

## **Blocking and Bracing**

Cargo must be secured from forward (longitudinal) and sideways (lateral) movement. When cargo is not firmly braced against a front-end structure or if cargo may shift sideways in transit, the cargo must be securely blocked against the sides, sideboards, or stakes of the vehicle or be secured by other means to prevent forward and/or sideways movement.

## **Requirements for Front-end Structures**

Commercial motor vehicles transporting cargo that is in contact with the front end structure of the vehicle must meet the following:

- The front end structure must extend either to a height of 4 feet above the floor of the vehicle or to a height at which it blocks forward movement of any item of cargo, whichever is lower.
- The front end structure must have a width which is at least equal to the width of the vehicle or which blocks forward movement of any item of cargo, whichever is lower.
- The front end structure must have no aperture large enough to permit any article of cargo in contact with the structure to pass through it.
- These requirements may be met through the use of other devices that provide the same protection as a front end structure.

## **Projecting Loads**

The load of any vehicle may not extend more than 3 feet beyond the front wheels or front bumper of the vehicle. Any vehicle having a load which extends 4 inches or more beyond the sides or more than 4 feet beyond the rear shall have the extremities marked with a red flag, not less than 18 inches square and lights when required.

## **Manner of Loading**

No vehicle is to be operated on a highway unless it is so secured as to prevent any of its load from dropping, sifting, leaking, blowing or otherwise escaping. This does not apply to vehicles operated by a farmer when transporting produce such as small grains, shelled corn, soybean, or other produce of a size and density not likely to cause injury or damage to property.

## **Commodity Specific Requirements**

There are commodity specific requirements for logs, lumber, metal coils, paper rolls, concrete pipe, intermodal containers, crushed vehicles, roll off containers, and large boulders. More information about these commodity specific requirements can be obtained here:

[FMCSA Cargo Securement Rules](#)

[Driver's Handbook on Cargo Securement](#)

# Cargo Securement



**Safe Loading**

No person may operate a commercial motor vehicle unless the vehicle’s cargo is properly distributed and adequately secured. The vehicle’s tail- gate, tailboard, doors, tarps, spare tire and other equipment and the means of fastening the cargo must be secured.

The operator of a truck or truck tractor is required to examine and make adjustments as necessary to the cargo and its securement devices within the first 50 miles after beginning a trip. Periodic examination should also be made every 3 hours or 150 miles, whichever occurs first (unless the trailer is sealed and the driver is ordered not to open it to inspect the cargo).

**Basic Requirements**

The basic requirements of cargo securement apply to trucks, truck tractors, semitrailers, full trailers and pole trailers. Each commercial motor vehicle must be loaded/equipped and the cargo secured to prevent cargo from leaking, spilling, blowing or falling from the vehicle. Cargo must be secured or immobilized to prevent shifting upon or within the vehicle to such an extent that the vehicle’s stability is adversely affected.

**Cargo Securement Devices**

Tiedown assemblies may consist of chains, cables, steel straps, fiber webbing, etc. All tiedowns and cargo securement systems must be in proper working order when used to secure cargo with no damage or weakened components such as cracks or cuts that will adversely affect their performance.

**General Requirements**

Cargo must be immobilized or secured on or within a vehicle by structures of adequate strength, dunnage or dunnage bags, shoring bars, tiedowns or a combination of these.

**General Requirements (Continued)**

The aggregate WLL of tiedowns must be at least one-half the weight of the article or group of articles and is the sum of:

- 1/2 the WLL of each tiedown that goes from an anchor point on the vehicle to an anchor point on an article of cargo.
- 1/2 the WLL of each tiedown that is attached to an anchor point on the vehicle, passes through, over, or around the article of cargo and is then attached to an anchor point on the same side if the vehicle.
- The WLL for each tiedown that goes from an anchor point on the vehicle, through, over, or around the article of cargo, and then attaches to anchor point on the other side of the vehicle.

**Determining the WLL of a Securement Device**

The working load limit (WLL) of a tiedown, connector or attachment mechanism is the lowest WLL of any of its components, or the WLL limit of the anchor points to which it is attached, whichever is less.

The WLL of tiedowns may be determined by using the manufacturer’s markings or the following tables: These tables are to be used when the tiedown material has not been marked with a WILL by the manufacturer.

**How many tiedowns are needed?**

When an article is blocked or braced to prevent forward movement, it must be secured by at least one tiedown for every 10 feet of article length or fraction thereof.

If the article is not blocked or braced to prevent forward movement, it must be secured by at least:

- One tiedown for articles 5 feet or less in length, and 1,100 pounds or less in weight;
- Two tiedowns if the article is:
  - 5 feet or less in length and more than 1,000 pounds in weight, or
  - Longer than 5 feet but less than or equal to 10 feet in length, regardless of weight.
  - Two tiedowns if the article is longer than 10 feet, and one additional tiedown for every 10 feet of article length, or fraction thereof, beyond the first 10 feet of length.

<b>Synthetic Webbing</b>	
<b>Width</b>	<b>WLL</b>
<b>45 mm (1-3/4 in)</b>	<b>790 kg (1750 lb.)</b>
<b>50 mm (2 in)</b>	<b>910 kg (2000 lb.)</b>
<b>75 mm (3 in)</b>	<b>1360 kg (3000 lb.)</b>
<b>100 mm (4 in)</b>	<b>1810 kg (4000 lb.)</b>

<b>Size</b>	<b>Steel Chain - Working Load Limit</b>				
	<b>Grade 30 proof coil</b>	<b>Grade 43 High test</b>	<b>Grade 70 Transport</b>	<b>Grade 80 Alloy</b>	<b>Grade 100 Alloy</b>
<b>7 mm (1/4 in)</b>	<b>580 kg (1300 lb)</b>	<b>1180 kg (2600 lb)</b>	<b>1430 kg (3150 lb)</b>	<b>1570 kg (3500 lb)</b>	<b>1950 kg (4300 lb)</b>
<b>8 mm (5/16 in)</b>	<b>860 kg (1900 lb)</b>	<b>1770 kg (3900 lb)</b>	<b>2130 kg (4700 lb)</b>	<b>2000 kg (4500 lb)</b>	<b>2600 kg (5700 lb)</b>
<b>10 mm (3/8 in)</b>	<b>1200 kg (2650 lb)</b>	<b>2450 kg (5400 lb)</b>	<b>2990 kg (6600 lb)</b>	<b>3200 kg (7100 lb)</b>	<b>4000 kg (8600 lb)</b>
<b>11 mm (7/16 in)</b>	<b>1680 kg (3700 lb)</b>	<b>3270 kg (7200 lb)</b>	<b>3970 kg (8750 lb)</b>	<b>-</b>	<b>-</b>
<b>13 mm (1/2 in)</b>	<b>2030 kg (4500 lb)</b>	<b>4170 kg (9200 lb)</b>	<b>5130 kg (11300 lb)</b>	<b>5440 kg (12000 lb)</b>	<b>6800 kg (15000 lb)</b>
<b>16 mm (5/8 in)</b>	<b>3130 kg (6900 lb)</b>	<b>5910 kg (13000 lb)</b>	<b>7170 kg (15800 lb)</b>	<b>8200 kg (18100 lb)</b>	<b>10300 kg (22600 lb)</b>
<b>Chain Marks:</b>					
<b>Example 1</b>	<b>3</b>	<b>4</b>	<b>7</b>	<b>8</b>	<b>10</b>
<b>Example 2</b>	<b>30</b>	<b>40</b>	<b>70</b>	<b>80</b>	<b>100</b>