

# Load Securement Basics

Load securement is regulated under Department of Transportation regulations, 49 CFR Part 393, Subpart I, Protection Against Shifting and Falling Cargo. This regulation is based on the North American Cargo Securement Standard and applies to:

- Vehicles with GVWR, GCWR, GVW, GCW of 10,001 pounds or more
- OR
- Vehicles transporting hazardous materials and requiring placarding

This document provides a **summary** of the general load securement requirements. Requirements for these specific commodities can be found within Part 393:

- Logs
- Dressed lumber
- Metal coils
- Paper rolls
- Concrete pipe
- Intermodal containers
- Autos, light trucks, and vans (393.128)
- Heavy vehicles, equipment, machinery (393.130)
- Flattened or crushed cars
- Roll-on/roll-off containers
- Boulders

## The Basics:

Changes in vehicle direction and/or speed cause cargo to shift during transit. Even the normal actions of acceleration, braking, or turning can cause cargo to shift during transit. It's vital to ensure loads are secured properly to reduce the likelihood of shifting, falling, or creating an unsafe condition.

Securement is designed to keep cargo secure during "normal" driving conditions. When are normal driving conditions ever seen? The load securement method(s) used can also help keep cargo secure during a collision with another vehicle or object or during a rollover.

Cargo can go in **five directions** if not inadequately secured or not secured: Up, down, front, rear, and sides. When securing a load, you must consider **ALL** directions and include booms for equipment.

Cargo is typically secured on or within a vehicle by:

- Immobilizing the cargo, meaning it's not capable of being moved.
- Restraining the cargo, meaning it's limited to or held back from any movement.
- Containing the cargo, meaning it's packaged or placed within a vehicle structure (trailer) and it cannot leave its space.

Friction is a key component that holds cargo in place. To a certain degree, it prevents movement of cargo. Different surfaces have different friction levels. Think about it. It takes less force to slide a block of ice across a metal deck than it does to slide a large piece of stone across a wood deck.

**For all loads**, the number of tiedowns and securement devices needed to properly secure cargo depends on:

- Whether the cargo is prevented from moving forward
- The length of the cargo
- The weight of the cargo
- The strength of the tiedowns
- Commodity-specific requirement

**These factors must be determined when considering a load securement system:**

- The rough weight of what you're hauling
- Tie down method being used
- Cargo prevented from moving forward

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## Tie Down Methods

Direct Tie Downs – Attach to the cargo and work by counteracting the forces acting on the cargo.

Indirect Tie Downs – Pass over the cargo, increasing the effective weight of the cargo.

### The minimum number of tiedowns needed depends on:

- Whether the cargo is prevented from moving forward
- The length and weight of the cargo

### Number of Tie Downs needed for cargo NOT prevented from forward movement

Article Size	Weight	Number of Tie downs
Under 5 feet	Under 1,100 lbs.	1 tie down needed
Under 5 feet	Greater than 1,100 lbs.	2 tie downs needed
Greater than 5 feet but less than 10 feet	All Weights	2 tie downs needed
Greater than 10 feet	N/A	2 tie downs PLUS one for each additional 10' of length or part thereof

**Working Load Limit (WLL):** The maximum load that may be applied to a component of a cargo securement system during normal service. Assigned by manufacturer of component.

**The aggregate WLL of any securement system must be at least 50% of the weight of the cargo being secured.**

Use 50% of WLL when using direct tie downs.

Use 100% of WLL of when using indirect tie downs.

Also need to determine WLL of components used (chains, webbing, rope, etc.).

### References:

- Federal Motor Carrier Safety Administration. Cargo Securement Rules. Obtained from the internet.
- J.J. Keller and Associates, Inc. Cargo Securement Handbook for Drivers (#445-H). 1-800-327-6868.
- **DOT regulations**, 49 CFR Part 393, Subpart I, Protection Against Shifting and Falling Cargo.
- American Trucking Association, Practical Cargo Securement, [www.practicalcargosecurement.com/products](http://www.practicalcargosecurement.com/products)

