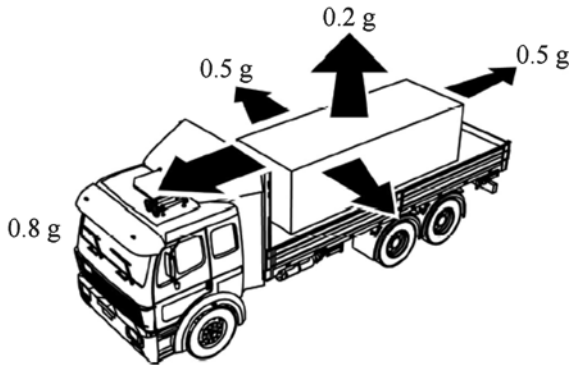


2.1 The Fundamentals of Cargo Securement

How well must the securement system work?

Each cargo securement system must be able to withstand a minimum amount of force in each direction, as follows:

- **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, unless cargo is fully contained within the structure of the vehicle.



The above forces represent “extreme” conditions just short of a crash. Under normal, day-to-day operating conditions, you have to make sure the *working load limit* of the system is not exceeded under a:

- Forward force of 44% of the cargo weight,
- Rearward force of 50% of the cargo weight, and
- Sideways force of 25% of the cargo weight.



Canada does not distinguish between “extreme” operating conditions and “normal” operating conditions. The securement system must withstand the “extreme” forces above at all times.