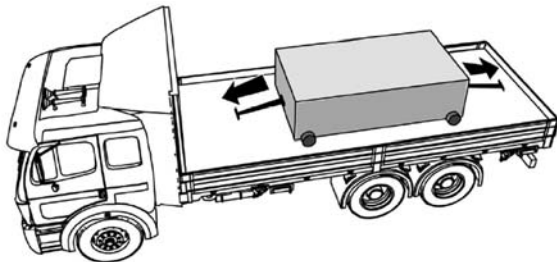
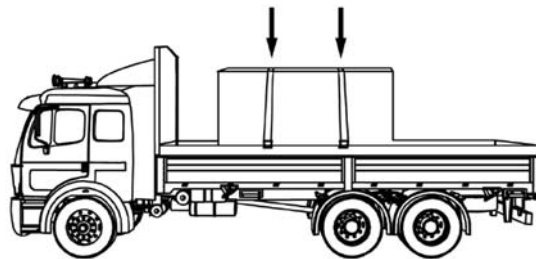


2.2 The Securement System and its Components



Direct tie-downs attach to cargo

Some tie-downs pass over or through the cargo, creating a downward force that increases the effect of friction between the cargo and the deck, thereby restraining the cargo. These are called *indirect tie-downs*. In many cases, this friction between the load and deck is the principal factor affecting load securement (although friction alone is never enough to secure a load).



Indirect tie-downs pass over or through cargo

Tiedown construction and maintenance

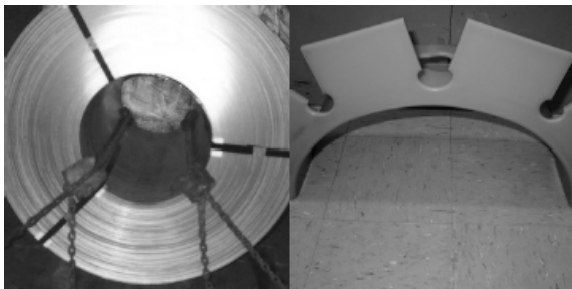
Tie-downs and/or their associated connectors or attachment mechanisms (except for steel strapping) must be designed, constructed, and maintained so that the driver can tighten them.

All components of each tie-down must be in proper working order, with no defects that reduce the working load limit:

- No knots, cracks, cuts, or other obvious damage that would adversely affect performance.

2.2 The Securement System and its Components

Edge protection is also useful for protecting cargo or dunnage that is much softer than the tiedown, to prevent damage from crushing.



Blocking and bracing

The material used for blocking or bracing and as chocks and cradles must be strong enough to withstand being split or crushed by the cargo or tiedowns.

This requirement also applies to any material used for dunnage (“dunnage” is any loose material used to support and protect cargo).

If wood is used:

- Hardwood is recommended.
- It should be properly seasoned.
- It should be free from rot or decay, knots, knotholes, and splits.
- The grain should run lengthwise when using wood for blocking or bracing.



- When using blocking, use new nails whenever possible, and pound them straight through the block (perpendicular to the deck) until the head contacts the block. At least $1\frac{1}{4}$ inches of nail should penetrate into the deck.
- Don't leave clearance between the block and the cargo, and place blocks on all sides of the cargo.
- Replace damaged or splintered blocks and deck boards.
- Blocking should not be relied upon as a significant contributor to the securement of heavy cargo. Keep this in mind: A typical 16d nail through a softwood 2x4 has a WLL of only about 300 pounds.