(In response to (c)(5) of 49 CFR 381.310

WOODEN BOXES AND PLASTIC BINS-LOADING, SECUREMENT, AND TRANSPORTATION

I § Applicability.

This section shall apply to the loading, securement, and transportation of loaded and empty boxes and bins constructed of wood or plastic, subject to the provision of 393.100. This section only applies to the transportation of agricultural products from the field or storage to the first point of processing and the return or delivery of empty containers to the field or storage location. Loads transported in vans or contained on four sides by racks, or for other than agricultural operation as described, must be transported in accordance with the general cargo securement rules of 393.100 through 393.114.

II § Definitions.

The following definitions shall apply for the purposes of this section.

(a) Stack. A "stack" is a single column of interlocked or not interlocked boxes or bins positioned one above the other.

(b) Row. A "row" consists of two or more stacks of boxes or bins positioned parallel either to the sides or the ends of the vehicle.

(c) Tier. A "tier" is one layer of boxes or bins.

(d) Corner Iron. A corner iron is a section of right-angle metal with a boxed end and a hook used in conjunction with perimeter tiedowns. The hook shall be welded to the outer surface of the right-angle metal, and shall have strength not less than that of 1/2 -inch

cold rolled steel, and shall have a radius of at least 3/8 -inch to permit free movement of the tiedown. Corner irons shall meet one of the following construction requirements:

(1) At least a 3- by 3- by 3/16 -inch right-angle metal not less than 26 inches in length, a hook not less than 10 inches or more than 13 inches from the top outside corner, and topped by not less than a squared and welded 10-gage (9/64 -inch) steel plate (Figure 1); or

(2) At least 8- by 8-inch, 12-gage (7/64 -inch) or 11 1/2 - by 11 1/2 -inch, 14-gage (5/64 -inch) steel not less than 48 inches in length with at least a 3/4 -inch double thickness at each outer edge, a hook not less than 10 or more than 24 inches from the top outside corner, and topped by not less than a squared and welded 10-gage (9/64 -inch) steel plate.

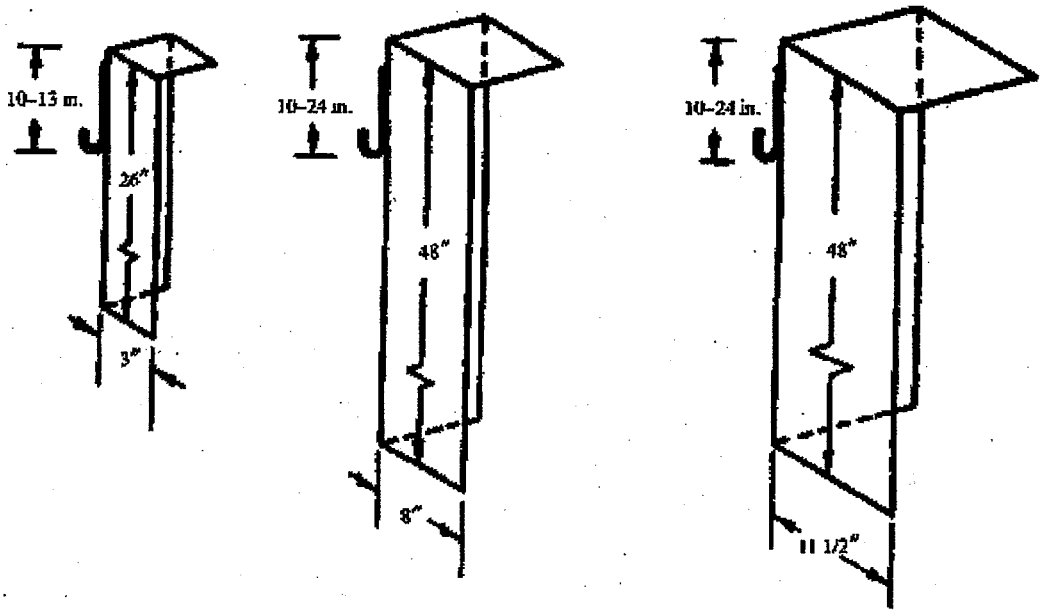


Figure 1

III § General Provisions.

Tiedowns used in the loading, securement, and transportation of empty boxes or bins shall meet the requirements of 49 CFR 393.108 and shall comply with the following additional requirements.

(a) Perimeter Tiedowns. Perimeter tiedowns, minimum of two per load, shall have a working load limit (WLL) of not less than 3,000 pounds and shall be limited to 3/8 inch or greater wire rope.

(b) Lateral tiedowns. Lateral tiedowns shall have working load limit of not less than 625 pounds and shall be limited to the following types:

(1) Wire rope

(2) Rope listed in 393.108 meeting the WLL requirement

(3) Synthetic webbing

(c) Corner Irons of preceding Section II (d) shall be used in conjunction with perimeter tiedowns.

(d) Winch Attachments. Winch attachments and anchorages used with perimeter tiedowns shall be as uniformly spaced from the vehicle centerline and as close to the outside edge of the vehicle bed as is practicable (in no case more than 28 inches from corners on the ends of the bed, nor more than 60 inches from corners on the sides of the bed).

IV § Construction of Loads.

The following provisions shall govern the construction of loads of laden boxes or bins.

(a) Construction. Loads shall be abutted against each other without gaps or openings.

(1) Uniform Height of Load. Except as provided in (4), loads shall consist of stacks of uniform height to facilitate load stability.

(2) Uniform Length of Load. Loads shall consist of uniform tiers the approximate full width and length of the transport vehicle.

(3) Partial length loads should be placed up against the forward required blocking as required by Section V(c), and must use perimeter tiedowns as applicable, and are required to use lateral straps across the midpoint of each of the two rearmost stacks, in addition to any other required lateral straps, unless the rearmost stacks, are blocked in accordance with Section V(c).

(4) Additional loaded boxes or bins. When a load consists of full tiers of boxes or bins not exceeding the maximum vehicle height requirement, additional boxes may be loaded side by side, laterally, to form stacks 1 additional box or bin high These stacks shall be located as close as possible to the center of the transport vehicle. The additional boxes or bins shall be secured with a lateral tiedown (Figure 2). This section does not relieve the requirement of the load to comply with vehicle height or weight restrictions.

(b) Size of loads. All loads shall be contained within the exterior dimensions of the transport vehicle.

(1) Laden boxes or bins. Except as provided in (a)(4), loads of laden boxes and bins shall be of uniform height.

(2) Empty boxes or bins. Loads of empty bins or boxes shall be of uniform height and shall not exceed road height restrictions.

(c) Mixed Loads. Mixed Loads of laden and unladen bins or boxes are allowed. Laden bins/boxes shall not be on top of unladen bins or boxes.

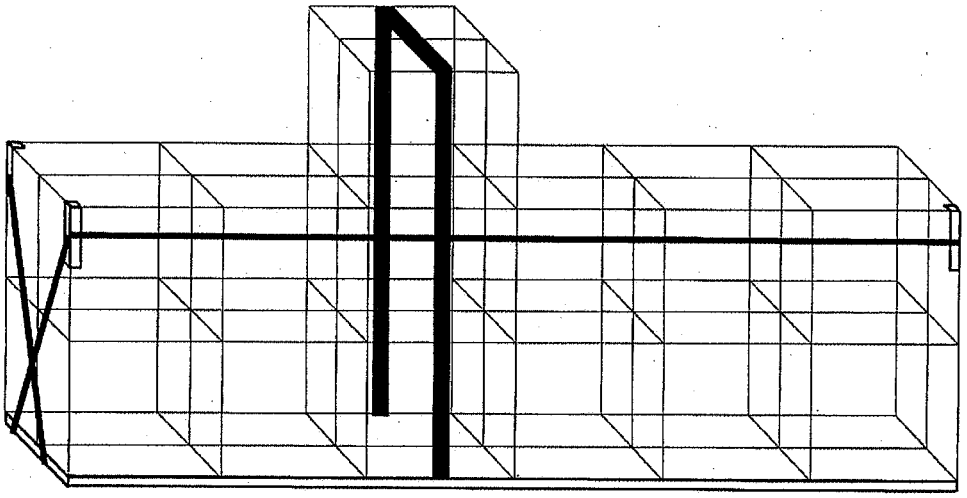
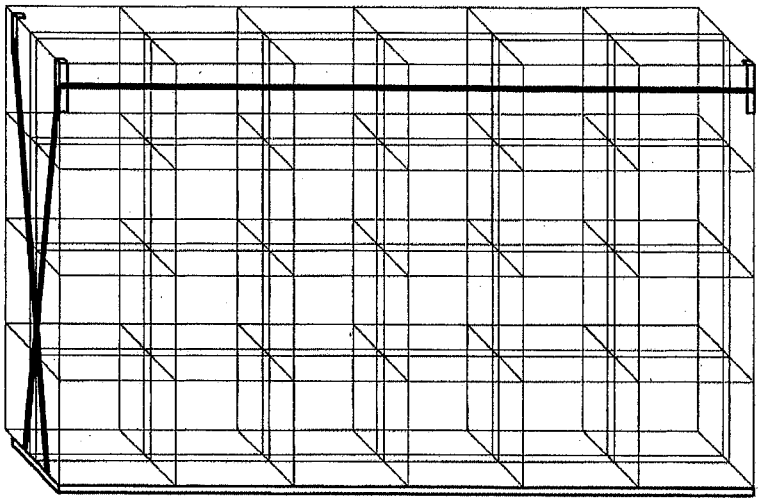


Figure 2

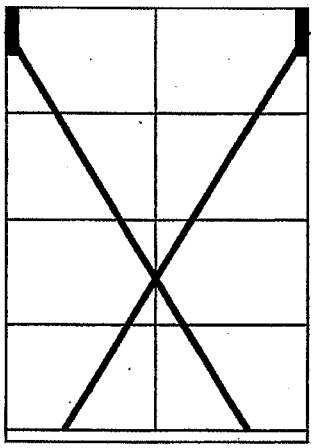
V § Securement of Loads.

The following provisions shall govern the securement of loads of unladen boxes or bins.

(a) Uniform Size Boxes or Bins. Boxes or bins of uniform size shall be secured to the transport vehicle by perimeter tiedowns with corner irons (Figure 3).



Sides



Front and rear

Figure 3

(b) Perimeter Tiedowns. Perimeter tiedowns shall be used in pairs. One perimeter tiedown shall be attached near the front right corner of the vehicle bed, extended diagonally across the front of the load to the upper left corner of the boxes or bins and through the front left corner iron hook. The tiedown shall then extend around the side, at the same height, to the rear left corner of the boxes or bins, through the left rear corner iron hook and fasten near the rear right corner of the vehicle bed. The second tiedown shall be attached near the front left corner of the vehicle bed, extend diagonally across the front of the boxes or bins and through the front right corner iron hook. The tiedown shall then extend around the side, at the same height, to the rear right corner of the boxes or bins, through the right rear corner iron hook and fasten near the rear left corner of the vehicle bed. (Figures 2, 3)

(c) Front blocking. Loads of both laden and unladen boxes and bins shall be restrained, in addition to required tiedowns, at the front end of the transport vehicle by blocking. The blocking shall be comprised of (at a minimum) metal bars or rods 5/8th inch diameter

or more) attached to the vehicle by welding or equivalent means. Each length of blocking must be a minimum of 14 inches in length for each longitudinal row of boxes or bins. The blocking shall be attached to the metal frame of the vehicle bed. Blocking can also consist of right-angle metal, equal to or greater than 3/16 inch thick, with nominal minimum dimensions of 2" x 2" wide, a minimum of 14 inches in length for each longitudinal row of boxes or bins, and attached to the vehicle with a minimum of two ½ inch grade 8 fasteners or secured by equivalent means, i.e., welding, stake pockets. Blocking can also consist of a flat iron, equal to or greater than 3/16 inch thick, with nominal minimum dimensions of 2" in height, a minimum of 14 inches in length for each longitudinal row of boxes or bins, secured to a minimum of 2 stakes, each with a minimum 4 inches in height. Vehicles with front end structures as defined in 393.114 meet the requirements of this section for the front end of the transport vehicle only.

(d) Lateral tiedowns.

(1.) Trucks, trailers, and semitrailers 32 feet or less in length require the use of a minimum of one lateral tiedown placed in the approximate center of the truck or trailer.

(2.) Trucks, trailers, and semitrailers greater than 32 feet in length require the use of a minimum of two lateral tiedowns which must be positioned at approximately 1/3 and 2/3rds of the length of the truck or trailer.

(3.) Loads of laden boxes or bins. When additional boxes or bins are loaded on top as provided in Section IV(a)(2), the additional row of boxes or bins shall be secured with a lateral tiedown that has a minimum WLL of 625 pounds. If rope is utilized as a lateral tiedown, it shall either be attached at one side of the vehicle to

a synching device or winch, or secured at one side of the vehicle by a synching knot as illustrated in Figure 5.

The lateral tiedown shall be attached to an anchor point commensurate with the WLL of the tiedown.

(5.) Lateral tiedowns may be positioned over or under perimeter tiedowns.

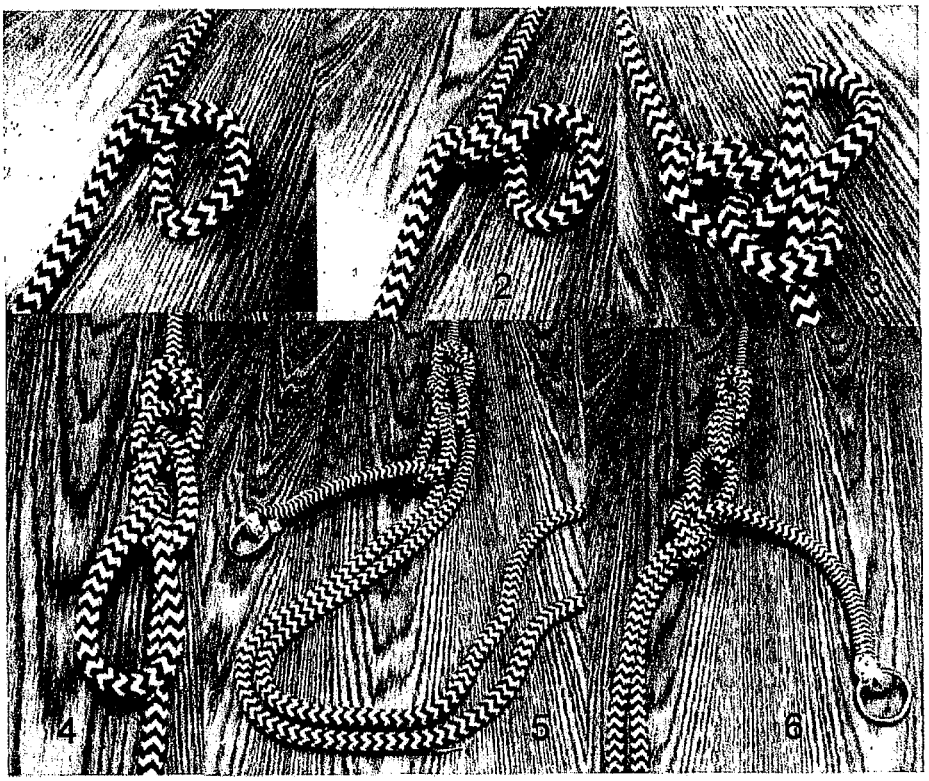


Figure 5

FIBERGLASS TUBS-LOADING, SECUREMENT, AND TRANSPORTATION

I § Applicability.

This section shall apply to the loading, securement, and transportation of a single laden or unladen fiberglass tub that is transported on flatbed truck, trailer, or semi-trailer. The nominal dimensions of the tub shall not be more than 28 feet 6 inches long, 96 inches wide, and 48 inches high. Tubs transported on a flatbed truck or trailer 28 feet 6 inches long are subject to the provision of 393.100. Size of tubs shall be determined by inside dimensions, excluding cleats, separators, or other attachments. This section only applies to the transportation of agricultural products from the field to the first point of processing and the return or delivery of empty containers to the field or storage location. Except as provided in part Section IV, loads transported in vans or contained on four sides by racks, or for other than agricultural operation as described, must be transported in accordance with the general cargo securement rules of 393.100 through 393.114.

II § General Provisions.

Tiedowns used in the securement, and transportation of tubs shall meet the requirements of 393.108 of this code and shall comply with the following additional requirements.

(a) Corner Eyes. Each of the four corners of a fiberglass tub shall have a corner eye for the securement of perimeter tiedowns. The corner eye shall have a minimum WLL of 3,000 pounds. Corner eyes shall be not less than 1 inch, nor more than 12 inches down from the top edge of the tube.

(b) Perimeter Tiedowns. Perimeter tiedowns, minimum of two per tub, shall have a working load limit of not less than 3,000 pounds and shall be limited to 3/8 inch diameter or greater wire rope.

(c) Winch Attachments. Winch attachments and anchorages used with perimeter tiedowns shall be as uniformly spaced from the vehicle centerline and as close to the outside edge of the vehicle bed as is practicable. The winches shall be positioned no more than 28 inches, measured from the outer corners on the ends of the bed, nor more than 60 inches, measured from the outer corners on the sides of the bed.

III § Securement of Loads.

Loads of fiberglass tubs shall be secured to the transport vehicle with perimeter tiedowns. One perimeter tiedown shall be attached near the front right corner of the vehicle bed, extended diagonally across the front of the load to the upper left corner of the tub and through the front left corner eye. The tiedown shall then extend around the side, at the same height, to the rear left corner of the tub, through the rear left corner eye, and fasten near the rear right corner of the vehicle bed. The second tiedown shall be attached near the front left corner of the vehicle bed, extend diagonally across the front of the tub and through the front right corner eye. The tiedown shall then extend around the side, at the same height, to the rear right corner of the tub, through the rear right corner eye and fasten near the rear left corner of the vehicle bed. (Figure 1).

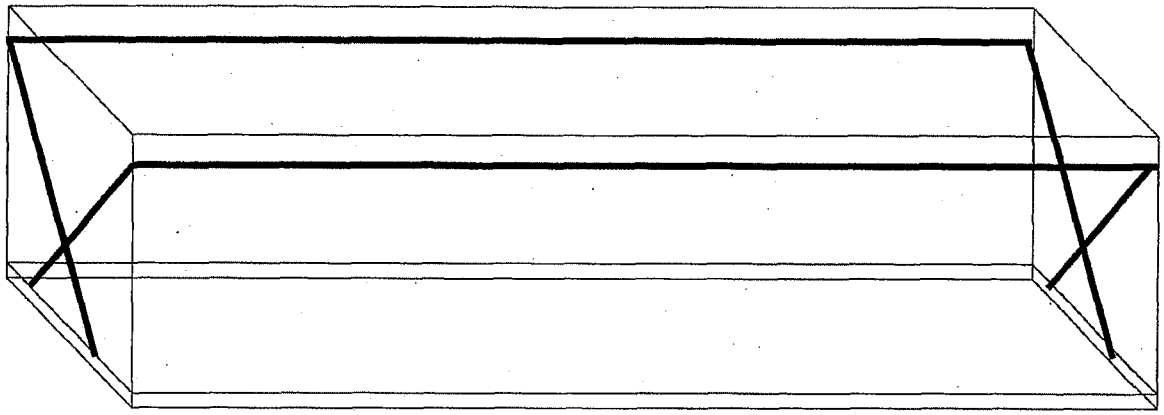


Figure 1

IV § Loading

Loads of agricultural products transported in tubs shall be constructed as follows:

(a) Construction. Vehicles transporting loads of agricultural commodities are not required to cover the load if, where it contacts the sides, front and back of the tub, the commodity remains below the upper edge.

(1) (Figure 2).

BALED COTTON, PAPER, AND JUTE – SECUREMENT FOR TRANSPORTATION

I § Applicability.

This article shall apply to the securement of all types and sizes of baled cotton, paper, and jute bagging transported on highways, except when loaded in vans or on vehicles equipped with racks on four sides must be secured in accordance with sections 393.100 through 393.114.

II § Definitions.

The following definitions shall apply for the purposes of this article.

(a) Tier. A tier is one layer of bales.

(b) Detachable Cargo Carrier. A detachable cargo carrier is a flatbed structure used with or without sides or bulkheads for the transportation of property and designed so as to be readily removable from the chassis of the transporting vehicle.

III § General Provisions.

Tiedowns used for the loading, securement, and transportation of baled cotton, paper, and jute shall meet the requirements 393.108 of this code and shall comply with the following additional requirements.

(a) Longitudinal Tiedowns. Longitudinal tiedowns shall have a WLL of not less than 3,000 pounds and shall be limited to the following types:

(1) Chain

(2) Wire rope

(3) Manila rope

(4) Synthetic fiber rope

(5) Synthetic webbing

(b) Perimeter Tiedowns. Perimeter tiedowns shall have a WLL not less than 3,000 pounds and shall be limited to the following types:

(1) Chain

(2) Wire rope

(3) Manila rope

(4) Synthetic fiber rope

(c) Crosstiedowns. Crosstiedowns shall have a WLL of not less than 315 pounds and shall be limited to the following types:

(1) Chain

(2) Wire rope

(3) Manila rope

(4) Synthetic fiber rope

(5) Steel strapping

(6) Synthetic webbing

(d) V-Boards (V-Bars). When V-boards (V-bars) are used, they shall be positioned at the top edge of the load under the tiedowns, and shall be in compliance with the following requirements:

(1) V-boards shall be not less than 3 ft nor more than 12 ft long, and shall be constructed of either one-piece, right-angled metal or plastic or of two parallel pieces of lumber, metal, or plastic attached at each end by flexible material. V-boards more than 6 ft long shall also be attached at the approximate midpoint.

(2) V-boards shall be long enough to restrain at least one-half of each bale to which they are applied. As far as practicable, multiple tiedowns shall be uniformly spaced over the entire length of a V-board.

(3) Materials used in the construction of V-boards shall be of a strength not less than that of nominal size 1 in. by 6-in Douglas fir. Lumber V-boards shall be free of strength-impairing knots or defects.

(e) Detachable Cargo Carriers. Manufacturers of detachable cargo carriers equipped with bulkheads on each end shall provide certification that the bulkheads are capable of withstanding stress calculated as follows: When a force 0.2 times the weight of the maximum load is uniformly distributed over the entire bulkhead area, the yield strengths of the bulkhead materials shall be not less than the calculated stresses times a safety factor of five.

III § Securement.

Securement requirements shall be met before a vehicle enters a highway and shall be maintained en route by periodic inspection. If there is any evidence of load instability, the vehicle shall be driven from the highway and shall not be moved again on the highway until corrective load securement adjustments are made.

IV § Load Securement.

Loads of baled cotton, paper, and jute bagging shall be secured as follows.

(a) Horizontal Bales. Horizontal bales shall be secured by at least two parallel longitudinal tiedowns over the top of the load, and by crosstiedowns as follows:

(1) Loads more than one tier high, with horizontal bales laid crosswise in the top tier shall have not less than four crosstiedowns uniformly spaced across the top of the load (Figure 1).

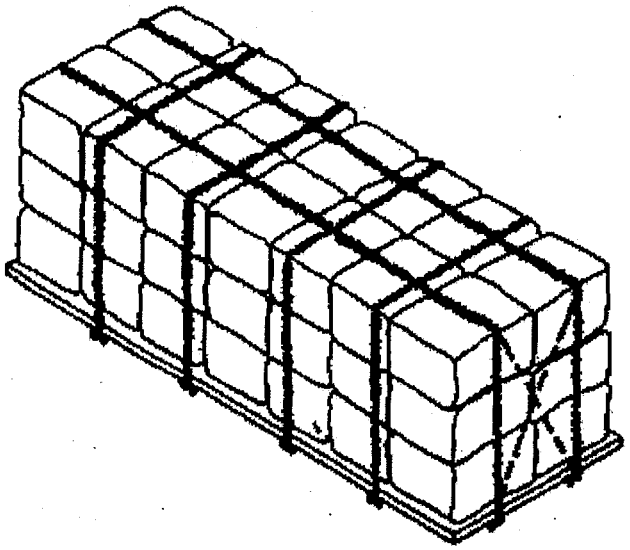


Figure 1

(2) Loads more than one tier high, with horizontal bales laid lengthwise in the top tier shall have one crosstiedown placed near the midpoint of each such bale (Figure 2)

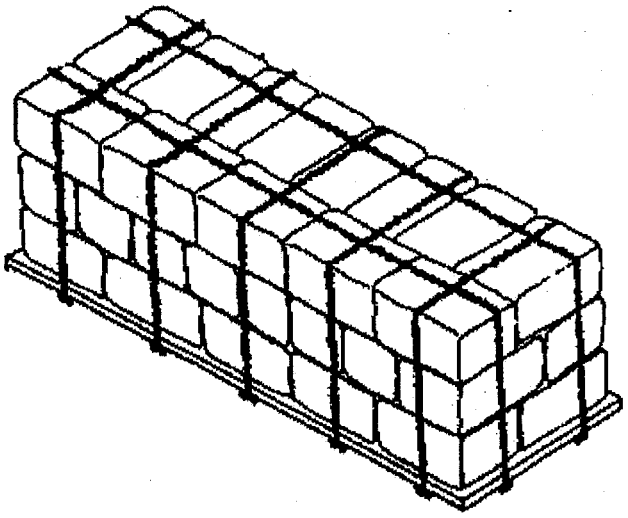


Figure 2

(b) Vertical Bales in One Tier. Loads of one tier of vertical bales (Figure 3) shall be secured to the vehicle with two perimeter tiedowns as follows:

(1) One perimeter tiedown shall be attached near the front right corner of the vehicle bed, extended across the front of the load to a point not less than two-thirds of the height of the front left corner bale (measured from the vehicle bed), extended around the side at the same height to the rear left corner bale of the load, and fastened near the rear right corner of the vehicle bed, and

(2) The second perimeter tiedown shall be attached near the front left corner of the vehicle bed, extended across the front of the load to a point not less than two-thirds of the height of the right corner bale (measured from the vehicle bed), extended around the side at the same height to the rear right corner bale of the load, and fastened near the rear left corner of the vehicle bed.

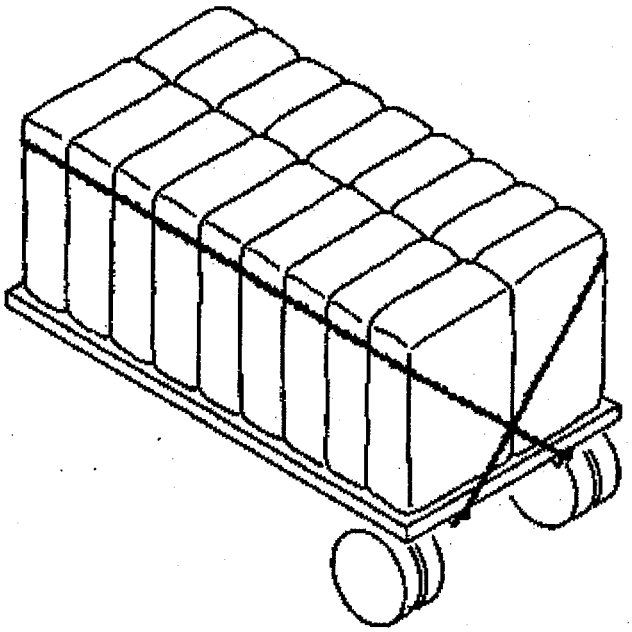


Figure 3

(c) Vertical Bales in Bottom Tier. Multi-tiered loads with vertical bales in the bottom tier shall be secured to the vehicle as follows:

(1) Loads with vertical bales two across in the bottom tier and vertical bales in the second tier:

(A) Not less than two longitudinal tiedowns shall extend in parallel lines over the top of the load and may be crossed or parallel at the ends, and not less than four crosstiedowns shall be uniformly spaced over V-boards (Figure 4); or

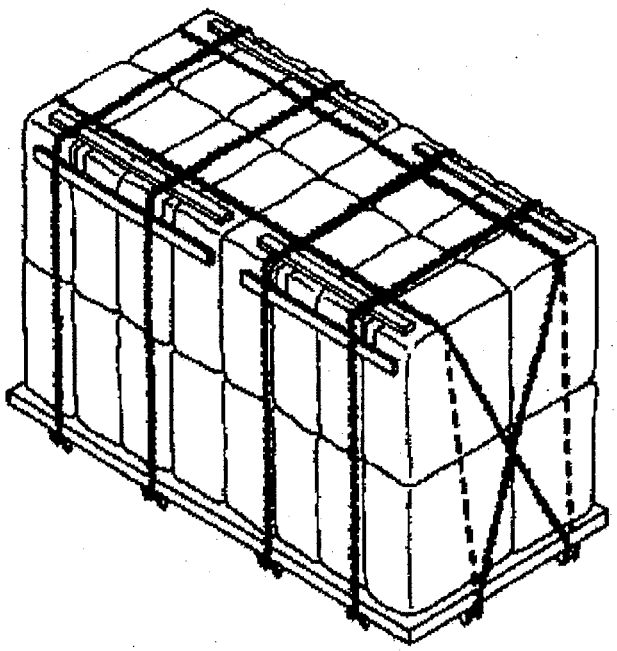


Figure 4

(B) Two perimeter tiedowns shall be applied to the top tier as prescribed in subsections (b)(1) and (2), and not less than four crosstiedowns shall be uniformly spaced across the top of the load (Figure 5).

(2) Multi-tiered loads with vertical and horizontal bales in the bottom tier and vertical bales in the top tier shall be secured with two perimeter tiedowns as prescribed in sub-sections (b)(1) and (2) applied to the top tier and not less than four crosstiedowns uniformly spaced across the top of the load (Figure 5).

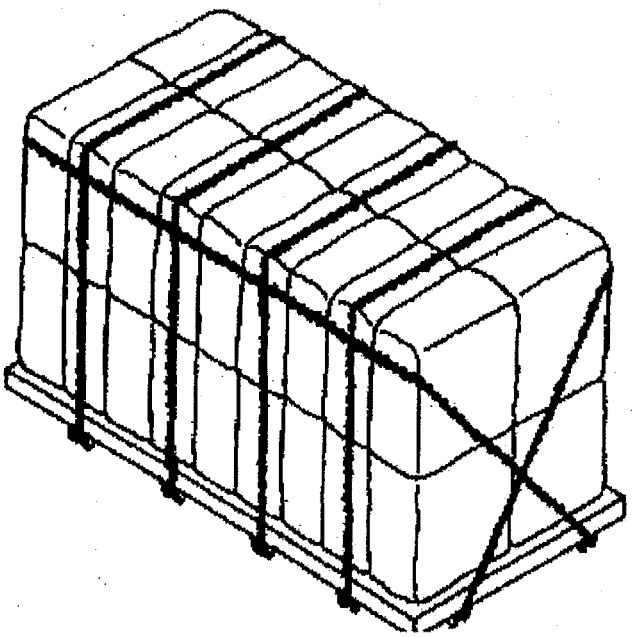


Figure 5

(3) Loads with vertical bales two across in the bottom tier and horizontal bales in the tier(s) above: Not less than two longitudinal tiedowns shall extend in parallel lines and may be crossed or parallel at the ends, and not less than four crosstiedowns shall be uniformly spaced over the length of the load (Figure 6).

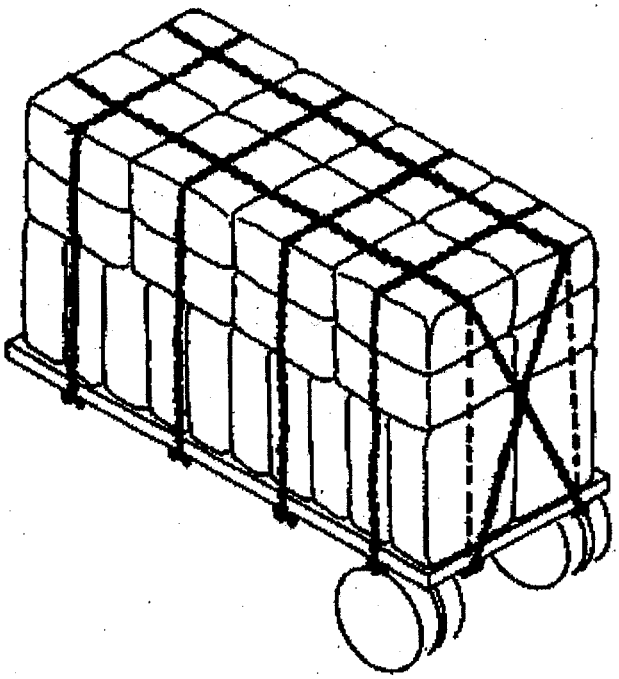


Figure 6

(4) Loads with vertical bales three or more across in the bottom tier and horizontal bales in the second tier (Figure 7):

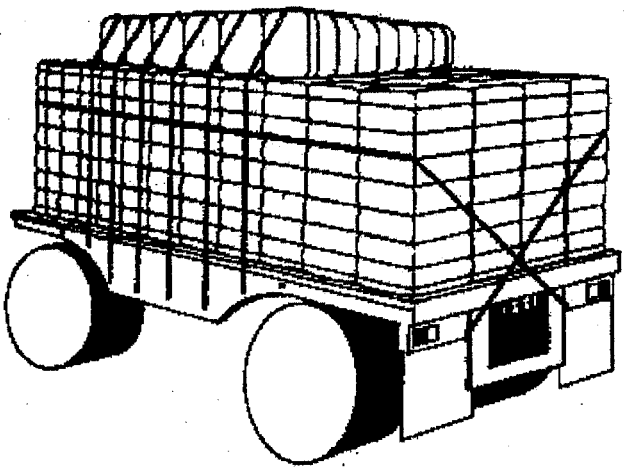


Figure 7

(A) One perimeter tiedown shall be attached near the front right corner of the vehicle bed, extended across the front of the load to a point not less than two-thirds of the height of the front lower left corner bale (measured from the vehicle bed), extended around the side at the same height to the rear lower left corner bale, and fastened near the rear right corner of the vehicle bed; and

(B) Another perimeter tiedown shall be attached near the front left corner of the vehicle bed, extended across the front of the load to a point not less than two-thirds of the height of the front lower right corner bale (measured from the vehicle bed), extended around the side at the same height to the rear lower right corner bale, and fastened near the rear left corner of the vehicle bed; and

(C) Not less than one crosstiedown shall be uniformly placed near the midpoint of each bale stacked horizontally in the second tier. As an alternative, crosstiedowns may be placed over V-boards as specified in subsection (d) of this section. When V-boards are used, not less than two crosstiedowns shall be placed over each V-board.

(d) Detachable Cargo Carrier Load. Longitudinal or perimeter tiedowns are not required to secure loads to detachable cargo carriers equipped with bulkheads certified as prescribed in subsection (e). Lateral tiedowns shall be attached either to the container or to the vehicle bed and shall extend over the approximate midpoint of each bale in a row of bales (Figure 8).

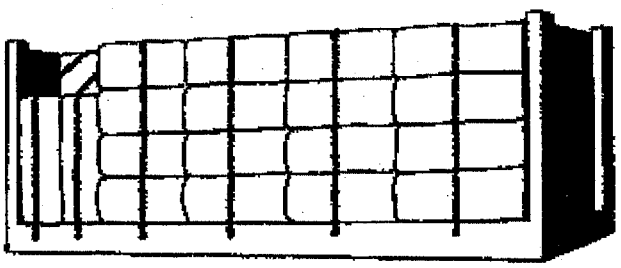


Figure 8