

Cargo Securement

The Function of Cargo Securement

All types of cargo whether on a flat bed or inside a trailer traveling down a highway must remain secure with the vehicle. When improperly secured the load being carried could shift causing damage to the vehicle or cargo. Additionally, shifting cargo could lead to fines and/or accidents, even leading to loss of life. The driver plays a major role in making sure the loads they carry are properly secured and must be diligent in following all the regulations to do so.

The North American securement standard covers all commercial vehicles including combination vehicles that are operated on highways with a GVW rating over 10,000 lbs/4500 kgs. The Federal Motor standard covers all cargo from general freight to hazardous materials carried by equipment for vehicle operation or intermodal containers. There are also specific additional regulations for specialized commodities and certain dangerous or hazardous materials.



Securement Systems and Requirements

A securement system is defined as a method using one or more devices of the same or various types to secure the load. This could include a combination of vehicle structure along with devices to secure, block or brace the load. The system chosen must take into account the size, shape and strength of the cargo as well as any other characteristics that should be considered.

The vehicle structure includes floors, walls, decks, tie downs, headboards, bulkheads, stakes, posts and anchor points. Securing devices come in many different forms such as steel or synthetic webbing, grab hooks, load binders, chains, ratchet straps, clamping bars, cargo bars, winches, anti-slip mats, and load nets.

Cargo securement systems and devices must be designed, installed, and maintained so they don't exceed the manufactures breaking strength rating under the following forces:

- Forward Force 0.8g (80%)
- Rearward Force 0.5g (50%)
- Sideways Force 0.5g (50%)
- Upward Force 0.2g (20%)

For the structure or anchor points to be considered in good working order they must have no obvious damage or distress such as cracks, bends, or signs of weakened points. The working load limit (WLL) of any fastening device including tie downs and synthetic webbing must not exceed the WLL of the device under the following conditions when applied separately:

- 0.435g deceleration in the forward direction
- 0.5g acceleration in the rearward direction
- 0.25g acceleration in the lateral direction

The securement system must provide a downward force of at least 20% of the cargo if it's not contained within a structure. Many manufactures mark their components with the WLL rating or use a recognized manufacturer's standard code or symbol. Whenever purchasing securing devices make sure they are properly marked by their manufacturer so everyone from the carrier to the driver and the inspector can verify that proper equipment is being used.

Transporting Cargo

When transporting cargo the Federal Motor Carriers Safety Administration (FMCSA) states that one of the following three conditions must be met:

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Transporting Cargo *(continued from page 1)*

1. When cargo is fully contained by the structure of the vehicle such as a van trailer or box vehicle then the structure strength must be able to withstand the lateral forces as outline in the securement components section. Cargo cannot shift or tip and must be restrained against movement horizontally by the vehicle structure or other cargo.
2. Cargo being immobilized by the structure of the vehicle must have adequate strength by using any combination of structure, blocking or bracing to prevent the cargo from shifting.
3. Cargo immobilized by using tie downs in combination with other methods such as blocking, bracing, friction mats or void fillers must be able to prevent the load from shifting and/or tipping.

A tie down system can be a combination of load securing devices that attach to various anchor points and the cargo itself with the goal of securely restraining the load. On flatbeds you'll see tie downs placed over the top of the cargo being hauled to create enough downward force between the cargo and the floor of the vehicle to restrain the load from moving. Tie downs can be attached to the cargo as well as the vehicle or can pass through or around the cargo and then be attached to the vehicle.



As stated earlier, the driver plays a significant role in making sure the load is secure. The regulations are very clear, the components being used for securement should be checked regularly for wear and tear. If the load cannot be restrained from forward movement by the use of bulkhead, headboard or additional cargo, then the driver needs to follow the regulations for how many tie downs are needed based on the cargo weight and length. If the cargo is over 1,100 lbs then a minimum of 2 tie downs are required. If less than 1,100 lbs then only 1 tie down is required. A cargo length of 5' but less than 10' would require a minimum of 2 tie downs. Cargo greater than 10' requires 2 tie downs for the first 10' and then 1 additional tie down for every 10' in length or fraction thereof beyond the first 10'. Any cargo which is prevented from forward movement due to a bulkhead, headboard or additional cargo requires 1 tie down every 10' to make sure the load is securely fastened.

Tie downs must be checked regularly to make sure they are in proper working condition at all times and cannot have knots or other damage or show any signs of distress or weak points. If any of these are discovered, replacement is highly recommended. A cargo restraint system is only as strong as its weakest link.

Dayton Parts has partnered with Doleco USA to provide load securing products throughout the US and Canada. Dayton Parts offers a catalog (Cargo Restraint Systems) along with a buyer's guide to assist carriers to choose the correct device or devices to secure their cargo properly.



For additional Information contact your local Dayton Parts Distributor, Dayton Parts District Sales Manager, or Dayton Parts Customer Service at 800-233-0899
or go to:

<http://www.fmcsa.dot.gov/regulations/cargo-securement/cargo-securement-rules>

to learn more about the law and download the drivers handbook.

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