the use of loading bridges.

c. Procedure to avoid damage to the wagon floor and drop sides. In the case of equipment with rubber shod-tracks, no particular precaution is necessary. In the case of metal shod-tracks, a rubbing plate must be laid below the vehicle tracks (*).

8. Special marking of the German Railways (DB) wagons

a. In order to facilitate the task of the military authorities responsible for loading and unloading, all DB flat wagons have a special marking on the side members.

b. This marking applies only to the end-on loading and unloading of wheeled equipment.

(*) In the Netherlands, this procedure In not mandatory but only recommended.

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c. The sketch reproduced in Annex N gives the following information :

(1) Above the horizontal line and inside the circle :

the maximum permissible weight (in metric tons) per wheel of the equipment to be loaded ; in excess of this weight, load spreaders must be used below the equipment, both when moving and when stationary on the wagon floor (permissible load for wagon floor) or on the tail-gates.

(2) Below the horizontal line, left of the triangle :

the maximum permissible weight (in metric tone) per axle in excess of which the wagon overhang must be buttressed during the loading or unloading operations.

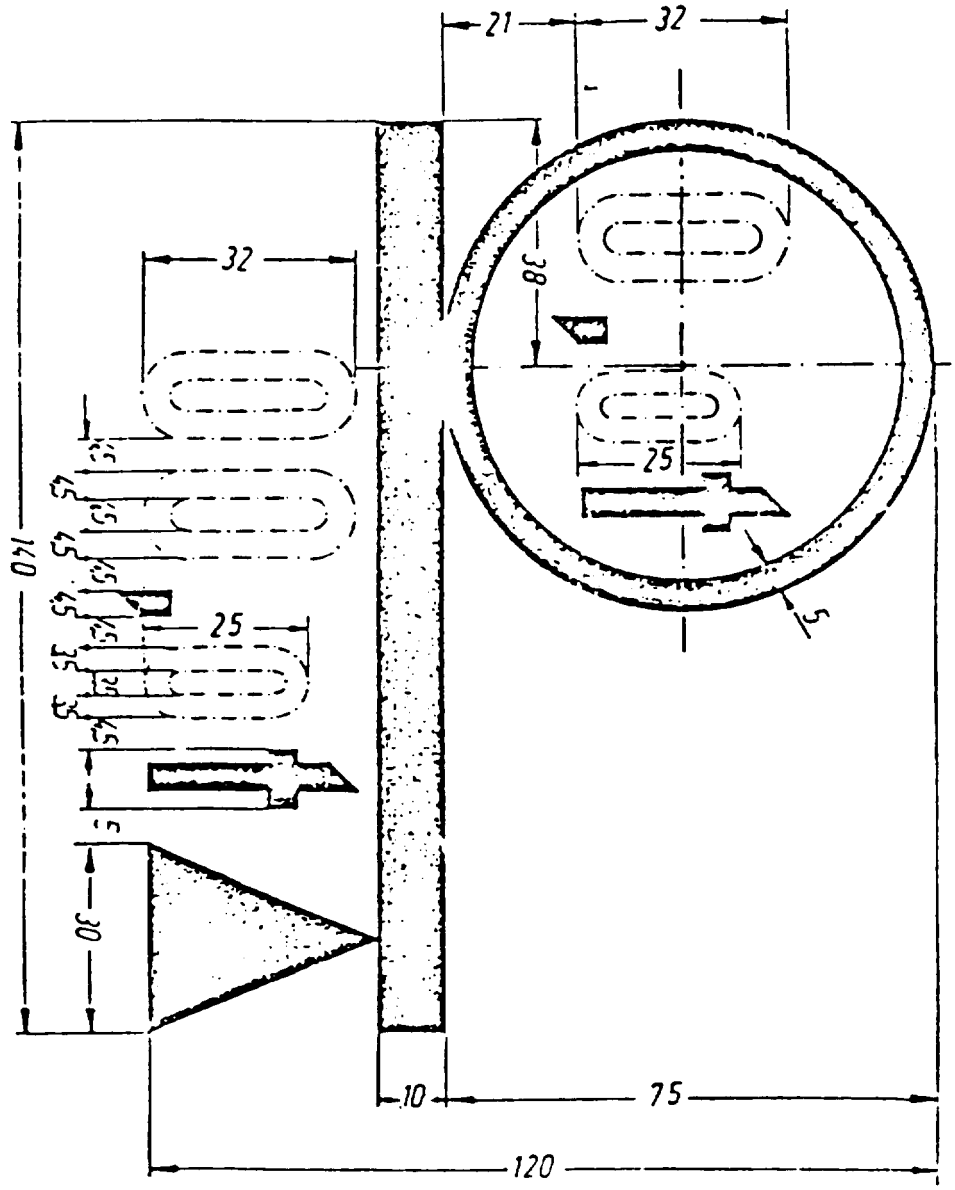
IMPLEMENTATION OPF THE AGREEMENT

9. This STANAG is implemented when the appropriate orders/instructions have been issued directing the forces concerned to put this agreement into effect.

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ANNEX H. TO STANAG 2943
(Edition 1)

SPECIAL MARKING ON GERMAN RAILWAYS (DB) FLAT WAGONS



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STANAG 2943
(Edition 1)

RATIFICATION AND IMPLEMENTATION DETAILS
STADE DE RATIFICATION ET DE MISE EN APPLICATION

NATION	NATIONAL RATIFICATION REFERENCE DE LA RATIFICATION NATIONALE	NATIONAL IMPLEMENTING DOCUMENT NATIONAL DE MISE EN APPLICATION	IMPLEMENTATION/MISE EN APPLICATION					
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			NAVY MER	ARMY TERRE	AIR	NAVY MER	ARMY TERRE	AIR
BE	CMTpt/3/02539 of/du 14.3.84	IF 23				3.85	3.85	3.85
CA	2441-2943(DTRP 2-2-2) of/du 30.1.84	DHQ STAND IN pending publication in CFP 303(10)Part 2					3.85	
DA	M.204?66/S.2943/MAS ARMY 05964 of/du 13.3.84	HRN 717-1				5.85	5.85	5.85
FR								
GE								
GR	F.069/16/450240 of/du 6.4.84							
IT	SMDn.143/004952/4522 of/du 2.3.84					1.85	1.85	1.85
LU	CMTpt/3/02539 of/du 14.3.84	IF 23					3.85	
NL								
NO	MAS/1220/83/B/HST/TRENINSP/ HTK/HCW/WEG/STANAG 2943 of/du 25.11.83		3.85	3.85	3.85			
PO	MOD PORTUGAL RRN 057/84/DD of/du 5.6.84					9.84	9.84	9.84
TU	Gn.P.P.:2307-735-83/AND.D. MAS.S.(2943) of/du 29.12.83							
UK	D/D MOV(A°/54/1/GGQ(Mov)1a of/du 3.1.84	JSP 327	6.85	6.85	6.85			
US	Letter DRCIP-P of/du 19.1.84		3.85	3.85	3.85			

See reservation overleaf/
Voir réserve au verso

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RESERVATIONS

TU: Implementation date cannot be given at present.

UK: Naval implementation limited to Royal Marines only.

RESERVES

TU: Aucune date de mise en application ne peut Otre donnee pour le moment.

UK: Pour la marine la mise en application concerne exclusivement lea Royal Marines.

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GLOSSARY

ACRONYMS AND ABBREVIATIONS

AAR	Association of American Railroads
AR	Army Regulation
CAPY	Capacity
COMPASS	Computerized Movement Planning And Status System
CONUS	Continental United States
CONUSA	Continental United States Army
DFE	Director of Facilities Engineering
DFRIF	Defense Freight Rail Interchange Fleet
DOT	Department of Transportation
FM	Field Manual
FORSCOM	Forces Command
FR	FORSCOM Regulation
GBL	Government Bill of Lading
ITO	Installation Transportation Officer
Ld Lmt	Load Limit
Lt Wt	Light Weight
MI	Military Impedimenta
MILSTAMP	Military Standard Transportation And Movement Procedures
MSC	Military Sealift Command
NATO	North Atlantic Treaty Organization
STANAG	Standardization Agreement
TB	Technical Bulletin
TDA	Tables of Distribution and Allowances
TOE	Table of Organization and Equipment
UMD	Unit Movement Data
USADACS	US Army Defense Ammunition Center and School

TERMS

Installation transportation officer (ITO)-This manual, when referring to the "installation transportation officer" or ITO, pinpoints the individual on the installation commander's staff who is responsible for transportation functions, regardless of his title. He may be a transportation corps officer, or a qualified civilian. At some activities he may be designated as "traffic manager," "chief, movements division," "chief, transportation division," or some similar title, rather than the transportation officer.

Military impedimenta (MI)- For purposes of this manual, MI is defined as that equipment owned or controlled by a unit (table of organization and equipment, or TOE). It does not include personal baggage, and moves simultaneously (or in conjunction) with troops. MI consists of material such as housekeeping equipment, spare parts, tools, vehicles, weapons, and records. MI is normally in the possession of a unit at all times, except when it is in transit between stations.

Unit Movement Data (UMD)- A list of unit personnel and their baggage, supplies, and unit equipment in shipping configuration. This will usually be provided by printout from Forces Command (FORSCOM) Computerized Movement Planning And Status System (COMPASS).

Unit Loading Plan-A preplanned method for loading personnel, unit equipment, or impedimenta on transport equipment.

Unit Movement Plan-A summary of transportation requirements for the movement of a unit from its home station. It is prepared for special contingency or maneuver (training exercise) plans. For more information refer to AR 55-113, AR 220-10, FM 55-65, and FORSCOM Regulation 55-1.

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ARNG & USAR: Div (2).
For explanation of abbreviations used, see AR310-19

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