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H.O. L-22

SAVANNA, ILLINOIS

MIL-STD-1320C (NAVY)
30 AUGUST 1979

SUPERSEDING
MIL-STD-1320B (NAVY)
22 JULY 1977 AND
INTERIM NOTICE 1 (OS)
12 SEPTEMBER 1978

MILITARY STANDARD

TRUCKLOADING OF AMMUNITION AND EXPLOSIVES

FSC 8140

DEPARTMENT OF THE NAVY
Naval Sea Systems Command
Washington, D.C. 20362

Truckloading of Ammunition and Explosives

MIL-STD-1320C (Navy)

1. This standard has been approved by the Department of the Navy and is published to establish requirements for truckloading of ammunition and explosives.

2. As of the promulgation date of this document, this standard is a mandatory requirement to be invoked in work orders, specifications, purchase descriptions, or military interdepartmental procurement requests (and contracts, when necessary) for the transportation of naval ammunition, explosives, and associated items to be transported by truck. It is mandatory for performance of truckloading operations by all elements of the Navy and Marine Corps.

3. Requests for technical interpretations, approval of deviations, or special assistance should be sent to Commanding Officer, Naval Weapons Station Earle, Naval Weapons Handling Center, Colts Neck, N. J. 07722, or call Autovon 449-7691, 7692, or 7693.

4. Copies of this complete standard and/or individual dash sheets alone may be obtained from the Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, Pa. 19120. (When ordering, specify whether the complete document is required or specific dash sheet only are needed.)

5. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Naval Weapons Station Earle, Naval Weapons Handling Center, Colts Neck, N. J. 07722 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) attached at the back of this document or by letter.

FOREWORD

This standard describes general procedures and practices applicable to loading, blocking and bracing ammunition, explosives, and associated items for transportation by or to the Navy in trucks and trailers.

Different loads require different blocking and bracing applications. It is the intent of this military standard not only to describe the special applications but also to set up minimum acceptable standards for all truck and trailer loads. These procedures will help loading personnel prepare safe and economical loads.

Physical dimensions, weights, types of loads, and vehicles vary greatly, precluding the coverage of all combinations. The examples and procedures given in this basic standard should be considered as typical. Mandatory requirements for specific loads are given in a series of MIL-STD dash numbered sheets which form a part of this standard.

A motion picture, pertinent to this standard, entitled "Blocking and Bracing Ammunition for Semitrailer on Highway, Semitrailer on Flatcar, and Container on Flatcar," MA-10715B, is available for training purposes from local Naval Education and Training Support Centers by submitting requests on Training Aids Temporary Loan Request/Invoice (5NC GEN 1551/1 Rw 9-4).

Certain Weapon Requirements (WR's) referenced in this standard are in process of supersedure by proposed military standards. If an equivalent military standard dash number sheet has not been published, the applicable WR slash number sheet shall be used. The following cross-reference correlates the new designator with the previous designator:

New	Previous
MIL-STD-1320	WR-51
MIL-STD-1322	WR-53
MIL-STD-1323	WR-54
MIL-STD-1325	WR-52

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MILITARY STANDARD

TRUCKLOADING OF AMMUNITION AND EXPLOSIVES

1. SCOPE

1.1 **Scope.** This standard, consisting of a general document and dash numbered sheet, establishes the approved methods for the preparation of full-truckload (FTL) and less-than-truckload (LTL) shipments of ammunition, explosives and associated items. It also contains guidance to be followed in all truckloading procedures when specific instructions in the form of MIL-STD dash number sheets do not exist.

1.2 **Application.** This standard is to be used by all personnel engaged in truckloading ammunition, explosives, and associated items for or to the Navy. MIL-STD-1320-1, MIL-STD-1320-2, and MIL-STD-1320-3 are typical specifications applicable to truckloading typical palletized unit loads of many different items which do not require the detail shown by specific truckloading plans (dash number sheets).

2. REFERENCED DOCUMENTS

2.1 **Issues of documents.** The following documents of the issue in effect on the date of invitation for bids or request for proposal form a part of this standard to the extent specified herein.

SPECIFICATIONS

FEDERAL

FF-N-105	Nails, Brads, Staples and Spikes: Wire Cut and Wrought
MM-L-751	Lumber; Softwood
QQ-S-781	Strapping, Steel, Flat and Seals

PUBLICATIONS

HANDBOOK

MIL-HDBK-236	Index to Standards for Palletizing, Truck Loading, Railcar Loading and Container Loading of Hazardous Materials

NAVAL SEA SYSTEMS COMMAND (CODE IDENT 10001)

OP 5	Ammunition and Explosives Ashore
OP 2165	Navy Transportation Safety Handbook
OP 2239	Driver's Handbook, Ammunition, Explosives and Dangerous Articles
OP 3681	Motor Vehicle and Railcar Shippings Inspector's Manual for Ammunition, Explosives and Other Hazardous Materials.

DEPARTMENT OF DEFENSE

DD Form 626	Inspection Report, Motor Vehicle Transporting Class A or Class B Ammunition and Explosives Over Public Highways

(Copies of specifications and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 **Other documents.** The following documents form a part of this standard to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

DEPARTMENT OF TRANSPORTATION

CODE OF FEDERAL REGULATIONS

49 CFR 100-199	Transportation
49 CFR 390-397	Federal Motor Carrier Safety Regulations

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402. Orders for the publication should cite "the latest issue and supplements thereto.")

AMERICAN TRUCKING ASSOCIATION

Tariff No. 111-C ATA Hazardous Materials Tariff

(Application for copies should be addressed to the American Trucking Association, Inc., 1616 P Street N. W. Washington, D. C. 20036.)

NATIONAL ASSOCIATION OF CHAIN MANUFACTURERS

Welded and Weldless Chain Specification, adopted November 1975.

(Application for copies should be addressed to National Association of Chain Manufacturers, 111 West Washington Street, Chicago, Illinois 60602.)

3. DEFINITIONS

3.1 **General.** The following definitions cover terms as they are used in this standard and are not to be confused with definitions appearing elsewhere.

3.2 **Ammunition.** A contrivance charged with explosives, propellants, pyrotechnics, initiating composition, or nuclear, biological, or chemical material for use in connection with defense or offense including demolition, training, ceremonial, signaling or nonoperational purposes.

3.3 **Backup cleat.** Short piece of wood used to prevent movement of other blocking or bracing.

3.4 **Brace, sway.** A piece or assembly used to prevent sideways motion of the lading resulting from lateral sway of the truck.

3.5 **Bracing.** Struts and other dunnage used to retain lading.

3.6 **Bulkhead, front.** A dunnage assembly designed to square the front wall of a van to eliminate rounded corners, distribute the forward forces in the load over the frontal area of the van, and provide physical protection to the van's wall.

3.7 **Bureau of Explosives.** The regulatory body of the Association of American Railroads responsible for the issuance and approval of appropriate rules for safety in the rail shipment of explosives and hazardous materials by the railroad.

3.8 **Cleat.** A member used to reinforce other members or to hold other members in position. Cleat is usually modified by a functional description.

3.9 **Crossmember.** A wood dunnage member or part of a dunnage assembly that is oriented across the width of a truck or trailer. Also a metal dunnage member which attaches to steel rails that are permanently fastened to the side walls of a vehicle.

3.10 **Diagonal.** Wood bracing placed at an angle. (See 3.5.)

3.11 **Dunnage.** Lumber, strapping, nails, or other material used to secure and protect lading.

3.12 **Eggcrating.** A method of dunnaging so that each unit of lading is confined in its own cell.

3.13 **Fillers or spacer frames.** Structures, frames, or strips used to fill void spaces throughout the load to obtain a tight load.

3.14 **Hazardous materials (HM).** A substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety and property when transported in commerce and which has been so designated in 49 CFR 100-199.

3.15 **Intermediate or separator gates.** An assembly of dunnage placed crosswise between sections of the lading.

3.16 **Kicker.** A strip of wood nailed to the floor to restrain other dunnage bracing.

3.17 **Lading.** The load or cargo being shipped.

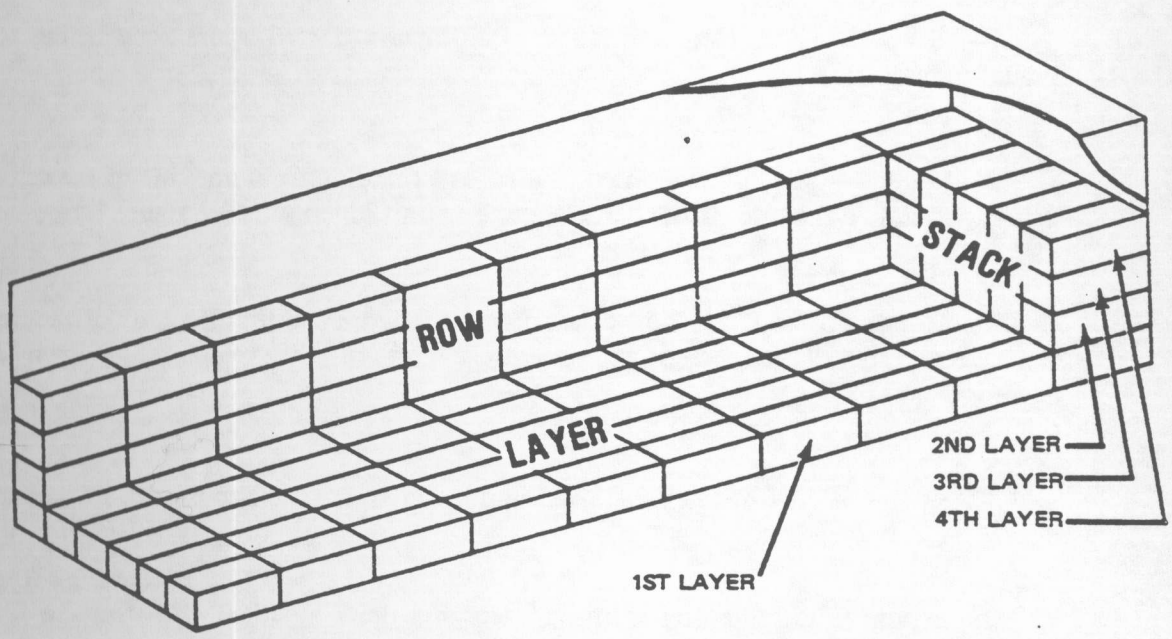


FIGURE 1. PARTIAL TRUCKLOAD SHOWING NOMENCLATURE

3.18 **Layer.** A course or stratum of the lading parallel to the floor of the vehicle and one container or unit load high. (See figure 1.)

3.19 **Load pattern.** Placement pattern of the load on or in the vehicle.

3.20 **Pallet.** A platform or skid on which lading is placed and secured. It is used to facilitate handling with mechanical handling equipment.

3.21 **Protector, stake pocket.** A metal pad used in a stake pocket of a flatbed trailer to prevent tiedown strapping from wearing through.

3.22 **Riser.** A unit, usually made of wood, used to step down a load; in some cases, units of lading may be utilized as a riser.

3.23 **Row.** A pile of containers or articles extending lengthwise of the vehicle, parallel to the sides of the vehicle and one unit wide. (See figure 1.)

3.24 **Sleeper.** Wood member nailed to floor and butted against the lading to prevent lateral movement.

3.25 **Stack.** A pile of containers or articles extending from one side of the vehicle to the other, parallel to the end of the vehicle and one unit in length. (See figure 1.)

3.26 **Stepdown load.** Method of arranging the lading so that the bulk of the weight is on the axles and is stepped down to the center of the vehicle. Stepdown is usually accomplished by use of risers.

3.27 **Stiffener.** Wood member used under the steel straps to unitize stacked unit loads.

3.28 **Strapped unit load.** Method of securing units together with straps to form a unit load.

3.29 **Strapping.** Metal (steel) banding used for securing lading.

3.30 **Stringer.** Wood member, either secured to the deck or placed between tiers of lading, used to support or provide support for a load.

3.31 **Strut.** Wood member that spreads or separates the load bearing surfaces of a blocking assembly.

3.32 **Technical directing activity (TDA).** An activity designated by the cognizant systems command headquarters by contract, task assignment, or project order to assume responsibility for performing, directing, or monitoring the design and test of packaging, packing, shipping and handling, and transportation equipment for weapon system components.

3.33 **Truckloading plan.** A specific design concerning the physical arrangement of lading and dunnage materials to protect the lading from damage during transportation.

3.34 **Truss.** Wood member used to increase tension on strapping.

3.35 **Unit load.** Composed of two or more items banded together to make a single unit, generally supported on a pallet or base to facilitate handling with mechanical handling equipment.

3.36 **Unitizing.** Strapping together two or more containers or unit loads for restraint during shipment only.

4. GENERAL REQUIREMENTS

4.1 **Danger in shipment.** Military explosives and ammunition are produced for waging war and as such are manufactured primarily to kill and destroy. Such products have inherent hazards that affect all handling operations from time of manufacture until expended in service. With a knowledge of the hazards involved, the first and foremost principle that should be considered is that explosives and weapons must be handled and shipped in a manner that will afford optimum protection against accidental ignition or detonation. Danger is always present when explosives are being handled, and more care is required than for other items. An accident with a nonhazardous material may cause a short delay, while the same type of accident with an explosive may cause death and the destruction of equipment and material. Proper truckloading procedures will minimize the danger in shipment. Methods of loading and bracing that do not follow the precepts of this document may result in a catastrophy.

4.2 **Load movement.** Under normal transportation conditions, the lading is subjected to vertical, lateral and longitudinal forces that could cause a loosening of the load and may allow some movement of the lading. Blocking and bracing of the lading must be sufficient to control movement that could cause accidental damage to, or ignition or detonation of the lading.

4.2.1 The forward movement of loads not properly braced is primarily caused by braking of the vehicle on steep descents or by sudden stops. Rearward movement is primarily caused by ascension of steep hills, load rebounds after the sudden application of brakes, or sudden increase of speed. Lateral movement is the result of rounding corners or sharp curves, traveling on high crowned or banked roads, or by swerving. Vertical movement is caused by vibration or traveling over rough terrain.

4.3 **Control of load movement.** Load movement can be controlled by proper blocking and bracing. All loads shall be properly distributed in the vehicle lengthwise and crosswise and adequately blocked and braced before the vehicle is moved. Shipping Activities are reminded that failure to properly load, block, and brace hazardous materials shipments is in violation of 49 CFR 100-199 and may subject all personnel involved to civil or criminal penalties.

4.3.1 Forward movement in vans can be controlled by placing the lading against the front bulkhead. The front bulkhead serves to square the front wall of the van and to distribute load pressures over the frontal area of the vehicle.

4.3.2 Rearward movement can be controlled by use of a rear gate or rear blocking. The rear gate shall be braced, either with diagonal supports back to the floor of the vehicle or with side frames against the door or with a combination of both. The rear blocking is nailed to the trailer floor or designed to fill the void between the lading and the doors bearing against both.

4.3.3 Lateral movement can be controlled in vans by sleepers nailed to the floor, sway braces between rows, or filler assemblies between the rows or row and side wall of van.

4.3.4 Lateral, forward, and rearward movements on flatbed trailers or trucks can be controlled by blocking attached to the floor of the flatbed. Vertical movement is controlled by securing the lading to the flatbed with over-the-load strapping or chain.

4.4 **MIL-STD dash number sheets.** Specific instructions pertaining to the loading of specific ammunition and explosive items are contained on the MIL-STD dash number sheets. These sheets are identified by using a dash number following the basic MIL-STD-1320 designator. As they are published, the MIL-STD-1320 dash number sheets will supersede the WR-51 slash number sheets now in use. Until the superseding MIL-STD-1320 dash number sheet is published, the WR-51 slash number sheet forms a part of this standard.

4.4.1 Identification numbering of these MIL-STD sheets consists of the basic MIL-STD-1320 designator followed by a dash number for each group of sheets; or, in the case of WR sheets, the numbering identification will be the WR-51 designator followed by a slash number for each group of sheets.

4.4.2 **Use of MIL-STD dash number sheets.** Where a MIL-STD dash number sheet exists for a given item, the loading, blocking, and bracing procedures shown in the dash number

sheet shall be followed without exception for full truckloads and less-than-full truckloads. MIL-STD-1320-1, MIL-STD-1320-2 and MIL-STD-1320-3 are "Typical Truckloads for Palletized Unit Loads".

4.4.2.1 The laws governing the size and weight limitations of vehicles are constantly changing. Since the trend is toward longer trailers, greater gross axle weights, and greater gross vehicle weights, many published MIL-STD dash number sheets do not reflect these changes. Dash number sheets permitting a greater number of items to be shipped with the resultant heavier gross vehicle weights are being revised on an as needed basis. Newly produced documents permit loadings consistent with the law at the date of issue of the dash sheet.

4.4.2.2 Shipping activities desiring to ship a greater number of items, load vehicles to a heavier weight, or use equipment other than specified shall obtain authorization to deviate from existing requirements from the Naval Weapons Handling Center (NWHC) Naval Weapons Station Earle, Colts Neck, N. J. Autovon 449-7692, 7693, 7691.

4.4.3 If the MIL-STD dash number sheets contained in this standard do not apply to an item to be shipped, use of this standard will allow plans to be developed by the shipping activity. When requested, NWHC will provide technical assistance on a case by case basis. Repetitious requests for the same commodity will prompt development of a specific MIL-STD dash number sheet.

4.5 MIL-HDBK-236. This handbook titled "Index to Standards for Palletizing, Truckloading, Railcar Loading and Container Loading of Hazardous Materials" provides an index to MIL-STD-1320 dash documents (truckloading) in addition to the documents in the other areas listed in the title. The handbook includes three types of listings designated as Section 1, Section 2, and Section 3.

Section 1 lists, in alpha-numerical sequence, DODIC/NALC designated items that have "specific" or "typical" dash number documents authorized for truckloading of the items listed.

Section 2 lists, in alphabetical order, all the ammunition and weapon system component items that have "specific" or "typical" dash number sheets authorized for truckloading of the items listed.

Section 3 lists all dash number documents numerically, giving the revision and change notice status of each document.

NOTE

Users of MIL-STD-1320 dash number sheets shall consult Section 3 of the latest revision of MIL-HDBK-236 to confirm that they are using up-to-date dash number sheets.

5. DETAILED REQUIREMENTS

5.1 **General.** Ammunition and explosive shipments shall be initiated in accordance with the procedures established by current area logistics plans, as approved by the Chief of Naval Operations. Shipments of explosives and other dangerous articles shall comply with all applicable requirements of special and general federal regulations controlling the shipping and transportation of these materials, including publications OP 5 Volume 1, OP 2165, OP 2239, and the Department of Transportation (DOT) regulations. In addition to the federal regulations governing interstate transportation, each state and nearly all municipalities have regulations or ordinances regulating such transportation within their jurisdiction. Shipments shall comply with all these requirements.

5.2 **Preparation of shipment.**

5.2.1 **Using the correct dash number sheets.** When planning to move ammunition and explosives by truck, MIL-HDBK-236 shall be consulted to determine the proper MIL-STD-1320 dash number sheet to use. This document should be studied so that all of its requirements can be met and the proper equipment ordered.

5.2.2 **Type of vehicles.** The dash number sheet specifies the type of vehicle required. It will specify:

(a) Type of vehicle required (usually a van or flatbed).

(b) The location of the trailer's tandem axles and whether a sliding tandem is required.

(c) The length of the trailer (40, 42, 44, or 45 feet).

(d) The weight of equipment, if special weight equipment is required.

(e) The type of trailer floor authorized (wood, metal, including nailable or non-nailable floors).

5.2.3 **Special requirements.** The truckloading requirements of a particular dash number sheet may have some special requirements that must be met. These may be:

(a) Chains and load binders. These are carrier supplied and must be ordered with the equipment.

(b) Fire-resistant and waterproof tarpaulins. These are carrier supplied and must be ordered with the equipment.

(c) Antiskid plates between lading items. These are supplied by the shipper.

5.2.4 **DOT regulations.** DOT regulations for the transportation of hazardous materials on public highways by truck are contained in ATA Hazardous Materials Tariff (Tariff III-C or superseding issue) published by the American Trucking Association. This publication is normally on file in the office of the Transportation Officer.

5.2.4.1 DOT regulations require every vehicle containing any quantity of Ammunition or Explosives (Hazardous Materials) to be placarded consistent with the hazard classification of the load. These requirements are listed in OP 2165.

5.2.5 **Maximum weights.** The carrier is responsible for informing the shipper of the maximum gross vehicle weight and maximum gross axle weights permitted in the routing that the Military Traffic Management Command (MTMC) has assigned the shipment. It is the responsibility of the shipper to load the vehicle in such a manner that these maximum weights are not exceeded. Tables B-I, B-II, and B-III of appendix B list by State the permissable "vehicle size and weight limits".

NOTE

Users of these tables are cautioned that the various States are constantly changing their size and weight laws and that the table is only accurate as of the date of the table.

5.2.6 **Motor vehicle inspection.** All motor vehicles to be used for the transportation of ammunition or explosives over public highways must be inspected by the shipping activity, using DD Form 626, for compliance with safety regulations prescribed by transportation

regulatory bodies and the Department of Defense. Vehicles noted unsatisfactory on DD Form 626 shall not be accepted for loading. Vehicles will not be rejected, however, if deficiencies are corrected before loading. The inspector shall sign the DD Form 626 approving or rejecting the vehicle. Prior to the release of a loaded vehicle the inspector and the driver of the vehicle shall sign the DD Form 626 to certify that the vehicle is safely loaded and meets the requirements of items number 24 through 32 inclusive of the DD Form 626. Detail procedures for load and vehicle inspection, placarding, discrepency reporting, etc., are contained in OP 3681. Related information may be found in OP 2165 and OP 2239.

5.2.7 **Weighing of vehicles (empty and loaded).**

5.2.7.1 Every vehicle that is approved for loading (see 5.2.6) should be weighed when empty. This provides a tare weight so that it will be possible to determine how much has been loaded on the vehicle. Also, where the tare weight and the weight of the proposed load are added together, it can be determined if the vehicle will exceed the permissable gross vehicle weight. The dash number sheet also may require lightweight vehicles to accommodate heavier loads.

5.2.7.2 Every loaded vehicle shall be weighed prior to its release. This is necessary to verify that the gross vehicle weight and the gross axle weights do not exceed the legal limits imposed by its routing (see 5.2.5) and DD Form 626. Also the gross vehicle weight minus the tare vehicle weight (less dunnage) is the weight of the lading and provides a check against the given weight of the lading.

5.3 **Preparing the vehicle.** Prior to loading, the vehicle shall be swept clean. All protruding nails and obstructions to loading shall be removed. Minor repairs may be undertaken if considered desirable in the interest of permitting early shipment. Major repairs shall not be undertaken. Vehicles not meeting inspection requirements shall be rejected.

5.3.1 All vehicles presented for loading shall have been inspected and have a completed DD Form 626 as required by OP 2165.

5.4 **Loading and unloading of long ordnance items.** The MIL-STD-1320 dash number documents provide detailed instructions for specific items, including long ordnance items. In almost all cases, these documents specify that flatbed vehicles be used for long ordnance items. However, a few do authorize the use of closed equipment when flatbed equipment is not available and shipment is mandatory. The loading of long ordnance items in closed truck vans is authorized only when flatbed equipment is not available and shipment must be made because of military necessity. Blocking and bracing shall be as specified in the appropriate

military standard. All activities shall truckload long ordnance items as specified by the dash number document and as follows:

(a) When loading long ordnance items into closed equipment, extreme care should be exercised in positioning the item into the vehicle. Approved end handling equipment should be used whenever available. Sliding by pushing or pulling the lading over the floor or deck should be held to a minimum.

(b) When required to unload long items from a closed vehicle, it may be necessary to snake the item out. Particular care should be exercised to assure that the chain or cable being used has an adequate safe working load for the weight of the item being snaked out and the attachment is secure. Personnel should be cautioned to stand clear of the chain or cable during the snaking process. Do not use fiber or plastic rope for this procedure.

5.5 **Lumber.**

5.5.1 All lumber used shall be yard lumber conforming to MM-L-751. Unless otherwise specifically indicated, lumber used may be rough or dressed. Designs are based upon the dressed sizes indicated in table I. The species and grades of lumber most commonly used for truckloading are listed in table II.

5.5.2 **Nominal strengths.** Strength values for lumber used in dunnaging are based on past experience as to what values have successfully passed tests or trial shipments, rather than on strictly scientific calculations. Strength values for the various species of wood may be found in MM-L-751. In order to standardize drawings, however, permitting maximum interchangeability and ability to load trucks anywhere in the United States, strength values used in the design of truckloading, blocking, and bracing shall be conservative. When selecting the size of lumber for blocking and bracing, consideration should be given to the weight, size, and nature of the lading to be secured within the vehicle.

Table I

SIZES OF DRESSED LUMBER

Nominal dimensions (in.)	Actual dimensions (in.)
	Softwood
1	21/32
1-1/4	15/16
1-1/2	1-3/16
2	1-1/2
3	2-1/2
4	3-1/2
5	4-1/2
6	5-1/2

Table II

SPECIES AND GRADES OF LUMBER

Species	Grade	Association grading rules[1]
Softwoods:		
Cedar:		
Western red	Standard dimension	WCLIB
Western red	No. 2 timbers	WPA
Cypress	No. 1 common	SCMA, NHLA
Douglas fir:		
Coast type	Standard	WCLIB
Mountain type	No. 2 dimension	WPA
Fir:		
Balsam	No. 1 dimension	NELMA, NPMA
White	No. 2 dimension	WPA
White	Standard dimension	WCLIB
Hemlock:		
Eastern	No. 2 dimension	NHHMA
West Coast	Standard framing or standard studding	WCLIB
Larch, western	No. 2 dimension	WPA
Pine:		
Lodgepole	No. 2 dimension	WPA
Norway (red)	No. 1 dimension	NPMA
Ponderosa	No. 2 dimension	WPA
Southern yellow	No. 3	SPIB
Redwood	Snap common dimension	CRA
Spruce:		
Engelmann	No. 2 dimension	WPA
Eastern	No. 1 dimension	NELMA, NPMA
Sitka	Standard dimension	WCLIB

[1]WCLIB - West Coast Bureau of Lumber Grades and Inspection; WPA - Wood Pine Association; SCMA - Southern Cypress Manufacturing Association; NHLA - National Hardwood Lumber Association; NELMA - Northeastern Lumber Manufacturing Association; NPMA - Northern Pine Manufacturing Association; NHHMA - Northern Hemlock and Hardwood Manufacturing Association; SPIB - Southern Pine Inspection Bureau; and CRA - California Redwood Association.

5.5.3 **Selecting lumber.** All blocking and bracing material should be selected from sound lumber, free from cross grain, dry rot, knots, knot holes, checks, or splits which will affect its strength or interfere with proper nailing. Knots, knot holes, checks, and splits or other defects are permitted in lumber as long as they do not impair the strength of the blocking and bracing. Blocking and bracing personnel shall take particular care in selecting lumber used in struts, gates, cross bracing, side and center bracing, diagonals, holddowns, and K-bracing by upgrading lumber as necessary. It is usually possible to upgrade any given piece of lumber by culling through lower grades and, unless the required length is too great, cutting out defects (see figure 2).

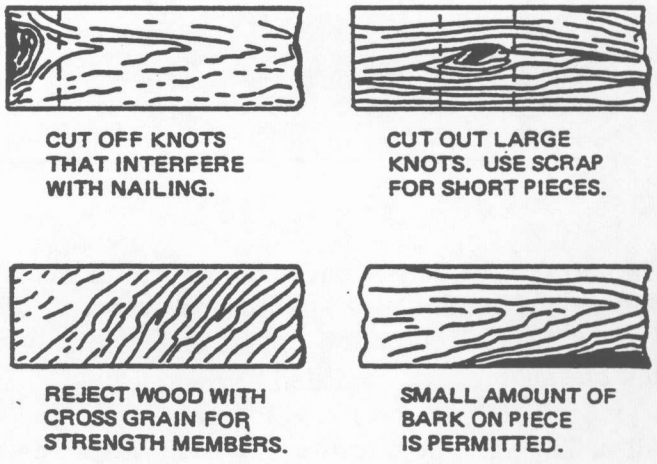


FIGURE 2. LUMBER DEFECTS

5.5.3.1 The minimum grade requirement for dunnaging lumber is No. 2 dimension, rough or finished. Better grades of lumber will be used only when No. 2 dimension is not available or when used lumber of better grades are available for the same or lower cost.

5.6 **Nails.**

5.6.1 Unless otherwise specified, nails shall be common bright nails, conforming to FF-N-105, type II, style 10. Table III gives actual sizes of nails.

Table III

SIZES OF NAILS

Size (d = penny)	Nails	
	Length (in.)	Diameter (in.)
2d	1	0.072
3d	1-1/4	0.080
4d	1-1/2	0.099
5d	1-3/4	0.099
6d	2	0.113
7d	2-1/4	0.113
8d	2-1/2	0.131
9d	2-3/4	0.131
10d	3	0.1483
12d	3-1/4	0.1483
16d	3-1/2	0.162
20d	4	0.192

5.6.2 The proper selection of nails will ensure the necessary holding power without the risk of splitting the lumber and affecting the strength of the dunnage structures. Some general rules for nail selection and application, which have gained general acceptance in blocking and bracing practice, are listed below.

(a) All nailing shall be into the side grain of the lumber; end grain nailing should be avoided. Use plenty of nails. Balanced nailing is important. Stagger nails along the piece being nailed. Do not nail along one grain of wood. Whenever possible drive nails straight; do not toenail unless called for in the MIL-STD dash number sheet.

(b) Nails shall be of such length as to give the necessary holding power and ample penetration into floors or bracing and blocking. To obtain the most holding power, nails shall be of such length that they nearly penetrate but do not protrude through the timber holding the point of the nail. Nails shall not be so large as to cause splitting. The general rule of thumb is that the nail should be three times as long as the thickness of the piece holding the head of the nail, but the nail point should not protrude beyond the second piece unless clinching is required.

(c) Generally, no nail shall be driven closer to the end of a piece of lumber than the thickness of that piece, nor closer to the edge than half the thickness of the piece holding the nail head.

(d) When pieces are of different thicknesses, the nailhead should be in the thinner piece.

(e) When the density of the wood dunnage is such that diamond-point nails cause splitting that could weaken the dunnage structures, the nails should be blunted before use.

(f) Ideally, nail heads should be set flush with the nailing surface, but if deeper penetration occurs it should not be more than one-eighth the thickness of the piece retaining the head.

(g) When driving nails near hazardous materials, extreme care must be taken to ensure that the nails are not directed, or are likely to be deflected, toward or into the packaging or hazardous material.

WARNING

Never nail dunnage directly to the lading.

(h) Pieces which are end nailed and which are used as a supporting structure should always be reinforced by cleats.

5.6.3 When nailing backup cleats, sleepers, and other laminated dunnage members to a vehicle floor, always nail as follows:

(a) Nail first piece to vehicle floor with one nail every 6 to 8 inches, stagger nails to increase holding power of cleat and to help prevent splitting.

(b) Nail second piece to third piece in like manner, staggering the nails to the opposite side of nails in the first piece.

(c) If three high, nail third piece to second piece, staggering nails to the opposite side of the nails in the second piece.

5.7 **Steel strapping.**

5.7.1 Steel strapping used in truckloading shall be flat strapping conforming to QQ–S-781, type I, heavy duty, finish A, B, or C. Unless otherwise specified, all strapping shall be dry (unwaxed) strapping and all joints shall be crimped seal joints consisting of two seals (style II, thread on or closed), each double crimped. Heavy duty strapping sizes 1-1/4 inches and 2 inches shall be marked to indicate manufacturer's or supplier's name and the letters "AAR" to show compliance with the requirements of the American Association of Railroads (AAR) for strapping to be used in open-top railcar loading.

5.7.1.1 Unless otherwise specified, the maximum authorized weight of lading to be restrained per strap is shown in table IV. Only 2 X .050 strap shall be used as strapping.

Table IV

MAXIMUM LOAD PER STRAP

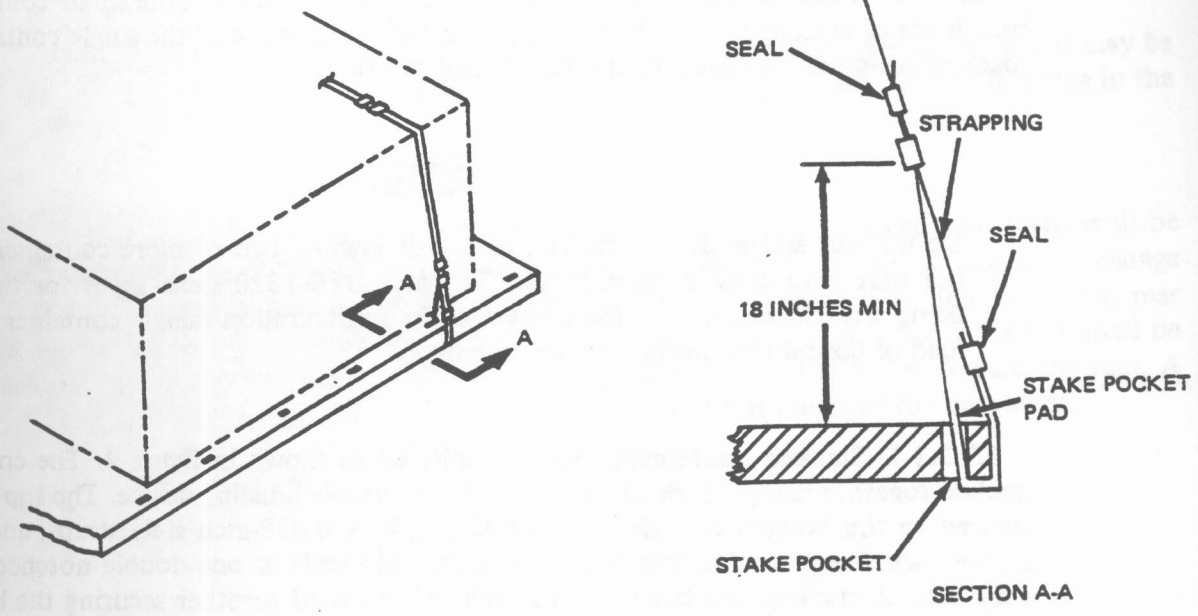
Strap size (inches)	Minimum strap breaking strength (lbs)	Maximum authorized lading weight per strap (lbs)
1-1/4 x 0.035	4,750	2,200
1-1/4 x 0.050	6,750	3,100
2 x 0.050	10,600	5,000

5.7.1.2 **Crimping/notching strap seals.** Strap seals shall be carefully crimped/notched to ensure that the joint develops at least 75 percent of the minimum breaking strength of the strap shown in Table IV. Methods and tools used should be frequently tested to prove this by pulling sample sealed joints.

5.7.2 **Tiedown strapping on flatbed vehicles.**

5.7.2.1 **Determining number and size of straps.** Determine the total weight of the stack to be strapped down to the vehicle. Divide this number by the maximum load per strap of the strap proposed to be used (see Table IV). The result will be the number of straps required. A minimum of two straps per stack shall be used.

5.7.2.2 The approved method of applying tiedown straps is illustrated in figure 3. It is preferred to position, tension, and double crimp the strap seals at the top of the load, if practicable.



THE STRAPPING IS SECURED TO THE STAKE POCKETS, ONE PIECE ON EACH SIDE OF THE TRAILER, AND IS BROUGHT UP OVER THE LOAD, TENSIONED, AND SEALED WITH TWO DOUBLE-CRIMPED SEALS ON THE TOP. METHOD OF SECURING STRAPPING TO STAKE POCKET IS SHOWN IN SECTION A-A. THE SHORT END IS ON THE OUTSIDE AND IS SECURED WITH TWO DOUBLE-CRIMPED SEALS AT A MINIMUM OF 18 INCHES ABOVE THE TRAILER BED. A STAKE POCKET PAD (A SHORT PIECE OF THE SAME STRAPPING 18 INCHES LONG) IS INSERTED BETWEEN THE MAIN STRAP AND THE STAKE POCKET AND IS SECURED TO THE MAIN STRAP WITH A SEAL AS SHOWN.

FIGURE 3. TIEDOWN STRAPPING

5.7.3 **Unitizing containers.**

5.7.3.1 When truckloading single containers or unit loads of containers that are stacked two or more high, they shall be strapped together to form a unit ensuring that the stacking features are in continuous engagement.

WARNING

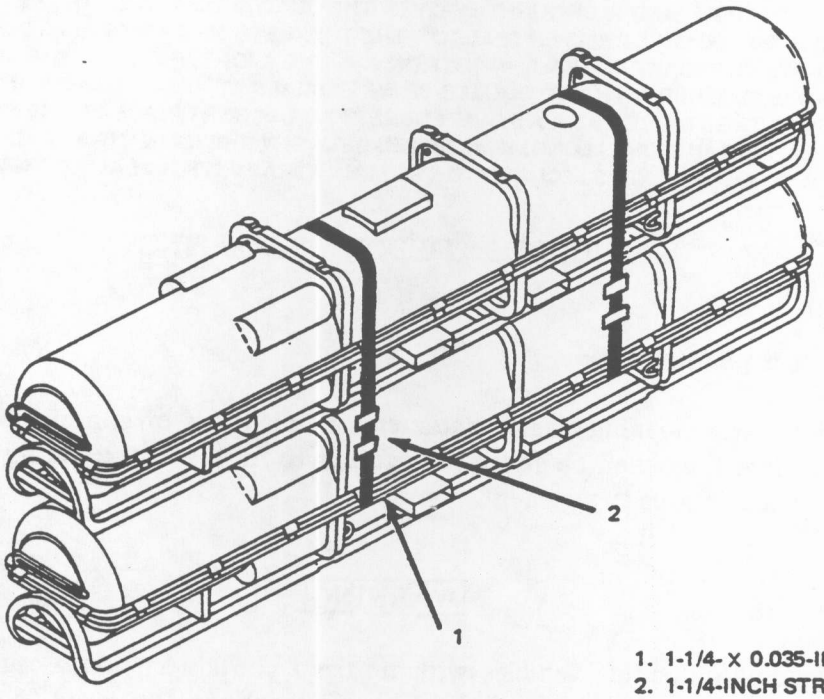
When loading/unloading vehicles with unitized containers, extra caution should be taken to prevent toppling. Special attention should be given to appropriate backup of outboard containers. Containers shall be deunitized after unloading the vehicle.

As soon as the containers are off loaded, the straps unitizing the single containers or the unit loads of containers should be cut, stacks broken down, and the single containers or unit loads of containers handled in the authorized manner.

NOTE

Do not cut straps that form part of a unit load of two or more containers since the unit load must remain intact. The MIL-STD-1320 slash sheet for the item being truckloaded shows the correct basic configuration (single container or unit load of containers) in the bubble on page 1.

5.7.3.1.1 Stacked containers shall be unitized as shown in figure 4. The containers are stacked together using a fork lift truck or other suitable hoisting device. The top container is secured to the bottom container with two 1-1/4- X 0.035-inch steel straps, and the straps secured with two double-crimped 1-1/4-inch strap seals or one double notched 1-1/4-inch strap seal. A stack of containers three high are strapped together securing the bottom container to the center container and the center container to the top container.



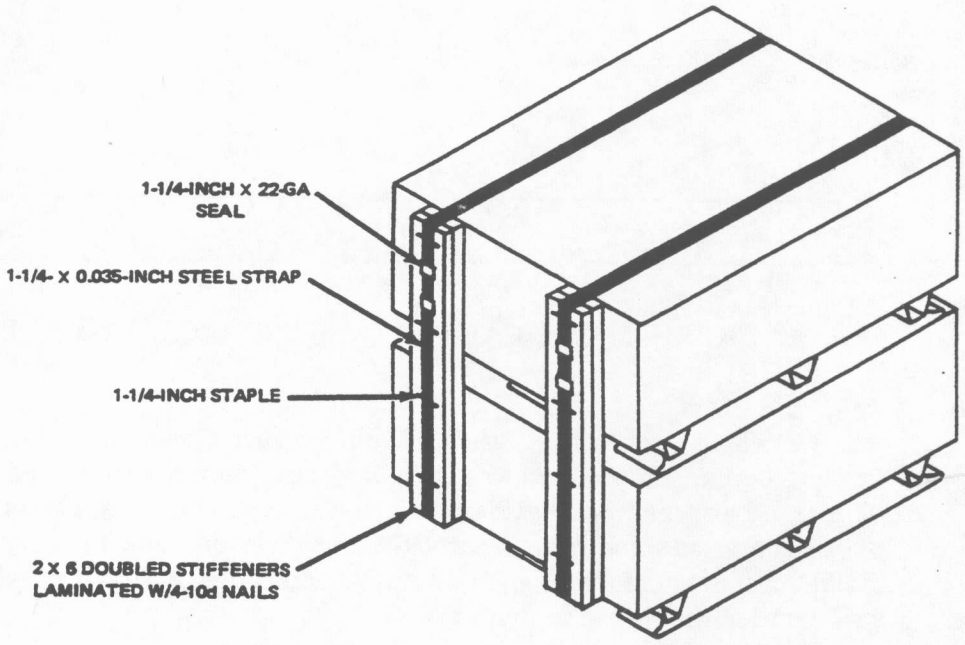
1. 1-1/4- X 0.035-INCH STEEL STRAP
2. 1-1/4-INCH STRAP SEAL

FIGURE 4. UNITIZING CONTAINERS

5.7.4 **Unitizing unit loads.**

5.7.4.1 When the unit loads in a truck or trailer are more than one layer high, it may be necessary to unitize certain unit loads to prevent longitudinal movement of the lading in the second (or third) layers.

5.7.4.2 Unless otherwise specified, the two (or three) high stacked unit loads shall be unitized as shown in figure 5. Unitizing is necessary where the layers of unit loads change from two layers high to one layer high (three layers high to two layers high) and at the rear of the trailer when the unit loads are stacked two or more high. The stiffeners shall be positioned toward the lower layer(s) or, when at the rear of the trailer toward the rear. A single stack of unit loads in a row shall have stiffeners at both ends of the unit loads.



1. WHEN REQUIRED BY THE FTL OR LTL REQUIREMENTS OF THIS DOCUMENT THE TWO HIGH STACKED UNIT LOADS SHALL BE UNITIZED AS SHOWN ABOVE.
2. THE DOUBLED 2 X 6 STIFFENER SHALL EXTEND FROM THE TOP OF THE STACKED UNIT LOADS TO THE PALLET OF THE BOTTOM UNIT LOAD.
3. THE 1-1/4-INCH STEEL STRAPS, POSITIONED AS SHOWN, ENCIRCLE THE STACKED UNIT LOADS AND PASS UNDER THE DECK OF THE BOTTOM PALLET. THE STRAPS HOLD THE STIFFENERS IN PLACE.
4. TENSION STRAPS AND SEAL WITH TWO DOUBLE-CRIMPED SEALS. SECURE EACH STRAP TO THE STIFFENER WITH FOUR 1-1/4-INCH STAPLES.

FIGURE 5. UNITIZING UNIT LOADS

5.8 **Chains and load binders.**

5.8.1 Chains and load binders may be used to secure lading to a flatbed trailer. The chain shall conform to the National Association of Chain Manufacturer's Welded Chain Specification adopted November 1975. One chain and load binder shall be used for each 5,000 pounds of lading to be retained. A minimum of two chains and load binders shall be used for each stack of items. The method of applying chains and binder is shown in figure 6.

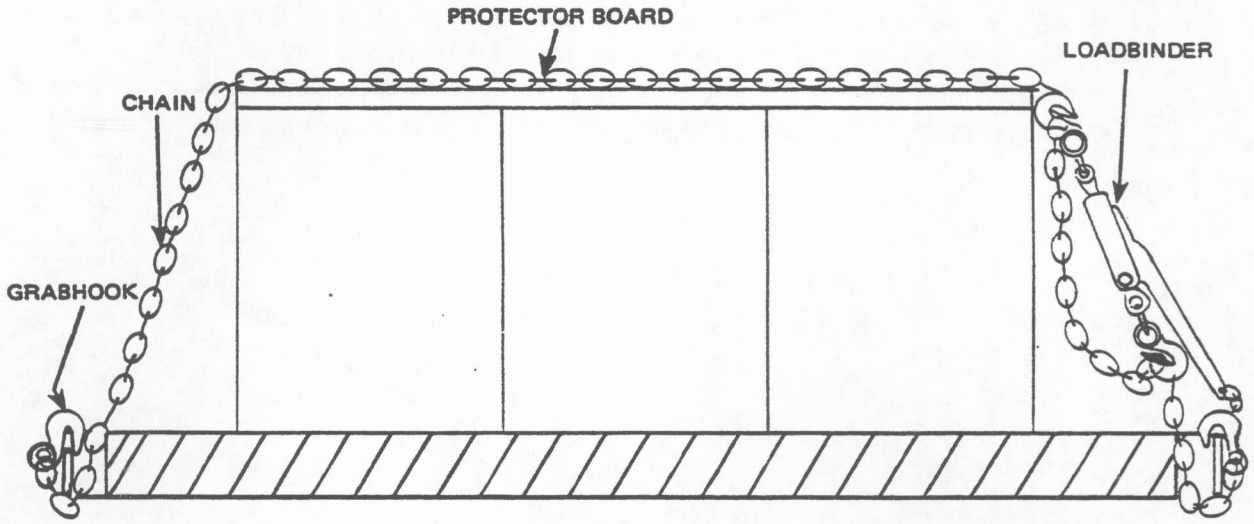


FIGURE 6. TYPICAL TIEDOWN USING CHAIN AND LOADBINDER

5.8.2 Three-eighths-inch, grade 43, High-Test Chain or five-sixteenth-inch, grade 70, Binding Chain is authorized to secure hazardous material to flatbed vehicles. All chains shall be marked as prescribed by the National Association of Chain Manufacturers' Welded Chain Specification adopted November 1975. At least one link in every 36 links shall carry the manufacturer's permanent and distinctive mark identifying the grade of the chain. No chain shall be used that is not so marked.

5.8.2.1 Three-eigths-inch, grade 43, High-Test Chain shall be marked H or 4 or 43 or 430 or HT.

5.8.2.2 Five-sixteenths-inch, grade 70, Binding Chain shall be marked 7 or 70 or 700.

5.8.2.3 In addition to the grade marking described in 5.8.2.1 and 5.8.2.2, the chain may also carry a letter(s) or symbol identifying the manufacturer of the chain. The presence of the manufacturer's marking is not mandatory.

5.8.3 The grabhooks on the ends of the chain may be of the following types with grade markings as indicated:

(a) Clevis grabhook. Three-eighths-inch clevis grabhooks do not require grade marking. Five-sixteenths-inch alloy clevis grabhooks shall carry the manufacturer's grade mark of 7 or 70 or 700. The hooks shall be used on appropriate size chain.

(b) Closed eye grabhooks. Three-eighths-inch and five-sixteenth-inch closed eye grabhooks may be used on the appropriate size chain if they are part of a chain assembly which was provided by a chain manufacturer, and the chain assembly carries the correct grade identification mark as specified in 5.8.2.1 and 5.8.2.2. Closed eye grabhooks that form a part of the assembly are exempt from grade markings.

5.8.4 Chain and fitting of a higher grade may be substituted for the specified grade; i.e., grade 70 Binding Chain and grade 80 Alloy Steel Chain may be substituted for grade 43 High-Test Chain. Grade 80 Alloy Steel Chain may be substituted for grade 70 Binding Chain.

5.8.5 Load binders shall be 5/16- to 3/8-inch size and have a working load limit of 5,400 pounds (minimum breaking strength of 16,200 pounds). Overcenter type loadbinders shall be safety-wired with 16 gauge soft annealed iron wire or secured using slack portion of chain. The size of the load binders shall be compatible with the size of the chain being used.

5.8.6 Prior to loading the trailer and during the preloading inspection required by OP 2165, the chain fittings and load binders shall be inspected for stretch, gouging, bent links, wear, and any other noticeable defects. The inspector shall record the results of his inspection on DD Form 626. Any deficiency shall be cause for rejection of a chain or load binder.

5.8.7 Unless otherwise specified, the lading shall be protected from chain damage by inserting a doubled 2 X 6 X full lading width protector board between the chain and the lading.

5.9 **Dunnaging in van trailers.**

5.9.1 **Van trailer lengths.** The length of van trailers in use vary and loading activities should be prepared to load all lengths. The most common van trailer length is still 40 feet, however 42-, 44-, and 45-foot vans are becoming more commonplace. The additional van length produces additional cube which is of little value in shipments of hazardous materials since most full truckloads (FTL) weigh out before they cube out.

5.9.1.1 When a van trailer is being loaded to capacity, the length of the trailer determines the load pattern which in turn determines the location of the apparent center of gravity of the lading. The location of this apparent center of gravity controls how much of the lading's weight will be carried by the trailer's tandem axles and how much will be carried by the tractor's drive axles. Shifting it forward will put more weight on the tractor's drive axles while shifting it aft will put more weight on the trailer's tandem axles.

5.9.2 **Trailer axles.** The location of the trailer's tandem axles is important for the proper weight balance. Most trailers have fixed (nonsliding) axles which are located in the "Western" or "West Coast" setting (at the extreme rear of the trailer). The distance between the rear of the trailer and midway between the two wheels of the tandem axles is approximately 60 inches. The "Western" location is the one almost all dash number sheets require. Sliding tandem axles may be required in isolated cases; however the tandem axles may be positioned at the extreme rear of the trailer giving a trailer with a "Western" setting.

5.9.2.1 The dash number documents of this standard provide the correct load pattern for the number of items being shipped and the length of the trailer being loaded. Deviation from the prescribed load pattern could cause uneven weight distribution with possible axle over weight.

WARNING

Trailers must have the tandem axles located as specified or the gross axle weights may exceed the maximum permissable weight.

5.9.3 **Controlling forward movement.**

5.9.3.1 **Front bulkhead.** Forward movement of the load can be controlled by using a front bulkhead. The front bulkhead serves to square the front of the van and to distribute load pressure over the front area of the van rather than just at the points of contact. The front bulkhead design shall be compatible with the type and size van used and with the load being shipped. When a van has rounded corners, the front bulkhead provides a means of adapting the front of the van to the load. The majority of vans in use are provided with plywood, aluminum, or other thin metal shells designed primarily for weather protection and will not withstand concentrated load pressures encountered in normal transportation conditions. The front bulkhead when properly installed, provides the needed strength for localized pressures. Installation should permit removal as a unit for reuse with future loads when possible.

5.9.3.1.1 Figure 7 illustrates a type suitable for a square nose, rounded corner van. The forward crossmembers (1) and aft crossmembers (3) are nailed to the verticals (2). This type of bulkhead is used when the rounded corners of the vehicle prohibit proper placement of the lading or when it is necessary to spread the load pressure over the entire front wall of the trailer. It is the most used of all front bulkheads.

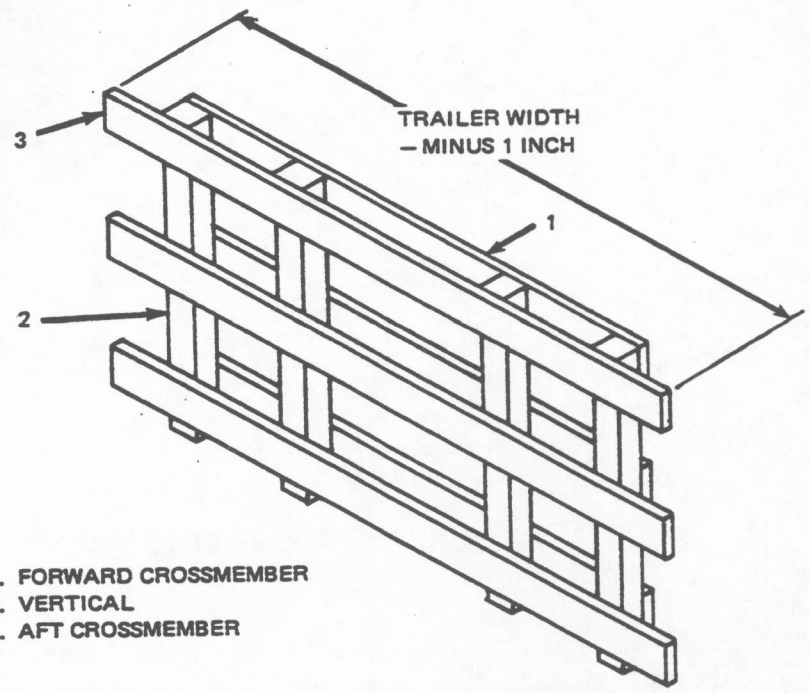


FIGURE 7. FRONT BULKHEAD (FOR SQUARE NOSE, ROUNDED CORNER VANS)

5.9.3.1.2 Figure 8 illustrates a type of front bulkhead used to fill a void space in the front of a van when it is desired to position the lading aft to equalize axle loads. The aft strut cleats (1) are nailed to the aft verticals (2). The forward strut cleats (3) are nailed to the forward verticals (4). The horizontals (5) are nailed to the forward verticals (4), and the struts (6) are nailed to the strut cleats (1 and 3) and verticals (2 and 4).

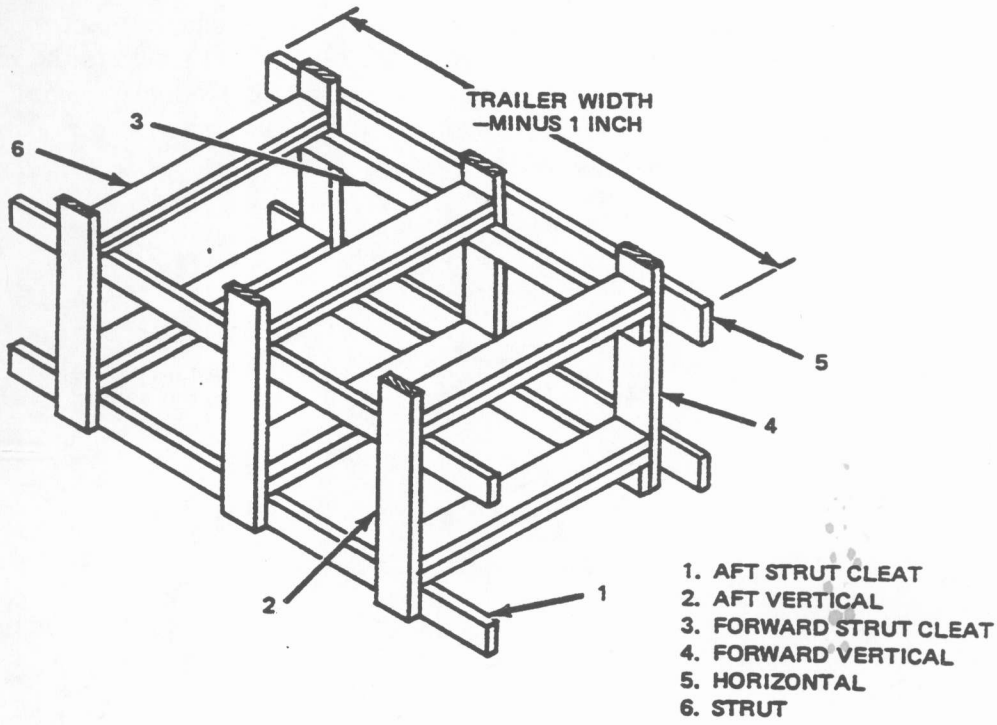


FIGURE 8. FRONT BULKHEAD (VOID SPACE)

5.9.3.1.3 Figure 9 illustrates a third type of front bulkhead used with a square nose van to spread the load over the forward end of the van.

5.9.3.1.4 Figure 10 illustrates a fourth type of front bulkhead. It can be used only when the major "hard point" of the lading is at a low level and support at a higher level is not necessary. The forward crossmember (1) and the aft crossmember (3) are nailed to the verticals (2.)

5.9.3.2 Front bulkheads are not necessary in vans with square front ends when the lading will bear uniformly against the forward wall so that its load is distributed evenly over the entire area. Ladings that have unusual configurations that concentrate loads in small areas do require a bulkhead.

5.9.3.3 Partial layers. Partial layers of unit loads require special bracing procedures to control forward movement. The approved method of preventing the top layer(s) from sliding forward over the bottom layer is described in 5.7.4.

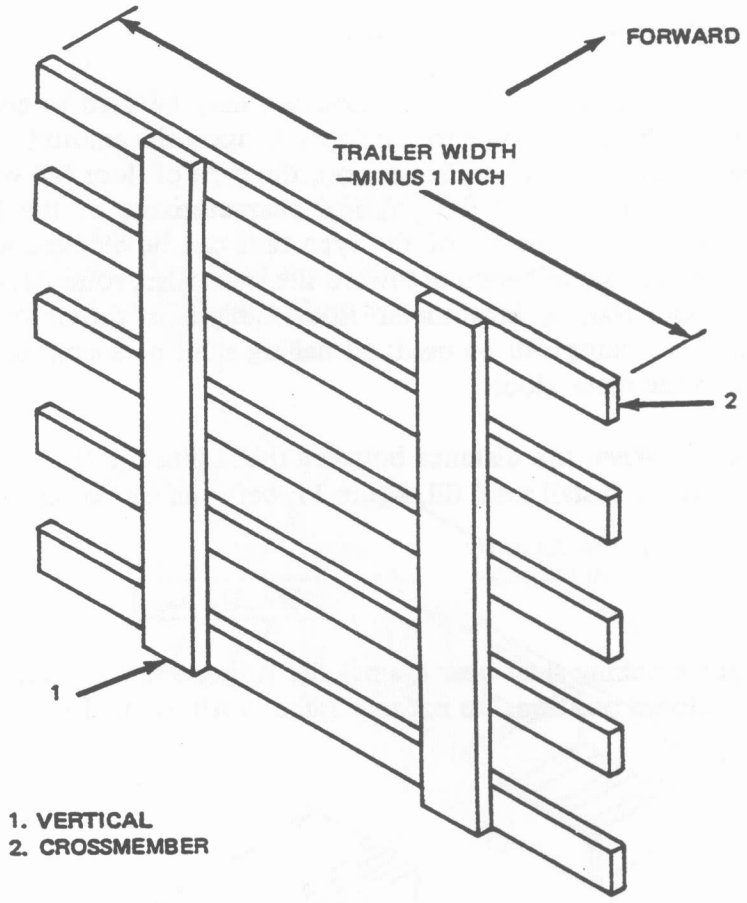


FIGURE 9. FRONT BULKHEAD (SQUARE NOSE)

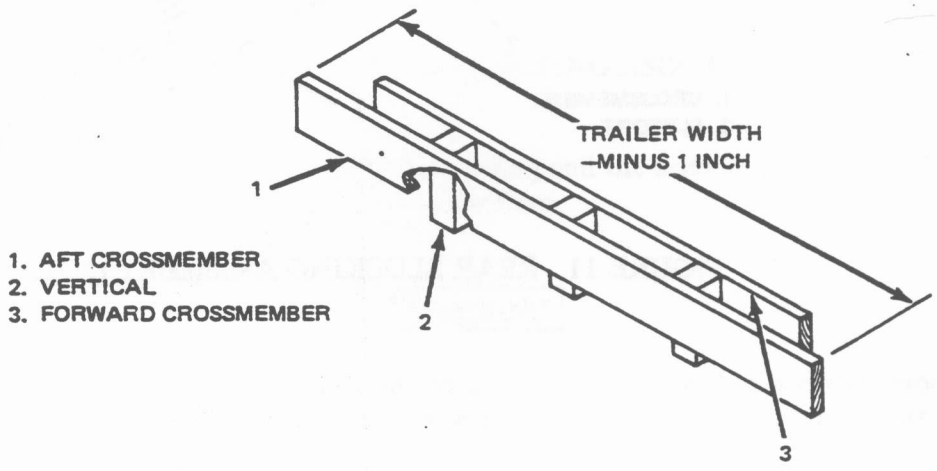


FIGURE 10. FRONT BULKHEAD (LOW)

5.9.4 **Controlling rearward movement.**

5.9.4.1 **Floor blocking.** Floor blocking may be used to control rearward movement of the lading. The proper type to use depends upon the amount of space at the rear of the load (distance from lading to trailer doors), the type of floor (all wood, metal with wood nailing strips, or all metal), and the physical characteristics of the lading. To use floor blocking safely, the lading must be of the type that can be blocked at the floor line and does not present any danger of toppling toward the rear. Also, some blocking requires nailing into the trailer floor. Nailing into metal floor trailers is prohibited. In this type trailer, only "floating" blocking can be used; all nailing shall be accomplished within the blocking and never into the metal floor.

5.9.4.1.1 When the distance between the lading and the trailer doors, when closed, is less than 12 inches, install solid fill, figure 11, between the lading and the doors.

WARNING

Rear blocking shall bear against the lading and the trailer doors with the doors in the closed position. Do not use trailers with rollup doors.

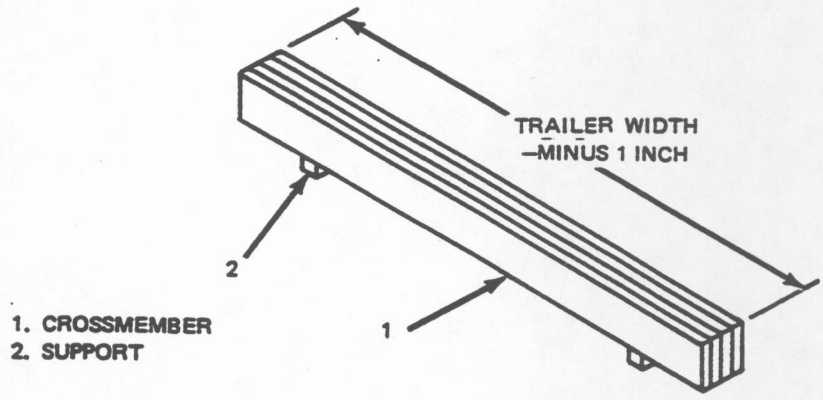


FIGURE 11. REAR BLOCKING ASSEMBLY (SOLID FILL)

5.9.4.1.2 When the distance between the lading and the trailer door is 12 to 36 inches, install rear blocking assembly, figure 12, between the lading and the doors.

WARNING

Rear blocking shall bear against the lading and the trailer doors with the doors in the closed position. Do not use trailers with rollup doors.

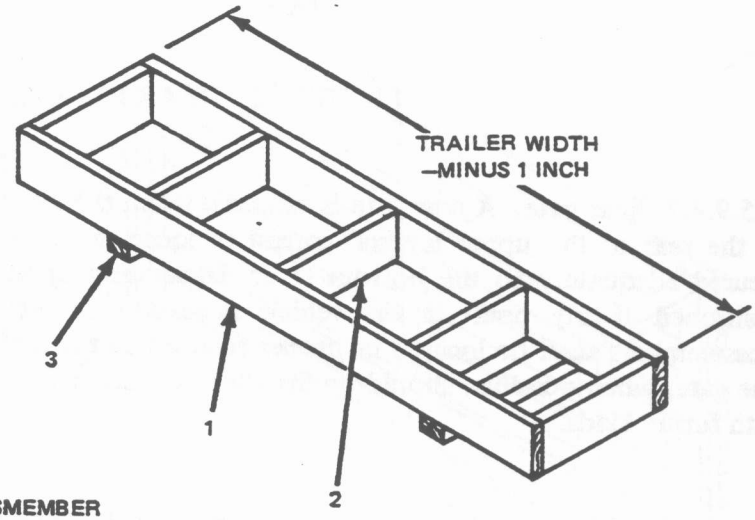


FIGURE 12. REAR BLOCKING ASSEMBLY

5.9.4.1.3 When the distance between the lading and the door is greater than 36 inches, install rear blocking, figure 13, nailed to trailer floor.

WARNING

Do not use when trailers have all metal floors. If trailer has a metal floor with wood nailing strip, position crossmember and backup cleat over nailing strips and nail to strips.

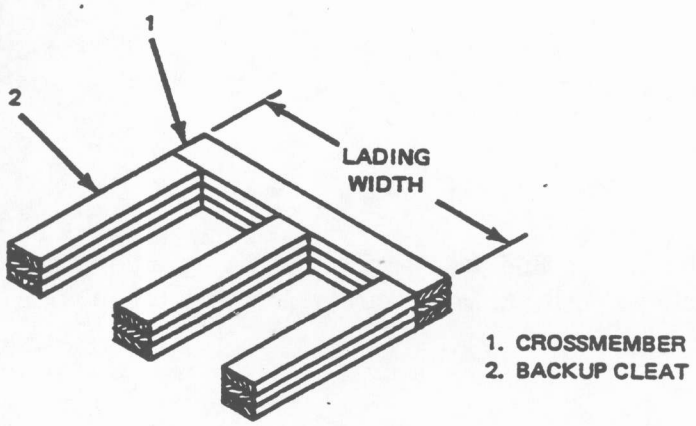


FIGURE 13. REAR BLOCKING

5.9.4.2 **Rear gate.** A rear gate is essential when the lading is of the type that may topple to the rear or the upper layer(s) consist of loose items or palletized loads that cannot be secured adequately to the bottom layer. Depending upon their design, rear gates may be positioned at any point in the vehicle necessary to secure a full or partial load. Gate crossmembers shall be located in proper relation to the lading to provide adequate support. The gate, when possible, should be installed so that it may be removed as a unit for reuse with future loads.

5.9.4.2.1 Figure 14 illustrates a rear gate suitable when the lading is 2 or 3 feet from the rear door. The gate is constructed of crossmembers (1) and verticals (2 and 5). The space between the gate and the trailer corner posts is filled with preassembled filler assemblies (3) and braced securely in the center by placing a diagonal (4) between the gates center vertical (5) and the rear door sill. The diagonal (4) is secured at each end by cleats (6). A backup cleats (7) are placed against the bottom gate crossmember on each side of the center vertical (5) securing the gate in position.

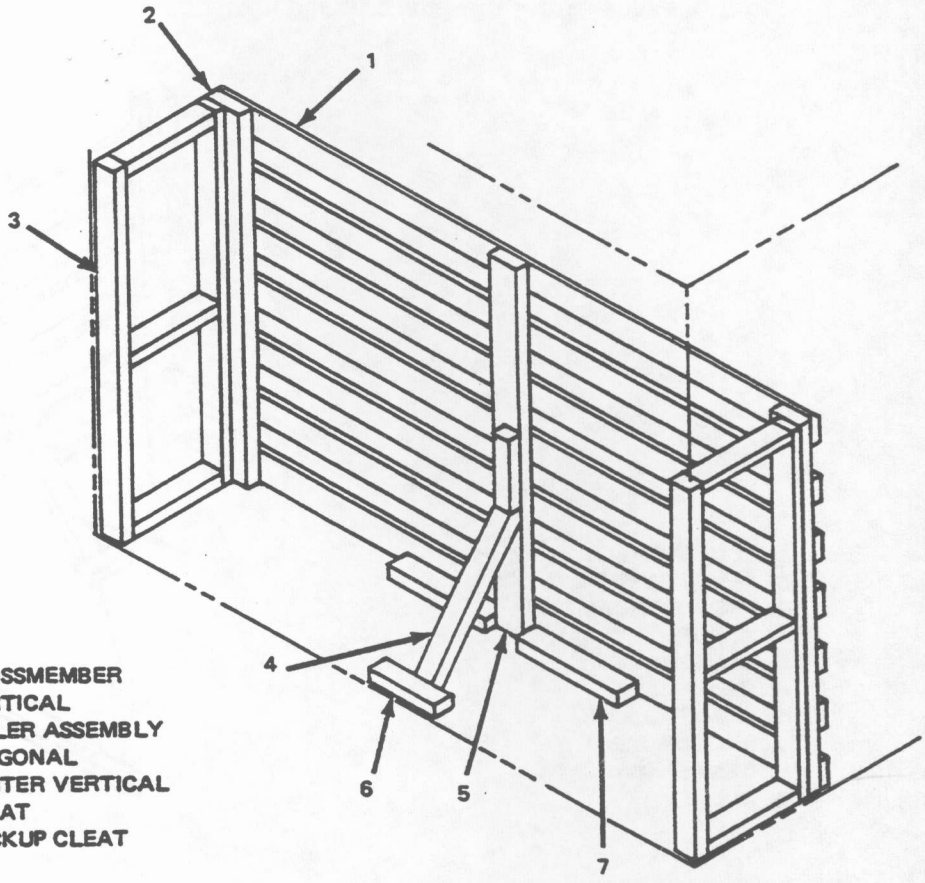


FIGURE 14. REAR GATE (2 TO 3 FEET FROM REAR DOOR)

5.9.4.2.2 Figure 15 illustrates a rear gate suitable for less than truckloads or other situations where it is not feasible to block to the rear of the vehicle. Crossmembers (1) are nailed to center vertical (2) and end verticals (3). Kickers (4) are installed against the end verticals, extending toward the door posts for a minimum of 6 feet. Diagonals (5) are placed between the end verticals (3) and kickers (4), braced at the upper end with upper cleats (6) and at the lower end with lower cleats (7). The gate is braced in the center by placing diagonal (9) in the center, secured by cleats (10) at each end. A backup cleat (8) is secured to the floor between center uprights and end uprights.

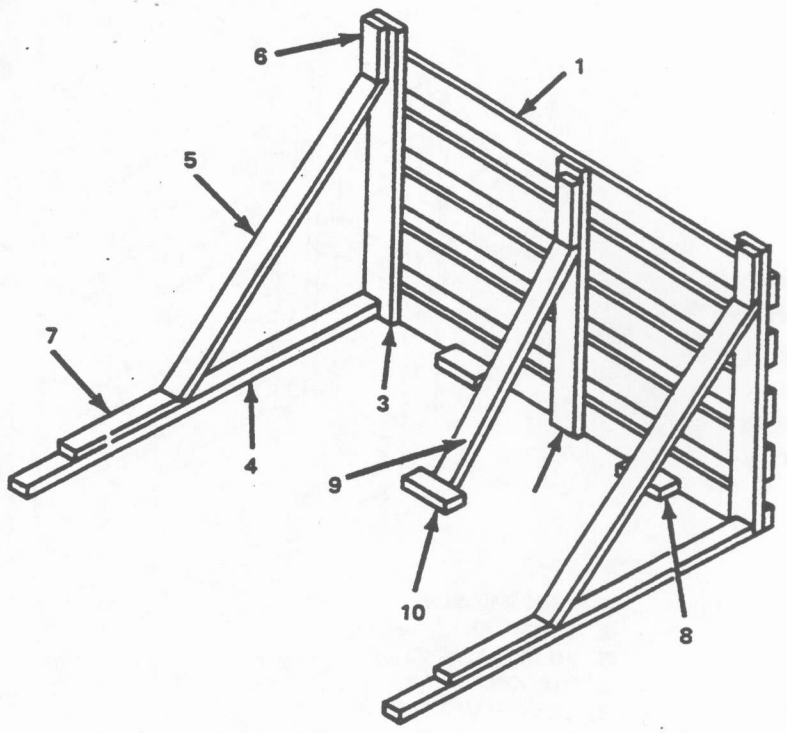


FIGURE 15. REAR GATE (LOCATED FURTHER THAN 6 FEET FROM REAR DOOR)

5.9.4.3 **Partial layers.** Partial layers of unit loads require special bracing procedures to control rearward movement. The approved method of preventing the top layer(s) from sliding aft over the bottom layer is described in 5.7.4. The doubled 2 × 6 stiffeners of the unitized loads shall be positioned toward the rear of the trailer.

5.9.5 **Controlling lateral movement.**

5.9.5.1 **Sleeper.** A Sleeper is used to control lateral motion in the first layer of the lading and only when the trailer has a nailable floor (it cannot be used when the trailer has metal floors). The sleeper is nailed to the floor against the lading and running parallel to the longitudinal axis of the trailer. Figure 16 shows sleepers installed against a unit load of propellant charges.

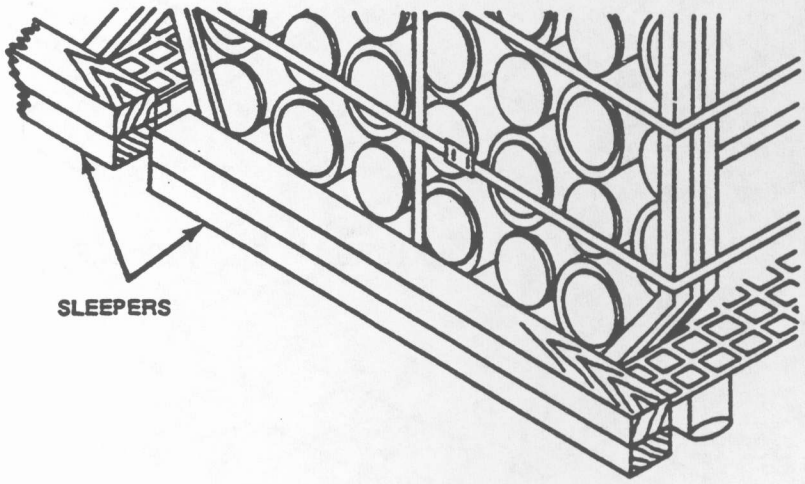


FIGURE 16. SLEEPERS

5.9.5.2 **Sway brace.** A sway brace is used between units of lading to hold them against the side walls of the trailer and control lateral motion. They are generally used in the second (and third) layers however they must also be used for the first layer in lieu of a sleeper when a van has a nonnailable floor.

5.9.5.2.1 Figure 17 shows the most commonly used type of sway brace. It is supported and held in place by the pallets of the unit loads (or the fork pockets of containers). This type can also be used for preventing lateral motion in the first layer of the load when the van has nonnailable (metal) floors since it does not require nailing into the floor.

5.9.5.2.2 Figure 18 is a type of sway brace to be used on top of the lading. It is supported by its support pieces on top of the lading and must be secured in place, usually by twist-tieing with 16-gauge, soft-annealed iron wire to some fixed part of the lading.

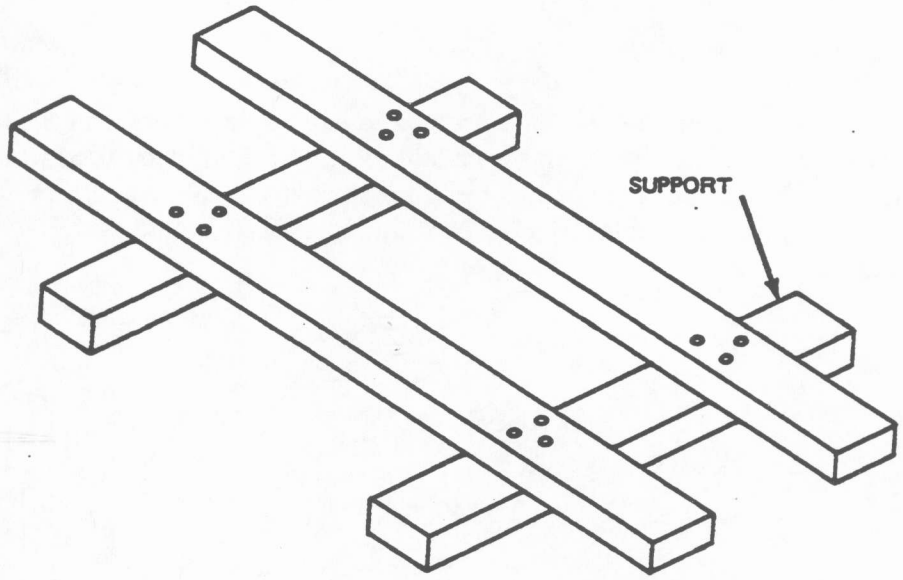


FIGURE 17. SWAY BRACE

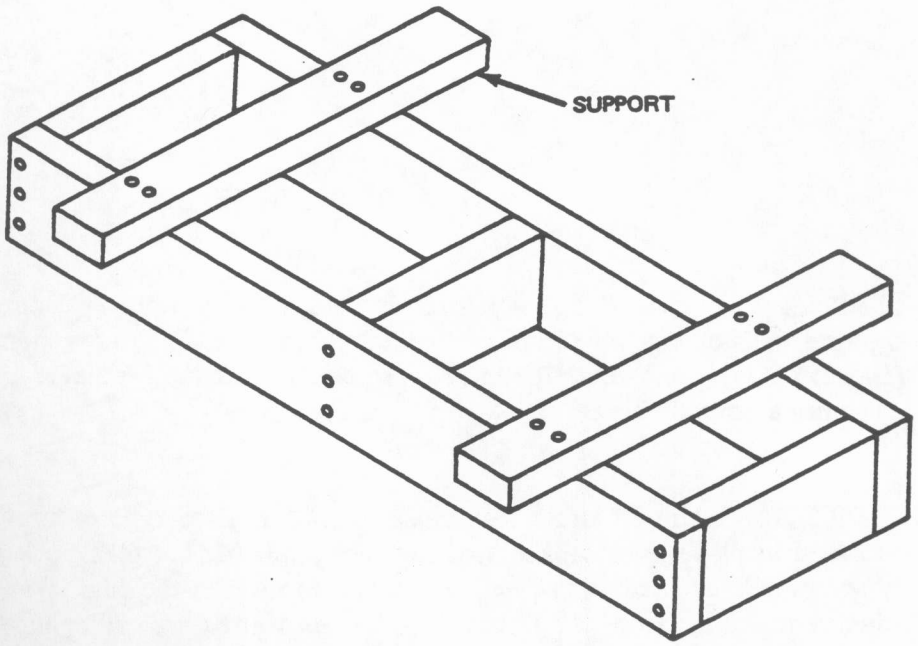


FIGURE 18. TOP-OF-LOAD SWAY BRACE

5.9.5.3 **Filler Assemblies.** When the lateral void space between units of lading is too small to install sway braces, a filler assembly may be used. The assembly should be prefabricated and slid into the void. The thickness of the material or the design may be varied so that the assembly fills the void. Figure 19 shows examples of filler assemblies for one high and two high layers of lading.

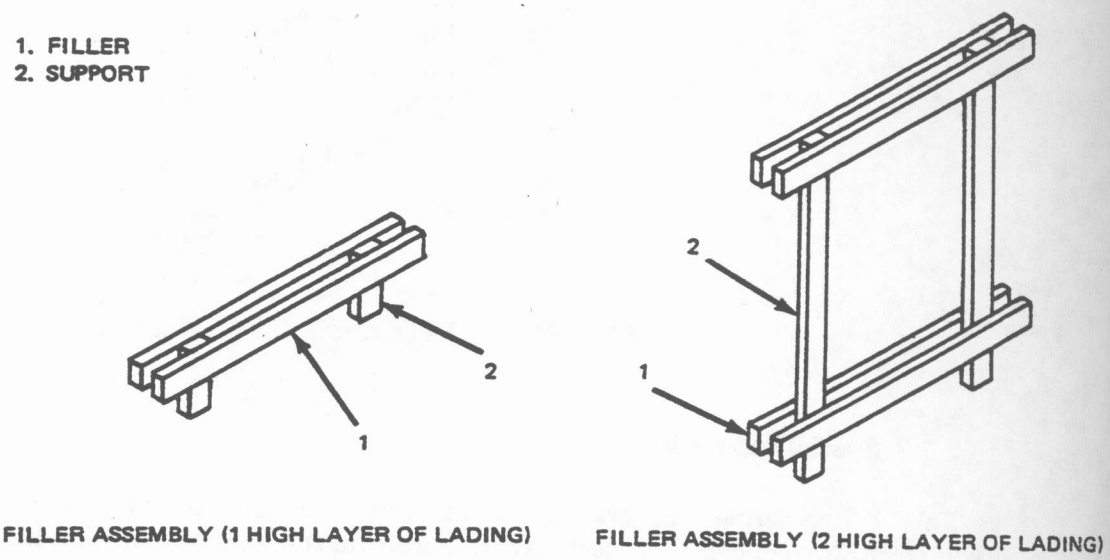


FIGURE 19. FILLER ASSEMBLIES

5.9.6 **Intermediate gates.** Intermediate gates may be used as necessary in mixed loads to separate containers or units of different weight, size, and type. Gates may be used between a unit of heavy, strong containers and lighter, weak units when subjected to load pressures that might cause crushing. Intermediate gates shall be floating and not secured to floor or walls. Figure 20 shows a typical intermediate gate.

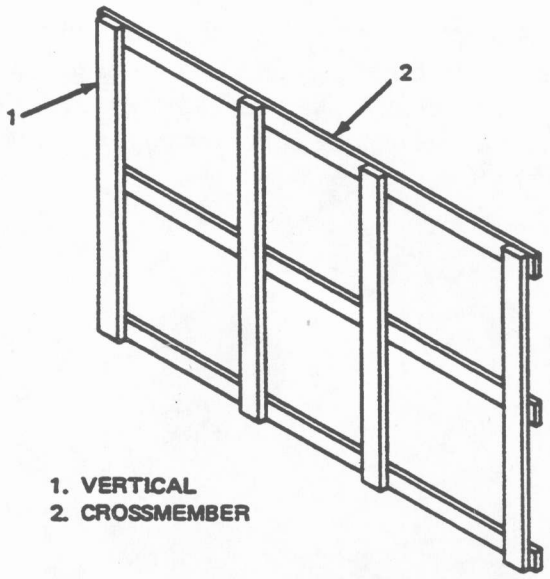


FIGURE 20. INTERMEDIATE GATE

5.9.7 **Special van loads.**

5.9.7.1 **Eggcrating.** Eggcrating, as shown in figure 21, connotes each component being secured in its own cell. The load may be a uniform full load or a divided load. The load shall be tight enough to prevent the component moving within the cell; when the load is divided, support shall be provided to assure complete rigidity of the load. Stiffeners (4) installed crosswise and nailed to spacers (6) are used to provide the support and should be used as required. One stiffener is used when the distance between the fore and aft load exceeds 84 inches; two stiffeners are necessary when the distance exceeds 100 inches. The cell is formed with separators (2), intermediate bulkheads (7), and side supports (5). Spacers (3 and 8) are used to prevent athwart movement. Aft bulkhead (1) prevents rearward movement of the load. Loose components of not less than 4-1/2 inches in diameter may be shipped eggcrated. When less than 4-1/2 inches in diameter, the components shall be packed and properly secured in strong wooden or metal boxes or suitably palletized.

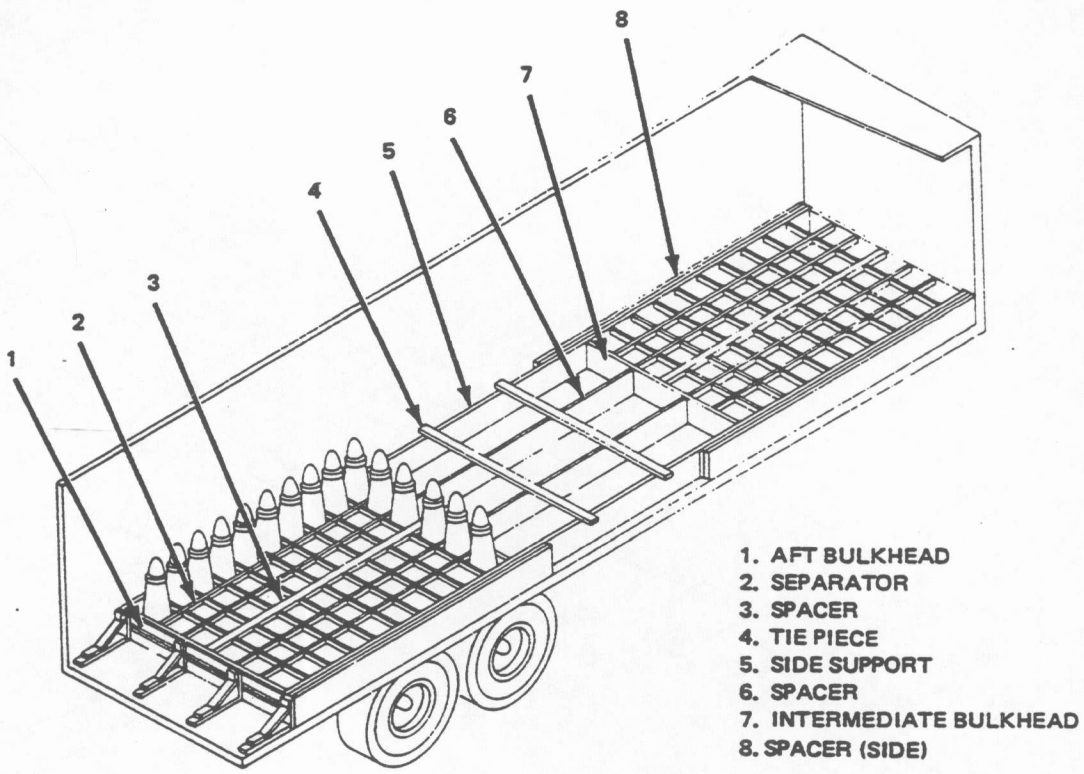


FIGURE 21. EGGCRATING

5.9.7.2 **Stepdown loads.** A stepdown load, shown in figure 22, may be used to distribute the weight of the lading within a vehicle to prevent exceeding the permissible gross axle weights. It may also be used to prevent the fore or aft motion of a partial layer. The stepping down of the load is achieved by the use of a riser (2); the height of the riser shall be half the height of the unit or container being braced. In some cases the item or container being loaded may be utilized as a riser, each row securing the adjacent row. However, in most instances, the riser should be fabricated from lumber. The dimensions and weight of the riser will depend on the size and weight of the units making up the load and on the vehicle being used. A front bulkhead (1) is installed to square up the nose of the vehicle and to provide even distribution of weight. A rear gate (3) is installed at the rear of the lading to prevent rearward load movement and to provide a tight, secure load. The methods of achieving the stepdown load described herein are to be considered typical and adapted to other loads as applicable.

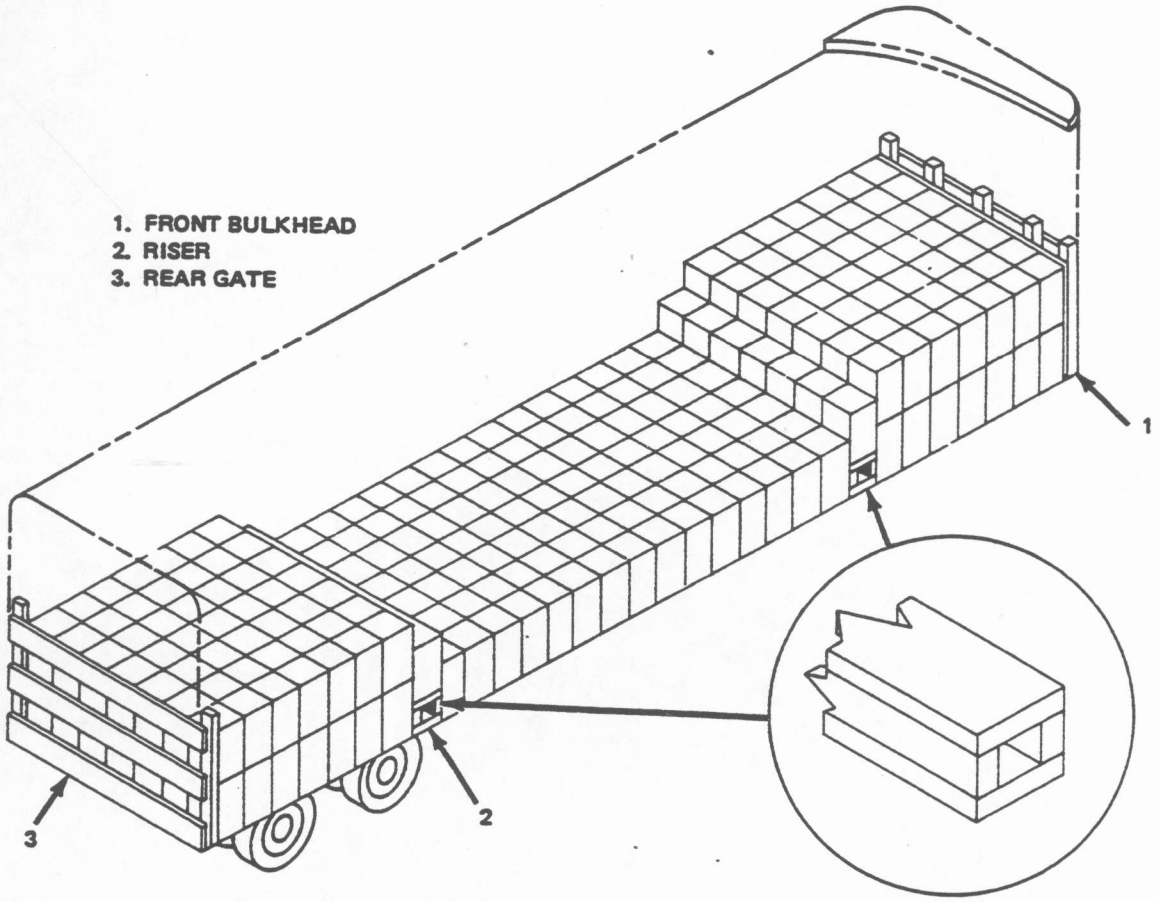


FIGURE 22. STEPDOWN LOADS

5.10 **Dunnaging flatbed trailers.**

5.10.1 The basic difference between the loading of flatbed trailers and the loading of van-type trailers is that, on flatbeds, all lengthwise, crosswise, and vertical forces must be restrained without the assistance of end or side walls. Because of this, the fundamental concept is to hold the load in position on the flatbed trailer with blocking and to hold the load down with tiedowns.

5.10.2 **Arrangement of lading.** When loading a flatbed trailer, the containers are arranged in stacks and located so that the permissible gross axle weights are not exceeded. All of the containers shall be within the perimeter of the trailer.

5.10.3 A stack of containers on a flatbed trailer must be held together to form a good solid stack that will not shift during highway movement. This is accomplished by unitizing the containers and holding the top of the stack together with cross straps.

5.10.3.1 **Unitizing.** When containers are placed one on top of the other, the strapping together of this vertical grouping is called unitizing. It is required to maintain interlocking of the stacking features during highway movement. Containers shall be unitized as described in 5.7.3. When adequate handling equipment is available, containers may be unitized prior to loading them on the trailer. If the handling equipment is not adequate, the containers should be loaded onto the trailer one at a time and then unitized.

5.10.3.2 **Cross strapping.** A stack of unitized containers two or more containers wide and two or more high shall be cross strapped together with a minimum of two 1-1/4- X 0.035 inch straps. These straps encircle the top layer of the containers, binding the top of the stack together. (See figure 23.) One high stacks do not require unitizing.

5.10.4 **End blocking.** An end crossmember is placed across the end of the containers to help distribute the load more evenly over the width of the trailer. (See figure 23.) While they obviously add to the strength of the blocking arrangement, their strength is not counted when determining the amount of end blocking needed. Backup cleats are placed at the ends of the last stacks (fore and aft) and aligned with the container or container skids. End blocking is two or three layers high depending upon the end configuration of the container skids. In figure 23 the container skid has a sufficient radius to require the end blocking to be three layers high.

5.10.5 **Sleepers.** Sleepers are placed against the skids or against the sides of the bottom container in the stack and near its ends. They are always doubled and usually positioned parallel to the length of the container, and are not placed against the end crossmember. (See figure 23.)

5.10.5.1 Under certain situations, the trailer's steel floor beams may prevent nailing and positioning of sleepers as prescribed in paragraph 5.10.5 or the slash numbered document. In these cases, other adequate blocking procedures may be used. One method considered adequate is to increase sleeper size to 2 X 6 and position sleeper (space permitting) at right angles to the lading, nailing it to the trailer floor beyond the steel beam. Another method would be to increase the prescribed width of the sleeper so that it extends sufficiently beyond the metal area to permit nailing.

5.10.6 **Tarpaulins.** Explosives, other than backpowder, may be transported on flatbed vehicles if the explosive portion of the load is packed in a fire and water resistant container, or covered with a fire resistant and waterproof tarpaulin. The load depicted in figure 23 has fire resistant and waterproof metal containers; therefore tarpaulins are not required.

5.10.6.1 For sake of clarity, MIL-STD dash number sheets showing loads that require a tarpaulin do not show the load covered with a tarpaulin. Usually a *NOTE* in a prominent area adjacent to the isometric drawing informs the user that a fire resistant and waterproof tarpaulin shall cover the load.

5.10.6.2 When applying tarpaulins, it is almost always better to cover the load before applying the tiedowns. This permits the tarpaulin to fit snugly around the containers with a minimum amount of void spaces under the tarpaulin, thereby making it less susceptible to wind damage.

5.10.7 **Tiedowns.** All loads on flatbed trailers shall be tied down with 2- × 0.050-inch steel strapping or 5/16-inch or 3/8-inch chain and load binders. The strapping and chain are interchangeable on a 1-to-1 basis. A load may have a chain and strap on the same trailer. Each stack shall have a minimum of two tiedowns. One tiedown shall be used for each 5000 pounds of lading.

5.10.7.1 Steel straps shall be applied as specified in 5.7.2. Chain and load binders shall be applied as specified in 5.8.

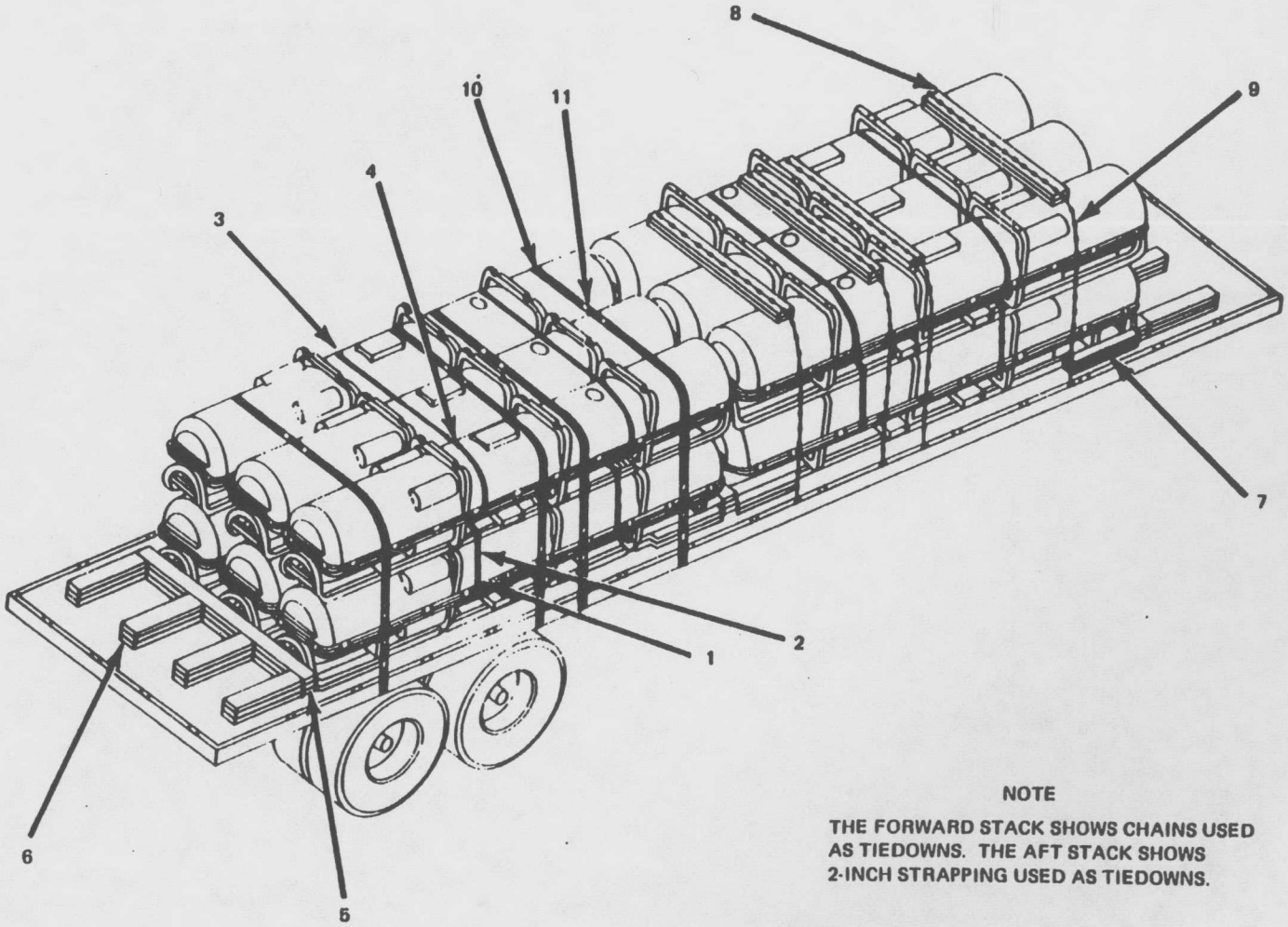
5.11 **Sample flatbed load.**

5.11.1 Figure 23, a sample flatbed load, shows the basic principles of flatbed dunnaging. The forward stack illustrates the correct application of chain and load binders. The aft stack illustrates the correct application of the 2- × 0.050-inch steel strapping.

5.12 **Dunnaging in double trailers.**

5.12.1 A full trailer attached to a semitrailer powered by a single tractor is a double. Doubles normally consist of a combination of two single-axle trailers, each measuring 23 to 28 feet in length. These units are called "West Coast" doubles. "East Coast" doubles are two tandem-axle trailers, each measuring approximately 40 feet in length. Doubles may be used to transport naval ammunition, explosives, and associated items wherever state law permits doubles and the maximum axle weights and gross vehicle weight are not exceeded. Figure 24 is a map of the continental United States and shows those states that permit and prohibit

1. 1-1/4- X 0.035-INCH
2. 1-1/4-INCH STRAP SEAL
3. 1-1/4- X 0.035-INCH STRAP
4. 1-1/4-INCH STRAP SEAL
5. END CROSSMEMBER
6. BACKUP CLEAT
7. SLEEPER
8. PROTECTOR BOARD
9. CHAIN AND LOAD BINDER
10. 2- X 0.05-INCH TIEDOWN STRAP
11. 2-INCH STRAP SEAL



NOTE

THE FORWARD STACK SHOWS CHAINS USED AS TIEDOWNS. THE AFT STACK SHOWS 2-INCH STRAPPING USED AS TIEDOWNS.

FIGURE 23. SAMPLE FLATBED LOAD

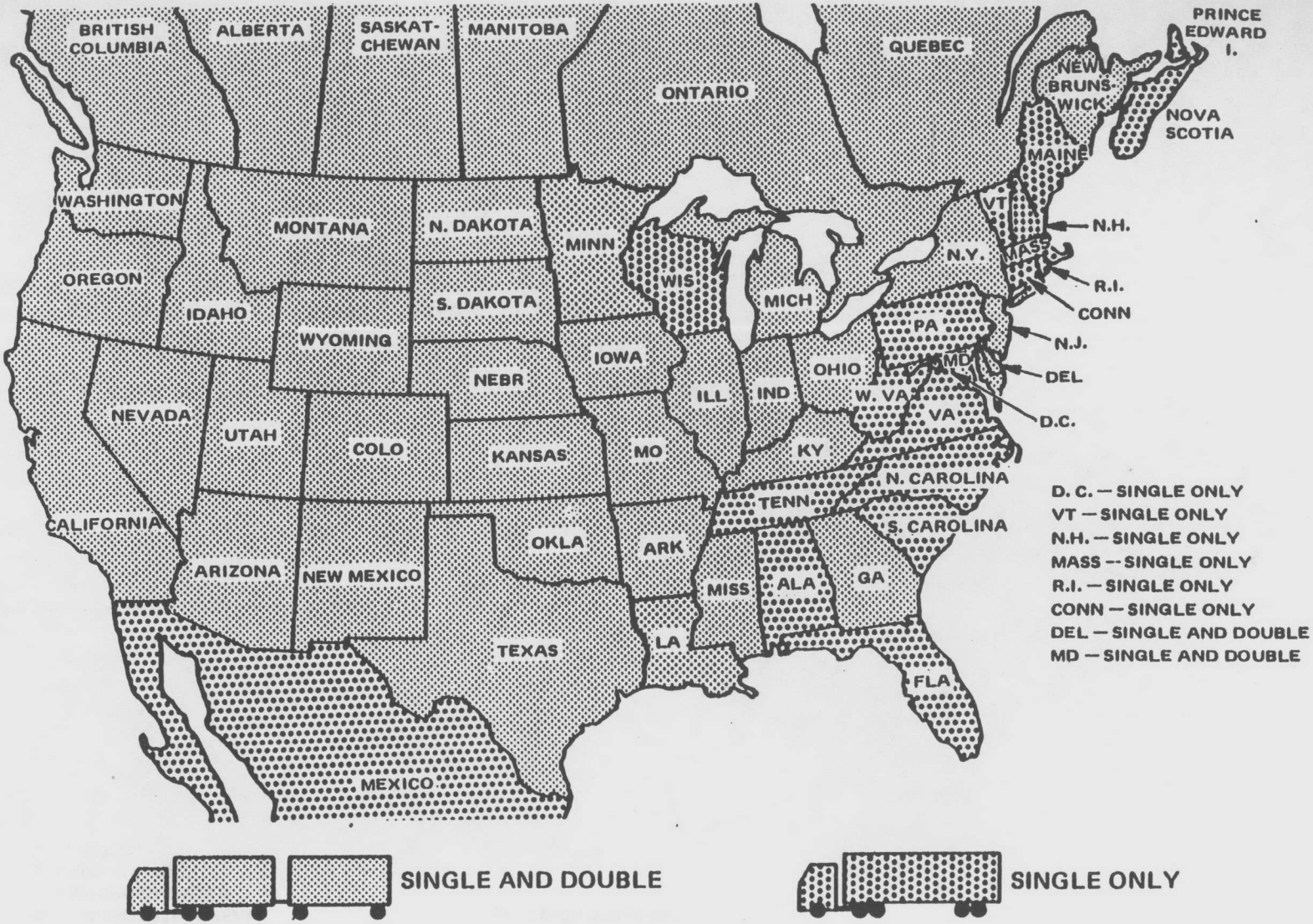


FIGURE 24. ALLOWABLE TRAILERS BY STATE

doubles. Data on size, weight, and load limits established for doubles by each of the 48 States are given in appendix B.

5.12.2 Blocking and bracing of ammunition and explosives in doubles is accomplished using the principles outlined by this document and the dash number document for the item. The quantities loaded into a double shall be consistent with the size and capacity of the double, making sure that all state laws are obeyed.

5.12.3 Double trailers can be used for the shipment of hazardous materials provided the following conditions are satisfied:

(a) Delivery may be accomplished without transfer of the lading.

(b) There is compliance with paragraphs 293.70(a) through (c) of the DOT Motor Carrier Safety Regulations.

(c) Noncompatible explosives may be shipped as indicated in the Code of Federal Regulations, Title 49, Paragraph 177.835, DOT Regulations.

5.12.4 To prevent shipments of hazardous materials on doubles consigned to activities within the States that do not permit doubles and thereby necessitating the transfer of the lading into a single trailer in order to make a delivery, the traffic manager shall ascertain, by referring to figure 24, that the routing assigned by MTMC will permit movement to the destination without transfer of lading. In addition, the consignor shall attach a statement to the carrier's copy of the bill of lading, or other shipping documents, informing him that transfer of the lading is prohibited unless required by reason of an emergency.

Custodian:
Navy—OS

Review activities:
Navy—AS, MC

User activities:
Navy—SH, SA

Preparing activity:
Navy—OS
(Project No. 8140-N375)

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Appendix A

10. QUALITY ASSURANCE PROVISIONS

10.1 **Scope.** This appendix covers road hazard testing, trial shipment, and inspection of truck and trailer loads of ammunition and explosives.

10.2 **Purpose.** This appendix is intended to establish standard procedures for the following:

(a) Truck and trailer road hazard tests of truckloads or less than truckloads of unique items of lading and new methods of dunnaging

(b) Trial loadings and trial shipments of truckloads or less than truckloads of lading, new methods of dunnaging, or shipments that are presenting particular difficulties

(c) Inspection of truckloads and less than truckloads that have an approved MIL-STD dash number sheet

(d) Inspection of truckloads and less than truckloads that do not have an approved MIL-STD dash number sheet

(e) Inspection of mixed truckloads and less than truckloads.

10.3 **Application.** When specified, the material contained in this appendix is a mandatory part of this standard.

10.4 **Responsibility for truck and trailer road hazard tests, trial shipments, and inspections.**

(a) The performance of truck and trailer road hazard tests is the responsibility of NAVSEASYSCOM and WPNSTA Earle, Naval Weapons Handling Center (NWHC).

(b) The performance of trial loadings and trial shipments is the responsibility of NAVSEASYSCOM, WPNSTA Earle NWHC, the shipping activity, and the receiving activity.

(c) Quality Conformance Inspection of all truckloads and less than truckloads is the responsibility of the shipping activity.

10.5 **Classification of inspections.** The inspection requirements specified herein are classified as follows:

(a) First article inspection. First article inspection consists of those examinations and tests conducted, prior to general use, on proposed loads (inert or prototype), to ensure that the design is such that the load is capable of withstanding the rough handling test requirements of this standard. (See 10.6.)

(b) Quality conformance inspection. Quality conformance inspection consists of those examinations accomplished on approved loads, prior to shipment, to ensure that the lading is loaded in conformance with the approved truckloading plan and the methods specified in this standard. (See 10.7.)

10.6 **First article inspection.** As determined necessary by either NAVSEASYSCOM or WPNSTA Earle (NWHC), first article inspection shall consist of examining the lading and the proposed loading procedures for conformity with the existing rules and regulations together with similar previously approved truckloads as specified in this document; and when this conformance does not exist, the test specified in 10.6.2 or 10.6.3 apply.

10.6.1 **First article sample.** The first article sample shall consist of one prototype load of inert material, representative of that to be shipped, placed on a trailer exactly as indicated by the proposed truckloading plan. Dummy loads may be used during the development program when inert loaded end products are not available. The dummy shall have the following characteristics identical to those of the objects being simulated:

(a) Envelope dimensions
(b) Weight, center of gravity, and radii of gyration in the three principal axes.

10.6.2 **Truck and trailer road hazard test.** Truck and trailer road hazard tests shall be coordinated with NAVSEASYSCOM and WPNSTA Earle (NWHC).

10.6.2.1 **Truck and trailer road hazard test procedure.** The truck or trailer shall be loaded and:

(a) Driven at 5 ± 1 miles per hour (mph) in both directions over the hazard course

(b) Subjected, in forward drive, to full braking stops on a dry, downgrade, concrete or blacktop road from speeds of 5, 10, and 15 mph and in reverse drive at the greatest possible safe speed.

(c) Driven at maximum safe speed over gravel, concrete, and blacktop roads for a distance of at least 30 miles. Road course shall include two or more of each of the following: rail-truck grade crossings, sharp curves (at least one in each direction), and full stops (upgrade and downgrade).

10.6.2.2 **Hazard course.** The hazard course shall conist of approximately 400 feet of straight, reasonably level, concrete or asphalt road with appropriate turn around areas at each end. Two sets of hazards, separated by approximately 200 feet, shall be provided. Each hazard set shall consist of six obstacles placed on either side of the roadway centerline so as to strike wheels on opposite sides alternately. The first set shall be placed on 10-foot centers and the second set shall be placed on 8-foot centers. Each hazard shall produce a 4-inch vertical rise, a 6- to 12-inch horizontal travel, and a 4-inch vertical drop. Upper corners may be rounded on an approximately 1-inch radius. (Imbedded railroad ties have proven satisfactory.)

10.6.3 **Trial shipment.** A trial shipment is conducted to verify that loading instructions do in fact, provide the protection required. Trial shipments shall be in accordance with the requirements specified in OP 2165.

10.6.3.1 **Trial shipment procedure.** The truck or trailer shall be loaded, blocked and braced exactly as required by the truckloading plan (inert material not required). The responsible activities shall:

(a) Record the position of the lading together with the dunnage and fastenings used to constrain it (sketches or photographs).

(b) Arrange for the transport of the truck or trailer over the prescribed route.

(c) Upon Receipt of shipment, inspect the lading and the constraining dunnage and fastenings. Record any evidence of damage or inadequacies.

(d) After unloading, the contained item shall be tested or inspected to ascertain any change in its original operating or functional characteristics. Any indication of shipping damage shall be recorded accordingly.

10.6.4 **Acceptance criteria.** Upon completion of the tests, there shall be no damage to the lading, dunnage and no movement of the lading that is likely to produce damage to the lading, dunnage or truck or trailer.

10.6.5 **Test report.** A report shall be prepared as a separate document or as a part of the request for approval. This report shall define all tests performed and give complete results of the tests, including any minor damage which may not be considered as cause for rejection. Photographs of the unit load before and after testing shall be made a part of this report. Additional photographs shown in any special test setups shall also be included in the report.

10.7 **Quality conformance inspection.** Quality conformance inspection shall consist of visual examinations specified by Table A-1 and shall be accomplished before, during, and after loading to ensure that the vehicle is safe for transportation of the intended load, the loading procedures are in accordance with approved standards, and the lading is loaded and secured in accordance with approved loading plans and practices. Truckloads shall be examined as follows:

(a) Truckloads and less than truckloads that have an approved MIL-STD dash number sheet shall be examined to assure that the loading has been accomplished in accordance with the approved document. Particular emphasis shall be placed on assuring that the lading, when called for, is tightly positioned against the end walls and side walls of the vehicle and that dunnage fills all void spaces longitudinally and laterally.

(b) Truckloads and less than truckloads that do not have an approved MIL-STD dash number sheet and all mixed truckloads and less than truckloads shall be examined to assure that the loading has been accomplished in accordance with the applicable paragraphs of this standard as referenced in table A-1 and the rules and regulations of DOT.

10.7.1 **Rejection criteria.** Nonconformance with any one of the applicable acceptance criteria listed in table A-1 shall be cause for rejection of the vehicle or truckloads as applicable. Minor economical repairs are permitted in order to bring a vehicle to an acceptable level of serviceability.

10.8 **Vehicle signoff.** Prior to releasing the vehicle to the carrier, the load inspector shall complete items 24 through 32 of the DD Form 626. Both the inspector and the driver must sign the lower portion of DD Form 626. All deficiencies shall be corrected before the vehicle is released to the carrier for shipment to the destination.

Table A-I

VISUAL EXAMINATION OF TRUCK AND TRAILER LOADS

Examination	Applicable paragraph/ reference	Acceptance criteria
A. Use of MIL-STD dash number sheets	4.4.2	Loading, blocking, and bracing procedures shall be in accordance with the appropriate MIL-STD dash number sheet.
	4.4.3	Use of Std when dash numbered sheets do not apply.
B. Vehicle (Empty) Cargo Space	5.3	The cargo space is clean. All protruding items removed.
	5.2.4	Complies with requirements of DD Form 626.
Type	5.2.2	Vehicle is proper type and length, has axles in specified location and has correct flooring.
Special Requirements	5.2.3	Chains and load binders and tarpaulins are supplied when specified.
Vehicle Inspection	5.2.6	Vehicle inspected using DD Form 626.
Weighing	5.2.7 5.2.2(c)	Empty vehicle has been weighed and is suitable for proposed load.
Lading (Prior to Loading) Item identification	5.1 OP 2165	Packages and containers are properly packed and marked in accordance with DOT and DOD requirements.
C. Dunnage Material		
Lumber	5.5	Lumber is sound, free from crossgrain knots, knot holes, and checks or splits which would impair strength of material or interfere with proper nailing. Lumber is in accordance with MM-L-751.
Nails	5.6	Nails are suitable for intended use and conform to FF-N-105.
Strapping	5.7	Strapping is suitable for intended use and in accordance with QQ-S-781 and this standard.
Chain	5.8.2	Chain is proper size and strength and marking.
Grab Hooks	5.8.3	Correct size and markings.
Load Binders	5.8.5	Correct size.
Chains, fittings & load binders	5.8.6	Inspected and recorded on DD Form 626.

Table A-I (contd)

Examination	Applicable paragraph/ reference	Acceptance criteria
D. Practices		
Nailing	5.6.2, 5.6.3	Quantity of nails are as specified or sufficient to hold the load.
		Nails are staggered to prevent splitting of lumber.
		Nails are long enough to provide necessary holding power and penetration into floors and other bracing without penetrating cargo.
		Where nail points protrude, the points are crimped back into the lumber.
Unitized Containers	5.7.3	Stacked containers are unitized to ensure continuous engagement of stacking features.
		Stacking features are properly engaged.
		Straps are of correct size and properly applied.
Unitized Unit Loads		
When to unitize	5.7.4.1	Unless otherwise specified, whenever more than one layer high.
Stiffeners	5.7.4.2	Stiffeners in place and oriented as required.
Straps and Seals	5.7.4.2	Straps located, tensioned, and sealed as required.
		Stiffeners toward the lower layer or when at rear of load, toward the rear.
		Single stack to have stiffeners at both ends of unit load.
Tiedown Chain	5.8	Applied as specified.
Tiedown Strapping	5.7.2	Applied as specified.

Table A-I (contd)

Examination	Applicable paragraph/ reference	Acceptance criteria
E. Vans		
Controlling forward movement	5.9.3.1	Front bulkhead constructed properly and in place.
Controlling rearward movement	5.9.4.1 or 5.9.4.2	Floor blocking constructed and installed as specified. Rear gate constructed & installed as specified.
Partial layers	5.9.3.3 5.9.4.3	Unitizing used where required and specified.
Controlling lateral motion	5.9.5.1	Sleepers installed as specified.
	5.9.5.2	Sway braces constructed & installed as specified.
	5.9.5.3	Tiller assemblies installed and adequate.
Load patterns	5.9.2.1	Load is being installed in accordance with predetermined load pattern.
Intermediate Gates	5.9.6	Used when specific.
Eggcrating	5.9.7.1	Conforms to requirements.
Stepdown loads	5.9.7.2	Conforms to requirements.
F. Flatbeds		
Unitizing	5.10.3.1	Containers are unitized when more than one layer high.
Cross Strapping	5.10.3.2	Cross straps are in place.
Endblocking	5.10.4	End blocking is in place and as specified.
Sleepers	5.10.5	Sleepers are in place and as specified.
Tarpaulins	5.10.6	Tarpaulins are used when required.
Steel Strap (tiedown)	5.10.7	Correct number of straps used.
	5.7.2	Straps properly applied.
Chain & Load Binders	5.10.7	Correct number of chains used.
	5.8	Chain properly applied.
Strap Seals	5.7.1.2	Seals properly crimped.

Table A-I (contd)

Examination	Applicable paragraph/ reference	Acceptance criteria
G. Prior to Release of Loaded Vehicle		
Marking or placarding	5.2.4.1	
Location	OP 2165	Marking or placarding is displayed on front, rear, and each side of vehicle. Front marking or placard is displayed on front of either truck, truck body, truck tractor, or the trailer.
Combination loads	OP 2165	When a vehicle contains more than one kind of HM, the aggregate gross weight of which totals 1,000 pounds or more, the vehicle is marked or placarded DANGEROUS. When the vehicle contains any quantity of explosives Class A, explosives Class B, poison Class A, or radioactive materials requiring a red label, it displays the appropriate marking or placard in addition to the DANGEROUS placard. When two or more vehicles are transporting HM, each is placarded according to its contents.
Placement of shipping documents	OP 2165	Shipping documents are attached to dunnage or some conspicuous place, before vehicle doors (when applicable) are closed and sealed.
Weight distribution and gross weight	5.2.5	Weight restrictions and load axle limitations specified for the vehicle are not exceeded.
Sealed outgoing vehicle	5.1 OP 2165	Whenever a shipment of HM is moved from a shipping activity to a receiving activity without being opened, the vehicle is sealed. This requirement applies to all classified shipments, truck loads of Classes A, B, or C explosives, and less-than-truckload shipments when exclusive use of the vehicle is authorized.
Number	5.1 OP 2165	For shipments in closed-type vehicles, the cargo compartment of the truck is secured with numbered seals. For shipments in open-type trucks, the waterproof, fire-resistant cover over the load is sealed to the conveyance at several points.
Seal tag	5.1 OP 2165	When a shipment carries a security classification, a waterproof tag is threaded onto the metal band of the seal.

Table A-I (contd)

Examination	Applicable paragraph/ reference	Acceptance criteria
Notice of seals	5.1 OP 2165	A Notice of Seals, NAVSANDA Form 408, is attached to the cargo opening of any vehicle transporting HM for which numbered seals are required.
Driver instructions (special)	5.1 OP 2165	The driver of each vehicle used to transport HM has inspected the load and has been given a copy of the special instructions applicable to the load.
Vehicle signoff	10.13	Prior to releasing the vehicle to the carrier, the load inspector has completed DD Form 626.

MILITARY STANDARD

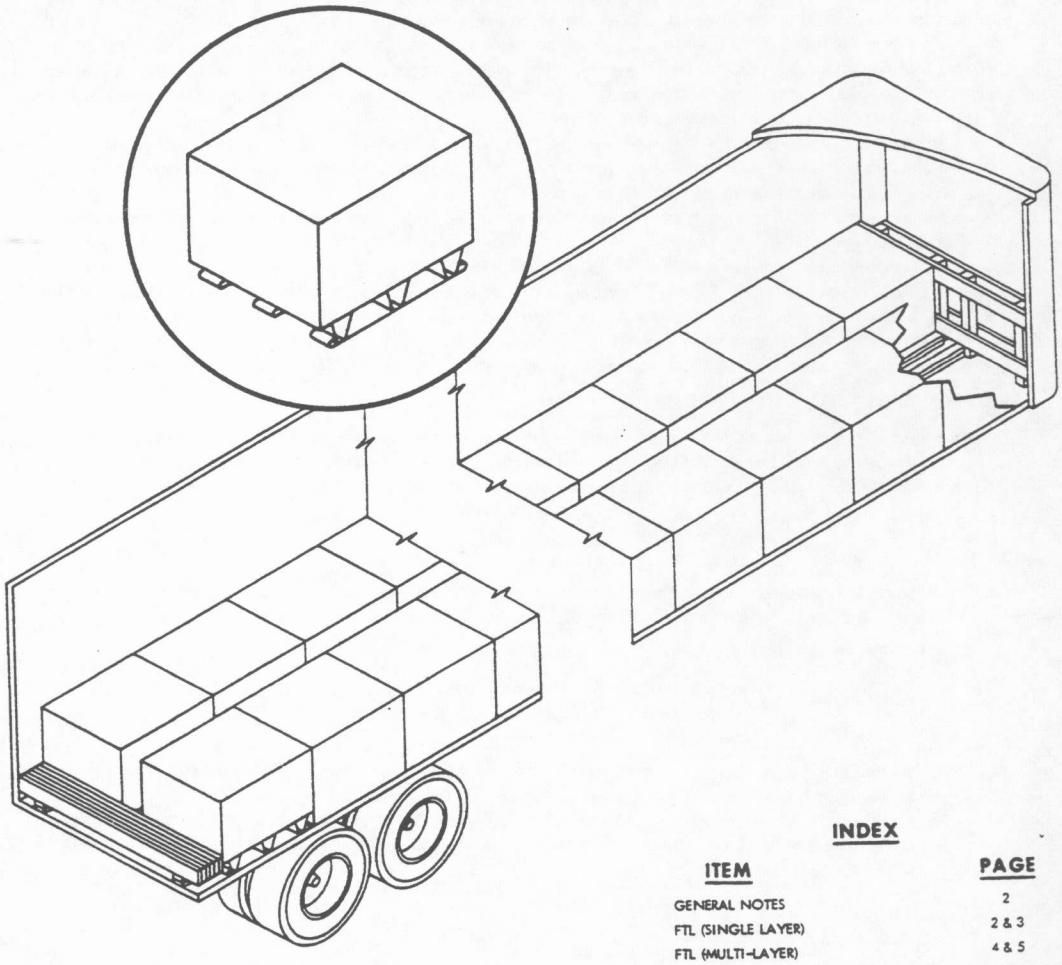
TRUCKLOADING OF HAZARDOUS MATERIALS

PALLETIZED UNIT LOADS
DOUBLE ROW PATTERN

MIL-STD-1320-2
(NAVY)

29 JANUARY 1975

SUPERSEDING
WR-51/2A
22 AUGUST 1967



NOTES:

1. UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
2. FOR CROSS REFERENCE TO ASSOCIATED PALLETIZING, CONTAINER-LOADING AND CARLOADING MILITARY STANDARDS. REFER TO INDEX TO STANDARDS, MIL-HDBK-236.

INDEX

FSC 8140

AUTHORIZED AND RELEASED FOR HIGHWAY SHIPMENTS ONLY

M.S Engr. NWHL 1/29/75
SIGNATURE TECHNICAL DIRECTION AGENT (TDA) DATE

J.E. [illegible] 1-29-75
SIGNATURE SEASYSCOM BY DIRECTION DATE

ORIGINATOR [signature]
SIGNATURE

NAVAL WEAPONS HANDLING LABORATORY
N A D EARLE, NEW JERSEY

GENERAL NOTES

1. THE INDEX TO STANDARDS FOR PALLETIZING, TRUCKLOADING, RAILCAR LOADING AND CONTAINER LOADING, MIL-HDBK-236 (NAVY) LISTS WEAPON COMPONENTS AND INDICATES THE CORRECT DOCUMENT TO BE USED IN TRUCKLOADING OF EACH ITEM INDEXED. MIL-HDBK-236 INDEXES THE UNIT LOADS THAT ARE AUTHORIZED TO BE TRUCKLOADED IN ACCORDANCE WITH THIS DOCUMENT.
2. THIS DOCUMENT PROVIDES DETAILED TRUCKLOADING INSTRUCTIONS APPLICABLE TO PALLETIZED UNIT LOADS WHEN THE WIDTH OF THE UNIT LOAD PERMITS LOADING IN THE PATTERN PRESCRIBED.
3. PROCEDURES AND PRACTICES CONTAINED HEREIN ARE INTENDED FOR VAN-TYPE TRAILERS OF ALL LENGTHS. THE TRAILERS MAY HAVE WOOD FLOORS, METAL FLOORS, OR METAL FLOORS WITH WOOD NAILING STRIPS.
4. THE BLOCKING METHODS SHOWN ON PAGES 3, 5 & 7 ARE FOR WOOD FLOOR TRAILERS WITH UNIT LOADS OF DIMENSIONS THAT PERMIT THE PROCEDURES SHOWN. WHEN THE TRAILER HAS METAL FLOORS, METAL FLOORS WITH NAILING STRIPS OR THE CHARACTERISTICS OF UNIT LOAD MAKES BLOCKING AND BRACING SHOWN IMPRACTIBLE TO USE, CHOOSE AN APPROPRIATE ALTERNATE METHOD AS EXPLAINED IN THE SPECIFIC INSTRUCTIONS FOR THE LOAD.
5. A FULL TRUCK LOAD (FTL) CONSISTS OF AS MANY UNIT LOADS AS CAN BE ARRANGED IN THE TRAILER CONSIDERING ITS CUBE, PERMISSIBLE GROSS WEIGHT AND AXLE LOAD LIMITATIONS. IF THESE LIMITATIONS PERMIT, UNIT LOADS MAY BE DOUBLE OR TRIPPLE LAYER IN ACCORDANCE WITH THE PRINCIPLES SET FORTH ON PAGES 4 AND 5.
6. A LESS-THAN-TRUCK LOAD (LTL) SHOULD BE ARRANGED CONSIDERING THE WEIGHT DISTRIBUTION ON THE TRUCK. A TYPICAL LTL IS SHOWN ON PAGE 6.
7. AFTER BLOCKING AND BRACING HAS BEEN INSPECTED, ATTACH SHIPPING DOCUMENT TO INSIDE OF TRAILER IN AN ACCESSIBLE AREA, CLOSE AND SEAL TRAILER DOORS AND ATTACH APPROPRIATE PLACARD (IF REQUIRED) TO BOTH SIDES, FRONT, AND BACK OF TRAILER.
8. APPLICABLE MATERIAL SPECIFICATIONS: DUNNAGE LUMBER, MM-L-75; NAILS FF-N-105, TYPE II, STYLE 10, COMMON BRIGHT; STRAPPING QQ-S-781, TYPE I, CLASS A.
9. FOR GENERAL TRUCKLOADING PROCEDURES REFER TO THE GENERAL TRUCKLOADING DOCUMENT MIL-STD-1320 (NAVY).

PROCEDURE (SINGLE LAYER)

1. THE LOAD SHOWN ON PAGE 3 IS INTENDED TO ILLUSTRATE TYPICAL BLOCKING AND BRACING PROCEDURES FOR A SINGLE LAYER LOAD IN A WOOD FLOOR TRAILER. FOR TRAILERS WITH METAL FLOORS OR METAL FLOORS WITH WOOD NAILING STRIP, USE THE APPROPRIATE AUTHORIZED ALTERNATE BLOCKING METHOD. (SEE NOTE 3 BELOW.)

WARNING

DO NOT NAIL BLOCKING OR BRACING INTO METAL FLOORS.

2. WHEN SPACE BETWEEN PALLETS DOES NOT PERMIT SLEEPERS AGAINST EACH PALLET AS SHOWN ON PAGE 3 OR INSTALLATION IS DIFFICULT, A DOUBLED SLEEPER(S) OF TWO INCH NOMINAL THICKNESS AND APPROPRIATE WIDTH(S) MAY BE USED.

NOTE

WHEN THE SPACE BETWEEN THE UNIT LOADS IS LESS THAN 4 INCHES, BLOCKING TO PREVENT LATERAL MOTION MAY BE OMITTED.

3. WHEN THE TRAILER HAS METAL FLOORS OR WOOD NAILING STRIP THAT WILL NOT ACCOMODATE SLEEPERS, USE SWAY BRACES TO PREVENT LATERAL MOTION AS SHOWN FOR THE LOWER UNIT LOADS IN DETAIL G, PAGE 6.
4. WHEN ALL LOADS ARE IN PLACE, INSTALL REAR BLOCKING. TYPE REQUIRED IS DEPENDENT UPON DISTANCE BETWEEN TRAILER DOOR WHEN CLOSED AND REAR OF LADING. DETERMINE THIS DISTANCE AND INSTALL BLOCKING AS INDICATED BELOW:

DISTANCE LESS THAN 12 INCHES

INSTALL BLOCKING DETAIL B AS SHOWN ON PAGE 3.

CAUTION

REAR BLOCKING MUST BEAR AGAINST TRAILER DOOR WHEN DOOR IS IN CLOSED POSITION. DO NOT USE TRAILERS WITH ROLL UP DOORS.

DISTANCE 12 TO 36 INCHES

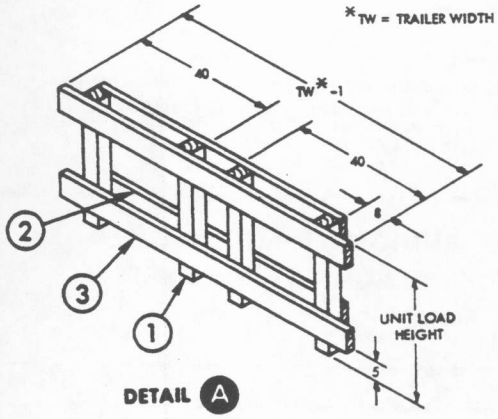
INSTALL BLOCKING DETAIL E AS SHOWN ON PAGE 5.

CAUTION

REAR BLOCKING MUST BEAR AGAINST TRAILER DOOR WHEN DOOR IS IN CLOSED POSITION. DO NOT USE TRAILERS WITH ROLL UP DOORS.

DISTANCE GREATER THAN 36 INCHES

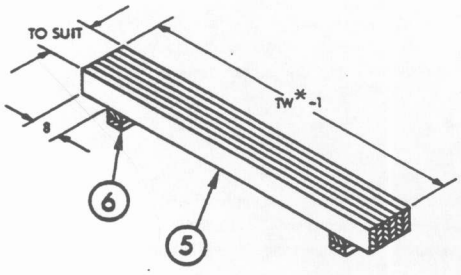
INSTALL BLOCKING AS SHOWN IN TYPICAL LTL, PAGE 7.



DETAIL A

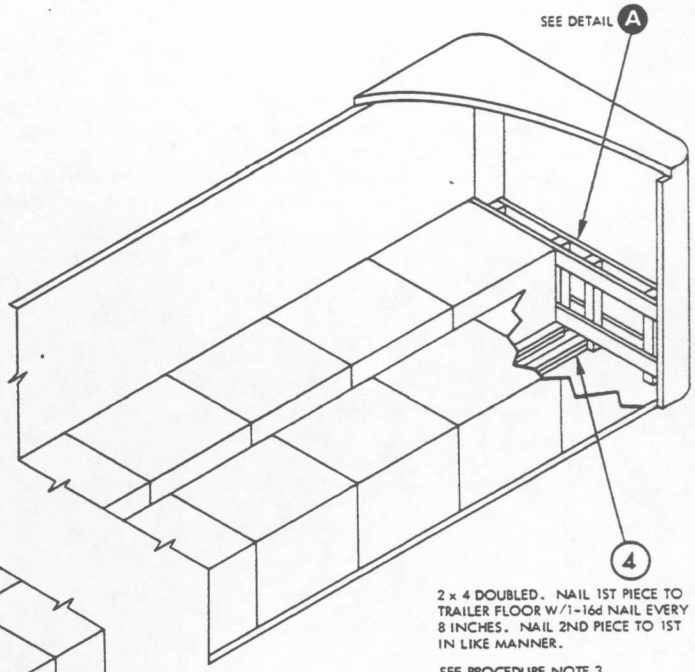
FRONT BULKHEAD 1 REQUIRED

*TW = TRAILER WIDTH



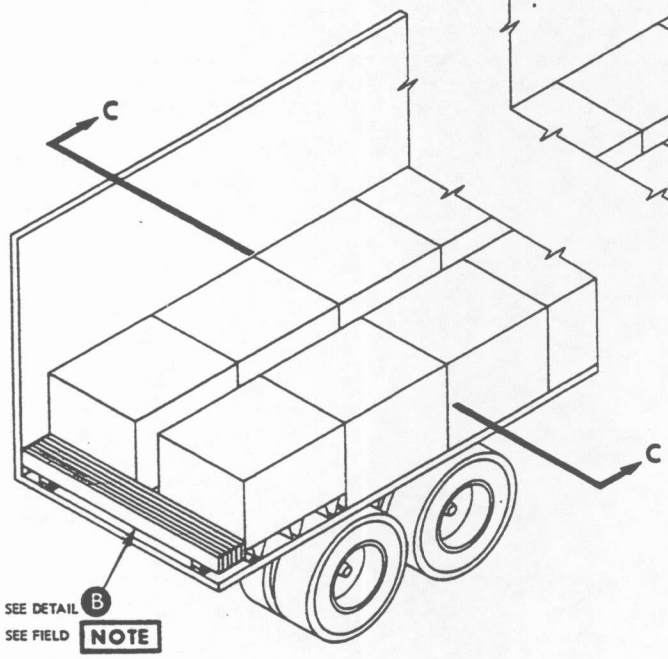
DETAIL B

REAR BLOCKING ASSEMBLY
1 REQUIRED



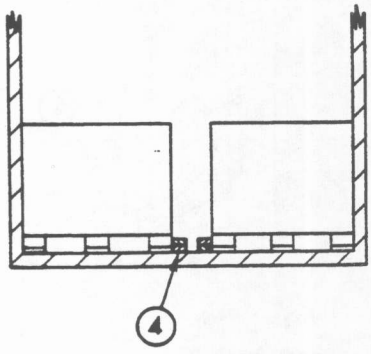
2 x 4 DOUBLED. NAIL 1ST PIECE TO TRAILER FLOOR W/1-16d NAIL EVERY 8 INCHES. NAIL 2ND PIECE TO 1ST IN LIKE MANNER.

SEE PROCEDURE NOTE 3.



NOTE

THIS DRAWING ILLUSTRATES A LOAD WHEN THE DISTANCE BETWEEN THE LADING AND THE TRAILER DOORS, WHEN CLOSED, IS 12 INCHES OR LESS. SEE SINGLE LAYER PROCEDURE NOTE 4 FOR DETAILED INSTRUCTIONS FOR THIS AND OTHER CONFIGURATIONS.



SECTION C-C

*TW = TRAILER WIDTH

PIECE NO.	DESCRIPTION	SIZE	NO. PCS REQD	NAIL TO	NAILS NUMBER	NAILS SIZE
LIST OF MATERIALS AND NAILING DATA						
6	SUPPORT	2 x 4 TO SUIT	4	5	3	10d
				6	3	10d
5	SOLID FILL	THICKNESS TO SUIT x 6 x TW* -1	AS REQD	LAMINATE	6/PIECE	TO SUIT
4	SLEEPER	2 x 4 TO SUIT	AS REQD	SEE FIELD NOTE		
3	AFT CROSSMEMBER	2 x 6 x TW*-1	2	1	3/JOINT	12d
2	FWD CROSSMEMBER	2 x 6 TO SUIT	2	1	3/JOINT	12d
1	VERTICAL	4 x 4 x UNIT LOAD HEIGHT	4	SEE 2 & 3	-	-

FTL SINGLE LAYER (ALL LENGTH TRAILERS)

PAGE 3

PROCEDURE (MULTI-LAYER)

1. THE LOAD SHOWN ON PAGE 5 IS INTENDED TO ILLUSTRATE TYPICAL BLOCKING AND BRACING PROCEDURES FOR A TWO LAYER LOAD IN A WOOD FLOOR TRAILER. FOR TRAILERS WITH METAL FLOORS OR METAL FLOORS WITH WOOD NAILING STRIPS, USE THE APPROPRIATE AUTHORIZED ALTERNATE BLOCKING METHOD. (SEE NOTE 5 BELOW.)

WARNING

DO NOT NAIL BLOCKING OR BRACING INTO METAL FLOOR

2. TO PREVENT LONGITUDINAL MOVEMENT IN THE SECOND (AND THIRD) LAYER(S) WHERE THE LAYER CHANGES FROM TWO LAYERS TO ONE LAYER HIGH (OR THREE LAYERS TO TWO LAYERS HIGH) AND AT THE REAR OF THE LOAD WHEN TWO OR MORE LAYERS HIGH, THE UNIT LOADS SHALL BE UNITIZED AS SHOWN ON PAGE 8. THE STIFFENERS SHALL BE POSITIONED TOWARDS THE LOWER LAYER(S) OR WHEN AT THE REAR OF THE LOAD, TOWARDS THE REAR.
3. WHEN SPACE BETWEEN PALLETS DOES NOT PERMIT SLEEPERS AGAINST EACH PALLET AS SHOWN ON PAGE 5 OR INSTALLATION IS DIFFICULT, A DOUBLED SLEEPER(S) OF TWO INCH NOMINAL THICKNESS AND APPROPRIATE WIDTH(S) MAY BE USED.
4. USE SWAY BRACE, DETAIL H, PAGE 6 BETWEEN UNIT LOADS IN SECOND (AND THIRD LAYERS). WHEN SPACE BETWEEN UNIT LOADS DOES NOT PERMIT INSTALLATION OF SWAY BRACE, INSTALL FILLER ASSEMBLY, DETAIL J, PAGE 6. WHEN USING FILLER ASSEMBLY, SLEEPERS PIECE 4 ARE NOT REQUIRED.

NOTE

WHEN SPACE BETWEEN UNIT LOADS IS LESS THAN 4 INCHES, BLOCKING TO PREVENT LATERAL MOTION MAY BE OMITTED.

5. WHEN TRAILER HAS FLOORS OF METAL OR METAL WITH WOOD NAILING STRIPS THAT WILL NOT ACCOMODATE SLEEPERS, USE SWAY BRACES TO PREVENT LATERAL MOTION AS SHOWN IN DETAIL G, PAGE 6 OR USE THE FILLER ASSEMBLY, DETAIL J, PAGE 6 AS APPROPRIATE.
6. INSTALL REAR BLOCKING. TYPE REQUIRED IS DEPENDENT UPON DISTANCE BETWEEN TRAILER DOOR WHEN CLOSED AND REAR LADING. DETERMINE THIS DISTANCE AND INSTALL BLOCKING AS INDICATED BELOW:

DISTANCE LESS THAN 12 INCHES:

INSTALL BLOCKING DETAIL B AS SHOWN ON PAGE 3.

CAUTION

REAR BLOCKING MUST BEAR AGAINST TRAILER DOOR WHEN DOOR IS IN CLOSED POSITION. DO NOT USE TRAILERS WITH ROLL UP DOORS.

DISTANCE 12 TO 36 INCHES:

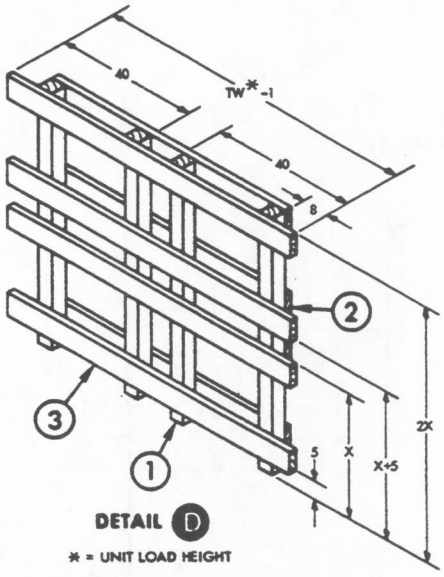
INSTALL BLOCKING DETAIL E AS SHOWN ON PAGE 5.

CAUTION

REAR BLOCKING MUST BEAR AGAINST TRAILER DOOR WHEN DOOR IS IN CLOSED POSITION. DO NOT USE TRAILERS WITH ROLL UP DOORS.

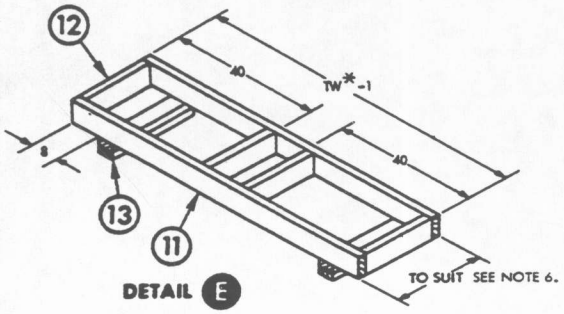
DISTANCE GREATER THAN 36 INCHES:

INSTALL BLOCKING AS SHOWN IN TYPICAL LTL, PAGE 7.

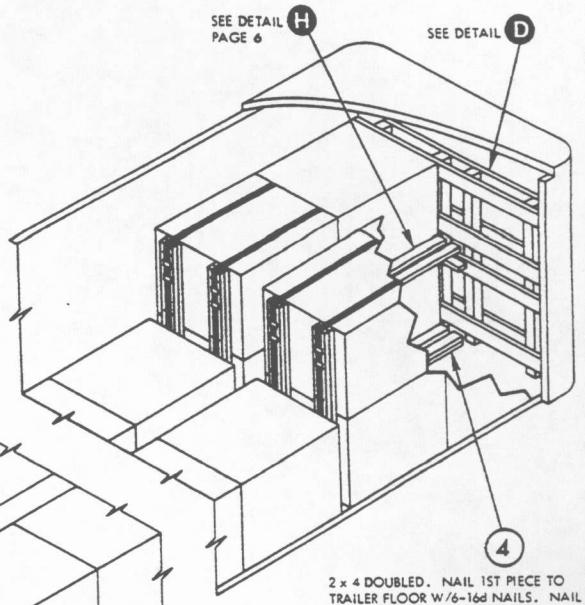


DETAIL D

* = UNIT LOAD HEIGHT

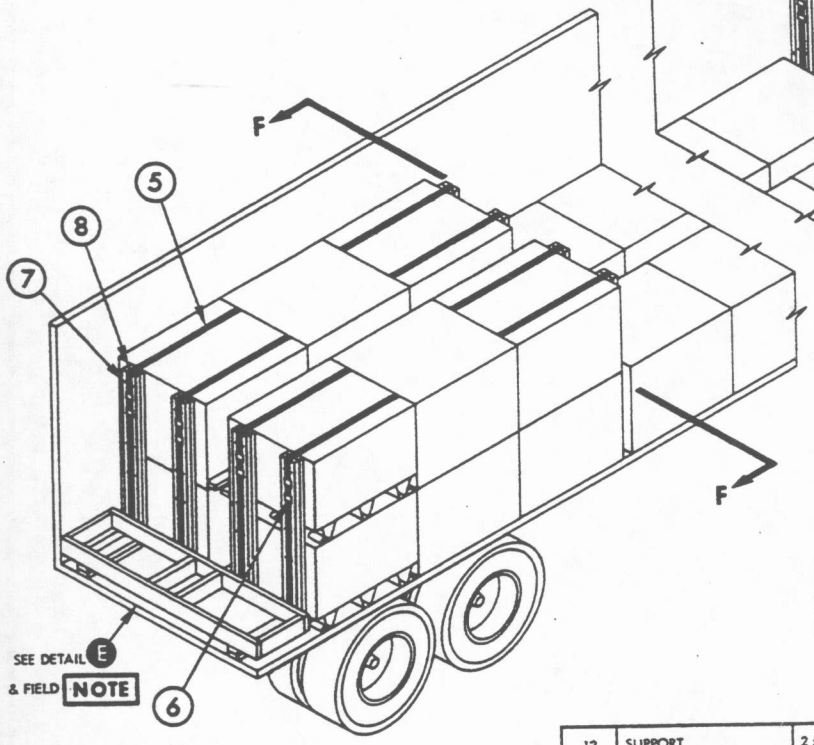


DETAIL E



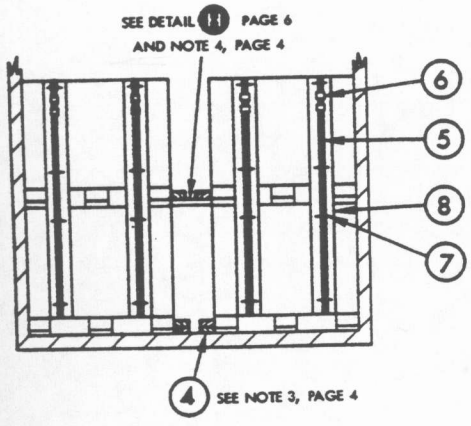
2 x 4 DOUBLED. NAIL 1ST PIECE TO TRAILER FLOOR W/6-16d NAILS. NAIL 2ND PIECE TO 1ST IN LIKE MANNER.

SEE NOTE 3, PAGE 4.



NOTE

THIS DRAWING ILLUSTRATES A LOAD WHEN THE DISTANCE BETWEEN THE LADING AND THE TRAILER DOORS, WHEN CLOSED, IS 12 TO 36 INCHES. SEE NOTE 6, PAGE 4 FOR DETAILED INSTRUCTIONS FOR THIS AND OTHER CONFIGURATIONS.



SECTION F-F

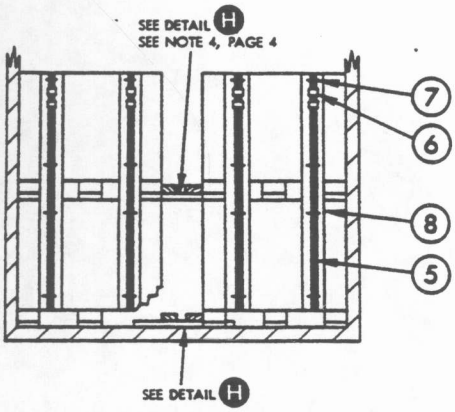
*TW = TRAILER WIDTH

PIECE NO.	DESCRIPTION	SIZE	NO. PCS REQD	NAIL TO	NUMBER NAILS	SIZE
13	SUPPORT	2 x 4 TO SUIT	8	11 13	2/JOINT 4/PIECE	10d 10d
12	STRUT	2 x 6 TO SUIT	4	SEE 11	-	-
11	CROSSMEMBER	2 x 6 x TW*-1	2	12	3/JOINT	16d
10	STRINGER	2 x 4 x UNIT LOAD LENGTH	10	9	3/JOINT	10d
9	SUPPORT (DETAIL H PAGE 6)	2 x 4 TO SUIT	10	SEE 10	-	-
8	STIFFENER (DETAIL H, PAGE 6)	2 x 6 TO SUIT	24	LAMINATE	5	10d
7	STAPLE	FOR 1 1/4 STRAP	48	-	-	-
6	SEAL	FOR 1 1/4 STRAP	24	-	-	-
5	STRAP	1 1/4 x .035 TO SUIT	12	-	-	-
4	SLEEPER	2 x 4 TO SUIT	AS REQD	SEE FIELD NOTE		
3	AFT CROSSMEMBER	2 x 6 x TW*-1	4	1	3/JOINT	10d
2	FWD CROSSMEMBER	2 x 6 TO SUIT	4	1	3/JOINT	10d
1	VERTICAL	4 x 4 TO SUIT	4	SEE 2 & 3	-	-

LIST OF MATERIALS AND NAILING DATA

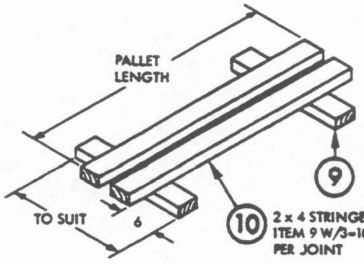
FTL MULTI-LAYER (ALL LENGTH TRAILERS)

PAGE 5



DETAIL G

SECTION OF A TWO LAYER HIGH LOAD
SHOWING USE OF SWAY BRACES DETAIL H

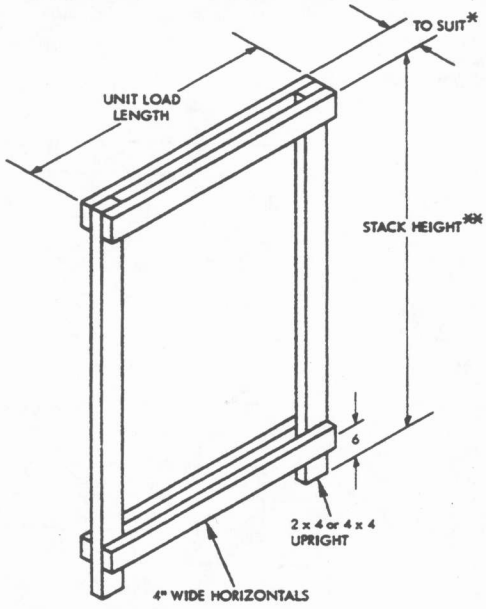


DETAIL H

SWAY BRACE
ASSEMBLE IN PLACE

*HORIZONTALS MAY BE LAMINATED AND THICKNESS CHOSEN TO SUIT TO FILL VOID BETWEEN UNIT LOADS.

**INSTALL THIRD SET OF HORIZONTALS BETWEEN TOP AND BOTTOM HORIZONTALS IF UNIT LOADS ARE 3 LAYERS HIGH.



DETAIL J

FILLER ASSEMBLY
(ALTERNATE FOR SWAY BRACE & SLEEPERS)

LTL ALL LENGTH TRAILERS

1. THE LTL SHOWN ON THIS PAGE IS INTENDED TO ILLUSTRATE TYPICAL BLOCKING AND BRACING METHODS FOR LTL IN WOOD FLOOR OR METAL WITH WOOD NAILING STRIP TRAILERS.

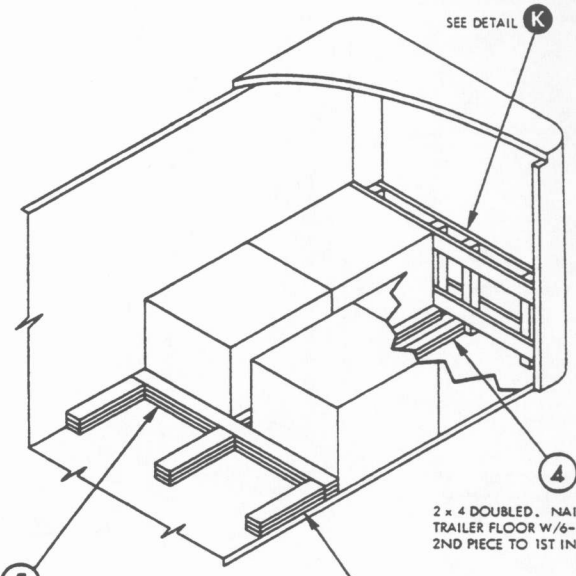
WARNING

DO NOT USE ALL METAL FLOOR TRAILERS FOR LTL SHIPMENTS AS THEY CAN NOT BE BLOCKED BY THIS METHOD.

2. SWAY BRACE, DETAIL H OR FILLER ASSEMBLY, DETAIL J ARE AUTHORIZED ALTERNATES FOR SLEEPERS PIECE 4.
3. AN LTL MAY CONSIST OF MORE OR LESS UNIT LOADS AND ARE NOT NECESSARILY LIMITED TO THE AMOUNT SHOWN.

NOTE

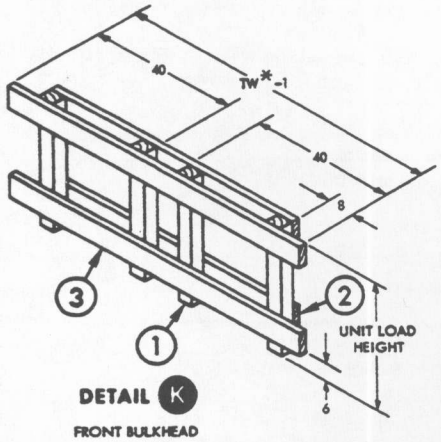
THIS DRAWING ILLUSTRATES A LOAD WHEN THE DISTANCE BETWEEN THE LADING AND THE TRAILER DOORS GREATER THAN 36 INCHES. THE TRAILER SHALL HAVE A WOOD FLOOR OR A METAL FLOOR WITH WOOD NAILING STRIPS.



2 x 4 DOUBLED. NAIL 1ST PIECE TO TRAILER FLOOR W/6-16d NAILS. NAIL 2ND PIECE TO 1ST IN LIKE MANNER.

2 x 6 TRIPLED. NAIL 1ST PIECE TO TRAILER FLOOR W/1-16d NAIL EVERY 8 INCHES. NAIL 2ND PIECE TO 1ST AND 3RD TO 2ND IN LIKE MANNER.

2 x 6 TRIPLED. NAIL 1ST PIECE TO TRAILER FLOOR W/6-16d NAILS. NAIL 2ND PIECE TO 1ST PIECE AND 3RD PIECE TO 2ND PIECE IN LIKE MANNER.



DETAIL K

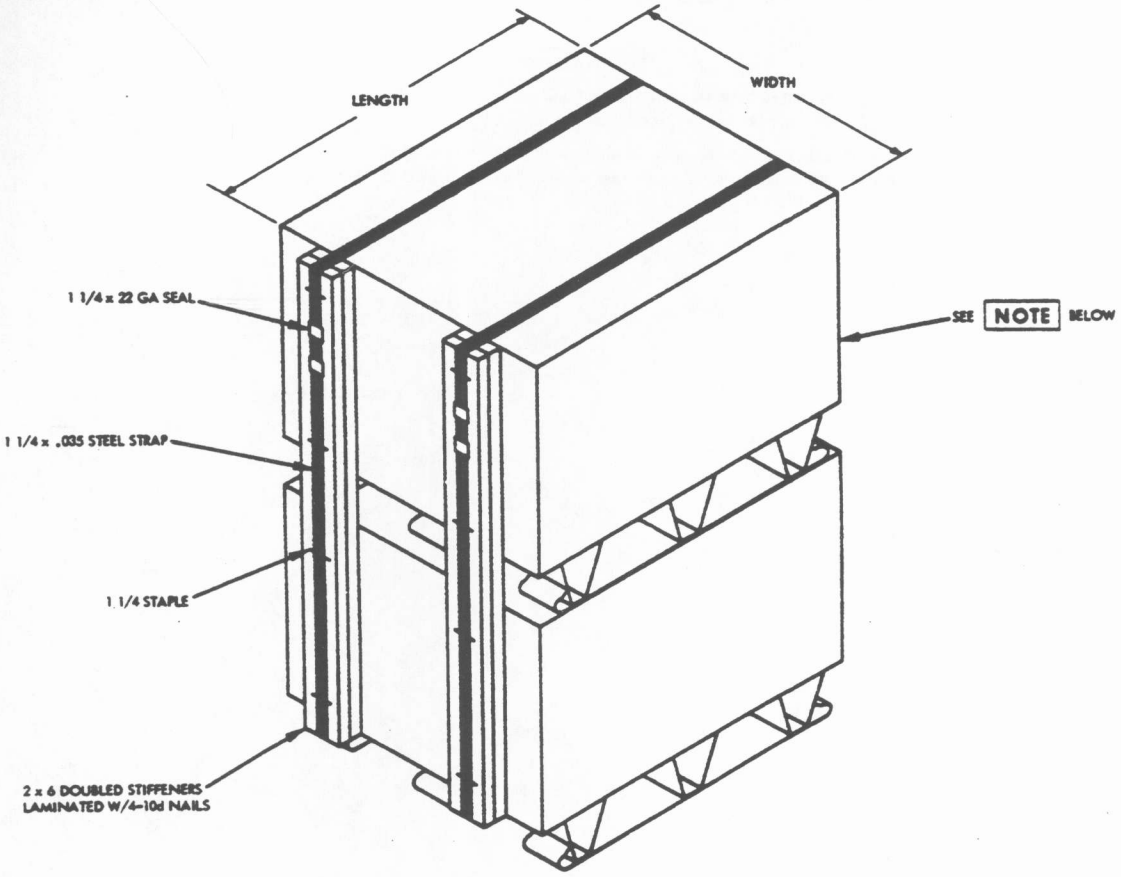
FRONT BULKHEAD
1 REQUIRED

*TW = TRAILER WIDTH

PIECE NO.	DESCRIPTION	SIZE	NO. PCS REQD	NAIL TO	NAILS NUMBER	NAILS SIZE
6	BACKUP CLEAT	2 x 6 x 30	9	SEE FIELD NOTE		
5	CROSSMEMBER	2 x 6 x TW*-1	3	SEE FIELD NOTE		
4	SLEEPER	2 x 4 TO SUIT	8	SEE FIELD NOTE		
3	AFT CROSSMEMBER	2 x 6 x TW*-1	2	1	3/JOINT	12d
2	FWD CROSSMEMBER	2 x 6 TO SUIT	2	1	3/JOINT	12d
1	VERTICAL	4 x 4 TO SUIT	4	SEE 2 & 3	-	-

LIST OF MATERIALS AND NAILING DATA

UNITIZING DETAIL



1. WHEN REQUIRED BY THE FTL OR LTL REQUIREMENTS OF THIS MIL-STD, THE STACKED UNIT LOADS SHALL BE UNITIZED AS SHOWN ABOVE.
2. THE DOUBLED 2 x 6 STIFFENER SHALL EXTEND FROM THE TOP OF THE STACKED UNIT LOADS TO THE PALLET OF THE BOTTOM UNIT LOAD.
3. THE 1 1/4 INCH STEEL STRAPS, POSITIONED AS SHOWN, ENCIRCLE THE STACKED UNIT LOADS AND PASS UNDER THE DECK OF THE BOTTOM PALLET. THE STRAPS HOLD THE STIFFENERS IN PLACE.
4. TENSION STRAPS AND SEAL WITH TWO DOUBLE CRIMPED SEALS. SECURE EACH STRAP TO THE STIFFENER WITH FOUR 1 1/4 INCH STAPLES.
5. WHEN UNITIZING THREE HIGH UNIT LOADS, FOLLOW THE PRINCIPLES OF THE TWO HIGH UNIT LOADS SHOWN ABOVE.

NOTE

WHEN LOADING TRAILER WITH A SINGLE STACK OF UNIT LOADS,
THE STIFFENERS SHALL BE AT BOTH ENDS OF THE UNITIZED LOADS.

REVIEW ACTIVITY:
NAVY - OS

PREPARING ACTIVITY:
NAVY - OS
(PROJECT NO. 8140-N276)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1975-603-115/4271

SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 22-R255

INSTRUCTIONS: This sheet is to be filled out by personnel, either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity. Comments and suggestions submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or serve to amend contractual requirements.

SPECIFICATION

MIL-STD-1320-2 (Navy)

ORGANIZATION

CITY AND STATE

CONTRACT NUMBER

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ SUBCONTRACT

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3. IS THE SPECIFICATION RESTRICTIVE?

☐ YES ☐ NO *(If "yes", in what way?)*

4. REMARKS *(Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)*

SUBMITTED BY *(Printed or typed name and activity - Optional)*

DATE

DD FORM 1 JAN 66 1426

REPLACES EDITION OF 1 OCT 64 WHICH MAY BE USED.

S/N-0102-014-1801 C-25254

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FOLD

MILITARY STANDARD

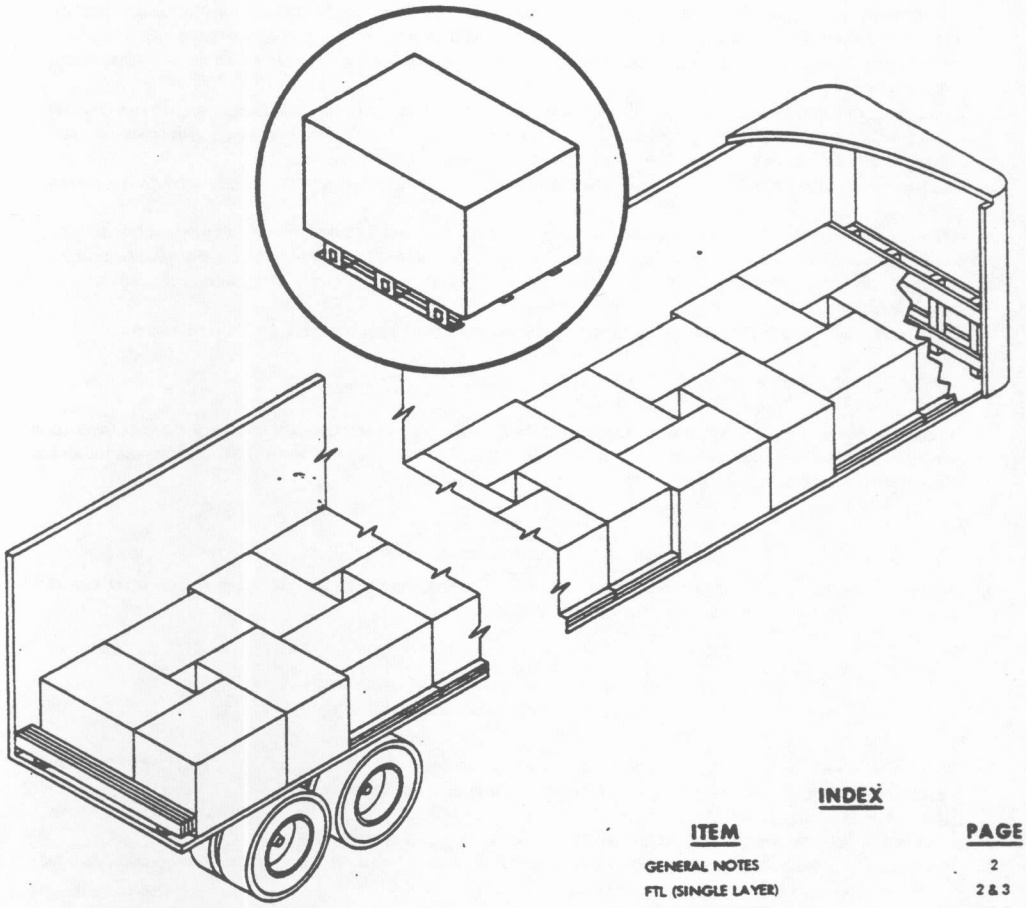
TRUCKLOADING OF HAZARDOUS MATERIALS

PALLETIZED UNIT LOADS
CHIMNEY PATTERN

MIL-STD-1320-3
(NAVY)

29 JANUARY 1975

SUPERSEDING
WR-51/3A
30 JULY 1964



INDEX

NOTES:

1. UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
2. FOR CROSS REFERENCE TO ASSOCIATED PALLETIZING, CONTAINERLOADING AND CARLOADING MILITARY STANDARDS. REFER TO INDEX TO STANDARDS, MIL-HDBK-236.

FSC 8140

AUTHORIZED AND RELEASED FOR HIGHWAY SHIPMENTS ONLY

M.S. Gray, NWHL 1-29-75
SIGNATURE TECHNICAL DIRECTION AGENT (TDA) DATE

J.E. [illegible] 1-29-75
SIGNATURE SEASYSCOM BY DIRECTION DATE

ORIGINATOR [signature]
SIGNATURE

NAVAL WEAPONS HANDLING LABORATORY
N A D EARLE, NEW JERSEY

PAGE 1 OF 8

GENERAL NOTES

1. THE INDEX TO STANDARDS FOR PALLETIZING, TRUCKLOADING, RAILCAR LOADING AND CONTAINER LOADING, MIL-HDBK 236 (NAVY), LISTS HAZARDOUS MATERIALS AND INDICATES THE CORRECT DOCUMENT TO BE USED IN TRUCKLOADING OF EACH ITEM INDEXED. MIL-HDBK-236 INDEXES THE UNIT LOADS THAT ARE AUTHORIZED FOR BLOCKING AND BRACING USING THIS DOCUMENT.
2. THIS DOCUMENT PROVIDES DETAILED TRUCKLOADING INSTRUCTIONS APPLICABLE TO PALLETIZED UNIT LOADS WHEN THE SUM OF THE LENGTH AND WIDTH OF A UNIT LOAD IS LESS THAN THE WIDTH OF A STANDARD TRAILER.
3. THE PROCEDURES AND PRACTICES CONTAINED HEREIN ARE INTENDED FOR VAN TYPE TRAILERS OF ALL LENGTHS. THE TRAILERS MAY HAVE WOOD FLOORS, METAL FLOORS OR METAL FLOORS WITH WOOD NAILING STRIPS.
4. THE BLOCKING METHODS SHOWN ON PAGES 3, 5 AND 6 ARE FOR TRAILERS WITH WOOD FLOORS AND METAL FLOORS WITH WOOD NAILING STRIPS. WHEN THE TRAILER HAS METAL FLOORS OR THE CHARACTERSITICS OF THE UNIT LOAD MAKES THE BLOCKING AND BRACING SHOWN IMPRACTICABLE TO USE, CHOOSE AN APPROPRIATE ALTERNATE METHOD EXPLAINED IN THE SPECIFIC INSTRUCTIONS FOR THIS LOAD.
5. A FULL TRUCKLOAD (FTL) CONSISTS OF AS MANY UNIT LOADS THAT CAN BE ARRANGED IN THE TRAILER CHIMNEY PATTERN; CUBE, PERMISSIBLE GROSS VEHICLE WEIGHT AND AXLE LOAD LIMITATIONS PERMITTING. IF THESE LIMITATIONS PERMIT, UNIT LOADS MAY BE DOUBLE OR TRIPPLE LAYER IN ACCORDANCE WITH THE PRINCIPLE SET FORTH IN THIS DOCUMENT.
6. A LESS-THAN-TRUCKLOAD (LTL) SHOULD BE ARRANGED CONSIDERING WEIGHT DISTRIBUTION IN THE TRAILER. A TYPICAL LTL IS SHOWN ON PAGE 6.
7. AFTER BLOCKING AND BRACING HAS BEEN INSPECTED, ATTACH SHIPPING DOCUMENT TO INSIDE OF TRAILER IN AN ACCESSIBLE AREA, CLOSE AND SEAL TRAILER DOORS, AND ATTACH APPROPRIATE PLACARD (IF REQUIRED) TO BOTH SIDES, FRONT AND BACK OF TRAILER.
8. APPLICABLE MATERIAL SPECIFICATIONS: DUNNAGE LUMBER, MM-L-751; NAILS FF-N-103, TYPE II, STYLE 10 COMMON BRIGHT; STRAPPING QQ-S-781, TYPE I, CLASS A.
9. FOR GENERAL TRUCKLOADING PROCEDURES, REFER TO THE GENERAL TRUCKLOADING DOCUMENT, MIL-STD-1320 (NAVY).

PROCEDURE (SINGLE LAYER)

1. THE LOAD SHOWN ON PAGE 3 IS INTENDED TO ILLUSTRATE TYPICAL BLOCKING AND BRACING PROCEDURES FOR A SINGLE LAYER LOAD IN TRAILERS WITH WOOD FLOORS AND METAL FLOOR WITH WOOD NAILING STRIPS. FOR TRAILER WITH METAL FLOORS, USE THE APPROPRIATE ALTERNATE BLOCKING METHOD (SEE NOTE 3 BELOW).

WARNING

DO NOT NAIL BLOCKING OR BRACING INTO METAL FLOORS.

2. WHEN THE CHARACTERISTICS OF THE UNIT LOAD PREVENTS NAILING SLEEPERS, PIECE 6, TO THE TRAILER FLOOR, USE A FILLER ASSEMBLY, DETAIL H OR J PAGE 7, AS APPROPRIATE, ON THE SIDE OF THE UNIT LOADS.

NOTE

WHEN SLACK (TRAILER WIDTH LESS LADING WIDTH) IS LESS THAN 3 1/2 INCHES, SLEEPERS AND OR FILLER ASSEMBLIES MAY BE OMITTED.

3. WHEN THE TRAILER HAS METAL FLOORS OR METAL FLOORS WITH NAILING STRIPS AND THE STRIPS ARE NOT IN THE DESIRED LOACTION, USE A FILLER ASSEMBLY, DETAIL H OR J PAGE 7, AS APPROPRIATE, AT THE SIDE OF THE UNIT LOADS.
4. FILLER ASSEMBLIES SHALL FILL THE VOID BETWEEN THE UNIT LOADS AND TRAILER SIDE WALL. THE QUANTITY AND THICKNESS OF THE MATERIAL USED TO FABRICATE THE FILLER ASSEMBLIES MAY BE VARIED AS NECESSARY TO FILL THE VOID.
5. THE TYPE OF REAR BLOCKING TO BE USED IS DEPENDENT UPON THE DISTANCE BETWEEN THE TRAILER DOORS, WHEN CLOSED, AND THE REAR OF THE LADING.

DISTANCE LESS THAN 12 INCHES

INSTALL REAR BLOCKING ASSEMBLY, DETAIL B, AS SHOWN ON PAGE 3.

CAUTION

REAR BLOCKING MUST BEAR AGAINST LADING AND TRAILER DOORS WHEN DOORS ARE CLOSED. DO NOT USE TRAILERS WITH ROLL UP DOORS.

DISTANCE 12 TO 36 INCHES

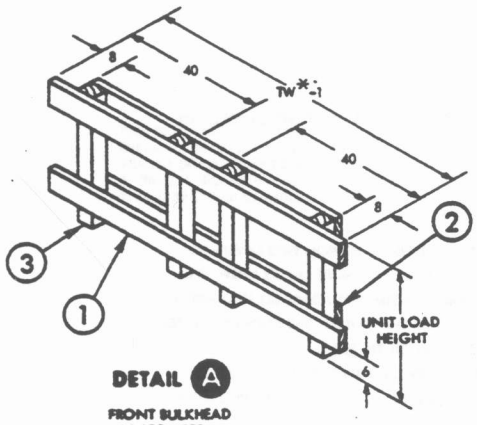
INSTALL REAR BLOCKING ASSEMBLY, DETAIL F, PAGE 5, AS SHOWN ON PAGE 5.

CAUTION

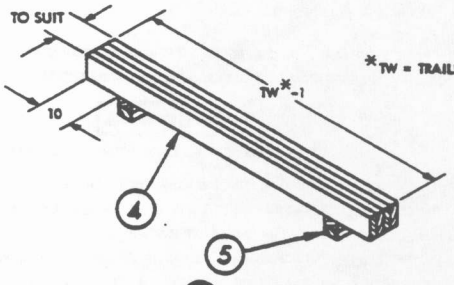
REAR BLOCKING MUST BEAR AGAINST LADING AND TRAILER DOORS WHEN DOORS ARE CLOSED. DO NOT USE TRAILERS WITH ROLL UP DOORS.

DISTANCE GREATER THAN 36 INCHES

INSTALL REAR BLOCKING AS SHOWN IN TYPICAL LTL, PAGE 6. DO NOT USE TRAILERS WITH ALL METAL FLOORS.



DETAIL A
FRONT BULKHEAD
1 REQUIRED

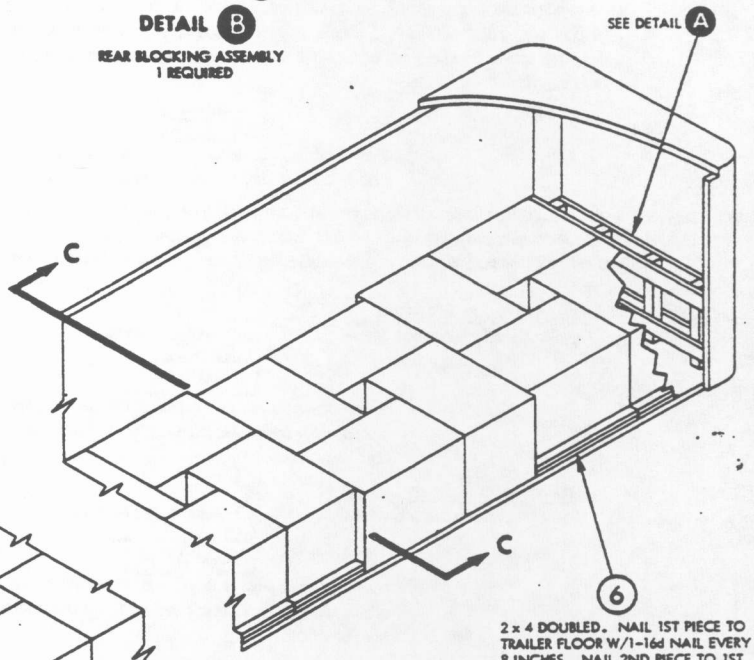


*TW = TRAILER WIDTH

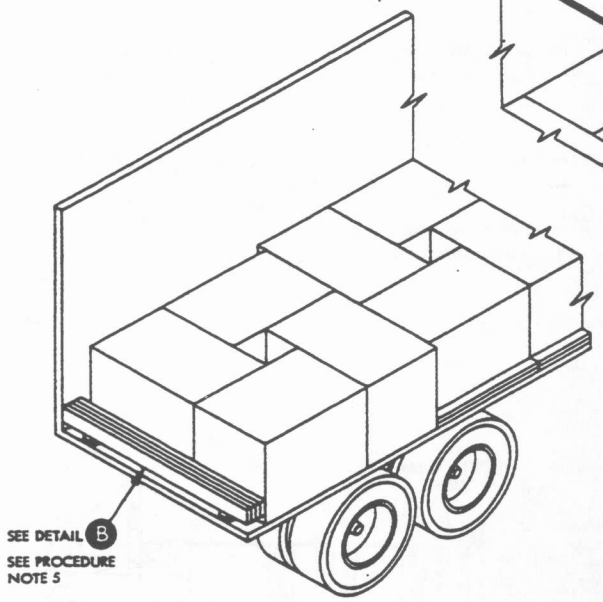
DETAIL B
REAR BLOCKING ASSEMBLY
1 REQUIRED

NOTE

CHIMNEY GROUPS OF FOUR PALLETS EACH ARE LOADED AGAINST ALTERNATE SIDES OF THE TRAILER.

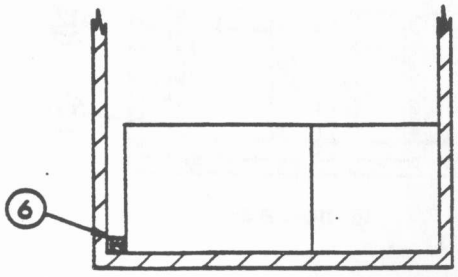


2 x 4 DOUBLED. NAIL 1ST PIECE TO TRAILER FLOOR W/1-16d NAIL EVERY 8 INCHES. NAIL 2ND PIECE TO 1ST IN LIKE MANNER.



NOTE

THIS DRAWING ILLUSTRATES A LOAD WHEN THE DISTANCE BETWEEN THE LADING AND THE TRAILER DOORS IS 12 INCHES OR LESS. SEE PROCEDURE NOTE 5 FOR DETAILED INSTRUCTIONS FOR THIS AND OTHER CONFIGURATIONS.



SECTION C-C

*TW = TRAILER WIDTH

PIECE NO.	DESCRIPTION	SIZE	NO. PCS REQD	NAIL TO	NUMBER NAILS	SIZE NAILS	NOTE
6	SLEEPERS	2 x 4 TO SUIT	AS REQD	SEE 4	3		10d
5	SUPPORT	2 x 4 TO SUIT	4	SEE 5	3		10d
4	SOLID FILL	THICKNESS TO SUIT x 6 x TW*-1	AS REQD	LAMINATE	6/PIECE		TO SUIT
3	VERTICAL	4 x 4 x UNIT LOAD HT	4	SEE 1 & 2	-		-
2	FWD HORIZONTAL	2 x 6 TO SUIT	2	3	3/JOINT		12d
1	AFT HORIZONTAL	2 x 6 x TW*-1	2	3	3/JOINT		12d

LIST OF MATERIALS AND NAILING DATA

PROCEDURE (MULTI-LAYER)

1. THE LOAD SHOWN ON PAGE 5 IS INTENDED TO ILLUSTRATE TYPICAL BLOCKING AND BRACING PROCEDURES FOR A TWO LAYER LOAD IN A TRAILER WITH WOOD, METAL OR METAL WITH WOOD NAILING STRIP FLOORS.

WARNING

DO NOT NAIL BLOCKING OR BRACING INTO METAL FLOORS.

2. TO PREVENT LONGITUDINAL MOVEMENT IN THE SECOND (AND THIRD) LAYER(S) WHERE THE LAYER CHANGES FROM TWO LAYERS TO ONE LAYER HIGH (OR THREE LAYERS TO TWO LAYERS HIGH) AND AT THE REAR OF THE LOAD WHEN TWO OR MORE LAYERS HIGH, THE UNIT LOADS SHALL BE UNITIZED AS SHOWN ON PAGE 8. THE STIFFENERS SHALL BE POSITIONED ON THE UNIT LOADS SO THAT WHEN THE UNIT LOADS ARE IN THE TRAILER, THE STRAPPING IS PARALLEL TO THE LONGITUDINAL AXIS OF THE TRAILER. THE STIFFENERS SHALL ALSO BE POSITIONED TOWARDS THE LOWER LAYER(S) AND WHEN AT THE REAR OF THE LOAD, TOWARDS THE REAR.
3. USE FILLER ASSEMBLIES, DETAILS H, J, K OR L, AS APPROPRIATE TO FILL THE VOIDS BETWEEN THE UNIT LOADS AND THE TRAILER SIDE WALLS. THE QUANTITY AND THICKNESS OF THE MATERIAL USED TO FABRICATE THE FILLER ASSEMBLIES MAY BE VARIED AS NECESSARY TO FILL THE VOID.

NOTE

WHEN SLACK (TRAILER WIDTH LESS LADING WIDTH) IS LESS THAN 3 1/2 INCHES, FILLER ASSEMBLIES MAY BE OMITTED.

4. WHEN TRAILER HAS FLOORS OF WOOD OR METAL WITH WOOD NAILING STRIPS, DOUBLED 2 x 4 SLEEPER MAY BE SUBSTITUTED FOR THE SPACER ASSEMBLY, DETAIL H, WHERE THE UNIT LOADS ARE ONE LAYER HIGH.
5. THE TYPE OF REAR BLOCKING TO BE USED IS DEPENDENT UPON THE DISTANCE BETWEEN THE LADING AND THE TRAILER DOORS WHEN CLOSED.

DISTANCE LESS THAN 12 INCHES

INSTALL REAR BLOCKING ASSEMBLY, DETAIL B, AS SHOWN ON PAGE 3.

CAUTION

REAR BLOCKING MUST BEAR AGAINST THE LADING AND TRAILER DOORS WHEN DOORS ARE CLOSED. DO NOT USE TRAILERS WITH ROLL UP DOORS.

DISTANCE 12 TO 36 INCHES

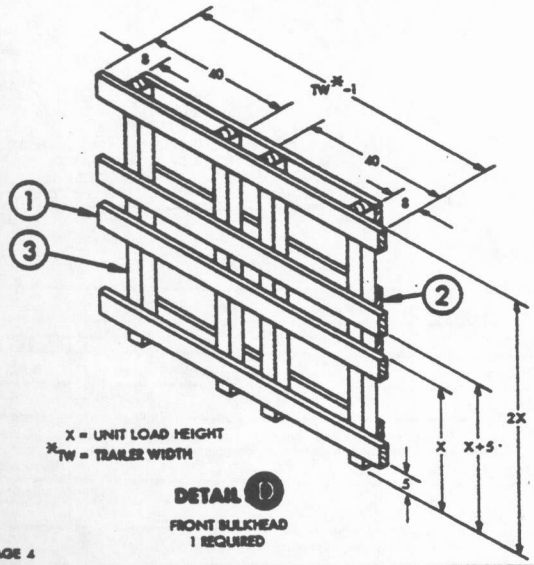
INSTALL REAR BLOCKING ASSEMBLY, DETAIL F, AS SHOWN ON PAGE 5.

CAUTION

REAR BLOCKING MUST BEAR AGAINST THE LADING AND TRAILER DOORS WHEN DOORS ARE CLOSED. DO NOT USE TRAILERS WITH ROLL UP DOORS.

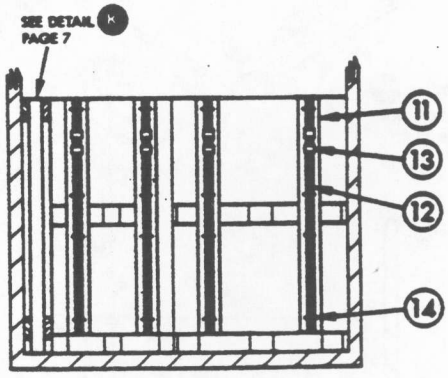
DISTANCE GREATER THAN 36 INCHES

INSTALL BLOCKING AS SHOWN IN TYPICAL LTL, PAGE 6.



DETAIL D

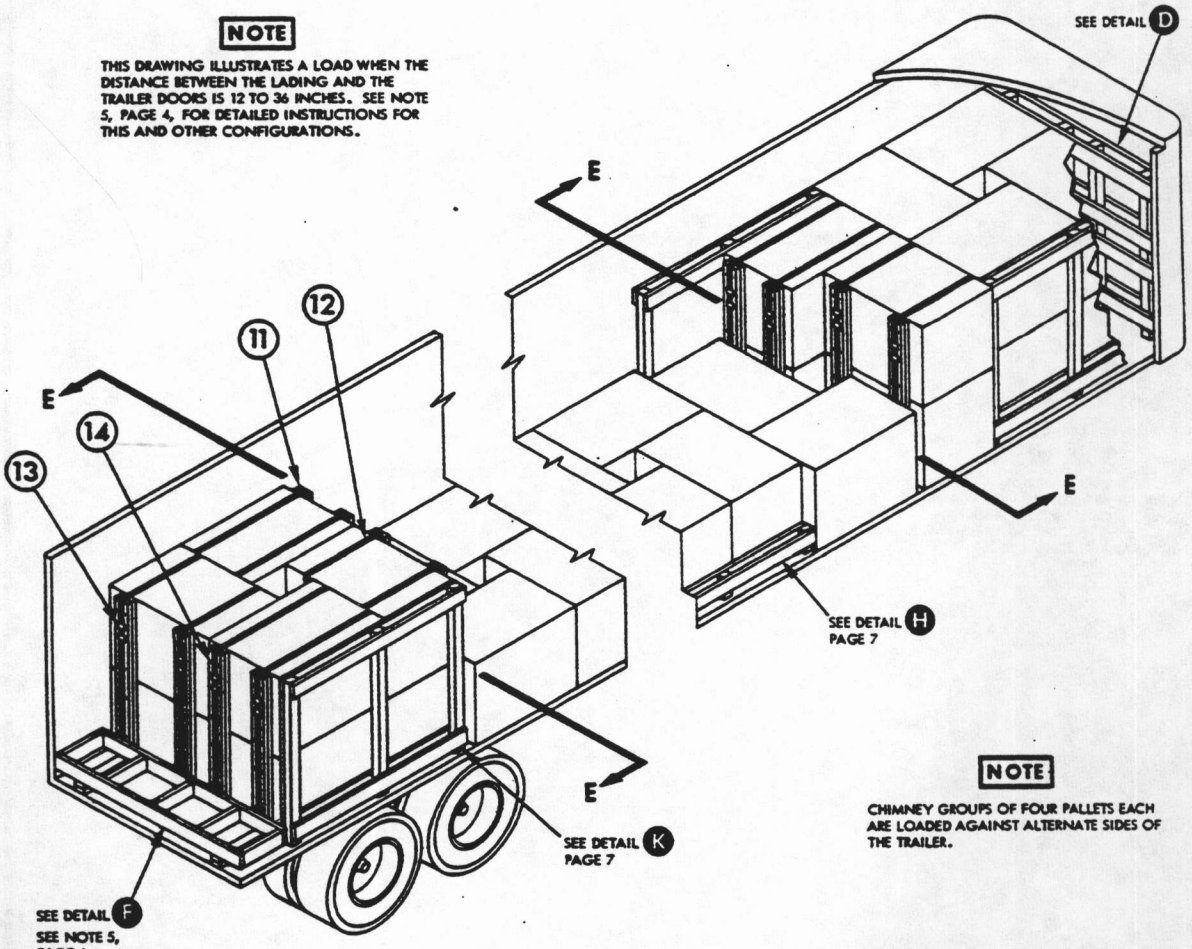
FRONT BULKHEAD
1 REQUIRED



SECTION E-E

NOTE

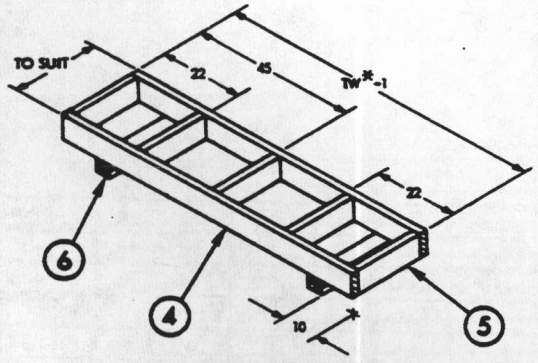
THIS DRAWING ILLUSTRATES A LOAD WHEN THE DISTANCE BETWEEN THE LADING AND THE TRAILER DOORS IS 12 TO 36 INCHES. SEE NOTE 5, PAGE 4, FOR DETAILED INSTRUCTIONS FOR THIS AND OTHER CONFIGURATIONS.



NOTE

CHIMNEY GROUPS OF FOUR PALLETS EACH ARE LOADED AGAINST ALTERNATE SIDES OF THE TRAILER.

*TW = TRAILER WIDTH



DETAIL F

REAR BLOCKING ASSEMBLY
1 REQUIRED

PIECE NO.	DESCRIPTION	SIZE	NO. PCS REQD	NAIL TO	NAILS NUMBER	NAILS SIZE
14	STAPLE	FOR 1 1/4 STRAP	48	-	-	-
13	SEAL	FOR 1 1/4 STRAP	24	-	-	-
12	STRAP	1 1/4 x .035	12	-	-	-
11	STIFFNER	2 x 6 TO SUIT	24	DBL LAMINATE	4	8d
10	VERTICAL	4 WIDE x THICKNESS TO SUIT	AS REQD	SEE 9	-	-
9	HORIZONTAL	6 WIDE x THICKNESS TO SUIT	AS REQD	10	3/JOINT	TO SUIT
8	VERTICAL	4 WIDE x THICKNESS TO SUIT x 10	AS REQD	SEE 7	-	-
7	HORIZONTAL	6 WIDE x THICKNESS TO SUIT	AS REQD	8	3/JOINT	TO SUIT
				6	2/JOINT	12d
6	SUPPORT	2 x 4 TO SUIT	4	5	3	12d
5	STRUT	2 x 6 TO SUIT	5	SEE 4	-	-
4	CROSSMEMBER	2 x 6 x TW*-1	2	5	3/JOINT	16d
3	VERTICAL	4 x 4 TO SUIT	4	SEE 1 & 2	-	-
2	FWD HORIZONTAL	2 x 6 TO SUIT	4	3	3/JOINT	12d
1	AFT HORIZONTAL	2 x 6 x TW*-1	4	3	3/JOINT	12d

LIST OF MATERIALS AND NAILING DATA

LTL (ALL LENGTH TRAILERS)

1. THE LTL SHOWN ON THIS PAGE IS INTENDED TO ILLUSTRATE TYPICAL BLOCKING AND BRACING METHODS FOR LTL IN A TRAILER HAVING WOOD FLOORS OR METAL FLOORS WITH WOOD NAILING STRIPS.

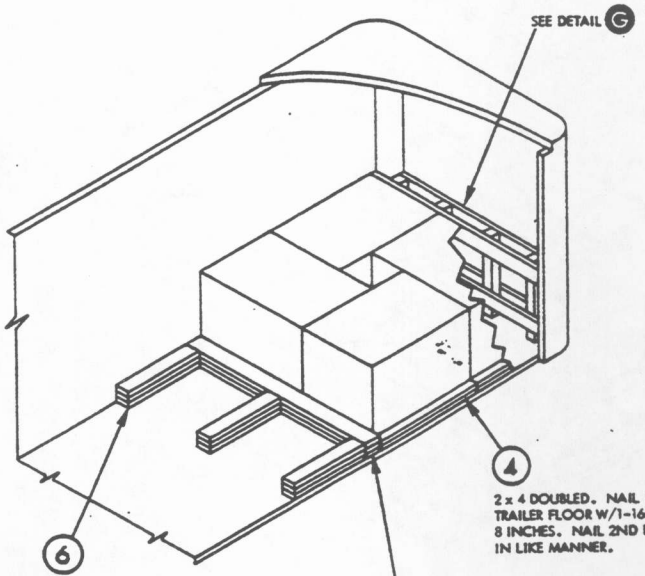
WARNING

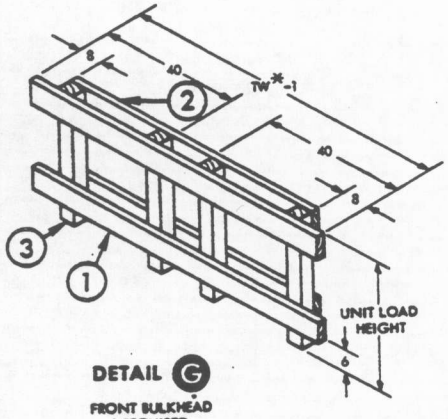
DO NOT USE ALL METAL FLOOR TRAILERS FOR LTL SHIPMENTS AS THEY CAN NOT BE BLOCKED BY THIS METHOD.

2. FILLER ASSEMBLIES, DETAIL H AND J, MAY BE USED AS AN ALTERNATE FOR SLEEPER, PIECE 4.
3. AN LTL MAY CONSIST OF MORE OR LESS UNIT LOADS AND ARE NOT NECESSARILY LIMITED TO THE AMOUNT SHOWN.

NOTE

THIS DRAWING ILLUSTRATES A LOAD WHEN THE DISTANCE BETWEEN THE LADING AND THE TRAILER DOORS IS GREATER THAN 36 INCHES. THE TRAILER SHALL HAVE WOOD FLOORS OR METAL FLOORS WITH NAILING STRIPS.





DETAIL G

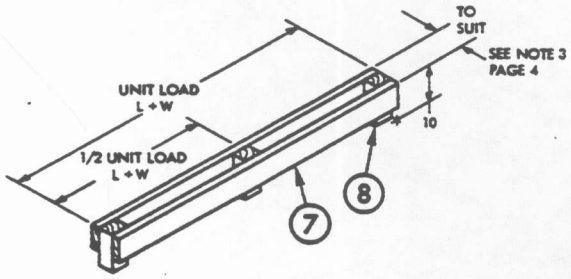
FRONT BULKHEAD
1 REQUIRED

*TW = TRAILER WIDTH

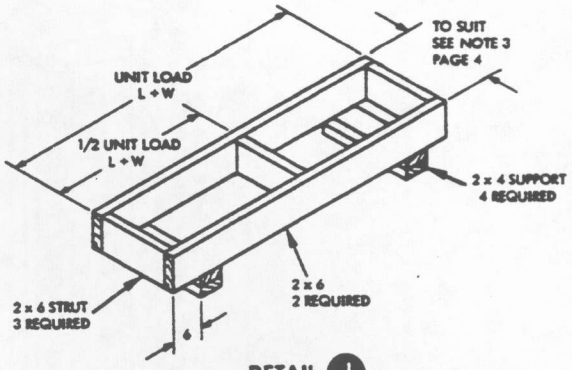
PIECE NO.	DESCRIPTION	SIZE	NO. PCS REQD	NAIL TO	NAILS NUMBER	NAILS SIZE	NOTE
6	BACKUP	2 x 6 x 36	9	SEE	FIELD		NOTE
5	CROSSMEMBER	2 x 6 x TW*-1	3	SEE	FIELD		NOTE
4	SLEEPER	2 x 4 TO SUIT	AS REQD	SEE	FIELD		NOTE
3	VERTICAL	4 x 4 x UNIT LOAD HT	4	SEE 1 & 2	-		-
2	FWD HORIZONTAL	2 x 6 TO SUIT	2	3	3/JOINT		12d
1	AFT HORIZONTAL	2 x 6 x TW*-1	2	3	3/JOINT		12d

LIST OF MATERIALS AND NAILING DATA

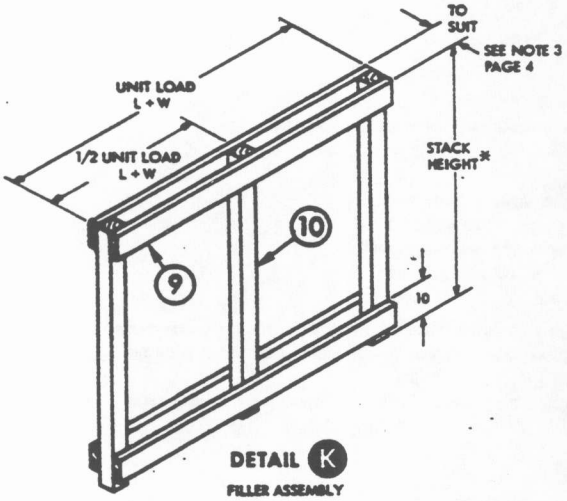
DETAILS (FILLER ASSEMBLIES)



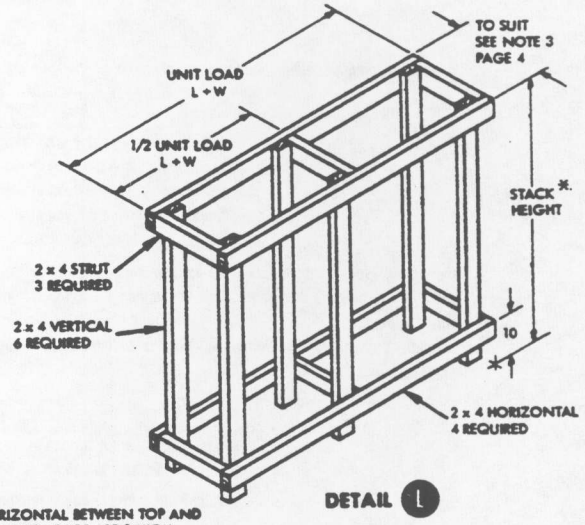
DETAIL H
FILLER ASSEMBLY



DETAIL J
FILLER ASSEMBLY



DETAIL K
FILLER ASSEMBLY



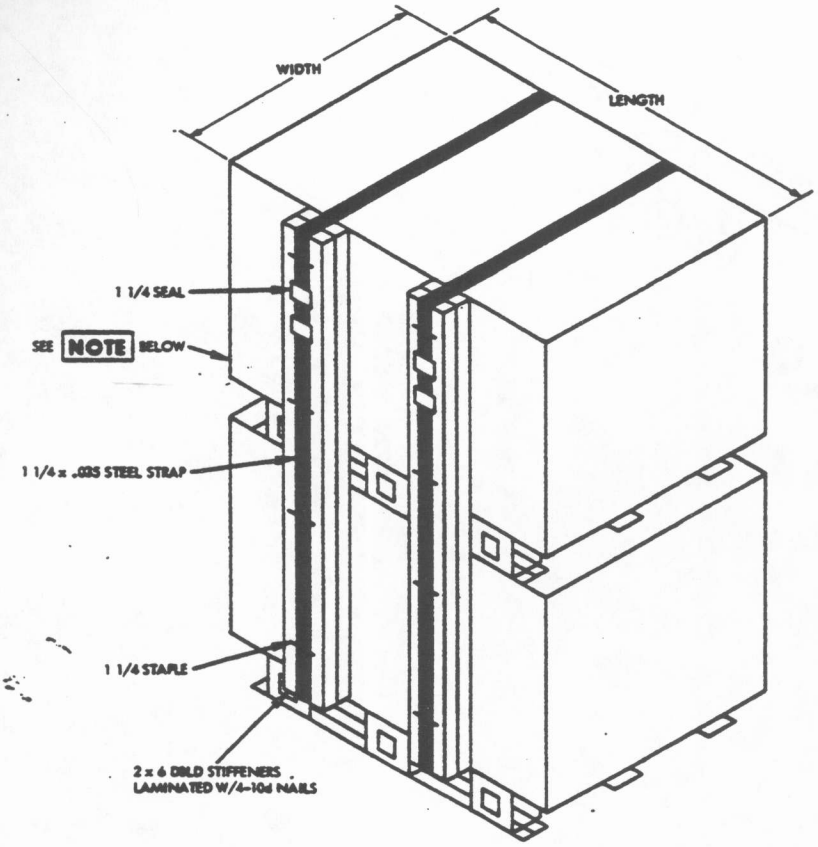
DETAIL L
FILLER ASSEMBLY

*INSTALL THIRD SET OF HORIZONTAL BETWEEN TOP AND BOTTOM HORIZONTALS IF UNIT LOADS ARE 3 HIGH.

NOTE

WHEN REQUIRED TO FILL A LARGE VOID, DETAIL J MAY BE SUBSTITUTED FOR DETAIL H AND DETAIL L MAY BE SUBSTITUTED FOR DETAIL K.

UNITIZING DETAIL



1. WHEN REQUIRED BY THE FTL OR LTL REQUIREMENTS OF THIS MIL-STD, STACKED UNIT LOADS SHALL BE UNITIZED.

WARNING

THE CHIMNEY PATTERN REQUIRES UNITIZING IN TWO CONFIGURATIONS: WITH THE STIFFENERS ON THE "LENGTH" SIDE OF THE STACKED UNIT LOADS AS SHOWN ABOVE AND STIFFENERS ON THE "WIDTH" SIDE. UNITIZING SHALL BE ACCOMPLISHED SO THAT THE REQUIREMENTS OF NOTE 2, PAGE 4 ARE SATISFIED.

2. THE DOUBLED 2 x 6 STIFFENERS SHALL EXTEND FROM THE TOP OF THE STACKED UNIT LOADS TO THE PALLET OF THE BOTTOM UNIT LOAD.
3. THE 1 1/4 INCH STEEL STRAPS POSITIONED AS SHOWN, ENCIRCLE THE STACKED UNIT LOADS AND PASS UNDER THE TOP DECK OF THE BOTTOM PALLET.
4. TENSION STRAPS AND SEAL WITH TWO DOUBLE CRIMPED SEALS. SECURE EACH STRAP TO THE STIFFENER WITH FOUR 1 1/4 INCH STRAP STAPLES.

NOTE

WHEN LOADING A TRAILER WITH A SINGLE STACK OF UNIT LOADS, THE STIFFENERS SHALL BE AT BOTH ENDS OF THE LOAD.

5. WHEN UNITIZING THREE HIGH, FOLLOW THE PRINCIPLES OF THE TWO HIGH UNIT LOADS SHOWN ABOVE.

REVIEW ACTIVITY:
NAVY - OS

PREPARING ACTIVITY:
NAVY - OS
(PROJECT NO. 8140-N281)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1975-603-115/4272

MILITARY STANDARD

MIL-STD-1320-53B

(NAVY)

10 JANUARY 1977

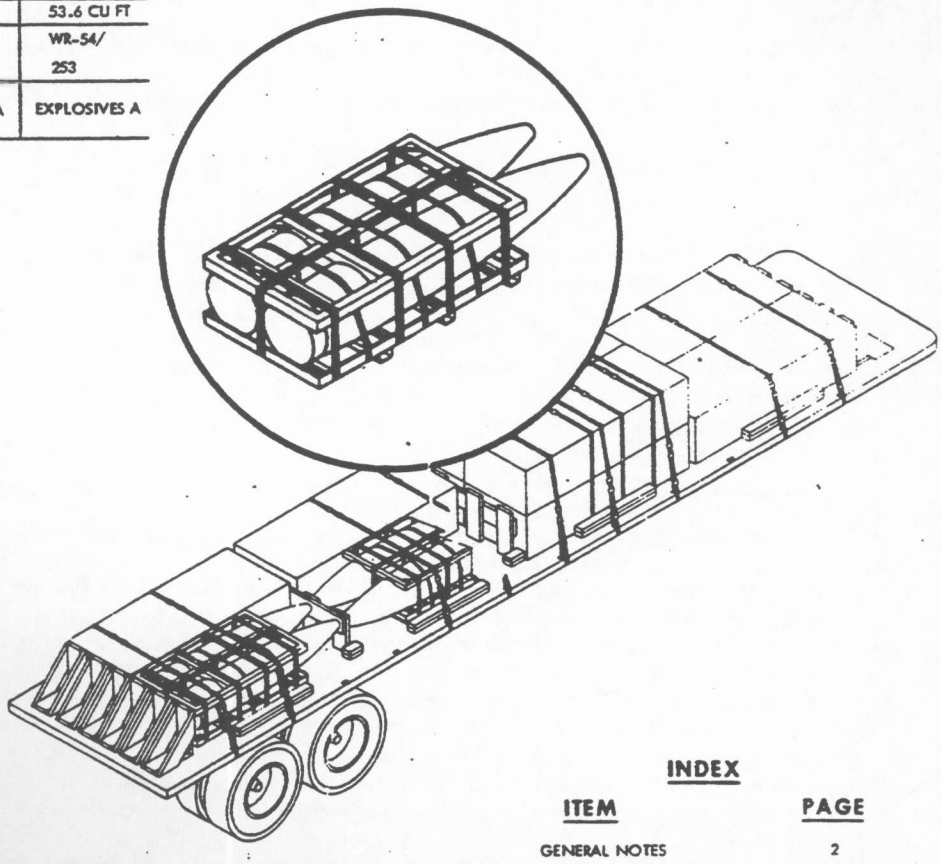
SUPERSEDING
MIL-STD-1320-53A
16 JUNE 1976

TRUCKLOADING

BOMB, GENERAL PURPOSE, MK 84 & MODS (2000LB.)
(WITH PLASTIC NOSE PLUG)
IN ADAPTER, UNIT LOAD, MK 79 MOD O
FLEET ISSUE UNIT LOAD

UNIT LOAD DATA

	UNCOATED	COATED
DIMENSIONS	L-99 W-38 H-24 1/4	L-99 W-38 H-24 5/8
WEIGHT (APPROX)	4053 LBS	4124 LBS
CUBE	52.8 CU FT	53.6 CU FT
DWG NO.	WR-54/ 127	WR-54/ 253
DOT HAZARD	EXPLOSIVES A	EXPLOSIVES A



INDEX

NOTES:

1. UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
2. FOR CROSS REFERENCE TO ASSOCIATED PALLETIZING, CONTAINERLOADING AND CARLOADING MILITARY STANDARDS. REFER TO INDEX TO STANDARDS, MIL-HDBK-236.

FSC 8140

AUTHORIZED AND RELEASED FOR HIGHWAY SHIPMENTS ONLY

M.S. Gray NWHC 1/6/77
SIGNATURE TECHNICAL DIRECTION AGENT (TDA) DATE

C.E. Feil 1/6/77
SIGNATURE AIRSYSCOM, BY DIRECTION DATE

ORIGINATOR Dennis McBride 1/6/77 DATE

NAVAL WEAPONS HANDLING LABORATORY
WPNSTA EARLE, NEW JERSEY

GENERAL NOTES

1. THIS DOCUMENT GIVES DETAILED INSTRUCTIONS FOR TRUCKLOADING 2000 LB. G.P. BOMBS MK 84 AND MODS WHEN THE BOMBS ARE PALLETIZED FLEET ISSUE UNIT LOAD, WR-54/127 OR WR-54/253.
2. THE PROCEDURES DESCRIBED HEREIN ARE INTENDED FOR 40 FT AND 42 FT FLATBED TRAILERS AND 40 FT VANS. THE TRAILERS SHALL HAVE THEIR AXLES LOCATED IN THE "WESTERN" POSITION (AT THE EXTREME REAR OF THE TRAILER). DO NOT USE TRAILERS WITH NON-NAILABLE FLOORS.

WARNING

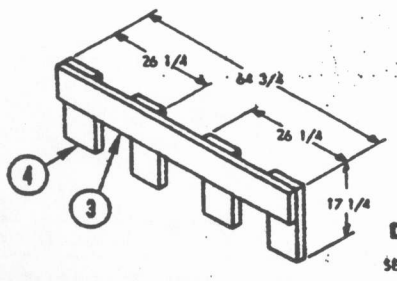
3. FLATBED TRAILERS ARE THE AUTHORIZED MODE OF TRANSPORTATION. VANS ARE AUTHORIZED ONLY WHEN FLATBED TRAILERS ARE NOT AVAILABLE AND SHIPMENT MUST BE MADE BECAUSE OF MILITARY NECESSITY.
4. DIRECTION OF ARROWS INDICATES NOSE END OF BOMB. UNIT LOAD MUST BE ORIENTED AS INDICATED TO PREVENT AXLE OVERLOAD.
5. THE PERMISSABLE GROSS VEHICLE WEIGHT AND AXLES WEIGHTS ARE THE RESPONSIBILITY OF THE CARRIER. THE CARRIER WILL ADVISE OF THE APPLICABLE WEIGHT REQUIREMENTS AND THE SHIPPER WILL LOAD ACCORDINGLY.
6. AFTER BLOCKING AND BRACING HAS BEEN INSPECTED, ATTACH "EXPLOSIVES A" PLACARD TO BOTH SIDES, FRONT, AND BACK OF TRAILER.
7. APPLICABLE MATERIAL SPECIFICATIONS: DUNNAGE LUMBER, MM-L-751; NAILS FF-N-105 TYPE II, STYLE 10, COMMON BRIGHT; STRAPPING QQ-S-781 TYPE I CLASS A.
8. FOR GENERAL TRUCKLOADING PROCEDURES REFER TO THE GENERAL TRUCKLOADING DOCUMENT, MIL-STD-1320 (NAVY).

FTL - 40 FT & 42 FT TRAILER (FLATBED)

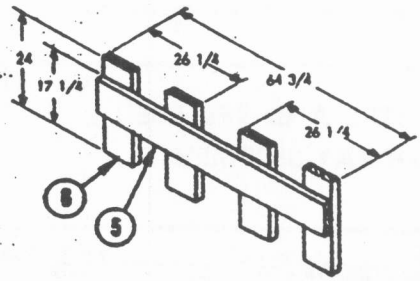
WARNING

THIS STANDARD PROVIDES FOR INCREASED LOADINGS WHICH PRODUCES HEAVIER GROSS TANDEM AXLE WEIGHTS AND GROSS VEHICLE WEIGHT. THESE INCREASED WEIGHTS ARE NOT AUTHORIZED IN ALL 50 STATES. BEFORE LOADING MORE THAN 10 UNIT LOADS, DETERMINE THAT THE RESTRICTIONS OF NOTE 1 BELOW ARE MET.

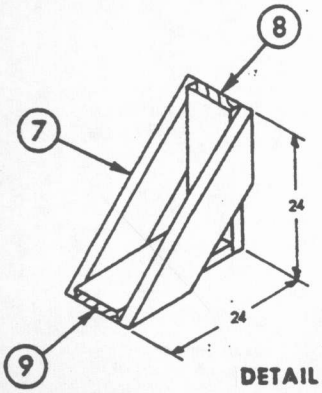
1. A FTL WHEN ROUTING IS THROUGH STATES PERMITTING 34,000 LBS OR MORE ON TANDEM AXLES AND 80,000 LBS GROSS VEHICLE WEIGHT CONSISTS OF:
   - A. UNCOATED BOMBS: 12 UNIT LOADS BLOCKED AND TIED DOWN AS SHOWN ON PAGE 3.
   - B. COATED BOMBS: 11 UNIT LOADS BLOCKED AND TIED DOWN AS SHOWN ON PAGE 4.
2. A FTL OF COATED AND UNCOATED BOMBS WHEN THE ROUTING IS THROUGH STATES LIMITING TANDEM AXLES TO 32,000 LBS CONSISTS OF 10 UNIT LOADS BLOCKED AND TIED DOWN AS SHOWN ON PAGE 5.
3. THE COMPLETED LOAD SHALL BE COVERED WITH A WATERPROOF AND FIRE RESISTANT TARPAULIN IF AVAILABLE. REGULAR TARPAULINS MAY BE USED IN ACCORDANCE WITH DOT SPECIAL PERMIT NO. 5815.
4. TIE-DOWNS MAY BE STEEL 2 X .050 STEEL STRAPS AND APPLIED AS SPECIFIED BY THE LOAD STRAPPING REQUIREMENT ON PAGE 8.
5. CHAINS AND STEEL STRAPS MAY BE USED INTERCHANGEABLY FOR TIE-DOWNS ON A 1 TO 1 BASIS.
6. STEEL STRAPS SHALL BE 2 X .050 AND APPLIED AS SPECIFIED BY THE LOAD STRAPPING REQUIREMENTS SHOWN ON PAGE 8.
7. CHAINS AND LOAD BINDERS SHALL MEET THE FOLLOWING CONDITIONS:
   - A. CHAINS AND FITTINGS SHALL BE 3/8 INCH AND LOADBINDERS 3/8 INCH CAPACITY.
   - B. CHAINS, FITTINGS AND LOADBINDERS SHALL HAVE A MINIMUM SAFE WORKING LOAD OF 5000 LBS.
   - C. LOADBINDERS SHALL BE SAFETY WIRED WITH 16 GAUGE SOFT ANNEALED IRON WIRE OR SECURED USING THE END PIECE OF THE 3/8 CHAIN.
8. PRIOR TO LOADING THE TRAILER AND DURING THE PRELOADING INSPECTION REQUIRED BY OP 2165 AND REPORTED ON DD FORM 626, THE CHAINS, FITTINGS AND LOADBINDERS SHALL BE INSPECTED FOR STRETCH, GOUGING, BENT LINKS, WEAR AND ANY OTHER NOTICEABLE DEFECTS. THE INSPECTOR SHALL CONFIRM THAT THE CHAINS AND LOADBINDERS HAVE BEEN INSPECTED AND SHALL SC NOTE IN ITEM NO. 22 OF DD FORM 626. ANY DEFICIENCY SHALL BE CAUSE FOR REJECTION OF A CHAIN OR LOADBINDER.



DETAIL A
SEPARATOR GATE
1 REQUIRED



DETAIL B
SEPARATOR GATE
2 REQUIRED



WITH BRACE IN POSITION, NAIL PIECE 9 TO TRAILER FLOOR WITH EIGHT 16d NAILS PER BRACE.

DETAIL C

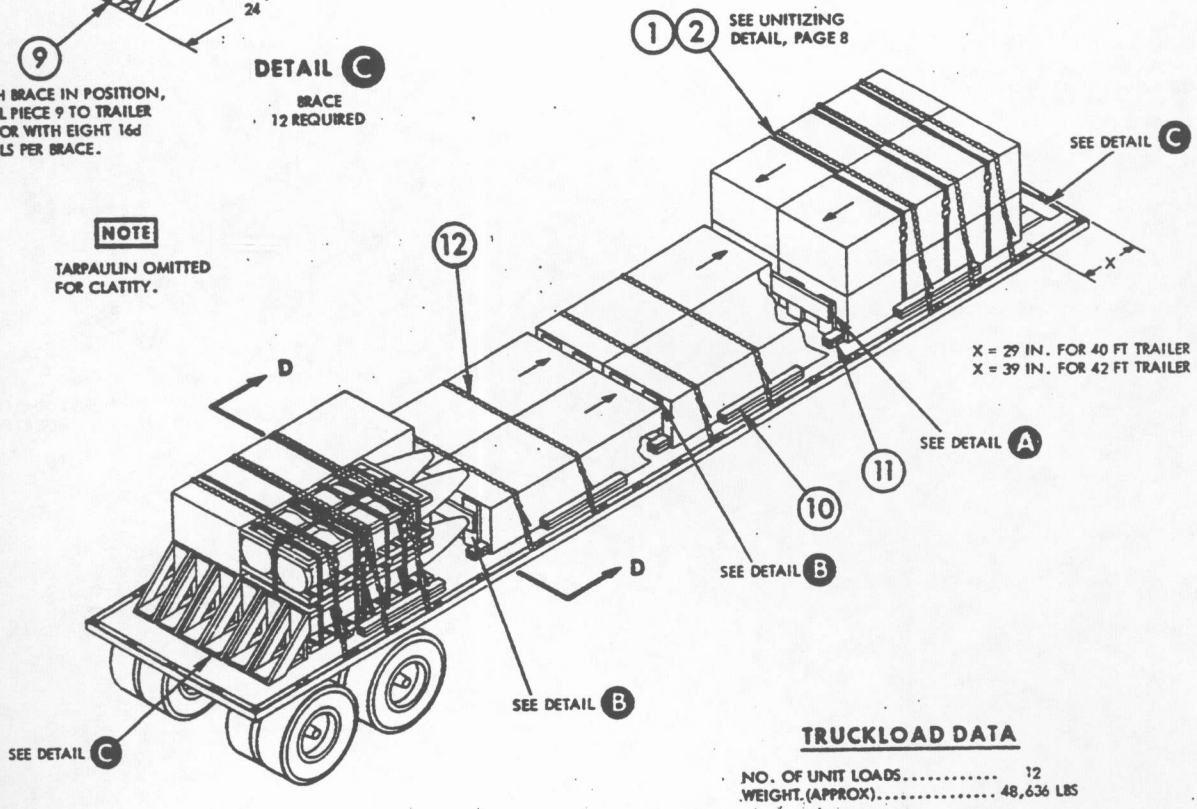
BRACE
12 REQUIRED

NOTE

THIS FTL ILLUSTRATES THE USE OF CHAIN AND LOAD BINDERS. 2 X .050 STRAPS ARE AN ALTERNATE. SEE FTL NOTES 4 AND 5.

WARNING

SEE FTL NOTE 1, PAGE 2.



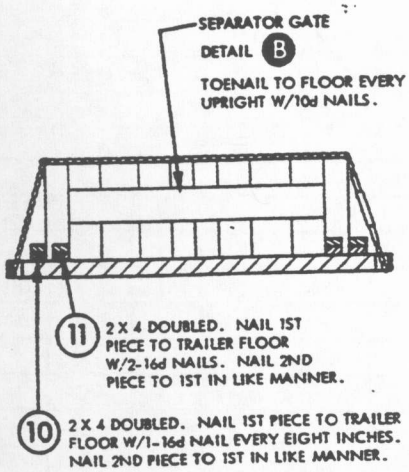
NOTE

TARPAULIN OMITTED FOR CLATITY.

X = 29 IN. FOR 40 FT TRAILER
X = 39 IN. FOR 42 FT TRAILER

TRUCKLOAD DATA

NO. OF UNIT LOADS..... 12
WEIGHT (APPROX)..... 48,636 LBS

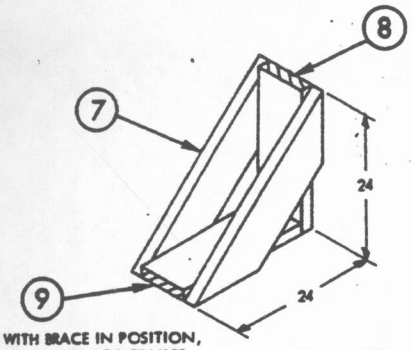


SECTION D-D

PIECE NO.	DESCRIPTION	SIZE	NO. OF PIECES REQ'D	NAIL TO	NAILS NUMBER	NAILS SIZE
12	CHAIN & LOADBINDER	3/8	10	-	-	-
11	GATE BLOCK	2 X 4 X 8	12	SEE SECTION D-D		
10	SLEEPER	2 X 4 X 46	16	SEE SECTION D-D		
9	BRACE, CLEAT	2 X 8 X 22 1/2	12	SEE DETAIL C		
8	BRACE, UPRIGHT	2 X 8 X 24	12	9	3	16d
7	BRACE, DIAGONAL	2 X 8 TO SUIT	24	8 & 9	4	16d
6	VERTICAL	2 X 8 X 24	8	5	4 PER JOINT	10d
5	HORIZONTAL	2 X 8 X 64 3/4	2	SEE 6	-	-
4	VERTICAL	2 X 8 X 17 1/4	4	3	4 PER JOINT	10d
3	HORIZONTAL	2 X 8 X 64 3/4	1	SEE 4	-	-
2	SEAL	FOR 1 1/4 STRAP	24	-	-	-
1	STRAP	1 1/4 X .035 X 15 FT	12	-	-	-

LIST OF MATERIALS & NAILING DATA

UNCOATED BOMBS,
FTL, 40/42 FT TRAILER (FLATBED)



WITH BRACE IN POSITION, NAIL PIECE 9 TO TRAILER FLOOR WITH EIGHT 16d NAILS PER BRACE.

DETAIL E

BRACE
12 REQUIRED

NOTE

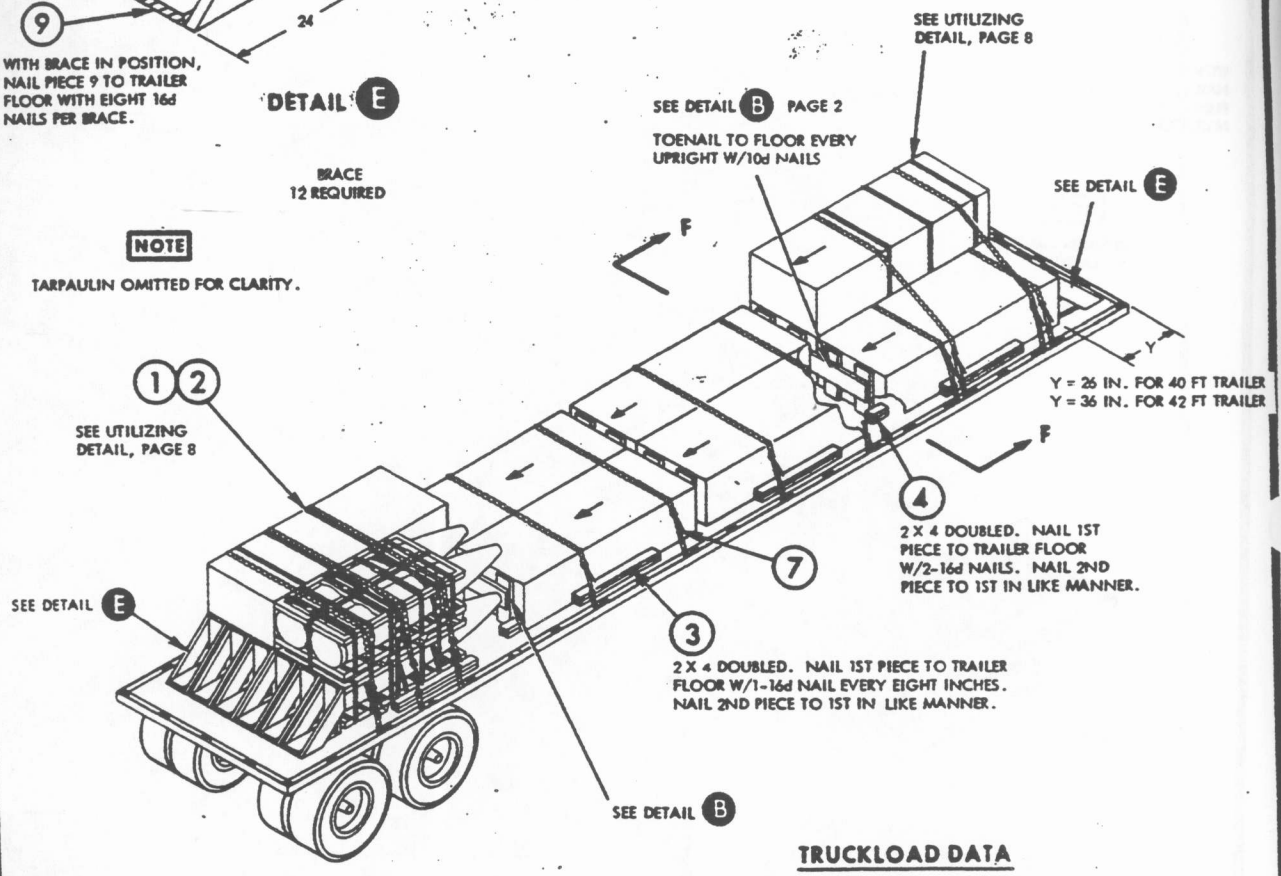
THIS FTL ILLUSTRATES THE USE OF CHAIN AND LOAD BINDERS. 2 X .050 STRAPS ARE AN ALTERNATE. SEE FTL NOTES 4 AND 5.

WARNING

SEE FTL NOTE 1, PAGE 2.

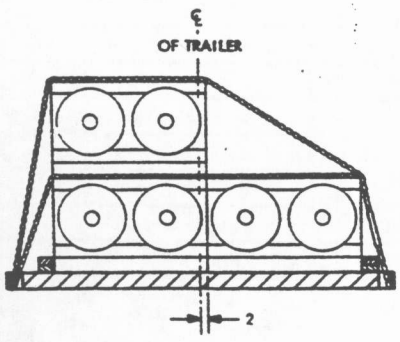
NOTE

TARPAULIN OMITTED FOR CLARITY.



TRUCKLOAD DATA

NO. OF UNIT LOADS 11
WEIGHT (APPROX) ..... 45,562 LBS

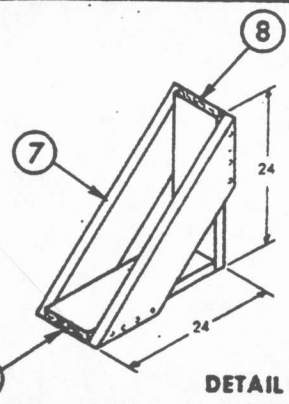


SECTION F-F

PIECE NO.	DESCRIPTION	SIZE	NO. OF PIECES REQ'D	NAIL TO	NUMBER	SIZE
					NAILS	
7	CHAIN & LOADBINDER	3/8	11	-	-	-
6	VERTICAL	2 X 8 X 24	12	5	4 PER JOINT	10d
5	HORIZONTAL	2 X 8 X 64 3/4	3	SEE 6	-	-
4	GATE BLOCK	2 X 4 X 8	12	SEE FIELD NOTE		
3	SLEEPER	2 X 4 X 46	16	SEE FIELD NOTE		
2	SEAL	FOR 1 1/4 STRAP	18	-	-	-
1	STRAP	1 1/4 X .035 X 15 FT	9	-	-	-

LIST OF MATERIALS & NAILING DATA

FTL, COATED BOMBS, 40/42 FT TRAILER (FLATBED)



DETAIL G
BRACE
12 REQUIRED

WITH BRACE IN POSITION, NAIL PIECE 9 TO TRAILER FLOOR WITH EIGHT 16d NAILS PER BRACE.

NOTE

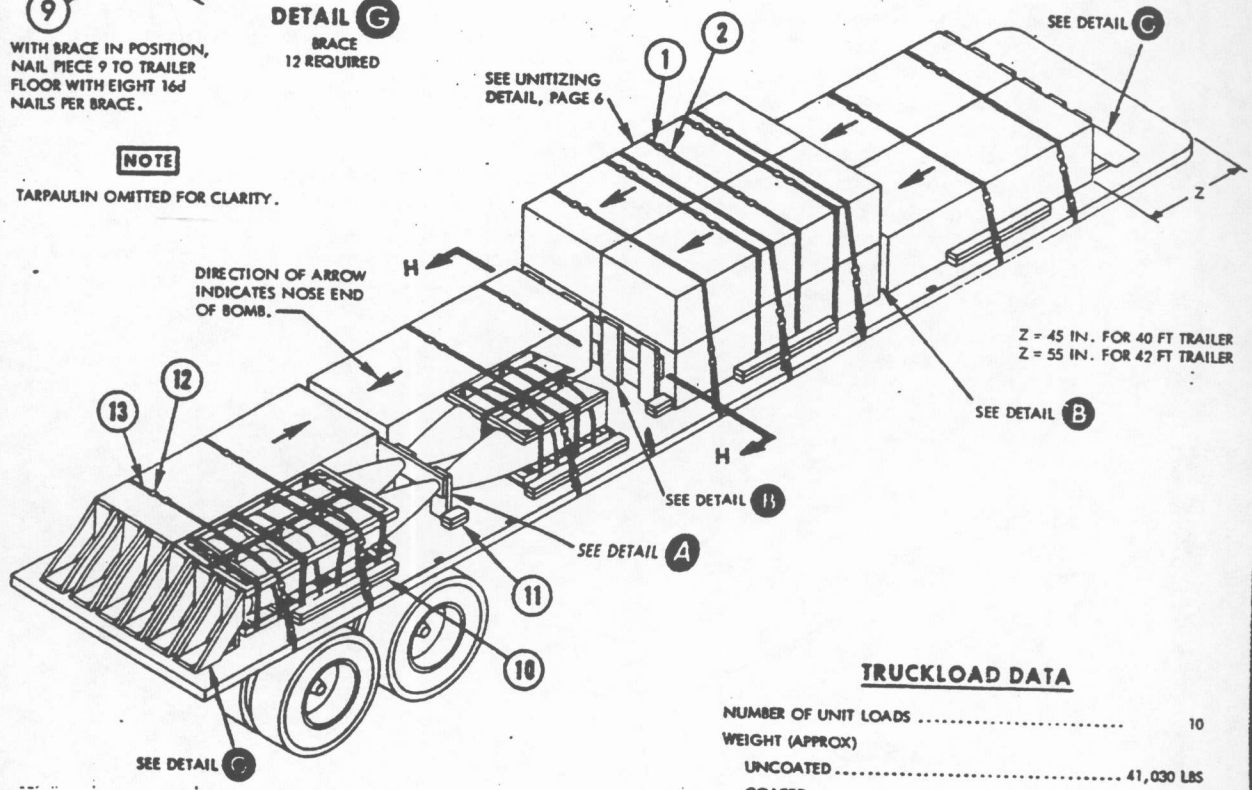
THIS FTL ILLUSTRATES THE USE OF 2 X .050 STRAPS AS TIEDOWNS. CHAINS AND LOAD BINDERS ARE AN ALTERNATE. SEE FTL NOTES 4, 5, 6, AND 7.

NOTE

SEE FTL NOTE 2, PAGE 2

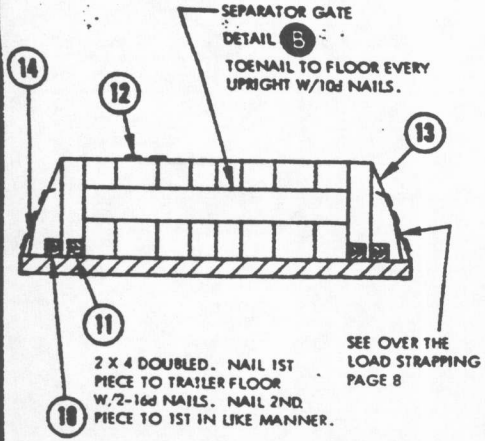
NOTE

TARPAULIN OMITTED FOR CLARITY.



TRUCKLOAD DATA

NUMBER OF UNIT LOADS 10
WEIGHT (APPROX)
UNCOATED ..... 41,030 LBS
COATED ..... 41,710 LBS



SECTION H-H

PIECE NO.	DESCRIPTION	SIZE	NO. PCS. REQ'D	NAIL TO	NUMBER NAILS	SIZE
14	STAKE POCKET PAD	2 X .050 X 18	18	-	-	-
13	STRAP	2 X .050 X 17 FT.	9	-	-	-
12	SEAL	2 X 16 GA. MIN.	72	-	-	-
11	GATE BLOCK	2 X 4 X 8	12	SEE SECTION H-H		
10	SLEEPER	2 X 4 X 46	16	SEE SECTION H-H		
9	BRACE, CLEAT	2 X 8 X 22 1/2	12	SEE DETAIL G		
8	BRACE, UPRIGHT	2 X 8 X 24	12	9	3	
7	BRACE, DIAGONAL	2 X 8 TO SUIT	24	8 & 9	4	16d
6	VERTICAL	2 X 8 X 24	8	5	4/JOINT	16d
5	HORIZONTAL	2 X 8 X 64 3/4	2	SEE 6	-	-
4	VERTICAL	2 X 8 X 17 1/4	4	3	4, JOINT	10d
3	HORIZONTAL	2 X 8 X 64 3/4	1	SEE 4	-	-
2	SEAL	1 1/4 X 22 GA. MIN.	12	-	-	-
1	STRAP	1 1/4 X .035 X 15 FT.	6	-	-	-

LIST OF MATERIAL AND NAILING DATA

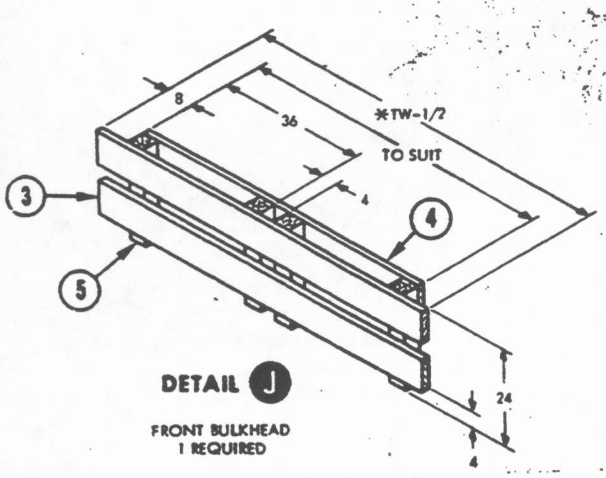
FTL 40 FT TRAILER (VAN TYPE)

(STD. VAN AND RAGTOP VAN)

WARNING

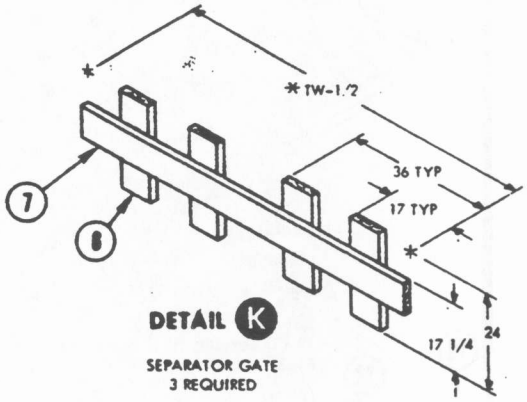
VANS ARE AUTHORIZED ONLY WHEN FLATBED TRAILERS ARE NOT AVAILABLE AND SHIPMENT OF BOMBS MUST BE MADE BECAUSE OF MILITARY NECESSITY.

1. THIS LOAD PLAN IS BASED ON THE USE OF STANDARD VANS AND "RAG TOP" VANS. ALL TRAILERS MUST HAVE AXLES LOCATED IN THE "WESTERN" POSITION (AT EXTREME REAR OF TRAILER) TO PREVENT AXLE OVERLOAD. DO NOT USE TRAILERS WITH METAL FLOORS.
2. WHEN LOADING INTO STANDARD VANS, ALWAYS USE TRAILERS DESIGNED FOR HEAVY FLOOR LOADING. TRAILER CROSS MEMBERS SHOULD BE ON 8-INCH CENTERS MINIMUM. DO NOT USE HANDLING EQUIPMENT THAT IS TOO HEAVY FOR THE JOB. USE THE LIGHTEST HANDLING EQUIPMENT CONSISTENT WITH APPROVED SAFETY PRACTICES.
3. UNIT LOADS MAY BE LOADED INTO "RAG TOP" VANS USING APPROPRIATE HOISTING EQUIPMENT.
4. SLEEPERS, ITEM 12, ARE LOCATED AGAINST TRAILER SIDE WALLS. THEY SHOULD BEAR AGAINST ALL THREE ADAPTER RUNNERS AND SHOULD NOT EXTEND BEYOND OUTBOARD RUNNERS.
5. SLEEPERS, ITEM 11, ARE LOCATED BETWEEN UNIT LOADS AS SHOWN IN SECTION H-H AND MAY BE ONE PIECE, WIDTH TO SUIT, IF DESIRED. SLEEPER SHOULD BEAR AGAINST ALL THREE ADAPTER RUNNERS AND SHOULD NOT EXTEND BEYOND OUTBOARD RUNNERS.



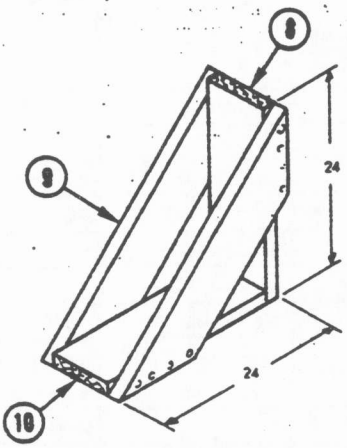
DETAIL J

FRONT BULKHEAD
1 REQUIRED



DETAIL K

SEPARATOR GATE
3 REQUIRED

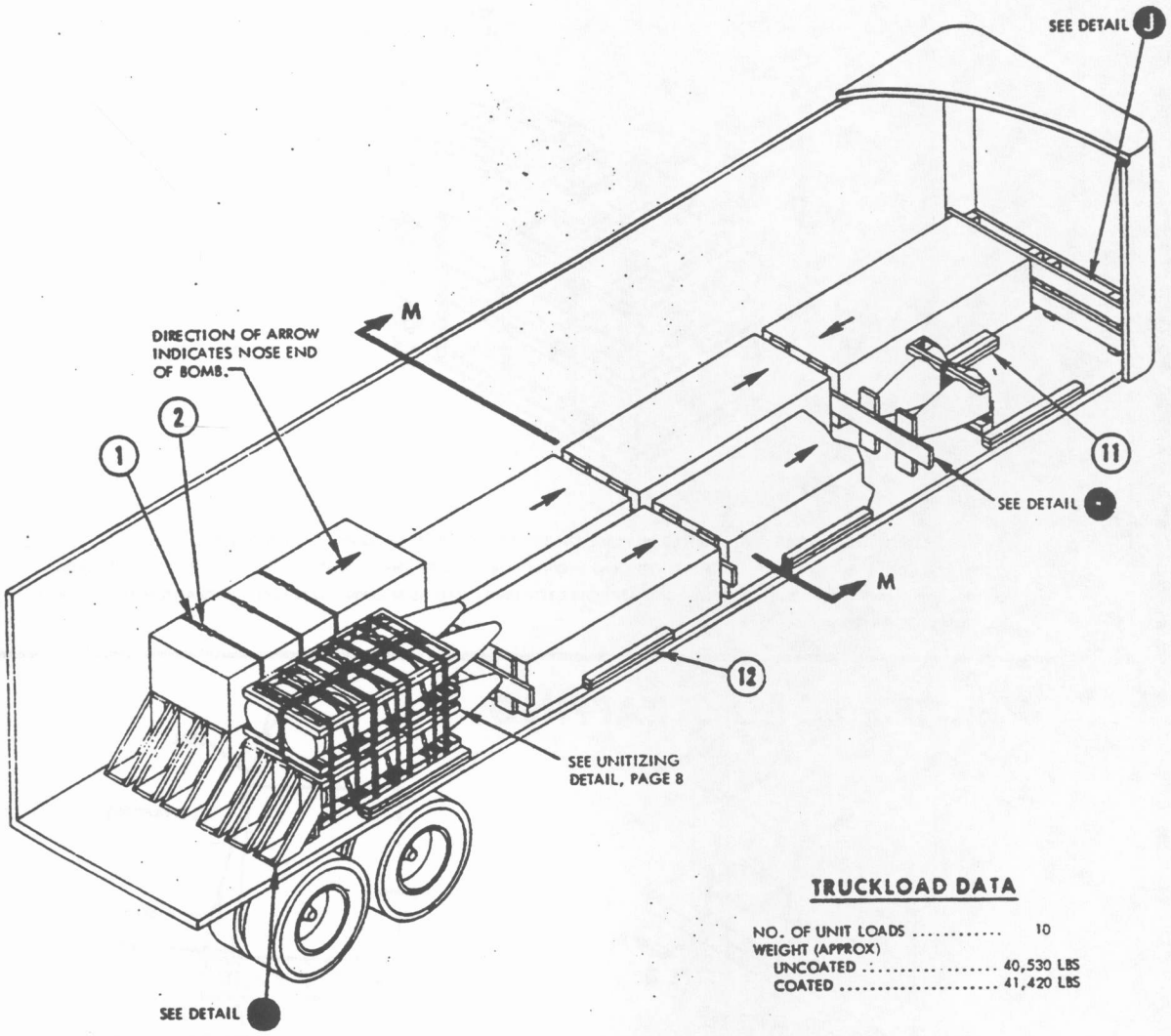


WITH BRACE IN POSITION, NAIL PIECE 10 TO TRAILER FLOOR WITH EIGHT 16d NAILS PER BRACE.

*TW EQUALS TRAILER WIDTH

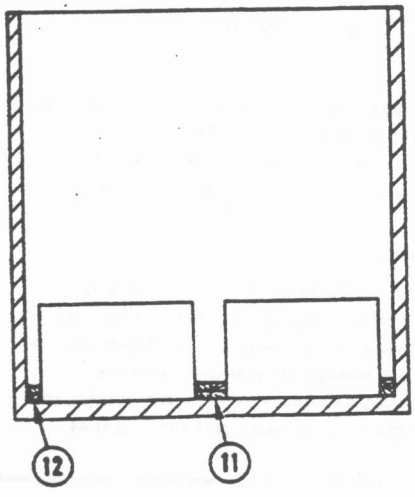
DETAIL L

BRACE
6 REQUIRED



TRUCKLOAD DATA

NO. OF UNIT LOADS 10
WEIGHT (APPROX)
UNCOATED ..... 40,530 LBS
COATED ..... 41,420 LBS



SECTION M-M

PIECE 11 & 12

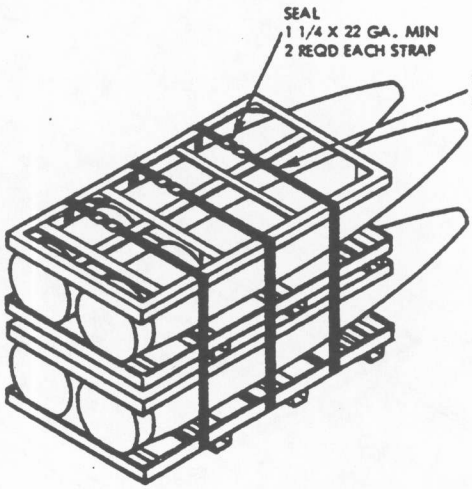
ARE 2 X 4 DOUBLED. NAIL 1ST PIECE TO TRAILER FLOOR W/1-16d NAIL EVERY EIGHT INCHES. NAIL 2ND PIECE TO 1ST PIECE IN LIKE MANNER.

* TW EQUALS TRAILER WIDTH

PIECE NO.	DESCRIPTION	SIZE	NO. PCS REQ'D	NAIL TO	NAILS NUMBER	NAILS SIZE
	LIST OF MATERIAL AND NAILING DATA					
12	SLEEPER	2 X 4 X 46	16	SEE SECTION H-H		
11	SLEEPER (CENTER)	2 X 4 X 46	16	SEE SECTION H-H		
10	BRACE, CLEAT	2 X 8 X 22 3/8	6	SEE DETAIL G		
9	BRACE, DIAGONAL	2 X 8 TO SUIT	12	8 X 10	4	12d
8	BRACE, UPRIGHT	2 X 8 X 24	6	10	3	12d
7	HORIZONTAL	2 X 8 X TW* -1/2	3	SEE 6	-	-
6	VERTICAL	2 X 8 X 24	12	7	4 JOINT	12d
5	VERTICAL	4 X 4 X 24	4	SEE 3&4	-	-
4	FWD. CROSS MEMBER	2 X 8 X TO SUIT	2	5	2 JOINT	12d
3	AFT CROSS MEMBER	2 X 8 X TW* -1 2	2	5	2 JOINT	12d
2	SEAL	1 1/4 X 22 GA. MIN.	12	-	-	-
1	STRAP	1 1/4 X .035 X 15 FT.	6	-	-	-

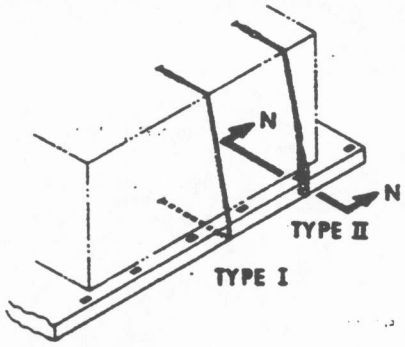
FTL 40 FT TRAILER (VAN TYPE)

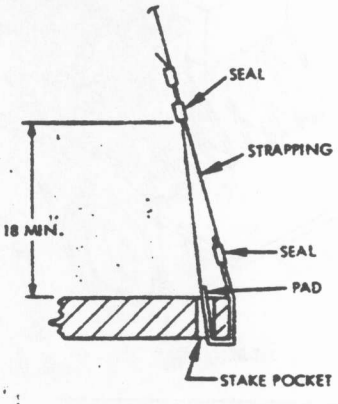
UNITIZING DETAIL



1. UNIT LOADS ARE STACKED AND STRAPPED IN PLACE ON THE TRAILER WITH LOADS IN EXACT POSITION.
2. STACK ONE UNIT LOAD ON TOP OF THE OTHER AS SHOWN MAKING SURE THAT THE STACKING FEATURES ARE ENGAGED.
3. THREAD STRAPS UNDER BOTTOM UNIT LOAD AND OVER TOP UNIT LOAD AS SHOWN. TENSION STRAPS AND SEAL WITH TWO DOUBLE CRIMPED SEALS.

OVER THE LOAD STRAPPING





SECTION N-N

TIE-DOWN STRAPPING

THE FOLLOWING TWO METHODS OF TIE-DOWN STRAPPING ARE APPROVED FOR USE WITH THE SHIPMENT OF LOADS ON FLATBED TRAILERS. STEEL STRAPPING SHALL BE IN ACCORDANCE WITH FEDERAL SPECIFICATION QQ-S-781. STRAPPING SEALS SHALL HAVE A MINIMUM TENSILE STRENGTH EQUAL TO 75 PER CENT OF THE STRAP STRENGTH. FOR EACH OF THE TYPES ILLUSTRATED ABOVE IT IS PREFERRED TO POSITION, TENSION, AND DOUBLE CRIMP THE STRAP SEALS AT THE TOP OF THE LOAD, IF PRACTICABLE.

TYPE I - CONTINUOUS STRAPPING AROUND THE FLATBED AND THE LOAD.

TYPE II - THE STRAPPING IS SECURED TO THE STAKE POCKETS, ONE PIECE ON EACH SIDE OF THE TRAILER, AND IS BROUGHT UP OVER THE LOAD, TENSIONED, AND SEALED WITH TWO DOUBLE-CRIMPED SEALS ON THE TOP. METHOD OF SECURING STRAPPING TO STAKE POCKET IS SHOWN IN SECTION N-N. THE SHORT END IS ON THE INSIDE AND IS SECURED WITH TWO DOUBLE-CRIMPED SEALS AT A MINIMUM OF 18 INCHES ABOVE THE TRAILER BED. A STAKE POCKET PAD (A SHORT PIECE OF THE SAME STRAPPING 18 INCHES LONG) IS INSERTED BETWEEN THE MAIN STRAP AND THE STAKE POCKET AND IS SECURED TO THE MAIN STRAP WITH A SEAL AS SHOWN.

REVIEW ACTIVITIES:
NAVY - OS, AS

PREPARING ACTIVITY:
NAVY - OS
(PROJECT NO. 8140-N170)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1977 -703-020/1242

LOADING AND BRACING PROCEDURES◓ FOR CONVENTIONAL AMMUNITION ITEMS IN/ON TACTICAL VEHICLES⊕

INDEX

◓ THESE PROCEDURES EMPLOY WOOD DUNNAGE, NAILS, AND STEEL STRAPPING TO SECURE THE LADING. THE UNIVERSAL TIE-DOWN SYSTEM, WHICH CONSISTS OF WEB STRAP ASSEMBLIES AND TIE-DOWN FITTINGS OR ANCHOR DEVICES FOR VEHICLE CARGO BEDS, IS NOT USED WITHIN THIS DRAWING.

⊕ THE PROCEDURES DEPICTED WITHIN THIS DRAWING ARE FOR ON HIGHWAY USE ONLY.

DO NOT SCALE

REVISIONS				DRAFTSMAN: DAK	PROJ ENG: JDS
				CHECKER: GRG	LOG ENGRG OFFICER: WJ Ernst
1	JAN 81	WFE	DC Fetter	APPROVED, U. S. ARMY ARMAMENT MATERIEL READINESS COMMAND: D.C. Fetters	
2	JAN 88	WFE	John Byrd	APPROVED BY ORDER OF COMMANDING GENERAL, U. S. ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND (DARCOM): John L. Byrd Jr.	
			WJ Ernst	U. S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL	
				U. S. ARMY DARCOM DRAWING	
				AUGUST 1979	

CLASS	DIVISION	DRAWING	FILE
19	48	4900	CA 1701

PROJECT CAP-TV 1-77

GENERAL NOTES

A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1.

B. THIS DRAWING COVERS PROCEDURES APPLICABLE TO THE TRANSPORT OF CONVENTIONAL AMMUNITION ITEMS IN/ON TACTICAL TYPE VEHICLES FOR ON HIGHWAY USE ONLY. SEE PAGES 4 AND 5 FOR TYPICAL LADING ITEMS.

C. ALL LOADS SHOWN HEREIN ARE TYPICAL, HOWEVER, THE PROCEDURES ARE ADAPTABLE TO THE SIZE OF THE UNIT TO BE TRANSPORTED. THE NUMBER OF UNITS POSITIONED ACROSS THE VEHICLE WIDTH AND THE NUMBER OF UNITS POSTIONED WITHIN THE VEHICLE LENGTH WILL BE DEPENDENT UPON THE UNIT LENGTH OR WIDTH. ALSO, THE TOTAL NUMBER OF UNITS IN/ON A VEHICLE MAY DEPEND UPON THE WEIGHT OF THE UNIT. COMBINATIONS OF ITEMS SHOWN MAY BE TRANSPORTED.

D. OTHER TYPES OF LADING ITEMS MAY BE TRANSPORTED WITH THOSE SHOWN. HOWEVER, THE TOTAL LOAD MUST BE COMPATIBLE AND THE OTHER LADING ITEMS MUST BE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING SPECIFIED HEREIN.

E. WHEN REFERRING TO THE PALLET UNIT LENGTH OR UNIT WIDTH, THE 40" OR 35" DIMENSION OF THE PALLET BASE CONSTITUTES THE PALLET UNIT LENGTH AND THE 48" OR 45 1/2" DIMENSION CONSTITUTES THE PALLET UNIT WIDTH. WHEN REFERRING TO THE SKIDDED UNIT LENGTH OR UNIT WIDTH, THE LENGTH OF THE BOXES CONSTITUTES THE WIDTH OF THE SKIDDED UNIT. SEE THE TYPICAL UNIT DETAILS ON PAGES 4 AND 5.

F. BECAUSE OF THE FACT THAT ALL THE LOADS SHOWN HEREIN ARE TYPICAL, IT IS MOST LIKELY THAT THE ACTUAL QUANTITY TO BE TRANSPORTED WILL NOT BE DEPICTED IN ANY OF THE LOADING PROCEDURES HEREIN. A LOAD PLAN SHOULD BE DEVELOPED WHICH WILL BE THE MOST EFFICIENT AS TO THE AMOUNT OF DUNNAGE REQUIRED AND THE EASE OF LOADING, FOR THE QUANTITY OF ITEMS TO BE TRANSPORTED, USING THE LOAD PLANNING GUIDANCE CHARTS, ON PAGE 3, IN CONJUNCTION WITH THE DEPICTED LOADING PROCEDURES. IN ORDER TO MAINTAIN SIMILARITY FROM ONE LOAD TO ANOTHER, INSTALLATIONS WHICH MAKE MULTIPLE SHIPMENTS OF THE SAME ITEM IN THE SAME TYPE OF VEHICLE, SHOULD MAKE AN ACTUAL PENCILED SKETCH OF THE LOAD. USING THE VARIOUS LOAD PATTERNS AND PROCEDURES SHOWN HEREIN AS GUIDANCE, THIS SKETCH WOULD DEPICT A COMBINATION WHICH WOULD BE MOST ADVANTAGEOUS AS FAR AS EASE OF LOADING AND EFFICIENT USE OF DUNNAGE IS CONCERNED FOR THE SPECIFIC ITEM THAT IS TO BE SHIPPED.

G. THE NUMBER OF ITEMS TO BE TRANSPORTED MAY BE ADJUSTED TO FIT THE CAPACITY OF THE VEHICLE BEING LOADED OR THE QUANTITY TO BE SHIPPED. HOWEVER, THE APPROVED METHODS SPECIFIED HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING AND BRACING OF THE SPECIFIED ITEM.

H. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.

J. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH, ONTO, OR RIGHT BESIDE A NAIL IN A LOWER PIECE.

CAUTION: NAILING THROUGH ANY PORTION OF AMMUNITION PACKAGES AS A MEANS TO SUPPORT THE BRACING OR ANY TYPE OF DUNNAGE IS PROHIBITED. ALL NAILING WILL BE WITHIN THE DUNNAGE OR INTO THE FLOOR OF A TRAILER, AS SPECIFIED HEREIN.

K. PORTIONS OF THE VEHICLES, SUCH AS SIDEWALL AND END WALLS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.

L. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIRS OF CRIMPS PER SEAL, MUST BE USED.

M. WHEN TRANSPORTING AMMUNITION ITEMS ON THE M871 AND/OR THE M872 SEMITRAILER IT WILL BE NECESSARY TO COVER THE HOLES IN THE SIDE FRAMES WITH THE HOLE COVERING PLATES WHICH ARE PROVIDED WITH THE VEHICLE. AFTER ALL SIDE PANELS AND REAR PANELS ARE IN POSITION THE STAKES MUST BE SECURELY "PINNED" OR "WIRE-TIED" TO THE STAKE POCKET TO PREVENT VERTICAL DISPLACEMENT DURING TRANSPORT. ALSO, THE SIDE PANELS MUST BE SECURED AT THE TOP WITH THE CROSS CHAINS WHICH ARE PROVIDED WITH THE VEHICLE. SEE "ALTERNATIVE HOLE COVERING METHODS" ON PAGE 59.

N. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED TYPICAL LOADS.

MATERIAL SPECIFICATIONS

LUMBER	SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
NAILS	FED SPEC FF-N-105, COMMON.
STRAPPING, STEEL	CLASS 1, TYPE I OR IV, HEAVY DUTY, FINISH A, B, (GRADE 2), OR C; FED SPEC QQ-S-781.
STRAP SEALS	TYPE D, STYLE I, II, OR IV, CLASS H, FED SPEC QQ-S-781.
WIRE	FED SPEC QQ-W-461.

ITEMIZED INDEX

NOTE: THE TACTICAL VEHICLES LISTED IN THE INDEX ABOVE AND SHOWN WITHIN THIS DRAWING WERE SELECTED AS TYPICAL ONLY. OTHER TYPES OF VEHICLES MAY BE USED IN LIEU OF THOSE SHOWN. BY USING THESE TYPICAL VEHICLES WITH TYPICAL LOADS, A LOAD PLAN MAY BE DEVELOPED FOR THE ACTUAL ITEM IN/ON THE ACTUAL VEHICLE. SEE GENERAL NOTES "C", "F", AND "G" ON THIS PAGE.

REVISIONS

REVISION NO. 1, DATED JANUARY 1981, CONSISTS OF:

1. ADDED PROCEDURES FOR SEMITRAILER, 22-1/2 TON, M871 AND SEMITRAILER, 34 TON, M872.
2. UPDATED GENERAL NOTES, MATERIAL SPECIFICATIONS, AND DRAWING FORMAT.

REVISION NO. 2, DATED JANUARY 1988, CONSISTS OF:

1. ADDING PROCEDURES FOR CARGO TRUCKS M998 (HMMWV), M1008 (CUCV), M977 AND/OR M985 (HEMTT), AND M871 DROPSIDE TRAILER.

CHART NO. 1

SKIDDED UNITS POSITIONED ACROSS THE VEHICLE WIDTH (SEE "NOTE ◉ " BELOW)

TYPICAL VEHICLE	INSIDE VEHICLE WIDTH	NUMBER OF UNITS WIDE	DIMENSION OF SKIDDED UNITS WITH LENGTH ACROSS THE VEHICLE WIDTH	DIMENSION OF SKIDDED UNITS WITH WIDTH ACROSS THE VEHICLE WIDTH
SEMITRAILER STAKE, 12 TON, M127	7'-6"	2-WIDE 3-WIDE	25" TO 41-1/2" 25" TO 27-1/2"	27" TO 41-1/2" 27" TO 27-1/2"
SEMITRAILER 22-1/2 TON, M871	7'-5-1/2"	2-WIDE 3-WIDE	25" TO 43" 25" TO 28"	25" TO 43" 25" TO 28"
SEMITRAILER 34 TON, M872	7'-7"	2-WIDE 3-WIDE	25" TO 43-1/2" 25" TO 29"	25" TO 43-1/2" 25" TO 29"
TRUCK, CARGO, 2-1/2" OR 5 TON	7'-4"	2-WIDE 3-WIDE	25" TO 43-3/4" 25" TO 29-1/4	27" TO 43-3/4" 27" TO 29-1/4"
TRUCK, CARGO, 8 TON, M520	8'-2-1/2"	2-WIDE 3-WIDE	25" TO 49" 25" TO 32-1/2"	27" TO 49" 27" TO 32-1/2"

NOTE ◉ : THE SIZE OF THE SKIDDED UNITS MAY BE 25" TO 47" IN LENGTH AND 27" TO 97" IN WIDTH.

CHART NO. 2

PALLETIZED UNITS POSITIONED ACROSS THE VEHICLE WIDTH (SEE "NOTE ● " BELOW.)

TYPICAL VEHICLE	INSIDE VEHICLE WIDTH	NUMBER OF UNITS WIDE	DIMENSION OF PALLETIZED UNITS WITH LENGTH ACROSS THE VEHICLE WIDTH	DIMENSION OF PALLETIZED UNITS WITH WIDTH ACROSS THE VEHICLE WIDTH
SEMITRAILER STAKE, 12 TON, M127	7'-6"	2-WIDE	35" TO 43"	NONE
SEMITRAILER 22-1/2 TON, M871	7'-5-1/2"	2-WIDE	35" TO 43"	NONE
SEMITRAILER 34 TON, M872	7'-7"	2-WIDE	35" TO 43"	NONE
TRUCK, CARGO, 2-1/2 OR 5 TON	7'-4"	2-WIDE	35" TO 43-3/4"	NONE
TRUCK, CARGO, 8 TON, M520	8'-2-1/2"	2-WIDE	35" TO 44"	45-1/2" TO 49"

NOTE ● : THE MAXIMUM PALLETIZED UNIT SIZE FOR AMMUNITION ITEMS ON A 35" LONG BY 45-1/2" WIDE PALLET IS 39" LONG BY 51-1/2" WIDE. THE MAXIMUM PALLETIZED UNIT SIZE FOR AMMUNITION ITEMS ON A 40" LONG BY 48" WIDE PALLET IS 44" LONG BY 54" WIDE.

CHART NO. 3

FOR NAILED DOWN BLOCKING ON SEMITRAILERS

NUMBER OF TRIPLED BACK-UP CLEATS REQUIRED AT EACH END OF THE LOAD *	LENGTH OF BACKUPS	NUMBER OF NAILS REQUIRED IN EACH PIECE *	MAX WEIGHT OF THE LOAD
2	18"	5	9,000
3	18"	5	13,500
4	18"	5	18,000
5	18"	5	22,500
6	18"	5	27,000
2	24"	6	10,000
3	24"	6	15,500
4	24"	6	20,000
5	24"	6	25,500
6	24"	6	30,000
2	30"	8	15,000
3	30"	8	22,500
4	30"	8	30,000
5	30"	8	37,500
6	30"	8	45,000
2	36"	9	16,000
3	36"	9	24,000
4	36"	9	32,000
5	36"	9	40,000
6	36"	9	48,000
2	42"	10	18,000
3	42"	10	27,000
4	42"	10	36,000
5	42"	10	45,000
6	42"	10	54,000

* ALL BACKUPS ARE 2" X 6" MATERIAL (TRIPLED). THE FIRST PIECE WILL BE NAILED TO THE TRAILER FLOOR WITH 12d NAILS. THE SECOND AND THIRD PIECES WILL BE NAILED TO THE FIRST PIECE WITH 20d NAILS. THE NAILS MUST BE STAGGERED IN EACH PIECE TO AVOID HITTING A NAIL IN A LOWER PIECE.

LOAD PLANNING GUIDANCE:

1. THE CHARTS ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SELECTION OF A LOAD PATTERN, AND IN DETERMINING THE QUANTITY OF UNITS WHICH CAN BE LOADED IN/ON A VEHICLE.

2. CHART NO. 1 MAY BE USED IN SELECTING A LOAD PATTERN FOR SKIDDED UNITS IN/ON TACTICAL VEHICLES.

   (A) WHEN LOADING 2-UNITS OR 3-UNITS WIDE ACROSS THE WIDTH OF A SEMITRAILER, AND USING NAILED DOWN SIDE BLOCKING AS SHOWN IN THE LOAD ON PAGE 6, THERE MUST BE ADEQUATE AVAILABLE SPACE REMAINING ON EACH SIDE OF THE LOAD TO POSITION THE SIDE BLOCKING PIECES AND NAIL IN PLACE.

   (B) WHEN LOADING 2-UNITS OR 3-UNITS WIDE, ACROSS THE WIDTH OF A SEMITRAILER, AND USING A STAGGERED LOAD PATTERN WITH NAILED DOWN BLOCKING AS SHOWN IN THE LOAD ON PAGE 12, THERE MUST BE ADEQUATE NAILABLE SPACE REMAINING ON THE SIDE OF THE LOAD TO POSITION THE SIDE BLOCKING PIECES AND NAIL IN PLACE.

   (C) WHEN LOADING 2-UNITS OR 3-UNITS WIDE, ACROSS THE WIDTH OF A SEMITRAILER, AND USING "FLOATING" SIDE BLOCKING AT THE BOTTOM AND "ANTI-SWAY ASSEMBLIES" AT THE TOP AS SHOWN IN THE LOAD ON PAGE 16, THERE MUST BE ADEQUATE SPACE REMAINING ON EACH SIDE OF THE LOAD TO POSITION THE SIDE BLOCKING AND "ANTI-SWAY ASSEMBLIES".

   (D). WHEN LOADING 2-UNITS OR 3-UNITS WIDE ACROSS THE WIDTH OF A CARGO TRUCK AS SHOWN IN THE LOAD ON PAGE 34, THERE MUST BE AT LEAST 1/2" EXCESS LATERAL SPACE REMAINING ACROSS THE VEHICLE WIDTH AFTER THE UNITS ARE POSITIONED.

3. CHART NO. 2 MAY BE USED IN SELECTING A LOAD PATTERN FOR PALLETIZED UNITS IN/ON TACTICAL VEHICLES.

   (A) WHEN LOADING 2-UNITS WIDE ACROSS THE WIDTH OF A SEMITRAILER FOLLOW STEPS (A), (B), AND (C) UNDER "LOAD PLANNING GUIDANCE" FOR SKIDDED UNITS, NUMBER 2, ABOVE.

   (B) WHEN LOADING 2-UNITS WIDE ACROSS THE WIDTH OF A CARGO TRUCK FOLLOW STEP (D) UNDER "LOAD PLANNING GUIDANCE" FOR SKIDDED UNITS, NUMBER 2,. ABOVE.

4. CHART NO. 3 MAY BE USED AS GUIDANCE IN DETERMINING THE LENGTH AND QUANTITY OF BACK-UP CLEATS REQUIRED TO SECURE THE LOAD ON A SEMITRAILER.

EXAMPLE OF LOAD PLANNING GUIDANCE.

PALLETIZED UNITS HAVING OVERALL DIMENSIONS OF 40-1/2" LONG BY 49-1/4" WIDE BY 55-3/4" HIGH AND WEIGHING 1,915 POUNDS ARE TO BE TRANSPORTED ON A SEMITRAILER, STAKE, 12 TON, M127.

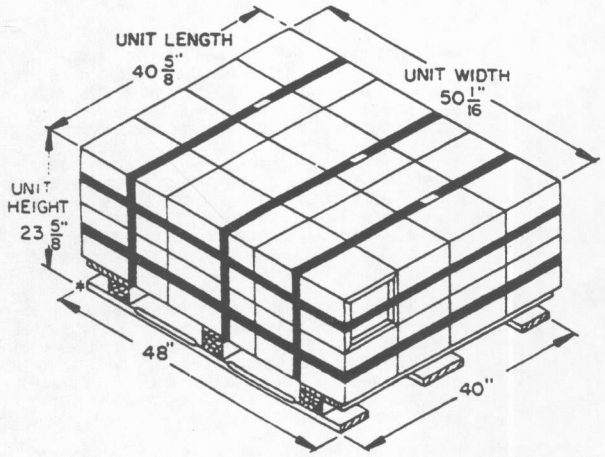
1. CHART NO. 2, ON THIS PAGE, "PALLETIZED UNITS POSITIONED ACROSS THE VEHICLE WIDTH" INDICATES THAT THE PALLETIZED UNIT LENGTH OF 40-1/2" WOULD BE WITHIN THE 35" TO 43" RANGE AND TWO PALLETIZED UNITS COULD BE POSITIONED ACROSS THE VEHICLE WIDTH.

2. THE SEMITRAILER HAS A LENGTH OF 28'-8" (344"). 344" DIVIDED BY THE PALLETIZED UNIT WIDTH OF 49-1/4" EQUALS 6. THIS INDICATES THAT THE LOAD WILL BE TWO PALLETIZED UNITS WIDE AND SIX PALLETIZED UNITS LONG FOR A TOTAL OF TWELVE PALLETIZED UNITS. TWELVE PALLETIZED UNITS WILL HAVE A TOTAL WEIGHT OF 22,980 POUNDS. THE EXCESS SPACE AT EACH END OF THE LOAD WILL BE 24" (APPROX).

3. TO FIND THE NUMBER AND LENGTH OF BACK-UPS REQUIRED TO RETAIN A LOAD OF 22,980 POUNDS LOOK AT CHART NO. 3, ON THIS PAGE, IN THE RIGHT HAND COLUMN UNDER "MAX WEIGHT OF THE LOAD". A WEIGHT OF 22,980 POUNDS WOULD REQUIRE SIX (6) TRIPLED 18" LONG BACK-UPS AT EACH END, OR FIVE (5) TRIPLED 24" BACK-UPS AT EACH END, OR FOUR (4) TRIPLED 30" LONG BACK-UPS AT EACH END. SINCE THE LOAD ONLY HAS 24" (APPROX) OF EXCESS SPACE AT EACH END, THE 18" LONG BACK-UP WOULD BE THE BEST LENGTH TO USE. THEREFORE, SIX (6) TRIPLED 18" LONG BACK-UPS WILL BE POSITIONED AT EACH END OF THE LOAD.

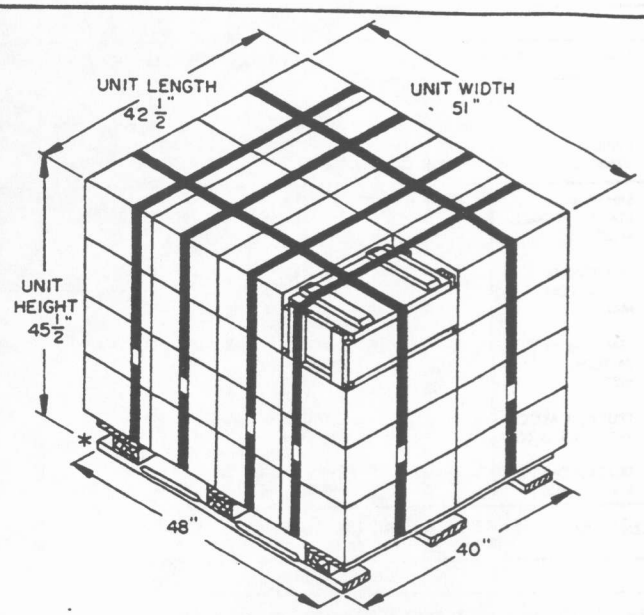
4. AFTER ACQUIRING THE INFORMATION IN STEPS 1, 2, AND 3, ABOVE, LOOK AT THE TYPICAL LOADS SHOWN ON AN M127, 12 TON SEMITRAILER ON PAGES 6 THROUGH 11 AND 18 THROUGH 27. READ THE SPECIAL NOTES FOR EACH LOAD AND SELECT A TYPICAL LOAD THAT WOULD BE SIMILAR TO THE LOAD TO BE TRANSPORTED. NOTE THAT THE PALLETIZED UNIT USED IN THIS EXAMPLE IS SHOWN IN THE LOAD ON PAGE 6. SEE GENERAL NOTE "F" ON PAGE 2.

5. THE PROCEDURES IN THE EXAMPLE ABOVE ARE APPLICABLE TO ALL PALLETIZED AND SKIDDED UNITS BEING TRANSPORTED ON A SEMITRAILER.



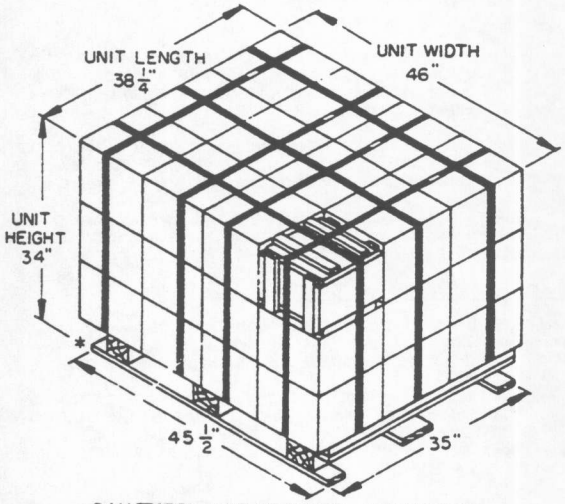
PALLETIZED UNIT OF BOXED AMMUNITION

(40" X 48" PALLET)



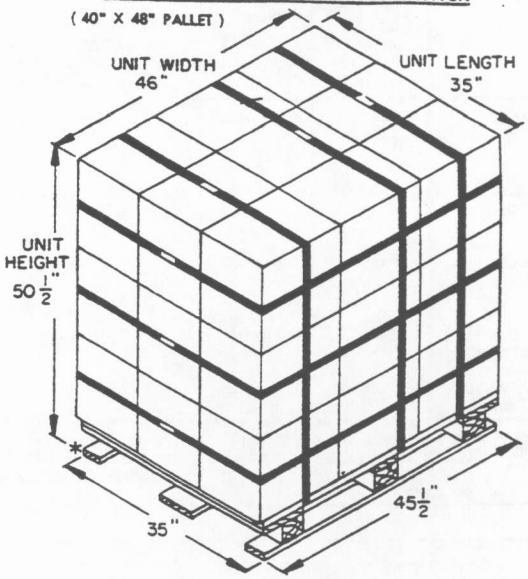
PALLETIZED UNIT OF BOXED AMMUNITION

(40" X 48" PALLET)



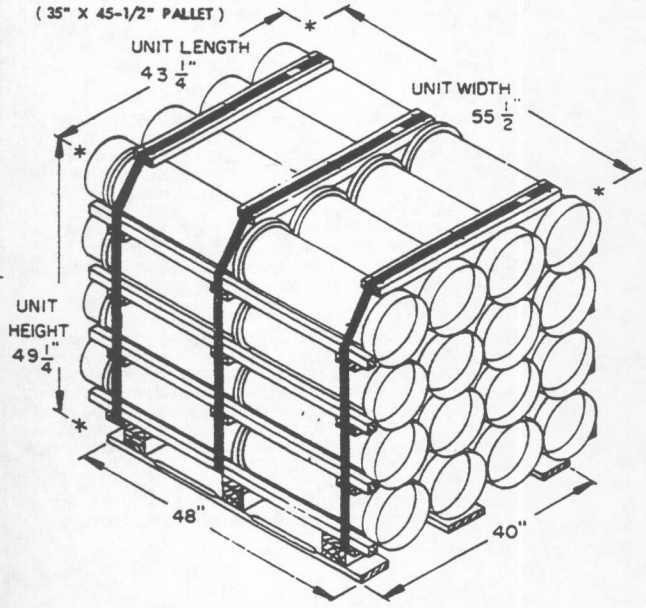
PALLETIZED UNIT OF BOXED AMMUNITION

(35" X 45-1/2" PALLET)



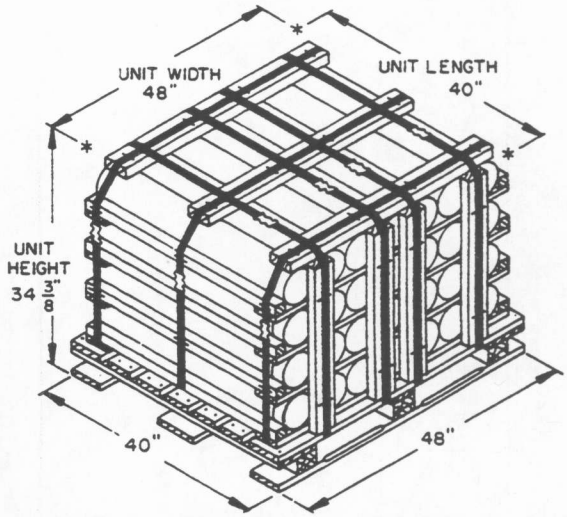
PALLETIZED UNIT OF BOXED AMMUNITION

(35" X 45-1/2" PALLET)



PALLETIZED UNIT OF PROPELLING CHARGES

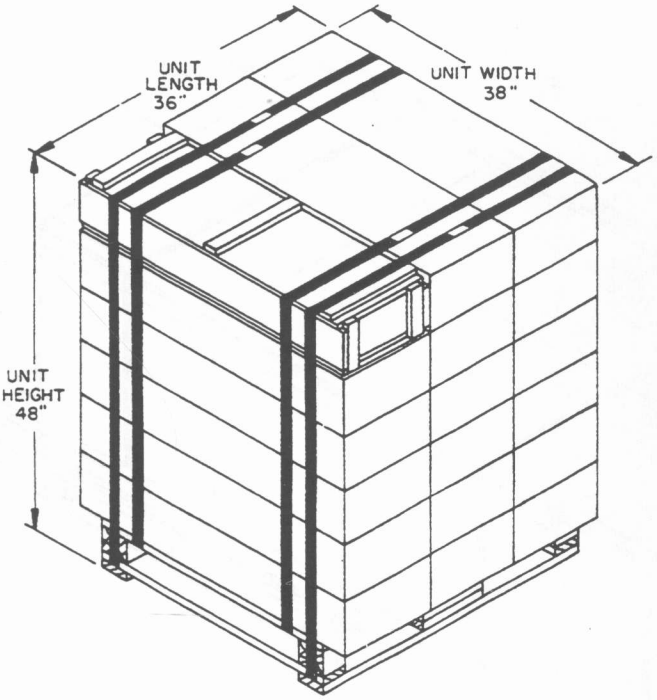
(40" X 48" PALLET)



PALLETIZED UNIT OF COMPLETE ROUNDS

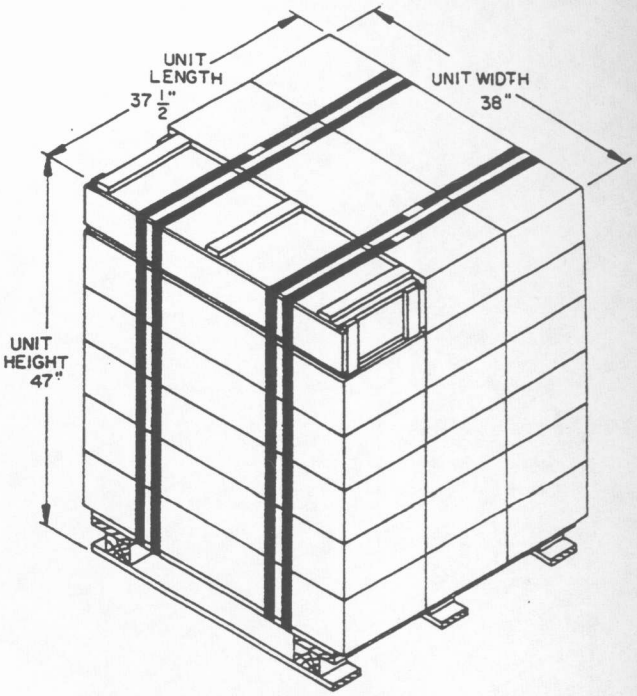
(40" X 48" PALLET)

TYPICAL LADING ITEMS



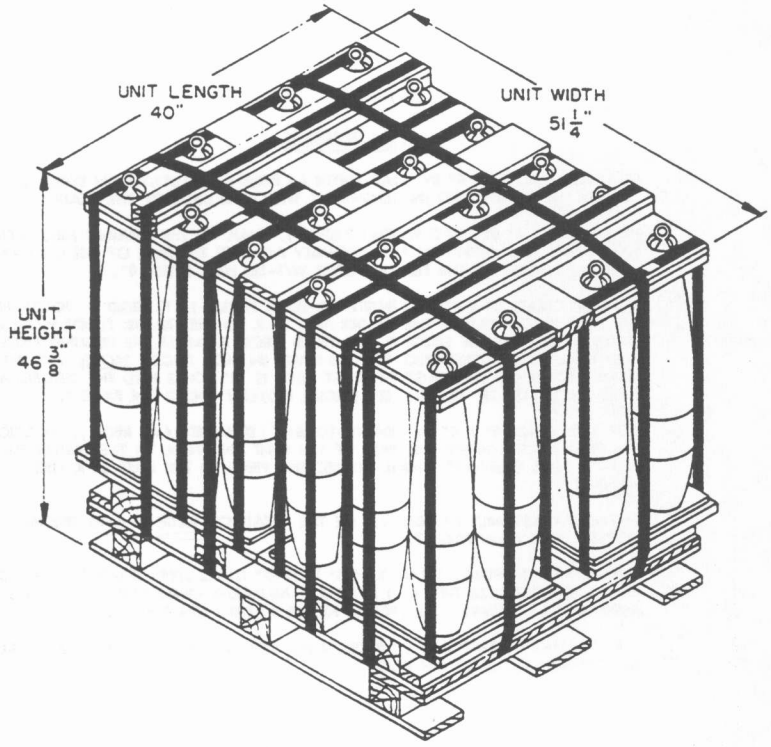
SKIDDED UNIT OF BOXED AMMUNITION

(TYPE I BASE)

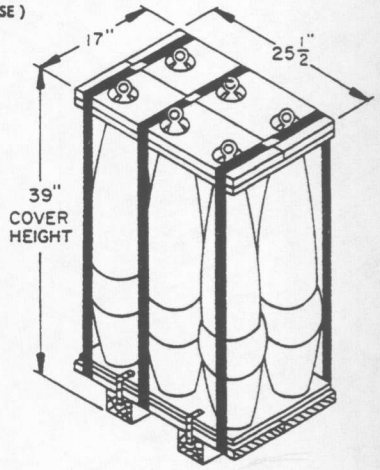


SKIDDED UNIT OF BOXED AMMUNITION

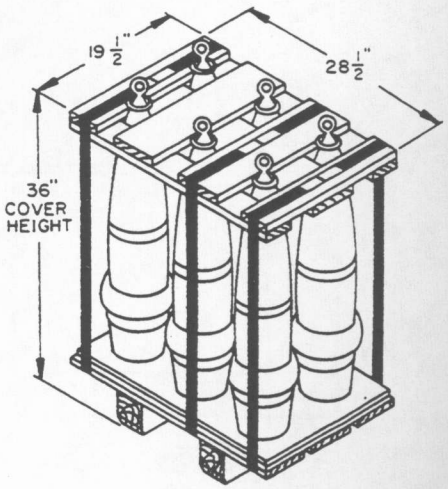
(TYPE II BASE)



175MM, 20/PALLET



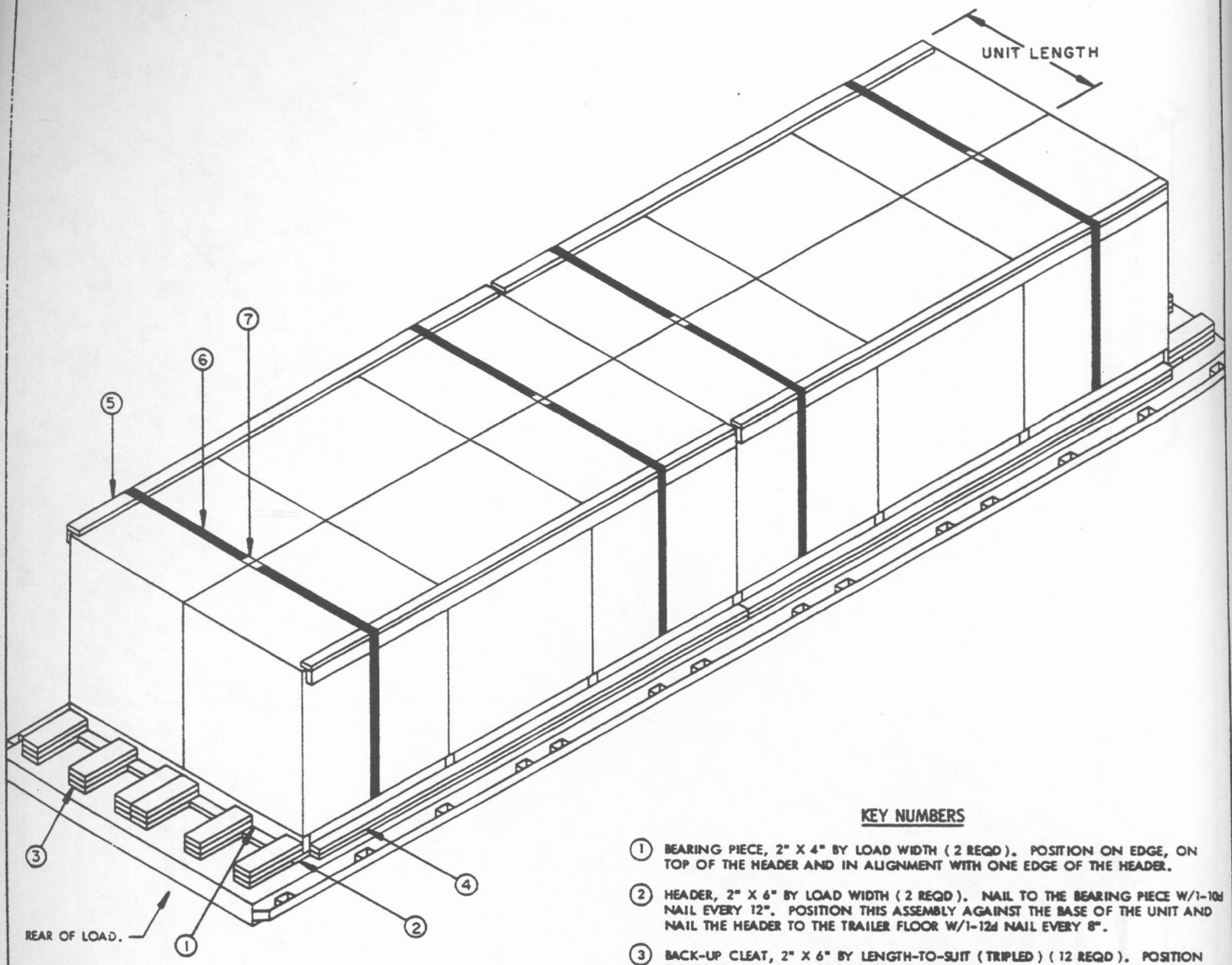
175MM, 6/PALLET



8", 6/PALLET

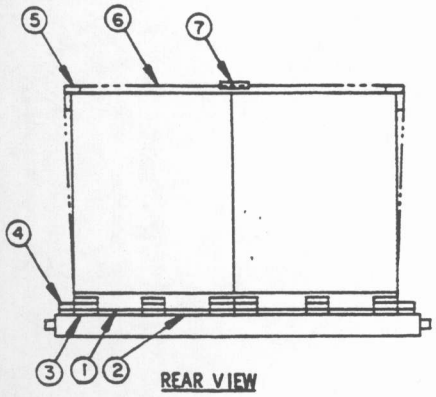
NOTE: THE ITEMS SHOWN ON PAGES 4 AND 5 DEPICT TYPICAL UNITS OF CONVENTIONAL AMMUNITION THAT MAY BE TRANSPORTED IN/ON TACTICAL VEHICLES. ALL ITEMS SHOWN WILL NOT BE DEPICTED IN THE TYPICAL LOAD VIEWS WITHIN THIS DRAWING.

TYPICAL LADING ITEMS



ISOMETRIC VIEW

A PALLETIZED UNIT IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO PALLETIZED OR SKIDDED UNITS.



REAR VIEW

KEY NUMBERS

(1) BEARING PIECE, 2" X 4" BY LOAD WIDTH (2 REQD). POSITION ON EDGE, ON TOP OF THE HEADER AND IN ALIGNMENT WITH ONE EDGE OF THE HEADER.

(2) HEADER, 2" X 6" BY LOAD WIDTH (2 REQD). NAIL TO THE BEARING PIECE W/1-10d NAIL EVERY 12". POSITION THIS ASSEMBLY AGAINST THE BASE OF THE UNIT AND NAIL THE HEADER TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8".

(3) BACK-UP CLEAT, 2" X 6" BY LENGTH-TO-SUIT (TRIPLED) (12 REQD). POSITION THE FIRST PIECE AGAINST THE HEADER AND NAIL TO THE TRAILER FLOOR W/5-12d NAILS. POSITION THE SECOND AND THIRD PIECES AGAINST THE BEARING PIECE AND NAIL TO THE FIRST PIECE W/5-20d NAILS IN EACH PIECE. NOTE: FOR THE LOAD SHOWN ON THIS PAGE THE FIRST PIECE IS 18" LONG AND THE SECOND AND THIRD PIECES ARE 22" LONG. SEE SPECIAL NOTES 7 AND 8 ON PAGE 7.

(4) SIDE BLOCKING, 2" X 4" BY LENGTH-TO-SUIT (DOUBLED) (AS REQD). POSITION THE FIRST PIECE AGAINST THE BASE OF THE UNIT AND NAIL TO THE TRAILER FLOOR W/1-12d NAIL EVERY 12". NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

(5) ANTI-SWAY ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 56 AND SPECIAL NOTES 3 AND 4 ON PAGE 7.

(6) ANTI-SWAY STRAPPING, 1-1/4" X .035" X 24'-0" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE TWO (2) LATERALLY ADJACENT UNITS AND THE "ANTI-SWAY ASSEMBLY" AS SHOWN. SEE SPECIAL NOTES 3 AND 4 ON PAGE 7.

(7) SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

SPECIAL NOTES.

1. A TYPICAL LOAD OF BOXED AMMUNITION ASSEMBLED ON A 40" X 48" PALLET IS SHOWN LOADED ON A SEMITRAILER, STAKE, 12 TON, M127, HAVING OVERALL DIMENSIONS OF 28'-8" LONG BY 8'-0" WIDE. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE SPECIAL NOTE 9 BELOW.

2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL 2-WIDE LOAD ON PAGE 6 HAS OVERALL DIMENSIONS OF 40-1/2" LONG BY 49-1/4" WIDE BY 55-3/4" HIGH AND A WEIGHT OF 1,915 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR PALLETIZED UNITS OF OTHER DIMENSIONS AND SKIDDED UNITS. REFER TO "CHART NO. 1" AND "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.

3. ALL PALLETIZED UNITS WHICH ARE OVER 30" IN HEIGHT MUST BE UNITIZED WITH ANTI-SWAY STRAPS, SHOWN AS PIECE MARKED (6) ON PAGE 6 TOGETHER WITH "ANTI-SWAY ASSEMBLIES" SHOWN AS PIECE MARKED (5) ON PAGE 6. UNITS WHICH ARE LESS THAN 30" IN HEIGHT MAY BE LOADED AS SHOWN IN THE LOAD ON PAGE 8.

4. ALL SKIDDED UNITS WHICH HAVE A HEIGHT GREATER THAN TWO-THIRDS OF THEIR LENGTH OR WIDTH (WHICHEVER IS SMALLER) MUST BE UNITIZED WITH ANTI-SWAY STRAPS, SHOWN AS PIECE MARKED (6) ON PAGE 6 TOGETHER WITH "ANTI-SWAY ASSEMBLIES" SHOWN AS PIECE MARKED (5) ON PAGE 6. UNITS THAT HAVE A HEIGHT ONE-THIRD LESS THAN THEIR WIDTH OR LENGTH (WHICHEVER IS SMALLER) MAY BE LOADED AS SHOWN IN THE LOAD ON PAGE 8.

5. WHEN SHIPPING UNITS SUCH AS PROPELLING CHARGES AND COMPLETE ROUNDS, THE ANTI-SWAY ASSEMBLY, SHOWN AS PIECE MARKED (5) ON PAGE 6 CANNOT BE USED. A UNITIZING STRAP, SHOWN AS PIECE MARKED (6) ON PAGE 6, MUST BE PLACED AROUND EVERY TWO LATERALLY ADJACENT UNITS. PLACE ANTI-CHAFING NEUTRAL BARRIER MATERIAL UNDER THE STRAPPING AT ALL POINTS OF CONTACT WITH CONTAINERS AND SECURE TO PREVENT DISLODGEMENT DURING AND AFTER STRAP APPLICATION.

6. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED. A LOAD CAN BE INCREASED OR REDUCED BY A MULTIPLE OF TWO (2) UNITS AND USING THE SAME PROCEDURES SHOWN ON PAGE 6. A LOAD CAN BE REDUCED OR INCREASED BY ONE (1) UNIT BY USING THE PROCEDURES SHOWN ON PAGE 19.

7. THE LENGTH OF THE BACKUP PIECES, SHOWN AS PIECE MARKED (3) ON PAGE 6, AND THE NAILS REQUIRED WILL CHANGE PER DIFFERENT LOAD WEIGHTS. LONGER BACKUP PIECES THAN SHOWN MAY BE USED AND 2" X 4" MATERIAL MAY BE USED IN LIEU OF THE 2" X 6" MATERIAL. SEE "CHART NO. 3" ON PAGE 3 FOR GUIDANCE.

8. SEE "DETAIL A" ON PAGE 55 FOR POSITIONING OF THE BEARING PIECE, HEADER, AND BACK-UP CLEAT, AGAINST THE PALLET BASE OF SKIDDED BASE.

9. PROCEDURES FOR LOADING AN M871 OR M872 SEMITRAILER:

   (A) SKIDDED UNITS WHICH WILL HAVE AT LEAST FOUR INCHES OF NAILABLE SPACE REMAINING ON EACH SIDE OF THE LOAD OR AMMUNITION ITEMS WHICH ARE PALLETIZED ON THE 35" X 45-1/2" PALLET AND HAVE A UNIT LENGTH OF 39" OR LESS MAY BE LOADED ON AN M872 SEMITRAILER OR THE REAR PORTION OF A M871 SEMITRAILER, USING THE SAME PROCEDURES SHOWN IN THE LOAD ON PAGE 6. FOR ALTERNATIVE LOADING PROCEDURES, SEE PAGES 12 THROUGH 17. SEE GENERAL NOTE "M" ON PAGE 2.

   (B) SKIDDED UNITS WHICH DO NOT MEET THE REQUIREMENTS IN (A) ABOVE AND PALLETIZED UNITS HAVING A LENGTH GREATER THAN 39" MUST BE LOADED AS SHOWN ON PAGES 12 THROUGH 17.

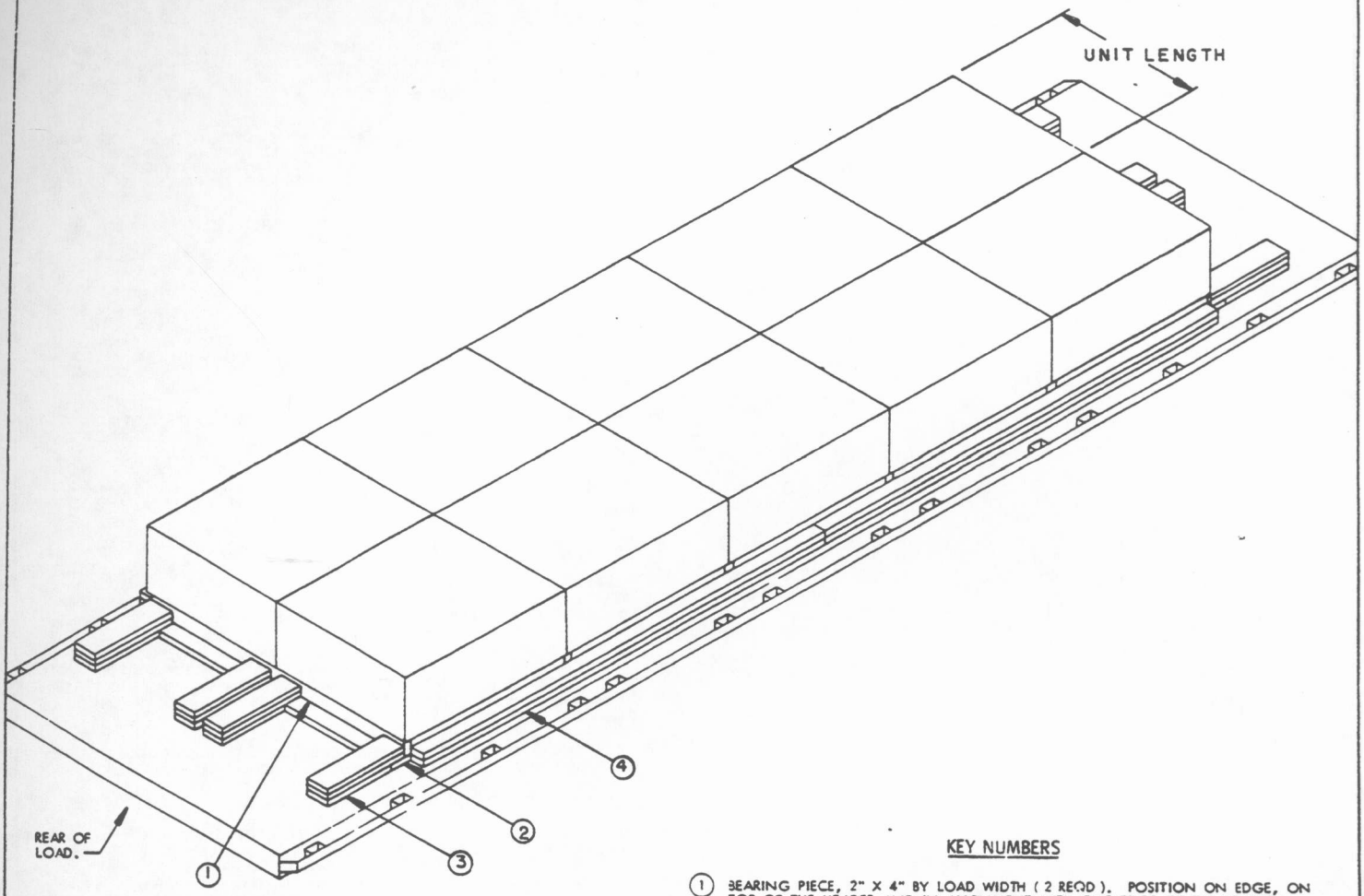
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4" 2" X 6"	206 76	138 76
NAILS	**NO. REQD**	**POUNDS**
10d (3") 12d (3-1/4") 20d (4")	86 180 120	1-1/2 3 4-1/2
STEEL STRAPPING, 1-1/4" X .035" ——— 96' REQD ——— 14 LBS SEAL FOR 1-1/4" STRAPPING ——— 8 REQD ——— NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLETIZED UNIT	12	22,980 LBS
DUNNAGE		451 LBS
TOTAL WEIGHT		23,431 LBS

SEMITRAILER, STAKE, 12 TON, M127 (TYPICAL)



ISOMETRIC VIEW

A PALLETIZED UNIT IS DEPICTED, HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO PALLETIZED OR SKIDDED UNITS. CAUTION: SEE SPECIAL NOTE 3 ON PAGE 9.

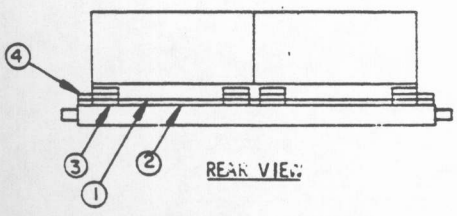
KEY NUMBERS

(1) BEARING PIECE, 2" X 4" BY LOAD WIDTH (2 REQD). POSITION ON EDGE, ON TOP OF THE HEADER AND IN ALIGNMENT WITH ONE EDGE OF THE HEADER.

(2) HEADER, 2" X 6" BY LOAD WIDTH (2 REQD). NAIL TO THE BEARING PIECE W/1-10d NAIL EVERY 12". POSITION THIS ASSEMBLY AGAINST THE BASE OF THE UNIT AND NAIL THE HEADER TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8".

(3) BACK-UP CLEAR, 2" X 6" BY LENGTH-TO-SUIT (TRIPLED) (8 REQD). POSITION THE FIRST PIECE AGAINST THE HEADER AND NAIL TO THE TRAILER FLOOR W/6-12d NAILS. POSITION THE SECOND AND THIRD PIECES AGAINST THE BEARING PIECE AND NAIL TO THE FIRST PIECE W/6-20d NAILS IN EACH PIECE. NOTE: FOR THE LOAD SHOWN ON THIS PAGE THE FIRST PIECE IS 24" LONG AND THE SECOND AND THIRD PIECES ARE 28" LONG. SEE SPECIAL NOTES 5 AND 6 ON PAGE 9.

(4) SIDE BLOCKING, 2" X 4" BY LENGTH-TO-SUIT (DOUBLED) (AS REQD). POSITION THE FIRST PIECE AGAINST THE BASE OF THE UNIT AND NAIL TO THE TRAILER FLOOR W/1-12d NAIL EVERY 12". NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER.



REAR VIEW

SPECIAL NOTES:

1. A TYPICAL LOAD OF BOXED AMMUNITION ASSEMBLED ON A 40" X 48" PALLET IS SHOWN LOADED ON A SEMITRAILER, STAKE, 12 TON, M127, HAVING OVERALL DIMENSIONS OF 28'-8" LONG BY 8'-0" WIDE. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE SPECIAL NOTE 8 BELOW.

2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL 2-WIDE LOAD ON PAGE 8 HAS OVERALL DIMENSIONS OF 40-5/8" LONG BY 50-1/16" WIDE BY 23-5/8" HIGH AND A WEIGHT OF 1,780 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR PALLETIZED UNITS OF OTHER DIMENSIONS AND SKIDDED UNITS. REFER TO "CHART NO. 1" AND "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2 AND SPECIAL NOTE 3 ON THIS PAGE.

3. THE PROCEDURES SHOWN ON PAGE 8 ARE ONLY FOR PALLETIZED UNITS WHICH HAVE A HEIGHT LESS THAN 30" OR SKIDDED UNITS WHICH HAVE A HEIGHT ONE-THIRD LESS THAN THEIR WIDTH OR LENGTH (WHICHEVER IS SMALLER). FOR HIGHER UNITS SEE THE LOADS SHOWN ON PAGES 6 AND 10.

4. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED. A LOAD CAN BE INCREASED OR REDUCED BY A MULTIPLE OF TWO (2) UNITS AND USING THE SAME PROCEDURES SHOWN ON PAGE 8. A LOAD CAN BE REDUCED OR INCREASED BY ONE (1) UNIT BY USING THE PROCEDURES SHOWN ON PAGE 19.

5. THE LENGTH OF THE BACKUP PIECES, SHOWN AS PIECE MARKED (3) ON PAGE 6, AND THE NAILS REQUIRED WILL CHANGE PER DIFFERENT LOAD WEIGHTS. LONGER BACKUP PIECES THAN SHOWN MAY BE USED AND 2" X 4" MATERIAL MAY BE USED IN LIEU OF THE 2" X 6" MATERIAL. SEE "CHART NO. 3" ON PAGE 3 FOR GUIDANCE.

6. SEE "DETAIL A" ON PAGE 55 FOR POSITIONING OF THE BEARING PIECE, HEADER, AND BACK-UP CLEAT, AGAINST THE PALLET BASE OR SKIDDED BASE.

7. SEE THE "TYPICAL LADING ITEMS" ON PAGE 4 FOR A DETAIL VIEW OF THE PALLETIZED UNIT, SHOWN IN THE LOAD ON PAGE 8.

8. PROCEDURES FOR LOADING AN M871 OR M872 SEMITRAILER:

   (A.) SKIDDED UNITS WHICH WILL HAVE AT LEAST FOUR INCHES OF NAILABLE SPACE REMAINING ON EACH SIDE OF THE LOAD OR AMMUNITION ITEMS WHICH ARE PALLETIZED ON THE 35" X 45-1/2" PALLET AND HAVE A UNIT LENGTH OF 39" OR LESS MAY BE LOADED ON AN M872 SEMITRAILER OR THE REAR PORTION OF A M871 SEMITRAILER, USING THE SAME PROCEDURES SHOWN IN THE LOAD ON PAGE 8. FOR ALTERNATIVE LOADING PROCEDURES SEE PAGES 12 THROUGH 17. SEE GENERAL NOTE "M" ON PAGE 2.

   (B.) SKIDDED UNITS WHICH DO NOT MEET THE REQUIREMENTS IN (A) ABOVE AND PALLETIZED UNITS HAVING A LENGTH GREATER THAN 39" MUST BE LOADED AS SHOWN ON PAGE 12 THROUGH 17.

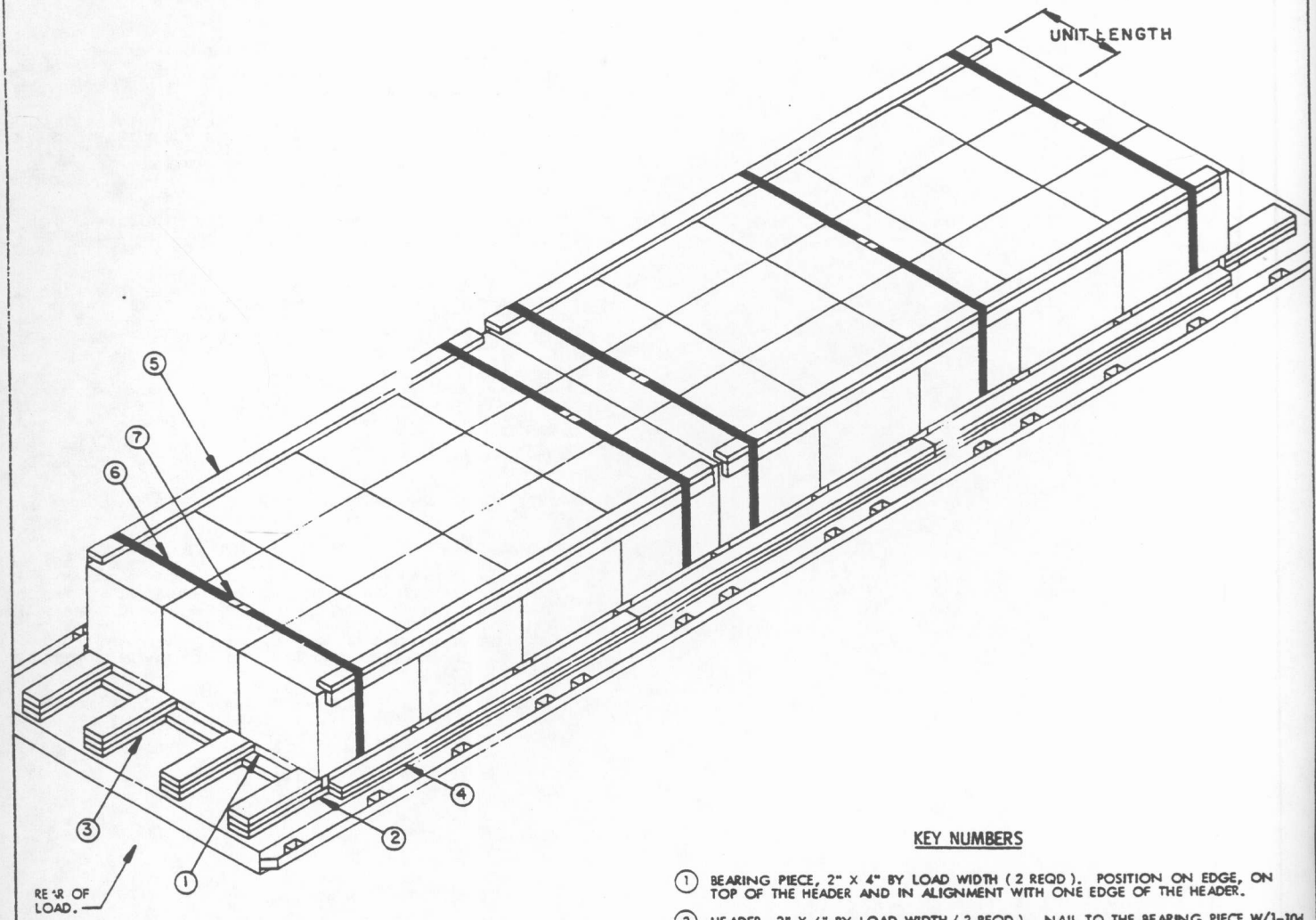
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4" 2" X 6"	94 67	63 67
NAILS	NO. REQD	POUNDS
10d (3") 12d (3-1/4") 20d (4")	14 152 96	1/4 2-3/4 3-1/2

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLETIZED UNIT	10	17,800 LBS
DUNNAGE		267 LBS
TOTAL WEIGHT		18,067 LBS

SEMITRAILER, STAKE, 12 TON, M127 (TYPICAL)

PAGE 9



ISOMETRIC VIEW

THE LOAD PROCEDURES DEPICTED ARE APPLICABLE TO SKIDDED UNITS ONLY.

KEY NUMBERS

(1) BEARING PIECE, 2" X 4" BY LOAD WIDTH (2 REQD). POSITION ON EDGE, ON TOP OF THE HEADER AND IN ALIGNMENT WITH ONE EDGE OF THE HEADER.

(2) HEADER, 2" X 6" BY LOAD WIDTH (2 REQD). NAIL TO THE BEARING PIECE W/1-10d NAIL EVERY 12". POSITION THIS ASSEMBLY AGAINST THE BASE OF THE UNIT AND NAIL THE HEADER TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8".

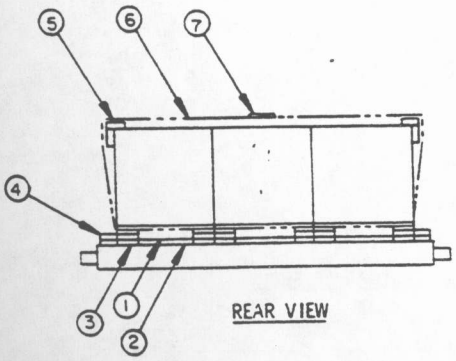
(3) BACK-UP CLEAT, 2" X 6" BY LENGTH-TO-SUIT (TRIPLED) (8 REQD). POSITION THE FIRST PIECE AGAINST THE HEADER AND NAIL TO THE TRAILER FLOOR W/6-12d NAILS. POSITION THE SECOND AND THIRD PIECES AGAINST THE BEARING PIECE AND NAIL TO THE FIRST PIECE W/6-20d NAILS IN EACH PIECE. NOTE: FOR THE LOAD SHOWN ON THIS PAGE THE FIRST PIECE IS 24" LONG AND THE SECOND AND THIRD PIECES ARE 28" LONG. SEE SPECIAL NOTES 5 AND 6 ON PAGE 11.

(4) SIDE BLOCKING, 2" X 4" BY LENGTH-TO-SUIT (DOUBLED) (AS REQD). POSITION THE FIRST PIECE AGAINST THE BASE OF THE UNIT AND NAIL TO THE TRAILER FLOOR W/1-12d NAIL EVERY 12". NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER.

(5) ANTI-SWAY ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 54 AND SPECIAL NOTE 3 ON PAGE 11.

(6) ANTI-SWAY STRAPPING, 1-1/4" X .035" X 20'-0" LONG STEEL STRAPPING (5 REQD). INSTALL TO ENCIRCLE THREE (3) LATERALLY ADJACENT UNITS AND THE "ANTI-SWAY ASSEMBLY" AS SHOWN.

(7) SEAL FOR 1-1/4" STRAPPING (10 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



REAR VIEW

SPECIAL NOTES:

1. A TYPICAL LOAD OF BOXED AMMUNITION ASSEMBLED ON A SKIDDED BASE IS SHOWN LOADED ON A SEMITRAILER, STAKE, 12 TON, M127, HAVING OVERALL DIMENSIONS OF 28'-8" LONG BY 8'-0" WIDE. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE SPECIAL NOTE 7 BELOW.

2. THE SKIDDED UNIT SHOWN IN THE TYPICAL 3-WIDE LOAD ON PAGE 10 HAS OVERALL DIMENSIONS OF 25" LONG BY 32" WIDE BY 29" HIGH AND A WEIGHT OF 720 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR SKIDDED UNITS OF OTHER DIMENSIONS. REFER TO "CHART NO. 1" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.

3. ALL SKIDDED UNITS WHICH HAVE A HEIGHT GREATER THAN TWO-THIRDS OF THEIR LENGTH OR WIDTH (WHICHEVER IS SMALLER) MUST BE UNITIZED WITH ANTI-SWAY STRAPS, SHOWN AS PIECE MARKED (6) ON PAGE 10 TOGETHER WITH "ANTI-SWAY ASSEMBLIES" SHOWN AS PIECE MARKED (5) ON PAGE 10. UNITS THAT HAVE A HEIGHT ONE-THIRD LESS THAN THEIR WIDTH OR LENGTH (WHICHEVER IS SMALLER) MAY BE LOADED AS SHOWN IN THE LOAD ON PAGE 8.

4. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED. A LOAD CAN BE INCREASED OR REDUCED BY A MULTIPLE OF THREE (3) UNITS AND USING THE SAME PROCEDURES SHOWN ON PAGE 10. A LOAD CAN BE REDUCED OR INCREASED BY ONE (1) UNIT BY USING THE PROCEDURES SHOWN ON PAGE 19.

5. THE LENGTH OF THE BACKUP PIECES, SHOWN AS PIECE MARKED (3) ON PAGE 10, AND THE NAILS REQUIRED WILL CHANGE PER DIFFERENT LOAD WEIGHTS. LONGER BACKUP PIECES THAN SHOWN MAY BE USED AND 2" X 4" MATERIAL MAY BE USED IN LIEU OF THE 2" X 6" MATERIAL. SEE "CHART NO. 3" ON PAGE 3 FOR GUIDANCE.

6. SEE "DETAIL A" ON PAGE 55 FOR POSITIONING OF THE BEARING PIECE, HEADER, AND BACK-UP CLEAT, AGAINST THE PALLET BASE OR SKIDDED BASE.

7. PROCEDURES FOR LOADING AN M871 OR M872 SEMITRAILER:

   (A) SKIDDED UNITS WHICH WILL HAVE AT LEAST FOUR INCHES OF NAILABLE SPACE REMAINING ON EACH SIDE OF THE LOAD MAY BE LOADED ON AN M872 SEMITRAILER OR THE REAR PORTION OF A M871 SEMITRAILER, USING THE SAME PROCEDURES SHOWN IN THE LOAD ON PAGE 10. FOR ALTERNATIVE LOADING PROCEDURES SEE PAGES 12 THROUGH 17. SEE GENERAL NOTE "M" ON PAGE 2.

   (B) SKIDDED UNITS WHICH DO NOT MEET THE REQUIREMENTS IN (A) ABOVE MUST BE LOADED AS SHOWN ON PAGES 12 THROUGH 17.

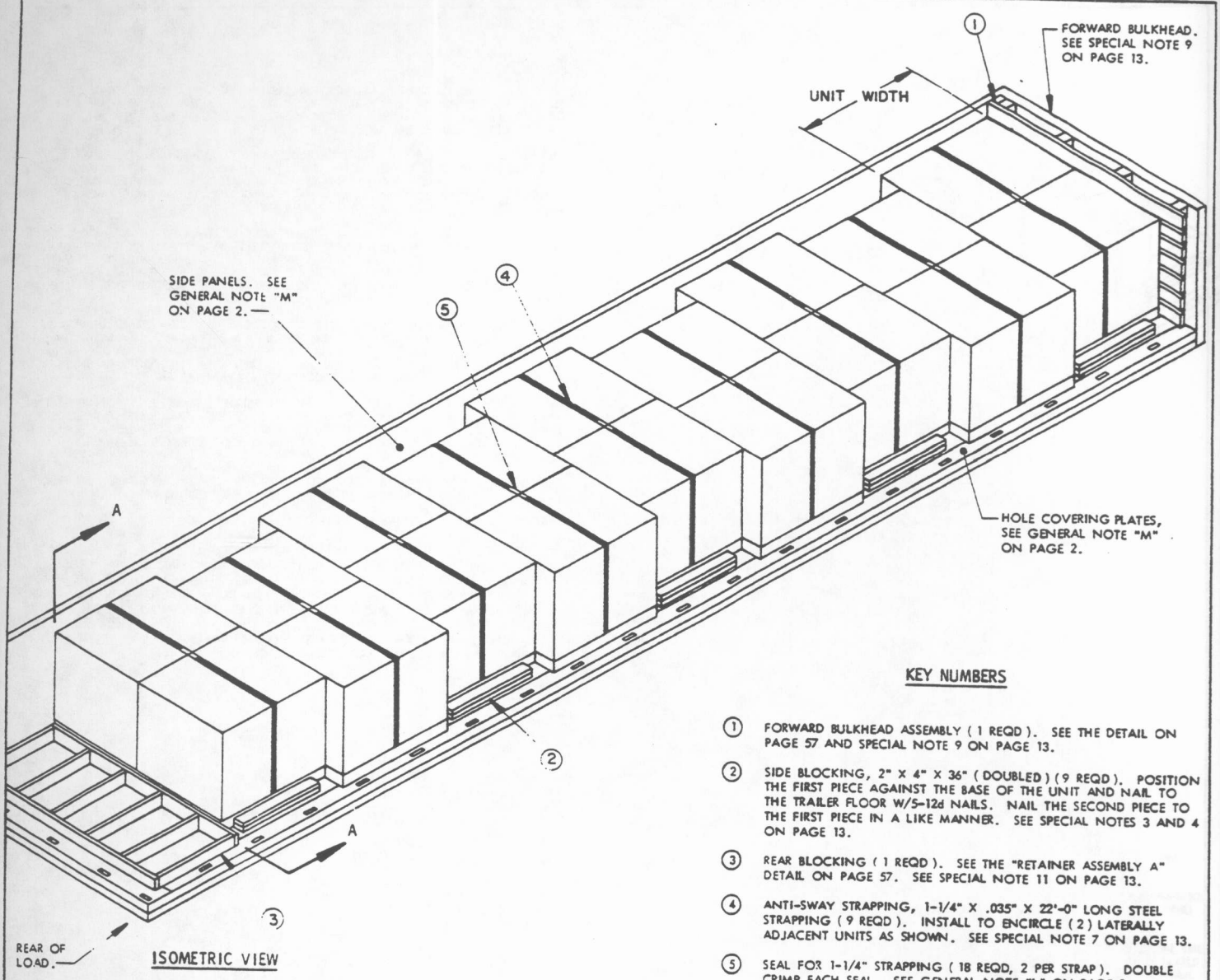
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	197	132
2" X 6"	66	66
NAILS	**NO. REQD**	**POUNDS**
10d (3")	80	1-1/4
12d (3-1/4")	168	3
20d (4")	96	3-1/4
STEEL STRAPPING, 1-1/4" X .035"	100' REQD	15 LBS
SEAL FOR 1-1/4" STRAPPING	10 REQD	NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
SKIDDED UNIT	27	19,440 LBS
DUNNAGE		419 LBS
TOTAL WEIGHT		19,859 LBS

SEMITRAILER, STAKE, 12 TON, M127 (TYPICAL)



ISOMETRIC VIEW

A PALLETIZED UNIT IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO PALLETIZED OR SKIDDED UNITS.

KEY NUMBERS

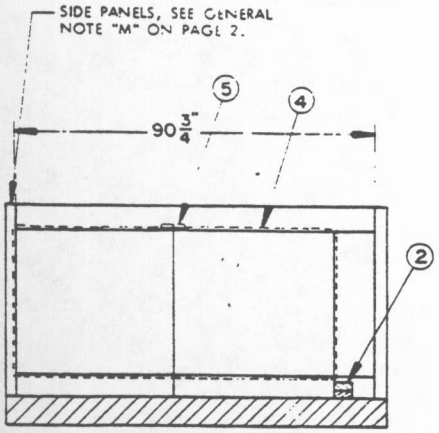
(1) FORWARD BULKHEAD ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 57 AND SPECIAL NOTE 9 ON PAGE 13.

(2) SIDE BLOCKING, 2" X 4" X 36" (DOUBLED) (9 REQD). POSITION THE FIRST PIECE AGAINST THE BASE OF THE UNIT AND NAIL TO THE TRAILER FLOOR W/5-12d NAILS. NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER. SEE SPECIAL NOTES 3 AND 4 ON PAGE 13.

(3) REAR BLOCKING (1 REQD). SEE THE "RETAINER ASSEMBLY A" DETAIL ON PAGE 57. SEE SPECIAL NOTE 11 ON PAGE 13.

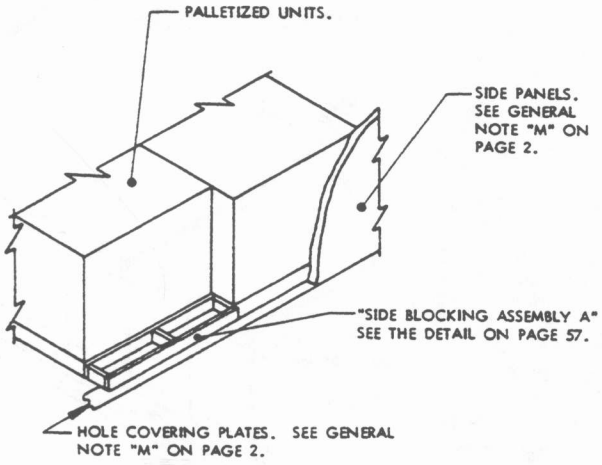
(4) ANTI-SWAY STRAPPING, 1-1/4" X .035" X 22'-0" LONG STEEL STRAPPING (9 REQD). INSTALL TO ENCIRCLE (2) LATERALLY ADJACENT UNITS AS SHOWN. SEE SPECIAL NOTE 7 ON PAGE 13.

(5) SEAL FOR 1-1/4" STRAPPING (18 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



SECTION A-A

SEMITRAILER, 34 TON, M872 (TYPICAL)



ALTERNATIVE SIDE BLOCKING

SEE SPECIAL NOTE 4 ON THIS PAGE.

SPECIAL NOTES:

1. A TYPICAL LOAD OF BOXED AMMUNITION ASSEMBLIED ON A 40" X 48" PALLET IS SHOWN LOADED ON A SEMITRAILER, 34 TON, M872, HAVING OVERALL DIMENSIONS OF 40'-9-1/4" LONG BY 8'-0" WIDE. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE GENERAL NOTE "M" ON PAGE 2.

2. THE PALLETIZED UNIT SHOWN IN THE TWO WIDE STAGGERED LOAD ON PAGE 12 HAS OVERALL DIMENSIONS OF 40" LONG BY 48" WIDE BY 42" HIGH AND A WEIGHT OF 2,500 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR PALLETIZED UNITS OF OTHER DIMENSIONS AND SKIDDED UNITS. REFER TO "CHART NO. 1" AND "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.

3. DUE TO THE SIDE HOLE COVERING PLATES WHICH REDUCE THE NAILABLE AREA ACROSS THE M872 TRAILER WIDTH, THE PROCEDURES DEPICTED ON PAGE 12 ARE ONLY APPLICABLE FOR PALLETIZED UNITS HAVING A LENGTH OF 41-1/2" OR LESS. IF THE PALLETIZED UNITS BEING LOADED HAVE A LENGTH GREATER THAN 41-1/2" LOAD AS SHOWN IN THE ISOMETRIC VIEW ON PAGE 12 BUT USE A "SIDE BLOCKING ASSEMBLY A" AS SHOWN IN THE "ALTERNATIVE SIDE BLOCKING " ON THIS PAGE IN LIEU OF EACH PIECE MARKED ②. NOTE: IF DESIRED THE "SIDE BLOCKING ASSEMBLY A" MAY ALSO BE USED IN THE LOAD SHOWN ON PAGE 12 IN LIEU OF PIECES MARKED ② , WHICH ARE NAILED TO THE TRAILER FLOOR IT IS PERMISSABLE TO POSITION THE PALLETIZED UNITS ON TOP OF THE HOLE COVERING PLATES.

4. IF THE LOAD IS BEING TRANSPORTED ON AN M871 SEMITRAILER, USE A "SIDE BLOCKING ASSEMBLY A" AS SHOWN IN THE "ALTERNATIVE SIDE BLOCKING " ON THIS PAGE, IN LIEU OF EACH PIECE MARKED ② . NOTE: A NON-NAILABLE SIDE BLOCKING IS REQUIRED DUE TO THE FORWARD 10'-0" LENGTH OF THE TRAILER FLOOR BEING ALL STEEL.

5. FOR AN ALTERNATIVE METHOD OF TRANSPORTING AMMUNITION ITEMS WHICH ARE PALLETIZED ON A 40" X 48" PALLET, SEE THE LOAD ON PAGES 14 THROUGH 19. FOR AN ALTERNATIVE METHOD OF TRANSPORTING AMMUNITION ITEMS WHICH ARE PALLETIZED ON A 35" X 45-1/2" PALLET SEE THE LOAD ON PAGES 6 THROUGH 9 AND PAGES 14 THROUGH 19. NOTE: BECAUSE OF THE HOLE COVERING PLATES ON THE SIDES OF THE M871 AND M872 SEMI-TRAILERS, THE METHODS SHOWN ON PAGES 6 THROUGH 9, DEPICTING NAILED DOWN SIDE BLOCKING, WILL NOT APPLY TO AMMUNITION ITEMS PALLETIZED ON A 40" X 48" PALLET.

6. FOR AN ALTERNATIVE METHOD OF TRANSPORTING SKIDDED UNITS SEE THE LOAD ON PAGES 6 THROUGH 11 AND PAGES 16 THROUGH 19.

7. ALL PALLETIZED UNITS WHICH ARE OVER 30" IN HEIGHT MUST BE UNITIZED WITH ANTI-SWAY STRAPS, SHOWN AS PIECE MARKED ④ ON PAGE 12. PALLETIZED UNITS WHICH ARE LESS THAN 30" IN HEIGHT WILL NOT REQUIRE ANTI-SWAY STRAPS. FOR EXAMPLE SEE THE LOAD ON PAGE 8.

8. ALL SKIDDED UNITS WHICH HAVE A HEIGHT GREATER THAN TWO-THIRDS OF THEIR LENGTH OR WIDTH (WHICHEVER IS SMALLER) MUST BE UNITIZED WITH ANTI-SWAY STRAPS, SHOWN AS PIECE MARKED ④ ON PAGE 12. SKIDDED UNITS THAT HAVE A HEIGHT ONE-THIRD LESS THAN THEIR WIDTH OR LENGTH (WHICHEVER IS SMALLER) WILL NOT REQUIRE ANTI-SWAY STRAPS. FOR EXAMPLE, SEE THE LOAD ON PAGE 8.

9. DUE TO "REINFORCING GUSSETS" LOCATED ON THE FORWARD BULKHEAD OF THE M872 SEMITRAILER A "FORWARD BULKHEAD ASSEMBLY", SHOWN AS PIECE MARKED ① ON PAGE 12, MUST BE USED. IF THE LOAD IS BEING TRANSPORTED ON AN M871 SEMI-TRAILER A "FORWARD BULKHEAD ASSEMBLY" MUST BE USED DUE TO THE FOUR (4) EYEBOLTS POSITIONED ON THE FORWARD BULKHEAD.

10. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED. A LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS AND USING THE SAME PROCEDURES SHOWN ON PAGE 12.

11. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12" USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 12. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 12" USE A "SOLID FILL REAR BLOCKING" AS SHOWN ON PAGE 58.

12. IF HOLE COVERING PLATES ARE NOT PROVIDED WITH THE VEHICLE SEE THE "ALTERNATIVE HOLE COVERING METHODS" ON PAGE 59.

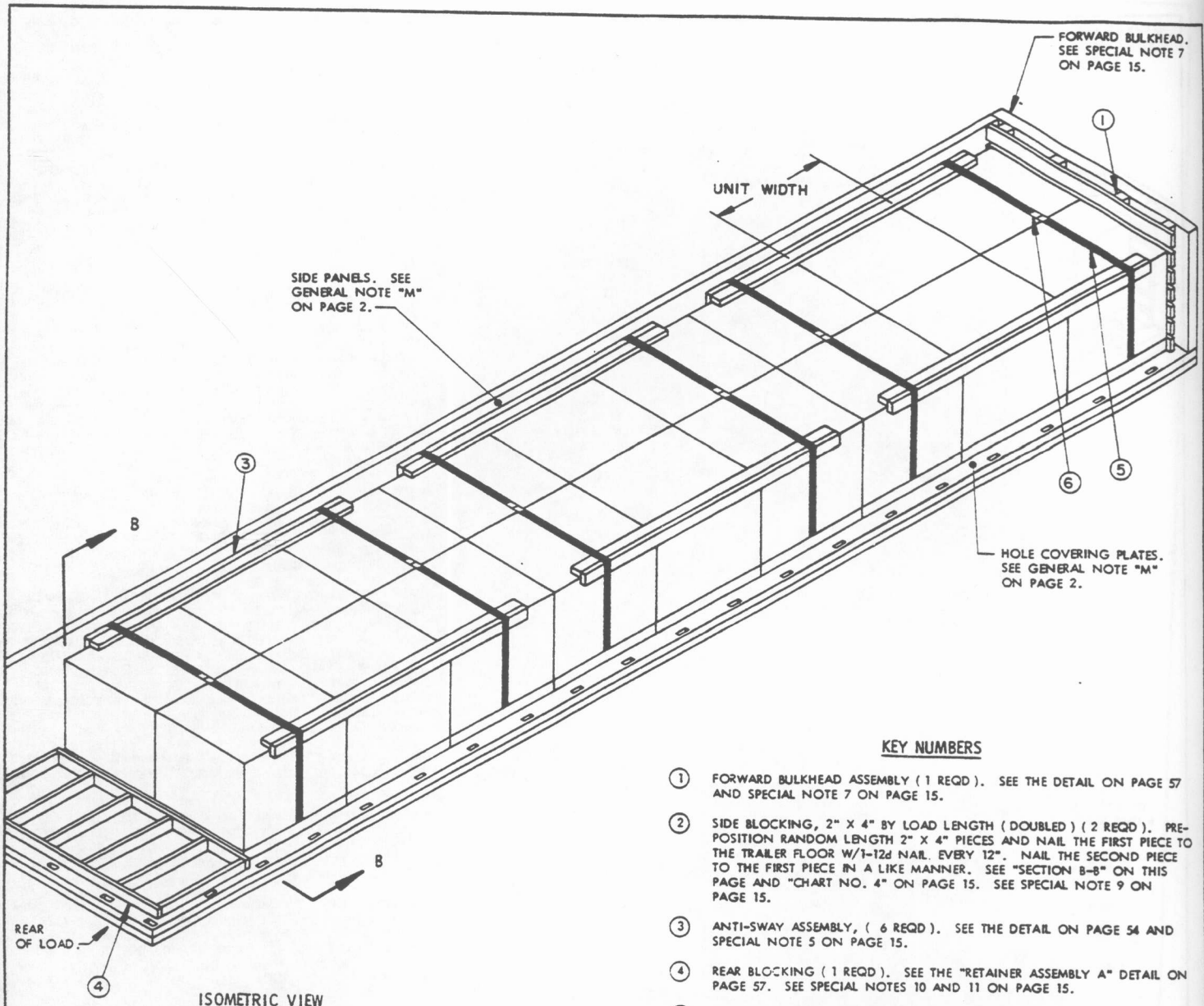
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	86	58
2" X 6"	53	53
4" X 4"	16	22
NAILS	NO. REQD	POUNDS
10d (3")	198	3-1/4
STEEL STRAPPING, 1-1/4" X .035"	189' REQD	27 LBS
SEAL FOR 1-1/4" STRAPPING	18 REQD	NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLETIZED UNIT	18	45,000 LBS
DUNNAGE		297 LBS
TOTAL WEIGHT		45,297 LBS

SEMITRAILER, 34 TON, M872 (TYPICAL)

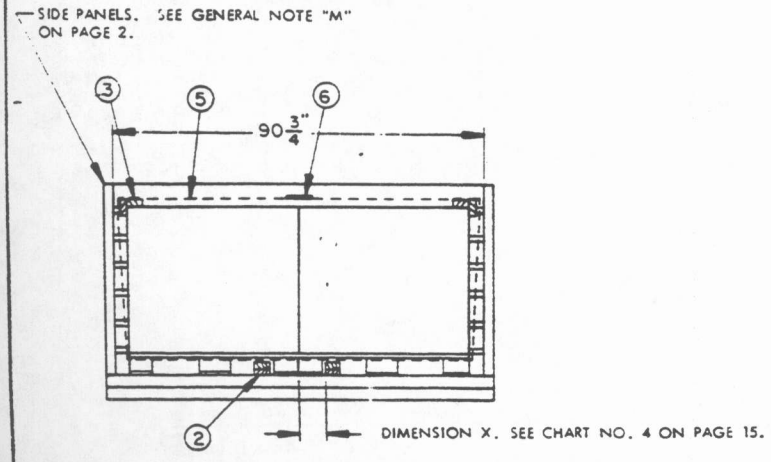


ISOMETRIC VIEW

THE LOAD PROCEDURES DEPICTED ARE APPLICABLE TO PALLETIZED UNITS ONLY. SEE SPECIAL NOTES 6 AND 9 ON PAGE 15.

KEY NUMBERS

1. FORWARD BULKHEAD ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 57 AND SPECIAL NOTE 7 ON PAGE 15.
2. SIDE BLOCKING, 2" X 4" BY LOAD LENGTH (DOUBLED) (2 REQD). PRE-POSITION RANDOM LENGTH 2" X 4" PIECES AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/1-12d NAIL EVERY 12". NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER. SEE "SECTION B-B" ON THIS PAGE AND "CHART NO. 4" ON PAGE 15. SEE SPECIAL NOTE 9 ON PAGE 15.
3. ANTI-SWAY ASSEMBLY, (6 REQD). SEE THE DETAIL ON PAGE 54 AND SPECIAL NOTE 5 ON PAGE 15.
4. REAR BLOCKING (1 REQD). SEE THE "RETAINER ASSEMBLY A" DETAIL ON PAGE 57. SEE SPECIAL NOTES 10 AND 11 ON PAGE 15.
5. ANTI-SWAY STRAPPING, 1-1/4" X .035" X 22'-0" LONG STEEL STRAPPING (6 REQD). INSTALL TO ENCIRCLE TWO (2) LATERALLY ADJACENT UNITS, AND THE "ANTI-SWAY ASSEMBLY" AS SHOWN, SEE SPECIAL NOTE 5 ON PAGE 15.
6. SEAL FOR 1-1/4" STRAPPING (12 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



SECTION B-B

SEMITRAILER, 34 TON, M872 (TYPICAL)

CHART NO. 4	
GUIDE FOR PRE-POSITIONED DUNNAGE, SHOWN AS PIECES MARKED ② , ON PAGE 14.	
IF THE LENGTH OF THE PALLETIZED UNIT IS	DIMENSIONS X WILL BE
35"	4-1/2"
36"	5"
37"	5-1/2"
38"	6"
39"	6-1/2"
40"	6-1/2"
41"	7"
42"	7-1/2"
43"	8"
44"	8-1/2"

SPECIAL NOTES:

1. A TYPICAL LOAD OF BOXED AMMUNITION ASSEMBLED ON A 40" X 48" PALLET IS SHOWN LOADED ON A SEMITRAILER, 34 TON, M872, HAVING OVERALL DIMENSIONS OF 40'-9-1/4" LONG BY 8'-0" WIDE. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE GENERAL NOTE "M" ON PAGE 2.

2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL 2-WIDE LOAD ON PAGE 14 HAS OVERALL DIMENSIONS OF 40" LONG BY 48" WIDE BY 42" HIGH AND A WEIGHT OF 2,500 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR PALLETIZED UNITS OF OTHER DIMENSIONS. RFER TO "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.

3. DUE TO THE SIDE HOLE COVERING PLATES, WHICH REDUCE THE NAILABLE AREA ACROSS THE M872 TRAILER WIDTH, THE PROCEDURES DEPICTED ON PAGE 14 ARE APPLICABLE FOR PALLETIZED UNITS HAVING A LENGTH OF 44" OR LESS. IT IS PERMISSABLE TO POSITION THE PALLETIZED UNITS ON TOP OF THE SIDE HOLE COVERING PLATES.

4. FOR AN ALTERNATIVE METHOD OF TRANSPORTING AMMUNITION ITEMS WHICH ARE PALLETIZED ON A 40" X 48" PALLET SEE THE LOAD ON PAGES 12, 13, AND PAGES 16 THROUGH 19. FOR AN ALTERNATIVE METHOD OF TRANSPORTING AMMUNITION ITEMS WHICH ARE PALLETIZED ON A 35" X 45-1/2" PALLET SEE THE LOAD ON PAGES 6 THROUGH 9, PAGES 12, 13, AND PAGES 16 THROUGH 19. NOTE: BECAUSE OF THE HOLE COVERING PLATES ON THE SIDES OF THE M871 AND M872 SEMITRAILERS, THE METHODS SHOWN ON PAGES 6 THROUGH 9, DEPICTING NAILED DOWN SIDE BLOCKING, WILL NOT APPLY TO AMMUNITION ITEMS PALLETIZED ON A 40" X 48" PALLET.

5. ALL PALLETIZED UNITS WHICH ARE OVER 30" IN HEIGHT MUST BE UNITIZED WITH ANTI-SWAY STRAPS, SHOWN AS PIECE MARKED ⑤ ON PAGE 14 TOGETHER WITH "ANTI-SWAY ASSEMBLIES" SHOWN AS PIECE MARKED ③ ON PAGE 14. PALLETIZED UNITS WHICH ARE LESS THAN 30" IN HEIGHT WILL NOT REQUIRE ANTI-SWAY STRAPS OR ANTI-SWAY ASSEMBLIES. FOR EXAMPLE SEE THE LOAD ON PAGE 8.

6. THE LOAD AS SHOWN ON PAGE 14 IS NOT APPLICABLE FOR SKIDDED UNITS BECAUSE OF THE PRE-POSITIONED SIDE BLOCKING MARKED ② . IF SKIDDED UNITS ARE BEING TRANSPORTED SEE THE LOAD ON PAGES 6 THROUGH 13 AND PAGES 16 THROUGH 19.

7. DUE TO THE "REINFORCING GUSSETS" LOCATED ON THE FORWARD BULKHEAD OF THE M872 SEMITRAILER,.A "FORWARD BULKHEAD ASSEMBLY" SHOWN AS PIECE MARKED ① ON PAGE 12, MUST BE USED.

8. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED. A LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS AND USING THE SAME PROCEDURES SHOWN ON PAGE 14.

9. THE LOAD AS SHOWN ON PAGE 14 IS NOT APPLICABLE FOR THE M871 SEMITRAILER BECAUSE THE FORWARD PORTION OF THE M871 SEMITRAILER FLOOR IS ALL STEEL. HOWEVER, IF DESIRED, THE METHOD SHOWN MAY BE USED ON THE REAR PORTION ONLY, IN WHICH CASE A HEADER AND BACK-UP CLEAT, AS SHOWN IN THE LOAD ON PAGE 6, MUST BE POSITIONED AT THE FORWARD END OF THE LOAD.

10. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12" USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 14.. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 12" USE A "SOLID FILL REAR BLOCKING" AS SHOWN ON PAGE 58.

11. IF DESIRED, OR IF REQUIRED TO MAKE LOAD ADJUSTMENTS, A "RETAINER ASSEMBLY A" SHOWN AS PIECE MARKED ④ ON PAGE 14, MAY BE USED AT THE FORWARD END OF THE LOAD IN LIEU OF THE "FORWARD BULKHEAD ASSEMBLY " SHOWN AS PIECE MARKED ① ON PAGE 14. A "RETAINER ASSEMBLY A" MAY ALSO BE USED IN THE CENTER OF THE LOAD FOR A LESS-THAN-FULL LOAD TO HELP DISTRIBUTE THE WEIGHT. SEE THE LOAD ON PAGE 26 FOR EXAMPLE.

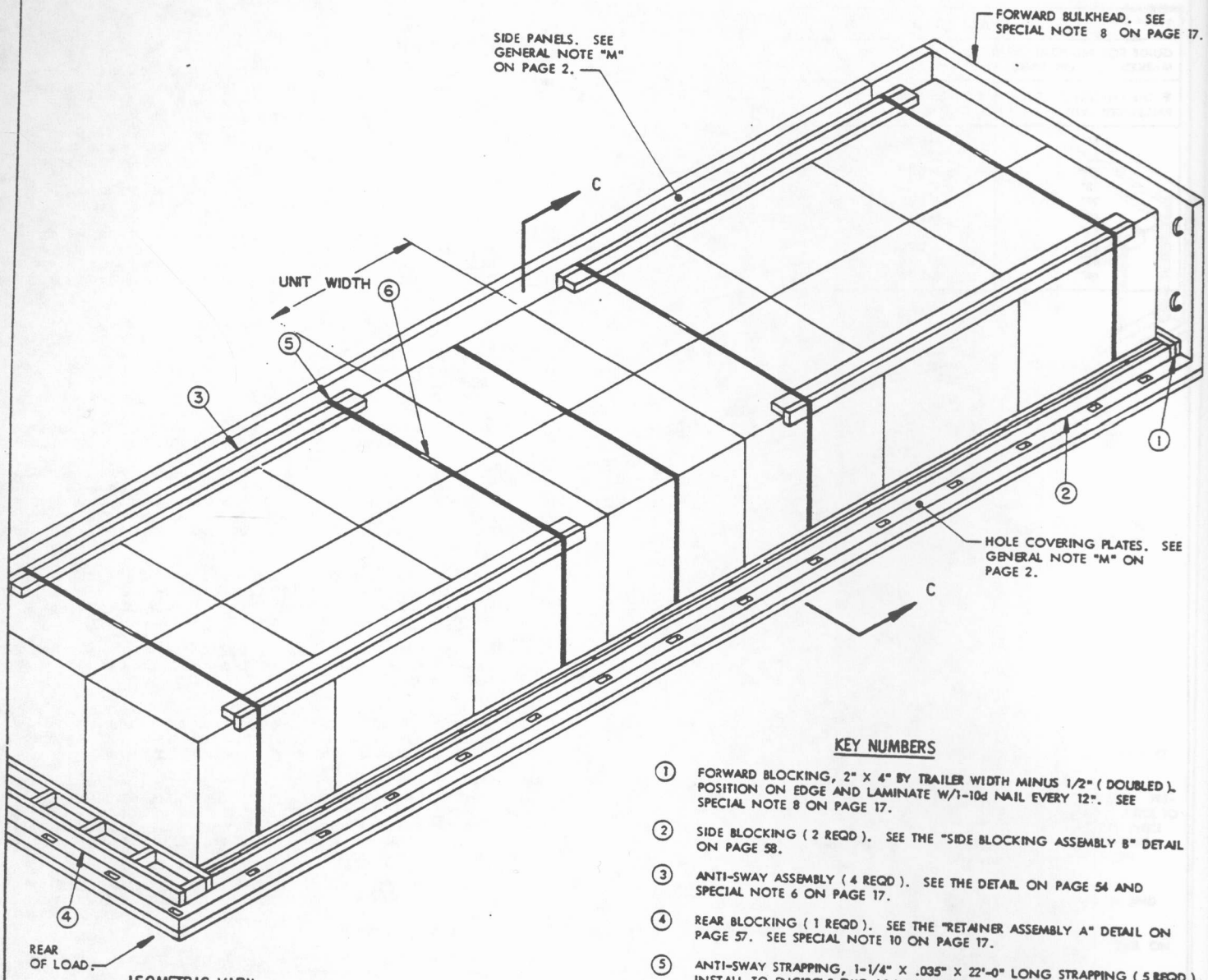
12. IF HOLE COVERING PLATES ARE NOT PROVIDED WITH THE VEHICLES, SEE THE "ALTERNATIVE HOLE COVERING METHODS" ON PAGE 59.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	296	198
2" X 6"	53	53
4" X 4"	16	22
NAILS	NO. REQD	POUNDS
10d (3")	204	3-1/4
12d (3-1/4")	148	2-1/2
STEEL STRAPPING, 1-1/4" X .035" ——— 132' REQD ——— 19 LBS		
SEAL FOR 1-1/4" STRAPPING ——— 12 REQD ——— NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLETIZED UNIT	18	45,000 LBS
DUNNAGE		571 LBS
TOTAL WEIGHT		45,571 LBS (APPROX)

SEMITRAILER, 34 TON, M872 (TYPICAL)

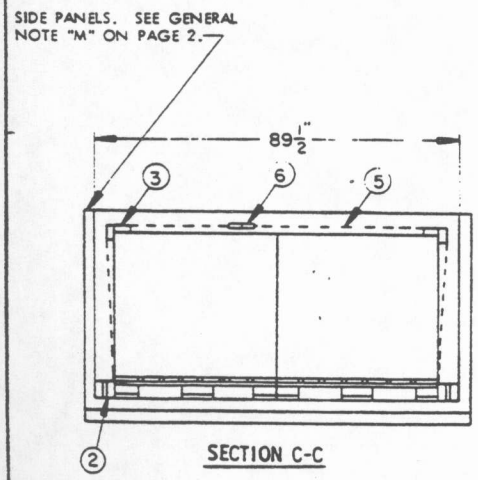


ISOMETRIC VIEW

A PALLETIZED UNIT IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO PALLETIZED OR SKIDDED UNITS.

KEY NUMBERS

1. FORWARD BLOCKING, 2" X 4" BY TRAILER WIDTH MINUS 1/2" (DOUBLED). POSITION ON EDGE AND LAMINATE W/1-10d NAIL EVERY 12". SEE SPECIAL NOTE 8 ON PAGE 17.
2. SIDE BLOCKING (2 REQD). SEE THE "SIDE BLOCKING ASSEMBLY B" DETAIL ON PAGE 58.
3. ANTI-SWAY ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 54 AND SPECIAL NOTE 6 ON PAGE 17.
4. REAR BLOCKING (1 REQD). SEE THE "RETAINER ASSEMBLY A" DETAIL ON PAGE 57. SEE SPECIAL NOTE 10 ON PAGE 17.
5. ANTI-SWAY STRAPPING, 1-1/4" X .035" X 22'-0" LONG STRAPPING (5 REQD). INSTALL TO ENCIRCLE TWO (2) LATERALLY ADJACENT UNITS AND THE "ANTI-SWAY ASSEMBLY" AS SHOWN. SEE SPECIAL NOTE 6 ON PAGE 17.
6. SEAL FOR 1-1/4" STRAPPING (10 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



SECTION C-C

PAGE 16

SEMITRAILER, 22-1/2 TON, M871 (TYPICAL)

SPECIAL NOTES:

1. A TYPICAL LOAD OF BOXED AMMUNITION ASSEMBLED ON A 40" X 48" PALLET IS SHOWN LOADED ON A SEMITRAILER, 22-1/2 TON, M871, HAVING OVERALL DIMENSIONS OF 29'-10" LONG BY 8'-0" WIDE. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE GENERAL NOTE "M" ON PAGE 2.

2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL 2-WIDE LOAD ON PAGE 16 HAS OVERALL DIMENSIONS OF 40" LONG BY 48" WIDE BY 42" HIGH AND A WEIGHT OF 2,500 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR PALLETIZED UNITS OF OTHER DIMENSIONS AND SKIDDED UNITS. REFER TO "CHART NO. 1" AND "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.

3. THE PROCEDURES DEPICTED ON PAGE 16 ARE APPLICABLE FOR PALLETIZED UNITS HAVING A LENGTH OF 43-1/4" OR LESS. THE PROCEDURES DEPICTED ARE ALSO APPLICABLE TO SKIDDED UNITS. IT IS PERMISSABLE TO POSITION THE UNITS ON TOP OF THE SIDE HOLE COVERING PLATES.

4. FOR AN ALTERNATIVE METHOD OF TRANSPORTING AMMUNITION ITEMS WHICH ARE PALLETIZED ON A 40" X 48" PALLET SEE THE LOAD ON PAGES 12 THROUGH 15, 18, AND 19. FOR AN ALTERNATIVE METHOD OF TRANSPORTING AMMUNITION ITEMS WHICH ARE PALLETIZED ON A 35" X 45-1/2" PALLET SEE THE LOAD ON PAGES 6 THROUGH 9, 12 THROUGH 15, 18 AND 19. NOTE: BECAUSE OF THE HOLE COVERING PLATES ON THE SIDES OF THE M871 AND M872 SEMITRAILERS, THE METHODS SHOWN ON PAGES 6 THROUGH 9, DEPICTING NAILED DOWN SIDE BLOCKING, WILL NOT APPLY TO AMMUNITION ITEMS PALLETIZED ON A 40" X 48" PALLET.

5. FOR AN ALTERNATIVE METHOD OF TRANSPORTING SKIDDED UNITS SEE THE LOAD ON PAGES 6 THROUGH 13 AND PAGES 16 THROUGH 19.

6. ALL PALLETIZED UNITS WHICH ARE OVER 30" IN HEIGHT MUST BE UNITIZED WITH ANTI-SWAY STRAPS, SHOWN AS PIECE MARKED (5) ON PAGE 16 TOGETHER WITH "ANTI-SWAY ASSEMBLIES" SHOWN AS PIECE MARKED (3) ON PAGE 16. PALLETIZED UNITS WHICH ARE LESS THAN 30" IN HEIGHT WILL NOT REQUIRE ANTI-SWAY STRAPS OR ANTI-SWAY ASSEMBLIES. FOR EXAMPLE SEE THE LOAD ON PAGE 8.

7. ALL SKIDDED UNITS WHICH HAVE A HEIGHT GREATER THAN TWO-THIRDS OF THEIR LENGTH OR WIDTH (WHICHEVER IS SMALLER) MUST BE UNITIZED WITH ANTI-SWAY STRAPS, SHOWN AS PIECE MARKED (5) ON PAGE 16 TOGETHER WITH "ANTI-SWAY ASSEMBLIES" SHOWN AS PIECE MARKED (3) ON PAGE 16. SKIDDED UNITS THAT HAVE A HEIGHT ONE-THIRD LESS THAN THEIR WIDTH OR LENGTH (WHICHEVER IS SMALLER) WILL NOT REQUIRE ANTI-SWAY STRAPS OR ANTI-SWAY ASSEMBLIES. FOR EXAMPLE SEE THE LOAD ON PAGE 8.

8. DUE TO THE "FOUR (4) EYEBOLTS" LOCATED ON THE FORWARD BULKHEAD OF THE M871 SEMITRAILER, FORWARD BLOCKING SHOWN AS PIECE MARKED (1) ON PAGE 16, MUST BE USED. IF DESIRED A "FORWARD BULKHEAD ASSEMBLY" SHOWN AS PIECE MARKED (1) ON PAGE 14 MAY BE USED. IF THE LOAD IS BEING TRANSPORTED ON AN M872 SEMITRAILER A "FORWARD BULKHEAD ASSEMBLY" MUST BE USED DUE TO THE "REINFORCING GUSSETS" POSITIONED ON THE FORWARD BULKHEAD.

9. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNITS BEING LOADED. A LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS AND USING THE SAME PROCEDURES SHOWN ON PAGE 16.

10. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12" USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 16. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 12" USE A "SOLID FILL REAR BLOCKING" AS SHOWN ON PAGE 58.

11. IF DESIRED, OR IF REQUIRED TO MAKE LOAD ADJUSTMENTS, A "RETAINER ASSEMBLY A" SHOWN AS PIECE MARKED (4) ON PAGE 16, MAY BE USED AT THE FORWARD END OF THE LOAD IN LIEU OF THE "FORWARD BLOCKING" SHOWN AS PIECE MARKED (1) ON PAGE 16. A "RETAINER ASSEMBLY A" MAY ALSO BE USED IN THE CENTER OF THE LOAD FOR A LESS-THAN-FULL LOAD TO HELP DISTRIBUTE THE WEIGHT. SEE THE LOAD ON PAGE 26 FOR EXAMPLE.

12. IF HOLE COVERING PLATES ARE NOT PROVIDED WITH THE VEHICLE, SEE THE "ALTERNATIVE HOLE COVERING METHODS" ON PAGE 59.

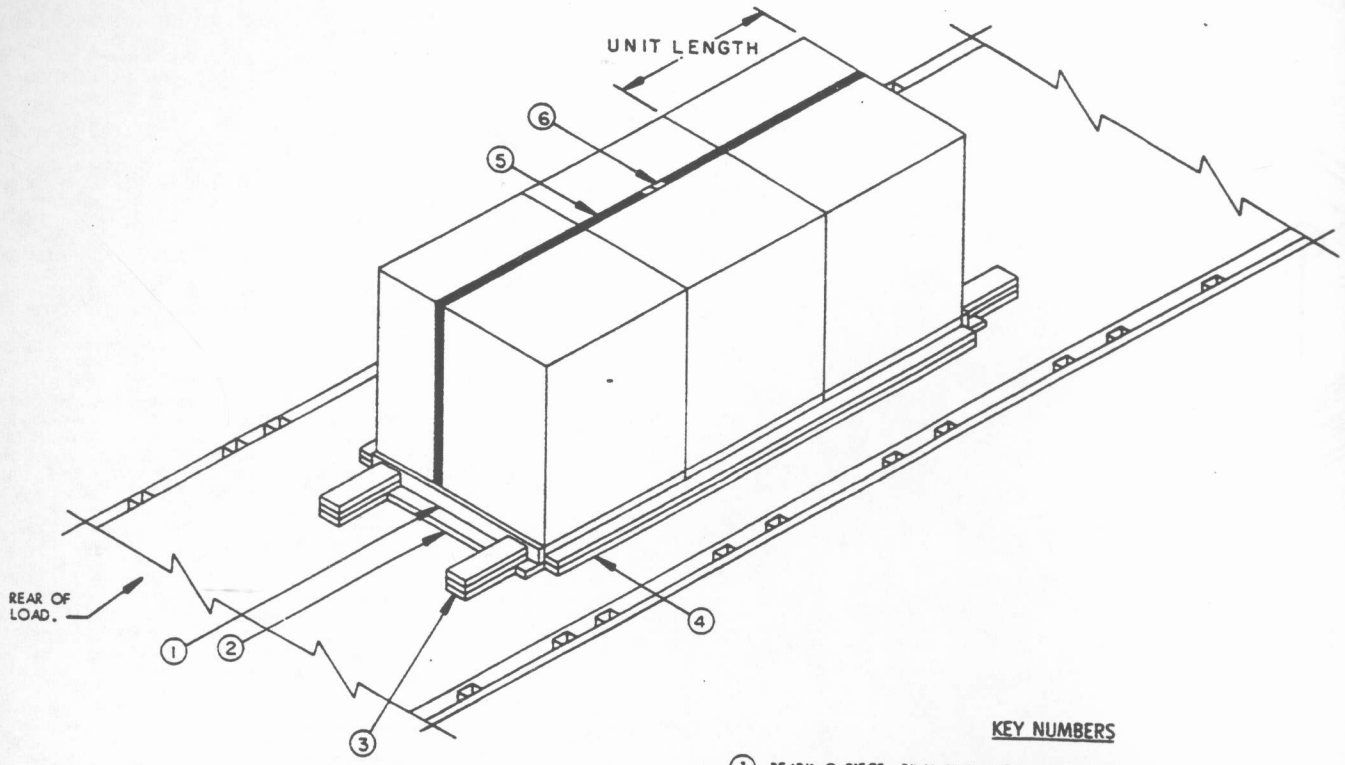
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4" 2" X 4"	16' 226'	6 151
NAILS	**NO. REQD**	**POUNDS**
6d 10d (3")	48 144	1/2 2-1/4
STEEL STRAPPING, 1-1/4" X .035" ----- 110' REQD -------- 16 LBS SEAL FOR 1-1/4" STRAPPING ---------- 10 REQD ------- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLETIZED UNIT	14	35,000 LBS
DUNNAGE		333 LBS
	TOTAL WEIGHT	35,333 LBS

SEMITRAILER, 22-1/2 TON, M871 (TYPICAL)



TYPICAL LTL

A PALLETIZED UNIT IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO PALLETIZED OR SKIDDED UNITS.

SPECIAL NOTES:

1. A TYPICAL LTL LOAD OF THREE (3) UNITS OF BOXED AMMUNITION ASSEMBLED ON A 40" X 48" PALLET IS SHOWN LOADED ON A SEMITRAILER, STAKE, 12 TON, M127, HAVING OVERALL DIMENSIONS OF 28'-8 LONG BY 8'-0" WIDE. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE SPECIAL NOTE 7 BELOW.
2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LTL LOAD ON THIS PAGE HAS OVERALL DIMENSIONS OF 40" LONG BY 48" WIDE BY 50-1/2" HIGH AND A WEIGHT OF 1,764 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR PALLETIZED UNITS OF OTHER DIMENSIONS AND SKIDDED UNITS. REFER TO "CHART NO. 1" AND "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.
3. THE LENGTH OF THE BACK-UP PIECES, SHOWN AS PIECE MARKED (3) ON THIS PAGE, AND THE NAILS REQUIRED WILL CHANGE PER DIFFERENT LOAD WEIGHTS. LONGER BACK-UP PIECES THAN SHOWN MAY BE USED AND 2" X 4" MATERIAL MAY BE USED IN LIEU OF THE 2" X 6" MATERIAL. SEE "CHART NO. 3" ON PAGE 3 FOR GUIDANCE.
4. ANTI-TIP STRAPPING IS NOT REQUIRED FOR PALLETIZED UNITS WHICH HAVE A HEIGHT LESS THAN 30" OR SKIDDED UNITS WHICH HAVE A HEIGHT ONE-THIRD LESS THAN THEIR WIDTH OR LENGTH (WHICHEVER IS SMALLER).
5. IF THE OVERHANG AT THE END OF THE UNIT IS GREATER THAN 1" USE 2" X 6" MATERIAL IN LIEU OF 2" X 4" MATERIAL FOR THE SIDE BLOCKING, TO PROVIDE MORE NAILING SURFACE.
6. SEE "DETAIL A" ON PAGE 55 FOR POSITIONING OF THE BEARING PIECE, HEADER, AND BACK-UP CLEAT, AGAINST THE PALLET BASE OF SKIDDED BASE.
7. THE METHOD SHOWN ABOVE MAY BE USED ON AN M871 OR M872 SEMITRAILER.

KEY NUMBERS

(1) BEARING PIECE, 2" X 4" BY LOAD WIDTH (2 REQD). POSITION ON EDGE, ON TOP OF THE HEADER AND IN ALIGNMENT WITH ONE EDGE OF THE HEADER.

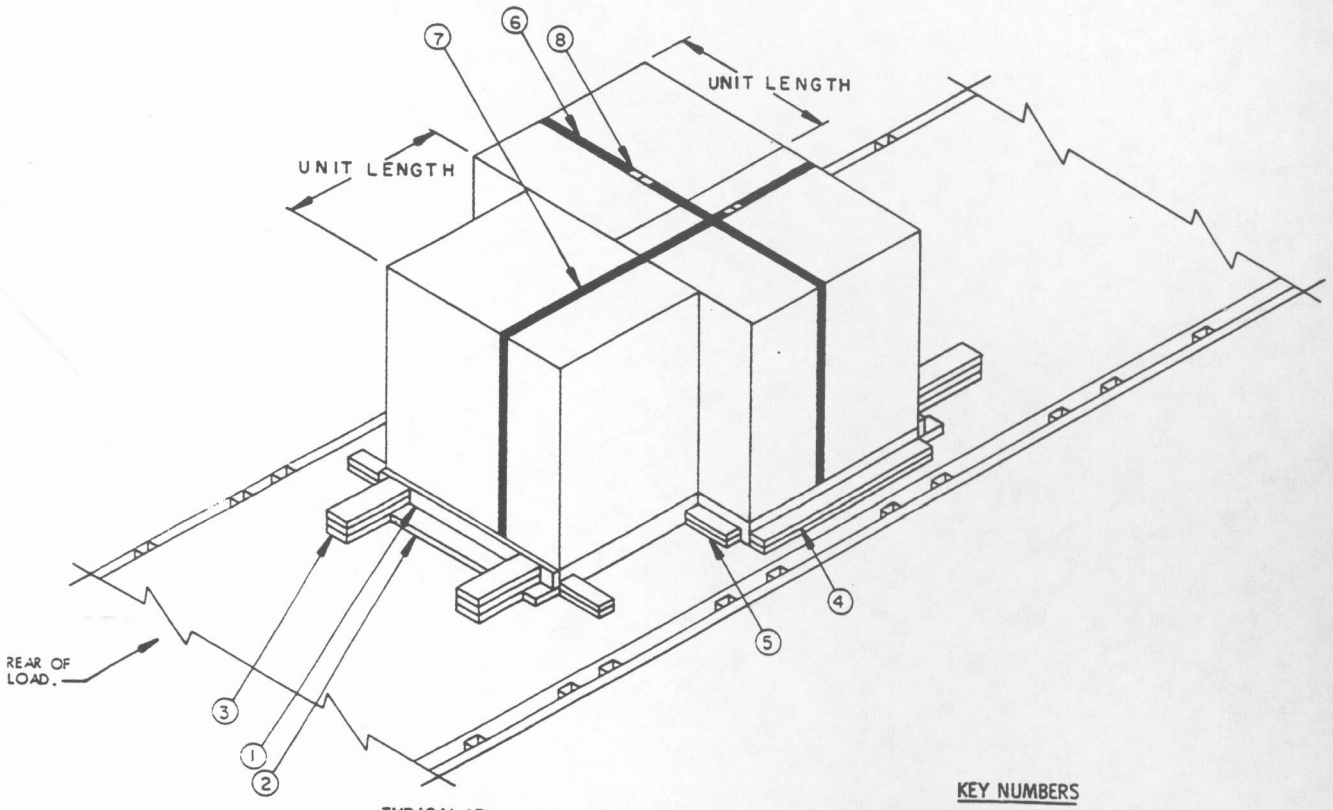
(2) HEADER, 2" X 6" BY LOAD WIDTH (2 REQD). NAIL TO THE BEARING PIECE W/1-10d NAIL EVERY 12". POSITION THIS ASSEMBLY AGAINST THE BASE OF THE UNIT AND NAIL THE HEADER TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8".

(3) BACK-UP CLEAT, 2" X 6" BY LENGTH-TO-SUIT (TRIPLED) (4 REQD). POSITION THE FIRST PIECE AGAINST THE HEADER AND NAIL TO THE TRAILER FLOOR W/5-12d NAILS. POSITION THE SECOND AND THIRD PIECES AGAINST THE BEARING PIECE AND NAIL TO THE FIRST PIECE W/5-20d NAILS IN EACH PIECE. NOTE: FOR THE LOAD SHOWN ON THIS PAGE THE FIRST PIECE IS 18" LONG AND THE SECOND AND THIRD PIECES ARE 22" LONG. SEE SPECIAL NOTES 3 AND 6 ON THIS PAGE.

(4) SIDE BLOCKING, 2" X 4" BY LENGTH-TO-SUIT (DOUBLED) (AS REQD). POSITION THE FIRST PIECE AGAINST THE BASE OF THE UNIT AND NAIL TO THE TRAILER FLOOR W/1-12d NAIL EVERY 12". NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER. SEE SPECIAL NOTE 5 ON THIS PAGE.

(5) ANTI-TIP STRAPPING, 1-1/4" X .035" BY LENGTH-TO-SUIT (AS REQD). INSTALL TO ENCIRCLE LONGITUDINALLY ADJACENT UNITS AS SHOWN. SEE SPECIAL NOTE 4 ON THIS PAGE.

(6) SEAL FOR 1-1/4" STRAPPING (2 REQD FOR EACH STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



TYPICAL LTL

A PALLETIZED UNIT IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO PALLETIZED OR SKIDDED UNITS.

SPECIAL NOTES:

1. A TYPICAL LTL LOAD OF THREE (3) UNITS OF BOXED AMMUNITION ASSEMBLED ON A 40" X 48" PALLET IS SHOWN LOADED ON A SEMITRAILER, STAKE, 12 TON, M127, HAVING OVERALL DIMENSIONS OF 28'-8" LONG BY 8'-0" WIDE. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE SPECIAL NOTE 6 BELOW.

2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LTL LOAD ON THIS PAGE HAS OVERALL DIMENSIONS OF 40-1/2" LONG BY 49-1/4" WIDY BY 55-3/4" HIGH AND A WEIGHT OF 1,915 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR PALLETIZED UNITS OF OTHER DIMENSIONS AND SKIDDED UNITS. REFER TO "CHART NO. 1" AND "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.

3. THE LENGTH OF THE BACK-UP PIECES, SHOWN AS PIECE MARKED (3) ON THIS PAGE, AND THE NAILS REQUIRED WILL CHANGE PER DIFFERENT LOAD WEIGHTS. LONGER BACK-UP PIECES THAN SHOWN MAY BE USED AND 2" X 4" MATERIAL MAY BE USED IN LIEU OF THE 2" X 6" MATERIAL. SEE "CHART NO. 3" ON PAGE 3 FOR GUIDANCE.

4. ANTI-TIP AND ANTI-SWAY STRAPPING IS NOT REQUIRED FOR PALLETIZED UNITS WHICH HAVE A HEIGHT LESS THAN 30" OR SKIDDED UNITS WHICH HAVE A HEIGHT ONE-THIRD LESS THAN THEIR WIDTH OR LENGTH (WHICHEVER IS SMALLER).

5. SEE "DETAIL A" ON PAGE 55 FOR POSITIONING OF THE BEARING PIECE, HEADER, AND BACK-UP CLEAT, AGAINST THE PALLET BASE OR SKIDDED BASE.

6. PROCEDURES FOR LOADING AN M871 OR M872 SEMITRAILER:

   (A.) SKIDDED UNITS WHICH WILL HAVE AT LEAST FOUR INCHES OF NAILABLE SPACE REMAINING ON EACH SIDE OF THE LOAD OR AMMUNITION ITEMS WHICH ARE PALLETIZED ON THE 35" X 45-1/2" PALLET AND HAVE A UNIT LENGTH OF 39" OR LESS MAY BE LOADED ON AN M872 SEMITRAILER OR THE REAR PORTION OF A M871 SEMITRAILER, USING THE PROCEDURES SHOWN ON THIS PAGE. FOR ALTERNATIVE LOADING PROCEDURES SEE PAGE 18. SEE GENERAL NOTE "M" ON PAGE 2.

   (B.) SKIDDED UNITS WHICH DO NOT MEET THE REQUIREMENTS IN(A)ABOVE AND PALLETIZED UNITS HAVING A LENGTH GREATER THAN 39" MUST BE LOADED AS SHOWN ON PAGE 18.

KEY NUMBERS

(1) BEARING PIECE, 2" X 4" BY LOAD WIDTH (2 REQD). POSITION ON EDGE, ON TOP OF THE HEADER AND IN ALIGNMENT WITH ONE EDGE OF THE HEADER.

(2) HEADER, 2" X 6" BY LOAD WIDTH (2 REQD). NAIL TO THE BEARING PIECE W/1-10d NAIL EVERY 12". POSITION THIS ASSEMBLY AGAINST THE BASE OF THE UNIT AND NAIL THE HEADER TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8".

(3) BACK-UP CLEAT, 2" X 6" BY LENGTH-TO-SUIT (TRIPLED) (4 REQD). POSITION THE FIRST PIECE AGAINST THE HEADER AND NAIL TO THE TRAILER FLOOR W/5-12d NAILS. POSITION THE SECOND AND THIRD PIECES AGAINST THE BEARING PIECE AND NAIL TO THE FIRST PIECE W/5-20d NAILS IN EACH PIECE. NOTE: FOR THE LOAD SHOWN ON THIS PAGE THE FIRST PIECE IS 18" LONG AND THE SECOND AND THIRD PIECES ARE 22" LONG. SEE SPECIAL NOTES 3 AND 5 ON THIS PAGE.

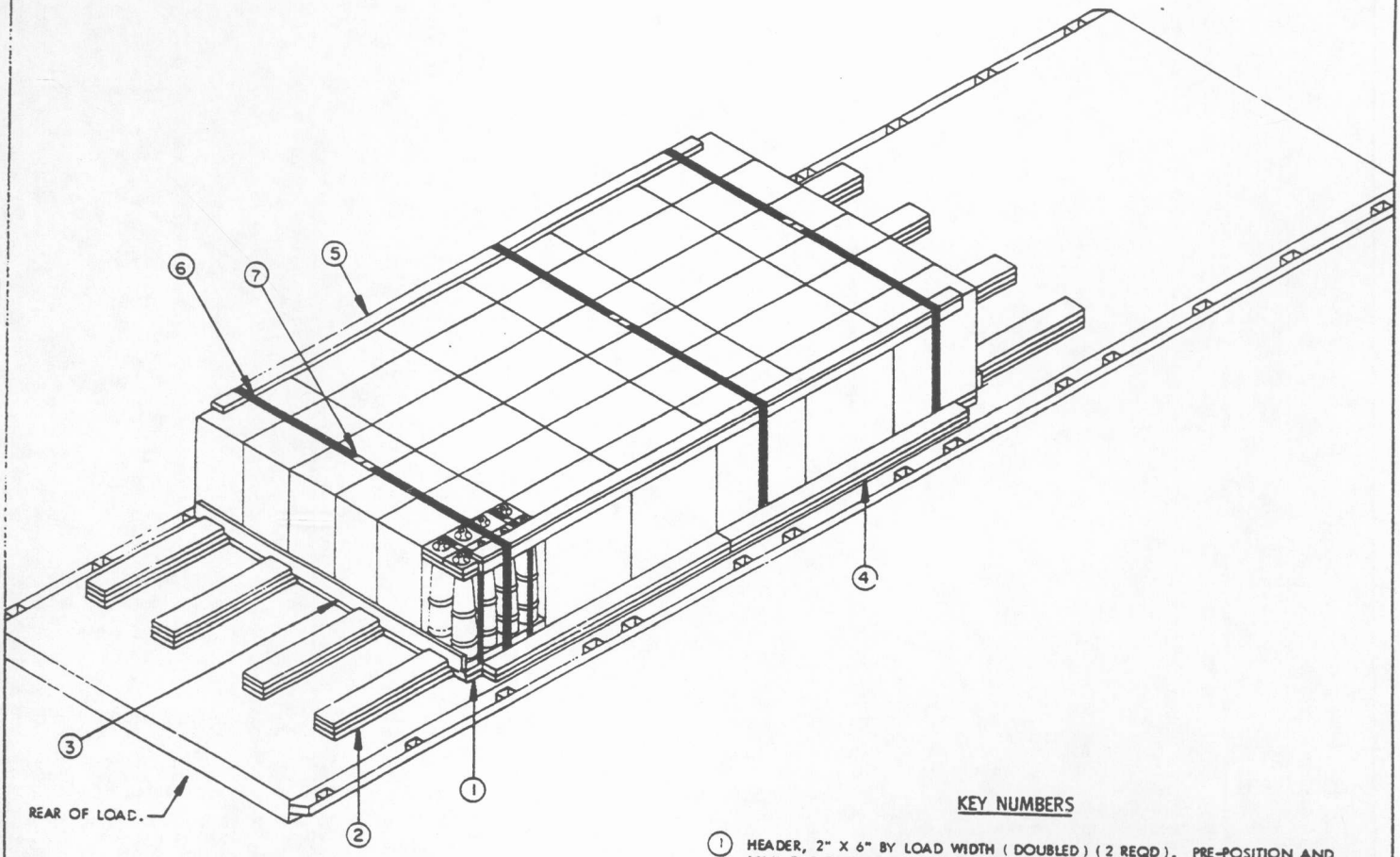
(4) SIDE BLOCKING, 2" X 4" BY LENGTH-TO-SUIT (DOUBLED) (AS REQD). POSITION THE FIRST PIECE AGAINST THE BASE OF THE UNIT AND NAIL TO THE TRAILER FLOOR W/1-12d NAIL EVERY 12". NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER.

(5) SIDE BLOCKING, 2" X 4" X 12" (DOUBLED) (4 REQD). POSITION THE FIRST PIECE AGAINST THE BASE OF THE UNIT AND NAIL TO THE TRAILER FLOOR W/3-12d NAILS. NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER.

(6) ANTI-SWAY STRAPPING, 1-1/4" X .035" BY LENGTH-TO-SUIT (AS REQD). INSTALL TO ENCIRCLE TWO (2) LATERALLY ADJACENT UNITS AS SHOWN. SEE SPECIAL NOTE 4 ON THIS PAGE.

(7) ANTI-TIP STRAPPING, 1-1/4" X .035" BY LENGTH-TO-SUIT (AS REQD). INSTALL TO ENCIRCLE LONGITUDINALLY ADJACENT UNITS AS SHOWN. SEE SPECIAL NOTE 4 ON THIS PAGE.

(8) SEAL FOR 1-1/4" STRAPPING (2 REQD FOR EACH STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



ISOMETRIC VIEW

THE 155MM, 8/PALLET, SLP IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO UNITS OF OTHER DIMENSIONS.

KEY NUMBERS

(1) HEADER, 2" X 6" BY LOAD WIDTH (DOUBLED) (2 REQD). PRE-POSITION AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST W/1-20d NAIL EVERY 8". POSITION THE HEADER AT THE FORWARD END OF THE LOAD FIRST. SEE SPECIAL NOTE 6 ON PAGE 21.

(2) BACK-UP CLEAT, 2" X 6" BY LENGTH-TO-SUIT (TRIPLED) (8 REQD). POSITION THE FIRST PIECE AGAINST THE HEADER AND NAIL TO THE TRAILER FLOOR W/9-12d NAILS. POSITION THE SECOND PIECE AGAINST THE HEADER AND NAIL TO THE FIRST PIECE W/9-20d NAILS. POSITION THE THIRD PIECE AGAINST THE BEARING PIECE AND NAIL TO THE SECOND PIECE W/9-20d NAILS. TOENAIL THE THIRD PIECE TO THE BEARING PIECE W/2-12d NAILS. NOTE: FOR THE LOAD SHOWN ON THIS PAGE THE FIRST AND SECOND PIECE WILL BE 36" LONG AND THE THIRD PIECE WILL BE CUT-TO-FIT. SEE SPECIAL NOTES 5 AND 7 ON PAGE 21.

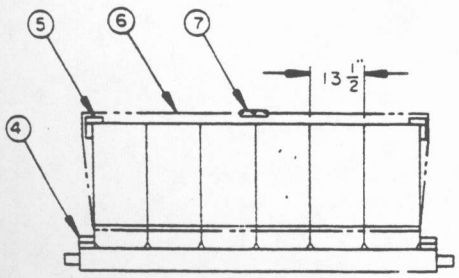
(3) BEARING PIECE, 2" X 4" BY LOAD WIDTH (2 REQD). POSITION AS SHOWN PRIOR TO POSITIONING AND NAILING THE THIRD (TOP) BACK-UP PIECES.

(4) SIDE BLOCKING, 2" X 4" BY LENGTH-TO-SUIT (DOUBLED) (2 REQD). POSITION THE FIRST PIECE AGAINST THE UNIT SKIDS AND NAIL TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER.

(5) ANTI-SWAY ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 52.

(6) ANTI-SWAY STRAPPING, 1-1/4" X .035" X 20'-0" LONG STEEL STRAPPING (3 REQD). INSTALL TO ENCIRCLE SIX (6) LATERALLY ADJACENT UNITS AND THE "ANTI-SWAY ASSEMBLY" AS SHOWN.

(7) SEAL FOR 1-1/4" STRAPPING (6 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



REAR VIEW

PIECES MARKED (1), (2), AND (3) HAVE BEEN OMITTED FOR CLARITY.

SEMITRAILER, STAKE, 12 TON, M127 (TYPICAL)

SPECIAL NOTES:

1. A TYPICAL LOAD OF PALLETIZED SEPARATE LOADING PROJECTILES IS SHOWN LOADED ON A SEMITRAILER, STAKE, 12 TON, M127, HAVING OVERALL DIMENSIONS OF 28'-8" LONG BY 8'-0" WIDE. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE SPECIAL NOTE 10 BELOW.

2. THE 155MM, 8/PALLET, SEPARATE LOADING PROJECTILE SHOWN IN THE LOAD ON PAGE 20 HAS OVERALL DIMENSIONS OF 13-1/2" LONG BY 27" WIDE BY 31-1/2" HIGH AND A WEIGHT OF 800 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR UNITS OF OTHER DIMENSIONS. IF SHIPPING THE 8", 6/PALLET SEE THE LOAD ON PAGE 24 AND IF SHIPPING THE 175MM, 6/PALLET SEE THE LOAD ON PAGE 22. SEE GENERAL NOTE "F" ON PAGE 2.

3. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED. A LOAD CAN BE INCREASED OR REDUCED BY A MULTIPLE OF SIX (6) UNITS AND USING THE SAME PROCEDURES SHOWN ON PAGE 20. A LOAD CAN BE REDUCED BY ONE (1) UNIT BY USING THE PROCEDURES SHOWN ON PAGES 24 AND 29

4. FOR SHIPMENT OF A PARTIAL LOAD SEE PAGES 28 AND 29.

5. THE LENGTH OF THE BACK-UP PIECES, SHOWN AS PIECE MARKED ② ON PAGE 20, AND THE NAILS REQUIRED WILL CHANGE PER DIFFERENT LOAD WEIGHTS. LONGER BACK-UP PIECES THAN SHOWN MAY BE USED AND 2" X 4" MATERIAL MAY BE USED IN LIEU OF THE 2" X 6" MATERIAL. SEE "CHART NO. 3" ON PAGE 3 FOR GUIDANCE. NOTE: THE BEARING PIECE, SHOWN AS KEY NUMBER ③ ON PAGE 20, MUST BE POSITIONED ON EDGE AND TIGHT AGAINST THE PALLET BASE PRIOR TO POSITIONING AND NAILING THE TOP BACK-UP CLEAT.

6. IF DESIRED, AND TO MAKE LOADING EASIER, THE HEADERS SHOWN AS KEY NUMBER ① MAY BE WIDER THAN 2" X 6" MATERIAL, PROVIDED THERE IS AS LEAST 3" OF NAILABLE SURFACE EXTENDING BEYOND THE PALLET OVERHANG. THIS WILL ELIMINATE THE NECESSITY OF PRE-POSITIONING THE HEADERS.

7. SEE "DETAIL B" ON PAGE 55 FOR POSITIONING OF THE BEARING PIECE, HEADER, AND BACK-UP CLEAT, AGAINST THE PALLET BASE.

8. IF DESIRED, A "FILLER ASSEMBLY", SHOWN AS PIECE MARKED ③ IN THE LOAD ON PAGE 26, MAY BE USED IN LIEU OF A SEPARATE LOADING PROJECTILE PALLET TO MAINTAIN AN EVEN LOAD PATTERN. MORE THAN ONE "FILLER ASSEMBLY" MAY BE USED WITHIN A LOAD.

9. THE LOAD MUST BE POSITIONED OVER THE STRONG POINTS OF THE SEMITRAILER, SUCH AS THE REAR AXLES AND/OR THE FIFTH WHEEL OF THE TOWING VEHICLE. IF DESIRED THE LOAD MAY BE "SPLIT" AS SHOWN ON PAGE 26.

10. PROCEDURES FOR LOADING AN M871 OR M872 SEMITRAILER:

    (A.) WHEN USING THE LOADING METHOD SHOWN ON PAGE 20 FOR AN M871 OR M872 SEMITRAILER, THERE MUST BE AT LEAST FOUR INCHES OF NAILABLE SPACE REMAINING ON EACH SIDE OF THE LOAD TO ALLOW FOR THE NAILED DOWN SIDE BLOCKING PIECES MARKED ④ . IF DESIRED, A "FLOATING" TYPE OF SIDE BLOCKING, SHOWN AS PIECES MARKED ⑥ IN THE LOAD ON PAGE 26, MAY BE USED IN LIEU OF THE NAILED DOWN SIDE BLOCKING PIECES MARKED ④ , ON PAGE 20.

    (B.) NOTE THAT ON AN M871 SEMITRAILER THE FORWARD 10'-0" LENGTH OF THE TRAILER FLOOR IS ALL STEEL. A MAXIMUM LOAD CAPACITY MAY BE ACHIEVED BY USING ALL "FLOATING" TYPE OF FLOOR BLOCKING, SHOWN AS PIECES MARKED ① , ② , ④ , AND ⑥ IN THE LOAD ON PAGE 26 IN LIEU OF THE NAILED DOWN BLOCKING SHOWN AS PIECES MARKED ① , ② , ③ , AND ④ IN THE LOAD ON PAGE 20.

    (C.) WHEN TRANSPORTING A LARGE QUANTITY OF SEPARATE LOADING PROJECTILES ON THE M871 OR M872 SEMITRAILER USE THE PROCEDURES SHOWN ON PAGES 26 AND 27.

BILL OF MATERIAL

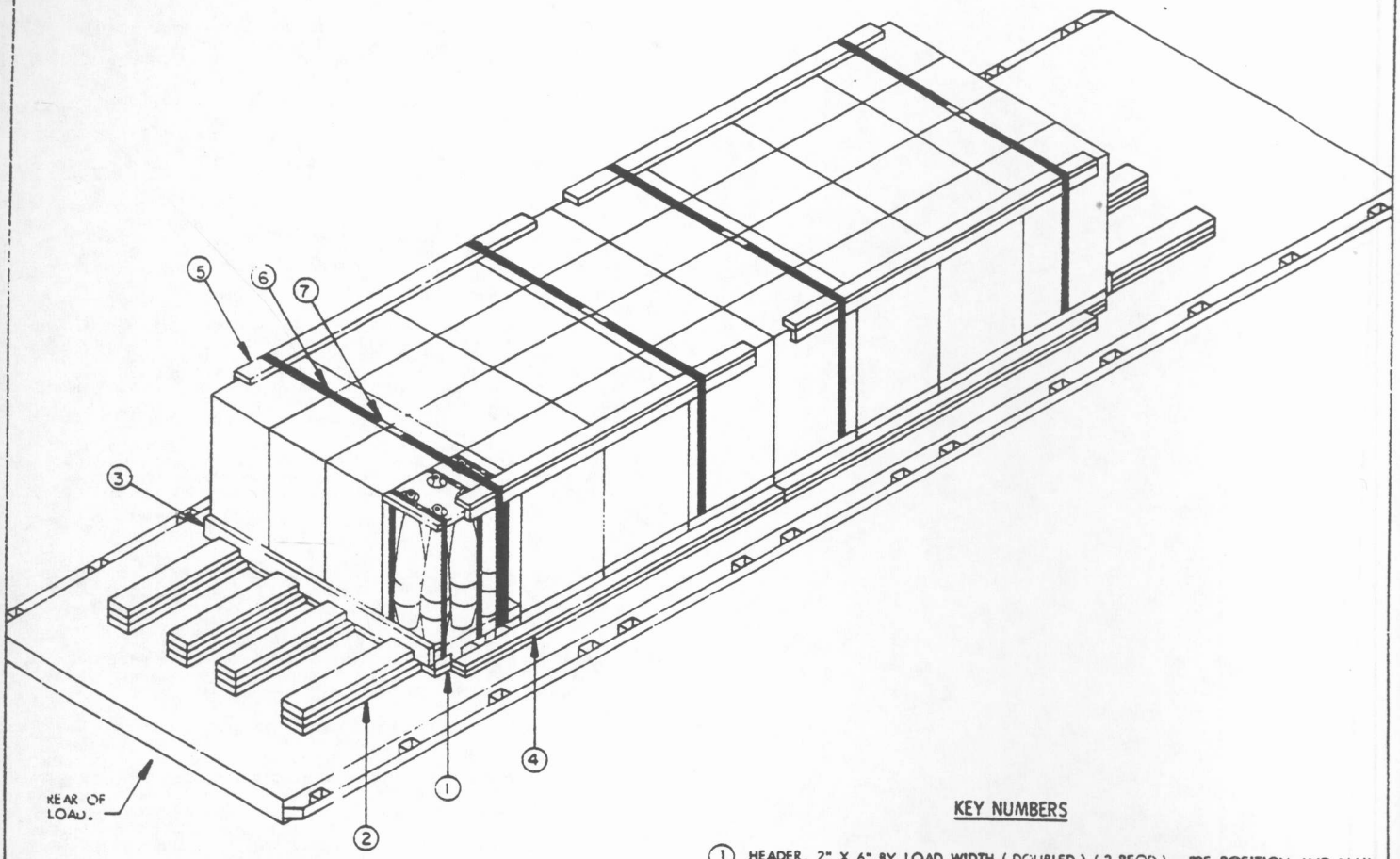
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	110	74
2" X 6"	98	98
NAILS	**NO. REQD**	**POUNDS**
10d (3")	38	3/4
12d (3-1/4")	186	3-1/4
20d (4")	166	6
STEEL STRAPPING, 1-1/4" X .035" ----- 60' REQD ---------- 9 LBS		
SEAL FOR 1-1/4" STRAPPING ---------- 6 REQD ---------- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
155MM, SLP	36	28,800 LBS
DUNNAGE		363 LBS
TOTAL WEIGHT		29,163 LBS

SEMITRAILER, STAKE, 12 TON, M127 (TYPICAL)

PAGE 21



ISOMETRIC VIEW

THE 175MM, 6/PALLET, SLP IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO UNITS OF OTHER DIMENSIONS.

KEY NUMBERS

(1) HEADER, 2" X 6" BY LOAD WIDTH (DOUBLED) (2 REQD). PRE-POSITION AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST W/1-20d NAIL EVERY 8". POSITION THE HEADER AT THE FORWARD END OF THE LOAD FIRST. SEE SPECIAL NOTE 6 ON PAGE 23.

(2) BACK-UP CLEAT, 2" X 6" BY LENGTH-TO-SUIT (TRIPLED) (8 REQD). POSITION THE FIRST PIECE AGAINST THE HEADER AND NAIL TO THE TRAILER FLOOR W/9-12d NAILS. POSITION THE SECOND PIECE AGAINST THE HEADER AND NAIL TO THE FIRST PIECE W/9-20d NAILS. POSITION THE THIRD PIECE AGAINST THE BEARING PIECE AND NAIL TO THE SECOND PIECE W/9-20d NAILS. TOENAIL THE THIRD PIECE TO THE BEARING PIECE W/7-12d NAILS. NOTE: FOR THE LOAD SHOWN ON THIS PAGE THE FIRST AND SECOND PIECE WILL BE 36" LONG AND THE THIRD PIECE WILL BE CUT-TO-FIT. SEE SPECIAL NOTES 5 AND 7 ON PAGE 23.

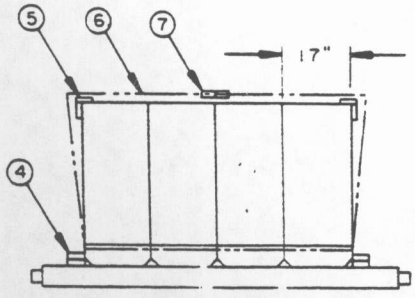
(3) BEARING PIECE, 2" X 4" BY LOAD WIDTH (2 REQD). POSITION AS SHOWN PRIOR TO POSITIONING AND NAILING THE THIRD (TOP) BACK-UP PIECES.

(4) SIDE BLOCKING, 2" X 4" BY LENGTH-TO-SUIT (DOUBLED) (2 REQD). POSITION THE FIRST PIECE AGAINST THE UNIT SKIDS AND NAIL TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER.

(5) ANTI-SWAY ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 54.

(6) ANTI-SWAY STRAPPING, 1-1/4" X .035" X 20'-0" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE FOUR (4) LATERALLY ADJACENT UNITS AND THE "ANTI-SWAY ASSEMBLY" AS SHOWN.

(7) SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



REAR VIEW

PIECES MARKED (1), (2), AND (3) HAVE BEEN OMITTED FOR CLARITY.

SPECIAL NOTES:

1. A TYPICAL LOAD OF PALLETIZED SEPARATE LOADING PROJECTILES IS SHOWN LOADED ON A SEMITRAILER, STAKE, 12 TON, M127, HAVING OVERALL DIMENSIONS OF 28'-8" LONG BY 8'-0" WIDE. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE SPECIAL NOTE 11 BELOW.
2. THE 175MM, 6/PALLET, SEPARATE LOADING PROJECTILE SHOWN IN THE LOAD ON PAGE 16 HAS OVERALL DIMENSIONS OF 17" LONG BY 25-1/2" WIDE BY 41" HIGH AND A WEIGHT OF 934 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR UNITS OF OTHER DIMENSIONS. IF SHIPPING THE 8", 6/PALLET SEE THE LOAD ON PAGE 24 AND IF SHIPPING THE 155MM, 8/PALLET SEE THE LOAD ON PAGE 20. SEE GENERAL NOTE "F" ON PAGE 2.
3. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED. A LOAD CAN BE INCREASED OR REDUCED BY A MULTIPLE OF FOUR (4) UNITS AND USING THE SAME PROCEDURES SHOWN ON PAGE 22. A LOAD CAN BE REDUCED BY ONE (1) UNIT BY USING THE PROCEDURES SHOWN ON PAGES 24 AND 29
4. FOR SHIPMENT OF A PARTIAL LOAD SEE PAGES 28 AND 29.
5. THE LENGTH OF THE BACK-UP PIECES, SHOWN AS PIECE MARKED ② ON PAGE 22 AND THE NAILS REQUIRED WILL CHANGE PER DIFFERENT LOAD WEIGHTS. LONGER BACK-UP PIECES THAN SHOWN MAY BE USED AND 2" X 4" MATERIAL MAY BE USED IN LIEU OF THE 2" X 6" MATERIAL. SEE "CHART NO. 3" ON PAGE 3 FOR GUIDANCE. NOTE: THE BEARING PIECE, SHOWN AS KEY NUMBER ③ ON PAGE 22 MUST BE POSITIONED ON EDGE AND TIGHT AGAINST THE PALLET BASE PRIOR TO POSITIONING AND NAILING THE TOP BACK-UP CLEAT.
6. IF DESIRED, AND TO MAKE LOADING EASIER, THE HEADERS SHOWN AS KEY NUMBER ① MAY BE WIDER THAN 2" X 6" MATERIAL, PROVIDED THERE IS AT LEAST 3" OF NAILABLE SURFACE EXTENDING BEYOND THE PALLET OVERHANG. THIS WILL ELIMINATE THE NECESSITY OF PRE-POSITIONING THE HEADERS.
7. SEE "DETAIL B" ON PAGE 55 FOR POSITIONING OF THE BEARING PIECE, HEADER, AND BACK-UP CLEAT, AGAINST THE PALLET BASE.
8. SEE THE "TYPICAL LADING ITEMS" ON PAGE 5 FOR A DETAIL VIEW OF THE 175MM, 6/PALLET, SLP, SHOWN IN THE LOAD ON PAGE 22.
9. IF DESIRED, A "FILLER ASSEMBLY", SHOWN AS PIECE MARKED ③ IN THE LOAD ON PAGE 26, MAY BE USED IN LIEU OF A SEPARATE LOADING PROJECTILE PALLET TO MAINTAIN AN EVEN LOAD PATTERN. MORE THAN ONE "FILLER ASSEMBLY" MAY BE USED WITHIN A LOAD.
10. THE LOAD MUST BE POSITIONED OVER THE STRONG POINTS OF THE SEMITRAILER, SUCH AS THE REAR AXLES AND/OR THE FIFTH WHEEL OF THE TOWING VEHICLE. IF DESIRED THE LOAD MAY BE "SPLIT" AS SHOWN ON PAGE 26.
11. PROCEDURES FOR LOADING AN M871 OR M872 SEMITRAILER:

    (A) WHEN USING THE LOADING METHOD SHOWN ON PAGE 22 FOR AN M871 OR M872 SEMITRAILER, THERE MUST BE AT LEAST FOUR INCHES OF NAILABLE SPACE REMAINING ON EACH SIDE OF THE LOAD TO ALLOW FOR THE NAILED DOWN SIDE BLOCKING PIECES MARKED ④. IF DESIRED, A "FLOATING" TYPE OF SIDE BLOCKING, SHOWN AS PIECES MARKED ⑥ IN THE LOAD ON PAGE 26, MAY BE USED IN LIEU OF THE NAILED DOWN SIDE BLOCKING PIECES MARKED ④, ON PAGE 22.

    (B) NOTE THAT ON AN M871 SEMITRAILER THE FORWARD 10'-0" LENGTH OF THE TRAILER FLOOR IS ALL STEEL. A MAXIMUM LOAD CAPACITY MAY BE ACHIEVED BY USING ALL "FLOATING" TYPE OF FLOOR BLOCKING, SHOWN AS PIECES MARKED ①, ②, ④, AND ⑥ IN THE LOAD ON PAGE 26 IN LIEU OF THE NAILED DOWN BLOCKING SHOWN AS PIECES MARKED ①, ②, ③, AND ④ IN THE LOAD ON PAGE 22.

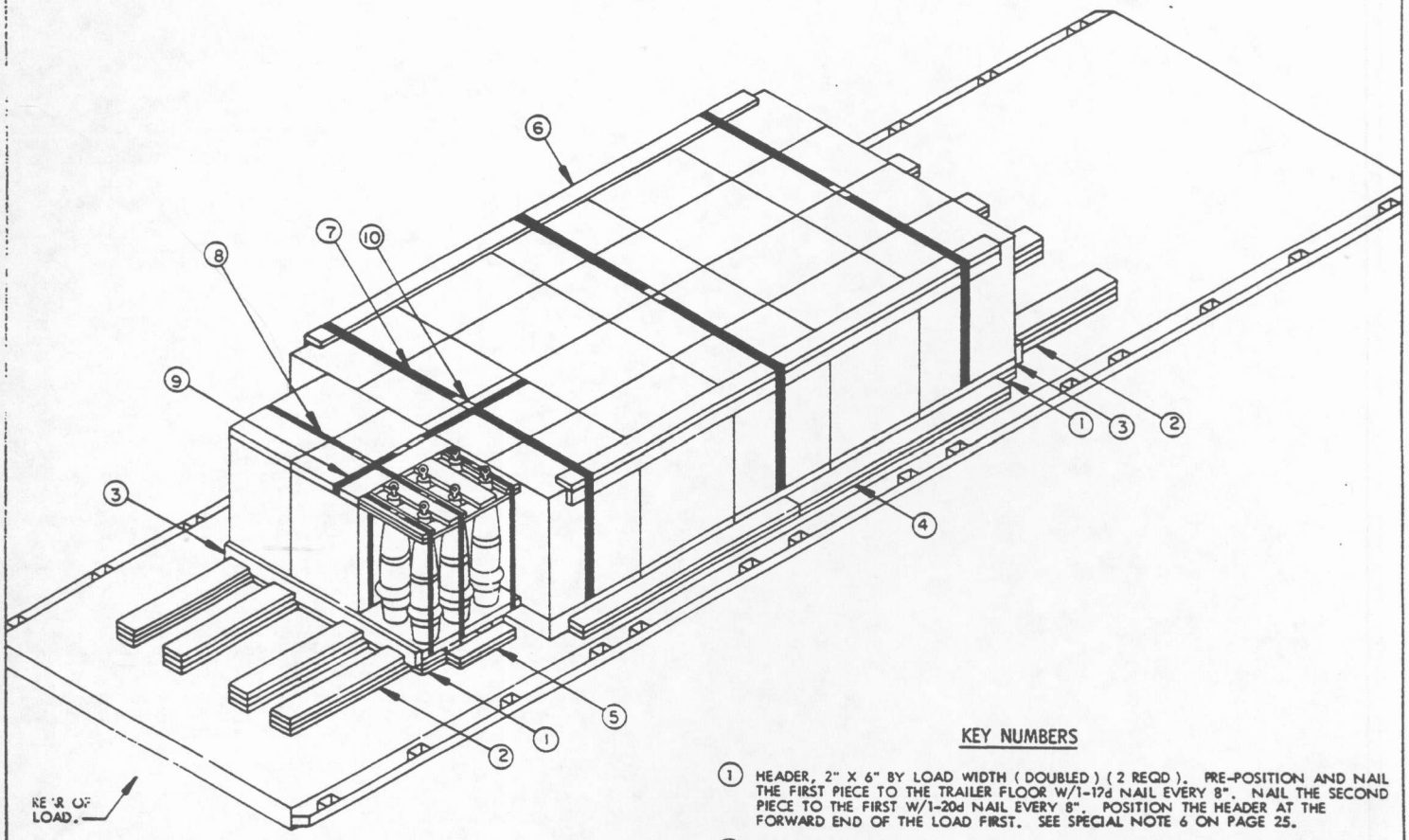
    (C) WHEN TRANSPORTING A LARGE QUANTITY OF SEPARATE LOADING PROJECTILES ON THE M871 OR M872 SEMITRAILER, USE THE PROCEDURES SHOWN ON PAGES 26 AND 27.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	140	94
2" X 6"	94	94
NAILS	**NO. REQD**	**POUNDS**
10d (3")	52	1
12d (3-1/4")	206	3-1/2
20d (4")	162	5-3/4
STEEL STRAPPING, 1-1/4" X .035" ——— 80' REQD ——— 12 LBS		
SEAL FOR 1-1/4" STRAPPING ——— 8 REQD ——— NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
175MM, SLP	32	29,888 LBS
DUNNAGE		398 LBS
TOTAL WEIGHT		30,286 LBS



ISOMETRIC VIEW

THE 8", 6/PALLET, SLP IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO UNITS OF OTHER DIMENSIONS.

KEY NUMBERS

(1) HEADER, 2" X 6" BY LOAD WIDTH (DOUBLED) (2 REQD). PRE-POSITION AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/1-17d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST W/1-20d NAIL EVERY 8". POSITION THE HEADER AT THE FORWARD END OF THE LOAD FIRST. SEE SPECIAL NOTE 6 ON PAGE 25.

(2) BACK-UP CLEAT, 2" X 6" BY LENGTH-TO-SUIT (TRIPLED) (8 REQD). POSITION THE FIRST PIECE AGAINST THE HEADER AND NAIL TO THE TRAILER FLOOR W/9-12d NAILS. POSITION THE SECOND PIECE AGAINST THE HEADER AND NAIL TO THE FIRST PIECE W/9-20d NAILS. POSITION THE THIRD PIECE AGAINST THE BEARING PIECE AND NAIL TO THE SECOND PIECE W/9-20d NAILS. TOENAIL THE THIRD PIECE TO THE BEARING PIECE W/2-12d NAILS. NOTE: FOR THE LOAD SHOWN ON THIS PAGE THE FIRST AND SECOND PIECE WILL BE 36" LONG AND THE THIRD PIECE WILL BE CUT-TO-FIT. SEE SPECIAL NOTES 5 AND 7 ON PAGE 25.

(3) BEARING PIECE, 2" X 4" BY LOAD WIDTH (2 REQD). POSITION AS SHOWN PRIOR TO POSITIONING AND NAILING THE THIRD (TOP) BACK-UP PIECES.

(4) SIDE BLOCKING, 2" X 4" BY LENGTH-TO-SUIT (DOUBLED) (4 REQD). POSITION THE FIRST PIECE AGAINST THE UNIT SKIDS AND NAIL TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER.

(5) SIDE BLOCKING, 2" X 4" BY LENGTH-TO-SUIT (DOUBLED) (2 REQD). POSITION THE FIRST PIECE AGAINST THE UNIT SKIDS AND NAIL TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER.

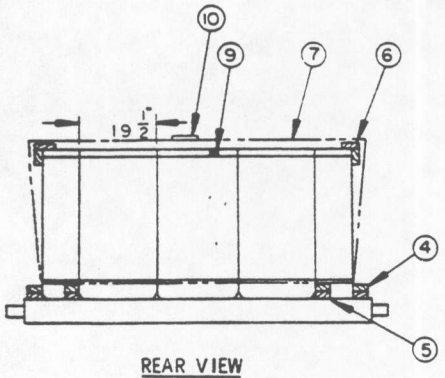
(6) ANTI-SWAY ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 54.

(7) ANTI-SWAY STRAPPING, 1-1/4" X .035" X 22'-0" LONG STEEL STRAPPING (3 REQD). INSTALL TO ENCIRCLE FOUR (4) LATERALLY ADJACENT UNITS AND THE "ANTI-SWAY ASSEMBLY" AS SHOWN.

(8) ANTI-SWAY STRAPPING, 1-1/4" X .035" X 18'-0" LONG STEEL STRAPPING (1 REQD). INSTALL TO ENCIRCLE THREE (3) LATERALLY ADJACENT UNITS AS SHOWN.

(9) ANTI-TIP STRAPPING, 1-1/4" X .035" X 10'-0" LONG STEEL STRAPPING (1 REQD). INSTALL AROUND TOP DECK OF TWO LONGITUDINALLY ADJACENT UNITS AS SHOWN.

(10) SEAL FOR 1-1/4" STRAPPING (10 REQD, 2 PER STRAP). DOUBLED CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



REAR VIEW

PIECES MARKED (1), (2), AND (3) HAVE BEEN OMITTED FOR CLARITY.

SPECIAL NOTES:

1. A TYPICAL LOAD OF PALLETIZED SEPARATE LOADING PROJECTILES IS SHOWN LOADED ON A SEMITRAILER, STAKE, 12 TON, M127, HAVING OVERALL DIMENSIONS OF 28'-8" LONG BY 8'-0" WIDE. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE SPECIAL NOTE 11 BELOW.
2. THE 8", 6/PALLET, SEPARATE LOADING PROJECTILE SHOWN IN THE LOAD ON PAGE 18 HAS OVERALL DIMENSIONS OF 19-1/2" LONG BY 28-1/2" WIDE BY 38-1/2" HIGH AND A WEIGHT OF 1,256 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR UNITS OF OTHER DIMENSIONS. IF SHIPPING THE 155MM, 8/PALLET, SEE THE LOAD ON PAGE 24 AND IF SHIPPING THE 175MM, 6/PALLET, SEE THE LOAD ON PAGE 20. SEE GENERAL NOTE "F" ON PAGE 2.
3. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED. A LOAD CAN BE INCREASED OR REDUCED BY A MULTIPLE OF FOUR (4) UNITS AND USING THE SAME PROCEDURES SHOWN ON PAGE 24. A LOAD CAN BE REDUCED BY ONE (1) UNIT BY USING THE PROCEDURES SHOWN ON PAGES 24 AND 29.
4. FOR SHIPMENT OF A PARTIAL LOAD, SEE PAGES 28 AND 29.
5. THE LENGTH OF THE BACK-UP PIECES, SHOWN AS PIECE MARKED (2) ON PAGE 24, AND THE NAILS REQUIRED WILL CHANGE PER DIFFERENT LOAD WEIGHTS. LONGER BACK-UP PIECES THAN SHOWN MAY BE USED AND 2" X 4" MATERIAL MAY BE USED IN LIEU OF THE 2" X 6" MATERIAL. SEE "CHART NO. 3" ON PAGE 3 FOR GUIDANCE. NOTE: THE BEARING PIECE, SHOWN AS KEY NUMBER (3) ON PAGE 24, MUST BE POSITIONED ON EDGE AND TIGHT AGAINST THE PALLET BASE PRIOR TO POSITIONING AND NAILING THE TOP BACK-UP CLEAT.
6. IF DESIRED, AND TO MAKE LOADING EASIER, THE HEADERS SHOWN AS KEY NUMBER (1) MAY BE WIDER THAN 2" X 6" MATERIAL, PROVIDED THERE IS AT LEAST 3" OF NAILABLE SURFACE EXTENDING BEYOND THE PALLET OVERHANG. THIS WILL ELIMINATE THE NECESSITY OF PRE-POSITIONING THE HEADERS.
7. SEE "DETAIL B" ON PAGE 55 FOR POSITIONING OF THE BEARING PIECE, HEADER, AND BACK-UP CLEAT, AGAINST THE PALLET BASE.
8. SEE THE "TYPICAL LADING ITEMS" ON PAGE 5 FOR A DETAIL VIEW OF THE 8", 6/PALLET, SLP, SHOWN IN THE LOAD ON PAGE 24.
9. IF DESIRED, A "FILLER ASSEMBLY", SHOWN AS PIECE MARKED (3) IN THE LOAD ON ON PAGE 26, MAY BE USED IN LIEU OF A SEPARATE LOADING PROJECTILE PALLET TO MAINTAIN AN EVEN LOAD PATTERN, MORE THAN ONE "FILLER ASSEMBLY" MAY BE USED WITHIN A LOAD.
10. THE LOAD MUST BE POSITIONED OVER THE STRONG POINTS OF THE SEMITRAILER, SUCH AS THE REAR AXLES AND/OR THE FIFTH WHEEL OF THE TOWING VEHICLE. IF DESIRED, THE LOAD MAY BE "SPLIT" AS SHOWN ON PAGE 26.
11. PROCEDURES FOR LOADING AN M871 OR M872 SEMITRAILER:

    (A.) WHEN USING THE LOADING METHOD SHOWN ON PAGE 24 FOR AN M871 OR M872 SEMITRAILER, THERE MUST BE AT LEAST FOUR INCHES OF NAILABLE SPACE REMAINING ON EACH SIDE OF THE LOAD TO ALLOW FOR THE NAILED DOWN SIDE BLOCKING PIECES MARKED (4). IF DESIRED, A "FLOATING" TYPE OF SIDE BLOCKING, SHOWN AS PIECES MARKED (6) IN THE LOAD ON PAGE 26, MAY BE USED IN LIEU OF THE NAILED DOWN SIDE BLOCKING PIECES MARKED (4).

    (B.) NOTE THAT ON AN M871 SEMITRAILER THE FORWARD 10'-0" LENGTH OF THE TRAILER FLOOR IS ALL STEEL. A MAXIMUM LOAD CAPACITY MAY BE ACHIEVED BY USING ALL "FLOATING" TYPE OF FLOOR BLOCKING, SHOWN AS PIECES MARKED (1), (2), (4), AND (6) IN THE LOAD ON PAGE 26 IN LIEU OF THE NAILED DOWN BLOCKING SHOWN AS PIECES MARKED (1), (2), (3), AND (4) IN THE LOAD ON PAGE 24.

    (C.) WHEN TRANSPORTING A LARGE QUANTITY OF SEPARATE LOADING PROJECTILES ON THE M871 OR M872 SEMITRAILER USE THE PROCEDURES SHOWN ON PAGES 26 AND 27.

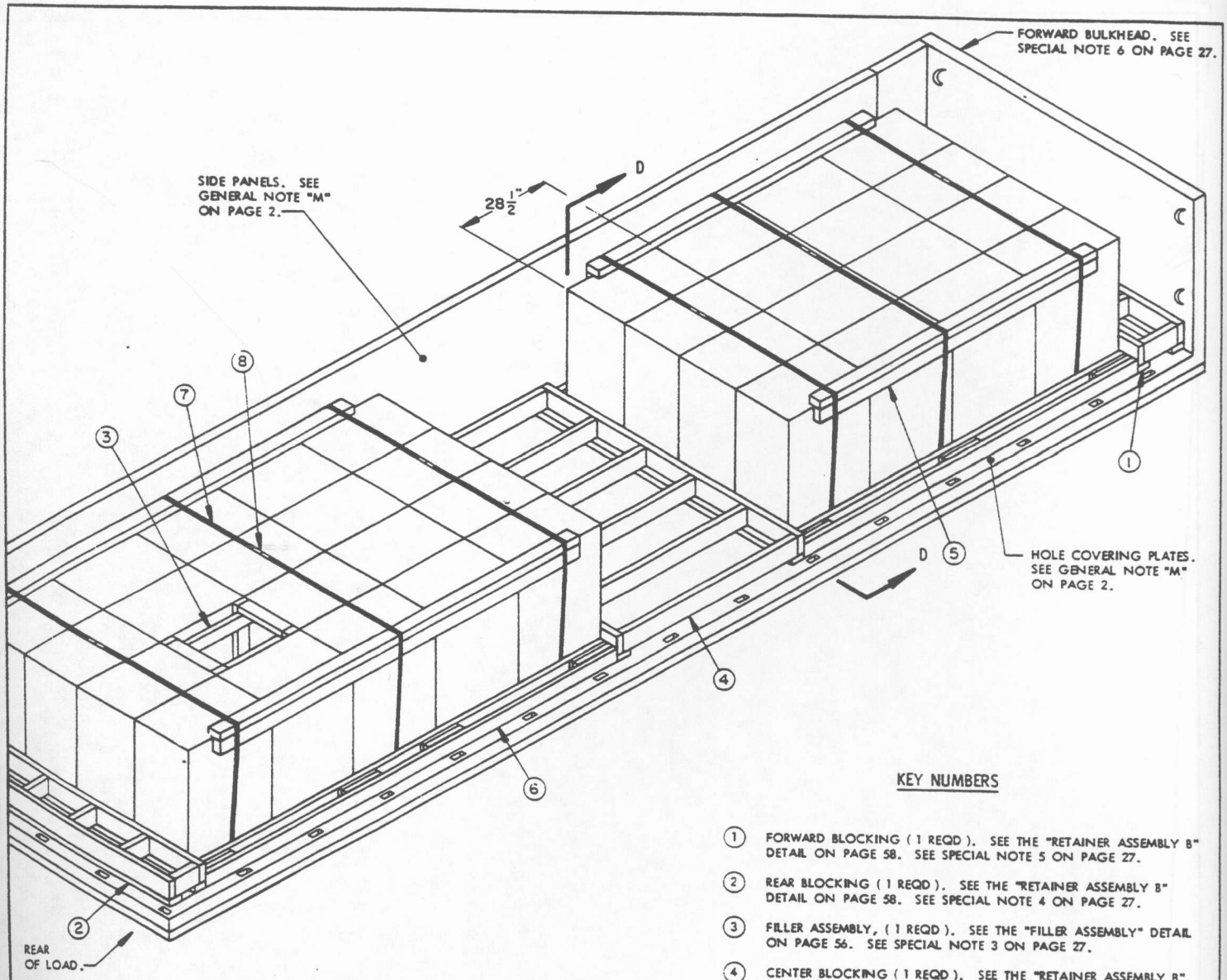
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	124	83
2" X 6"	98	98
NAILS	**NO. REQD**	**POUNDS**
10d (3")	38	3/4
12d (3-1/4")	210	3-1/2
20d (4")	162	5-3/4
STEEL STRAPPING, 1-1/4" X .035" ----	94' REQD ---------	14 LBS
SEAL FOR 1-1/4" STRAPPING ---------	10 REQD ---------	NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
8", SLP ----------	23 ----------	28,888 LBS
DUNNAGE ----------	----------	386 LBS
TOTAL WEIGHT ----------		29,274 LBS

SEMITRAILER, STAKE, 12 TON, M127 (TYPICAL)

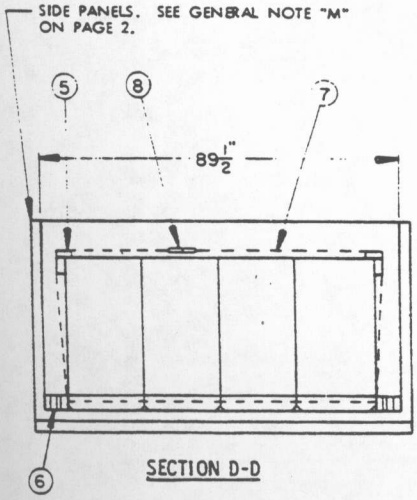


ISOMETRIC VIEW

THE 8", 6/PALLET, SLP IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO UNITS OF OTHER DIMENSIONS.

KEY NUMBERS

1. FORWARD BLOCKING (1 REQD). SEE THE "RETAINER ASSEMBLY B" DETAIL ON PAGE 58. SEE SPECIAL NOTE 5 ON PAGE 27.
2. REAR BLOCKING (1 REQD). SEE THE "RETAINER ASSEMBLY B" DETAIL ON PAGE 58. SEE SPECIAL NOTE 4 ON PAGE 27.
3. FILLER ASSEMBLY, (1 REQD). SEE THE "FILLER ASSEMBLY" DETAIL ON PAGE 56. SEE SPECIAL NOTE 3 ON PAGE 27.
4. CENTER BLOCKING (1 REQD). SEE THE "RETAINER ASSEMBLY B" DETAIL ON PAGE 58. SEE SPECIAL NOTE 4 ON PAGE 27.
5. ANTI-SWAY ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 54.
6. SIDE BLOCKING (4 REQD). SEE THE "SIDE BLOCKING ASSEMBLY B" DETAIL ON PAGE 58.
7. ANTI-SWAY STRAPPING, 1-1/4" X .035" X 22'-0" LONG STEEL STRAPPING (6 REQD). INSTALL TO ENCIRCLE TWO (2) LATERALLY ADJACENT UNITS AND THE "ANTI-SWAY ASSEMBLY" AS SHOWN.
8. SEAL FOR 1-1/4" STRAPPING (12 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



SECTION D-D

SPECIAL NOTES:

1. A TYPICAL LOAD OF PALLETIZED SEPARATE LOADING PROJECTILES IS SHOWN LOADED ON A SEMITRAILER, 22-1/2 TON, M871, HAVING OVERALL DIMENSIONS OF 29'-10" LONG BY 8'-0" WIDE. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE GENERAL NOTE "M" ON PAGE 2.

2. THE 8", 6/PALLET, SEPARATE LOADING PROJECTILE SHOWN IN THE LOAD ON PAGE 26 HAS OVERALL DIMENSIONS OF 19-1/2" LONG BY 28-1/2" WIDE BY 38-1/2" HIGH AND A WEIGHT OF 1,256 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR UNITS OF OTHER DIMENSIONS. SEE GENERAL NOTE "F" ON PAGE 2.

3. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED. A LOAD CAN BE INCREASED OR REDUCED BY A MULTIPLE OF FOUR (4) UNITS AND USING THE SAME PROCEDURES SHOWN ON PAGE 26. A LOAD CAN BE REDUCED BY ONE (1) UNIT BY USING A "FILLER ASSEMBLY", SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 26. MORE THAN ONE "FILLER ASSEMBLY" CAN BE USED WITHIN A LOAD.

4. FOR AN ALTERNATIVE METHOD OF TRANSPORTING SEPARATE LOADING PROJECTILES SEE THE LOAD ON PAGES 20 THROUGH 25 AND PAGES 28 AND 29. READ THE SPECIAL NOTES PROVIDED AS THE LOADS WILL HAVE TO BE MODIFIED WHEN LOADED ON THE M871 OR M872 SEMITRAILER.

5. IF DESIRED, A "FORWARD BULKHEAD ASSEMBLY" SHOWN AS PIECE MARKED (1) ON PAGES 12 AND 14 MAY BE USED IN LIEU OF THE "FORWARD BLOCKING" SHOWN AS PIECE MARKED (1) IN THE LOAD ON PAGE 26. THE LADING MUST THEN BE POSITIONED AGAINST THE "FORWARD BULKHEAD ASSEMBLY".

6. DUE TO THE "FOUR EYEBOLTS" LOCATED ON THE FORWARD BULKHEAD OF THE M871 SEMITRAILER, FORWARD BLOCKING SHOWN AS PIECE MARKED (1) ON PAGE 26, MUST BE USED. IF DESIRED A "FORWARD BULKHEAD ASSEMBLY" SHOWN AS PIECE MARKED (1) ON PAGE 14 MAY BE USED. IF THE LOAD IS BEING TRANSPORTED ON AN M872 SEMITRAILER A "FORWARD BULKHEAD ASSEMBLY" MUST BE USED DUE TO THE "REINFORCING GUSSETS" POSITIONED ON THE FORWARD BULKHEAD.

7. IF HOLE COVERING PLATES ARE NOT PROVIDED WITH THE VEHICLE SEE THE "ALTERNATIVE HOLE COVERING METHODS" ON PAGE 59.

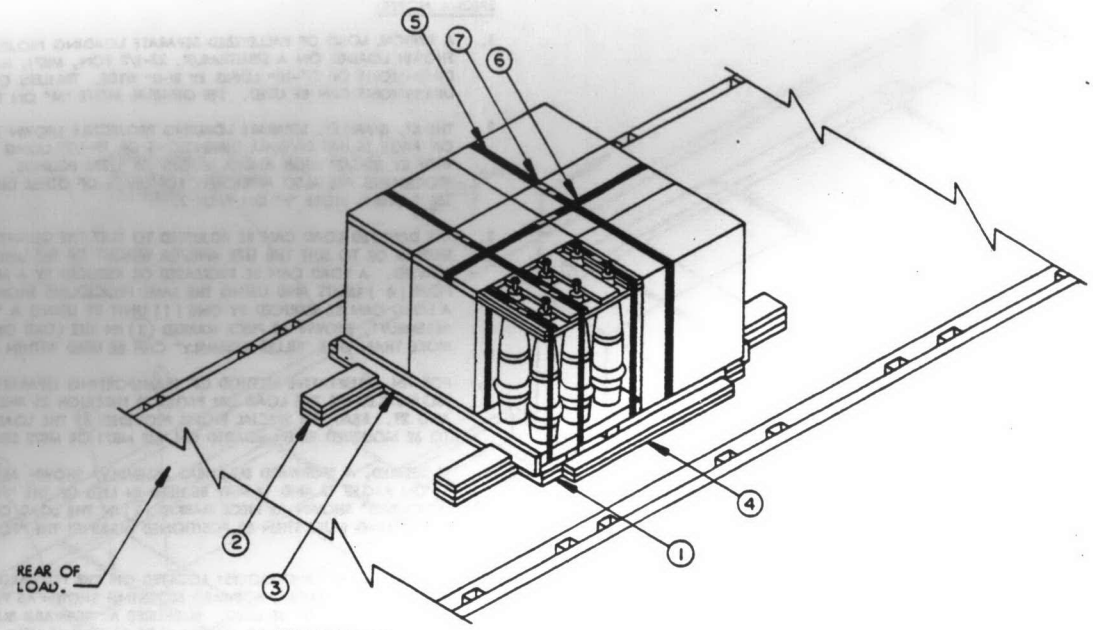
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	14	5
2" X 4"	244	163
2" X 6"	87	87
NAILS	**NO. REQD**	**POUNDS**
6d (2")	42	1/4
10d (3")	362	5-3/4
STEEL STRAPPING, 1-1/4" X .035" ------ 132' REQD -------19 LBS		
SEAL FOR 1-1/4" STRAPPING ---------- 12 REQD ------- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLETIZED UNIT	35	43,960 LBS
DUNNAGE		535 LBS

TOTAL WEIGHT ---- 44,495 LBS



TYPICAL LTL

THE 8", 6/PALLET, SLP IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO UNITS OF OTHER DIMENSIONS.

SPECIAL NOTES:

1. A TYPICAL LTL LOAD OF SIX (6) PALLETIZED SEPARATE LOADING PROJECTILES IS SHOWN LOADED ON A SEMITRAILER, STAKE, 12 TON, M127, HAVING OVERALL DIMENSIONS OF 28'-8" LONG BY 8'-0" WIDE. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE SPECIAL NOTE 8 BELOW.
2. THE 8", 6/PALLET, SEPARATE LOADING PROJECTILE SHOWN IN THE LOAD ON THIS PAGE HAS OVERALL DIMENSIONS OF 19-1/2" LONG BY 28-1/2" WIDE BY 38-1/2" HIGH AND A WEIGHT OF 1,456 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR UNITS OF OTHER DIMENSIONS.
3. THE LENGTH OF THE BACK-UP PIECES, SHOWN AS PIECE MARKED (2) ON THIS PAGE, AND THE NAILS REQUIRED WILL CHANGE PER DIFFERENT LOAD WEIGHTS. LONGER BACK-UP PIECES THAN SHOWN MAY BE USED AND 2" X 4" MATERIAL MAY BE USED IN LIEU OF THE 2" X 6" MATERIAL. SEE "CHART NO. 3" ON PAGE 3 FOR GUIDANCE. NOTE: THE BEARING PIECE, SHOWN AS KEY NUMBER (3), MUST BE POSITIONED ON EDGE AND TIGHT AGAINST THE PALLET BASE PRIOR TO POSITIONING AND NAILING THE TOP BACK-UP CLEAT.
4. IF DESIRED, AND TO MAKE LOADING EASIER, THE HEADERS SHOWN AS KEY NUMBER (1) MAY BE WIDER THAN 2" X 6" MATERIAL, PROVIDED THERE IS AT LEAST 3" OF NAILABLE SURFACE EXTENDING BEYOND THE PALLET OVERHANG. THIS WILL ELIMINATE THE NECESSITY OF PRE-POSITIONING THE HEADERS.
5. SEE "DETAIL B" ON PAGE 55 FOR POSITIONING OF THE BEARING PIECE, HEADER, AND BACK-UP CLEAT, AGAINST THE PALLET BASE.
6. SEE THE "TYPICAL LADING ITEMS" ON PAGE 5 FOR A DETAIL VIEW OF THE 8", 6/PALLET, SLP, SHOWN IN THE LOAD ABOVE.
7. THE LOAD MUST BE POSITIONED OVER THE STRONG POINTS OF THE SEMITRAILER, SUCH AS THE REAR AXLES AND/OR THE FIFTH WHEEL OF THE TOWING VEHICLE.
8. PROCEDURES FOR LOADING AN M871 OR M872 SEMITRAILER:

   (A.) WHEN USING THE LOADING METHOD SHOWN ON THIS PAGE FOR AN M871 OR M872 SEMITRAILER, THERE MUST BE AT LEAST FOUR INCHES OF NAILABLE SPACE REMAINING ON EACH SIDE OF THE LOAD TO ALLOW FOR THE NAILED DOWN SIDE BLOCKING PIECES MARKED (4), ON THIS PAGE.

   (B.) NOTE THAT ON AN M871 SEMITRAILER THE FORWARD 10'-0" LENGTH OF THE TRAILER FLOOR IS ALL STEEL.

KEY NUMBERS

(1) HEADER, 2" X 6" BY LOAD WIDTH (DOUBLED) (2 REQD). PRE-POSITION AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST W/1-20d NAIL EVERY 8". POSITION THE HEADER AT THE FORWARD END OF THE LOAD FIRST. SEE SPECIAL NOTE 4 ON THIS PAGE.

(2) BACK-UP CLEAT, 2" X 6" BY LENGTH-TO-SUIT (TRIPLED) (4 REQD). POSITION THE FIRST PIECE AGAINST THE HEADER AND NAIL TO THE TRAILER FLOOR W/5-12d NAILS. POSITION THE SECOND PIECE AGAINST THE HEADER AND NAIL TO THE FIRST PIECE W/5-20d NAILS. POSITION THE THIRD PIECE AGAINST THE BEARING PIECE AND NAIL TO THE SECOND PIECE W/5-20d NAILS. TOENAIL THE THIRD PIECE TO THE BEARING PIECE W/2-12d NAILS. NOTE: FOR THE LOAD SHOWN ON THIS PAGE THE FIRST AND SECOND PIECE WILL BE 18" LONG AND THE THIRD PIECE WILL BE CUT-TO-FIT. SEE SPECIAL NOTES 3 AND 5 ON THIS PAGE.

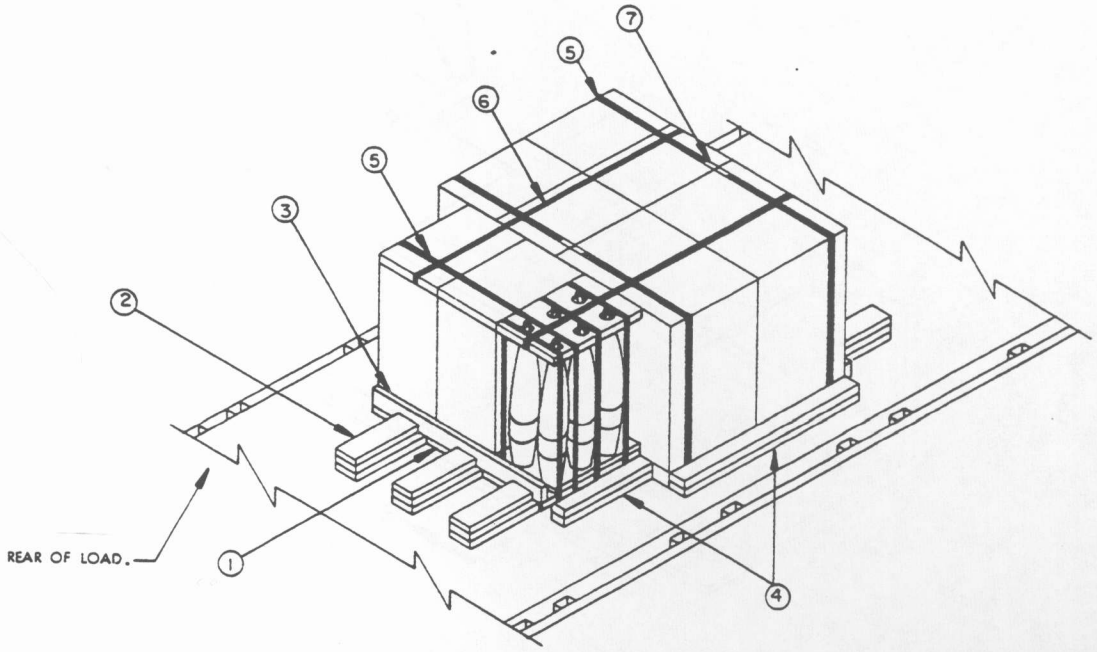
(3) BEARING PIECE, 2" X 4" BY LOAD WIDTH (2 REQD). POSITION AS SHOWN PRIOR TO POSITIONING AND NAILING THE THIRD (TOP) BACK-UP PIECES.

(4) SIDE BLOCKING, 2" X 4" BY LENGTH-TO-SUIT (DOUBLED) (2 REQD). POSITION THE FIRST PIECE AGAINST THE UNIT SKIDS AND NAIL TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER.

(5) ANTI-SWAY STRAPPING, 1-1/4" X .035" X 18'-0" LONG STEEL STRAPPING (2 REQD). INSTALL TO ENCIRCLE THREE (3) LATERALLY ADJACENT UNITS AS SHOWN.

(6) ANTI-TIP STRAPPING, 1-1/4" X .035" X 10'-0" LONG STEEL STRAPPING (1 REQD). INSTALL AROUND TOP DECK OF TWO LONGITUDINALLY ADJACENT UNITS AS SHOWN.

(7) SEAL FOR 1-1/4" STRAPPING (10 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



TYPICAL LTL

THE 175MM, 6/PALLET, SLP IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO UNITS OF OTHER DIMENSIONS.

SPECIAL NOTES:

1. A TYPICAL LTL LOAD OF ELEVEN (11) PALLETIZED SEPARATE LOADING PROJECTILES IS SHOWN LOADED ON A SEMITRAILER, STAKE, 12 TON, M127 HAVING OVERALL DIMENSIONS OF 28'-8" LONG BY 8'-0" WIDE. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE SPECIAL NOTE 8 BELOW.

2. THE 175MM, 6/PALLET, SEPARATE LOADING PROJECTILE SHOWN IN THE LOAD ON THIS PAGE HAS OVERALL DIMENSIONS OF 17" LONG BY 25-1/2" WIDE BY 41" HIGH AND A WEIGHT OF 934 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR UNITS OF OTHER DIMENSIONS. SEE GENERAL NOTE "F" ON PAGE 2.

3. THE LENGTH OF THE BACKUP PIECES, SHOWN AS PIECE MARKED (2) ON THIS PAGE, AND THE NAILS REQUIRED WILL CHANGE PER DIFFERENT LOAD WEIGHTS. LONGER BACKUP PIECES THAN SHOWN MAY BE USED AND 2" X 4" MATERIAL MAY BE USED IN LIEU OF THE 2" X 6" MATERIAL. SEE "CHART NO. 3" ON PAGE 3 FOR GUIDANCE. NOTE: THE BEARING PIECE, SHOWN AS KEY NUMBER (3), MUST BE POSITIONED ON EDGE AND TIGHT AGAINST THE PALLET BASE PRIOR TO POSITIONING AND NAILING THE TOP BACK-UP CLEAT.

4. IF DESIRED, AND TO MAKE LOADING EASIER, THE HEADERS SHOWN AS KEY NUMBER (1) MAY BE WIDER THAN 2" X 6" MATERIAL, PROVIDED THERE IS AT LEAST 3" OF NAILABLE SURFACE EXTENDING BEYOND THE PALLET OVERHANG. THIS WILL ELIMINATE THE NECESSITY OF PRE-POSITIONING THE HEADERS.

5. SEE "DETAIL B" ON PAGE 55 FOR POSITIONING OF THE BEARING PIECE, HEADER, AND BACK-UP CLEAT, AGAINST THE PALLET BASE.

6. SEE THE "TYPICAL LADING ITEMS" ON PAGE 5 FOR A DETAIL VIEW OF THE 175MM, 6/PALLET, SLP, SHOWN IN THE LOAD ABOVE.

7. THE LOAD MUST BE POSITIONED OVER THE STRONG POINTS OF THE SEMITRAILER, SUCH AS THE REAR AXLES AND/OR THE FIFTH WHEEL OF THE TOWING VEHICLE.

8. PROCEDURES FOR LOADING AN M871 OR M872 SEMITRAILER:

   (A.) WHEN USING THE LOADING METHOD SHOWN ON THIS PAGE FOR AN M871 OR AN M872 SEMITRAILER, THERE MUST BE AT LEAST FOUR INCHES OF NAILABLE SPACE REMAINING ON EACH SIDE OF THE LOAD TO ALLOW FOR THE NAILED DOWN SIDE BLOCKING PIECES MARKED (4), ON THIS PAGE.

   (B.) NOTE THAT ON AN M871 SEMITRAILER THE FORWARD 10'-0" LENGTH OF THE TRAILER FLOOR IS ALL STEEL.

KEY NUMBERS

(1) HEADER, 2" X 6" BY LOAD WIDTH (DOUBLED) (2 REQD). PRE-POSITION AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST W/1-20d NAIL EVERY 8". POSITION THE HEADER AT THE FORWARD END OF THE LOAD FIRST. SEE SPECIAL NOTE 4 ON THIS PAGE.

(2) BACK-UP CLEAT, 2" X 6" BY LENGTH-TO-SUIT (TRIMMED) (6 REQD). POSITION THE FIRST PIECE AGAINST THE HEADER AND NAIL TO THE TRAILER FLOOR W/5-12d NAILS. POSITION THE SECOND PIECE AGAINST THE HEADER AND NAIL TO THE FIRST PIECE W/5-20d NAILS. POSITION THE THIRD PIECE AGAINST THE BEARING PIECE AND NAIL TO THE SECOND PIECE W/5-20d NAILS. TOENAIL THE THIRD PIECE TO THE BEARING PIECE W/2-12d NAILS. NOTE: THE LOAD SHOWN ON THIS PAGE THE FIRST AND SECOND PIECE WILL BE 18" LONG AND THE THIRD PIECE WILL BE CUT-TO-FIT. SEE SPECIAL NOTES 3 AND 5 ON THIS PAGE.

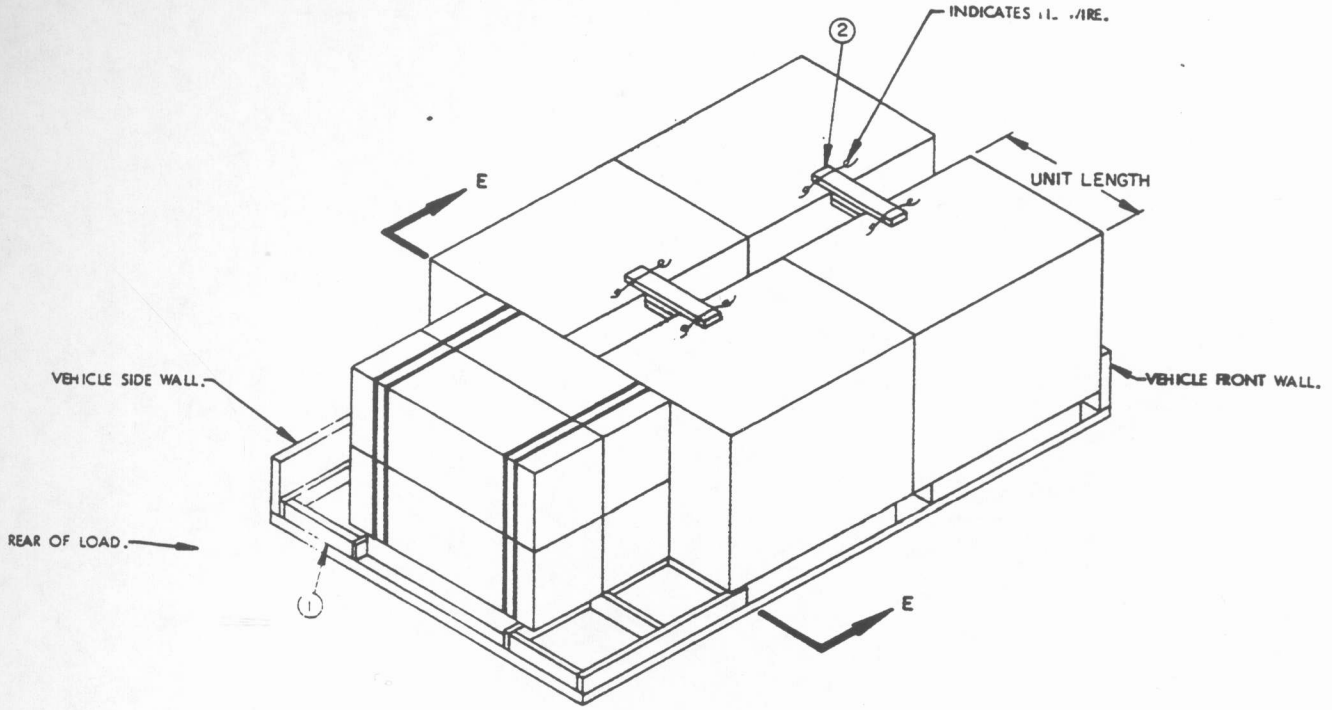
(3) BEARING PIECE, 2" X 4" BY LOAD WIDTH (2 REQD). POSITION AS SHOWN PRIOR TO POSITIONING AND NAILING THE THIRD (TOP) BACK-UP PIECES.

(4) SIDE BLOCKING, 2" X 4" BY LENGTH-TO-SUIT (DOUBLED) (4 REQD). POSITION THE FIRST PIECE AGAINST THE UNIT SKIDS AND NAIL TO THE TRAILER FLOOR W/1-12d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER.

(5) ANTI-SWAY STRAPPING, 1-1/4" X .035" X 20'-0" LONG STEEL STRAPPING (3 REQD). INSTALL TO ENCIRCLE LATERALLY ADJACENT UNITS AS SHOWN.

(6) ANTI-TIP STRAPPING, 1-1/4" X .035" X 14'-0" LONG STEEL STRAPPING (2 REQD). INSTALL AROUND TOP DECK OF THREE (3) LONGITUDINALLY ADJACENT UNITS AS SHOWN.

(7) SEAL FOR 1-1/4" STRAPPING (10 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



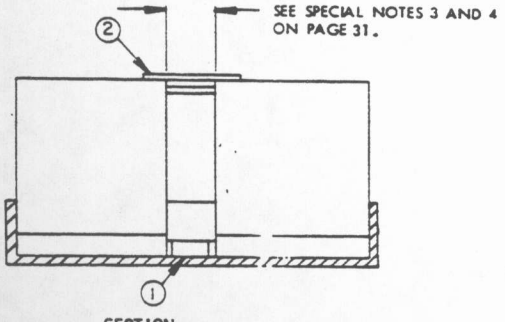
ISOMETRIC VIEW

A SKIDDED UNIT IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO PALLETIZED SKIDDED UNITS.

KEY NUMBERS

(1) SPACER ASSEMBLY (4 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 54. SEE SPECIAL NOTE 4 ON PAGE 31.

(2) TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 54. WIRE TIE TO A UNIT UNITIZING STRAP WITH NO. 14 GAGE WIRE AS SHOWN BY THE "POSITIONING OF TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLY" ON PAGE 54 SEE SPECIAL NOTE 3 ON PAGE 31.



SECTION E-E

S·ECIAL NOTES:

1. A TYPICAL LOAD OF BOXED AMMUNITION ASSEMBLED ON A SKIDDED BASE IS SHOWN LOADED IN A TRUCK, CARGO, 2-1/2 TON, M35, HAVING INSIDE DIMENSIONS OF 12'-3" LONG BY 7'-4" WIDE. TRUCKS OF OTHER DIMENSIONS CAN BE USED.

2. THE SKIDDED UNIT SHOWN IN THF TYPICAL 2-WIDE LOAD ON PAGE 30 HAS OVERALL DIMENSIONS OF 38" LONG BY 53" WIDE BY 45" HIGH AND A WEIGHT OF 1,280 POUNDS. THE DEPICTED .ROCEDURES ARE ALSO APPLICABLE FOR SKIDDED UNITS OF OTHER DIMENSIONS, AND PALLETIZED UNITS. REFER TO "CHART NO. 1" AND "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.

3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN IN THE LOAD VIEW AS PIECE MARKED ②, ARE TO BE POSITIONED BETWEEN ALL LATERALLY ADJACENT UNITS WHICH ARE OVER 44" HIGH. NOTE: TOP-OF-LOAD ANTI-SWAY BRACES ARE NOT REQUIRED IF THE TOTAL EXCESS SPACE ACROSS THE VEHICLE IS 6" OR LESS.

4. SPACER ASSEMBLIES, SHOWN AS PIECES MARKED ① IN THE LOAD ON PAGE 22, MUST BE POSITIONED AT THE SIDES OF THE SINGLE UNIT AT THE REAR OF THE LOAD AND BETWEEN EACH TWO (2) LATERALLY ADJACENT UNITS AT THE FORWARD END OF THE LOAD. NOTE: SPACER ASSEMBLIES ARE NOT REQUIRED BETWEEN EACH TWO (2) LATERALLY ADJACENT UNITS AT THE FORWARD END OF THE LOAD IF THE TOTAL EXCESS SPACE ACROSS THE VEHICLE IS 6" OR LESS.

5. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED. IF THE UNIT AT THE REAR OF THE LOAD IS OMITTED, USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 36.

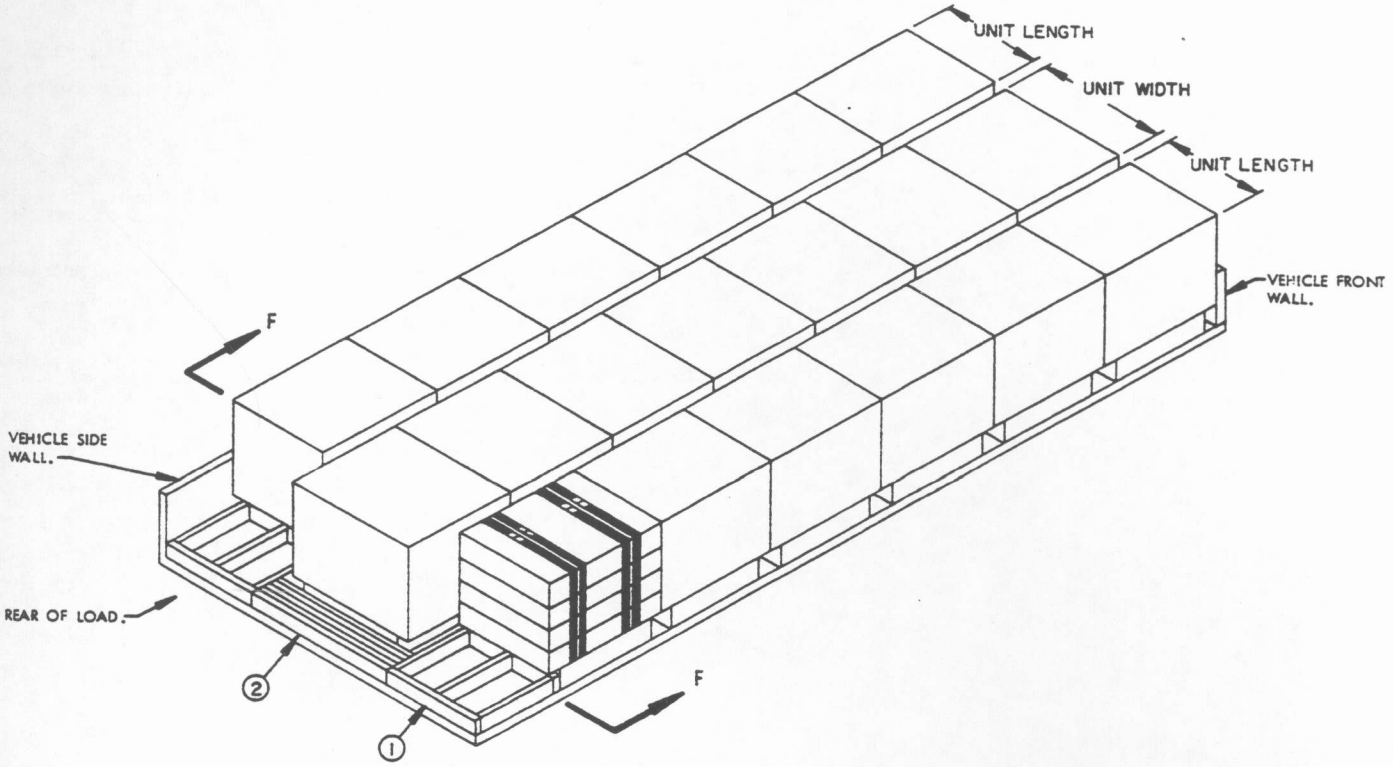
6. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 3", NO REAR BLOCKING IS REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 3" BUT LESS THAN 12", USE SOLID FILL REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 32. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12" USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 36.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	45	30
NAILS	NO. REQD	POUNDS
10d (3")	54	1
WIRE, NO. 14 GAGE ——— 20' REQD ——— 1 LB		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
SKIDDED UNIT	5	6,400 LBS
DUNNAGE		62 LBS
TOTAL WEIGHT		6,462 LBS

TRUCK, CARGO, 2-1/2 TON, M35 (TYPICAL)



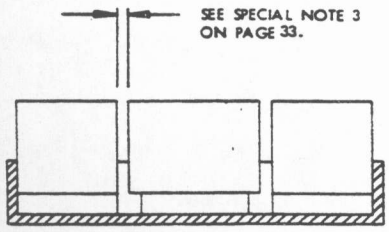
ISOMETRIC VIEW

THE LOAD PROCEDURES DEPICTED ARE APPLICABLE TO SKIDDED UNITS ONLY.

KEY NUMBERS

(1) REAR BLOCKING ASSEMBLY (2 REQD). SEE THE "REAR BLOCKING ASSEMBLY A" DETAIL ON .AGE 55. SEE S: ECIAL NOTE 5 ON PAGE 33.

(2) SOLID FILL, 4" WIDE BY LENGTH AND THICKNESS TO SUIT (AS REQUIRED TO FILL THE VOID AT THE REAR OF THE LOAD). POSITION ON EDGE AND LAMINATE EACH PIECE TO AN ADJACENT PIECE W/1-10d NAIL EVERY 12". SEE SPECIAL NOTE 5 ON PAGE 33.



SECTION F-F

SPECIAL NOTES:

1. A TYPICAL LOAD OF BOXED AMMUNITION ASSEMBLED ON A SKIDDED BASE IS SHOWN LOADED IN A TRUCK, CARGO, 2-1/2 TON, M36, HAVING INSIDE DIMENSIONS OF 17'-7" LONG BY 7'-4" WIDE. TRUCKS OF OTHER DIMENSIONS CAN BE USED.

2. THE SKIDDED UNIT SHOWN IN THE TYPICAL 3-WIDE LOAD ON PAGE 32 HAS OVERALL DIMENSIONS OF 25" LONG BY 32" WIDE BY 29" HIGH AND A WEIGHT OF 520 POUNDS. THE DEPICTED PROCEDURES ARE ONLY APPLICABLE TO SKIDDED UNITS. FOR MORE GUIDANCE IN POSITIONING 3-WIDE SEE THE LOAD ON PAGE 34, AND "CHART NO. 1" ON PAGE 3. SEE GENERAL NOTE "F" ON PAGE 2.

3. IF THE TOTAL EXCESS SPACE ACROSS THE VEHICLE WIDTH IS GREATER THAN 6", SPACER ASSEMBLIES SHOWN AS PIECE MARKED ① ON PAGE 30 WILL BE REQUIRED. IF THE EXCESS SPACE IS GREATER THAN 6" AND THE UNIT HEIGHT IS GREATER THAN 44", "TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLIES" SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 30, WILL BE REQUIRED.

4. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED.

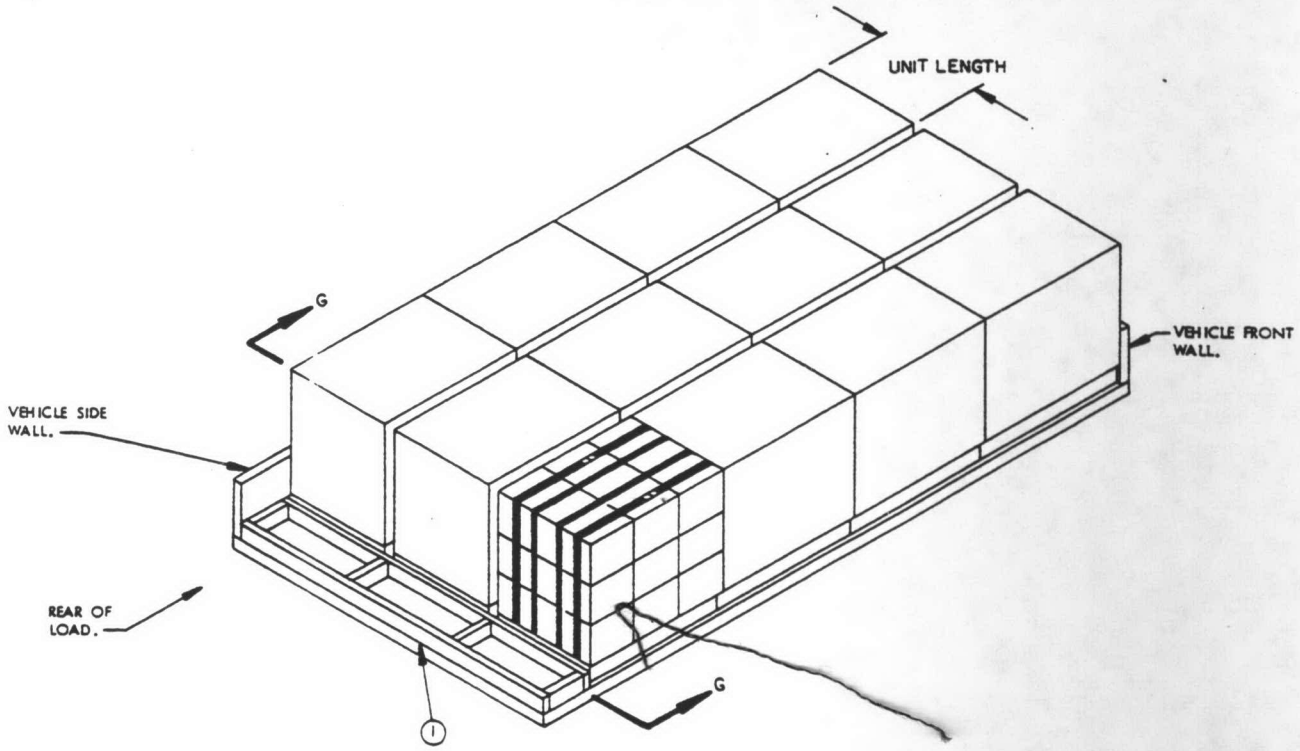
5. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 3" NO REAR BLOCKING IS REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 3" BUT LESS THAN 12", USE SOLID FILL REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 32. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12", USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 36.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	34	23
NAILS	NO. REQD	POUNDS
10d (3")	44	3/4

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
SKIDDED UNIT	19	9,880 LBS
DUNNAGE		47 LBS
TOTAL WEIGHT		9,927 LBS

TRUCK, CARGO, 2-1/2 TON, M36 (TYPICAL)

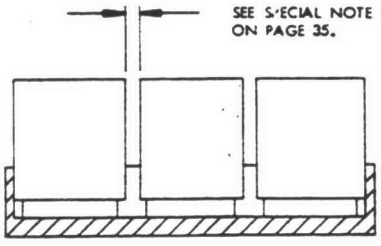


ISOMETRIC VIEW

THE LOAD PROCEDURES DEPICTED ARE APPLICABLE TO SKIDDED UNITS ONLY.

KEY NUMBER

(1) REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY B" DETAIL ON PAGE 55. SEE SPECIAL NOTE 5 ON PAGE 35.



SECTION G-G

SPECIAL NOTES:

1. A TYPICAL LOAD OF BOXED AMMUNITION ASSEMBLED ON A SKIDDED BASE IS SHOWN LOADED IN A TRUCK, CARGO, 5 TON, M54, HAVING INSIDE DIMENSIONS OF 14'-0" LONG BY 7'-4" WIDE. TRUCKS OF OTHER DIMENSIONS CAN BE USED.

2. THE SKIDDED UNIT SHOWN IN THE TYPICAL 3-WIDE LOAD ON PAGE 34 HAS OVERALL DIMENSIONS OF 38-1/4" LONG BY 27-1/4" WIDE BY 35-3/4" HIGH AND A WEIGHT OF 760 POUNDS. THE DEPICTED PROCEDURES ARE ONLY APPLICABLE TO SKIDDED UNITS HAVING A LENGTH OF 25" TO 29-1/4" OR A WIDTH OF 27" TO 29-1/4". FOR MORE GUIDANCE IN POSITIONING 3-WIDE, SEE THE LOAD ON PAGE 32, AND "CHART NO. 1" ON PAGE 3. SEE GENERAL NOTE "F" ON PAGE 2.

3. IF THE TOTAL EXCESS SPACE ACROSS THE VEHICLE WIDTH IS GREATER THAN 6", SPACER ASSEMBLIES SHOWN AS PIECE MARKED (1) ON PAGE 30, WILL BE REQUIRED. IF THE EXCESS SPACE IS GREATER THAN 6" AND THE UNIT HEIGHT IS GREATER THAN 44", "TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLIES" SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 30, WILL BE REQUIRED.

4. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED.

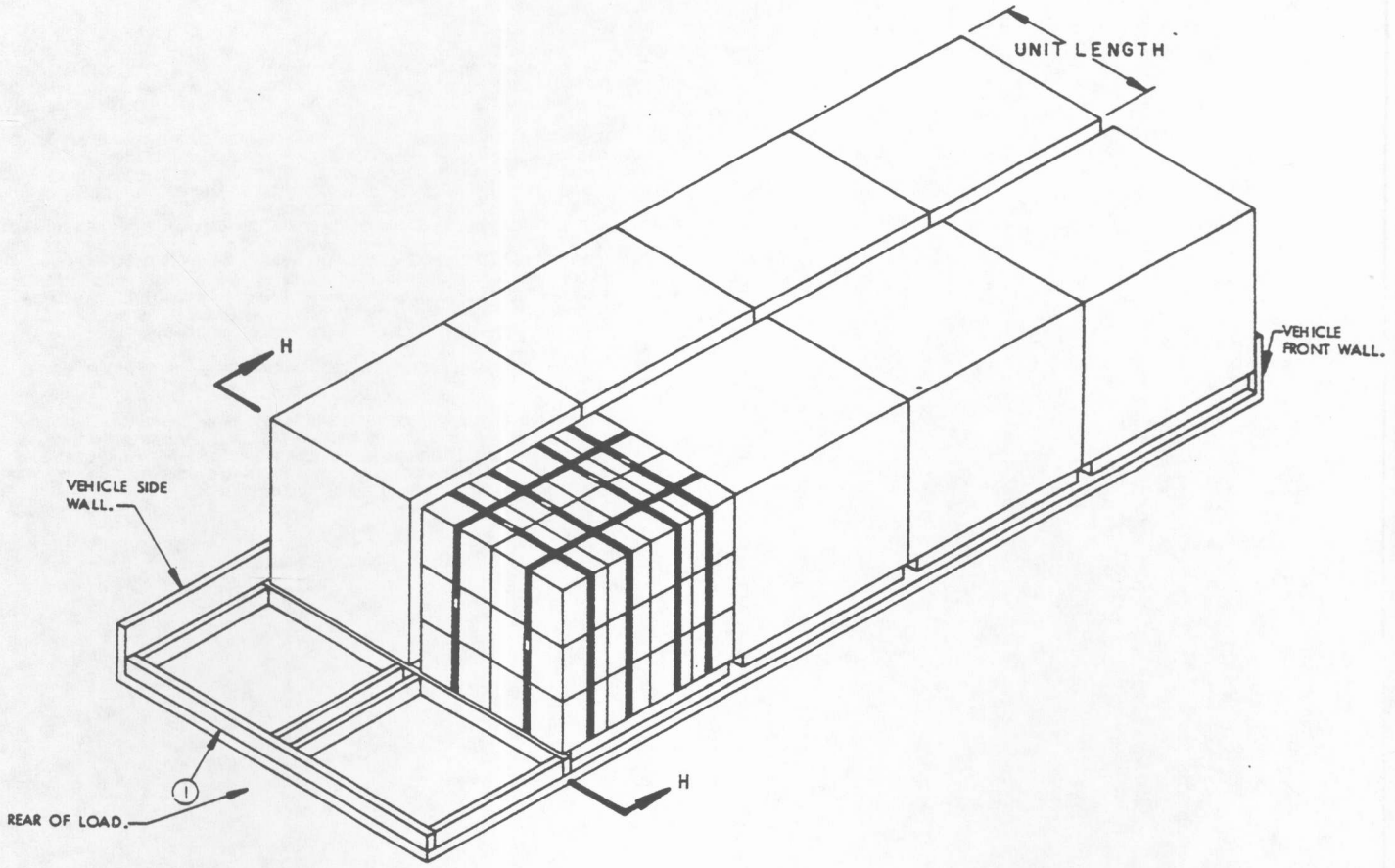
5. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 3" NO REAR BLOCKING IS REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 3" BUT LESS THAN 12" USE SOLID FILL REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 32. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12", USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 34.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	19	13
NAILS	NO. REQD	POUNDS
10d (3")	16	1/4

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
SKIDDED UNIT	12	9,120 LBS
DUNNAGE		27 LBS
TOTAL WEIGHT		9,147 LBS

TRUCK, CARGO, 5 TON, M54 (TYPICAL)

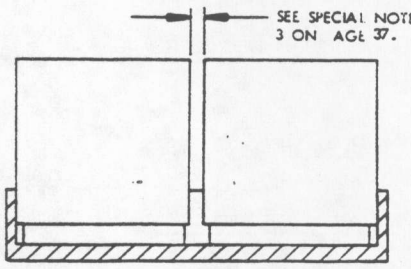


ISOMETRIC VIEW

A PALLETIZED UNIT IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO PALLETIZED OR SKIDDED UNITS.

KEY NUMBER

(1) REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY B" DETAIL ON PAGE 55. SEE SPECIAL NOTE 5 ON PAGE 37.



SECTION H-H

TRUCK, CARGO, 5 TON, M55 (TYPICAL)

SPECIAL NOTES:

1. A TYPICAL LOAD OF BOXED AMMUNITION ASSEMBLED ON A 40" X 48" PALLET IS SHOWN LOADED IN A TRUCK, CARGO, 5 TON, M55, HAVING INSIDE DIMENSIONS OF 20'-4" LONG BY 7'-4" WIDE. TRUCKS OF OTHER DIMENSIONS CAN BE USED.

2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL 2-WIDE LOAD ON PAGE 36 HAS OVERALL DIMENSIONS OF 42-1/2" LONG BY 50-1/2" WIDE BY 47" HIGH AND A WEIGHT OF 1,372 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR PALLETIZED UNITS OF OTHER DIMENSIONS, AND SKIDDED UNITS. REFER TO "CHART NO. 1" AND "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.

3. IF THE TOTAL EXCESS SPACE ACROSS THE VEHICLE WIDTH IS GREATER THAN 6", SPACER ASSEMBLIES SHOWN AS PIECE MARKED (1) ON PAGE 30, WILL BE REQUIRED. IF THE EXCESS SPACE IS GREATER THAN 6" AND THE UNIT HEIGHT IS GREATER THAN 44", "TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLIES" SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 30, WILL BE REQUIRED.

4. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED.

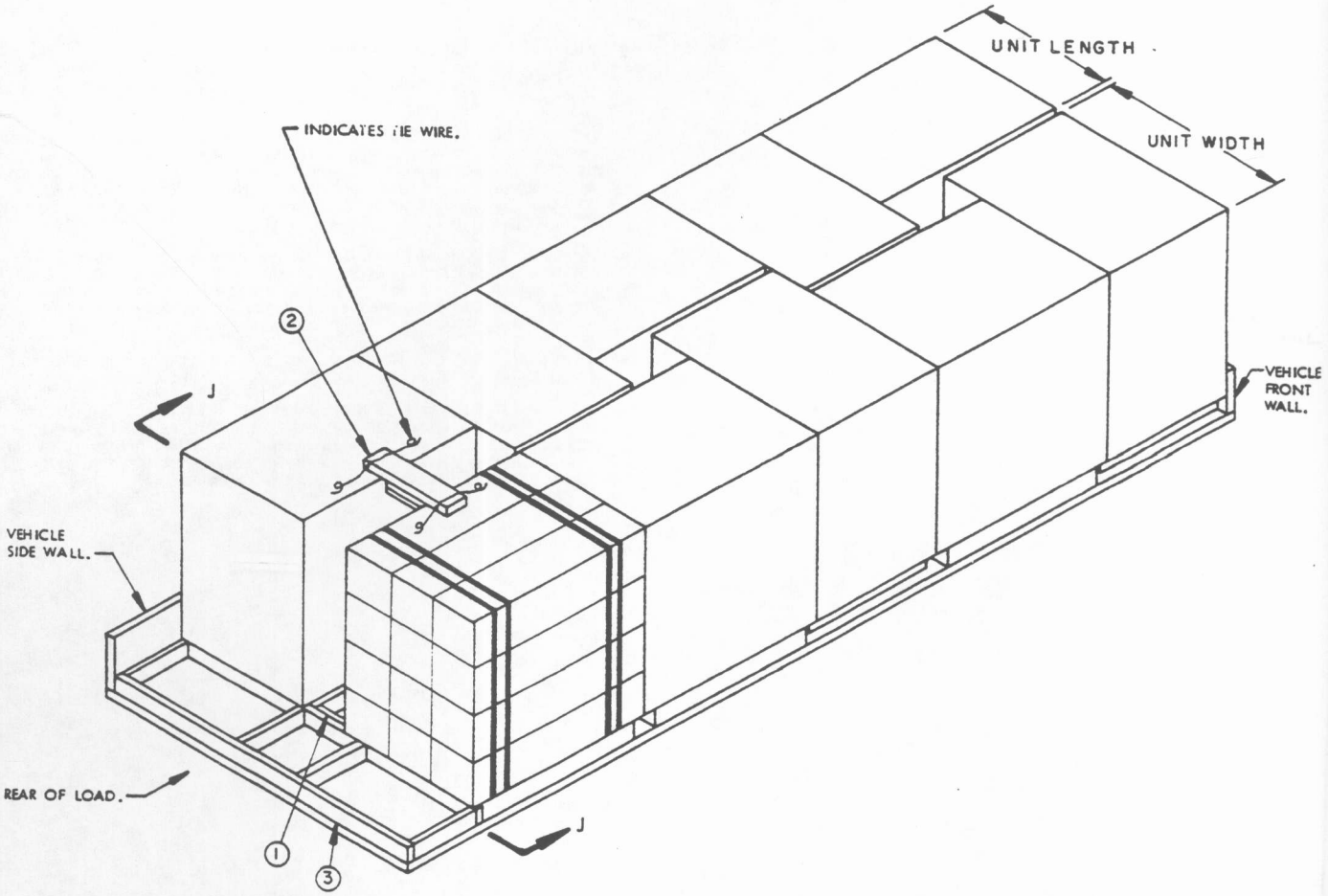
5. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 3" NO REAR BLOCKING IS REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 3" BUT LESS THAN 12", USE SOLID FILL REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 32. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12", USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 36.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	28	19
NAILS	NO. REQD	POUNDS
10d (3")	16	1/4

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLETIZED UNIT	8	10,976 LBS
DUNNAGE		39 LBS
TOTAL WEIGHT		11,015 LBS

TRUCK, CARGO, 5 TON, M55 (TYPICAL)



ISOMETRIC VIEW

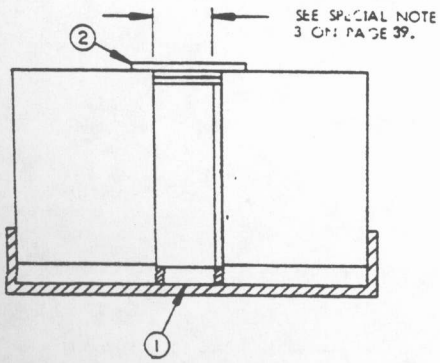
A SKIDDED UNIT IS DEPICTED. THE LOAD PROCEDURES ARE ONLY APPLICABLE TO SKIDDED UNITS OR ITEMS ASSEMBLIED ON THE 35" X 45-1/2" PALLET.

KEY NUMBERS

(1) SPACER ASSEMBLY (1 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 54. SEE SPECIAL NOTE 3 ON PAGE 39.

(2) TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 54. WIRE TIE TO A UNIT UNITIZING STRAP WITH NO. 14 GAGE WIRE AS SHOWN BY THE "POSITIONING OF TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLY" ON PAGE 54. SEE SPECIAL NOTE 3 ON PAGE 39.

(3) REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY B" DETAIL ON PAGE 55. SEE SPECIAL NOTE 5 ON PAGE 39.



SECTION J-J

SPECIAL NOTES:

1. A TYPICAL LOAD OF BOXED AMMUNITION ASSEMBLED ON A SKIDDED BASE IS SHOWN IN A TRUCK, CARGO, 5 TON, M55, HAVING INSIDE DIMENSIONS OF 20'-4" LONG BY 7'-4" WIDE. TRUCKS OF OTHER DIMENSIONS CAN BE USED.

2. THE SKIDDED UNIT SHOWN IN THE TYPICAL CHIMNEY PATTERN LOAD ON PAGE 38 HAS OVERALL DIMENSIONS OF 36" LONG BY 51" WIDE BY 54" HIGH AND A WEIGHT OF 1,990 POUNDS. THE DEPICTED PROCEDURES ARE ONLY APPLICABLE TO SKIDDED UNITS, AND ITEMS ASSEMBLED ON THE 35" X 45-1/2" PALLET. REFER TO "CHART NO. 1" AND "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.

3. IF THE TOTAL EXCESS SPACE ACROSS THE VEHICLE WIDTH IS GREATER THAN 6", SPACER ASSEMBLIES SHOWN AS PIECE MARKED ① ON PAGE 38, WILL BE REQUIRED. IF THE EXCESS SPACE IS GREATER THAN 6" AND THE UNIT HEIGHT IS GREATER THAN 44", "TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLIES" SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 38, WILL BE REQUIRED.

4. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED.

5. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 3", NO REAR BLOCKING IS REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 3" BUT LESS THAN 12", USE SOLID FILL REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 32. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12", USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 38.

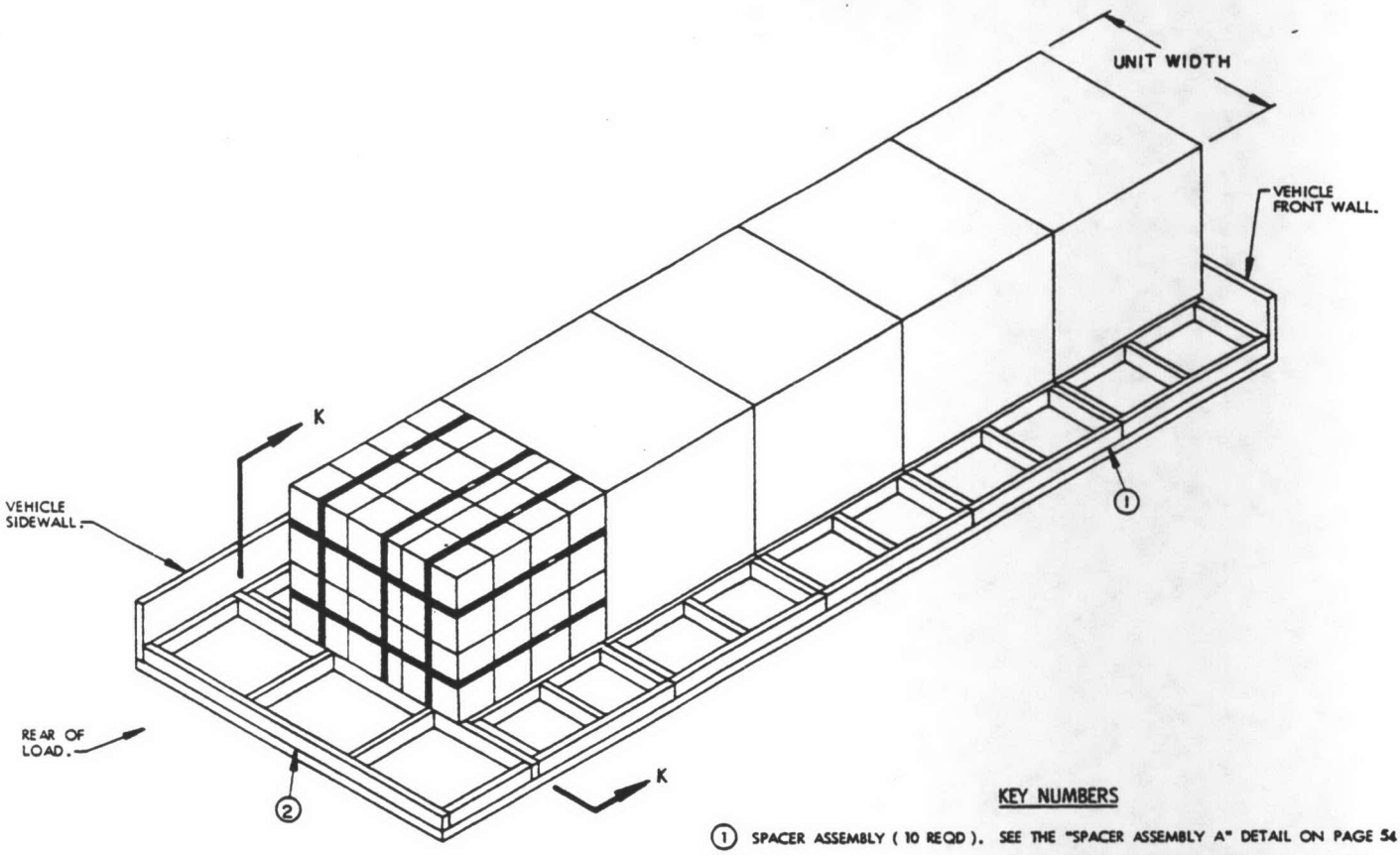
6. A CHIMNEY-PATTERN LOAD IS SHOWN ON PAGE 38. FOR AN ALTERNATIVE METHOD SEE THE LOAD ON PAGE 50.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	36	24
NAILS	NO. REQD	POUNDS
10d (3")	36	3/4
WIRE, NO. 14 GAGE -------- 12' REQD ---------- ------ 1/2 LB		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
SKIDDED UNIT	10	19,900 LBS
DUNNAGE		50 LBS
TOTAL WEIGHT		19,950 LBS

TRUCK, CARGO, 5 TON, M55 (TYPICAL)



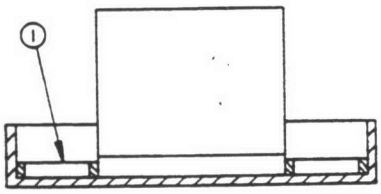
ISOMETRIC VIEW

A PALLETIZED UNIT IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO PALLETIZED OR SKIDDED UNITS.

KEY NUMBERS

(1) SPACER ASSEMBLY (10 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 54.

(2) REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY B" DETAIL ON PAGE 55 SEE SPECIAL NOTE 4 ON PAGE 41.



SECTION K-K

SPECIAL NOTES:

1. A TYPICAL LOAD OF BOXED AMMUNITION ASSEMBLED ON A 40" X 48" PALLET IS SHOWN LOADED IN A TRUCK, CARGO, 5 TON, M55, HAVING INSIDE DIMENSIONS OF 20'-4" LONG BY 7'-4" WIDE. TRUCKS OF OTHER DIMENSIONS CAN BE USED.

2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL 1-WIDE LOAD ON PAGE 40 HAS OVERALL DIMENSIONS OF 44" LONG BY 48" WIDE BY 42-1/2" HIGH AND A WEIGHT OF 1,996 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR PALLETIZED UNITS OF OTHER DIMENSIONS AND SKIDDED UNITS. NOTE: UNITS WHICH ARE 44" LONG OR GREATER WILL NOT FIT 2-WIDE AND MUST BE LOADED AS SHOWN ON PAGE 40. REFER TO "CHART NO. 1" AND "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.

3. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED.

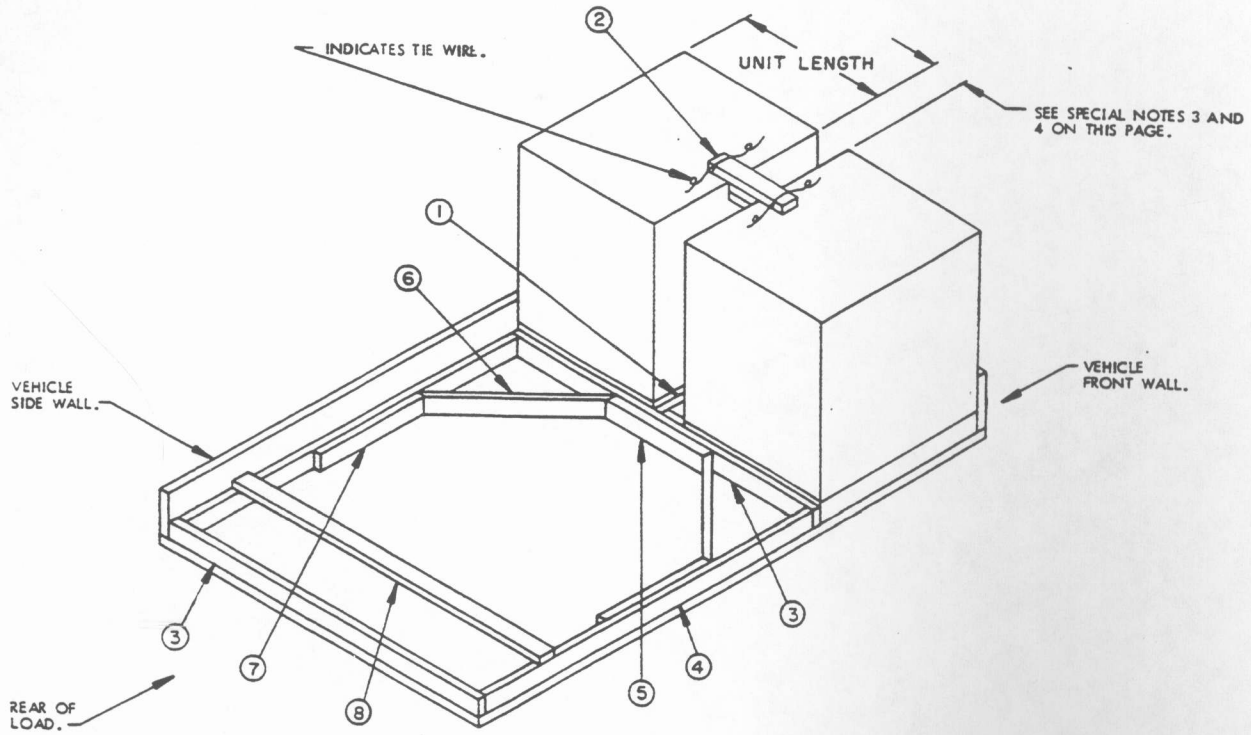
4. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 3" NO REAR BLOCKING IS REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 3" BUT LESS THAN 12" USE SOLID FILL REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 32. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12" USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 40.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	136	91
NAILS	NO. REQD	POUNDS
10d (3")	136	2-1/4

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLETIZED UNIT	5	9,980 LBS
DUNNAGE		185 LBS
TOTAL WEIGHT		10,165 LBS

TRUCK, CARGO, 5 TON, M55 (TYPICAL)



TYPICAL LTL

A PALLETIZED UNIT IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO PALLETIZED OR SKIDDED UNITS.

SPECIAL NOTES:

1. A TYPICAL LTL LOAD OF BOXED AMMUNITION ASSEMBLED ON A 40" X 48" PALLET IS SHOWN LOADED IN A TRUCK, CARGO, 2-1/2 TON, M35, HAVING INSIDE DIMENSIONS OF 12'-3" LONG BY 7'-4" WIDE. TRUCKS OF OTHER DIMENSIONS CAN BE USED.
2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LTL LOAD ON THIS PAGE HAS OVERALL DIMENSIONS OF 40" LONG BY 48" WIDE BY 50-1/2" HIGH AND A WEIGHT OF 1,764 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR PALLETIZED UNITS OF OTHER DIMENSIONS AND SKIDDED UNITS. REFER TO "CHART NO. 1" AND "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN IN THE LOAD VIEW AS PIECE MARKED ②, ARE TO BE POSITIONED BETWEEN ALL LATERALLY ADJACENT UNITS WHICH ARE OVER 44" HIGH. NOTE: TOP-OF-LOAD ANTI-SWAY BRACES ARE NOT REQUIRED IF THE TOTAL EXCESS SPACE ACROSS THE VEHICLE IS 6" OR LESS.
4. SPACER ASSEMBLIES, SHOWN AS PIECES MARKED ①, MUST BE POSITIONED BETWEEN EACH TWO (2) LATERALLY ADJACENT UNITS. NOTE: SPACER ASSEMBLIES ARE NOT REQUIRED IF THE TOTAL EXCESS SPACE ACROSS THE VEHICLE IS 6" OR LESS.
5. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED.
6. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 8'-0" USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 36.
7. ALL LTL LOADS, REGARDLESS OF THEIR SIZE, REQUIRE ONE STRUT BRACE POSITIONED NEAR THE REAR OF THE TRUCK AND NAILED TO THE SIDE STRUTS. IF THE SIDE STRUTS, PIECES MARKED ④, ARE LONGER THAN 7'-0", AN ADDITIONAL STRUT BRACE, PIECE MARKED ⑧, MUST BE APPLIED FOR EVERY 7'-0" OF SIDE STRUT LENGTH.
8. THE "K-BRACE" BLOCKING, SHOWN AS PIECES MARKED ③ THRU ⑧, IS ADEQUATE FOR RETAINING A MAXIMUM LTL LOAD.
9. DEPENDING ON THE NUMBER OF UNITS BEING LOADED, EACH OF THE SIDE STRUTS, PIECES MARKED ④, MAY NEED TO BE FORMED FROM MORE THAN ONE PIECE OF MATERIAL. IF SUCH IS THE CASE, THE SIDE STRUTS MUST BE SPLICED. SPLICING CAN BE ACCOMPLISHED BY CENTERING A 2" X 4" X 24" PIECE ON THE JOINT OF THE SIDE STRUTS AND NAILING IT TO THE SIDE STRUTS W/4-10d NAILS AT EACH END.

KEY NUMBERS

① SPACER ASSEMBLY (1 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 54. SEE SPECIAL NOTE 4 ON THIS PAGE.

② TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 54. WIRE TIE TO A UNIT UNITIZING STRAP WITH NO. 14 GAGE WIRE AS SHOWN BY THE "POSITIONING OF TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLY" ON PAGE 54. SEE SPECIAL NOTE 3 ON THIS PAGE.

③ HEADER, 2" X 4" BY TRUCK WIDTH MINUS 1/2" IN LENGTH (2 REQD).

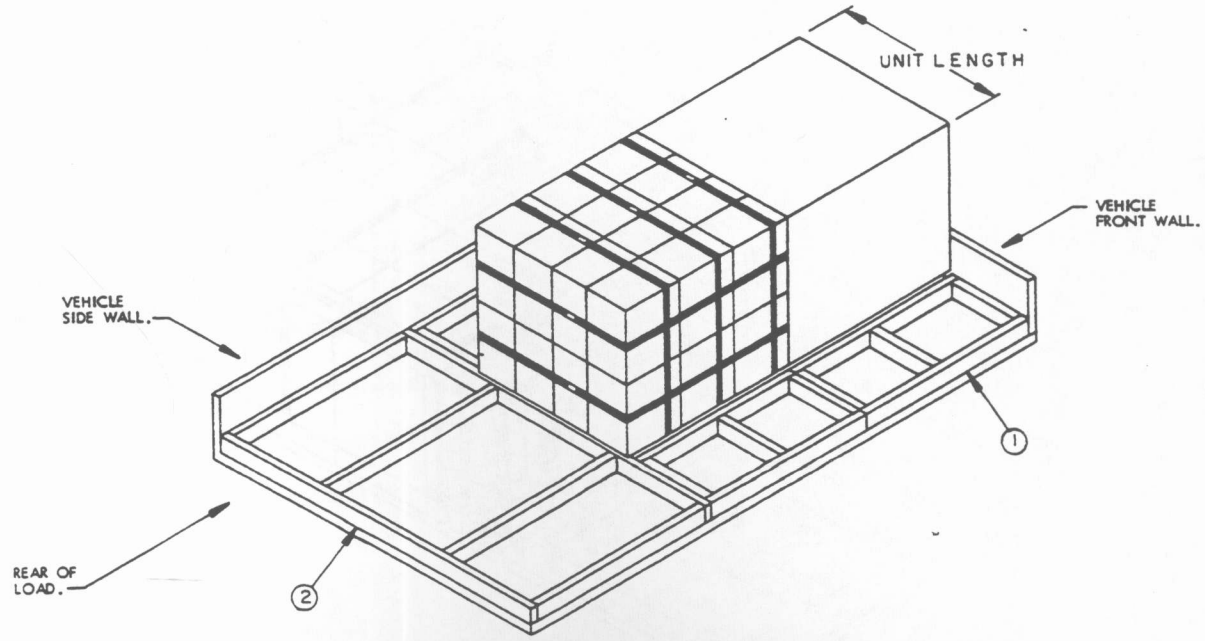
④ SIDE STRUT, 2" X 4" BY CUT-TO-FIT BETWEEN THE FORWARD AND REAR HEADERS, PIECES MARKED ③, (2 REQD). TOENAIL TO THE HEADERS W/2-12d NAILS AT EACH END. SEE SPECIAL NOTE 9 ON THIS PAGE.

⑤ CENTER CLEAT, 2" X 4" X 30" (1 REQD). NAIL TO A HEADER, PIECE MARKED ③, W/7-10d NAILS.

⑥ DIAGONAL BRACE, 2" X 4" BY CUT-TO-FIT (2 REQD). DOUBLE BEVEL EACH END WITH 45° CUTS. INSTALL AT A 45° ANGLE AS SHOWN AND TOENAIL TO A HEADER AND A SIDE STRUT, PIECES MARKED ③ AND ④, W/2-16d NAILS AT EACH END.

⑦ SIDE CLEAT, 2" X 4" X 30" (2 REQD). NAIL TO A SIDE STRUT, PIECE MARKED ④, W/8-10d NAILS.

⑧ STRUT BRACE, 2" X 4" BY TRUCK WIDTH MINUS 1/2" IN LENGTH (MINIMUM OF ONE REQUIRED). POSITION NEAR REAR OF TRUCK AND NAIL TO THE SIDE STRUTS, PIECES MARKED ④, W/2-12d NAILS AT EACH END. SEE SPECIAL NOTE 7 ON THIS PAGE.



TYPICAL LTL

A PALLETIZED UNIT IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO PALLETIZED OR SKIDDED UNITS.

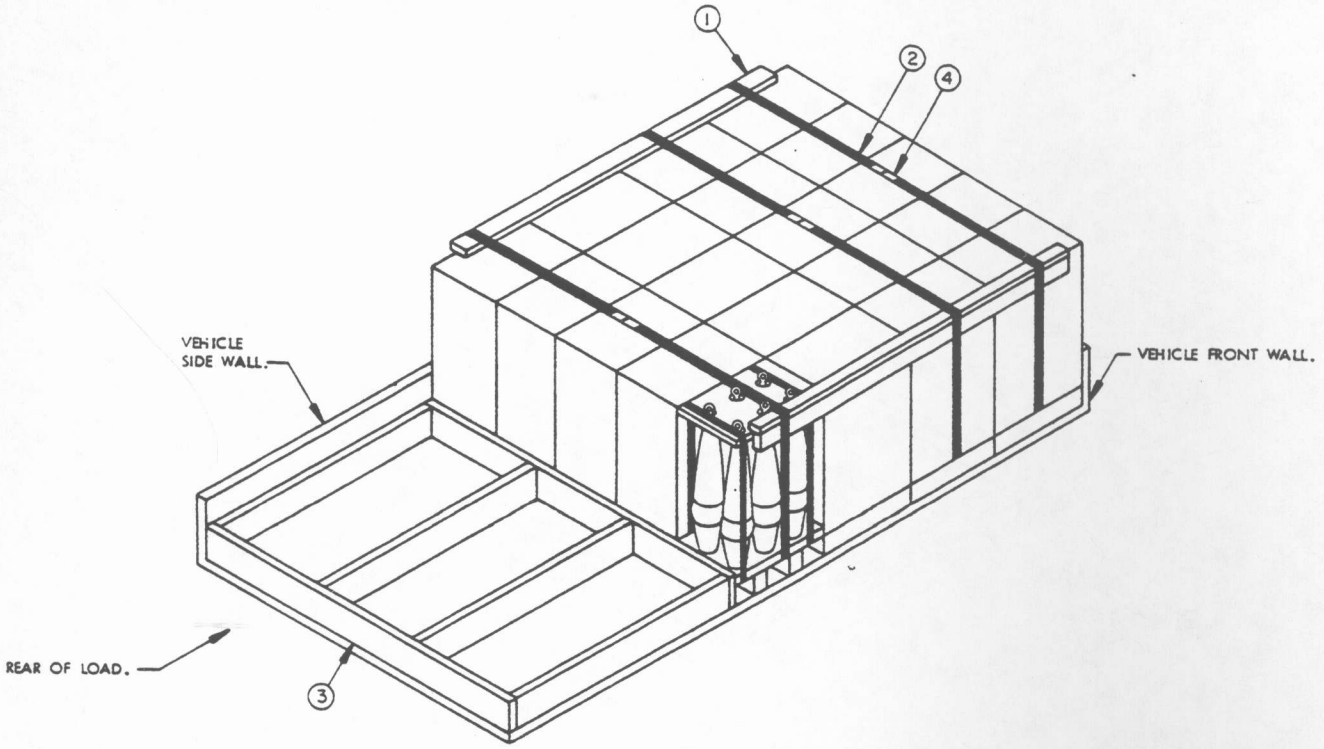
SPECIAL NOTES:

1. A TYPICAL LTL LOAD OF BOXED AMMUNITION ASSEMBLED ON A 40" X 48" PALLET IS SHOWN LOADED IN A TRUCK, CARGO, 2-1/2 TON, M35, HAVING INSIDE DIMENSIONS OF 12'-3" LONG BY 7'-4" WIDE. TRUCKS OF OTHER DIMENSIONS CAN BE USED.
2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LTL LOAD ON THIS PAGE HAS OVERALL DIMENSIONS OF 44" LONG BY 48" WIDE BY 42-1/2" HIGH AND A WEIGHT OF 1,996 POUNDS. THE DEPICTED PROCEDURES ARE APPLICABLE FOR UNITS WHICH CAN NOT BE POSITIONED TWO (2) WIDE ACROSS THE VEHICLE WIDTH DUE TO THE SIZE OF THE UNIT. HOWEVER, THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR PALLETIZED UNITS OF OTHER DIMENSIONS AND SKIDDED UNITS. REFER TO "CHART NO. 1" AND "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.
3. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED.
4. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 3" NO REAR BLOCKING IS REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 3" BUT LESS THAN 12" USE SOLID FILL REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 32. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12" USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 36.

KEY NUMBERS

(1) SPACER ASSEMBLY (4 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 54.

(2) REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY B" DETAIL ON PAGE 55. SEE SPECIAL NOTE 4 ON THIS PAGE.



ISOMETRIC VIEW

THE 175MM, 6/PALLET, SLP IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO UNITS OF OTHER DIMENSIONS.

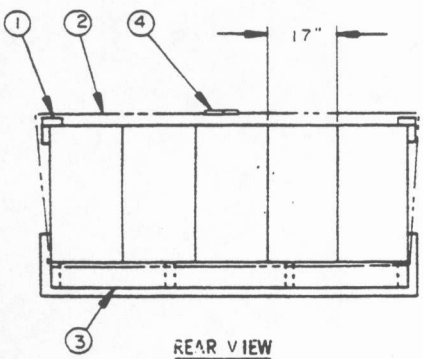
KEY NUMBERS

(1) ANTI-SWAY ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 54.

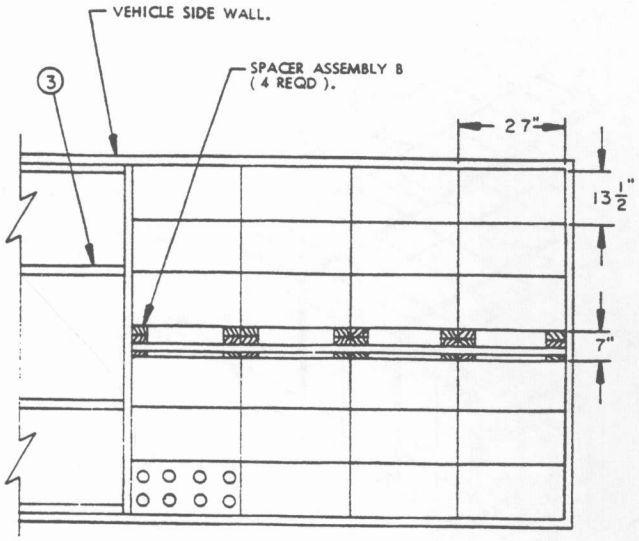
(2) ANTI-SWAY STRAPPING, 1-1/4" X .035" X 24'-0" LONG STEEL STRAPPING (3 REQD). INSTALL TO ENCIRCLE FIVE (5) LATERALLY ADJACENT UNITS AND THE "ANTI-SWAY ASSEMBLY" AS SHOWN.

(3) REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY B" DETAIL ON PAGE 55. SEE SPECIAL NOTE 4 ON PAGE 45.

(4) SEAL FOR 1-1/4" STRAPPING (6 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



REAR VIEW



PARTIAL PLAN VIEW

THE PARTIAL PLAN VIEW SHOWN ABOVE DEPICTS THE PROCEDURES TO BE USED WHEN THE EXCESS SPACE ACROSS THE VEHICLE WIDTH IS 6" OR GREATER. A LOAD OF 155MM, 8/PALLET, SLP IS SHOWN IN A TRUCK, CARGO, 5 TON, M54 AS A TYPICAL LOAD. KEY NUMBERS ① THROUGH ④ SHOWN IN THE LOAD ON PAGE 44 AND FOUR (4) "SPACER ASSEMBLY B" DETAILS, AS SHOWN ABOVE, ARE REQUIRED. SEE THE "SPACER ASSEMBLY B" DETAIL ON PAGE 56.

SPECIAL NOTES:

1. A TYPICAL LOAD OF PALLETIZED SEPARATE LOADING PROJECTILES IS SHOWN LOADED IN A TRUCK, CARGO, 5 TON, M54, HAVING INSIDE DIMENSIONS OF 14'-0" LONG BY 7'-4" WIDE. TRUCKS OF OTHER DIMENSIONS CAN BE USED.

2. THE 175MM, 6/PALLET, SEPARATE LOADING PROJECTILE SHOWN IN THE LOAD ON PAGE 44 HAS OVERALL DIMENSIONS OF 17" LONG BY 25-1/2" WIDE BY 41" HIGH AND A WEIGHT OF 934 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR UNITS OF OTHER DIMENSIONS. IF SHIPPING THE 155MM, 8/PALLET, SEE THE "PARTIAL PLAN VIEW" ON THIS PAGE. IF SHIPPING THE 8", 3/PALLET OR 8", 6/PALLET, SEE THE PROCEDURES ON PAGES 46 AND 47. SEE GENERAL NOTE "F" ON PAGE 2.

3. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED. A LOAD CAN BE INCREASED OR REDUCED BY A MULTIPLE OF FIVE (5) UNITS AND USING THE SAME PROCEDURES SHOWN ON PAGE 44, A LOAD CAN BE REDUCED BY ONE (1) OR MORE PALLET UNITS BY USING A "FILLER ASSEMBLY" AS SHOWN ON PAGE 52 IN LIEU OF EACH OMITTED PALLET.

4. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 3", NO REAR BLOCKING IS REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 3" BUT LESS THAN 12", USE SOLID FILL REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 32. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12", USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 44.

5. SEE THE "TYPICAL LADING ITEMS" ON PAGE 5 FOR A DETAIL VIEW OF THE 175MM, 6/PALLET, SLP, SHOWN IN THE LOAD ON PAGE 44.

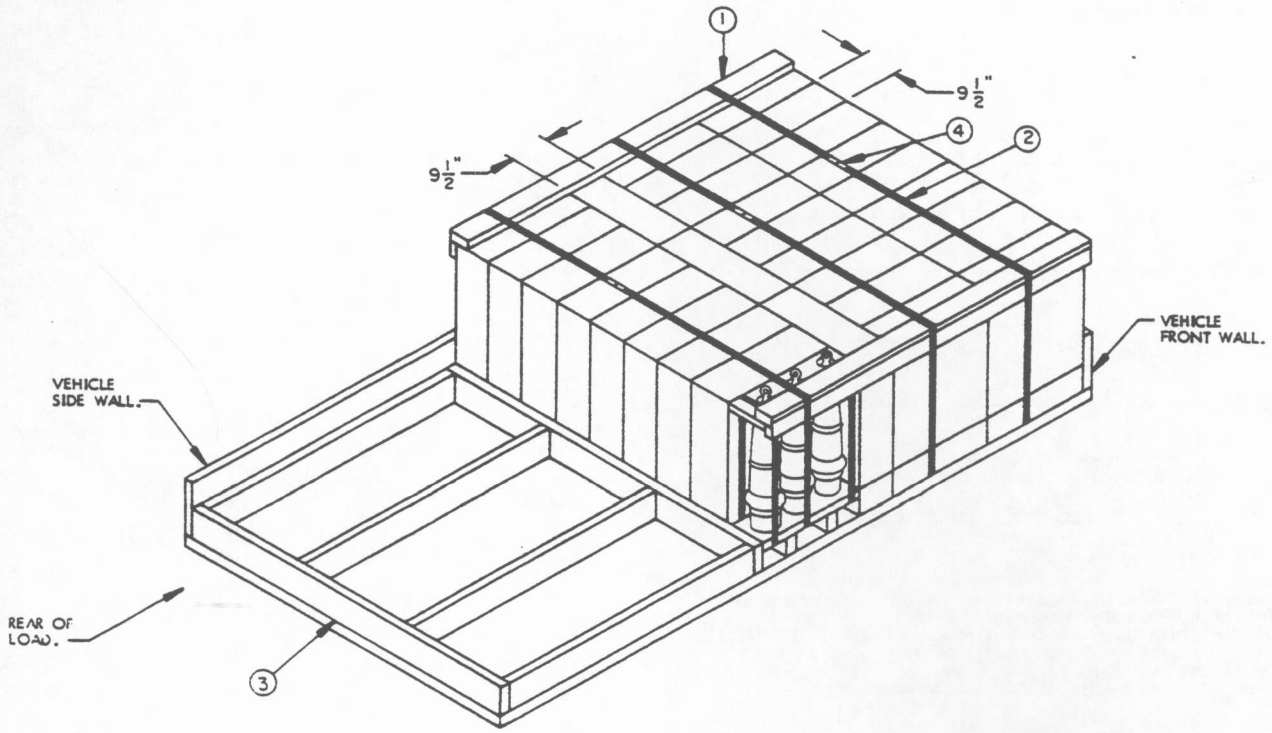
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	32	22
2" X 6"	36	36
NAILS	**NO. REQD**	**POUNDS**
10d (3")	50	1
STEEL STRAPPING, 1-1/4" X .035" ---- 72' REQD -------- 11 LBS		
SEAL FOR 1-1/4" STRAPPING ------- 6 REQD -------- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
175MM, SLP	20	18,680 LBS
DUNNAGE		128 LBS
TOTAL WEIGHT		18,808 LBS

TRUCK, CARGO, 5 TON, M54 (TYPICAL)



ISOMETRIC VIEW

THE 8", 3/PALLET, SLP IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO UNITS OF OTHER DIMENSIONS.

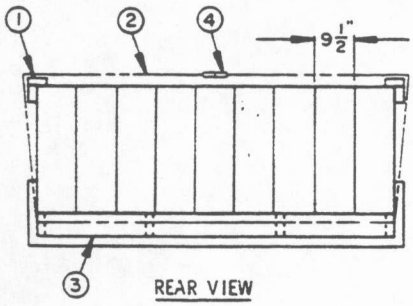
KEY NUMBERS

(1) ANTI-SWAY ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 54.

(2) ANTI-SWAY STRAPPING, 1-1/4" X .035" X 24'-0" LONG STEEL STRAPPING (3 REQD). INSTALL TO ENCIRCLE NINE (9) LATERALLY ADJACENT UNITS AND THE "ANTI-SWAY ASSEMBLY" AS SHOWN.

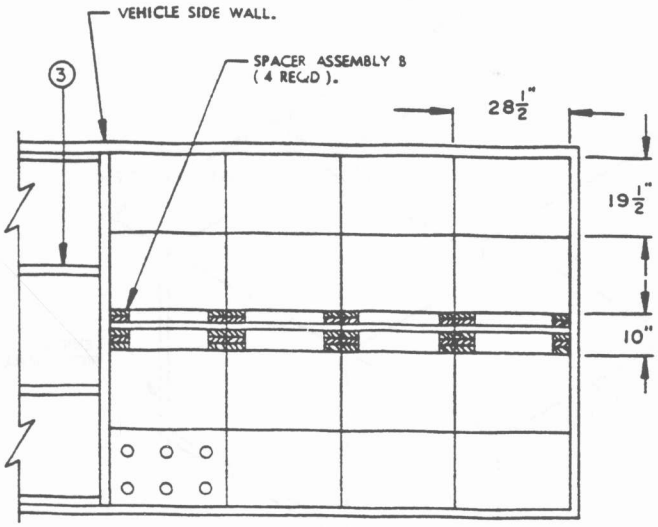
(3) REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY B" DETAIL ON PAGE 55. SEE SPECIAL NOTE 4 ON PAGE 47.

(4) SEAL FOR 1-1/4" STRAPPING (6 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



REAR VIEW

TRUCK, CARGO, 5 TON, M54 (TYPICAL)



PARTIAL PLAN VIEW

THE PARTIAL PLAN VIEW SHOWN ABOVE DEPICTS THE PROCEDURES TO BE USED WHEN THE EXCESS SPACE ACROSS THE VEHICLE WIDTH IS 6" OR GREATER. A LOAD OF 8", 6/PALLET, SLP IS SHOWN IN A TRUCK, CARGO, 5 TON, M54 AS A TYPICAL LOAD. KEY NUMBERS ① THROUGH ④ SHOWN IN THE LOAD ON PAGE 46 AND FOUR (4) "SPACER ASSEMBLY B" DETAILS, AS SHOWN ABOVE, ARE REQUIRED. SEE THE "SPACER ASSEMBLY B" DETAIL ON PAGE 56.

SPECIAL NOTES:

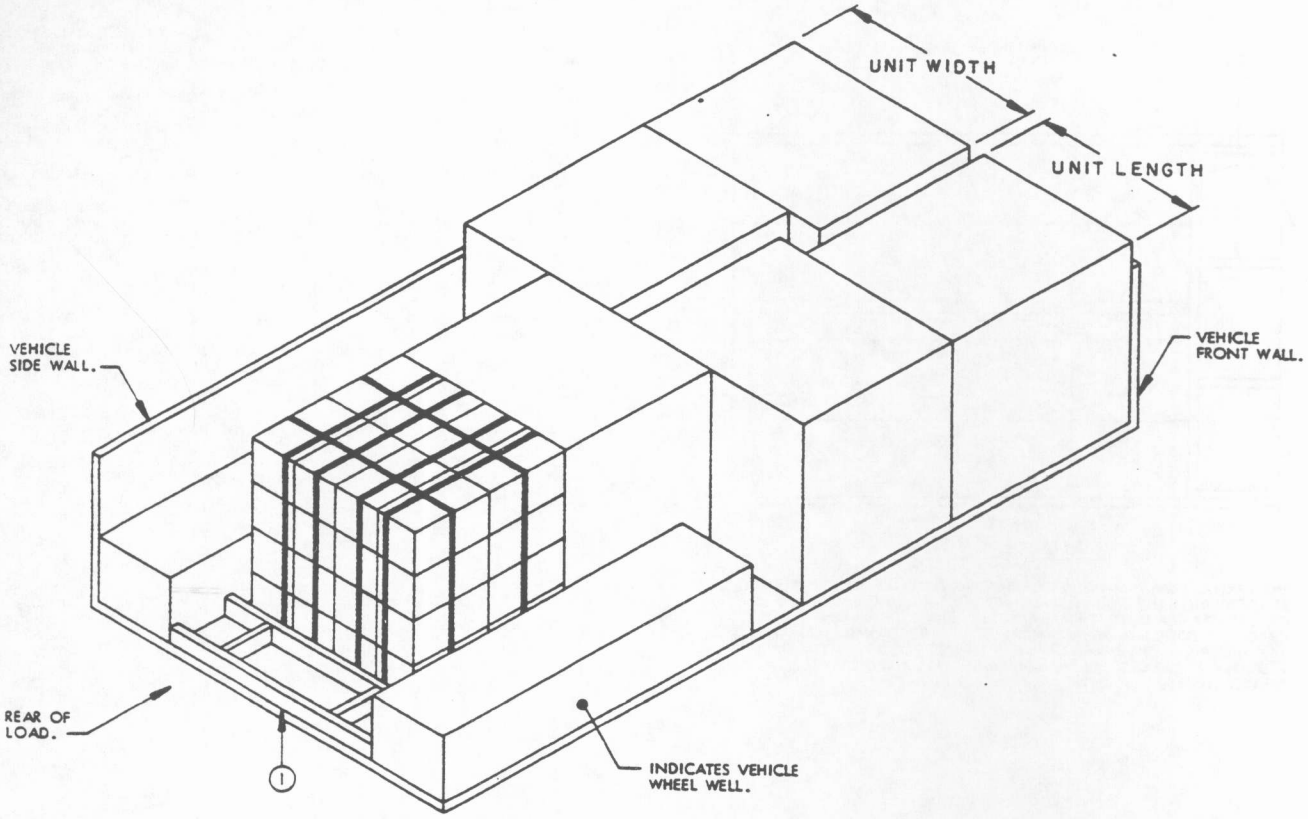
1. A TYPICAL LOAD OF PALLETIZED SEPARATE LOADING PROJECTILES IS SHOWN LOADED IN A TRUCK, CARGO, 5 TON, M54, HAVING INSIDE DIMENSIONS OF 14'-0" LONG BY 7'-4" WIDE. TRUCKS OF OTHER DIMENSIONS CAN BE USED.
2. THE 8", 3/PALLET, SEPARATE LOADING PROJECTILE SHOWN IN THE LOAD ON PAGE 46 HAS OVERALL DIMENSIONS OF 9-1/2" LONG BY 28-1/2" WIDE BY 38-1/2" HIGH AND A WEIGHT OF 633 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR UNITS OF OTHER DIMENSIONS. IF SHIPPING THE 8", 6/PALLET, SEE THE "PARTIAL PLAN VIEW" ON THIS PAGE. IF SHIPPING THE 155MM, 8/PALLET, SEE THE "PARTIAL PLAN VIEW" ON PAGE 45. SEE GENERAL NOTE "F" ON PAGE 2.
3. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED. A LOAD CAN BE INCREASED OR REDUCED BY A MULTIPLE OF NINE (9) UNITS AND USING THE SAME PROCEDURES SHOWN ON PAGE 46. A LOAD CAN BE REDUCED BY ONE (1) OR MORE PALLET UNITS BY USING A "FILLER ASSEMBLY" AS SHOWN ON PAGE 52. IN LIEU OF EACH OMITTED PALLET.
4. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 3" NO REAR BLOCKING IS REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 3" BUT LESS THAN 12" USE SOLID FILL REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 32. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12" USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 46.
5. PALLET UNITS POSITIONED WITH THE WIDTH ACROSS THE VEHICLE SHOULD NOT BE POSITIONED IN THE FIRST ROW OR THE LAST ROW.
6. SEE THE "TYPICAL LADING ITEMS" ON PAGE 5 FOR A DETAIL VIEW OF THE 8", 6/PALLET, SLP, SHOWN IN THE "PARTIAL PLAN VIEW" ON THIS PAGE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4" 2" X 6"	32 38	22 38
NAILS	NO. REQD	POUNDS
10d (3")	50	1
STEEL STRAPPING, 1-1/4" X .035" ------ 72' REQD ---------- 11 LBS SEAL FOR 1-1/4" STRAPPING ---------- 6 REQD ---------- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
8", SLP	30	18,990 LBS
DUNNAGE		132 LBS
TOTAL WEIGHT		19,122 LBS

TRUCK, CARGO, 5 TON, M54 (TYPICAL)

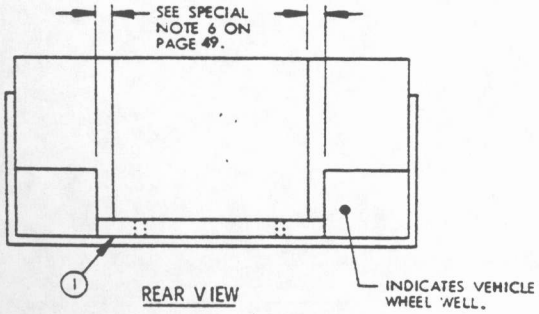


ISOMETRIC VIEW

A PALLETIZED UNIT IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO PALLETIZED OR SKIDDED UNITS.

KEY NUMBER

(1) REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY D" ON PAGE 56. SEE SPECIAL NOTE 4 ON PAGE 49.



REAR VIEW

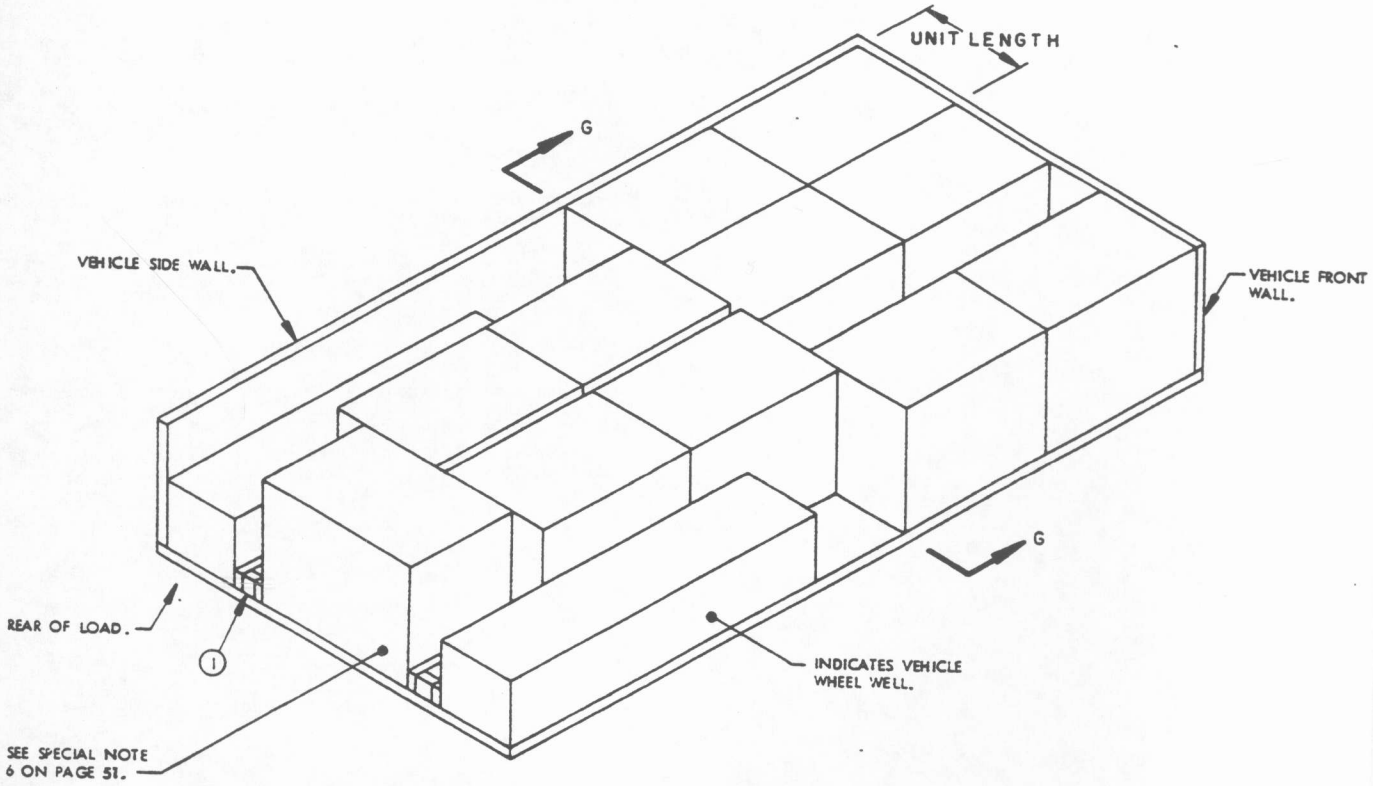
SPECIAL NOTES:

1. A TYPICAL LOAD OF BOXED AMMUNITION ASSEMBLED ON A 40" X 48" PALLET IS SHOWN LOADED IN A TRUCK, CARGO, 8 TON, M520, HAVING INSIDE DIMENSIONS OF 16'-4" LONG BY 8'-2-1/2" WIDE. TRUCKS OF OTHER DIMENSIONS CAN BE USED.
2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL 2-WIDE LOAD ON PAGE 48 HAS OVERALL DIMENSIONS OF 42-1/2" LONG BY 51" WIDE BY 45-1/2" HIGH AND A WEIGHT OF 2,180 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR PALLETIZED UNITS OF OTHER DIMENSIONS AND SKIDDED UNITS. REFER TO "CHART NO. 1" AND "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.
3. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED.
4. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 3" NO REAR BLOCKING IS REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 3" BUT LESS THAN 12" USE SOLID FILL REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 32. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12" USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 48.
5. A CHIMNEY-PATTERN LOAD IS SHOWN ON PAGE 48. FOR AN ALTERNATIVE METHOD SEE THE LOAD ON PAGE 50.
6. IF THE TOTAL EXCESS SPACE ACROSS THE VEHICLE WIDTH IS GREATER THAN 6" POSITION "SOLID FILL" (FABRICATED FROM 2" X 4" MATERIAL, ON EDGE AND LAMINATED W/10d NAILS) BETWEEN THE UNIT AND THE VEHICLE WHEEL WELL.
7. SEE THE "TYPICAL LADING ITEMS" ON PAGE 4 FOR A DETAIL VIEW OF THE PALLETIZED UNIT, SHOWN IN THE LOAD ON PAGE 48.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	13	9
NAILS	NO. REQD	POUNDS
10d (3")	8	1/4

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLETIZED UNIT	6	13,080 LBS
DUNNAGE		19 LBS
TOTAL WEIGHT		13,099 LBS

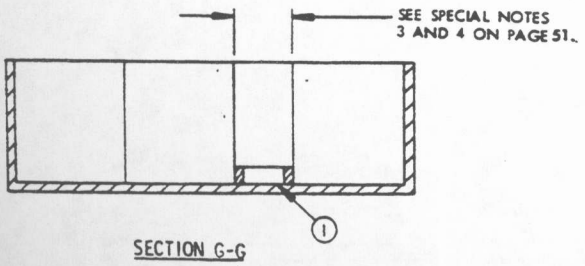


ISOMETRIC VIEW

A SKIDDED UNIT IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO SKIDDED OR PALLETIZED UNITS.

KEY NUMBER

(1) SPACER ASSEMBLY (3 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 54. SEE SPECAIL NOTE 4 ON PAGE 51.



SECTION G-G

TRUCK, CARGO, 8 TON, M520 (TYPICAL)

SPECIAL NOTES:

1. A TYPICAL LOAD OF BOXED AMMUNITION ASSEMBLED ON A SKIDDED BASE IS SHOWN LOADED IN A TRUCK, CARGO, 8 TON, M520, HAVING INSIDE DIMENSIONS OF 16'-4" LONG BY 8'-2-1/2" WIDE. TRUCKS OF OTHER DIMENSIONS CAN BE USED.

2. THE SKIDDED UNIT SHOWN IN THE TYPICAL 3-WIDE LOAD ON PAGE 50 HAS OVERALL DIMENSIONS OF 28-1/4" LONG BY 41-5/8" WIDE BY 31" HIGH AND A WEIGHT OF 253 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR SKIDDED UNITS OF OTHER DIMENSIONS, AND PALLETIZED UNITS. REFER TO "CHART NO. 1" AND "CHART NO. 2" ON PAGE 3 FOR GUIDANCE. SEE GENERAL NOTE "F" ON PAGE 2.

3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 42, ARE TO BE POSITIONED BETWEEN ALL LATERALLY ADJACENT UNITS WHICH ARE OVER 44" HIGH. NOTE: TOP-OF-LOAD ANTI-SWAY BRACES ARE NOT REQUIRED IF THE TOTAL EXCESS SPACE ACROSS THE VEHICLE IS 6" OR LESS.

4. SPACER ASSEMBLIES, SHOWN AS PIECES MARKED (1) IN THE LOAD ON PAGE 30, MUST BE POSITIONED AT THE SIDES OF THE SINGLE UNIT AT THE REAR OF THE LOAD AND BETWEEN LATERALLY ADJACENT UNITS AT THE FORWARD END OF THE LOAD. NOTE: SPACER ASSEMBLIES ARE NOT REQUIRED BETWEEN LATERALLY ADJACENT UNITS AT THE FORWARD END OF THE LOAD OR AT SIDES OF THE REAR UNIT, IF THE TOTAL EXCESS SPACE ACROSS THE VEHICLE IS 6" OR LESS.

5. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED.

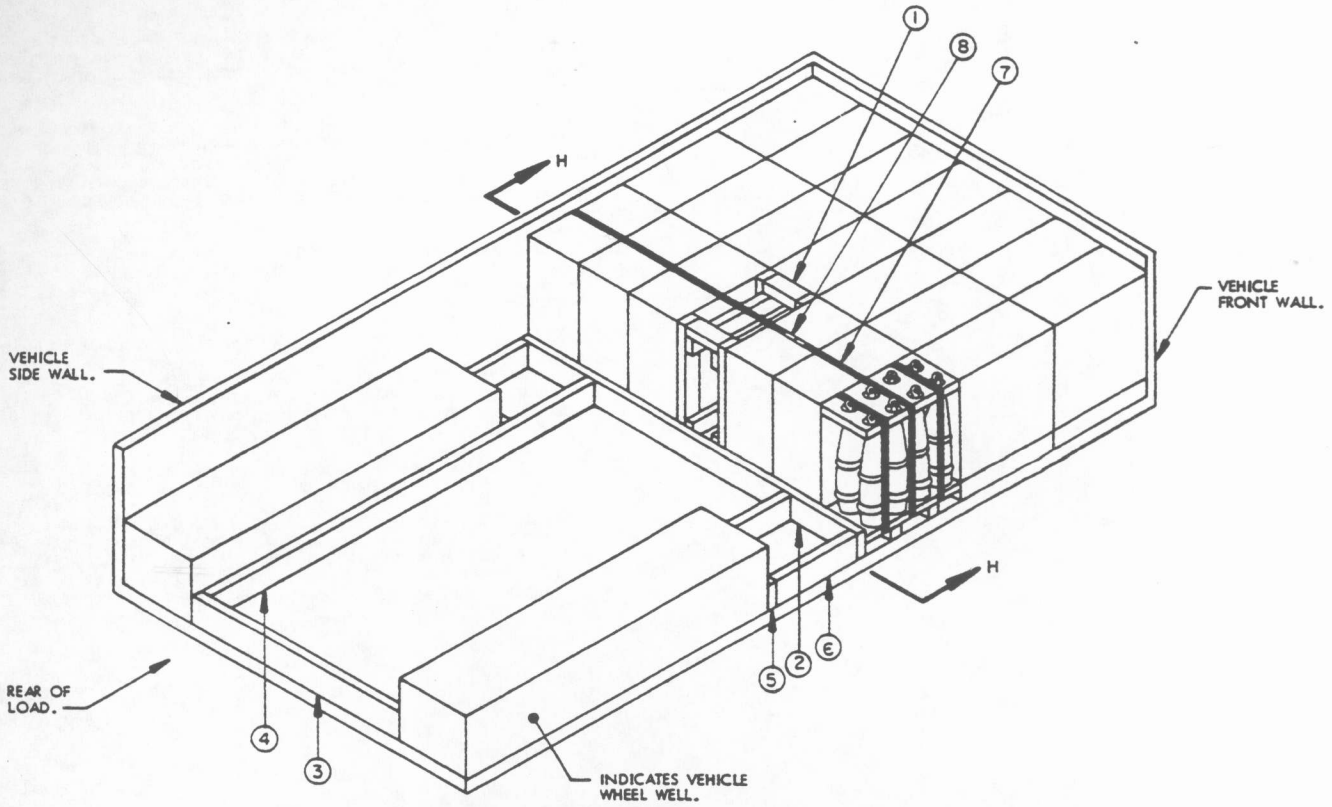
6. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 3", NO REAR BLOCKING IS REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 3" BUT LESS THAN 12", USE SOLID FILL REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 32. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12", USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 48.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	31	21
NAILS	NO. REQD	POUNDS
10d (3")	48	3/4

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
SKIDDED UNIT	11	2,783 LBS
DUNNAGE		43 LBS
TOTAL WEIGHT		2,826 LBS

TRUCK, CARGO, 8 TON, M520 (TYPICAL)



ISOMETRIC VIEW

THE 155MM, 8/PALLET, SLP IS DEPICTED. HOWEVER, THE LOAD PROCEDURES ARE APPLICABLE TO UNITS OF OTHER DIMENSIONS.

KEY NUMBERS

(1) FILLER ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 56. SEE SPECIAL NOTE 3 ON PAGE 53.

(2) FRONT BEARING PIECE, 2" X 6" BY VEHICLE WIDTH MINUS 1/2" (1 REQD). POSITION ON EDGE AS SHOWN.

(3) REAR BEARING PIECE, 2" X 6" BY LENGTH-TO-SUIT (1 REQD). POSITION ON EDGE AS SHOWN.

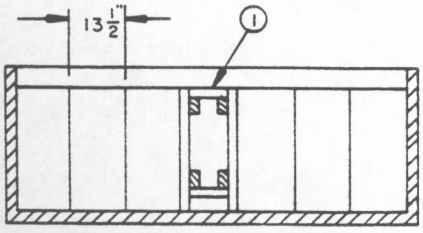
(4) STRUT, 2" X 6" BY CUT-TO-FIT (2 REQD). POSITION ON EDGE AND TOENAIL TO PIECES MARKED (2) AND (3) W/2-12d NAILS AT EACH END. NAIL TO PIECE MARKED (5) W/2-10d NAILS AT EACH JOINT.

(5) BUFFER PIECE, 2" X 6" BY CUT-TO-FIT (2 REQD). POSITION ON EDGE AGAINST WHEEL WELL AS SHOWN.

(6) STRUT, 2" X 6" BY CUT-TO-FIT (2 REQD). POSITION ON EDGE AND TOENAIL TO PIECES MARKED (2) AND (5) W/2-12d NAILS AT EACH END.

(7) UNITIZING STRAP, 1-1/4" X .035" X 24'-0" LONG STEEL STRAPPING (1 REQD). INSTALL TO ENCIRCLE SIX UNITS AND PIECE MARKED (1) AS SHOWN.

(8) SEAL FOR 1-1/4" STRAPPING (2 REQD). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



SECTION H-H

SPECIAL NOTES:

1. A TYPICAL LOAD OF PALLETIZED SEPARATE LOADING PROJECTILES IS SHOWN LOADED IN A TRUCK, CARGO, 8 TON, M520, HAVING INSIDE DIMENSIONS OF 16'-4" LONG BY 8'-2-1/2" WIDE. TRUCKS OF OTHER DIMENSIONS CAN BE USED.

2. THE 155MM, 8/PALLET, SEPARATE LOADING PROJECTILE SHOWN IN THE LOAD ON PAGE 52, HAS OVERALL DIMENSIONS OF 13-1/2" LONG BY 27" WIDE BY 31-1/2" HIGH AND A WEIGHT OF 800 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR UNITS OF OTHER DIMENSIONS.

3. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED. A LOAD CAN BE INCREASED OR REDUCED BY A MULTIPLE OF SEVEN (7) UNITS AND USING THE SAME PROCEDURES SHOWN ON PAGE 52. A LOAD CAN BE REDUCED BY ONE (1) OR MORE PALLET UNITS BY USING A "FILLER ASSEMBLY" AS SHOWN ON PAGE 52 IN LIEU OF EACH OMITTED PALLET.

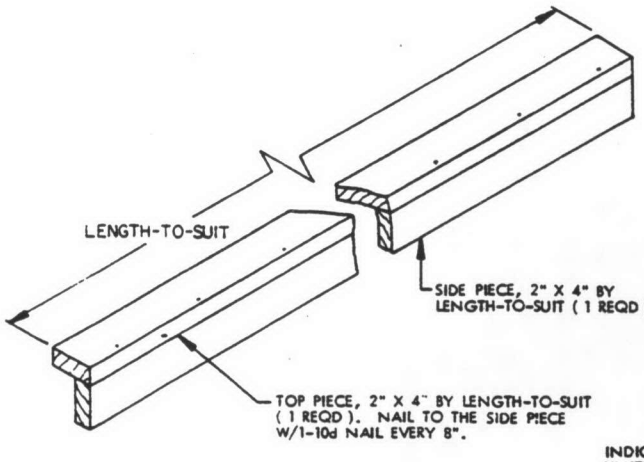
4. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 3" NO REAR BLOCKING IS REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 3" BUT LESS THAN 12" USE SOLID FILL REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 32. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12" USE REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 52.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4" 2" X 6"	23 40	16 40
NAILS	NO. REQD	POUNDS
10d (3") 12d (3-1/2")	44 16	3/4 1/2
STEEL STRAPPING, 1-1/4" X .035" ——— 24' REQD ——— 4 LBS SEAL FOR 1-1/4" STRAPPING ——— 2 REQD ——— NIL		

LOAD AS SHOWN

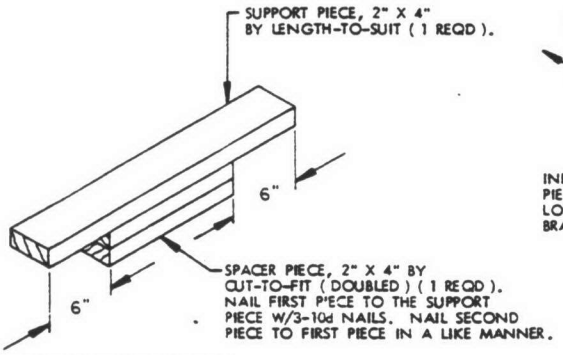
ITEM	QUANTITY	WEIGHT (APPROX)
155MM, SLP	20	16,000 LBS
DUNNAGE		118 LBS
TOTAL WEIGHT		16,118 LBS

TRUCK, CARGO, 8 TON, M520 (TYPICAL)



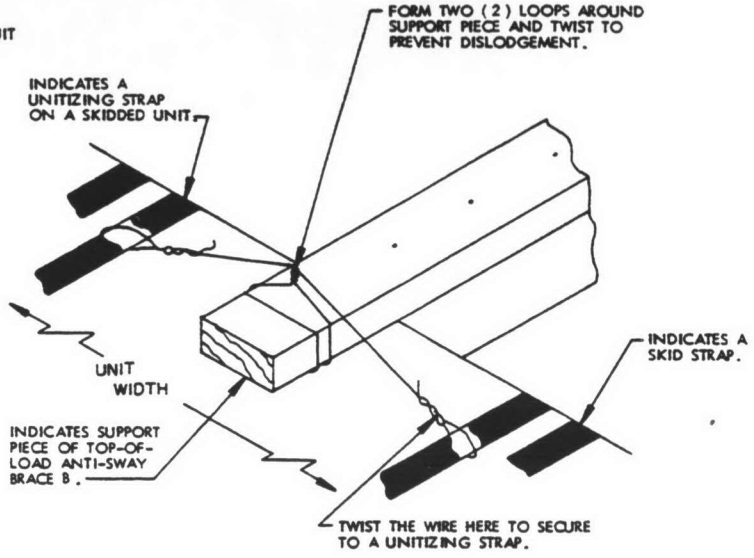
ANTI-SWAY ASSEMBLY A

THIS ASSEMBLY IS FOR USE IN LOADS OF PALLETIZED AND SKIDDED UNITS, OR LOADS OF SEPARATE LOADING PROJECTILES. SEE THE LOAD ON PAGE 6 AND PAGE 20 FOR GUIDANCE.



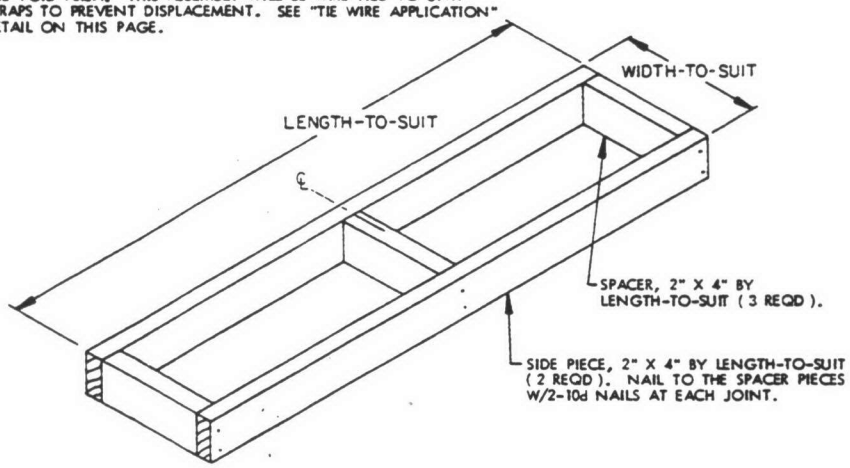
TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLY B

THIS ASSEMBLY IS DESIGNED FOR USE BETWEEN THE TOPS OF LATERALLY ADJACENT PALLETIZED OR SKIDDED UNITS, WHICH ARE OVER 44" HIGH, TO PREVENT THE UNITS FROM TIPPING INTO THE VOID AREA. THIS ASSEMBLY WILL BE WIRE TIED TO UNIT STRAPS TO PREVENT DISPLACEMENT. SEE "TIE WIRE APPLICATION" DETAIL ON THIS PAGE.



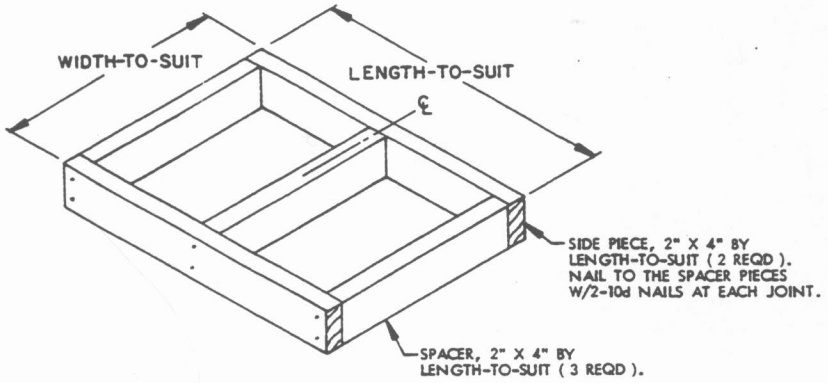
TIE WIRE APPLICATION

THIS VIEW DEPICTS THE SECUREMENT OF A TOP-OF-LOAD ANTI-SWAY BRACE B TO THE TOP OF A SKIDDED UNIT BY WIRE TYPING TO THE UNITIZING STRAPS WITH NO. 14 GAGE WIRE. THIS PROCEDURE IS APPLICABLE FOR SKIDDED AND PALLETIZED UNITS.



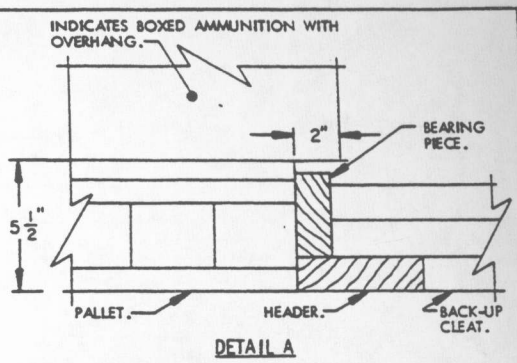
SPACER ASSEMBLY A

THIS ASSEMBLY IS FOR USE IN LOADS OF PALLETIZED OR SKIDDED UNITS. SEE THE LOAD ON PAGE 30 FOR GUIDANCE.



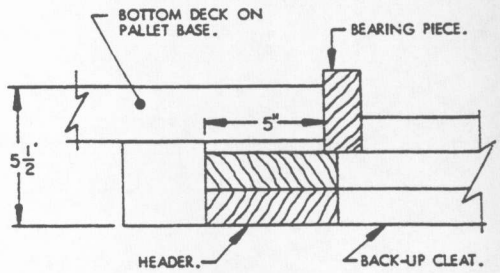
REAR BLOCKING ASSEMBLY A

THIS ASSEMBLY IS FOR USE IN A LOAD OF PALLETIZED OR SKIDDED UNITS. SEE THE LOAD ON PAGE 32 FOR GUIDANCE.



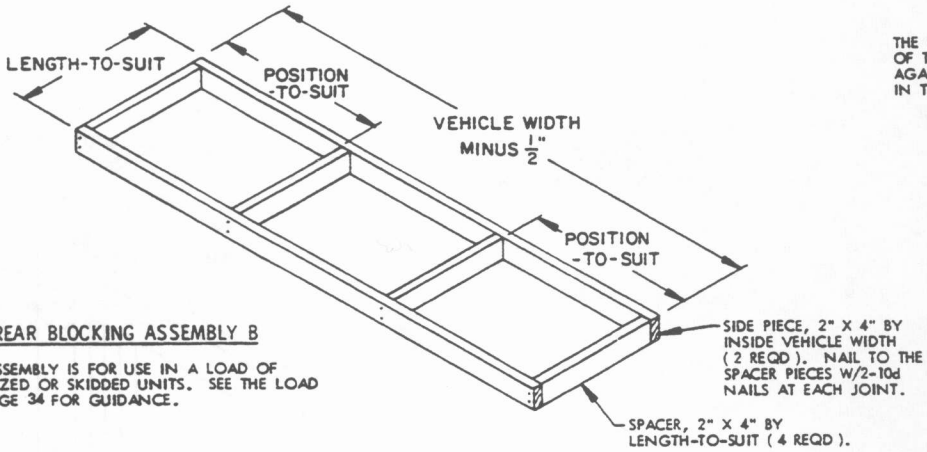
DETAIL A

THE PARTIAL VIEW ABOVE DEPICTS THE POSITIONING OF THE HEADER, BACK-UP CLEAT, AND BEARING PIECE AGAINST THE END OF A 40" X 48" OR 35" X 45-1/2" PALLET OR SKIDDED BASE AS SHOWN IN THE LOAD ON PAGE 6.



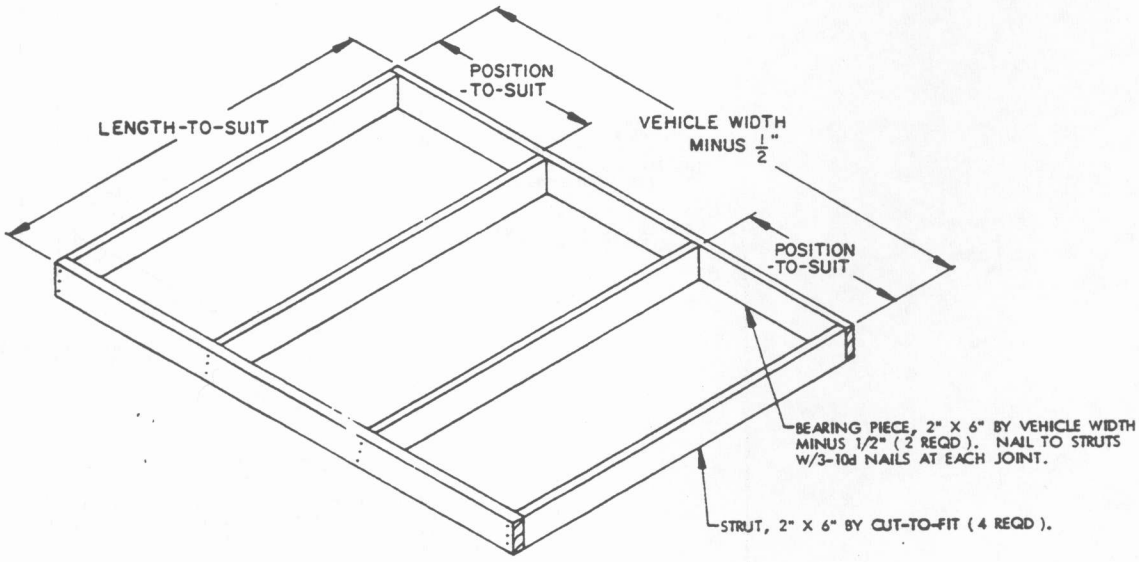
DETAIL B

THE PARTIAL VIEW ABOVE DEPICTS THE POSITIONING OF THE HEADER, BACK-UP CLEAT, AND BEARING PIECE AGAINST THE SLP PALLET BASE ASSEMBLY AS SHOWN IN THE LOAD ON PAGE 10.



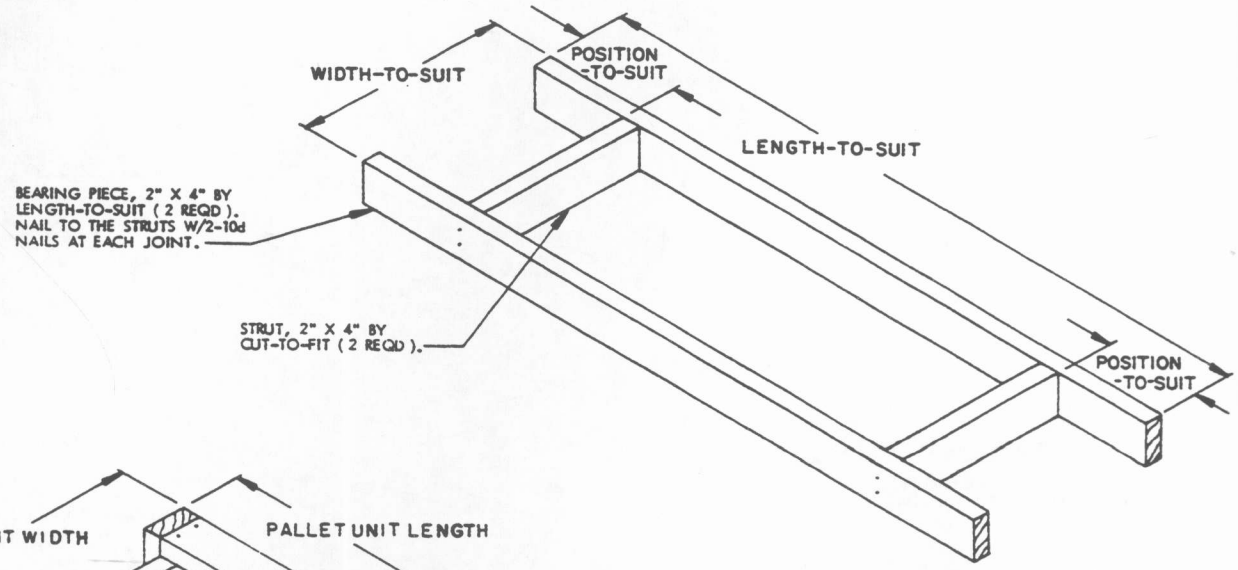
REAR BLOCKING ASSEMBLY B

THIS ASSEMBLY IS FOR USE IN A LOAD OF PALLETIZED OR SKIDDED UNITS. SEE THE LOAD ON PAGE 34 FOR GUIDANCE.



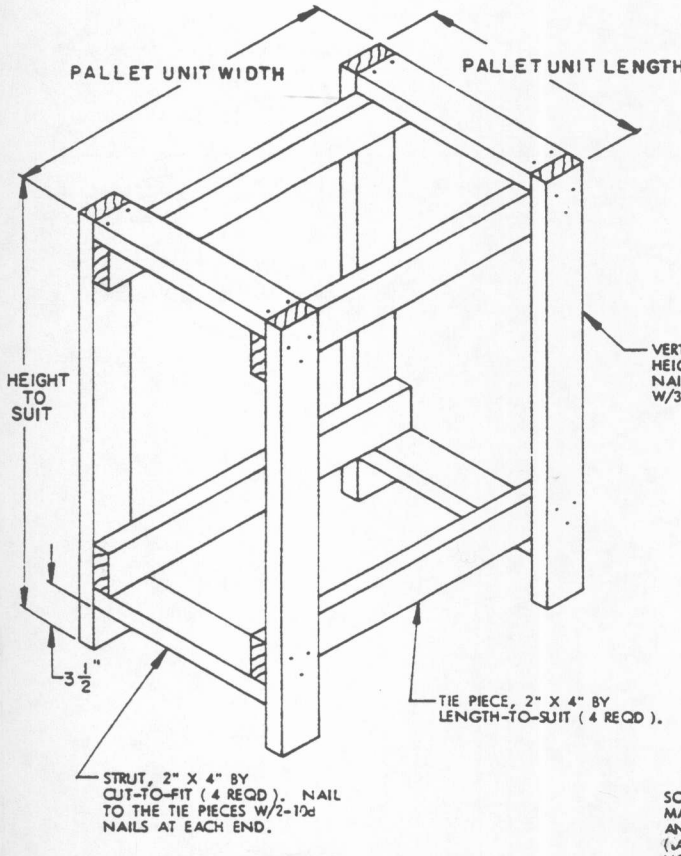
REAR BLOCKING ASSEMBLY C

THIS ASSEMBLY IS FOR USE IN A LOAD OF SEPARATE LOADING PROJECTILES. SEE THE LOAD ON PAGE 44 FOR GUIDANCE.



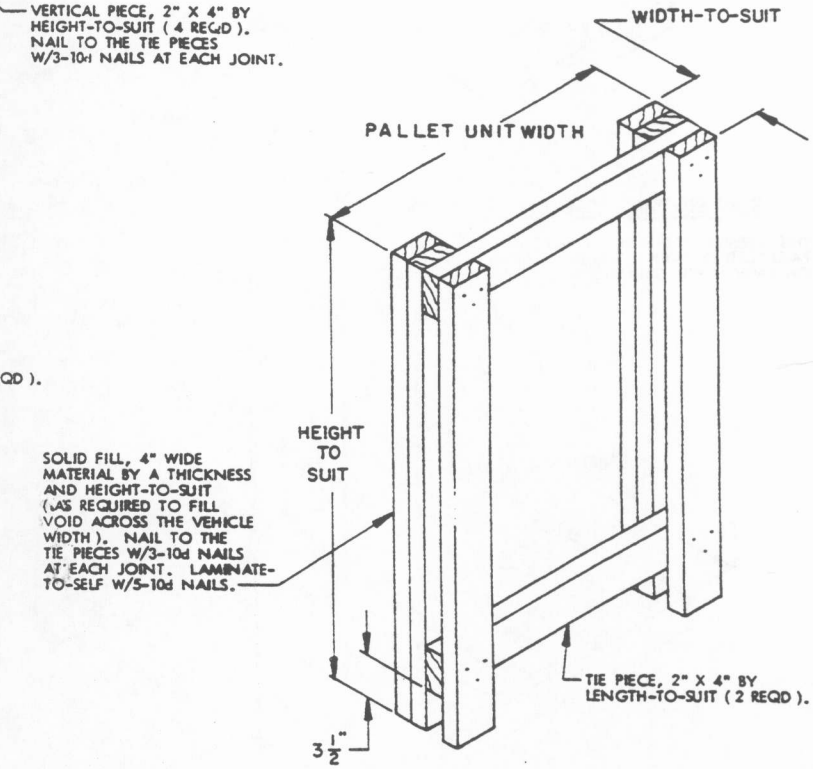
REAR BLOCKING ASSEMBLY D

THIS ASSEMBLY IS FOR USE IN A LOAD OF PALLETIZED OR SKIDDED UNITS WHEN THE REAR UNIT IS CENTERED ACROSS THE VEHICLE WIDTH. SEE THE LOAD ON PAGE 48 FOR GUIDANCE.



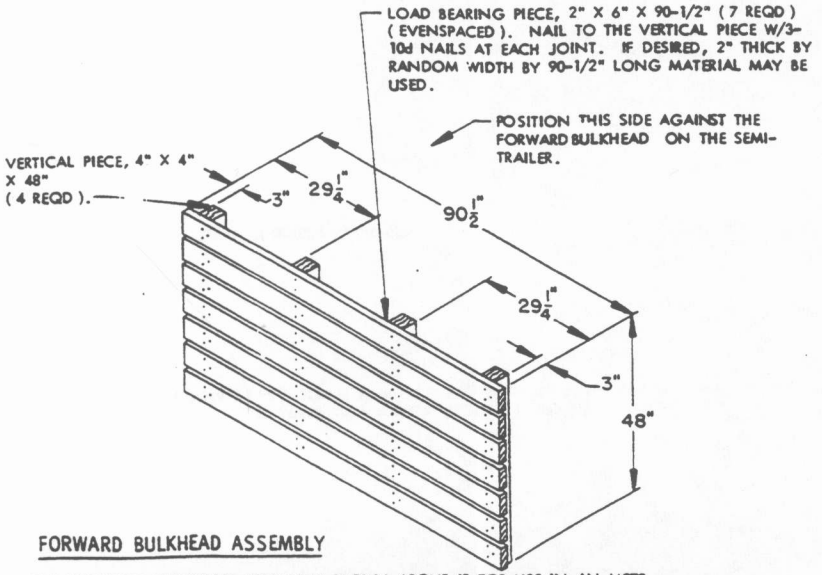
FILLER ASSEMBLY

THIS ASSEMBLY IS FOR USE IN A LOAD OF SEPARATE LOADING PROJECTILES. ONE FILLER ASSEMBLY IS REQUIRED FOR EACH PALLET OF SEPARATE LOADING PROJECTILES THAT IS OMITTED FROM A LOAD. SEE THE LOAD ON PAGE 52 FOR GUIDANCE.



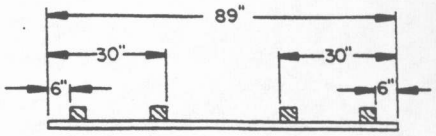
SPACER ASSEMBLY B

THIS ASSEMBLY IS FOR USE IN A LOAD OF SEPARATE LOADING PROJECTILES TO FILL THE EXCESS SPACE ACROSS THE VEHICLE WIDTH. SEE THE PARTIAL PLAN VIEWS ON PAGES 45 AND 47 FOR GUIDANCE.



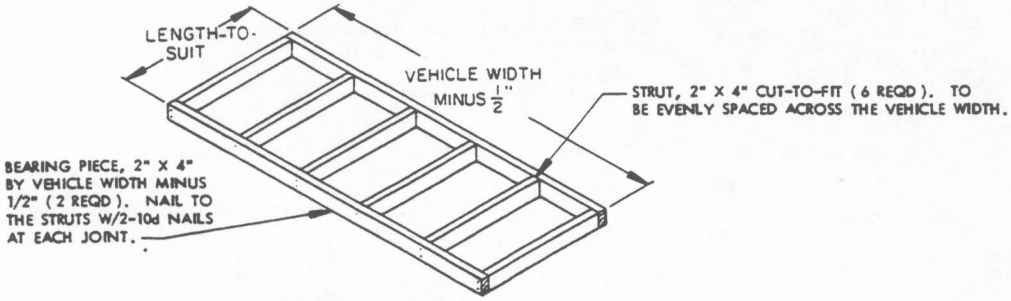
FORWARD BULKHEAD ASSEMBLY

THE "FORWARD BULKHEAD ASSEMBLY" SHOWN ABOVE IS FOR USE IN AN M872 SEMITRAILER. IF A M871 SEMITRAILER IS BEING USED SEE "DETAIL C" AT THE RIGHT FOR MODIFICATION. THIS ASSEMBLY IS REQUIRED AS THE FORWARD BULKHEAD ON THE M872 SEMITRAILER HAS "GUSSETS" AND THE FORWARD BULKHEAD ON THE M871 SEMITRAILER HAS "EYE-BOLTS", WHICH PROTRUDE INTO THE LADING AREA.



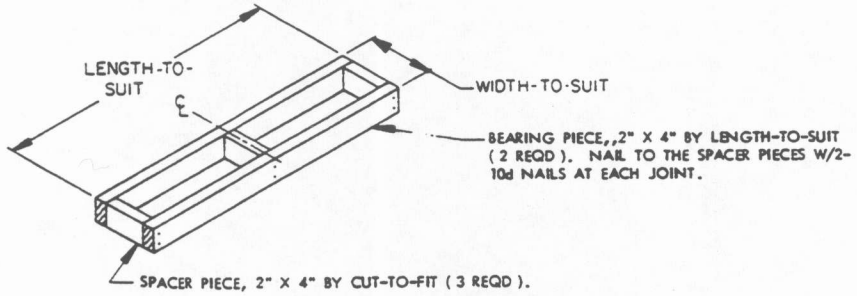
DETAIL C

WHEN CONSTRUCTING A "FORWARD BULKHEAD ASSEMBLY" FOR USE IN AN M871 SEMITRAILER POSITION THE 4" X 4" X 48" VERTICAL PIECES AS SHOWN ABOVE. THE SEVEN (7) 2" X 6" "LOAD BEARING PIECES" WILL BE 89" LONG. IF DESIRED, 2" THICK BY RANDOM WIDTH BY 89" LONG MATERIAL MAY BE USED.



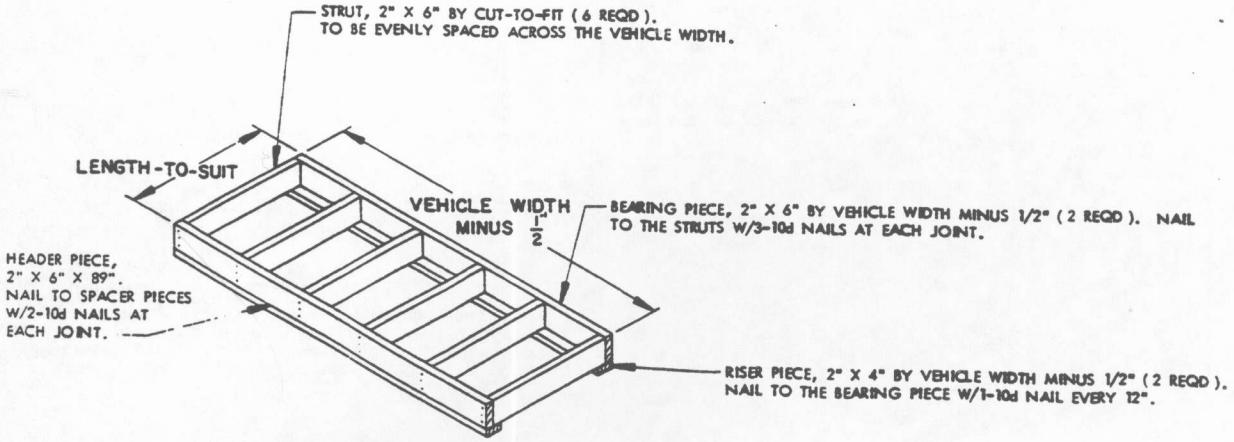
RETAINER ASSEMBLY A

THIS ASSEMBLY IS FOR USE IN A LOAD OF PALLETIZED OF SKIDDED UNITS IN/ON AN M871 OR M872 SEMITRAILER. SEE THE LOAD ON PAGE 14 FOR GUIDANCE.



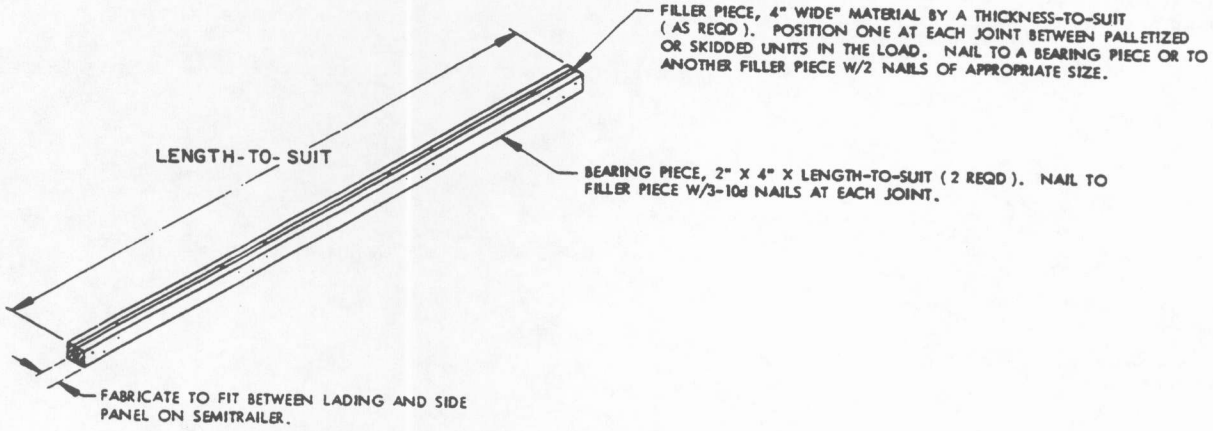
SIDE BLOCKING ASSEMBLY A

THIS ASSEMBLY IS FOR USE IN A LOAD OF PALLETIZED OR SKIDDED UNITS IN/ON AN M871 OR M872 SEMITRAILER. SEE THE LOAD ON PAGE 12 AND THE "ALTERNATIVE SIDE BLOCKING" ON PAGE 13 FOR GUIDANCE.



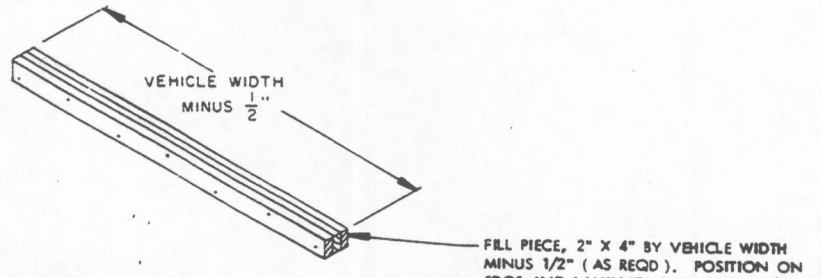
RETAINER ASSEMBLY B

THIS ASSEMBLY IS FOR USE IN A LOAD OF SEPARATE LOADING PROJECTILES IN/ON AN M871 OR M872 SEMITRAILER. IT MAY BE USED FOR FORWARD BLOCKING, CENTER BLOCKING, OR REAR BLOCKING. SEE THE LOAD ON PAGE 26 FOR GUIDANCE.



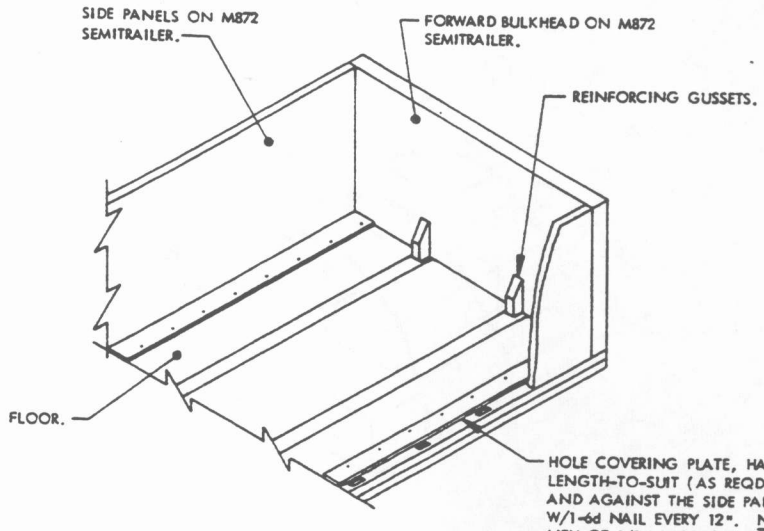
SIDE BLOCKING ASSEMBLY B

THIS ASSEMBLY IS FOR USE IN A LOAD OF PALLETIZED UNITS, SKIDDED UNITS, OR SEPARATE LOADING PROJECTILES IN/ON AN M871 OR M872 SEMITRAILER. THE BEARING PIECES MAY BE RANDOM LENGTH PIECES OF 2" X 4" MATERIAL. SEE THE LOAD ON PAGES 16 AND 26 FOR GUIDANCE.



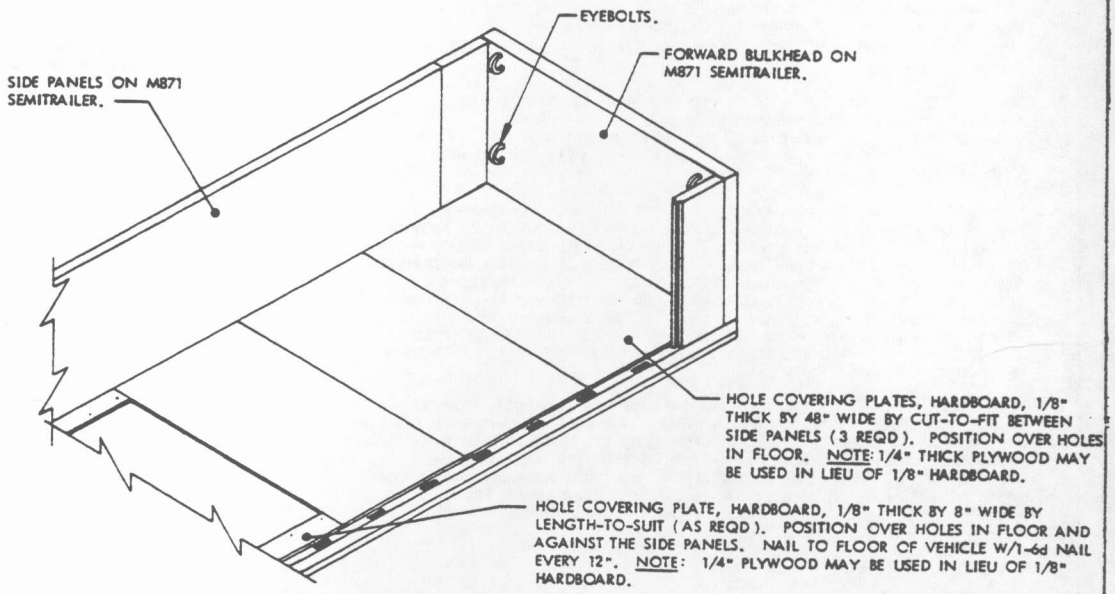
SOLID FILL REAR BLOCKING

THIS ASSEMBLY IS FOR USE IN A LOAD OF PALLETIZED OR SKIDDED UNITS. IT MAY BE USED AS AN ALTERNATIVE FOR REAR BLOCKING WHEN THE SPACE AT THE REAR OF A LOAD IS LESS THAN 12".



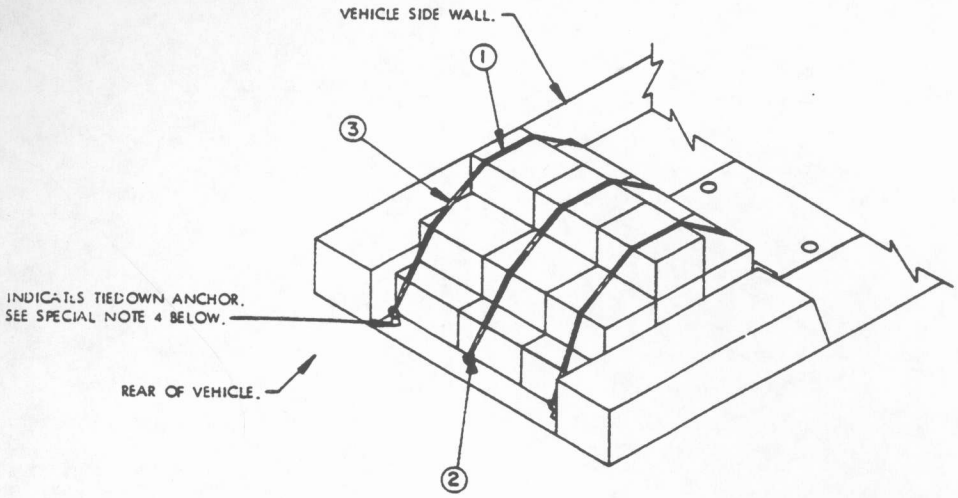
ALTERNATIVE HOLE COVERING FOR M872 SEMITRAILER

IF HOLE COVERING PLATES ARE NOT PROVIDED WITH THE VEHICLE, ALTERNATIVE HOLE COVERING PLATES MADE FROM 1/8" THICK HARDBOARD OR 1/4" THICK PLYWOOD MAY BE USED. THESE PLATES MUST BE POSITIONED SO THEY WILL BE AGAINST THE SIDE PANELS AND NOT UNDER THE SIDE PANELS. LADING MAY BE POSITIONED ON TOP OF THE HOLE COVERING PLATES. THE METHOD SHOWN ABOVE IS FOR THE M872 SEMITRAILER. SEE GENERAL NOTE "M" ON PAGE 2.



ALTERNATIVE HOLE COVERING FOR M871 SEMITRAILER

IF HOLE COVERING PLATES ARE NOT PROVIDED WITH THE VEHICLE, ALTERNATIVE HOLE COVERING PLATES MADE FROM 1/8" THICK HARDBOARD OR 1/4" THICK PLYWOOD MAY BE USED. THE HOLE COVERING PLATES AT THE FORWARD END OF THE M871 SEMITRAILER MUST BE CUT-TO-FIT BETWEEN SIDE PANELS, AS SHOWN ABOVE, BECAUSE THE FIRST 10'-0" PORTION OF THE TRAILER FLOOR IS ALL STEEL. ALTERNATIVE HOLE COVERING PLATES FOR THE REAR PORTION MAY BE THE SAME AS USED IN THE M872 SEMITRAILER. THESE PLATES MUST BE POSITIONED SO THEY WILL BE AGAINST THE SIDE PANEL AND NOT UNDER THE SIDE PANELS. LADING MAY BE POSITIONED ON TOP OF THE HOLE COVERING PLATES. THE METHOD SHOWN ABOVE IS FOR THE M871 SEMITRAILER. SEE GENERAL NOTE "M" ON PAGE 2.



ISOMETRIC VIEW

SPECIAL NOTES:

1. A TYPICAL LOAD OF TWENTY FOUR LOOSE BOXES OF AMMUNITION IS SHOWN IN A TRUCK, CARGO, 1-1/4-TON, M998 (HMMWV), HAVING USEABLE INSIDE DIMENSIONS OF 51" LONG BY 52" WIDE.

2. THE VEHICLE SHOWN WAS SELECTED AS TYPICAL ONLY, AND VEHICLES OF OTHER DIMENSIONS, AND/OR TRAILERS, WHICH HAVE A SUFFICIENT QUANTITY OF TIEDOWN ANCHORS, LOCATED IN THE SIDEWALL, END WALL, OR FLOOR, MAY BE USED TO TRANSPORT THE LOAD SHOWN, OR A PARTIAL LOAD.

3. THE LOAD SHOWN ON THIS PAGE DEPICTS A TYPICAL LOAD OF BOXED AMMUNITION CONSISTING OF TWENTY-FOUR BOXES OF CARTRIDGE, 5.56MM, HAVING DIMENSIONS OF 17" LONG BY 13-3/8" WIDE BY 9-9/16" HIGH. IF LOADING BOXES OF OTHER ITEMS, SIZES, OR QUANTITIES, FOLLOW THESE SAME PROCEDURES.

4. LOOSE BOXED AMMUNITION MAY BE TRANSPORTED IN THE M998 HMMWV AND SECURED USING THE ORIGINAL EQUIPMENT TIEDOWN ANCHORS, PROVIDED THE ANGLE OF THE INSTALLED HOLD DOWN STRAP IS 45 DEGREES OR LESS FROM THE HORIZONTAL CARGO BED. IF THE ANGLE EXCEEDS 45 DEGREES, AS DEPICTED ABOVE, THE TIEDOWN ANCHORS MUST BE REPLACED WITH 1/2" SHOULDER EYEBOLTS. SHOULDER EYEBOLTS USED MUST CONFORM TO MATERIAL SPECIFICATION MS 51937; SIZE 1/2", 13 UNC 2A, NSN 5306-00-050 0347. A 75 FT-LB MINIMUM TORQUE REQUIREMENT FOR TIEDOWN FIXTURES IS TO BE OBSERVED WHEN INSTALLING EYEBOLTS AND EYEBOLTS ARE TO BE ORIENTATED AS SHOWN IN THE ISOMETRIC VIEW ABOVE.

5. WHEN TRANSPORTING A LOAD OF MORE THAN THREE BOXES WIDE, A SHORT PIECE OF DUNNAGE MATERIAL, SUCH AS A 2" X 4", MUST BE POSITIONED ON TOP OF THE LOAD SO AS TO CONTACT ALL TOP LAYER BOXES THAT ARE NOT RESTRAINED BY A HOLD DOWN STRAP. THIS PIECE OF DUNNAGE MATERIAL SHALL BE OF SUCH A LENGTH TO INSURE CONTACT WITH EACH BOX IN THE TOP LAYER THAT IS NOT RESTRAINED BY AN INDIVIDUAL HOLD DOWN STRAP.

KEY NUMBERS

(1) HOLD DOWN STRAP, 3/4" X .035" OR .031" X 10' - 0" LONG STEEL STRAPPING (3 REQD). INSTALL FROM TWO (2) PIECES.

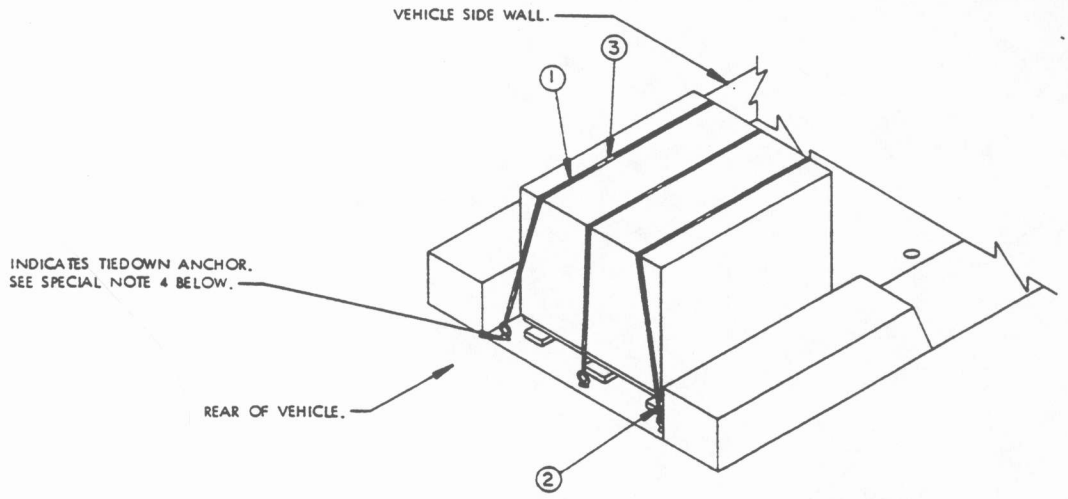
(2) PAD, 3/4" X 18" LONG STEEL STRAPPING (6 REQD). POSITION THRU TIEDOWN ANCHOR AND SEAL TO HOLD DOWN STRAP, PIECE MARKED (1), W/1 SEAL.

(3) SEAL FOR 3/4" STRAPPING (18 REQD; 6 PER STRAP). DOUBLE CRIMP EACH SEAL, EXCEPT THOSE USED TO SECURE THE PADS, PIECES MARKED (2) SEE GENERAL NOTE "L" ON PAGE 2.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
LOOSE BOXES	24	1,848 LBS

LOOSE BOXED AMMUNITION LOAD IN TRUCK, CARGO, 1-1/4-TON, M998 (HMMWV)



ISOMETRIC VIEW

SPECIAL NOTES:

1. A MAXIMUM LOAD OF ONE PALLET OF BOXED AMMUNITION IS SHOWN IN A TRUCK, CARGO, 1-1/4-TON, M998 (HMMWV), HAVING USEABLE INSIDE DIMENSIONS OF 51" LONG BY 52" WIDE. NOTE: THE MAXIMUM LOAD IS BASED ON THE WEIGHT OF THE PALLETIZED UNIT SHOWN.

2. THE VEHICLE SHOWN WAS SELECTED AS TYPICAL ONLY, AND VEHICLES OF OTHER DIMENSIONS, AND/OR TRAILERS, WHICH HAVE A SUFFICIENT QUANTITY OF TIEDOWN ANCHORS, LOCATED ON THE SIDEWALL, END WALL, OR FLOOR, MAY BE USED TO TRANSPORT THE LOAD SHOWN, OR A PARTIAL LOAD.

3. ONE PALLETIZED UNIT OF BOXED AMMUNITION HAVING DIMENSIONS OF 50" WIDE BY 44" LONG BY 38" HIGH IS SHOWN IN THE LOAD ABOVE. IF LOADING PALLETIZED UNITS OF OTHER ITEMS, SIZES, OR QUANTITIES, FOLLOW THESE SAME PROCEDURES. NOTE: PALLET UNIT DIMENSIONS PERPENDICULAR TO WHEEL WELL MUST BE 44" OR GREATER TO ALLOW FOR PROPER PLACEMENT OF THREE HOLD DOWN STRAPS.

4. PALLETIZED AMMUNITION MUST NOT BE TRANSPORTED ON THE M998 CARGO TRUCK UNLESS THE TIEDOWN ANCHORS HAVE BEEN REPLACED WITH 1/2" SHOULDER EYEBOLTS. SHOULDER EYEBOLTS USED MUST CONFORM TO MATERIAL SPECIFICATION MS 51937, SIZE 1/2", 13 UNC-2A NSN 5306-00-050-0347. A 75 FT-LB MINIMUM TORQUE REQUIREMENT FOR TIEDOWN FIXTURES IS TO BE OBSERVED WHEN INSTALLING EYEBOLTS AND EYEBOLTS ARE TO BE ORIENTED AS SHOWN IN THE ISOMETRIC VIEW ABOVE.

KEY NUMBERS

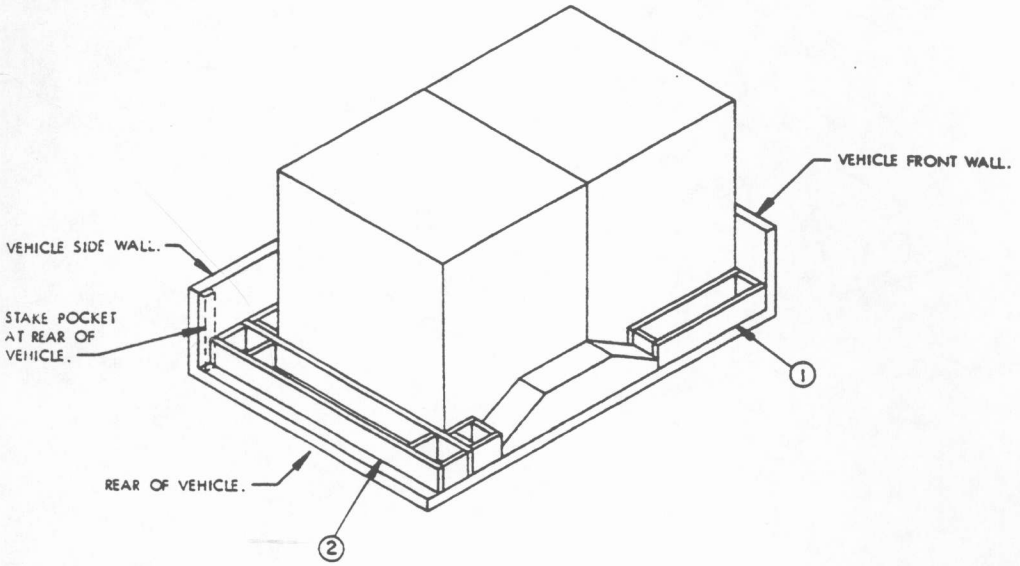
(1) HOLD DOWN STRAP, 3/4" X .035" OR .031" X 12' - 0" LONG STEEL STRAPPING (3 REQD). INSTALL FROM TWO (2) PIECES.

(2) PAD, 3/4" X 18" LONG STEEL STRAPPING (6 REQD). POSITION THRU TIEDOWN ANCHOR AND SEAL TO HOLD DOWN STRAP, PIECE MARKED (1), W/1 SEAL.

(3) SEAL FOR 3/4" STRAPPING (18 REQD, 6 PER STRAP). DOUBLE CRIMP EACH SEAL, EXCEPT THOSE USED TO SECURE THE PADS, PIECES MARKED (2). SEE GENERAL NOTE "L" ON PAGE 2.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLETIZED UNIT	1	2,300 LBS



ISOMETRIC VIEW

SPECIAL NOTES:

1. A MAXIMUM LOAD OF TWO SKIDDED UNITS OF BOXED AMMUNITION IS SHOWN IN A TRUCK, CARGO, 1-1/4-TON, M1008 (CUCV), HAVING INSIDE DIMENSIONS OF 98" LONG BY 65" WIDE (USEABLE WIDTH OF 48").
2. THE VEHICLE SHOWN WAS SELECTED AS TYPICAL ONLY, AND VEHICLES OF OTHER DIMENSIONS, AND/OR TRAILERS, MAY BE USED TO TRANSPORT THE LOAD SHOWN, OR A PARTIAL LOAD.
3. TWO SKIDDED UNITS OF BOXED AMMUNITION HAVING DIMENSIONS OF 42" WIDE BY 47" LONG BY 48" HIGH, ARE SHOWN AS A TYPICAL LOAD. IF LOADING SKIDDED UNITS OF OTHER ITEMS, SIZES, OR QUANTITIES, FOLLOW THESE SAME PROCEDURES.
4. IF THE SPACE AT THE REAR OF THE LOAD IS LESS THAN 3", NO REAR BLOCKING IS REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 3", BUT LESS THAN 12", USE SOLID FILL REAR BLOCKING AS SHOWN IN THE LOAD ON PAGE 32. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 12", USE THE REAR BLOCKING AS SHOWN IN THE ISOMETRIC VIEW ABOVE.

KEY NUMBERS

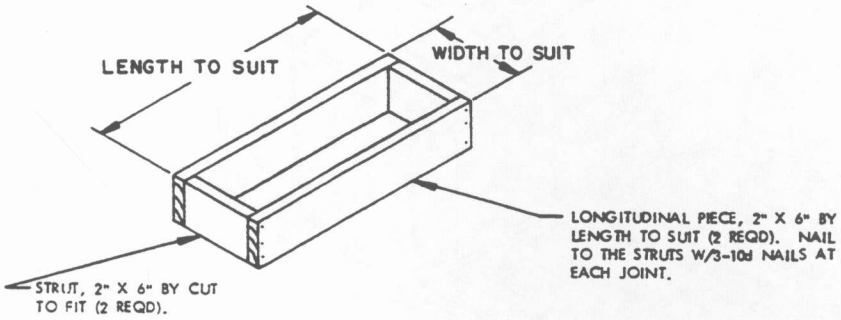
(1) SIDE BLOCKING (4 REQD). SEE THE "SIDE BLOCKING ASSEMBLY C" DETAIL ON PAGE 63.

(2) REAR BLOCKING (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY E" DETAIL ON PAGE 63. SEE SPECIAL NOTE 4 AT LEFT.

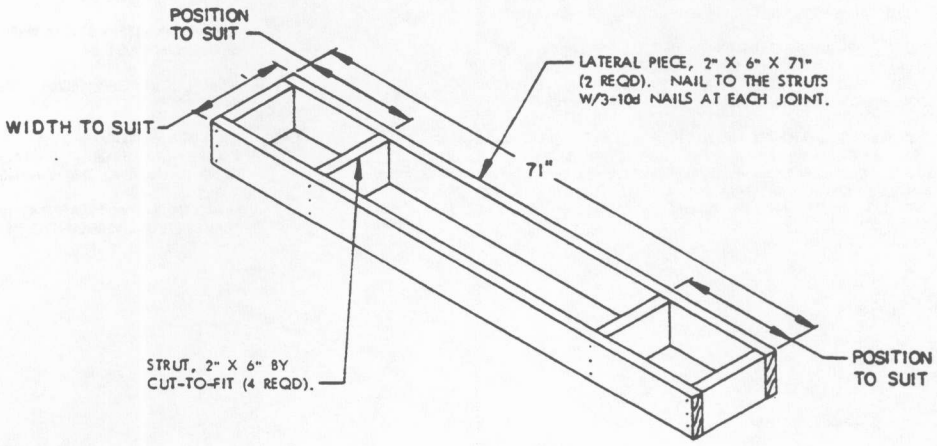
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
SKIDDED UNIT	2	2,380 LBS

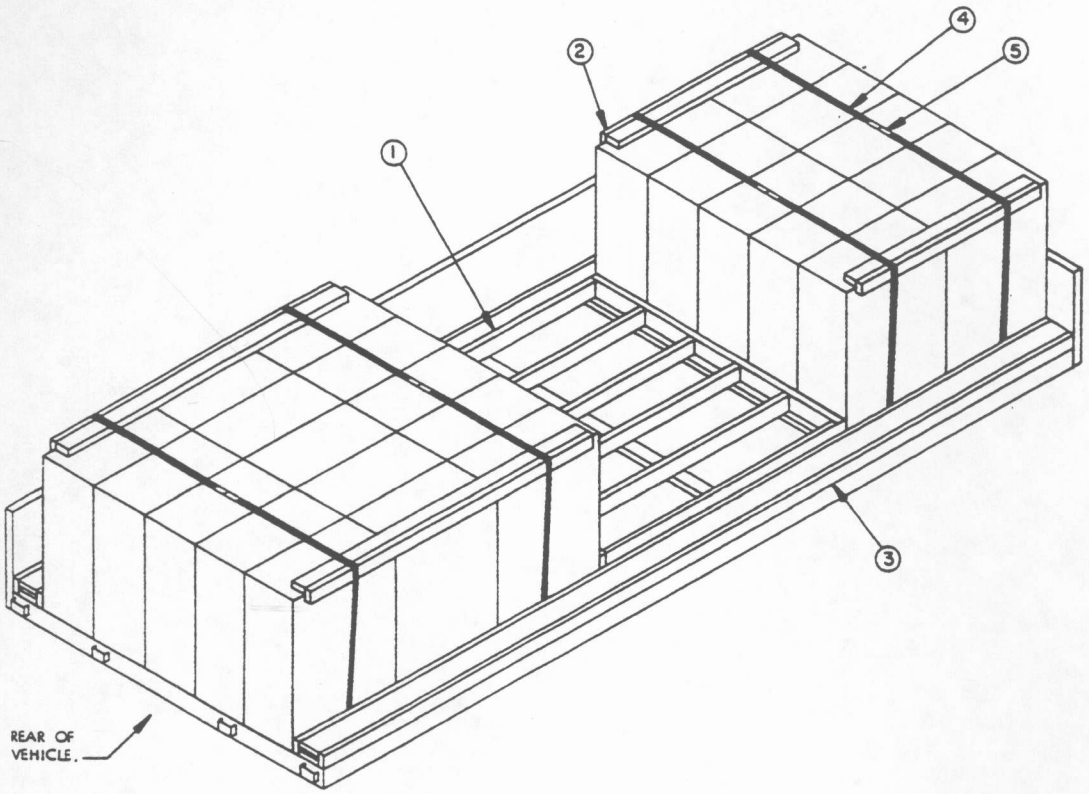
SKIDDED UNIT OF BOXED AMMUNITION LOADED IN TRUCK, CARGO, 1-1/4-TON, M1008 (CUCV)



SIDE BLOCKING ASSEMBLY C



REAR BLOCKING ASSEMBLY E



ISOMETRIC VIEW

SPECIAL NOTES:

1. A TYPICAL LOAD OF PALLETIZED SEPARATE LOADING PROJECTILES IS SHOWN ON THE TRUCK, HEAVY EXPANDED MOBILITY (HEMTT), 10-TON, M977 AND/OR M985, HAVING INSIDE DIMENSIONS OF 216-3/8" LONG BY 90-3/4" WIDE.
2. THE 155MM, 8/PALLET, SEPARATE LOADING PROJECTILE SHOWN IN THE ISOMETRIC VIEW ABOVE, HAS OVERALL DIMENSIONS OF 14-3/8" LONG BY 29-1/8" WIDE BY 38-3/8" HIGH AND A WEIGHT OF 830 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR UNITS OF OTHER DIMENSIONS.
3. THE DEPICTED LOAD CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED OR TO SUIT THE SIZE AND/OR WEIGHT OF THE UNIT BEING LOADED. A LOAD CAN BE INCREASED OR REDUCED BY A MULTIPLE OF FIVE (5) UNITS AND USING THE SAME PROCEDURES SHOWN. A LOAD CAN BE REDUCED BY ONE (1) OR MORE PALLET UNITS BY USING A "FILLER ASSEMBLY" AS SHOWN ON PAGE 52 IN LIEU OF EACH OMITTED PALLET.

KEY NUMBERS

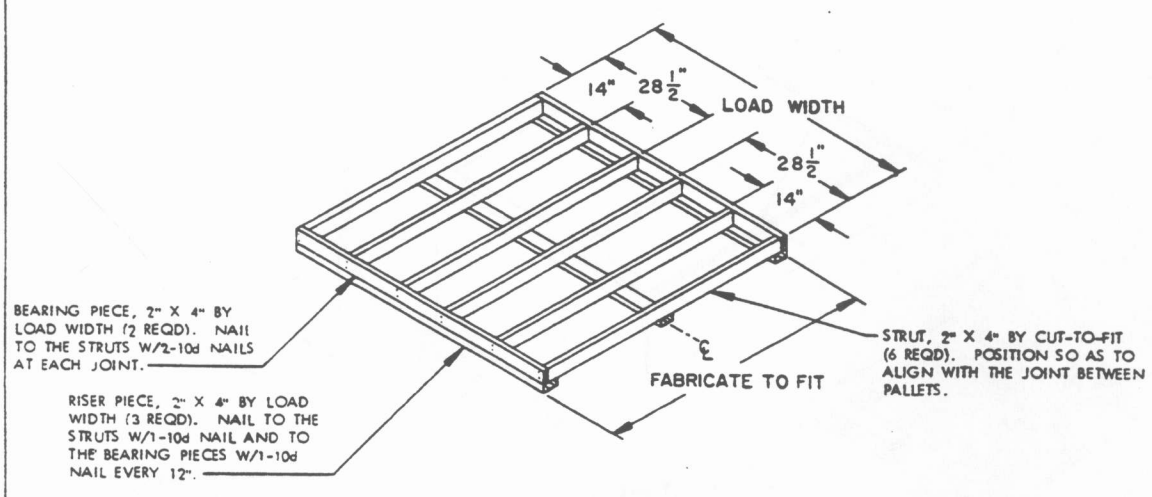
(1) CENTER BLOCKING (1 REQD). SEE THE "CENTER BLOCKING ASSEMBLY" DETAIL ON PAGE 65.

(2) ANTI-SWAY ASSEMBLY (4 REQD). SEE THE "ANTI-SWAY ASSEMBLY A" DETAIL ON PAGE 54.

(3) SIDE BLOCKING (2 REQD). SEE THE "SIDE BLOCKING ASSEMBLY D" ON PAGE 65.

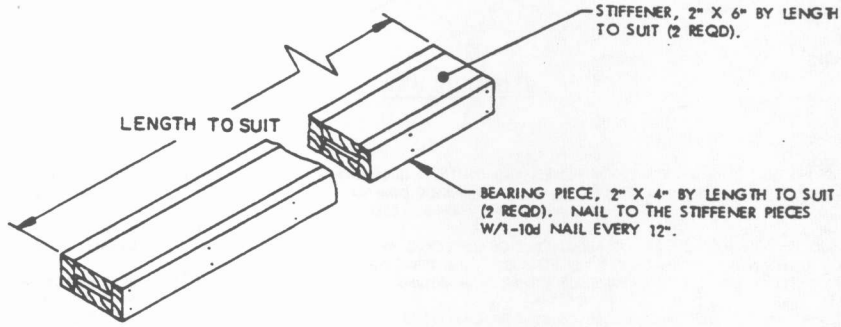
(4) ANTI-SWAY STRAPPING, 1-1/4" X .035" OR .031" X 20' - 0" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE FIVE (5) LATERALLY ADJACENT UNITS AND THE "ANTI-SWAY ASSEMBLY" AS SHOWN.

(5) SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.



CENTER BLOCKING ASSEMBLY

THIS ASSEMBLY IS FOR USE IN A LOAD OF SEPARATE LOADING PROJECTILES IN/ON AN M977 AND/OR M985 CARGO TRUCK.



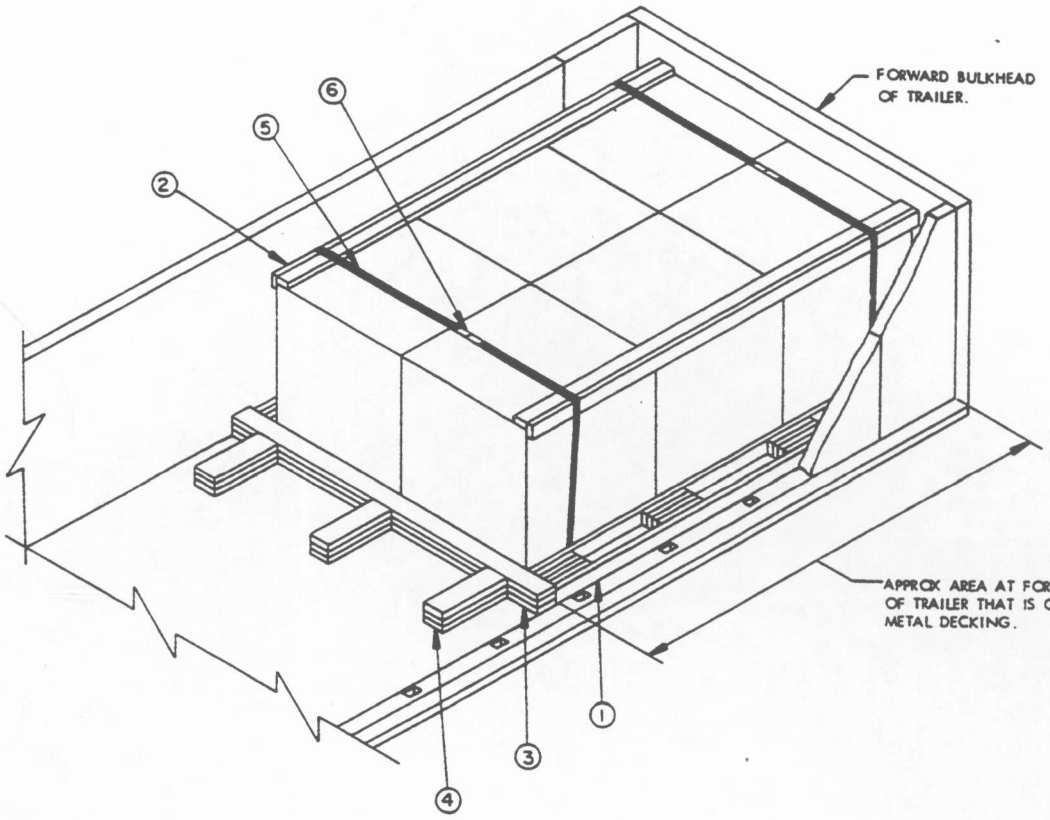
SIDE BLOCKING ASSEMBLY D

THIS ASSEMBLY IS FOR USE IN A LOAD OF SEPARATE LOADING PROJECTILES IN /ON AN M977 AND/OR M985 CARGO TRUCK. THE STIFFENER AND BEARING PIECES MAY BE MADE FROM RANDOM LENGTH PIECES, HOWEVER, THE JOINTS MUST BE STAGGERED.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4" 2" X 6"	181 72	120 72
NAILS	NO. REQD	POUNDS
10d (3")	242	3-3/4
STEEL STRAPPING, 1-1/4" X .035" OR .031" ---- 80' REQD ----- 11-1/2 LBS SEAL FOR 1-1/4" STRAPPING ---------- 8 REQD ----- NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
155MM SLP	25	20,750 LBS
DUNNAGE		399 LBS
TOTAL WEIGHT		21,149 LBS (APPROX)



ISOMETRIC VIEW

SPECIAL NOTES:

1. A TYPICAL LOAD OF TWO SKIDDED UNITS OF BOXED AMMUNITION IS SHOWN ON A SEMITRAILER, DROPSIDE, 22-1/2-TON, M871, HAVING INSIDE DIMENSIONS OF 95-3/4" WIDE. TRAILERS OF OTHER DIMENSIONS MAY BE USED.
2. THE SKIDDED UNIT SHOWN HAS OVERALL DIMENSIONS OF 36" LONG BY 37" WIDE BY 39" HIGH AND A WEIGHT OF 1,930 POUNDS. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR UNITS OF OTHER DIMENSIONS.
3. THE REAR BLOCKING PROCEDURES SHOWN ARE ONLY APPLICABLE FOR TRAILERS EQUIPPED WITH WOOD OR WOOD AND METAL FLOORS. FOR TRAILERS WITH NON-NAILABLE FLOORS, REFER TO THE PROCEDURES ON PAGE 16.
4. THE PROCEDURES DELINEATED ABOVE MAY ALSO BE USED WITH THE M872 DROPSIDE TRAILER MAKING ONLY THOSE ADJUSTMENTS REQUIRED FOR DIMENSIONAL VARIANCE OF THE TRAILERS.

KEY NUMBERS

(1) SIDE BLOCKING (2 REQD). SEE THE "SIDE BLOCKING ASSEMBLY B" DETAIL ON PAGE 58.

(2) ANTI-SWAY ASSEMBLY (2 REQD). SEE THE "ANTI-SWAY ASSEMBLY A" DETAIL ON PAGE 54.

(3) REAR BLOCKING, 2" X 6" X TRAILER WIDTH MINUS 1/2" (TRIPLED) (1 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/12-12d NAILS. NAIL EACH ADDITIONAL PIECE W/12-20d NAILS.

(4) BACK-UP CLEAT, 2" X 6" X 18" (TRIPLED) (3 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-12d NAILS. NAIL EACH ADDITIONAL PIECE W/5-20d NAILS.

(5) ANTI-SWAY STRAPPING, 1-1/4" X .035" OR .031" X 20'-0" LONG STEEL STRAPPING (2 REQD). INSTALL TO ENCIRCLE TWO (2) LATERALLY ADJACENT UNITS AND THE "ANTI-SWAY ASSEMBLY" AS SHOWN.

(6) SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	113	75
2" X 6"	35	35
NAILS	**NO. REQD**	**POUNDS**
10d (3")	134	2
12d (3-1/4")	23	1/4
20d (4")	46	1-1/2
STEEL STRAPPING, 1-1/4" X .035" OR 031" --- 40' REQD --- 6 LBS		
SEAL FOR 1-1/4" STRAPPING ---------- 4 REQD --- NIL		

LOAD AS SHOWN

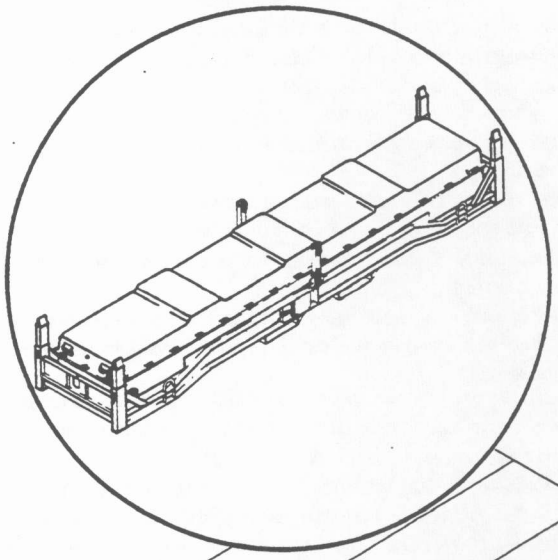
ITEM	QUANTITY	WEIGHT (APPROX)
SKIDDED UNIT	6	11,580 LBS
DUNNAGE		230 LBS
TOTAL WEIGHT		11,810 LBS (APPROX)

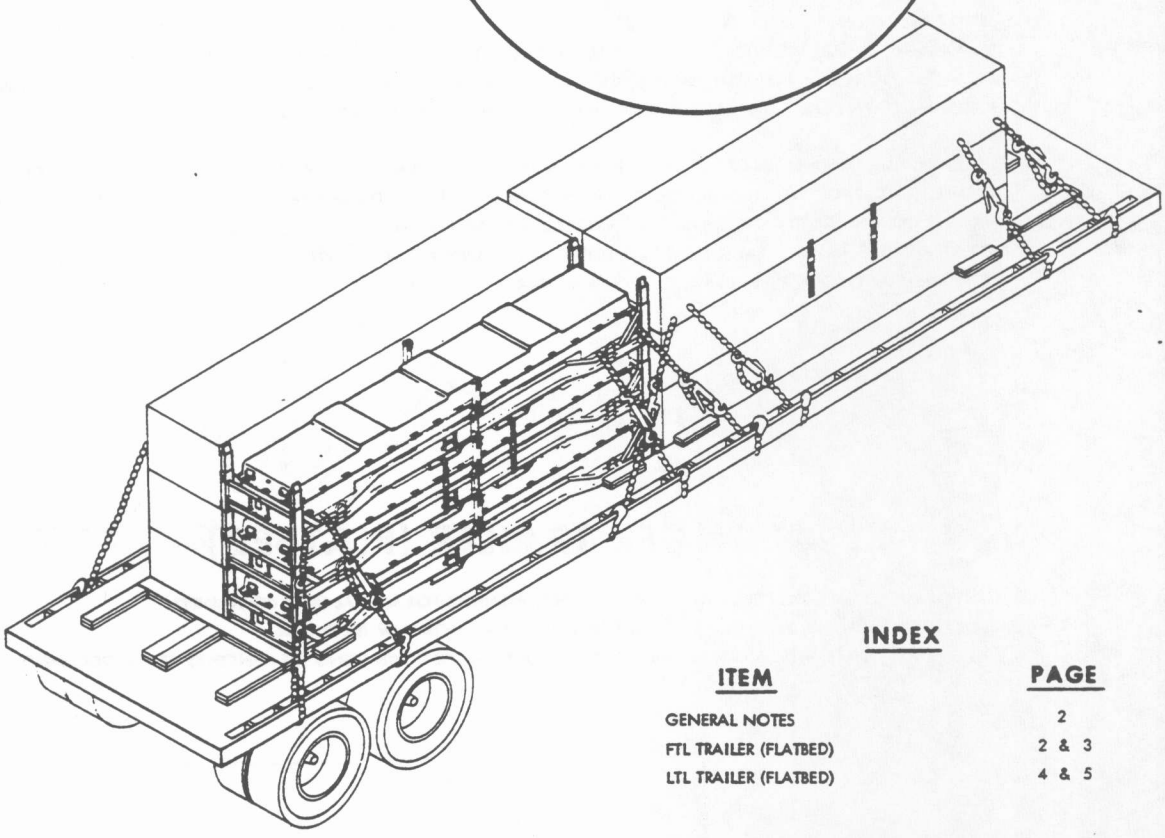
MILITARY STANDARD

MIL-STD-1320-208
(NAVY)
22 SEPTEMBER 1981

TRUCKLOADING

HARM MISSILE AGM-88A
IN CONTAINER CNU-295/E





CONTAINER DATA

MISSILES PER CONTAINER	2
DIMENSIONS	178 L X 36 W X 28 H
STACKING HEIGHT	25 1/4
TARE WEIGHT (APPROX.)	864 LBS.
GROSS WEIGHT (APPROX.)	2355 LBS.
CUBE	103.8 CU. FT.
DOT HAZARD CLASSIFICATION	EXPLOSIVES A

INDEX

NOTES:

1. UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
2. FOR CROSS REFERENCE TO ASSOCIATED PALLETIZING, CONTAINERLOADING AND CARLOADING MILITARY STANDARDS REFER TO INDEX TO STANDARDS, MIL-HDBK-236 (NAVY).

☆ U.S. GOVERNMENT PRINTING OFFICE: 1981—505-022/7395

FSC 8140

AUTHORIZED AND RELEASED FOR HIGHWAY SHIPMENT ONLY.

W.S. Gray NWHC 9/21/81
SIGNATURE TECHNICAL DIRECTION AGENT (TDA) DATE

J.E. Kelly 9/21/81
SIGNATURE AIRSYSCOM BY DIRECTION DATE

ORIGINATOR Charles McCorde 9/21/81
DATE

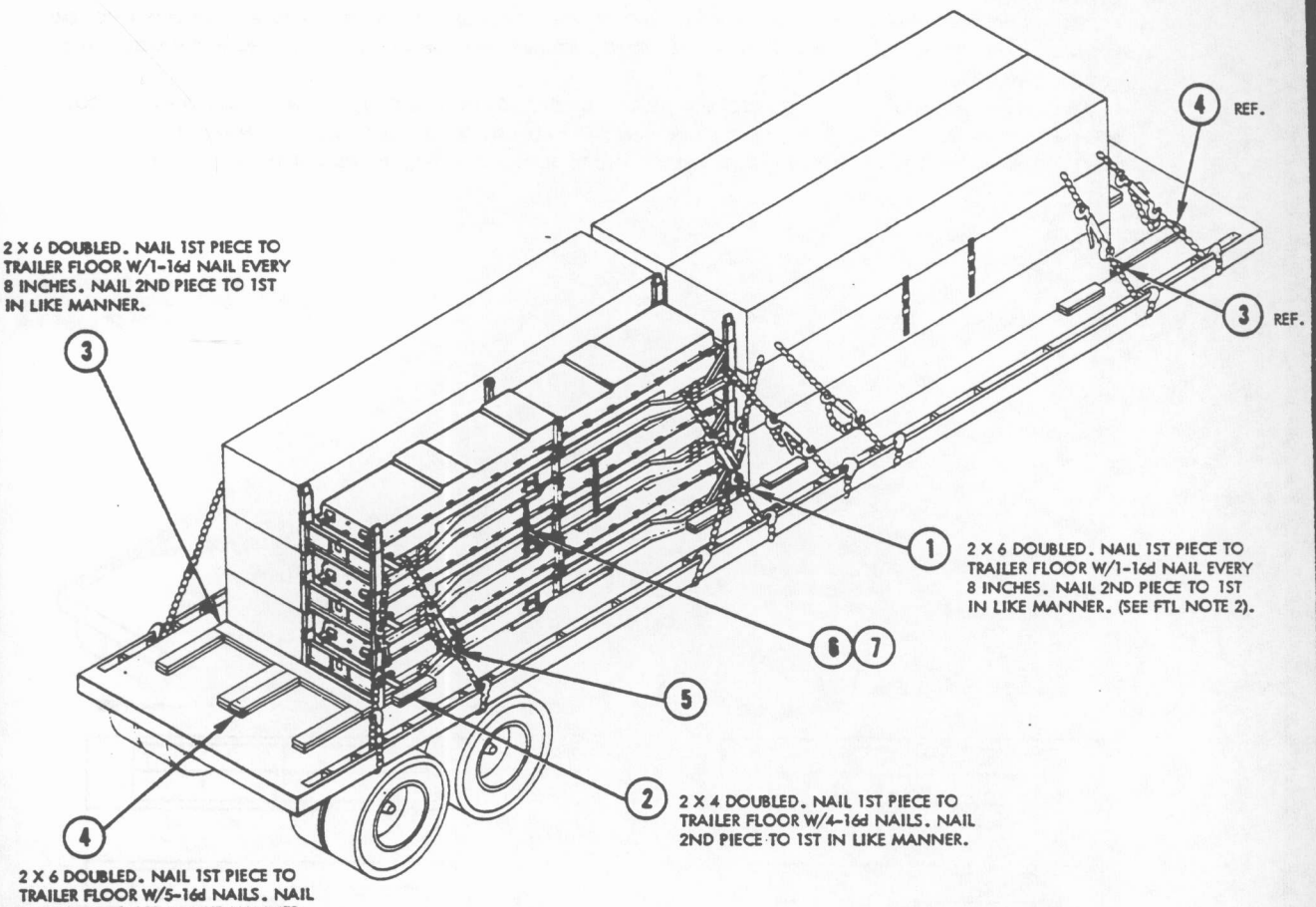
NAVAL WEAPONS HANDLING CENTER
WPNSTA EARLE, NEW JERSEY

GENERAL NOTES

1. THIS DOCUMENT GIVES DETAILED INSTRUCTIONS FOR TRUCKLOADING THE MISSILE AGM-88A (WITH WINGS AND FINS) IN CONTAINER, SHIPPING AND STORAGE, CNU-295/E. FOR GENERAL TRUCKLOADING PROCEDURES REFER TO THE GENERAL TRUCKLOADING DOCUMENT, MIL-STD-1320.
2. THE PROCEDURES AND PRACTICES DESCRIBED HEREIN ARE INTENDED FOR 40 FT FLATBED TRAILERS WITH THE TRAILERS TANDEM AXLES LOCATED IN THE "WESTERN POSITION" (AT THE EXTREME REAR OF THE TRAILER). DO NOT USE TRAILERS WITH METAL FLOORS.
3. EACH STACK OF CONTAINERS IS SECURED TOGETHER WITH TWO 1 1/4 X .035 CROSS STRAPS. THESE STRAPS PASS THROUGH THE FORK POCKETS OF THE TOP CONTAINERS AND RETURN THROUGH THE FORK POCKETS OF THE CONTAINERS IMMEDIATELY BELOW THE TOP CONTAINERS. TENSION STRAPS AND SEAL WITH TWO 1 1/4 SEALS DOUBLE CRIMPED OR ONE 1 1/4 SEAL DOUBLE NOTCHED.
4. ONLY CHAINS AND LOAD BINDERS SHALL BE USED FOR TIE DOWNS. (STEEL STRAPS ARE NOT AUTHORIZED).
5. ALL STACKS OF CONTAINERS THREE HIGH SHALL HAVE FOUR TIE DOWNS. STACKS LESS THAN THREE HIGH SHALL HAVE TWO TIE DOWNS.
6. CHAINS, FITTINGS, LOAD BINDERS, AND ALL OTHER MATERIALS (UNLESS OTHERWISE SPECIFIED) SHALL MEET THE REQUIREMENTS OF THE BASIC TRUCKLOADING DOCUMENT, MIL-STD-1320.
7. PRIOR TO LOADING THE TRAILER AND DURING THE PRELOADING INSPECTION REQUIRED BY NAVWEPS OP 2165 AND REPORTED ON DD FORM 626, THE CHAINS, FITTING AND LOAD BINDERS SHALL BE INSPECTED FOR STRETCH, GOUGING, BENT LINKS, WEAR AND ANY OTHER NOTICEABLE DEFECTS. THE INSPECTOR SHALL CONFIRM THAT THE CHAINS AND LOAD BINDERS HAVE BEEN INSPECTED AND SHALL SO NOTE IN ITEM NO. 22 OF DD FORM 626. ANY DEFICIENCY SHALL BE CAUSE FOR REJECTION OF A CHAIN OR LOAD BINDER.
8. THE MAXIMUM GROSS WEIGHT OF THE TRACTOR-TRAILER AND THE ALLOWABLE AXLE WEIGHTS ARE THE RESPONSIBILITY OF THE CARRIER. THE CARRIER WILL ADVISE THE SHIPPER OF THESE LIMITATIONS AND THE SHIPPER SHALL LOAD THE TRAILER IN SUCH A MANNER THAT THE TRACTOR-TRAILER WILL NOT EXCEED THESE LIMITATIONS.
9. AFTER BLOCKING AND BRACING HAS BEEN INSPECTED, ATTACH SHIPPING DOCUMENTS TO AN ACCESSIBLE AREA AND ATTACH "EXPLOSIVES A" PLACARD TO BOTH SIDES, FRONT AND REAR OF THE TRAILER.

FTL 40 FT & LONGER TRAILER (FLATBED)

1. A FULL TRUCKLOAD CONSISTS OF TWO STACKS OF SIX CONTAINERS FOR A TOTAL OF 12 CONTAINERS.
2. LOCATE CROSSMEMBER, PIECE NO. 1, AT THE FORE AND AFT MID-POINT OF THE TRAILER.
3. WHEN STATE LAW PERMITS, "DOUBLES" MAY BE USED. BLOCK AND TIE DOWN USING THE PRINCIPLES OF THIS DOCUMENT.



TRUCKLOAD DATA

NUMBER OF CONTAINERS 12
NUMBER OF MISSILES 24
WEIGHT (APPROX.) ..... 28,260 LBS.

PIECE NO.	DESCRIPTION	SIZE	NO. PCS. REQ'D	NAIL TO	NUMBER NAILS	SIZE NAILS
7	SEAL	FOR 1 1/4 STRAP	8	-	-	-
6	CROSS STRAP	1 1/4 X .035 X 18 FT.	4	-	-	-
5	CHAIN & LOAD BINDER	5/16 OR 3/8	8	-	-	-
4	BACKUP CLEAT	2 X 6 X 30	16	SEE FIELD NOTE		
3	CROSSMEMBER	2 X 6 X 72	4	SEE FIELD NOTE		
2	SLEEPER	2 X 4 X 18	16	SEE FIELD NOTE		
1	CROSSMEMBER	2 X 6 X 72	2	SEE FIELD NOTE		

LIST OF MATERIALS & NAILING DATA

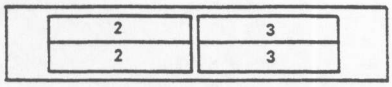
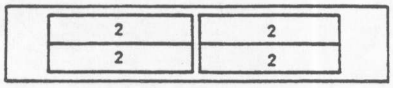
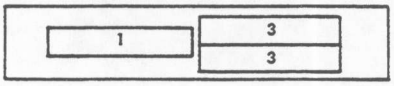
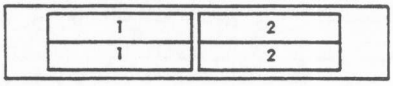
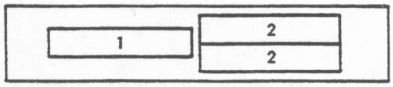
FTL 40 FT & LONGER TRAILER (FLATBED)

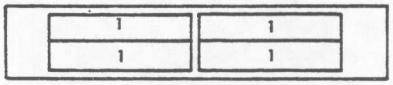
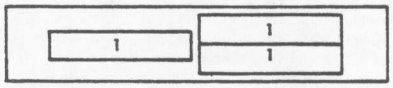
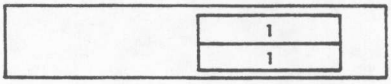
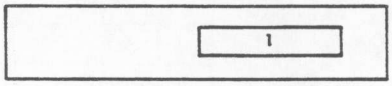
LTL 40 FT & LONGER TRAILER (FLATBED)

1. WHEN REQUIRED TO SHIP LESS-THAN-TRUCKLOAD, SELECT THE CORRECT LOAD PATTERN FOR THE NUMBER OF CONTAINERS TO BE SHIPPED FROM TABLE I .
2. ELEVEN OR NINE CONTAINERS CREATES A STACK UNEVEN IN HEIGHT AND SHOULD NOT BE SHIPPED BECAUSE OF TIE DOWN PROBLEMS.
3. POSITION CONTAINERS ON TRAILER AS SHOWN IN TABLE. BLOCK AND TIE DOWN USING THE PRINCIPLES SHOWN ON PAGES 3 AND 5 AND THE GENERAL DOCUMENT, MIL-STD-1320.
4. THE LTL PLAN SHOWN ON PAGE 5 IS THE CORRECT LESS-THAN-TRUCKLOAD FOR THE QUANTITY OF CONTAINERS SHOWN. THIS DOES NOT LIMIT SHIPMENTS TO THIS QUANTITY, SINCE LTL SHIPMENTS MAY CONSIST OF A LESSER NUMBER OF CONTAINERS.
5. WHEN STATE LAW PERMITS, "DOUBLES" MAY BE USED. BLOCK AND TIE DOWN USING THE PRINCIPLES OF THIS DOCUMENT.

TABLE I

LOAD PATTERN *

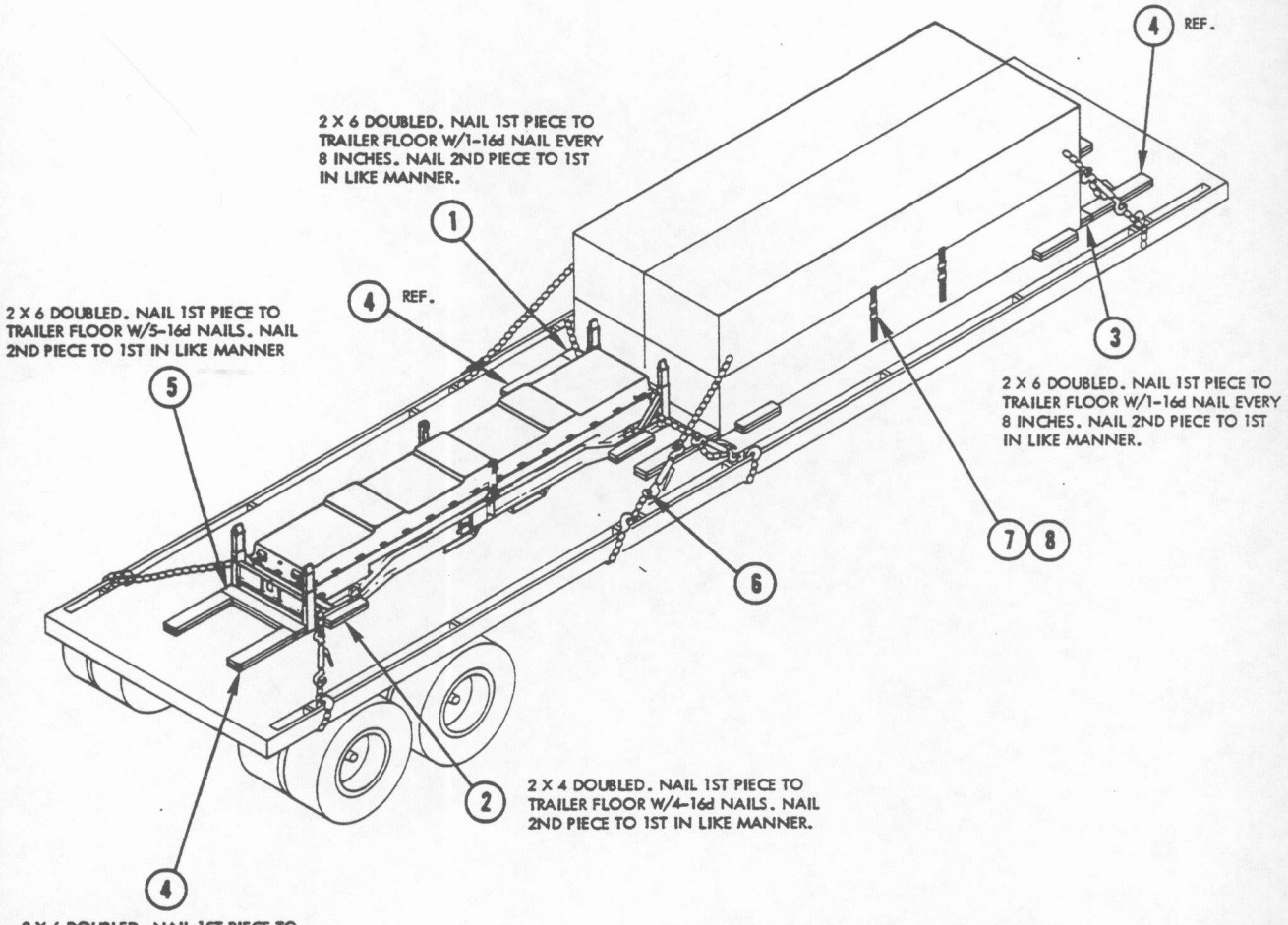
NO. OF CONTAINERS	→ FWD
10	
8	
7	
** 6	
5	

NO. OF CONTAINERS	→ FWD
*** 4	
3	
2	
1	

* LOAD PATTERN SHOWS FLOOR PLAN FOR TRAILER.
NUMBER INDICATES THE NUMBER OF CONTAINERS IN A LAYER.

** MAY BE ONE STACK THREE CONTAINERS HIGH AT FORWARD END OF TRAILER.

*** MAY BE ONE STACK TWO CONTAINERS HIGH AT FORWARD END OF TRAILER.



PIECE NO.	DESCRIPTION	SIZE	NO. PCS. REQ'D	NAIL TO	NUMBER	SIZE
					NAILS	
8	SEAL	FOR 1 1/4 STRAP	4	-	-	-
7	CROSS STRAP	1 1/4 X .035 X 17 FT	2	-	-	-
6	CHAIN & BINDER	5/16 OR 3/8	4	-	-	-
5	CROSSMEMBER	2 X 6 X 36	2	SEE FIELD NOTE		
4	BACKUP CLEAT	2 X 6 X 30	16	SEE FIELD NOTE		
3	CROSSMEMBER	2 X 6 X 72	2	SEE FIELD NOTE		
2	SLEEPER	2 X 4 X 18	16	SEE FIELD NOTE		
1	CROSSMEMBER	2 X 6 X 72	2	SEE FIELD NOTE		

LIST OF MATERIALS & NAILING DATA

TRUCKLOAD DATA

NUMBER OF CONTAINERS 5
NUMBER OF MISSILES 10
WEIGHT (APPROX.) ..... 11,775 LBS.

LTL 40 FT & LONGER TRAILER (FLATBED)

REVIEW ACTIVITY:
NAVY-OS, AS

PREPARING ACTIVITY:
NAVY-OS
(PROJECT NO.8140-N511)