21.10.8 After chains are tightened, they should be struck with a hammer or bar to eliminate any possible misalignment of links. Further tensioning may be required to take up any slack that develops due to link alignment.

21.10.9 After final tensioning, all winch assemblies must be adequately locked in position to eliminate the possibility of loosening during transit.

21.10.10 Ratchet pawls must be locked and the winch assembly must be correctly raised and locked in the track, as illustrated in Fig. 21.8.

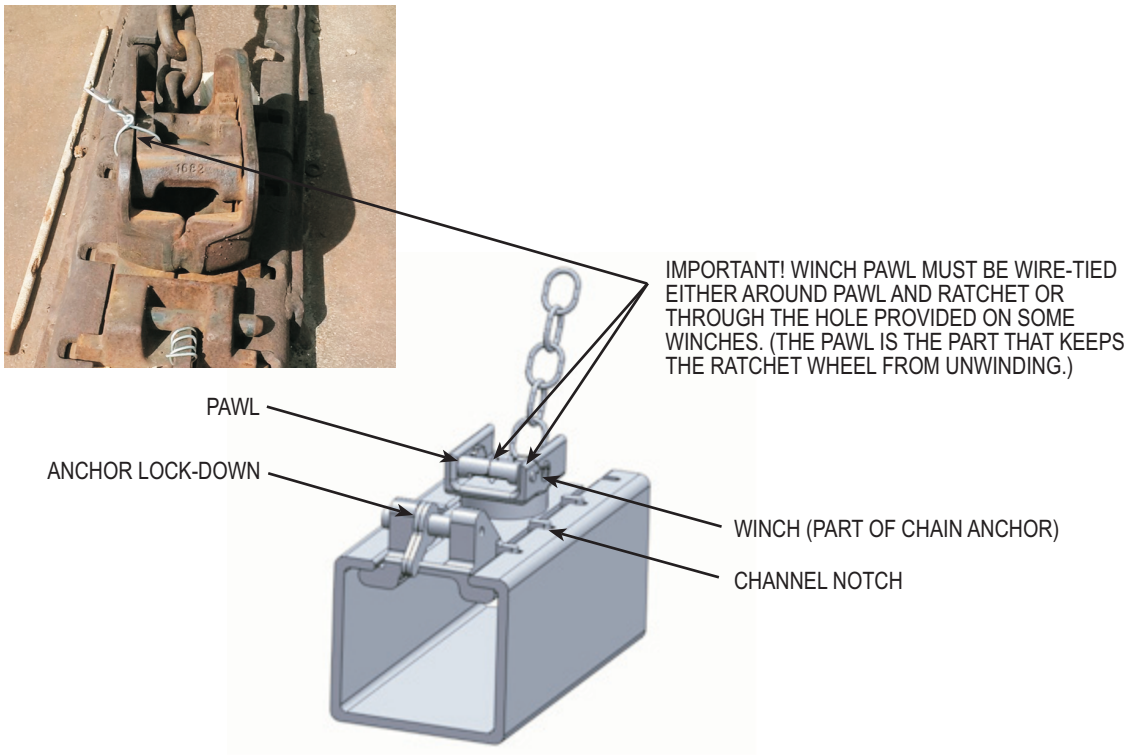


Fig. 21.8 Correct application of tie-down assembly and components

21.10.10.1 Winch pawl must be wire-tied either around the pawl and ratchet or through the hole provided on some winches. (The pawl is the part that keeps the ratchet wheel from unwinding.)

21.10.11 Chain and chain tie-down assemblies, dimensions, and minimum breaking strengths are shown in Appendix D, paragraph 4.7. See Table 21.4 for approved chain manufacturers and methods of identification.

Table 21.4 Approved chain manufacturers and method of identification

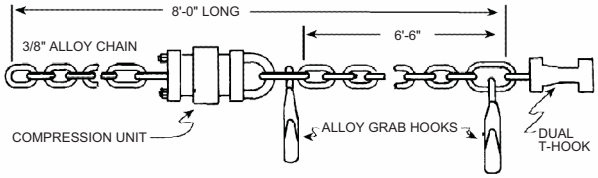
Manufacturer	Grade 30	Grade 43	Grade 70	Grade 80	Special Alloy	
					Prior to 9-1-96	Eff. 9-1-96
Acco	G3	G4	G7	A8A	—	—
Boltmaster-Taylor	BTPC or PC	THT	BT7	TAC	TAC	—
Campbell	C3/CP or P	C4/CH	C7	CA/C8 (+000)	CA/C8	—
Columbus McKinnon	CM/PC or G30	CM/HT or G43	CM/SG7 or G70	CM/Ha or HA800	—	—
Crosby	CG/PC/3	CG/C/4	CG/C/7	CG/A/8	—	—
Laclede	L3	N4 or L4	N7 or L7	G8 or L8	—	—
Holland/MacLean Fogg	—	—	—	—	-A-, P, PA or P8	P1H, PWAH, P10, PWA100
Peck & Hale[a/]						PCH16-10
Peerless[a/]	PC	PH	P7	P8	—	—
Holland/Portec[a/]	—	—	—	—	-A-, H, HA800, or BE	H37(8), W8 or 55
RUD-Kettenfabrik	—	—	—	VIP 8S	—	—
Teledyne McKay	—	4MK/MKH	MK7	MK8	—	—
Turner & Seymour	T3	T4	T7	—	—	—

[a/] All chain assembly components must be equal or greater in strength to the component chain in the chain assembly.

IMPLEMENTED 11/2015

21.11 Securing Commodity on Flatcars Equipped with Alloy Chain Tie-Down Assemblies

Fig. 21.9 illustrates an example of one type of chain assembly used on tie-down-equipped flatcars with floor channels (typically used to secure vehicles, tractors, and similar equipment). If compression unit gap is zero (solid), device becomes a "chain link." A solid gap makes loosening extremely difficult for the unloader.



3/8" ALLOY CHAIN ASSEMBLY—18,000-lb PROOF TEST

Fig. 21.9 Example of 3/8-in. chain assembly

21.11.1 Each commodity must be secured in accordance with the appropriate figure covering that commodity, using at least the minimum number of alloy chains required. If sufficient quantity of chain assemblies are not available for the total load securement, it will be necessary to chain-secure all possible locations and cable the balance of the load in accordance with the AAR method covering the commodity involved. If used, the cable must be of equal or greater strength than the 3/8-in. alloy chain.

21.11.2 An equal number of tie-down chains must be attached on each side and end of the commodity to be secured.

21.11.3 Tie-down winches are to be directly in line across the car to prevent possible twisting of the commodity during any in-transit shocks.

21.11.4 Before making chain hook-up, turn winch drum sufficiently to position approximately 1/2 turn of chain around the drum.

21.11.5 Swivel-type ratchets must be positioned so that the chain extends from the underneath side of the winch drum and at a point closest to the commodity being restrained.

21.11.6 Chain angles and attachment points or locations on the commodity must be made in accordance with the manufacturer's requirements and recommendations. To the extent allowed, apply chains as close to a 45° angle as possible.

21.11.7 After chains are tightened, they should be struck with a hammer or bar to eliminate any possible misalignment of links. Further tensioning may be required to take up any slack that develops due to link alignment.

21.11.8 After final tensioning, all winch assemblies must be adequately locked in position to eliminate the possibility of loosening during transit.

21.11.9 Ratchet pawls must be locked and the winch assembly must be correctly raised and locked in the track.

21.11.10 All unused chain tie-down assemblies must be securely positioned to eliminate the possibility of displacement over the car side, presenting a potential hazard.