

NOTE The cover page of this standard has been changed for administrative reasons. There are no other changes to this document. In addition, all dash sheets associated with this document are hereby designated as standard practices.

INCH-POUND

MIL-STD-1320C(NAVY)

30 AUGUST 1979

SUPERSEDING

MIL-STD-1320B(NAVY)

22 JULY 1977 AND

INTERIM NOTICE 1 (OS)

12 SEPTEMBER 1978

DEPARTMENT OF DEFENSE
STANDARD PRACTICE

TRUCKLOADING OF
AMMUNITION AND EXPLOSIVES



AMSC N/A

FSC 8140

MIL-STD-1320C (Navy)
30 August 1979

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.

MIL-STD-1320C (Navy)
30 August 1979

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:

<u>New</u>	<u>Previous</u>
MIL-STD-1320	WR-51
MIL-STD-1322	WR-53
MIL-STD-1323	WR-54
MIL-STD-1325	WR-52

MIL-STD-1320C (Navy)
30 August 1979

CONTENTS

<u>Paragraph</u>		<u>Page</u>
1	SCOPE	1
2	REFERENCED DOCUMENTS	1
3	DEFINITIONS	3
4	GENERAL REQUIREMENTS	7
4 1	Danger in shipment	7
4 2	Load movement	7
4 3	Control of load movement	8
4 4	MIL-STD dash number sheets	8
4 4 2	Use of MIL-STD dash number sheets	8
4 5	MIL-HDBK-236	9
5	DETAILED REQUIREMENTS	10
5 1	General	10
5 2	Preparation of shipment	10
5 2 1	Using the correct dash number sheets	10
5 2 2	Type of vehicles	10
5 2 3	Special requirements	11
5 2 4	DOT regulations	11
5 2 5	Maximum weights	11
5 2 6	Motor vehicle inspection	11
5 2 7	Weighing of vehicles (empty and loaded)	12
5 3	Preparing the vehicle	12
5 4	Loading and unloading of long ordnance items	12
5 5	Lumber	13
5 5 2	Nominal strengths	13
5 5 3	Selecting lumber	15
5 6	Nails	15
5 7	Steel strapping	17
5 7 1 2	Crimping/notching strap seals	18
5 7 2	Tiedown strapping on flatbed vehicles	18
5 7 2 1	Determining number and size of straps	18
5 7 3	Unitizing containers	19
5 7 4	Unitizing unit loads	21
5 8	Chains and load binders	22
5 9	Dunnaging in van trailers	23
5 9 1	Van trailer lengths	23
5 9 2	Trailer axles	24
5 9 3	Controlling forward movement	24
5 9 3 1	Front bulkhead	24
5 9 3 3	Partial lavers	26
5 9 4	Controlling rearward movement	28

MIL-STD-1320C (Navy)

30 August 1979

	<u>Page</u>
5 9 4 1	28
5 9 4 2	30
5 9 4 3	32
5 9 5	33
5 9 5 1	33
5 9 5 2	33
5 9 6	35
5 9 7	36
5 9 7 1	36
5 9 7 2	37
5 10	38
5 10 2	38
5 10 3 1	39
5 10 3 2	39
5 10 4	39
5 10 5	39
5 10 6	40
5 10 7	40
5 11	40
5 12	40
10	45
10 1	45
10 2	45
10 3	45
10 4	45
10 5	46
10 6	46
10 6 1	46
10 6 2	46
10 6 2 1	47
10 6 2 2	47
10 6 3	47
10 6 3 1	47
10 6 4	48
10 6 5	48
10 7	48
10 7 1	48
10 8	49
20	55

FIGURES

	<u>Page</u>
1 Partial Truckload Showing Nomenclature	5
2 Lumber Defects	15
3 Tiedown Strapping	19
4 Unitizing Containers	20
5 Unitizing Unit Loads	21
6 Typical Tiedown Using Chain and Loadbinder	22
7 Front Bulkhead (for Square Nose, Rounded Corner Vans)	25
8 Front Bulkhead (Void Space)	26
9 Front Bulkhead (Square Nose)	27
10 Front Bulkhead (Low)	27
11 Rear Blocking Assembly (Solid Fill)	28
12 Rear Blocking Assembly	29
13 Rear Blocking	30
14 Rear Gate (2 to 3 Feet From Rear Door)	31
15 Rear Gate (Located Further Than 6 Feet From Rear Door)	32
16 Sleepers	33
17 Sway Brace	34
18 Top-of-Load Sway Brace	34
19 Filler Assemblies	35
20 Intermediate Gate	36
21 Eggcrating	37
22 Stepdown Loads	38
23 Sample Flatbed Load	41
24 Allowable Trailers by State	42

TABLES

I Sizes of Dressed Lumber	13
II Species and Grades of Lumber	14
III Sizes of Nails	16
IV Maximum Load Per Strap	18
A-I Visual Examination of Truck and Trailer Loads	50
B-I Summary of Vehicle Size and Weight Limits	55
B-II Allowable Load for Motor Vehicles and Trailers (Load Figures in Thousands of Pounds)	61
B-III Gross Weights Allowable Under New Federal Weight Law Formula Enacted January 4, 1975	63

MIL-STD-1320C (Navy)
30 August 1979

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

MIL-STD-1320C (Navy)
30 August 1979

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

MIL-STD-1320C (Navy)
30 August 1979

(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

MIL-STD-1320C (Navv)
30 August 1979

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 Eggerating 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

MIL-STD-1320C (Navy)
30 August 1979

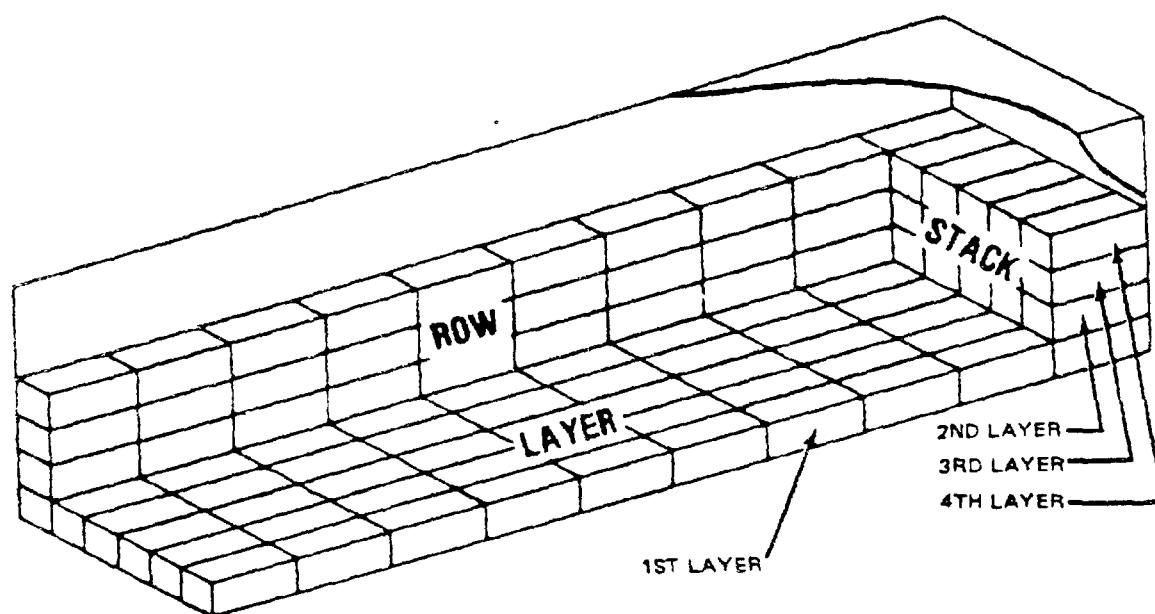


FIGURE 1 PARTIAL TRUCKLOAD SHOWING NOMENCLATURE

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)

MIL-STD-1320C (Navv)
30 August 1979

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

MIL-STD-1320C (Navy)
30 August 1979

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 catastrophe.

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.

MIL-STD-1320C (Navy)

30 August 1979

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

MIL-STD-1320C (Navy)
30 August 1979

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.

MIL-STD-1320C (Navv)

30 August 1979

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)

MIL-STD-1320C (Navv)
30 August 1979

(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 permissible "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

MIL-STD-1320C (Navy)

30 August 1979

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, discrepancy 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 permissible 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

MIL-STD-1320C (Navv)
30 August 1979

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

MIL-STD-1320C (Navv)
30 August 1979

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

¹WCLIB - 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.

MIL-STD-1320C (Navy)
30 August 1979

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).

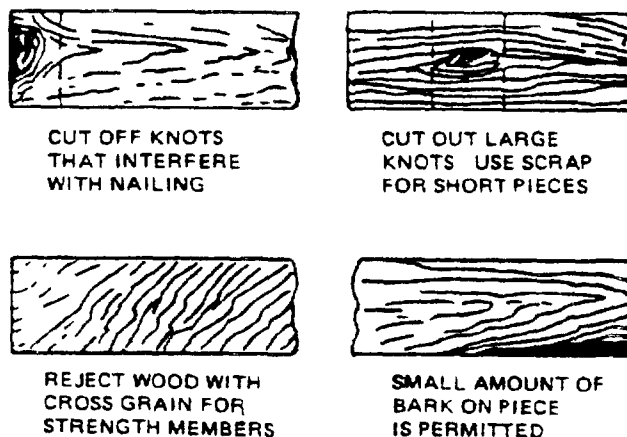


FIGURE 2 LUMBER DEFECTS

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.

MIL-STD-1320C (Navy)
30 August 1979

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.

MIL-STD-1320C (Navy)

30 August 1979

(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

MIL-STD-1320C (Navy)
30 August 1979

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.

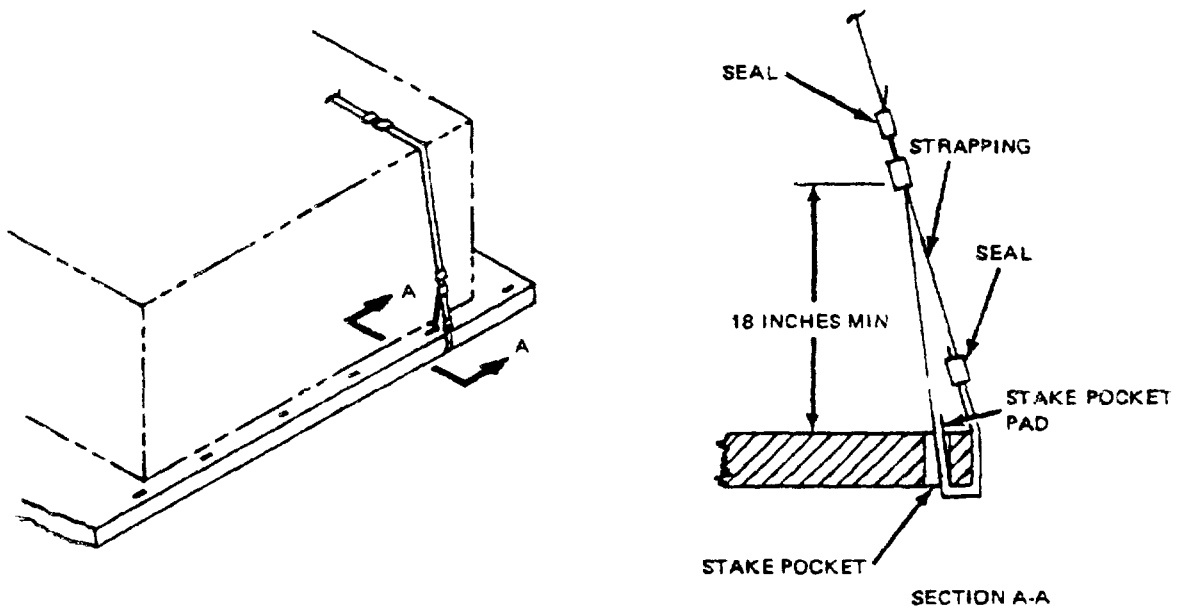
5 7 2 Tiedown strapping on flatbed vehicles

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.

MIL-STD-1300 (Navy)

30 August 1979



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.

MIL-STD-1320C (Navy)
30 August 1979

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-cramped 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.

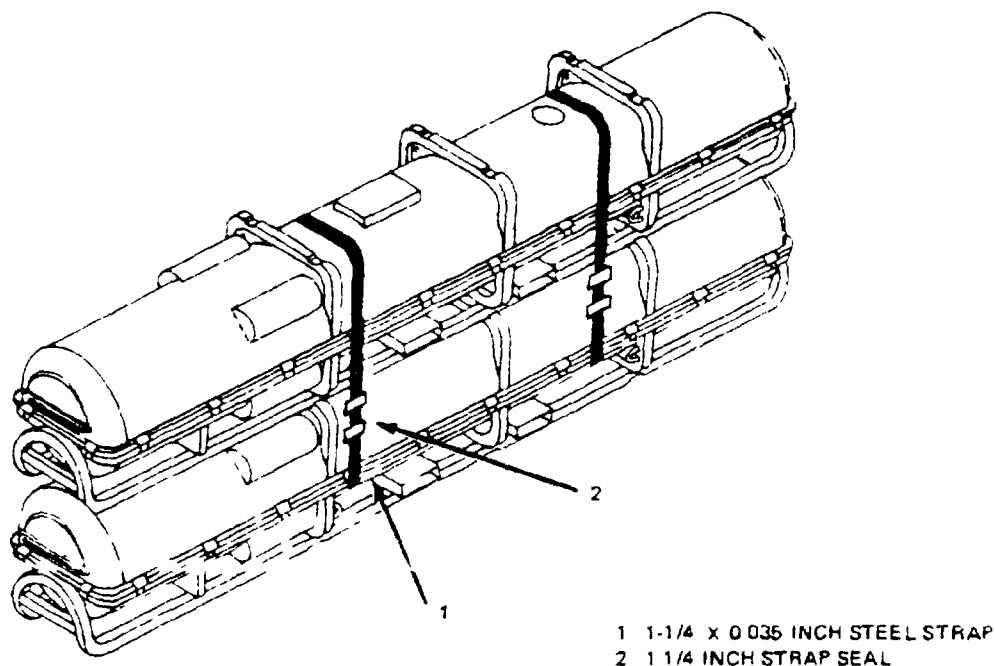


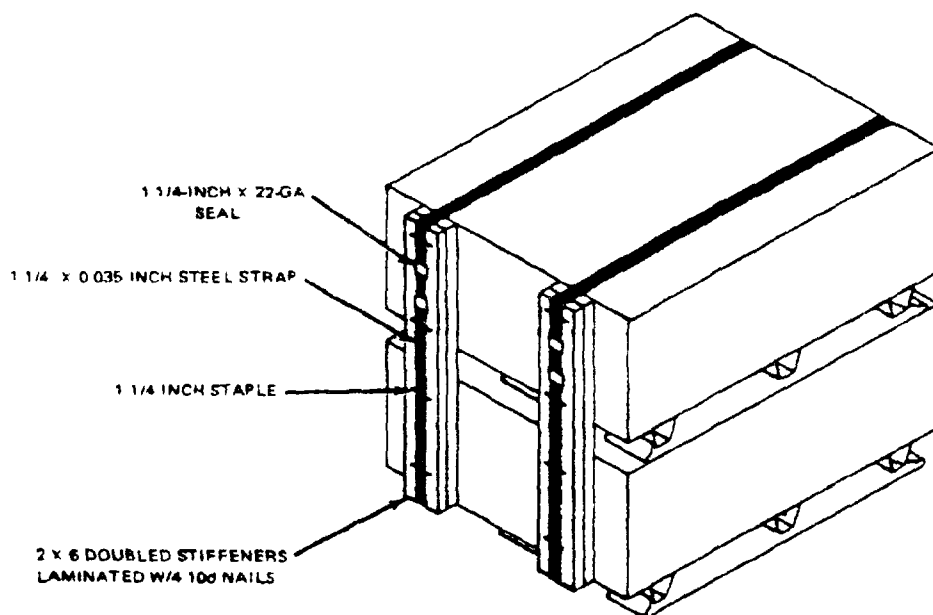
FIGURE 4 UNITIZING CONTAINERS

MIL-STD-1320C (Navy)
30 August 1979

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

MIL-STD-1320C (Navy)
30 August 1979

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 Manufacturers' 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.

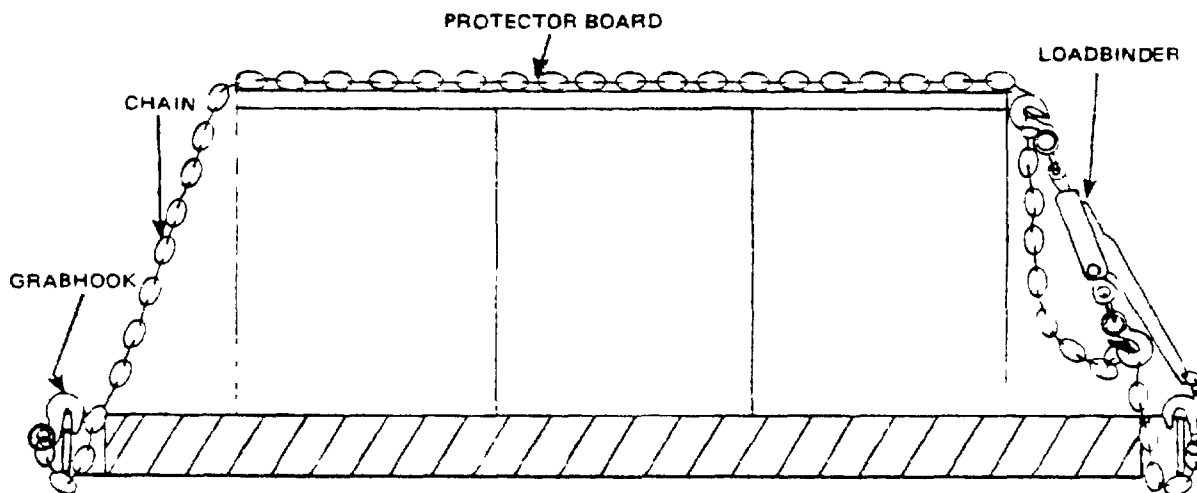


FIGURE 6 TYPICAL TIEDOWN USING CHAIN AND LOADBINDER

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-eighths-inch, grade 43, High-Test Chain shall be marked H or 4 or 43 or 430 or H1.

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.

MIL-STD-1320C (Navy)
30 August 1979

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

MIL-STD-1320C (Navy)

30 August 1979

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 permissible 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.

MIL-STD-1320C (Navy)
30 August 1979

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.

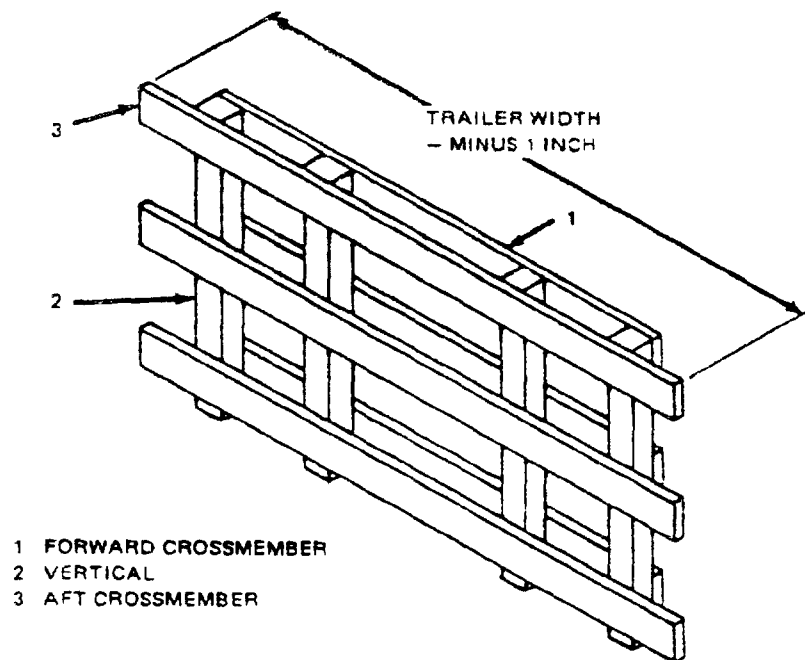


FIGURE 7 FRONT BULKHEAD (FOR SQUARE NOSE
ROUNDED CORNER VANS)

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).

MIL-STD-1320C (Navy)

30 August 1979

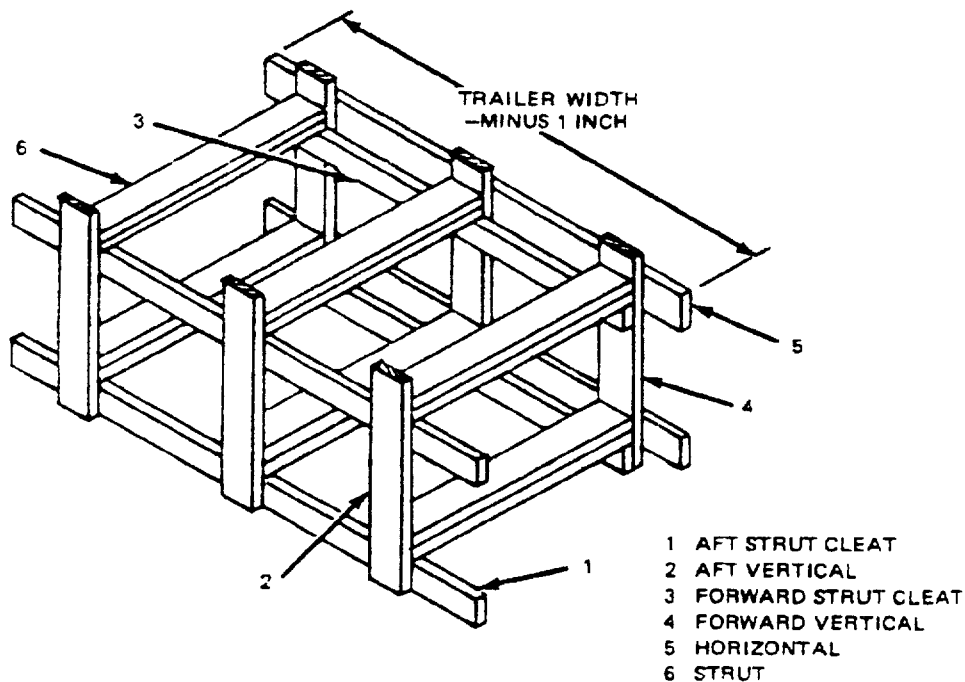


FIGURE 8 FRONT BULKHEAD (VOID SPACE)

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.

MIL-STD-1320C (rev)
30 August 1979

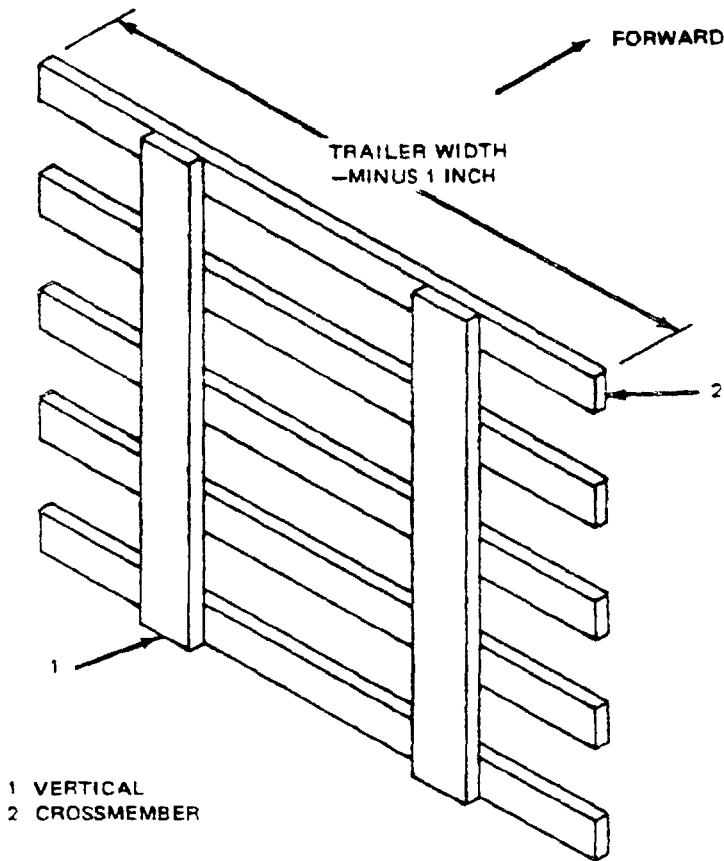


FIGURE 9 FRONT BULKHEAD (SQUARE NOSE)

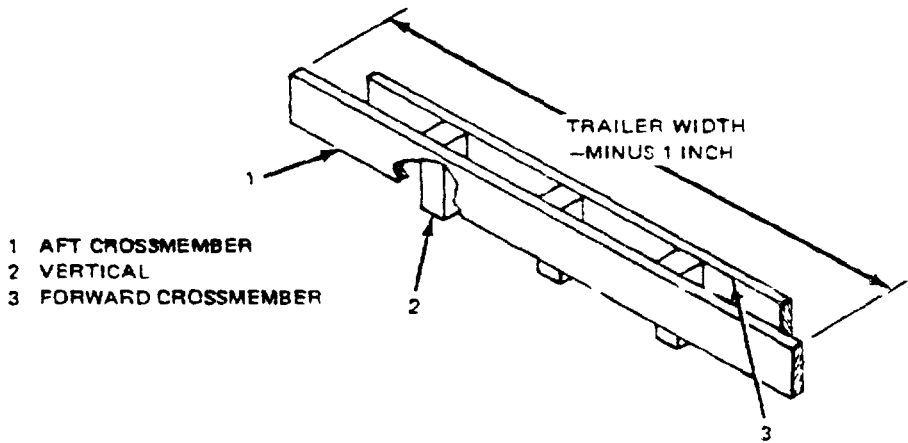


FIGURE 10 FRONT BULKHEAD (LOW)

MIL-STD-1520C (Navy)
30 August 1979

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.

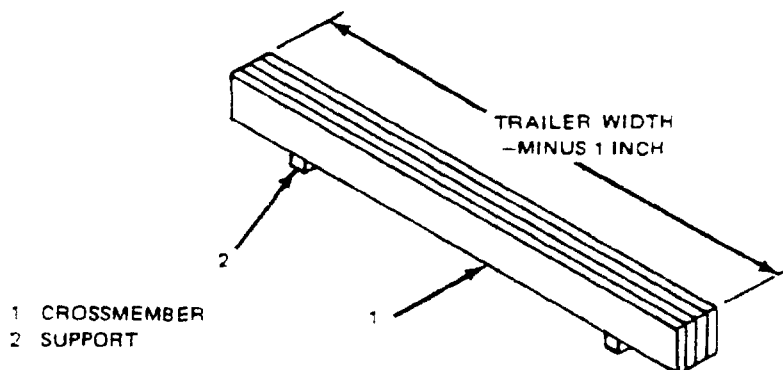


FIGURE 11 REAR BLOCKING ASSEMBLY (SOLID FILL)

MIL-STD-1320C (Navy)
30 August 1979

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

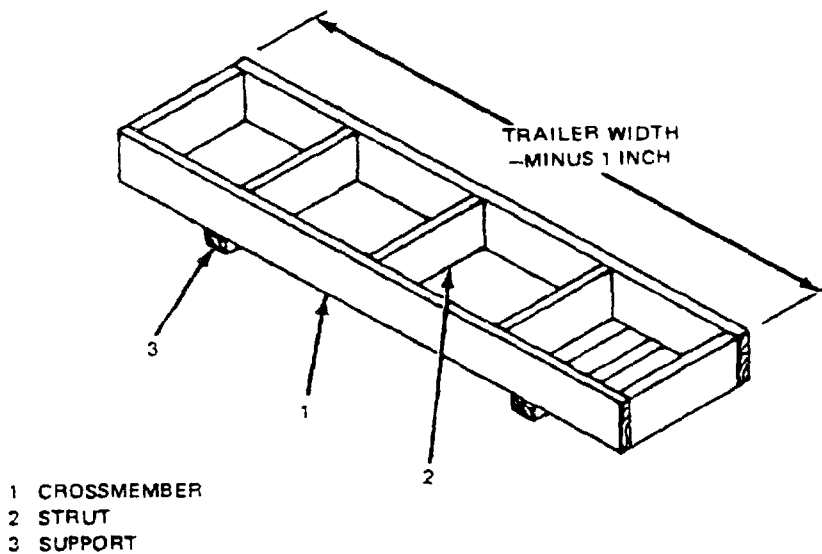


FIGURE 12 REAR BLOCKING ASSEMBLY

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

MIL-STD-1320C (Navy)
30 August 1979

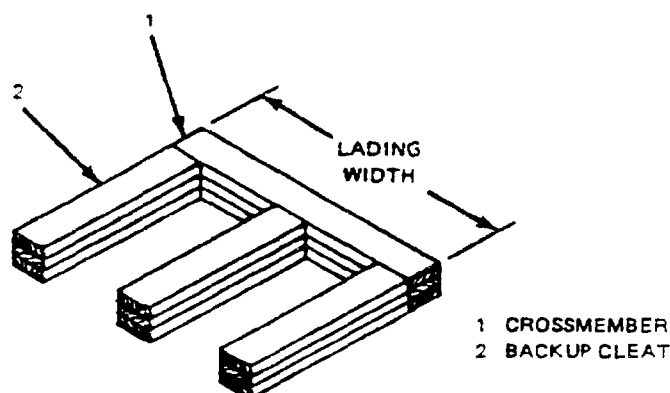


FIGURE 13 REAR BLOCKING

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 gate's 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.

MIL-STD-1320C (Navy)
30 August 1979

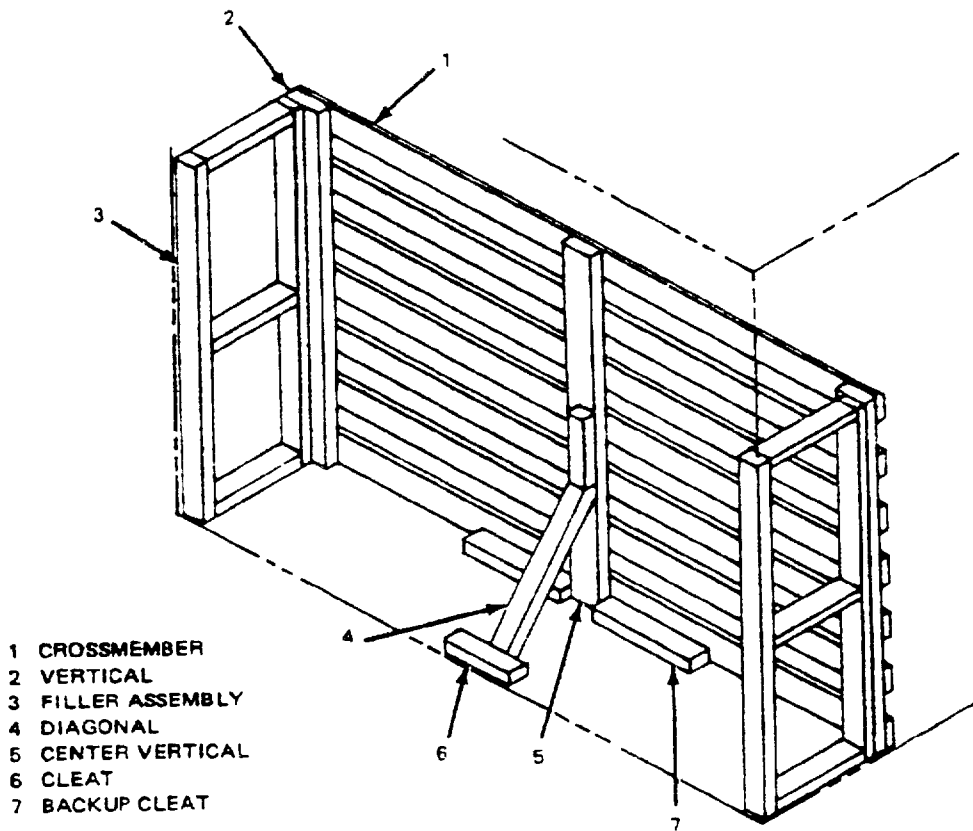


FIGURE 14 REAR GATE (2 TO 3 FEET FROM REAR DOOR)

MIL-STD-1320C (Navy)
30 August 1979

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.

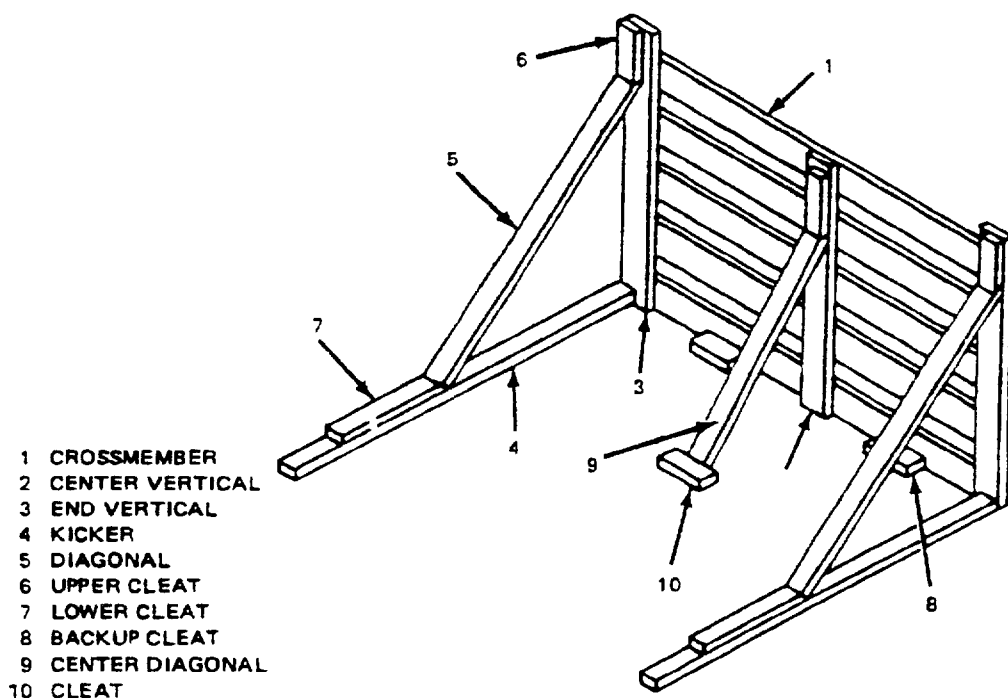


FIGURE 15 REAR GATE (LOCATED FURTHER THAN
6 FEET FROM REAR DOOR)

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 x 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

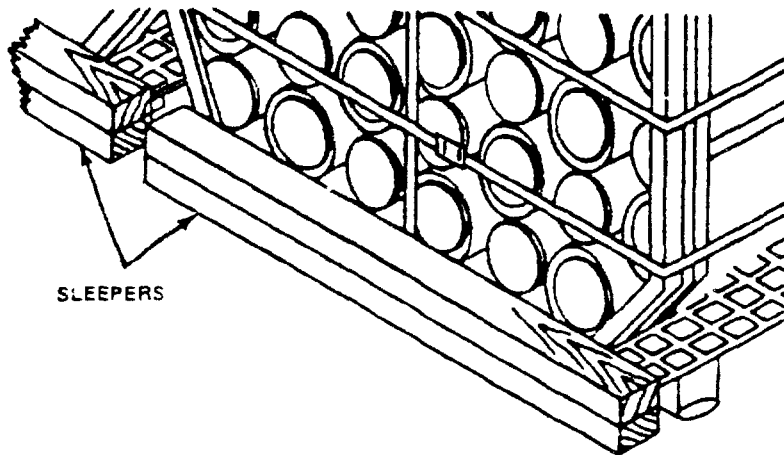


FIGURE 16 SLEEPERS

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-tying with 16-gauge, soft-annealed iron wire to some fixed part of the lading

MIL-STD-1320C (Navv)
30 August 1979

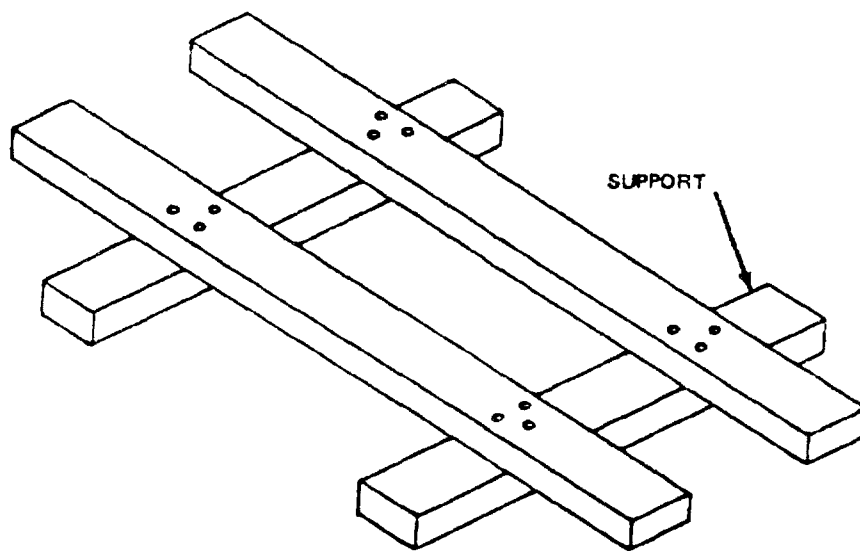


FIGURE 17 SWAY BRACE

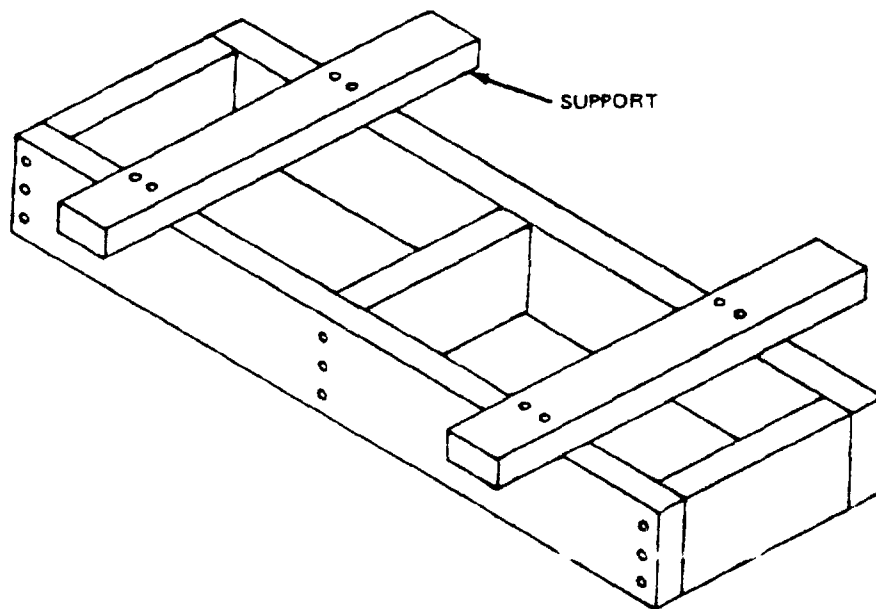
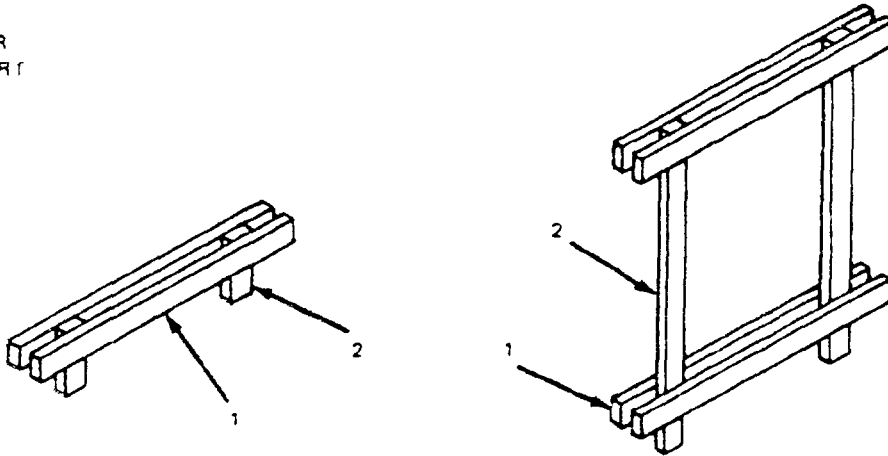


FIGURE 18 TOP-OF-LOAD SWAY BRACE

MIL-STD-1320C (Navy)
30 August 1979

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.

- 1 FILLER
- 2 SUPPORT



FILLER ASSEMBLY (1 HIGH LAYER OF LADING)

FILLER ASSEMBLY (2 HIGH LAYER 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.

MIL-STD-1320C (Navy)
30 August 1979

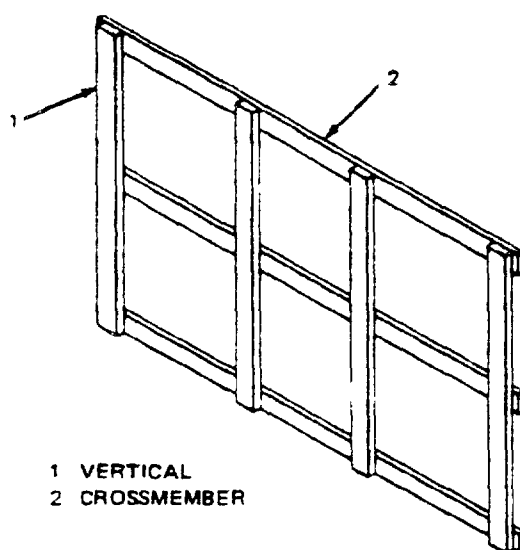


FIGURE 20 INTERMEDIATE GATE

5.9.7 Special van loads

5.9.7.1 Eggrating Eggrating 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 eggrated. 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.

MIL-STD-1320C (Navy)
30 August 1979

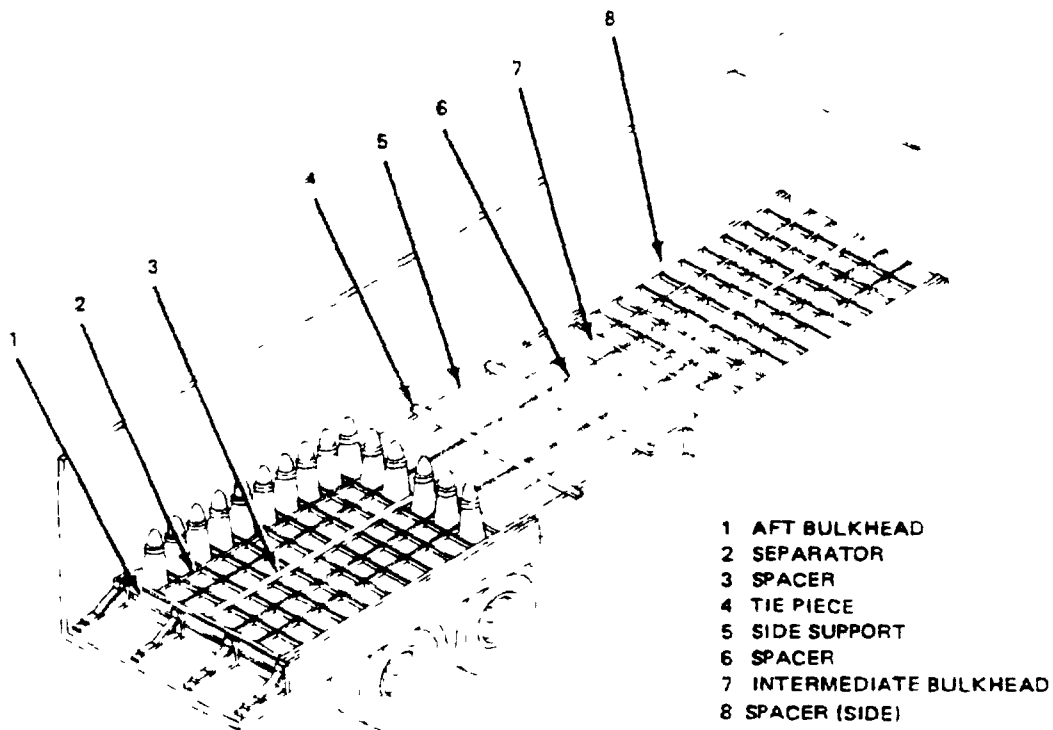


FIGURE 21 EGGCRATING

5 9 7 2 Stepdwn 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.

MIL-STD-1320C (Navy)

30 August 1979

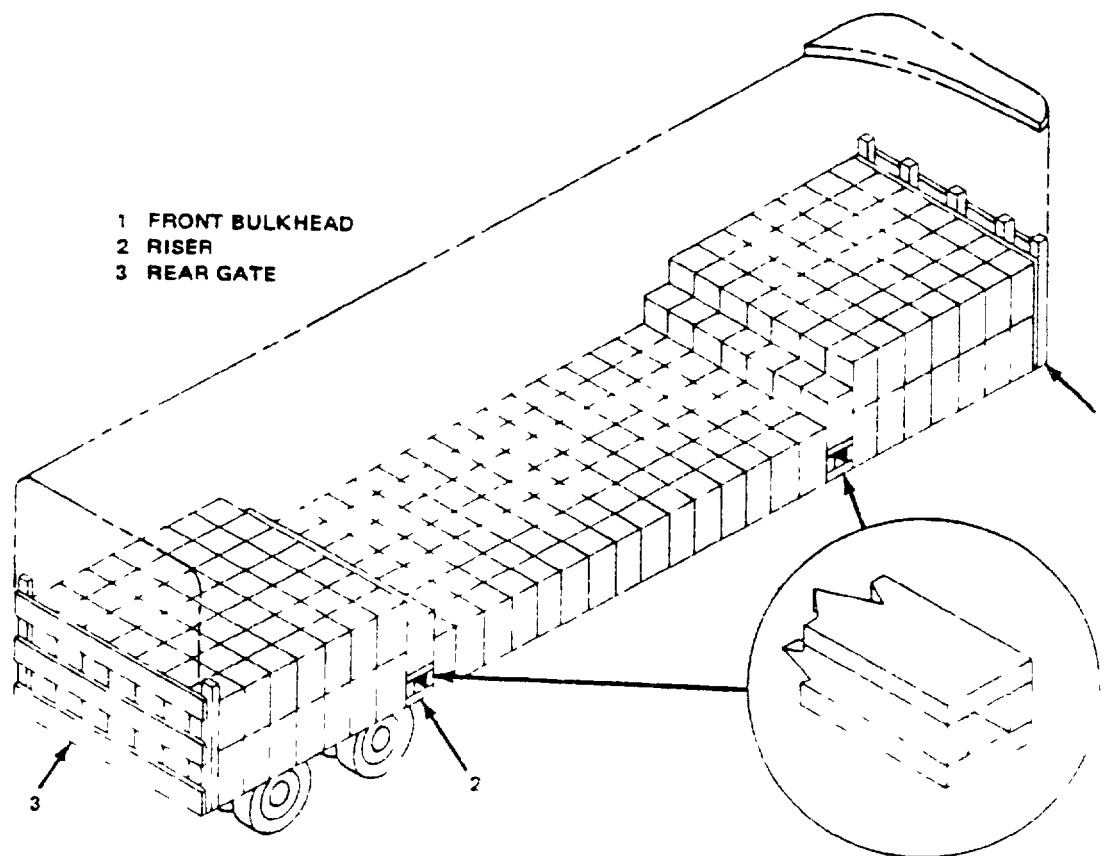


FIGURE 22 STEPDOWN LOADS

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.

MIL-STD-1320C (Navy)
30 August 1979

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.

MIL-STD-1320C (Navy)
30 August 1979

5 10 6 Tarpaulins Explosives, other than blackpowder, 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.

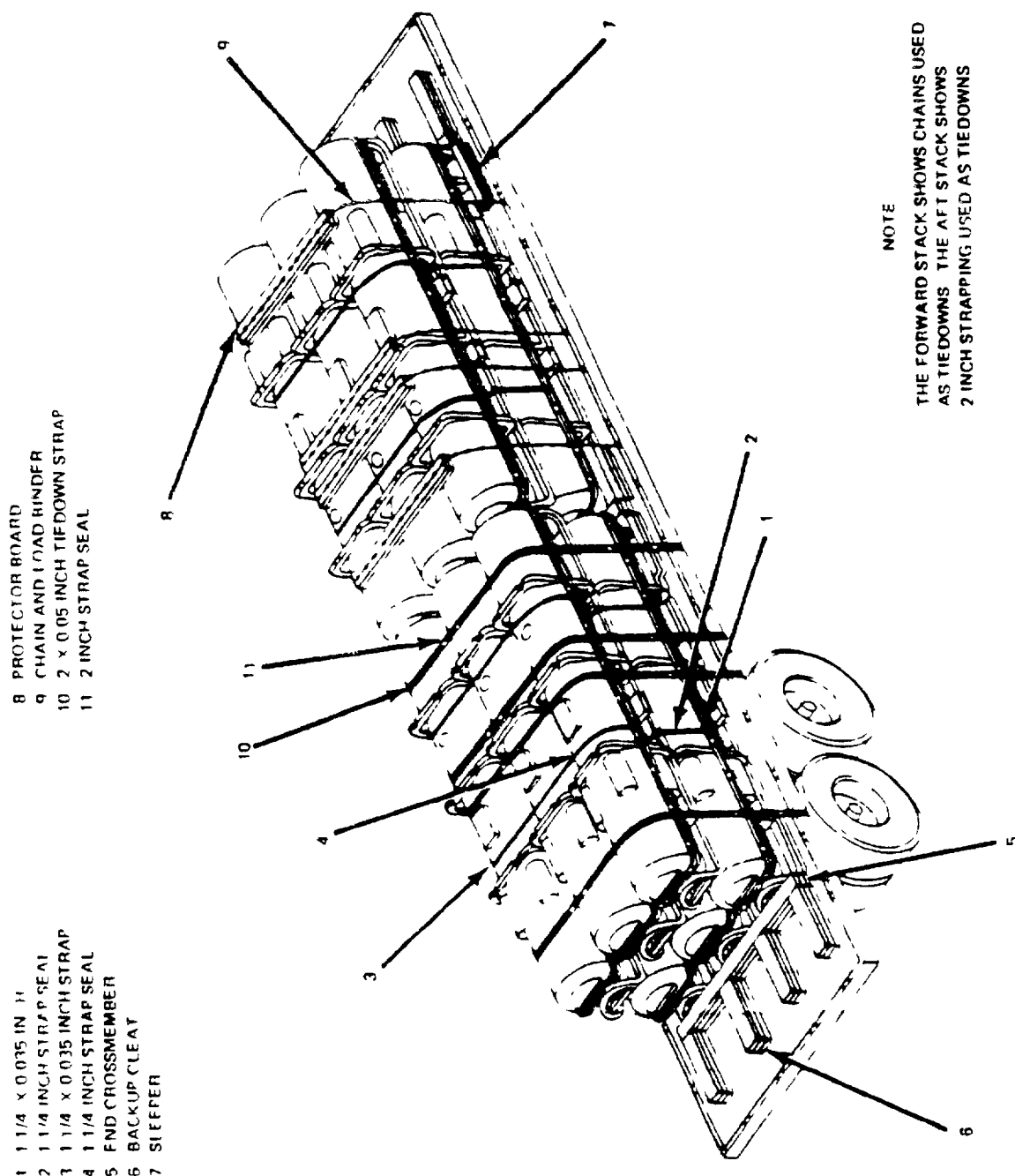
5 11 Sample flatbed load

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

MIL-STD-1320C (Navy)
30 August 1979



MIL-STD-1320C (Navy)

30 August 1979

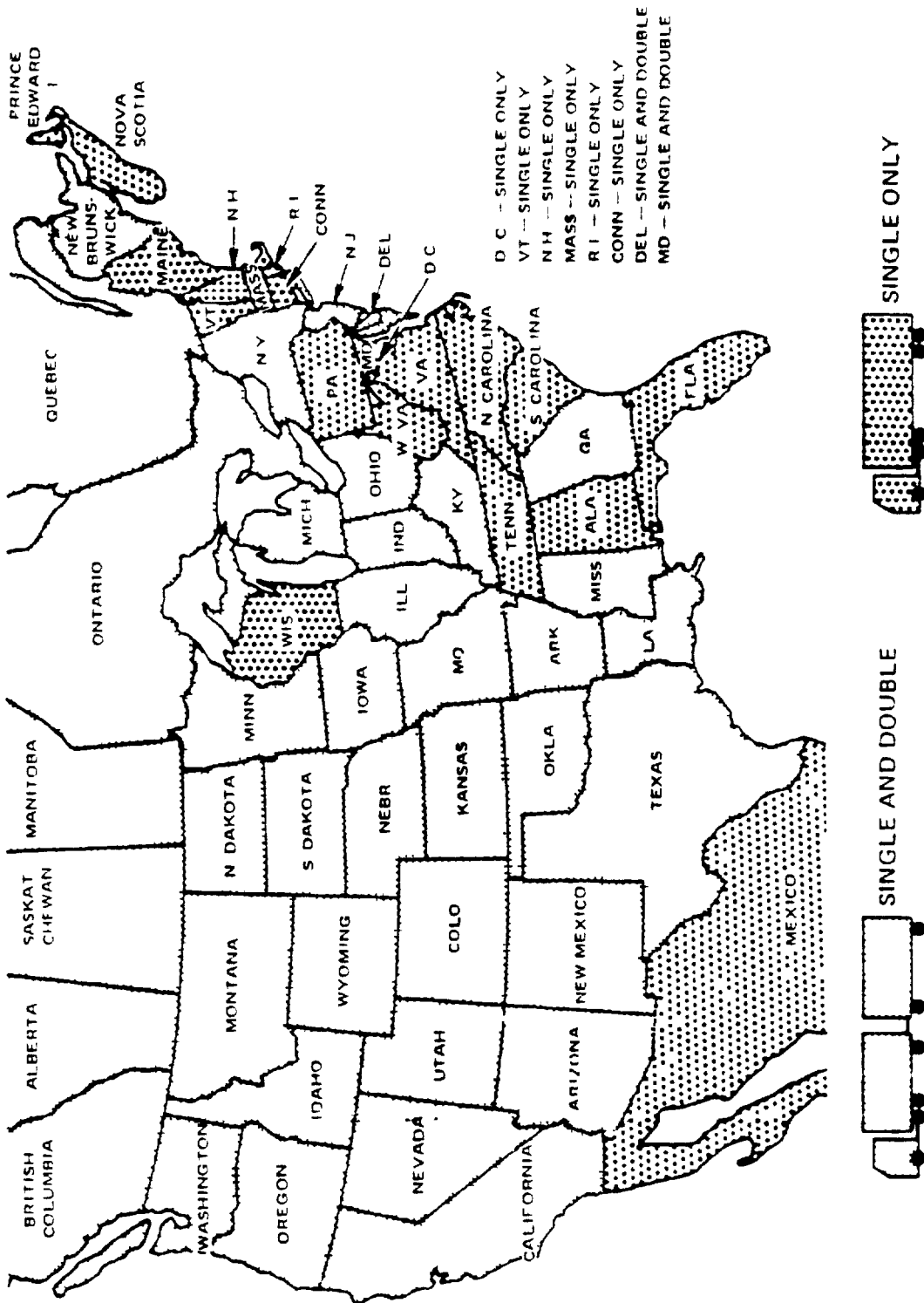


FIGURE 24 ALLOWABLE TRAILERS BY STATE

MIL-STD-1320C (Navy)
30 August 1979

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

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

Review activities
Navy—AS, MC

User activities
Navy—SH, SA

THIS PAGE INTENTIONALLY LEFT BLANK

MIL-STD-1320C (Navy)
30 August 1979

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 NAVSEASYSOM and WPNSTA Earle, Naval Weapons Handling Center (NWHC)

MIL-STD-1320C (Navy)

30 August 1979

(b) The performance of trial loadings and trial shipments is the responsibility of NAVSEASYSKOM 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 NAVSEASYSKOM 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 NAVSEASYSKOM and WPNSTA Earle (NWHC).

MIL-STD-1320C (Navy)
30 August 1979

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 consist 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.

MIL-STD-1320C (Navy)
30 August 1979

(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.

MIL-STD-1320C (Navy)

30 August 1979

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.

MIL-STD-1320C (Navv)
30 August 1979

Table A-I
VISUAL EXAMINATION OF TRUCK AND TRAILER LOADS

Examination	Applicable paragraph reference	Acceptance criteria
A <u>Use of MIL-STD dash number sheets</u>	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 <u>Vehicle (Empty) Cargo Space</u>	5 5	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
<u>Lading (Prior to Loading)</u> Item Identification	5 1 OP 2165	Packages and containers are properly packed and marked in accordance with DOT and DOD requirements
C <u>Dunnage Material</u>		
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-751 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

MIL-STD-1320C (Navy)
30 August 1979

Table A-I (contd)

Examination	Applicable paragraph reference	Acceptance criteria
D <u>Practices</u>		
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 6	Applied as specified
Tiedown Strapping	5 7 2	Applied as specified

MIL-STD-1320C (Navy)
30 August 1979

Table A-1 (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
Partial layers	5 9 2 3 5 9 4 3	Rear gate constructed & installed as specified Unitizing used where required and specified
Controlling lateral motion	5 9 5 1 5 9 5 2 5 9 5 3	Sleepers installed as specified Sway braces constructed & installed as specified 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 2 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 5 7 2	Correct number of straps used Straps properly applied
Chain & Load Binder	5 10 7 5 8	Correct number of chains used Chain properly applied
Strap Seals	5 7 1 2	Seals properly crimped

MIL-STD-1320C (Navy)
30 August 1979

Table A-1 (contd.)

Examination	Applicable paragraph reference	Acceptance criteria
G <u>Prior to Release of Loaded Vehicle</u>		
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.

MIL-STD-1320C (Navy)

30 August 1979

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

MIL-STD-1320C (Navy)
30 August 1979

Appendix B

20. MOTOR VEHICLE AND TRAILER SIZE AND WEIGHT LIMITATIONS (INCLUDING DOUBLES)

This appendix presents detailed data about size, weight and load limits established for motor vehicles and trailers (including doubles) in the United States, Canada and Mexico. Table B-I is a summary of vehicle size and weight limits. Table B-II lists those States that limit weight by an established table. Table B-III lists the allowable gross vehicle weight under the new Federal Weight Law enacted 4 January 1975.

The information in this appendix was derived from material prepared by the American Trucking Associations, Inc., 1616 P Street N.W., Washington D.C. 20036.

These tables were revised January 1979.

MIL-STD-1320C (Navy)
30 August 1979

Table B-1
SUMMARY OF VEHICLE SIZE AND WEIGHT LIMITS
(REVISED JANUARY 1979)

Jurisdiction	Width (ft in)	Height (ft in)	Length (ft in Inc Tolerances)					Axle Limits (Pounds, Inc Tolerances)		
			Truck	TST	5 trl Trl	Double Comb	Truck Trailer	Single Axle	Tandem Axle	Other
Alabama	96	13-6	40-0	55-0	NR	NP	NP	20,000 ²¹	39,600 ²¹	NR
Alaska	96	13-6	40-0	65-0	45-0	70-0	70-0	20,000	34,000	4-4
Arizona	96	13-6	40-0	65-0	NR ¹¹	65-0	65-0	20,000	34,000	NR
Arkansas	96	13-6	40-0	60-0	NR	65-0	65-0	18,000	32,000	12-4
California	96 ¹	13-6 ⁷	40-0	60-0	40-0 ¹²	65-0	65-0	20,000	34,000	15-4
Colorado	96 ^{2, 6}	13-0 ⁸	35-0	65-0	NR	65-0	65-0	20,000 ²²	36,000	11
Connecticut	102	13-6	55-0	55-0	NR	NP	NP	21,848	36,720	27
Delaware	96	13-6	40-0	60-0	NR	65-0	60-0	20,000	40,000	NR
Florida	96	13-6	40-0 ⁹	55-0	NR	NP	55-0	22,000	44,000	26
Georgia	96	13-6	55-0	55-0	NR	55-0	55-0	20,140	40,680	14
Hawaii	108	13-6	40-0	55-0	NR	65-0	65-0	24,000	34,000	18
Idaho	96 ³	14-0	40-0	65-0	NR	75-0 ¹⁸	75-0	20,000	34,000	10, 11
Illinois	96 ⁴	13-6	42-0	55-0	45-0 ¹³	65-0 ¹⁹	60-0	18,000	32,000	NR
Indiana	96	13-6	36-0	57-3	NR	65-0	55-0	18,000	32,000	10
Iowa	96	13-6	40-0	55-0	NR	60-0	55-0	18,540	32,960	NR
Kansas	96	13-6	42-6	65-0	NR ¹⁴	65-0	65-0	20,000	34,000	11
Kentucky	96	12-6 ⁸	35-0 ¹⁰	57-9 ¹⁰	NR	65-0 ¹⁰	65-0 ¹⁰	20,000 ²¹	34,000 ²¹	27, 46
Louisiana	96	13-6	40-0	65-0	NR	65-0 ²⁰	65-0	20,000 ²¹	34,000 ²¹	28, 44
Maine	96 ¹	13-6 ⁷	45-0	56-6	45-0	NP	56-6	22,000	34,000 ²¹	27, 45
Maryland	96	13-6	40-0	55-0	NR	65-0 ²⁰	55-0	22,400	40,000	NR
Massachusetts	96 ^{4, 6}	13-6	35-0	60-0	45-0	NP	55-0	22,400	36,000	10
Michigan	96	13-6	40-0	55-0	NR	65-0 ¹⁰	65-0 ¹⁰	20,000 ²²	34,000 ²¹	29
Minnesota	96	13-6	40-0	60-0	45-0 ¹⁵	60-0	60-0	20,000 ²⁴	34,000 ²⁴	11, 40
Mississippi	96	13-6	35-0	55-0	NR	55-0	55-0	18,000	32,000	11, 12
Missouri	96 ²	13-6	40-0	55-0	NR	65-0 ²⁰	65-0 ²⁰	18,000	32,000	NR
Montana	96 ¹	13-6	40-0	60-0	NR	60-0	60-0	18,000	32,000	NR
Nebraska	96	14-6	40-0	60-0	NR ¹¹	65-0	65-0	18,900 ²¹	33,600 ²¹	12
Nevada	96 ⁴	14-0	40-0	70-0	NR	70-0	70-0	20,000	34,000	NR
New Hampshire	96	13-6	35-0	55-0	NR	NP	55-0	22,400	36,000	27

See footnotes at end of table

MIL-STD-1320C (Navy)

30 August 1979

Table B I (contd)

Jurisdiction	Gross Weight Law Type		Maximum Practical Gross Weight (Pounds) ¹⁹							
			Wheelbase Only	5 Axle TST			5 Axle Twin			Maximum Weight
	Type Restriction	Any Axle Group		Interstate	Other	Interstate	Interstate	Other	Interstate	
Alabama	Formula B III	B III		79 500	88 000	NP	NP	NP	80 000	92 400
Alaska	Formula B III		B III		80 000			88 500		109 000
Arizona	Table B II	Under 18	Over 18	80 000	80 000	80 000	80 000	80 000	80 000	80 000
Arkansas	Axle & Gross			73 280	73 280	73 280	73 280	73 280	73 280	73 280
California	Table B III	B III		80 000	80 000	80 000	80 000	80 000	80 000	80 000
Colorado	Formula B II		B II	80 000	84 000	80 000	80 000	85 000	80 000	85 000
Connecticut	Specific Limits			73 000	73 000	NP	NP	NP	73 000	73 000
Delaware	Table B III ⁵⁰	B III		80 000	80 000	80 000	80 000	80 000	80 000	80 000
Florida	Tables B II & B III	B III	B II	79 500	79 500	NP	NP	NP	80 000	80 000
Georgia	Axle Limit Table B III	B III ⁵¹		79 000	79 000	79 000	79 000	79 000	80 000	80 000
Hawaii	Formula B-II & B III	B III	B-II ⁵²	79 500	79 500	80 000	80 000	88 000	80 800	88 800
Idaho	Tables B II & B III	B III	B II	80 000	80 000	80 000	80 000	92 000	80 000	105 500
Illinois	Table B II		B II	73 280	73 280	73 280	73 280	73 280	73 280	73 280
Indiana	Axle Limits			73 280	73 280	73 280	73 280	73 280	73 280	73 280
Iowa	Table B II	B II		73 280	73 280	73 280	73 280	73 280	73 280	73 280
Kansas	Table B II		B-II	80 000	80 000	80 000	80 000	85 500	80 000	85 500
Kentucky	Axle & Spec Limits			80 000	80 000	80 000	80 000	82 000	80 000	82 000
Louisiana	Axle & Spec Limits			80 000	80 000	80 000	80 000	80 000	83 400	88 000
Maine	Table B III	B III		80 000	80 000	NP	NP	NP	80 000	80 000
Maryland	Table B II		B II	73 280	73 280	73 280	73 280	73 280	73 280	73 280
Massachusetts	Formula B III	B III		79 500	79 500	NP	NP	NP	80 000	80 000
Michigan	Table B III	B III		79 500	79 500	80 000	80 000	80 000	148 000 ⁵³	148 000 ⁵⁴
Minnesota	Tables B II & B III	B II ⁵⁴ & B III		80 000 ²⁴	80 000 ²⁴	80 000 ²⁴	80 000 ²⁴	80 000 ²⁴	80 000 ²⁴	80 000 ²⁴
Mississippi	Table B II		B II	73 280	73 280	73 280	73 280	73 280	73 280	73 280
Missouri	Table B II		B II	73 280	73 280	73 280	73 280	73 280	73 280	73 280
Montana	Table B II		B II	76 000	76 000	76 000	76 000	76 000	76 800	76 800
Nebraska	Table B III	B III		73 280	80 000	73 280	73 280	86 500	73 280	95 000
Nevada	Table B-III	B III		80 000	80 000	80 000	80 000	88 500	80 000	109 000
New Hampshire	Tables B II & B III	B III ⁵⁵	B II	79 500	79 500	NP	NP	NP	80 000	80 000

See footnotes at end of table

MIL-STD-1320C (Navy)
30 August 1979

Table B-1 (contd)

Jurisdiction	Width (in)	Height (ft in)	Length (ft in Inc. Tolerances)				Axle Limits (Pounds Inc. Tolerances)			
			Truck	TST	5 Trl Trl	Double Comb	Truck Trailer	Single Axle	Tandem Axle	Other
New Jersey	96	13-6	35-0	55-0	NR	55-0	55-0	23,520	34,000 ²¹	30, 47
New Mexico	96 ^{5, 6}	13-6	40-0	65-0	NR	65-0	65-0	21,600	34,320	27, 36
New York	96	13-6	35-0	55-0	NR ¹⁶	55-0 ¹⁰	55-0	22,400	36,000	30, 37
North Carolina	96	13-6	40-0 ⁹	55-0	NR	NP	55-0	20,000	38,000	27, 32
North Dakota	96 ⁵	13-6	40-0	65-0	NR	65-0 ¹⁰	65-0	20,000	34,000	26, 33
Ohio	96	13-6	40-0	60-0	45-0	65-0	65-0	20,000	34,000	28, 45
Oklahoma	96 ⁵	13-6	40-0	65-0	NR	65-0	65-0	20,000	34,000	NR
Oregon	96 ²	13-6	40-0	60-0 ¹⁰	35-0 ¹⁷	75-0 ¹⁰	75-0 ¹⁰	20,000	34,000	26, 31
Pennsylvania	96 ⁵	13-6	40-0	55-0	NR	NP	55-0	23,070	37,080	30
Rhode Island	102	13-6	40-0	55-0	NR	NP	55-0	22,400	36,000	NR
South Carolina	96 ²	13-6	40-0 ⁹	55-0	NR	NP	55-0	20,000 ²¹	35,200 ²¹	NR
South Dakota	96	13-6	35-0	70-0	NR	70-0	70-0	20,000	34,000	27, 33
Tennessee	96	13-6	40-0	55-0	NR	NP	55-0	18,000	32,000	39
Texas	96	13-6	45-0	65-0	NR	65-0	65-0	20,000	34,000	28, 32
Utah	96	14-0	45-0	65-0	45-0	64-0	65-0	20,000	34,000	35
Vermont	96	13-6	60-0	60-0	NR	NP	60-0	22,400 ²¹	36,000 ²¹	27
Virginia	96	13-6	40-0	56-0	NR	NP	55-0	20,000 ²¹	34,000 ²¹	28
Washington	96 ^{4, 6}	14-0	35-0	65-0	45-0	65-0	65-0	20,000	34,000	25
West Virginia	96	12-6 ⁸	40-0 ⁹	55-0 ¹⁰	NR	NP	55-0 ¹⁰	20,000	34,000	NR
Wisconsin	96	13-6	35-0	59-0	45-0	NP	55-0	20,000	34,000	33, 43
Wyoming	96 ⁵	14-0	60-0	85-0	NR	85-0	85-0	20,000	36,000	31
Dist. of Columbia	96	13-6	40-0	55-0	NR	NP	55-0	22,000	38,000	NR

See footnotes at end of table

30 August 1979

Table B-I (cont'd)

Jurisdiction	Gross Weight Law Type			Maximum Practical Gross Weight (Pounds) ⁴⁹					
	Type Restriction	Any Axle Group	Wheelbase Only	5 Axle TST		5 Axle Twin		Maximum Weight	
				Interstate	Other	Interstate	Other	Interstate	Other
New Jersey	Formula B III	B III		79,500	79,500	79,500	79,500	80,000	80,000
New Mexico	Table B-III		B II	80,640	80,640	86,400	86,400	86,400	86,400
New York	Tables B II & B III	B III ⁵⁶	B II	79,500	79,500	79,500	79,500	80,000	80,000
North Carolina	Spec Limits Table A		B II	79,800	79,800	NP	NP	79,800	79,800
North Dakota	Formula B III	B III		80,000	80,000	80,000	85,500	80,000	105,500
Ohio	Formula B II		B-II	80,000	80,000	80,000	80,000	80,000	80,000
Oklahoma	Table B-III	B III		80,000	80,000	80,000	85,500	80,000	90,000
Oregon	Table B III	B III		80,000	80,000	80,000	80,000	80,000	80,000
Pennsylvania	Specific Limits			73,280	73,280	NP	NP	73,280	73,280
Rhode Island	Specific Limits			80,000	80,000	NP	NP	80,000	80,000
South Carolina	Spec Limits, Table B III	B III ⁵⁷		79,500	80,600	NP	NP	80,000	80,600
South Dakota	Table B III	B-III		80,000	80,000	80,000	85,500	80,000	95,000
Tennessee	Specific Limits			73,280	73,280	NP	NP	73,280	73,280
Texas	Table B-III	B III		80,000	80,000	80,000	80,000	80,000	80,000
Utah	Table B III	B III		80,000	80,000	80,000	80,000	80,000	80,000
Vermont	Table B III	B III		80,000	80,000	NP	NP	80,000	80,000
Virginia	Table B III	B III		79,800	79,800	NP	NP	79,800	79,800
Washington	Table B III	B III		80,000	80,000	80,000	80,000	80,000	80,000
West Virginia	Table B III	B III ⁵⁵		79,500	79,500	NP	NP	80,000	80,000
Wisconsin	Tables B II & B III	B II & B III		80,000	80,000	NP	NP	80,000	80,000
Wyoming	Tables B II & B III	B II & B III		80,000	84,000	80,000	92,000	80,000	101,000
Dist of Columbia	Table B-II	B II		73,280	73,280	NP	NP	73,280	73,280

See footnotes at end of table

MIL-STD-1320C (Navy)
30 August 1979

Table B-I (contd)

FOOTNOTES - General	
NR - no specific restriction	
NP - not permitted	
P - see special permit section	
FOOTNOTES - Width	
1 load and tire width 100'	29 700 lbs/inch width of tire
2 excludes safety devices	30 800 lbs/inch width of tire
3 102' on non Interstate highways	31 tire weight table in law
4 102" includes safety devices	32 single wheel 9 000 lbs
5 102" on designated highways	33 single wheel 10 000 lbs
6 102' tire width	34 single wheel 10 170 lbs
	35 single wheel 10 500 lbs
	36 single wheel 11 000 lbs
	37 single wheel 11 200 lbs
	38 single wheel 12 000 lbs
	39 steering axle 12 000 lbs, tractor only
	40 steering axle 12 000 lbs, with exceptions
	41 steering axle 12 500 lbs
	42 steering axle 12 500 lbs with exceptions
	43 steering axle 13 000 lbs
	44 tri axle limit 42 000 lbs
	45 tri axle limit 48 000 lbs
	46 tri axle limit 50 000 lbs
	47 tri axle limit 51 000 lbs
	48 Tables "B-II" & "B-III" refer to tables B-II and B-III, formulae refer to formulae resulting in tables "B-II" & "B-III"
	49 maximum weights are calculated assuming (i) maximum allowable length, (ii) optimum axle spacing and load distribution, (iii) wheelbase 5' less than length and (iv) steering axle 12 000 lbs
	50 specific limits off Interstate
	51 Table "B-III" applies over 73 280 lbs
	52 Table "B-II" weights over 80 000 lbs, allowed off Interstate
	53 axles on these combinations are limited to 13 000 lbs with one 32 000 lb tandem axle
	54 Table "B-II" weights includes single axle limit 18 000 lbs, and tandem axle limit 32 000 lbs
	55 Table "B-III" applies only to 5 axle combinations
	56 Table "B-III" applies only over 71 000 lbs
	57 Table "B-III" applies only over 75 000 lbs on Interstate highways
	58 Table "B-III" applies only over 65 000 lbs on designated highways

FOOTNOTES - Length	
92 axle truck 35'	
10 on designated highways	
11 full trailer 40'	
12 no semitrailer limit if distance from kingpin to rear most axle not over 38'	
13 full trailer 42'	
14 full trailer 42' 6"	
15 plus 6' for bumpers	
16 full trailer 35'	
17 in TST combination semitrailer limited with distance from kingpin to rear most axle at 38'	
18 double & triple trailer combination authorized to 105' under rules & regulations	
19 on 4 lane and designated 2 lane highways	
20 on 4 lane highways with limited access on lesser highways authorized	
FOOTNOTES - Weight	
21 higher limits off Interstate highways	
22 18 000 lbs off Interstate highways	
23 26 000 lbs off Interstate highways	
24 Interstate and other designated highways	
25 550 lbs/inch width of tire (tires under 12' wide), otherwise 660 lbs/inch width of tire	
26 550 lbs/inch width of tire	
27 600 lbs/inch width of tire	
28 650 lbs/inch width of tire	

MIL-STD-1320C (Navy)

30 August 1979

Table B-11

ALLOWABLE LOADS FOR MOTOR VEHICLES AND TRAILERS
(LOAD FIGURES IN THOUSANDS OF POUNDS)

Distance	Arizona	Colorado	Florida	Hawaii	Idaho		Illinois			Iowa	Kansas	Maryland	Minnesota		
					3-4 Axles	5 Axles	3 Axles	4 Axles	5 Axles				2 Axles	3 Axles	4 or more Axles
4	34.0	44.0	44.0	-	-	-	-	-	-	33.0	34.0	40.0	32.0	-	-
5	34.0	45.0	44.0	-	-	-	-	-	-	33.0	34.0	40.0	32.0	-	-
6	34.0	46.0	44.0	32.2	-	-	-	-	-	33.0	34.0	40.0	32.0	-	-
7	34.0	47.0	44.0	32.9	-	-	-	-	-	33.0	34.0	40.0	32.0	37.0	-
8	42.0	48.0	44.0	33.6	-	-	-	-	-	35.2	34.6	40.0	33.0	38.5	-
9	42.5	49.0	48.6	34.3	-	-	-	-	-	36.3	36.5	41.6	34.0	39.9	-
10	43.5	50.0	49.5	35.0	-	-	41.0	-	-	37.7	38.5	42.5	35.0	41.2	42.5
11	44.0	51.0	50.4	35.7	-	-	42.0	-	-	39.1	40.5	43.3	36.0	42.4	44.5
12	50.0	52.0	51.3	36.4	-	-	43.0	-	-	41.4	42.0	44.2	-	43.5	46.0
13	50.5	53.0	52.2	46.6	56.5	56.5	44.0	-	-	42.4	43.0	45.0	-	44.5	47.6
14	51.5	54.0	53.1	47.5	57.9	57.9	44.5	-	-	43.5	44.0	45.9	-	45.5	49.1
15	52.0	55.0	54.1	48.4	59.4	59.4	45.0	50.0	-	44.6	45.0	47.0	-	46.5	50.5
16	52.5	56.0	55.0	49.3	60.6	60.6	46.0	50.5	-	45.6	46.0	48.5	-	47.5	51.8
17	53.5	57.0	55.9	50.2	61.8	61.8	47.0	51.5	-	46.7	47.0	50.0	-	48.5	53.0
18	54.0	48.0	56.8	51.0	63.1	63.1	47.5	52.0	-	47.7	48.0	51.5	-	49.5	54.0
19	54.5	59.0	57.7	51.9	64.3	64.3	48.0	52.5	-	48.8	49.0	53.0	-	50.5	54.5
20	55.5	60.0	58.6	52.8	65.4	65.4	49.0	53.5	-	49.8	50.0	54.5	-	51.5	55.5
21	56.0	61.0	59.6	53.7	66.0	66.3	50.0	54.0	-	50.8	51.0	55.5	-	52.2	56.0
22	56.5	62.0	60.5	54.6	-	67.2	-	54.5	-	51.8	52.0	56.5	-	52.9	56.5
23	57.5	63.0	61.4	55.4	-	67.9	-	55.5	-	52.8	53.0	57.5	-	53.6	57.5
24	58.0	64.0	62.3	56.3	-	68.5	-	56.0	-	53.8	54.0	58.7	-	54.0	58.0
25	58.5	65.0	63.2	57.2	-	69.1	-	56.5	-	54.8	55.0	59.6	-	-	58.5
26	59.5	66.0	64.1	58.1	-	69.8	-	57.5	-	55.8	56.0	60.6	-	-	59.5
27	60.0	67.0	65.1	59.0	-	70.4	-	58.0	-	56.8	57.0	61.5	-	-	60.0
28	60.5	68.0	66.0	59.8	-	70.9	-	58.5	-	57.8	58.0	62.5	-	-	60.5
29	61.5	69.0	66.9	60.7	-	71.5	-	59.5	-	58.7	59.0	63.4	-	-	61.5
30	62.0	70.0	67.8	61.6	-	72.0	-	60.0	-	59.7	60.0	64.4	-	-	62.5
31	62.5	71.0	68.7	62.5	-	72.6	-	60.5	-	60.8	61.0	65.3	-	-	63.5
32	63.5	72.0	69.6	63.4	-	73.1	-	61.5	-	61.9	62.0	66.3	-	-	64.0
33	64.0	73.0	70.6	64.2	-	73.7	-	62.0	-	63.0	63.1	67.2	-	-	-
34	64.5	74.0	71.5	65.1	-	74.2	-	62.5	-	64.1	64.2	68.2	-	-	-
35	65.5	75.0	72.4	66.0	-	74.8	-	63.5	-	65.2	65.5	69.1	-	-	-
36	66.0	76.0	73.3	66.9	-	75.3	-	64.0	-	66.3	66.6	70.1	-	-	-
37	66.5	77.0	-	67.8	-	75.9	-	-	-	67.4	67.9	71.0	-	-	-
38	67.5	78.0	-	68.6	-	76.4	-	-	-	68.5	69.1	72.0	-	-	-
39	69.0	79.0	-	69.5	-	77.0	-	-	-	69.6	70.3	72.9	-	-	-
40	70.5	80.0	-	70.4	-	77.6	-	-	-	70.7	71.7	73.3	-	-	-
41	72.5	81.0	-	71.3	-	78.1	-	-	-	71.8	72.8	-	-	-	-
42	74.0	82.0	-	72.2	-	78.6	-	-	70.2	72.9	74.0	-	-	-	-
43	75.0	83.0	-	73.0	-	79.0	-	-	73.0	73.3	75.0	-	-	-	-
44	75.5	84.0	-	73.9	-	-	-	-	73.3	-	75.5	-	-	-	-
45	76.0	85.0	-	74.8	-	-	-	-	-	-	76.0	-	-	-	-
46	76.5	-	-	75.7	-	-	-	-	-	-	76.5	-	-	-	-
47	77.5	-	-	76.6	-	-	-	-	-	-	77.5	-	-	-	-
48	78.0	-	-	77.4	-	-	-	-	-	-	78.0	-	-	-	-
49	78.5	-	-	78.3	-	-	-	-	-	-	78.5	-	-	-	-
50	79.0	-	-	79.2	-	-	-	-	-	-	79.0	-	-	-	-
51	80.0	-	-	80.0	-	-	-	-	-	-	80.0	-	-	-	-
52	-	-	-	81.0	-	-	-	-	-	-	80.5	-	-	-	-
53	-	-	-	81.8	-	-	-	-	-	-	81.0	-	-	-	-
54	-	-	-	82.7	-	-	-	-	-	-	81.5	-	-	-	-
55	-	-	-	83.6	-	-	-	-	-	-	82.5	-	-	-	-
56	-	-	-	84.5	-	-	-	-	-	-	83.0	-	-	-	-
57	-	-	-	85.4	-	-	-	-	-	-	83.5	-	-	-	-
58	-	-	-	86.2	-	-	-	-	-	-	84.0	-	-	-	-
59	-	-	-	87.1	-	-	-	-	-	-	85.0	-	-	-	-
60	-	-	-	88.0	-	-	-	-	-	-	85.5	-	-	-	-
61	-	-	-	88.9	-	-	-	-	-	-	-	-	-	-	-

MIL-STD-1320C (Navy)

30 August 1979

Table B-II (contd)

Distance	Mississippi	Missouri	Montana	New Hampshire		New Mexico	New York	North Carolina	Ohio	Wisconsin			Wyoming	D.C.
				3 Axles	4 5 Axles					2 Axles	3 Axles	4 Axles		
4	32 0	32 0	32 0	-	-	34 3	38 0	-	-	32 0	-	-	-	-
5	32 0	32 0	32 0	-	-	35.1	39 0	-	-	32 0	-	-	-	-
6	32 0	32 0	32 2	-	-	35 9	40 0	-	-	32 0	-	-	-	-
7	32 0	32 0	32 9	-	-	36 7	41 0	-	-	33 0	37 0	-	-	-
8	32 6	33 2	33 6	-	-	37 4	42 0	-	48 0	35 0	38 5	-	-	37 0
9	34 5	34 4	34 3	-	-	38 2	43 0	-	48 0	37 0	39 9	-	-	38 1
10	36 5	35 6	35 0	-	-	39 0	44 0	-	48 0	38 0	41 2	42 5	43 5	39 1
11	38 3	36 8	35 7	-	-	39 8	45 0	-	48 0	39 0	42 4	44 3	45 0	40 2
12	40 0	38 0	36 4	-	-	40 6	46 0	-	48 8	-	43 5	46 0	48 0	41 3
13	41 0	39 2	37 1	-	-	41 3	47 0	-	49 7	-	44 5	47 6	50 0	42 3
14	42 0	40 4	43 2	-	-	42 1	48 0	-	50 6	-	45 5	49 1	52 0	43 4
15	43 0	41 6	44 0	-	-	42 9	49 0	-	51 5	-	46 5	50 5	54 0	44 5
16	44 0	42 8	44 8	-	-	43 7	50 0	-	52 4	-	47 5	51 8	54 0	45 6
17	45 0	44 0	45 6	-	-	44 5	51 0	-	53 3	-	48 5	53 0	54 0	46 7
18	46 0	45 2	46 4	-	-	45 2	52 0	-	54 2	-	49 5	54 1	56 0	47 8
19	47 0	46 4	47 2	-	-	53 1	53 0	-	55 1	-	50 5	55 1	58 0	48 8
20	48 0	47 6	48 0	-	-	54 0	54 0	-	56 0	-	51 5	56 0	62 0	49 9
21	49 0	48 8	48 8	-	-	54 9	55 0	-	56 9	-	52 2	56 8	64 0	51 0
22	50 0	50 0	49 6	-	-	55 8	56 0	-	57 8	-	52 9	57 6	65 0	52 1
23	51 0	51 0	50 4	-	-	56 7	57 0	-	58 7	-	53 6	58 4	66 0	53 1
24	52 0	52 0	51 2	-	-	57 6	58 0	-	59 6	-	54 3	59 2	66 0	54 2
25	53 0	53 0	55 3	47 4	-	58 5	59 0	-	60 5	-	55 0	60 0	66 0	55 3
26	54 0	54 0	56 1	48 3	-	59 4	60 0	-	61 4	-	55 7	60 8	66 0	56 4
27	55 0	55 0	56 9	49 3	-	60 3	61 0	-	62 3	-	56 4	61 6	66 0	57 4
28	56 0	56 0	57 8	50 4	48 3	61 2	62 0	-	63 2	-	57 1	62 4	66 0	58 5
29	57 0	57 0	58 7	51 5	49 3	62 1	63 0	-	64 1	-	57 8	63 2	66 0	59 6
30	58 0	58 0	59 5	52 6	50 4	63 0	64 0	-	65 0	-	58 5	64 0	67 0	60 7
31	59 0	59 0	60 4	-	51 5	63 9	65 0	-	65 9	-	-	-	68 0	61 7
32	60 0	60 0	61 2	-	52 8	64 8	66 0	-	66 8	-	-	-	69 0	62 6
33	61 0	61 1	62 1	-	54 3	65 7	67 0	-	67 7	-	-	-	70 0	63 9
34	62 2	62 2	62 9	-	56 0	66 6	68 0	-	68 6	-	-	-	71 0	65 0
35	63 5	63 5	63 8	-	58 0	67 5	69 0	73 5	69 5	-	-	-	72 0	66 2
36	64 6	64 6	68 0	-	60 0	68 4	70 0	74 0	70 4	-	-	-	73 0	67 2
37	65 9	65 9	68 0	-	62 0	69 3	71 0	74 5	71 3	-	-	-	74 0	68 1
38	67 1	67 1	68 0	-	64 4	70 2	-	75 6	72 2	-	-	-	75 0	68 9
39	68 3	68 3	68 0	-	66 4	71 1	-	76 1	73 1	-	-	-	76 0	69 7
40	69 7	69 7	70 0	-	73 3	72 0	-	76 6	74 0	-	-	-	76 0	70 6
41	70 8	70 8	72 0	-	-	72 9	-	77 2	74 9	-	-	-	76 0	71 4
42	72 0	72 0	73 3	-	-	73 8	-	77 7	75 2	-	-	-	76 0	72 3
43	73 3	73 3	73 3	-	-	74 7	-	78 7	76 7	-	-	-	76 0	-
44	-	-	73 3	-	-	75 6	-	79 3	77 6	-	-	-	76 0	-
45	-	-	73 3	-	-	76 5	-	79 8	78 5	-	-	-	77 0	-
46	-	-	73 3	-	-	77 4	-	-	79 4	-	-	-	77 4	-
47	-	-	73 3	-	-	78 3	-	-	80 0	-	-	-	78 3	-
48	-	-	73 3	-	-	79 2	-	-	-	-	-	-	79 9	-
49	-	-	73 3	-	-	80 1	-	-	-	-	-	-	-	-
50	-	-	73 3	-	-	81 0	-	-	-	-	-	-	-	-
51	-	-	73 3	-	-	81 9	-	-	-	-	-	-	-	-
52	-	-	73 6	-	-	82 8	-	-	-	-	-	-	-	-
53	-	-	74 4	-	-	83 7	-	-	-	-	-	-	-	-
54	-	-	75 2	-	-	84 6	-	-	-	-	-	-	-	-
55	-	-	76 0	-	-	85 5	-	-	-	-	-	-	-	-
56	-	-	76 4	-	-	86 4	-	-	-	-	-	-	-	-
57	-	-	76 8	-	-	-	-	-	-	-	-	-	-	-
58	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61	-	-	-	-	-	-	-	-	-	-	-	-	-	-

MIL-STD-1320C (Navy)
30 August 1979

Table B-III
GROSS WEIGHT ALLOWABLE UNDER NEW FEDERAL WEIGHT
LAW FORMULA ENACTED JANUARY 4, 1975

$$\text{BRIDGE FORMULA } W = 500 \frac{(LN + 12N + 36)}{N-1}$$

W = maximum weight in pounds carried on any group of two or more axles compared to nearest 500 pounds
L = distance in feet between the extremes of any group of two or more consecutive axles
N = number of axles in group under consideration

TABLE "B-III" (in 1,000 lbs.)

Distance in feet between the extremes of any group of 2 or more consecutive axles	Maximum load in pounds carried on any group of 2 or more consecutive axles			
	2 axles	3 axles	4 axles	5 axles
4	34 0			
5	35 0			
6	36 0			
7	37 0			
8	38 0	42 0		
9	39 0	43 0		
10	40 0	43 5		
11		44 5		
12		45 0	50 0	
13		46 0	50 5	
14		46 5	51 5	
15		47 5	52 0	
16		48 0	52 5	58 0
17		49 0	53 5	58 5
18		49 5	54 0	59 5
19		50 5	54 5	60 0
20		51 0	55 5	60 5
21		52 0	56 0	61 0
22		52 5	56 5	62 0
23		53 5	57 5	62 5
24		54 0	58 0	63 0
25		55 0	58 5	63 5
26		55 5	59 5	64 5
27		56 5	60 0	65 0
28		57 0	60 5	65 5
29		58 0	61 5	66 0
30		58 5	62 0	67 0
31		59 5	62 5	67 5
32		60 0	63 5	68 0
33			64 0	68 5
34			64 5	69 5
35			65 5	70 0
36			68 0	70 5
37			68 0	71 0
38			68 0	72 0
39			68 0	72 5
40			68 5	73 0

MIL-STD-1320C (Navy)
30 August 1979

Table B-III (contd)

Distance in feet between the extremes of any group of 2 or more consecutive axles	Maximum load in pounds carried on any group of 2 or more consecutive axles			
	2 axles	3 axles	4 axles	5 axles
41			69.5	73.5
42			70.0	74.5
43			70.5	75.0
44			71.5	75.5
45			72.0	76.0
46			72.5	77.0
47			73.5	77.5
48			74.0	78.0
49			74.5	78.5
50			75.5	79.5
51			76.0	80.0
52			76.5	80.5
53			77.5	81.0
54			78.0	82.0
55			78.5	82.5
56			79.5	83.0
57			80.0	83.5
58				84.5
59				85.0
60				85.5
61				86.0
62				87.0
63				87.5
64				88.0
65				88.5
66				89.5
67				90.0
68				90.5
69				91.0
70				92.0
71				92.5
72				93.0
73				93.5
74				94.5
75				95.0
76				95.5
77				96.0
78				97.0
79				97.5
80				98.0
81				98.5
82				99.5
83				100.0

NOTE States which have a "table" in their law may have slight weight differences for selected axle distances

NOTE All states applying Table B or Formula B restrict interstate highways to 80,000 lbs

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS This form is provided to solicit beneficial comments which may improve this document and enhance its use. DoD contractors, government activities, manufacturers, vendors, or other prospective users of the document are invited to submit comments to the government. Fold on lines on reverse side, staple in corner, and send to preparing activity. Attach any pertinent data which may be of use in improving this document. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity. A response will be provided to the submitter, when name and address is provided, within 30 days indicating that the 1426 was received and when any appropriate action on it will be completed.

NOTE This form shall not be used to submit requests for waivers, deviations or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

DOCUMENT IDENTIFIER (Number) AND TITLE

MIL-STD-1320C (NAVY) TRUCKLOADING OF AMMUNITION AND EXPLOSIVES

NAME OF ORGANIZATION AND ADDRESS OF SUBMITTER

☐ VENDOR ☐ USEP ☐ MANUFACTURER

1 ☐ HAS ANY PART OF THE DOCUMENT CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? ☐ IS ANY PART OF IT TOO RIGID, RESTRICTIVE, LOOSE OR AMBIGUOUS? PLEASE EXPLAIN BELOW.

A. GIVE PARAGRAPH NUMBER AND WORDING

B. RECOMMENDED WORDING CHANGE

C. REASON FOR RECOMMENDED CHANGE(S)

2 REMARKS

SUBMITTED BY (Printed or typed name and address — Optional)

TELEPHONE NO

DATE

DD FORM 1426
1 OCT 78

EDITION OF 1 JAN 72 WILL BE USED UNTIL EXHAUSTED

FOLD

POSTAGE AND FEES PAID



OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300

COMMANDING OFFICER
NAVAL WEAPONS STATION
NAVAL WEAPONS HANDLING CENTER
COLTS NECK, N.J. 07722

FOLD