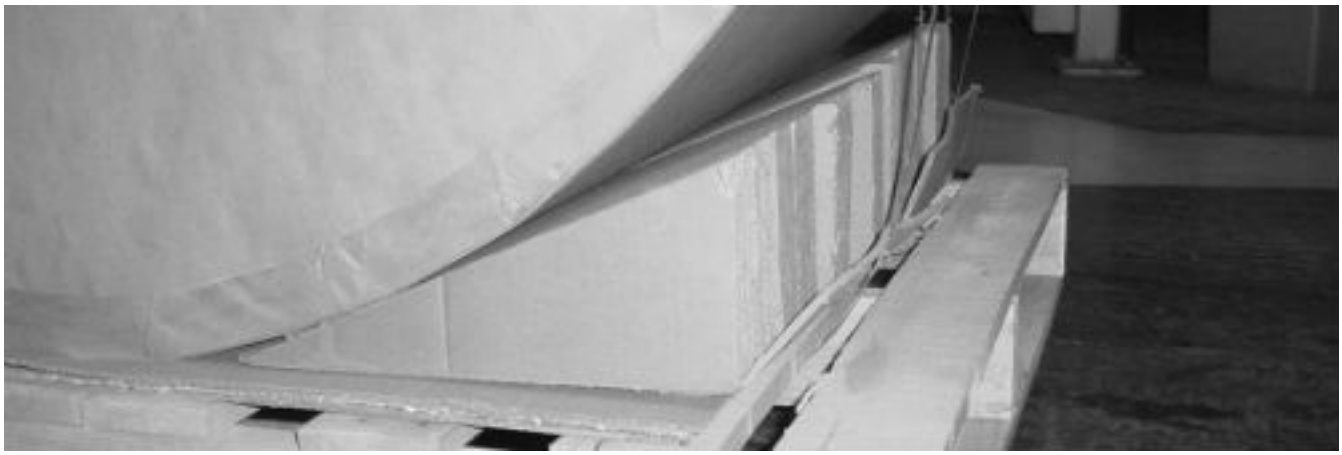
SAFETY

SOME ARTICLES HAVE A TENDENCY TO ROLL. TO PREVENT ROLLING, PROVIDE MORE THAN ONE POINT OF CONTACT:

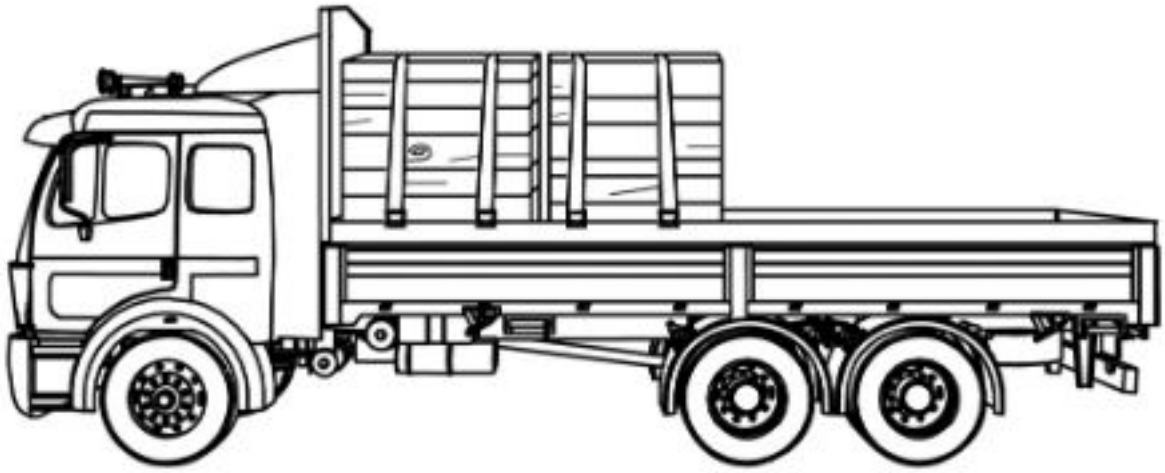
- **Lift the cargo off the deck AND/OR**
- **Place chockes, wedges, a cradle, or other equivalent means that prevent rolling. These must be secured to the deck.**



The method used to prevent rolling must not become unfastened or loose while the vehicle is in transit.

For articles that have a tendency to tip:

- **Prevent tipping or shifting by bracing the cargo.**

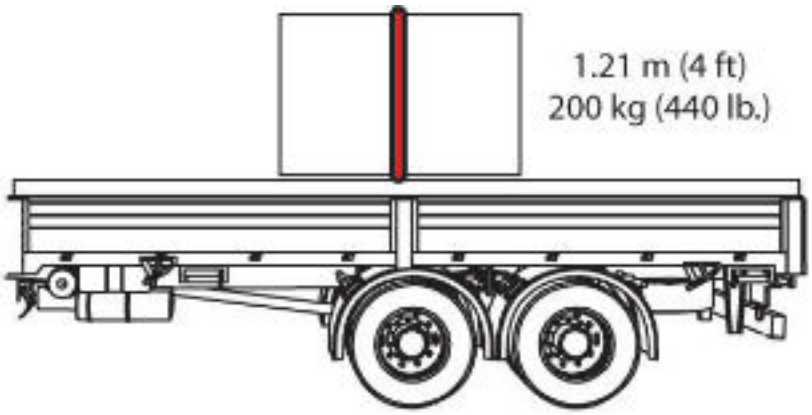


IMMOBILIZTING, AND SECURING CARGO: RESTRAINING THE CARGO CORRECTLY

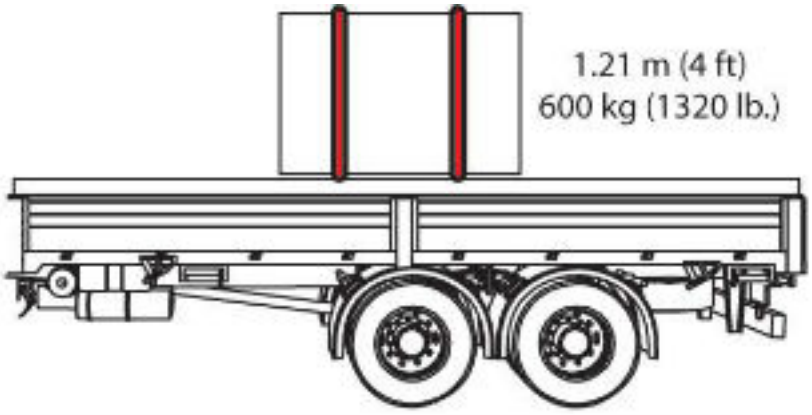
HOW MANY TIEDOWNS ARE REQUIRED?

If cargo is not prevented from forward movement (for example, by the headboard, bulkhead, other cargo, or tiedown attached to the cargo), secure the cargo according to the following requirements:

ARTICLE DESCRIPTION	MINIMUM # OF TIEDOWNS
1.52 m (5 ft) or shorter 500 kg (1,100 lb.) or lighter	1



ARTICLE DESCRIPTION	MINIMUM # OF TIEDOWNS
1.52 m (5 ft) or shorter Over 500 kg (1,100 lb.)	2

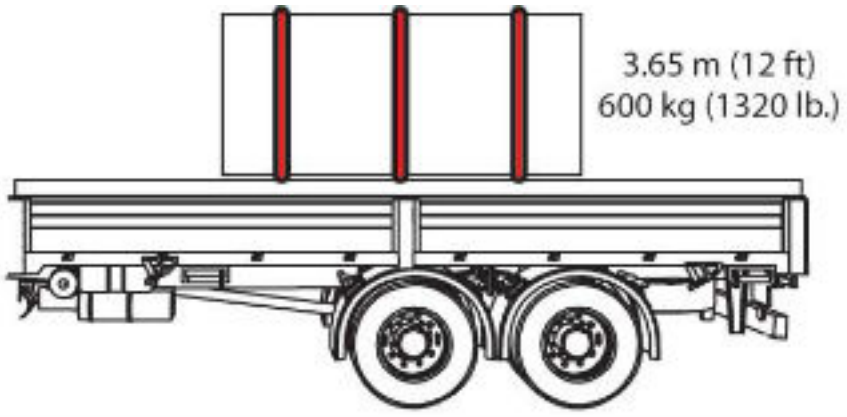


IMMOBILIZTING, AND SECURING CARGO: RESTRAINING THE CARGO CORRECTLY

HOW MANY TIEDOWNS ARE REQUIRED?

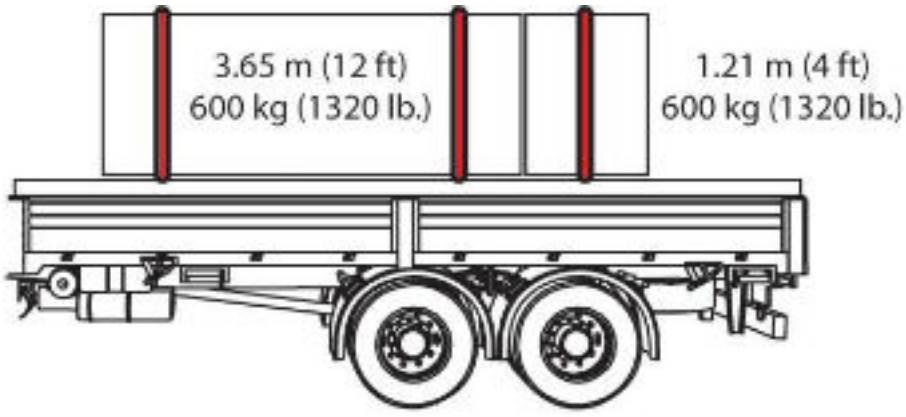
If cargo is not prevented from forward movement (for example, by the headboard, bulkhead, other cargo, or tiedown attached to the cargo), secure the cargo according to the following requirements:

ARTICLE DESCRIPTION	MINIMUM # OF TIEDOWNS
More than 1.52 m (5 ft) but 3.02 m (10 ft) or less	2



When cargo is prevented from forward movement (for example, by the headboard, bulkhead, other cargo, or tiedown), secure the cargo according to the following requirements:

ARTICLE DESCRIPTION	MINIMUM # OF TIEDOWNS
All Cargo	1 tiedown for every 3.04m (10ft), or part therof



SAFETY

Note: A vehicle transporting one or more articles of cargo such as, but not limited to, machinery or fabricated structural items (e.g., steel or concrete beams, crane booms, girders, and trusses, etc.) which, because of their design, size, shape, or weight, must be fastened by special methods.

However, any article of cargo carried on that vehicle must be securely and adequately fastened to the vehicle.

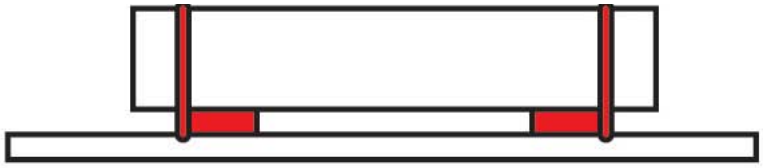
HOW SHOULD TIEDOWNS BE ATTACHED?

- **Tiedowns can be used in two ways:**
- **Attached to the cargo**
- **Tiedowns attached to the vehicle and attached to the cargo.**
- **Tiedowns attached to the vehicle, pass through or aroundan article of cargo, and then are attached to the vehicle again.**

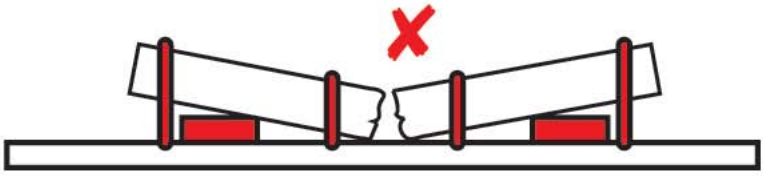
- **Pass over the cargo**
- **Tiedowns attached to the vehicle, passed over the cargo, and then attached to the vehicle again.**

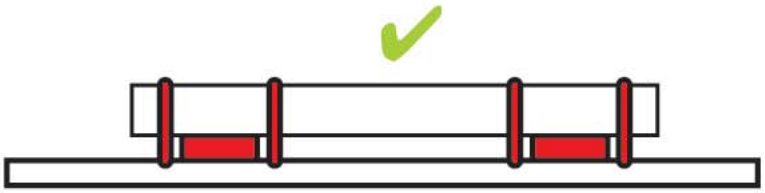
TIEDOWN PLACEMENT

- **Place the tiedown as close as possible to the spacer.**
- **Position the tiedowns as symetrically as possible over the length of the article.**



- **Position the tiedowns to preserve the integrity of the article.**





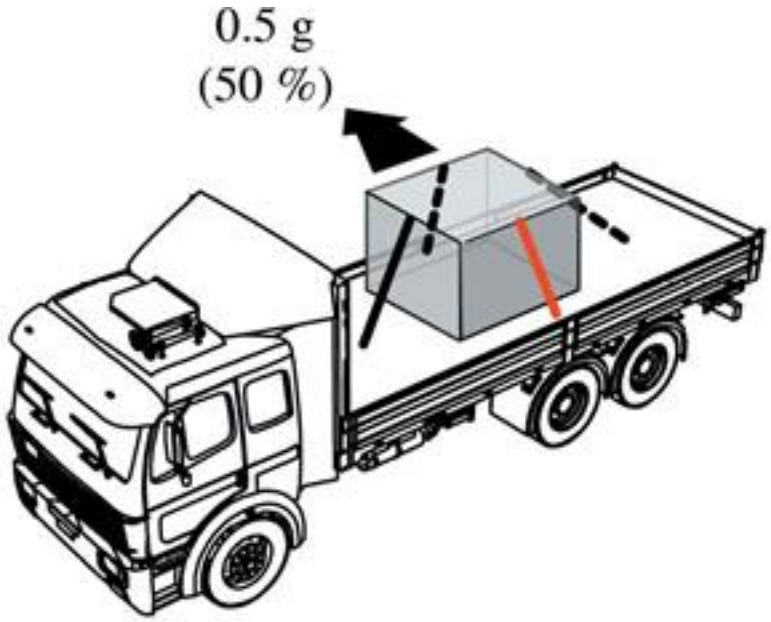
TIEDOWNS ATTACHED TO THE CARGO

Tiedowns attached to the cargo work by counteracting the forces acting on the cargo.

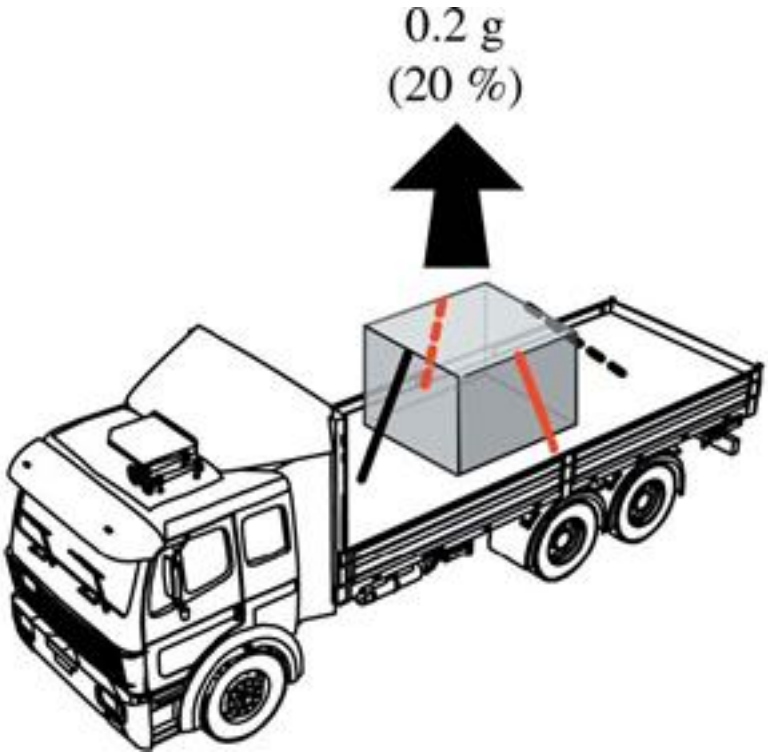
The angle where the tiedown attaches to the vehicle should be shallow, not deep (ideally less than 45).

To counteract forward movement, attach the tiedown so it pulls the cargo toward the rear of the vehicle.

To counteract rearward movement, attach the tiedown so it pulls the cargo toward the front of the vehicle.



To counteract movement to one side, attach the tiedown so it pulls the cargo toward the opposite side of the vehicle.



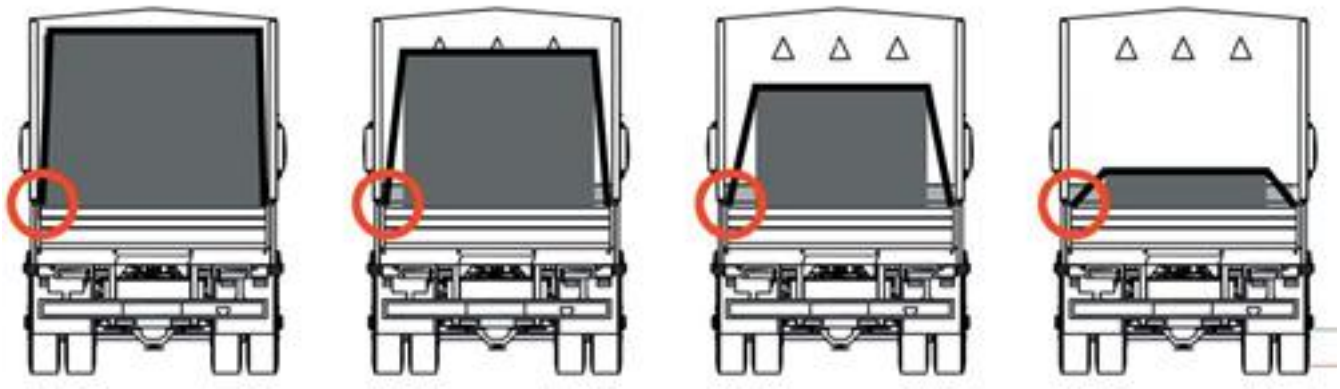
To counteract upward movement, attach tiedowns to opposing sides of the cargo so they pull the cargo down.

TIEDOWNS THAT PASS OVER THE CARGO

Tiedowns that pass over the cargo work by increasing the effective weight of the cargo (make the cargo seem heavier). This increases the pressure of the cargo on the deck and keeps the cargo from shifting.

Tension these tiedowns to as high an initial tension as possible.

The steeper the tiedown angle, the less shifting (ideally more than 45).



WHAT SHOULD YOU USE IN LOW-FRICTION SITUATIONS?

When there is low friction between the cargo and the deck (for example, with snow, ice, sand, gravel, and oil):

- **Use tiedowns attached to the cargo.**
- **Use a means to improve the friction such as friction mats or tiedown that pass over the cargo.**
- **Use blocking and tiedowns.**

CONTAINING, IMMOBILIZING, AND SECURING CARGO: USING ADEQUATE SECURING DEVICES

WHAT IS A WORKING LOAD LIMIT (WLL)?

The Working Load Limit is the maximum load that may be applied to a component of a cargo securement system during normal service.

The WLL is usually assigned by the component manufacturer.