Nationwide®
is on your side

Fundamentals of Securing Flatbed Cargo

This information is intended to assist you in avoiding accidents, cargo claims and violations due to improper cargo securement. This is not a comprehensive guide or a complete review of the Federal Motor Carrier Safety Regulations (FMCSR) Cargo Securement Rules. For a complete listing of these rules, consult CFR 49 Part 393 Subpart I – Protection Against Shifting and Falling Cargo.

The Current Situation

It's unfortunate, but every year thousands of accidents occur that are caused by cargo falling from a flatbed trailer. Often, these accidents occur because the cargo was not secured properly, and other times it is because of defective or damaged load securement devices. Improper load securement or damaged tiedowns can result in cargo damage, loss of a load, crashes and loss of life. Drivers are responsible for knowing the cargo securement regulations and understanding how the cargo should be placed on the trailer.

Top Five Cargo Securement Violations at Roadside Inspections[1]:

1. Failure to prevent shifting/loss of load
2. Failure to secure truck equipment
3. Damaged tie-downs
4. Insufficient tie-downs
5. Loose tie-downs

General Load Securement Requirements

TWO TYPES OF CARGO SECUREMENTS:

Direct cargo securement is a tie-down that goes from an anchor point on the vehicle to an anchor point on an article of cargo, or, 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 of the vehicle. Direct tie-downs provide resistance to oppose the forces that are acting on the cargo.

Indirect cargo securement is a tie-down that goes from an anchor point on the vehicle, through, over, or around the article of cargo, and then attaches to another anchor point on the other side of the vehicle. Indirect tie-downs create a downward force that increases friction between the cargo and the deck of the trailer.

Guidelines for How Well Cargo Must Be Secured:

1. Tiedown assemblies and other fastening devices must be designed, installed, and maintained to ensure that the maximum forces acting on the devices or systems do not exceed the manufacturer's breaking strength rating.

2. Cargo must be immobilized by structures of adequate strength or a combination of structure, blocking and bracing to prevent shifting or tipping. Cargo loaded side-by-side should be placed in direct contact, or blocking should be used to prevent items from shifting towards each other.

3. To prevent shifting or tipping, the following can be used in addition to tie-downs: blocking, bracing, friction mats, other cargo, void fillers, or a combination of these. To prevent articles that tend to roll from rolling, lift the cargo off the deck and/or place chocks, wedges, cradles, pipe pins, or other equivalent means to prevent rolling.

[1]According to the Commercial Vehicle Safety Alliance (CVSA)

Continued >>

Tie-Down Requirements: Length

Part 393.110	Load Description	Minimum # of Tie-downs
If cargo is not prevented from forward movement (for example, by the headboard, bulkhead, other cargo, or tie-down attached to the cargo), secure the cargo according to these requirements:	▪ 1.52 m (5 feet) or shorter ▪ 500 kg (1,100 lb.) or lighter	1
	▪ 1.52 m (5 feet) or shorter ▪ Over 500 kg (1,100 lb.)	2
	More than 1.52 m (5 feet) but 3.02 m (10 feet) or less	3
	Longer than 3.02 m (10 feet)	2 + 1 tiedown for every additional 3.02 m (10 feet) or part thereof
If cargo is prevented from forward movement:	All cargo	1 tiedown for every additional 3.04 m (10 feet) or part thereof

Note: there are commodity specific rules for:

- Logs (Part 393.116; FMCSR)
- Dressed lumber/similar building products (Part 393.118)
- Metal coils (Part 393.120)
- Paper rolls (Part 393.122)
- Concrete pipe (Part 393.124)
- Intermodal containers (Part 393.126)
- Automobiles, light trucks, and vans (Part 393.128)
- Heavy vehicles, equipment, and machinery (Part 393.130)
- Flattened or crushed vehicles (Part 393.132)
- Roll-on/roll-off and hook-lift containers (Part 393.134)
- Large boulders (see Part 393.136)

Tie-Down Requirements: WLL

The Working Load Limit (WLL) is the maximum load that may be applied to a component of a cargo securement system during normal service and is normally assigned by the component manufacturer. The WLL listed in the tables of Part 393.108 (FMCSR) are to be used when the tiedown material is not marked by the manufacturer.

It is recommended that you purchase and use components that are rated and marked by their manufacturer, so the carrier, driver, shipper, and inspector can verify that the proper equipment is being used for the job. The WLL for a tie-down is the lowest WLL of any of its parts or the WLL of the anchor points it is attached to, whichever is less.

The aggregate working load limit of tie-downs used to secure an article or group of articles against movement must be at least one-half times the weight of the article or group of articles. For example, cargo weighing 10,000 lbs would require tie downs with a aggregate WLL of 5,000 lbs. The aggregate WLL is the sum of:

- One-half the WLL of each tie-down that goes from an anchor point on the vehicle to an anchor point on an article of cargo (direct).
- One-half the WLL of each tie-down 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 of the vehicle (direct).
- The WLL for each tie-down that goes from an anchor point on the vehicle, through, over, or around the article of cargo, and then attaches to another anchor point on the other side of the vehicle (indirect).

OTHER SECUREMENT BASICS

- All vehicle structures, systems, parts, and components used to secure cargo should be in proper working order (no cracks, cuts, fraying) with no damaged or weakened components that will adversely affect their performance for cargo securement purposes.
- Edge protection must be used if a tie-down could be cut or torn when touching an article of cargo.
- Each tie-down, or its associated connectors, or its attachment mechanisms must be designed, constructed, and maintained so the driver of an in-transit commercial motor vehicle can tighten them (does not apply to the use of steel strapping).
- Never move a truck/trailer unless the cargo is secured.
- Never have chains pulling in only one direction.
- A direct tie-down is considered effective against forward, lateral and rearward forces if it makes an angle less than 45 degrees. An indirect tie-down that is used to prevent side-to-side or front to back movement must make an angle of at least 30 degrees.
- Trailer decks should be sound with no visible holes or boards that are rotted and could break once loaded.
- If the trailer does not have a front end structure, it is recommended that the truck be equipped with a headache rack that extends 48" above the trailer deck. (see Part 393.114 for front end structure requirements).
- Cargo checks need to be performed within 50 miles from the start of the trip, every 150 miles or 3 hours (whichever comes first), and at each change of duty status (see Part 392.9).

Suggested Load Securement Checklist Items:

1. Is your trailer deck in good condition with no visible holes or rotted boards?
2. Is the cargo undamaged?
3. Are cargo securement devices in good working order? No cuts, knots or fraying (straps) cracks or bent links (chains)?
4. Is edge protection required?
5. Is the cargo properly distributed on the trailer for weight and center of gravity?
6. Do securement devices meet the aggregrate WLL requirement for the weight of the cargo?
7. Are there enough load securement devices for the length of items?
8. Is cargo secure from any forward, backward, vertical or lateral movement?
9. Are all commodity-specific regulations being followed?
10. Are required cargo checks being performed and logged properly?
11. Are securement devices properly stored when not in use?

TUBULAR LOADS (ADDITIONAL ITEMS)

1. Is adequate blocking in place for each layer?
2. Are pipe pins (stanchions) in place?
3. Is each layer properly chocked and strapped?

For additional information:

- FMCSA - Cargo Securement Rules website
- Commercial Vehicle Safety Alliance - Practical Cargo Securement

Nationwide® is on your side

Providing solutions to help our members manage risk.®

For your risk management and safety needs, contact Nationwide Loss Control Services: 1-866-808-2101 or LCS@nationwide.com.