



## **CARGO SECUREMENT**

### **INTRODUCTION**

Cargo securement standards in Alberta apply to all types of cargo carried in or on a commercial vehicle. A commercial vehicle is a vehicle or combination of vehicles that are registered for or weigh more than 4,500 kilograms (excluding buses). According to Section 41 of the Commercial Vehicle Certificate and Insurance Regulation (AR314/2002), carriers must ensure all drivers are trained in how to properly secure cargo.

Section 17(3) of the Commercial Vehicle Safety Regulation (AR 121/2009) states that all cargo must be properly secured by a carrier according to the requirements found in NSC Standard 10. Section 17(4)(a) of the Commercial Vehicle Safety Regulation (AR121/2009) which states:

- a. cargo must not leak, spill, blow from, fall from, fall through or otherwise be dislodged from a commercial vehicle, or
- b. shift upon or within the vehicle to such an extent that the vehicle's stability or maneuverability is adversely affected.

There are 3 ways cargo may be transported – Fully Contained, Immobilized, or General Securement. According to Division 2 of NSC Standard 10, Swab Master Ltd. falls under General Securement, as all rigs and tank trucks are custom made and are PME – permanently mounted equipment.

The proper securement of cargo is important not only for the protection of the cargo itself, but also for ensuring the safety of a driver and the motoring public. Cargo that shifts or tips may cause a vehicle to tip or operate in an unsafe manner.



*Propane tank inserted into bolted in place holder with secondary chain around top; special seat belt net secured by master links over the bird's nest (area at back of rig that folds down when stationed at location and provides access to the rig)*

**NOTE - According to the Canadian Council of Motor Transport Administrators (CCMTA), bungee cords and tarp straps are not suitable for use as tie downs and are equally unsuited to having an assigned Working Load Limit (WLL). They may still be used, however, as supplementary restraint for light weight cargo and equipment.**

## **SECTION 1 – CARGO SECUREMENT SYSTEMS**

- (1.1) According to Division 2 of NSC Standard 10, all vehicle structures, systems and parts used to secure cargo must:
  - a. be in proper working order,
  - b. be fit for the purpose for which they are used,
  - c. have no knots, damaged or weakened components that will adversely affect the performance for cargo securement purposes, and
  - d. not have any cracks or cuts.
- (1.2) A securing device, integral locking device, movable structure or blocking device used to secure cargo to a vehicle shall itself be secured in a manner that prevents it from becoming unfastened while the vehicle is on a highway.
- (1.3) Articles of cargo that are likely to shift, tip or roll must be restrained by chocks, wedges, or a cradle to prevent movement. These restraints must stay fastened or secured while the vehicle is moving.

- (1.4) Cargo shall be firmly immobilized or secured on or within a vehicle by structures of adequate strength, blocking, bracing, dunnage or dunnage bags, shoring bars, tiedowns or a combination of these primary securements.
- (1.5) Chains, nets and tie down straps may be used as additional secondary securement but not primary.

## **SECTION 2 – PERFORMANCE CRITERIA**

(2.1) The cargo securement system shall be capable of withstanding the forces that result if the vehicle is subjected to each of the following accelerations:

- a. 0.8 g deceleration in a forward direction;
- b. 0.5 g deceleration in a rearward direction;
- c. 0.5 g acceleration in either sideways direction.

(2.2) The cargo securement system shall provide a downward force equal to at least 20 % of the weight of an article of cargo if the article is not fully contained within the structure of the vehicle.

(2.3) The load on a component of a cargo securement system that reacts to a force referred to in subsection (2.1) or (2.2), shall not exceed the working load limit of the component.

## **SECTION 3 – APPROPRIATE SYSTEM**

(3.1) The cargo securement system used to contain, immobilize or restrain cargo shall be appropriate for the size, shape, strength and characteristics of the cargo.

(3.2) Additionally, the securing devices used to secure cargo on or within a vehicle shall be

- a. designed and constructed for the purpose for which they are used, and
- b. used and maintained in accordance with the manufacturer's instructions.

## **SECTION 4 – PROPER USE OF TIE DOWNS**

(4.1) Each tie down must be secured so that it does not come loose, unfastened, opened, or released while the vehicle is moving. This means that the driver of a vehicle must be able to securely tighten a tie down before transporting their cargo on a highway.

**(4.2)** Current standards forbid the use of unmarked tie downs. Tie downs must be marked by the manufacturer with respect to their Working Load Limit (WLL). This ensures that all drivers use the proper equipment for securing a load. Tie downs and other securement devices must be strong enough to properly secure a load. Manufacturers test these devices to determine how much force can be applied to them before they break. The “working load limit” of a securement device refers to the maximum load that may be applied to that device during normal service.

**(4.3)** An edge protector shall be used where a tiedown would be subject to abrasion or cutting at the point where it touches an article of cargo. An edge protector used between a tiedown and cargo shall be resistant to abrasion, cuts and crushing. An edge protector used between a tiedown and cargo shall allow the tiedown to slide freely when it is tightened or loosened.

**(4.4)** Cargo transported by a vehicle shall be secured using the number of tiedowns calculated under subsection (4.4.1) or (4.4.2).

**(4.4.1)** Where an article of cargo is not blocked or immobilized by a front-end structure, bulkhead, by other immobilized cargo or by another device that prevents it moving forward, it shall be secured by at least:

- a. 1 tiedown where the article is 1.52 metres or shorter and weighs not more than 500 kilograms
- b. 2 tiedowns where the article is
  - i. 1.52 metres or shorter and weighs more than 500 kilograms, or
  - ii. longer than 1.52 metres but not longer than 3.04 metres regardless of its weight, or
- c. where the article is longer than 3.04 metres
  - i. 2 tiedowns for the first 3.04 metres of length, and
  - ii. 1 extra tiedown for each additional 3.04 metres or fraction of 3.04 metres.

**(4.4.2)** Where an article of cargo is blocked or immobilized by a front-end structure, bulkhead, by other immobilized cargo or by another device to prevent it moving forward, it shall be secured by at least:

- a. 1 tiedown where the article is not longer than 3.04 meters, or
- b. where the article is longer than 3.04 metres
  - i. 1 tiedown for the first 3.04 metres of length, and
  - ii. 1 extra tiedown for each additional 3.04 metres or fraction of 3.04 metres.



*Tie downs on tank truck to keep the rubber hose from shifting during transit*



*Securing the lube on the derrick so it won't bounce around during transit.*



*A fixed hose is primarily wrapped around a secure piece of equipment and a bungee is attached over the hose as a secondary securement.*

## SWAB MASTER LTD. CARGO SECUREMENT TRAINING QUIZ

1. The Commercial Vehicle Safety Regulation states cargo must not leak, spill, blow from, fall from, fall through, or otherwise be dislodged from a commercial vehicle.

TRUE

FALSE

2. It is okay to use a frayed ratchet strap to secure cargo.

TRUE

FALSE

3. Division 2 of NSC Standard 10 states that all vehicle structures, systems and parts used to secure cargo must what? Name 3 things

---

---

---

4. Bungee cords and tarp straps can be used to secure heavy cargo.

TRUE

FALSE

5. What does WLL stand for?

- a. Weight level load
- b. Weight load level
- c. Working level load
- d. Working load limit

6. How many tie downs are required to secure a 10m length of cargo

- a. 5
- b. 2
- c. 3
- d. 4

7. Swab Master Ltd. has custom permanently mounted equipment, and uses tarp straps as secondary securement, which is legal

YES

NO

8. All ratchet straps must have WLL marked on it, to ensure drivers use the proper equipment to secure a load.

TRUE

FALSE

9. Name 3 pieces of equipment on a Swab Master rig or tank truck where you would use a secondary securement device.

---

---

---

10. Proper securement of cargo is important

- a. To protect the cargo
- b. To protect the driver
- c. To protect the public
- d. All of the above

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_