



G-FORCE

GREIF LOAD SECUREMENT INNOVATIONS

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Proper Load Securement = Safety & Savings

Presentation to Chemical Packaging Committee

October 7, 2008

GREIF

You Ship It. We Protect It.™

Proper Load Securement = Safety & Savings

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Proper load securement ensures that cargo is fully contained.

Why is this important?

- Reduces product damage during transit
- Safety for loaders, unloaders, carriers, and the public
- Complies with regulations

Focus of presentation: over-the-road load securement

Studying Large Truck Crashes in U.S.

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FMCSA and NHTSA's *Report to Congress on the Large Truck Crash Causation Study* (2006)

- National study on large-truck fatal and injury crashes
- Only significant study that focuses on pre-crash factors
- Limitation: ignores non-injury accidents

Another key reference: FMCSA's *National Crash Facts*

- Includes non-injury crashes

In 2006, 95,000 People Were Killed or Injured from Truck Crashes

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In 2006, about 147,000 total large truck crashes in U.S.

- 5,000 of these crashes resulted in a fatality
- 60,000 crashes resulted in injuries to about 90,000 people
 - In last ten years, rate of fatalities/injuries fell about 28% ... but large trucks traveled 20% more miles.

Driver error was the critical factor in 87% of these cases

- Decision (38%)
- Recognition (28%)
- Non-Performance (12%)
- Performance (9%)

Source: FMCSA & NHTSA's Report to Congress on the Large Truck Crash Causation Study (2006) and FMCSA's National Crash Facts

Cargo Securement Issues Identified as a Significant Factor in Large Truck Crashes

Cargo shifting and securement issues were primary or contributing factors in, at the very least, 7% of the large truck crashes

- No load securement system
- Inadequate or improperly deployed load securement system

(7% may be understated, because non-injury / non-fatal accidents not included in this statistic)

Source: FMCSA & NHTSA's Report to Congress on the Large Truck Crash Causation Study (2006) and FMCSA's National Crash Facts

Evolution of Today's Cargo Securement Standards

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1993: Federal Highway Administration participated in an research program with Canadian Council of Motor Transport Administrators (CCMTA) with three objectives:

- Determine how parts of securement system contribute to overall system
- Demonstrate adequacy of cargo securement components and overall system
- Develop principals that would guide North American cargo securement standard

1999: Final version of NA Cargo Securement Standard Model Regulations published

2002: Adopted into Federal Motor Carrier Safety Regulations, Title 49 of Code of Federal Regulations, Parts 390, 391, 392

2004: Rules effective

What Does the FMCSR Cargo Securement Standard Cover?

- All commercial vehicles operated on a highway and have gross vehicle rating over 10,000 lbs.
- All cargo (except for bulk commodities in tank or hopper)

Not just hazardous!

Source: DOT's Driver's Handbook on Cargo Securement

What Are the Standard Requirements?

All cargo must be contained, immobilized, or secured so that it does not ...

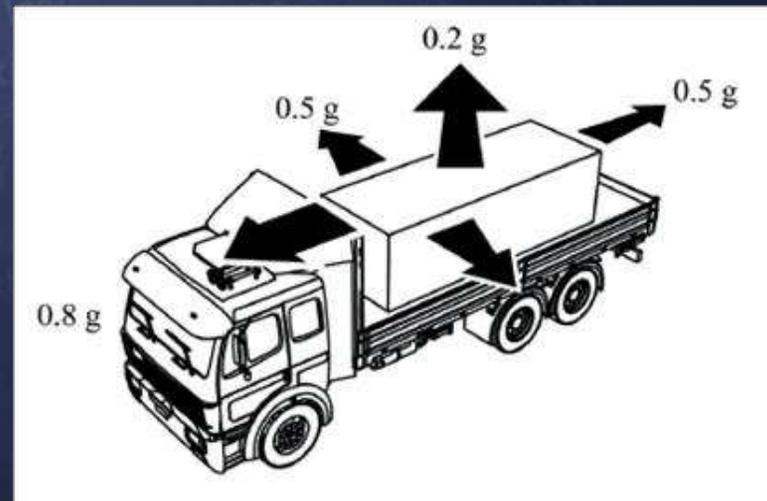
- Leak
- Spill
- Blow off the vehicle
- Fall from the vehicle
- Fall through the vehicle
- Otherwise become dislodged from the vehicle
- Shift upon or within the vehicle to such an extent that the vehicle's stability or maneuverability is adversely affected

Source: DOT's Driver's Handbook on Cargo Securement

What Does “Fully Contained” Mean?

Each cargo securement system must be able to withstand a minimum amount of force in each direction.

- Forward Force = 80% of cargo weight when braking while driving straight ahead.
- Rearward Force = 50% of cargo weight when accelerating, shifting gears while climbing a hill, or braking in reverse.
- Sideways Force = 50% of cargo weight when turning, changing lanes, or braking while turning.
- Upward Force = 20% of cargo weight when traveling over bumps in the road or cresting a hill.



Source: DOT's Driver's Handbook on Cargo Securement

What is a Securement System?

A securement system is a securement method that uses one or a combination of the following elements:

- Vehicle Structure: floors, walls, decks, bulkheads, anchor points, etc.
- Securing Devices: webbing, chain, strapping, rope, friction mats
- Blocking and Bracing Equipment: wood, dunnage, air bags, chocks, cradles, locking bars



Source: DOT's Driver's Handbook on Cargo Securement

Who's Responsible for Ensuring Standard is Met?

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FMCSR Section 392.9 indicates that the driver of the commercial motor vehicle must ensure that the cargo is properly distributed and adequately secured.

- The driver must also conduct specific inspection activities:

Driver action required	Pre-Trip	Within first 80 km (50 mi)	When duty status of driver changes	At 3 hour intervals or every 240 km (150 mi), whichever is first
Inspect Cargo and Securing devices	✓	✓	✓	✓
Inform Carrier if Packaging is Not Adequate	✓			
Adjust Cargo and/or Securing devices	As necessary	As necessary	As necessary	As necessary
Add Additional Securing devices	As necessary	As necessary	As necessary	As necessary

So the shipper isn't responsible meeting the securement standards, right?

- Unfortunately, it's not so straightforward ...*

Who's Responsible for Ensuring Standard is Met?

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The driver is **exempt** from the FMCSR cargo securement requirement when ...

- The vehicle has been sealed, and the driver has been ordered not to open it
- The vehicle has been “loaded in a manner that makes inspection impractical”

What does “impractical” mean? Who's ultimately responsible?

Enforcement of FMCSA's Securement Rules

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DOT's FHWA possess power of enforcement for FMCSA securement rules

- Routine compliance inspections
- If load securement violations found, can result ...
 - Vehicle detention – taken out of service
 - Citations and fine

Roadcheck 2007

- Commercial Vehicle Safety Alliance (CVSA) and Federal Motor Carrier Safety Administration (FMCSA) certified inspectors performed 62,370 truck and bus inspections during 72-hours testing period
- 6.2% of drivers had violations that took the vehicle out of service
 - 10% of these violations resulted from improper load securement

How Does the Securement Standard Apply to Drums or IBCs?

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The FMCSA rule establishes specific standards for the most challenging types of commodities (e.g., lumber, metal coils, vehicles, etc.)

Drums and IBCs are considered general freight

- No specific rules ... but still must be secured to the same standards
- If not adequately and properly secured, shipments of drums and IBCs may violate federal regulations and contribute to unsafe conditions.

What Happens to Drums and IBCs during Highway Transit?

Forces that affect drums and IBCs during typical highway transit

- Emergency Braking (Longitudinal Forces)
- Vertical Isolation (Harmonics)
- Steep Grades (Longitudinal Forces)
- Sharp Turns/Curves (Lateral Forces)
- Trailer's Construction (Air Ride vs Standard Suspension, Camber, Side Wall-Flexible vs Rigid, etc)
- With liquid, affect of hydraulics (Movement in all three directions)

In even normal conditions,
many forces at play – each challenging cargo's containment

Don't Forget the Obvious Benefits of Securement

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Properly securing cargo helps ...

- Reduce rejected loads
- Minimize costs of replacing, salvaging, or disposing of damaged product
- Improve customer satisfaction
- Avoiding the time and expense of cleaning up a load that's shifted

What Should You Do?

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Questions to Ask

- Are you living up to the FMCSA load securement standards on all shipments – not just Hazmat?
- Are you your carriers and other third-parties complying with the cargo standards?

Sources of Information to Investigate

- FMCSA's Cargo Securement website: <http://www.fmcsa.dot.gov/rules-regulations/truck/vehicle/cs.htm>
- Canadian Council of Motor Transport Administrators's Cargo Securement website: <http://www.ccmta.ca/english/committees/cra/cargo/cargo.cfm>
- Upcoming, revised CPC handbook on load securement
- Load securement specialist

Focus on Load Securement for All Shipment

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Proper load securement is important for all shipments

Making certain that your cargo is fully contained can help you ...

- Reduce product damage during transit
- Provide safety environment for loaders, unloaders, carriers, and the public
- Comply with regulations