

Fleet: Securing heavy machinery

Securement guidelines for heavy vehicles, equipment and machinery

When moving heavy equipment – like tractors, bulldozers, or sprayers that weigh over 10,000 pounds – there are some important rules to follow to make sure everything stays put on the road. These rules from the Federal Motor Carrier Safety Administration are found in section **49 CFR 393.130**. If moving lighter gear like skid steers or forklifts, securement may comply with the same guidelines or those outlined in sections **393.100** through **393.114**.

Loading and positioning

Ensure the equipment is properly loaded onto the trailer with space evenly side to side and adhering to axle weight limits. Cover any Slow-Moving Vehicle (SMV) emblems during transport. For wheeled equipment, use chocks to prevent forward or backward movement.

Selection of securement devices

Determine the vehicle’s weight and select the appropriate chain and binder to secure the total weight. Refer to the provided chart for guidance. When utilizing snap binders, confirm that the handle is securely fastened and remains within the rub-rail protected area. Avoid over-tightening ratchet binders.

Weight assessment and securement

Determine the weight of the equipment and select the appropriate chain and binder combination to safely secure 50% of the weight using the **Working Load Limits (WLL), Chain table** for assistance in determination. A direct tie-down for each axle will be required with a tensioning device at each tie-down. Remember, on direct tie-downs, you can only use 50% of the WLL of your securement device.

Size mm (inches)	Working Load Limits, Chain Table, WLL in kg (pounds)				
	Grade 30 proof coil	Grade 43 high test	Grade 70 transport	Grade 80 alloy	Grade 100 alloy
1. 7 (1/4)	580 (1,300)	1,180 (2,600)	1,430 (3,150)	1,570 (3,500)	1,950 (4,300)
2. 8 (5/16)	860 (1,900)	1,770 (3,900)	2,130 (4,700)	2,000 (4,500)	2,600 (5,700)
3. 10 (3/8)	1,200 (2,650)	2,450 (5,400)	2,990 (6,600)	3,200 (7,100)	4,000 (8,800)
4. 11 (7/16)	1,680 (3,700)	3,270 (7,200)	3,970 (8,750)		
5. 13 (1/2)	2,030 (4,500)	4,170 (9,200)	5,130 (11,300)	5,400 (12,000)	6,800 (15,000)
6. 16 (5/8)	3,130 (6,900)	5,910 (13,000)	7,170 (15,800)	8,200 (18,100)	10,300 (22,600)
Chain Mark Examples:					
Example 1	3	4	7	8	10
Example 2	30	43	70	80	100
Example 3	300	430	700	800	1000

Source: ECFR

§ 393.130 What are the rules for securing heavy vehicles, equipment and machinery?

(a) Applicability. The rules in this section apply to the transportation of heavy vehicles, equipment and machinery which operate on wheels or tracks, such as front-end loaders, bulldozers, tractors, and power shovels and which individually weigh 4,536 kg (10,000 lb.) or more. Vehicles, equipment and machinery which is lighter than 4,536 kg (10,000 lb.) may also be secured in accordance with the provisions of this section, with § **393.128**, or in accordance with the provisions of §§ **393.100** through **393.114**.

(b) Preparation of equipment being transported.

- (1) Accessory equipment, such as hydraulic shovels, must be completely lowered and secured to the vehicle.
- (2) Articulated vehicles shall be restrained in a manner that prevents articulation while in transit.

(c) Securement of heavy vehicles, equipment or machinery with crawler tracks or wheels.

- (1) In addition to the requirements of paragraph (b) of this section, heavy equipment or machinery with crawler tracks or wheels must be restrained against movement in the lateral, forward, rearward, and vertical direction using a minimum of four tiedowns.
- (2) Each of the tiedowns must be affixed as close as practicable to the front and rear of the vehicle, or mounting points on the vehicle that have been specifically designed for that purpose.

Preparation of equipment for transport

All accessory equipment, such as hydraulic shovels, must be fully lowered and secured. They can be secured with suitable synthetic webbing.

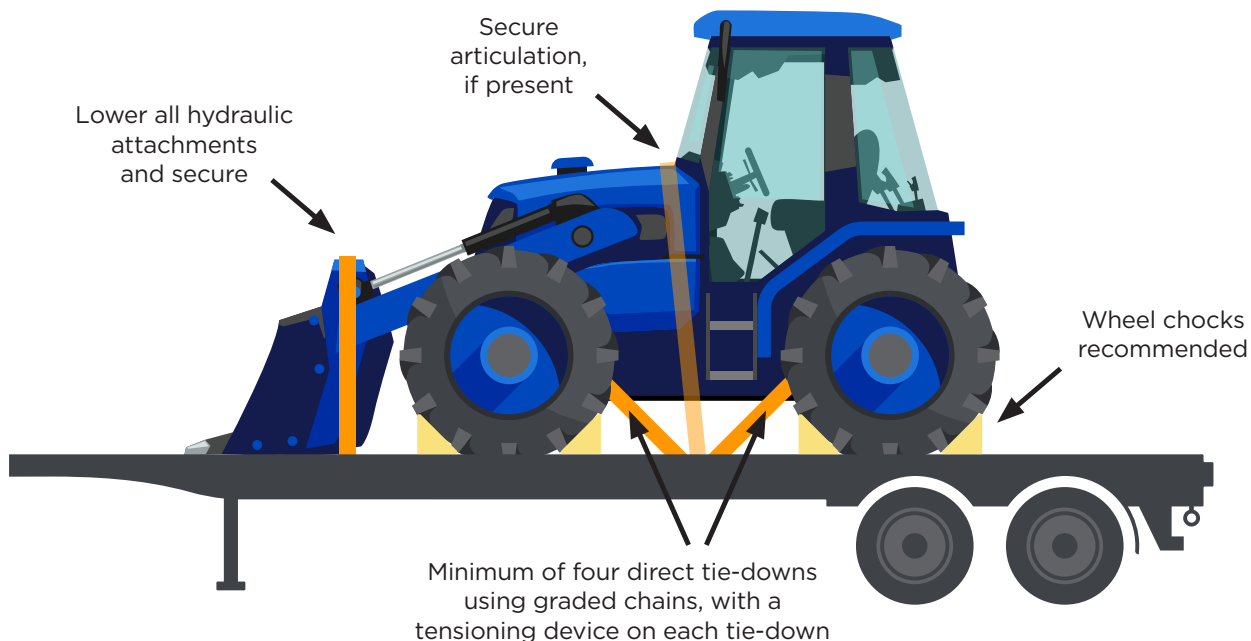
Articulated vehicles must be secured to prevent any movement at the articulation joint during transport. On newer equipment, simply place and secure the articulation pin. On older equipment, employ a securement device across the articulation or secure four points at the axles on side of the articulation with 2 securements on the opposite side.

Securement of heavy vehicles, equipment or machinery with crawler tracks or wheels

In addition to the requirements of paragraph (b) of this section, heavy equipment or machinery with crawler tracks or wheels must be restrained against movement in the lateral, forward, rearward, and vertical direction using a minimum of four tiedowns.

Each of the tiedowns must be affixed as close as practicable to the front and rear of the vehicle, or mounting points on the vehicle that have been specifically designed for that purpose.

While not required by code, the addition of chocks at the wheels helps reduce the chances of the vehicle moving and would be a best practice.



For further guidance, refer to Federal Motor Carrier Safety Administration 49 CFR Part 393 Subpart I ([ecfr.gov/current/title-49/section-393.130](https://www.ecfr.gov/current/title-49/section-393.130)).



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