

*This Guide is Prepared for the Purpose of
Convenience Only, for Accurate Reference
Refer to the Highway Traffic Act and
Regulation*

Prepared and issued without charge by the

FORWARD

A properly secured load is an essential element in the safe operation of a vehicle. This guide is provided to industry to assist operators and drivers in the proper securement of loads and is a revised version of the Load Security Guide published in 1981. All the information from the previous guide is included in addition to new standards for the determination of ineffective tiedown devices.

The illustrations and language in this guide are an attempt to present the requirements of the Load Security Regulation in an informal manner. The standards described are minimums and the illustrations of components and devices are provided as examples only. Although these illustrations show various devices, they should not be taken as an exhaustive inventory of all equipment available on the market. Other devices not described here may also conform to the Regulation.

It is the objective of this Ministry, through this guide, to minimize deaths, injuries and property damage resulting from improperly secured loads.

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PART I

GENERAL INFORMATION ON TIEDOWNS

Definitions

Break Strength (Ultimate Load, UL)

means the load or force at which the tiedown fails.

Proof Test

a test which the manufacturer has performed on a product to detect defects in the product.

Tiedown

means a device used to secure a load to a vehicle and includes but is not limited to, chains, cables, webbing and steel straps.

Working Load Limit (WLL)

means the maximum load assigned by a manufacturer that may be applied to a tiedown or component during normal service.

Aggregate Working Load Limit

means the total working load limits of all tiedowns used for a specific load securement.

Note: The following terms have the same meaning as working load limit (WLL)

Rated Load Value (RLV)

Safe Working Load (SWL)

Resultant Safe Working Load (RSWL)

Aggregate Working Load Limits

Tiedowns used to secure loads shall have an aggregate working load limit equal to the weight of the article or articles being secured.

i.e. The working load limits of all the tiedowns added together must total the weight of the object being secured.

Example: The object weighs 2,000 kg

Four tiedowns with an individual working load limit of 500 kg each would be required.
(500 kg X 4 = 2,000 kg)

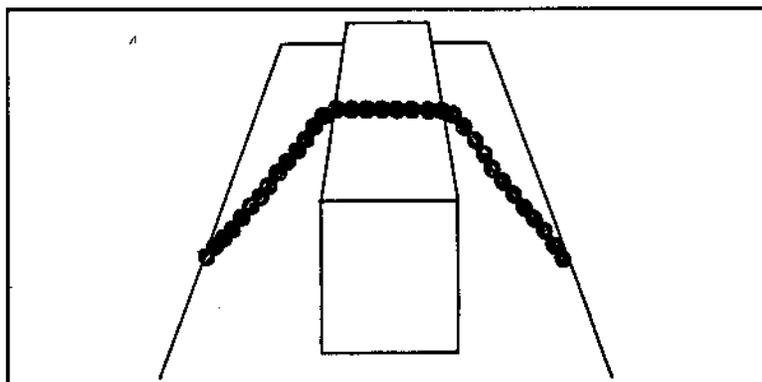
The working load limit of a tiedown shall be rated at the working load limit of the weakest component of that tiedown.

Tiedowns, other than those that are permanently crimped, must be capable of being tightened in transit.

When determining aggregate working load limits, each tension portion of the tiedown that is attached to the vehicle and then passes over, through, around, or is attached to the load, and is again attached to the vehicle shall be considered as a separate tiedown. (see the next page for examples)

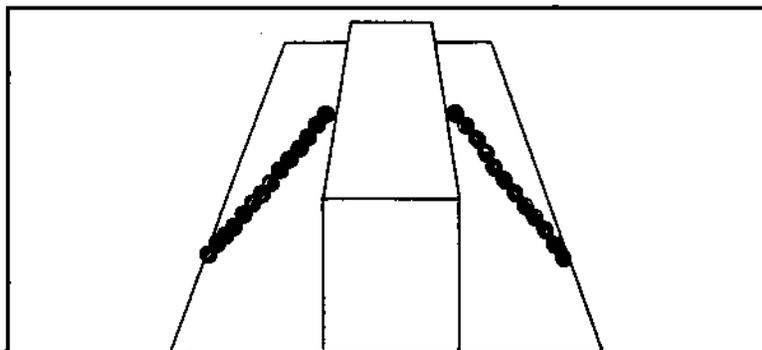
Example

A chain with a working load limit of 2,500 kg that is attached to the side and over the load and attached to the other side, is counted as two separate tiedowns when determining *aggregate* working load limits.



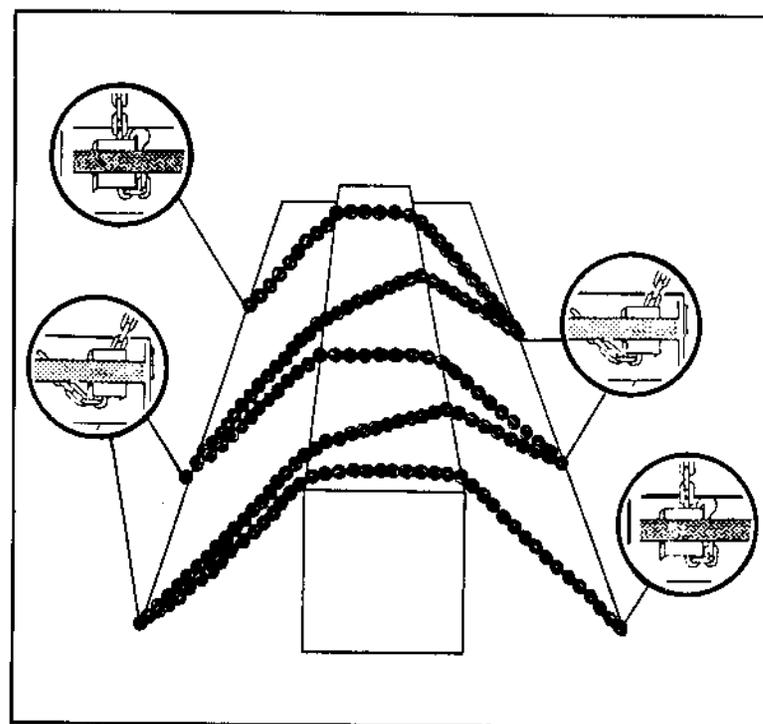
The *aggregate* working load limit of this tiedown method is 5,000 kg.

Two chains with individual working load limits of 2,500 kg that are attached to the side and re-attached to the load are two separate tiedowns when determining *aggregate* working load limits.



Note: A tiedown that passes over, through, or around a load *more than once* will only be counted as two tiedowns.

i.e. If the example tiedown had a working load limit of 2,500 kg the *aggregate* working load limit of this tiedown method would be 5,000 kg.

Example

This does not apply if the tiedown is attached to the vehicle at each contact point (pocket in this example) in such a way that if one tensioned portion of the tiedown

PART II

TIEDOWN DEVICES

CHAIN

Chain links are generally stamp marked with a grade identification. This identification consists of a letter(s) or a number(s) or a combination of both on the link's face or side.

Samples of typical chain markings:

PC, 3, or 30 for
Proof coil (Grade 3 chain)

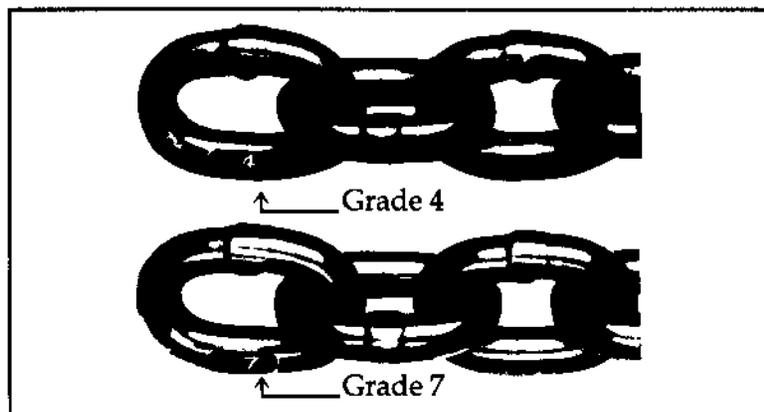
M, PH, HT, 4, 43, 430 for
High test (Grade 4 chain)

7, 70, 700 for
Transport 7 (Grade 7 chain)

A, T, 8, 80, 800 for
Alloy (Grade 8 chain)

Chain is generally marked every 0.9 metres (3 ft) or less.

Examples



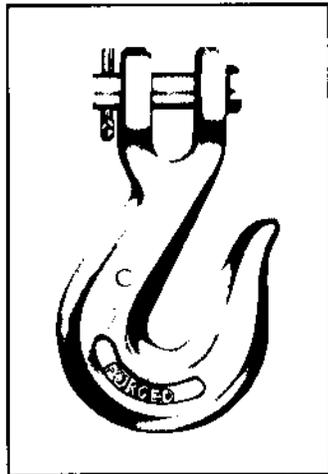
Where a chain is not marked or a grade cannot be identified, the working load limit for proof coil (Grade 3) chain will be used.

CHAIN WORKING LOAD LIMITS

Chain size		Proof coil Grade 3		High test Grade 4	
in	mm	lbs	kg	lbs	kg
1/4	7	1,300	580	2,600	1,180
5/16	8	1,900	860	3,900	1,770
3/8	10	2,650	1,200	5,400	2,450
7/16	12	3,500	1,590	5,800	2,630
1/2	13	4,500	2,030	9,200	4,170
5/8	16	6,900	3,130	11,500	5,220

Chain size		Transport 7 Grade 7		Alloy Grade 8	
in	mm	lbs	kg	lbs	kg
1/4	7	3,150	1,430	3,500	1,590
5/16	8	4,700	2,130	5,100	2,310
3/8	10	6,600	2,990	7,100	3,200
7/16	12	8,750	3,970	-	-
1/2	13	11,300	5,130	12,000	5,400
5/8	16	15,800	7,170	18,100	8,200

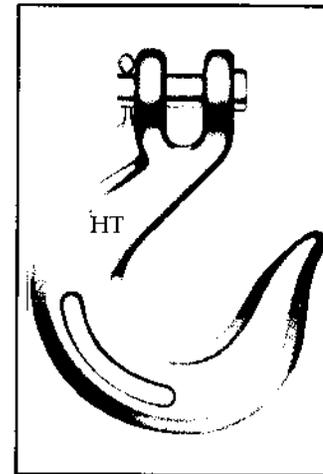
Chain Hooks



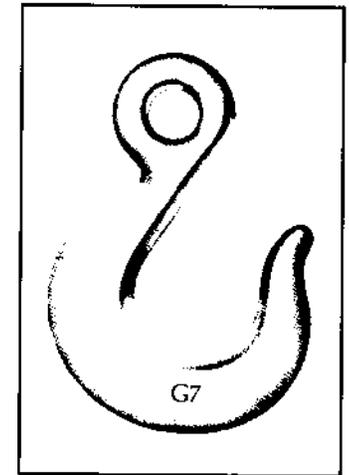
Clevis Grab Hook



Eye Grab Hook



Clevis Slip Hook



Eye Slip Hook

Chain hooks are generally stamp marked with a grade identification.

Where a hook is not marked or a grade can not be identified, the working load limit for the corresponding size of proof coil chain (page 6) will be used.

Where a hook is marked with a **C, H, HT, High Test, G4, G40, or G43** the working load limits in Table A will be used.

Where a hook is marked with an **A, AA, AL, Alloy, Transport 7 or 70, T7, G7, G70 or S7** the working load limits in Table B will be used.

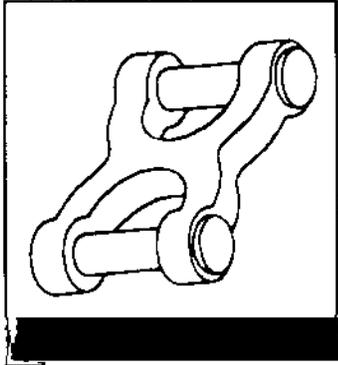
TABLE A

Size		Grab Hook		Slip Hook	
in	mm	lbs	kg	lbs	kg
1/4	7	2,600	1,180	1,950	880
5/16	8	3,900	1,770	2,870	1,310
3/8	10	5,400	2,450	4,000	1,810
7/16	12	5,800	2,630	5,000	2,270
1/2	13	9,200	4,170	6,500	2,950
5/8	16	11,500	5,220	9,250	4,200

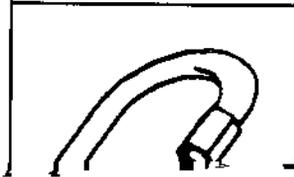
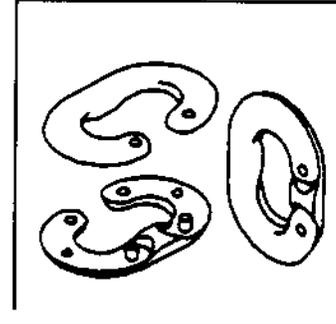
TABLE B

Size		Grab Hook		Slip Hook	
in	mm	lbs	kg	lbs	kg
1/4	7	3,150	1,430	2,750	1,250
5/16	8	4,700	2,130	4,300	1,950
3/8	10	6,600	2,990	5,250	2,380
7/16	12	8,750	3,970	7,000	3,170
1/2	13	11,300	5,130	9,000	4,080
5/8	16	15,800	7,170	13,500	6,120

Approved Type of Repair Links



Unapproved Types of Repair Links

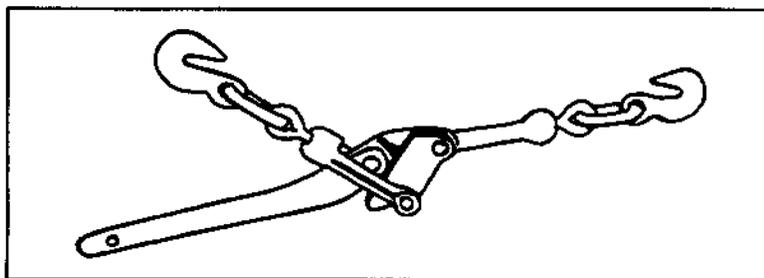


Load Binders

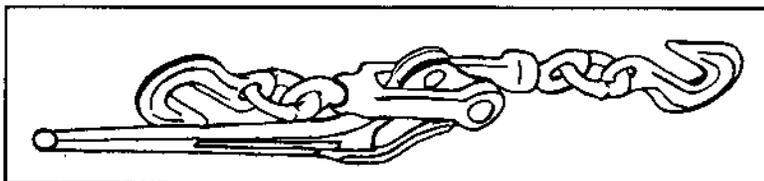
Where the working load limit of a load binder cannot be determined, the lowest value for the same size and type of binder shown in the following charts will apply.

RECOILLESS RELEASE TYPE LOAD BINDER

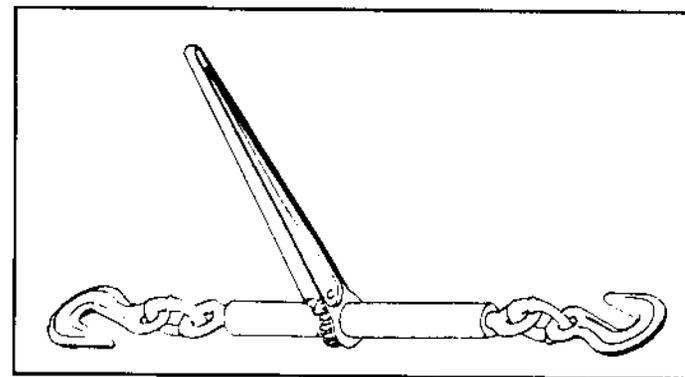
Size		Working load limit	
in	mm	lbs	kg
3/8	10	2,650	1,200
1/2	13	4,500	2,040

**STANDARD LOAD BINDER**

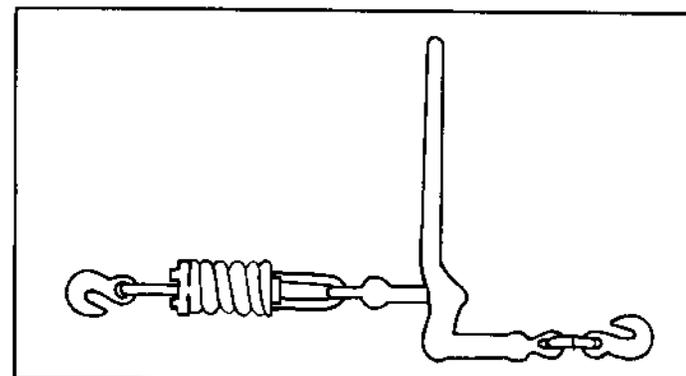
Size		Working load limit	
in	mm	lbs	kg
3/8	10	2,650	1,200
1/2	13	4,500	2,040
5/8	16	6,900	3,130

**RATCHET LOAD BINDER**

Size		Working load limit	
in	mm	lbs	kg
3/8	10	2,650	1,200
1/2	13	4,500	2,040
5/8	16	6,900	3,130

**SNUBBING LOAD BINDER**

Size		Working load limit	
in	mm	lbs	kg
3/8	10	2,650	1,200
1/2	13	4,500	2,040



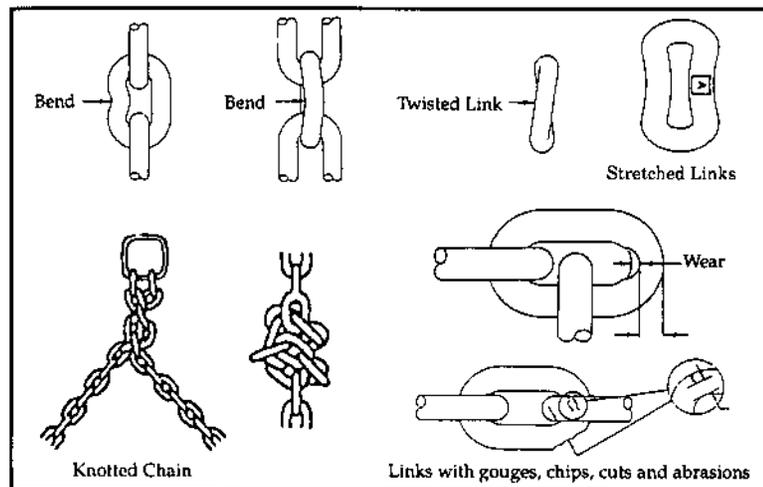
Defective Chain

Chains, fittings and attachments that are loose or have the following defects will not be counted as part of a tiedown system

1. components that are:
 - a. broken or cracked,
 - b. significantly gouged, twisted, bent or visibly stretched;
2. chain that is knotted;
3. obvious reduction in section through wear or corrosion;
4. hooks that are opened in the throat beyond the original throat opening;
5. repair welding or distortion from heat;
6. load binders that are distorted or stretched.

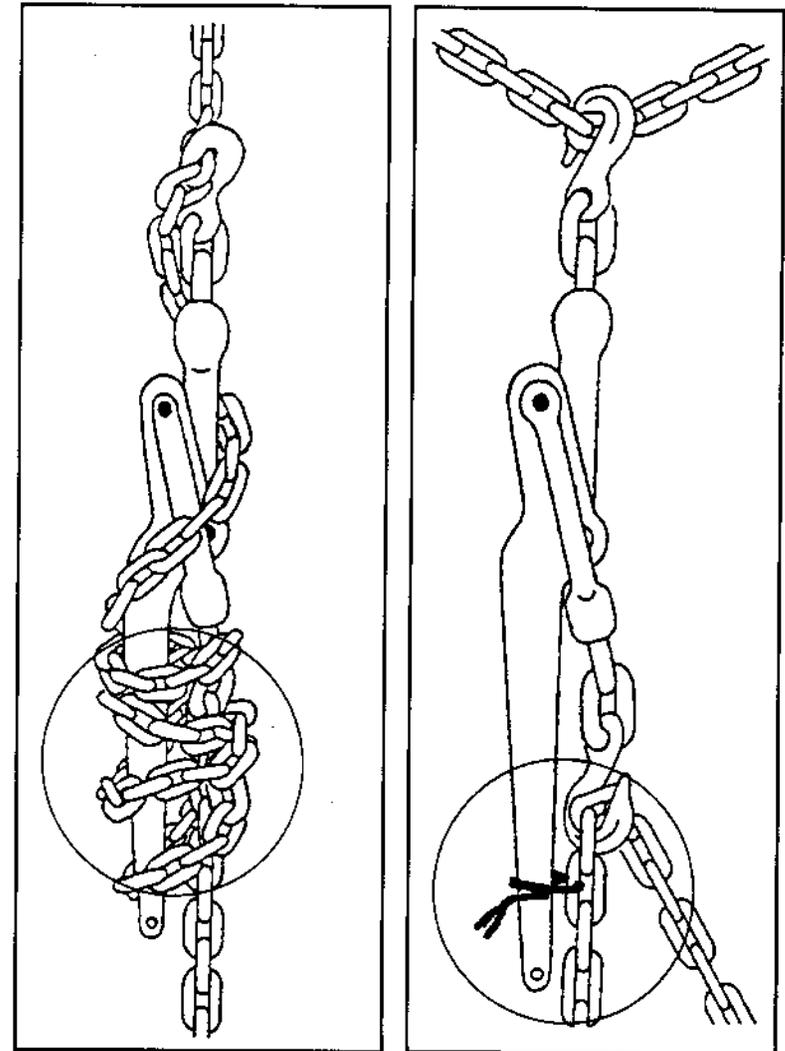
Note: Other types of defects may also apply.

Examples



If an "over-the-centre" type of tiedown tensioner is used, the handle shall be locked in place and secured by some means to prevent its accidental release.

Examples



SYNTHETIC WEBBING

Nylon or Polyester

Web tiedowns are commonly labelled within 46 cm (18") from one end. The labels generally contain the working load limits.

Where the webbing is not tagged or marked showing its working load limit, the lowest value for the same size material shown in the following chart shall apply.

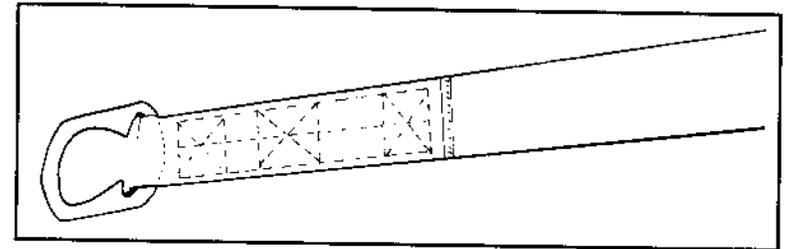
WORKING LOAD LIMITS FOR UNMARKED WEBBING

Width		Working load limit	
in	mm	lbs	kg
1 - 3/4	45	1,750	795
2	50	2,000	910
3	75	3,000	1,360
4	100	4,000	1,815

Defective Webbing

Webbing that is loose or contains the following defects will not be counted as part of a tiedown system

1. 25% or more of the lap portion stitches, used to secure a web to a fitting, are separated;



2. webbing that is knotted, spliced, contains damaged loop ends, severely worn or has been repaired;
3. damage such as cuts, burns, abrasions, holes or crushed areas through the webbing that total more than

in	mm		in	mm
3/8	10	for a web width of	1 - 3/4	45
3/8	10	for a web width of	2	50
5/8	16	for a web width of	3	75
3/4	19	for a web width of	4	100

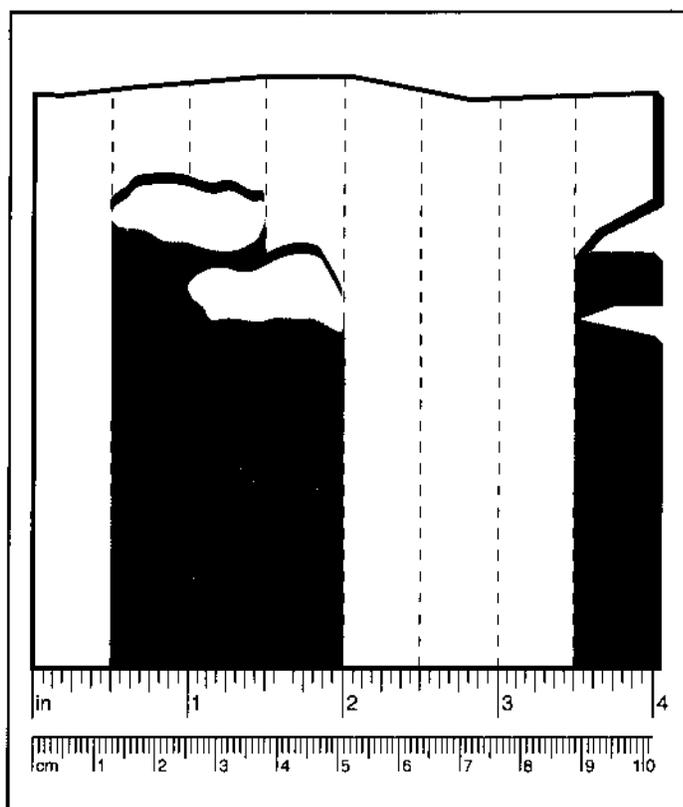
Note: Other types of defects may also apply.

Determining the Total Width of Damage

It is important to remember the following when adding together the individual widths of damaged areas.

The width of a specific area of damage is only counted once for the entire length of the web.

Example

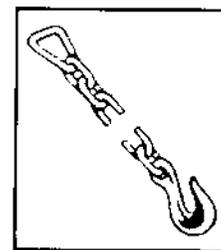


The total width that is affected by damage is 50 mm (2").

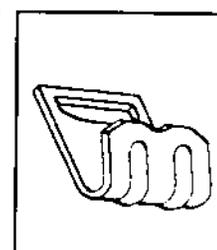
Web tiedown fittings, attachments, tensioning devices or hardware that are loose or have the following defects will not be counted as part of a tiedown system

1. broken, sprung, bent, twisted, visibly cracked, non-functioning or significantly gouged;
2. obvious reduction of section through wear or corrosion;
3. repair welded or distorted from heat.

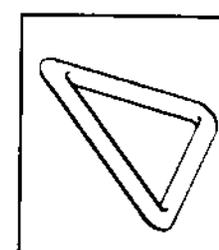
Note: Other types of defects may also apply. Some web winches are designed to be welded to the vehicle.



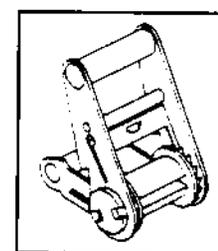
Chain Anchor



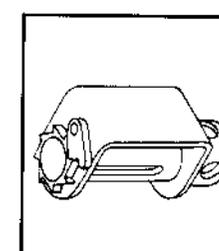
Flat Hook



Delta Ring



Web Ratchet



Web Winch

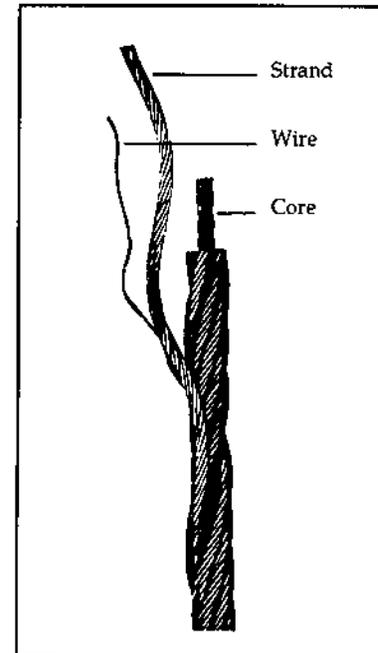
CABLE

Wire Rope

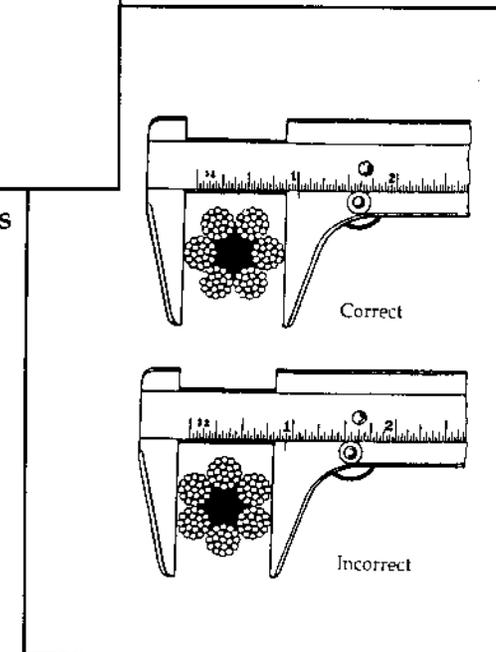
Where the working load limit of a cable cannot be determined, the value for the same size material shown in the following chart will apply.

WORKING LOAD LIMITS FOR CABLE

Cable diameter		Working load limit	
in	mm	lbs	kg
1/4	7	1,400	640
5/16	8	2,100	950
3/8	10	3,000	1,360
7/16	11	4,100	1,860
1/2	13	5,300	2,400
5/8	16	8,300	3,770
3/4	19	10,900	4,940
7/8	22	16,100	7,300
1	25	20,900	9,480



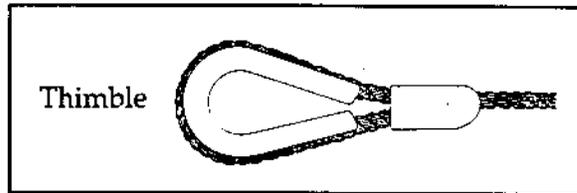
Cable Elements



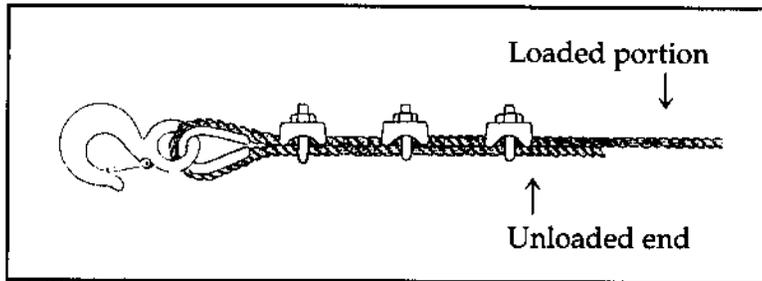
Measuring Cable

Where cable is used for tiedowns, it should be protected against damage. The following precautions and procedures should be observed.

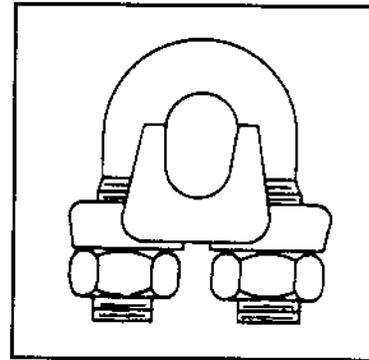
1. The use of thimbles is advised where cable is attached to hooks, chains, clevises, eyes or similar devices.



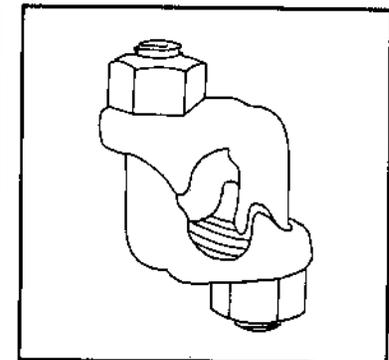
2. When "U" bolt type cable clamps (clips) are used, the "U" bolt must bear against the unloaded end of the cable.



3. All cable sizes up to and including 11 mm (7/16") diameter must use at least two clamps. Cables 13 mm (1/2") in diameter must have three clamps of the "U" bolt type or two clamps of the double base type.

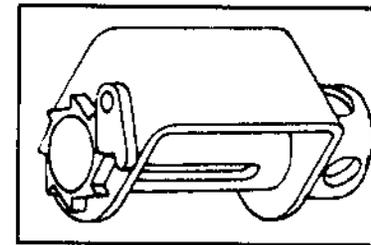


Standard Clamp



Double Base Clamp

4. Where cable is used on a winch designed for webbing, the cable must be protected against cutting and be anchored securely to the drum.

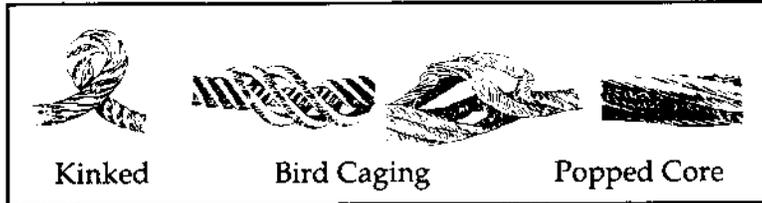


5. The cable must be protected where it contacts load edges that are sharp enough to cause damage.

Defective Cable

Cable that is loose or contains the following defects will not be counted as part of a tiedown system

1. kinks, bird caging or popped cores;

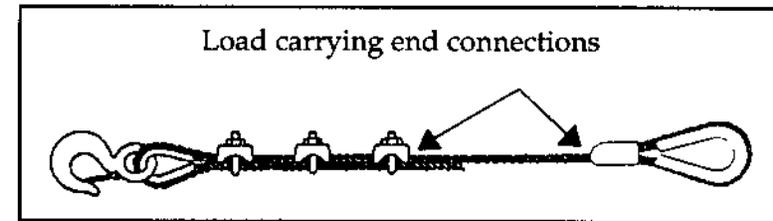


2. discoloration from excessive heat or electric arc;
3. corrosion with pitting of the external or internal wires;
4. more than 11 broken wires in a cable length of

Length			Diameter		
in	mm		in	mm	
1 - 1/2	38	for a	1/4	7	cable
1 - 7/8	48	for a	5/16	8	cable
2 - 1/4	57	for a	3/8	10	cable
2 - 5/8	67	for a	7/16	11	cable
3 - 0	76	for a	1/2	13	cable
3 - 3/4	95	for a	5/8	16	cable
5 - 1/4	133	for a	3/4	19	cable
6 - 0	152	for a	1	25	cable

5. more than three broken wires in any one strand;

6. more than two broken wires at an end connection or fitting;



7. improperly joined cables (i.e., tied in a knot);
8. any slippage is detectable at a cable clamp (clip).

Note: Other types of defects may also apply.

Cable fittings and attachments that are loose or have the following defects will not be counted as part of a tiedown system

1. obvious reduction of section through wear or corrosion;
2. hooks opened in the throat beyond the original throat opening;
3. obvious twisting out of the plane of a fitting;
4. repair welding or distortion from heat;
5. any visible cracks.

Note: Other types of defects may also apply.

STEEL STRAPPING

Where banding is not tagged or marked showing its working load limit, the value for the same *width and thickness* of material shown in the following chart shall apply.

If banding *thickness* cannot be determined, the working load limit shown for the thinnest material listed for that width shall apply.

Strapping Size		Number of			Working Load Limit	
Inches	mm	S*	N*	C*	lbs	kg
1/2 x 0.020	13 x 0.51	1	2		350	160
" x 0.023	" x 0.58	1	2		400	180
5/8 x 0.020	16 x 0.51	1	2		450	200
" x 0.023	" x 0.58	1	2		500	230
3/4 x 0.020	19 x 0.51	1	2		520	240
" x 0.023	" x 0.58	1	2		600	270
" x 0.025	" x 0.64	1	2		650	290
" x 0.031	" x 0.79	1	2		790	360
" x 0.035	" x 0.89	1	2		880	400

* S: Seals, N: Notches, C: Crimps

Continued

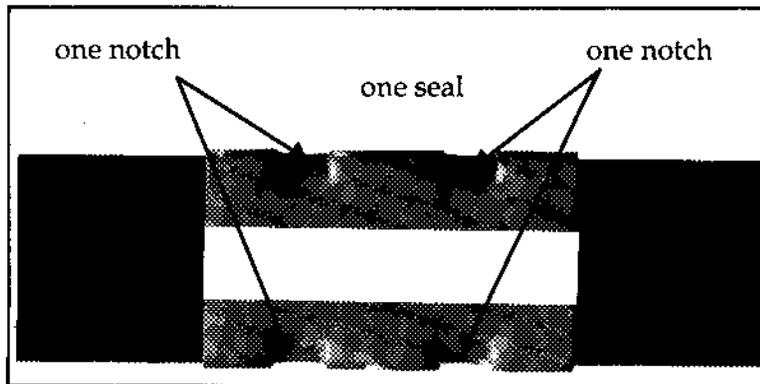
Strapping Size		Number of			Working Load Limit	
Inches	mm	S*	N*	C*	lbs	kg
1-1/4 x 0.031	32 x 0.79	2	4		1,400	630
		2		4	1,570	710
1-1/4 x 0.035	32 x 0.89	2	4		1,440	650
		2		4	1,610	730
1-1/4 x 0.044	32 x 1.12	2	4		2,140	970
		2		4	2,400	1,090
1-1/4 x 0.050	32 x 1.27	2	4		2,450	1,110
		2		4	2,730	1,240
1-1/4 x 0.057	32 x 1.45	2	4		2,870	1,300
		2		4	3,210	1,460
1-1/4 x 0.065	32 x 1.65	2	4		3,100	1,410
		2		4	3,470	1,570
2 x 0.044	51 x 1.12	2	4		3,160	1,430
		2		4	3,530	1,600
2 x 0.050	51 x 1.27	2	4		3,570	1,620
		2		4	4,000	1,810

* S: Seals, N: Notches, C: Crimps

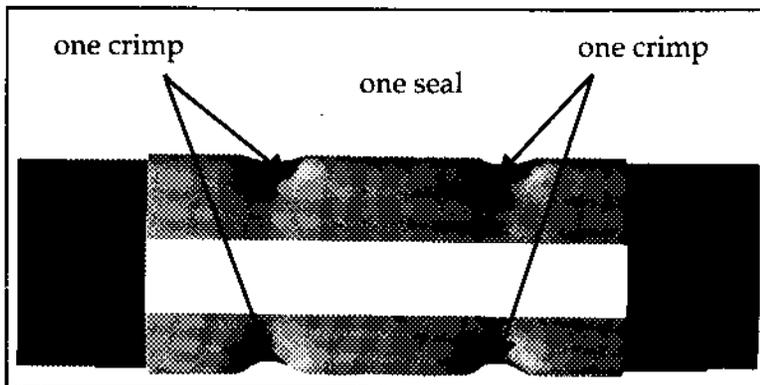
Seals

Notch and Crimp Joints

This seal contains *two* notches



This seal contains *two* crimps



Defective Strapping

Strapping that is loose or contains the following defects will not be counted as part of a tiedown system

1. visibly cracked or significantly gouged;
2. has obvious reduction of section through wear.

Strap fittings, attachments or hardware that are loose or have the following defects will not be counted as part of a tiedown system

1. broken, sprung, bent, twisted, visibly cracked or significantly gouged;
2. has obvious reduction of section through wear;
3. the strapping joint does not have the required number of seals, crimps or notches for the strap's width and thickness.

ROPE

Where rope is not tagged or marked showing its working load limit, the lowest value for the same size of material shown in the following chart shall apply.

Diameter		Working load limit	
in	mm	lbs	kg
3/8	10	250	110
7/16	11	350	160
1/2	13	400	180
5/8	16	600	275
3/4	20	800	360
1	25	1,300	590

Defective Rope

Rope that is loose or contains the following defects will not be counted as part of a tiedown system

1. burned or melted fibres except on heat-sealed ends;
2. a 20% reduction in diameter;
3. repairs, other than proper splices;
4. knots at other than fastening points.

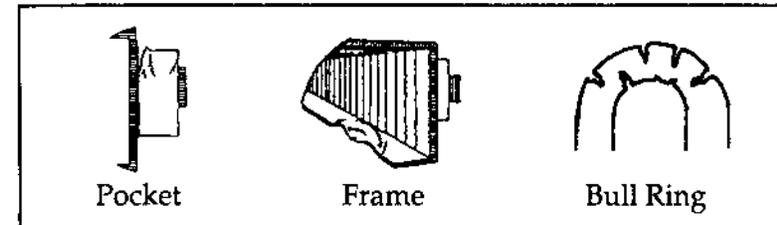
Note: Other types of defects may also apply.

TIEDOWN ANCHOR POINTS

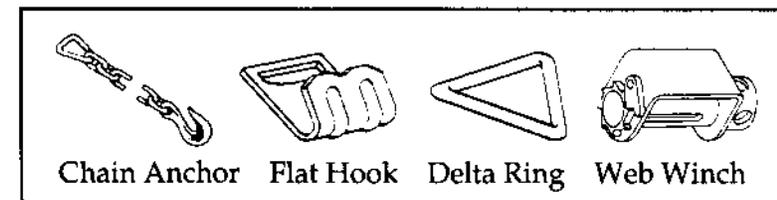
Load bearing anchor points and supports that are loose or have the following defects will not be counted as part of a tiedown system

1. broken, cracked, bent, distorted or loose components;
2. pockets that are broken, cracked, bent or distorted;
3. floor rings that are nicked, gouged, twisted, bent, stretched, excessively worn or have broken welds.

Note: Other types of defects may also apply.

Examples

All hooks, bolts, welds and other connectors used to attach a tiedown assembly to a vehicle and the tiedown anchor point itself shall have a working load limit equal to the aggregate working load limit of all the tiedowns attached to it, when loaded in any direction, or shall itself be the limit.

Examples

PART III

GENERAL SECUREMENT REQUIREMENTS

All loads on trucks and trailers must be secured or loaded, in such a manner that no portion of the load may become dislodged or fall from the vehicle.

There are two specific schedules, and they apply to coiled metal and miscellaneous metal articles. All other loads must comply with one of three options, unless exempt.

These options are:

- 1 Must have sideboards, sides or stakes and rear stakes, endgate or endboard, secured to the vehicle, that are strong enough and high enough to prevent the load from shifting upon or falling from the vehicle, and have no holes large enough that any part of the load may fall through.
- 2 Must have at least one tiedown for each three linear metres (10 ft) of lading, and as many additional tiedowns as may be necessary to secure each part of the load, either by direct contact with the load or dunnage in contact with the load and the tiedown.
- 3 Must have other means of protecting against a shifting or falling load, that are similar to and at least as effective as Option 1 or 2.

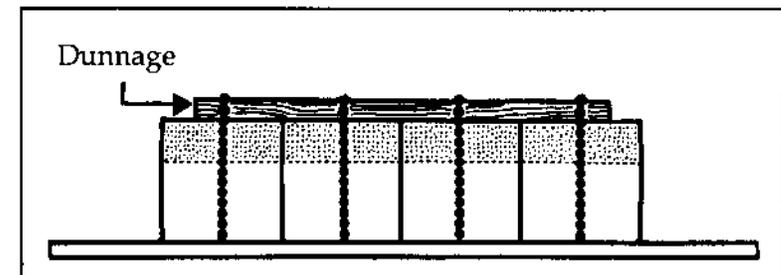
THE FOLLOWING APPLIES TO ALL THREE OPTIONS

Where a load may shift in transit, it must be blocked, restrained or contained

- (a) so that it will not shift forward when the vehicle decelerates at a rate of 6 metres (20 ft) per second, per second. This deceleration rate would cause a 10,000 kg load to exert a forward force of approximately 6,000 kg.
- (b) so that it will not shift sideways, and this may be prevented by securely blocking or bracing the load against the sides, sideboards or stakes of the vehicle.

For the purposes of Option 2.

Tiedowns or dunnage contacting the exterior, top-most items of the load and securely holding each interior and lower item meet the requirements.

Side view

At least one tiedown assembly for each three linear metres (10 ft) of lading.

Options 1, 2 and 3 do not apply where a load is being transported under any of the following conditions.

1. Coils of metal that are secured in accordance with **PART IV** of this guide.
2. Loads of miscellaneous metal articles that are secured in accordance with **PART V** of this guide.
3. Loads carried on vehicles that are being operated under the authority of an oversize/overweight permit that provides an exemption to the requirements of the load security regulation.

Note: This is not an exemption from the requirements in the Highway Traffic Act which requires loads to be secured.

4. Intermodal cargo containers that are secured to the vehicle with container fasteners that prevent the containers from becoming unfastened.

5. Loads on road-building machines and motor vehicles actually performing construction or maintenance on a highway.
6. Articles that, because of their size, shape or weight, must be carried on a special-purpose vehicle or must be fastened by special methods provided that such special loads are securely and adequately fastened to the vehicle.
7. Special loads of machinery or fabricated structural items, such as beams, girders or trusses, that are fastened by special methods provided that such special loads are securely and adequately fastened to the vehicle.
8. A load on a pole trailer that has at least two tiedowns securing the load to the forward bolster and at least two tiedowns securing the load to the rear bolster.

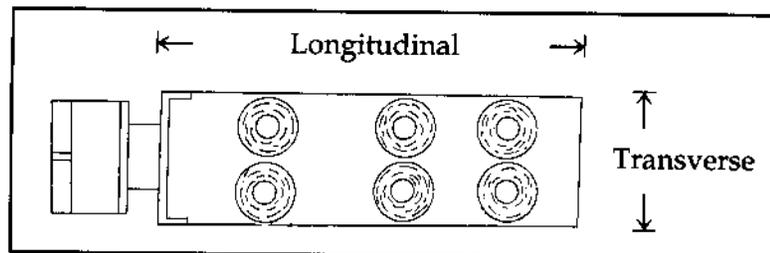
PART IV

SCHEDULE A

SECUREMENT OF COILED METALS

Vehicles transporting coils of metal, which either individually or banded together weigh 2,300 kg (5,070 lbs) or more, may choose to use this schedule. If this schedule is not used, Option 1, 2 or 3 must be met.

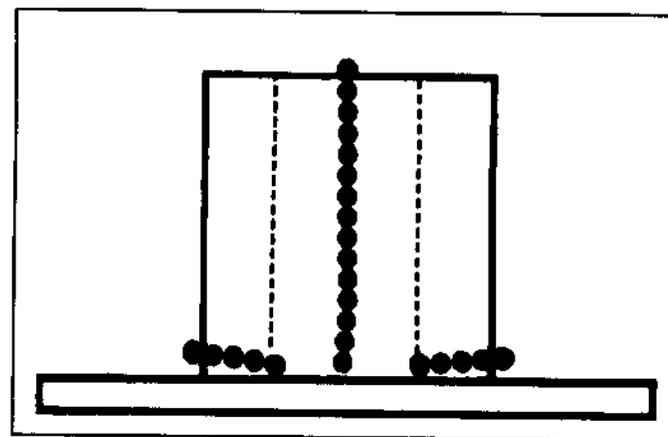
Terms



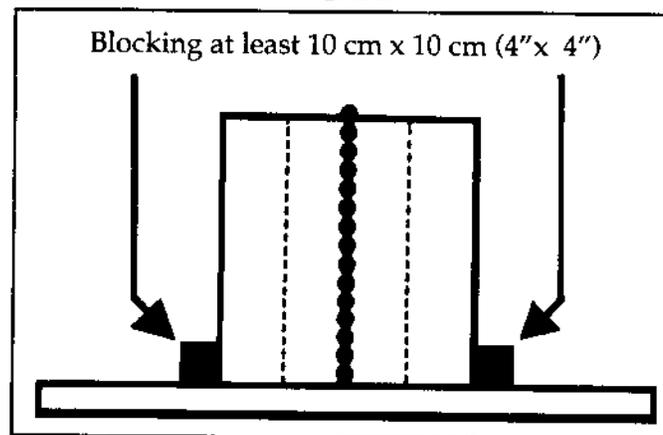
COILS WITH EYES VERTICAL

When coils are transported with eyes vertical, there must be a tiedown or blocking against the front of each coil or row of coils to prevent forward motion, and the same against the rear coil or row of coils to prevent rearward motion, and a tiedown over the top of each coil or transverse row of coils to prevent vertical motion.

Side view



OR

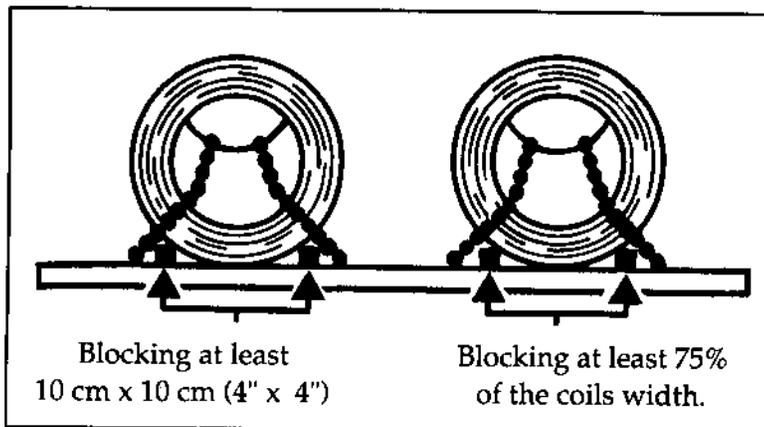


COILS WITH EYES CROSSWISE

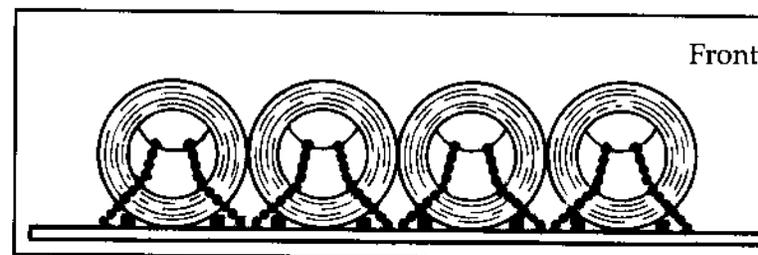
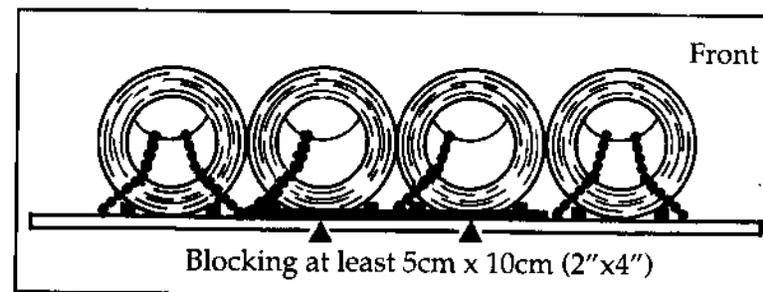
When coils are transported with eyes crosswise, and not in contact with other coils, they must be secured by two tiedowns, passing through each coil to prevent forward and rearward motion.

Tiedowns must make an angle of less than 45° from the horizontal, when viewed from the side of the vehicle.

Timber at least 10 cm x 10 cm (4" x 4") that blocks at least 75% of the width of the coil must be placed tightly against the front and rear of each coil.

Side view

When coils are transported with eyes crosswise in longitudinal rows and contacting each other, the interior coils do not require tiedowns through the eyes to prevent rearward motion if timber of at least 5 cm x 10 cm (2" x 4") is blocked tightly against the outer ends of each coil or interior row of coils.

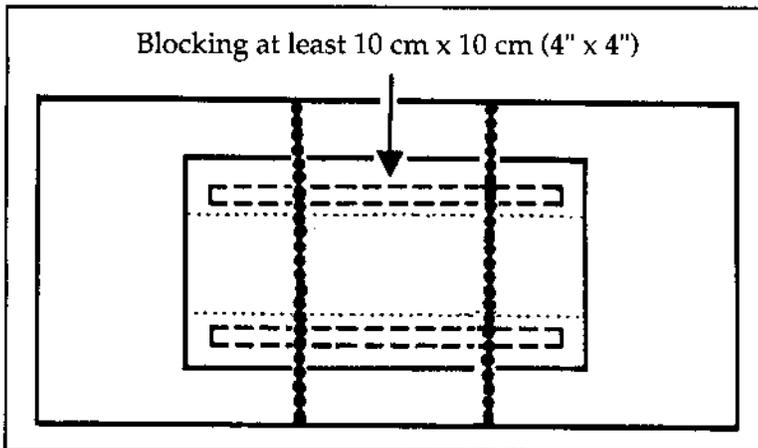
Side view**OR**

COILS WITH EYES LENGTHWISE

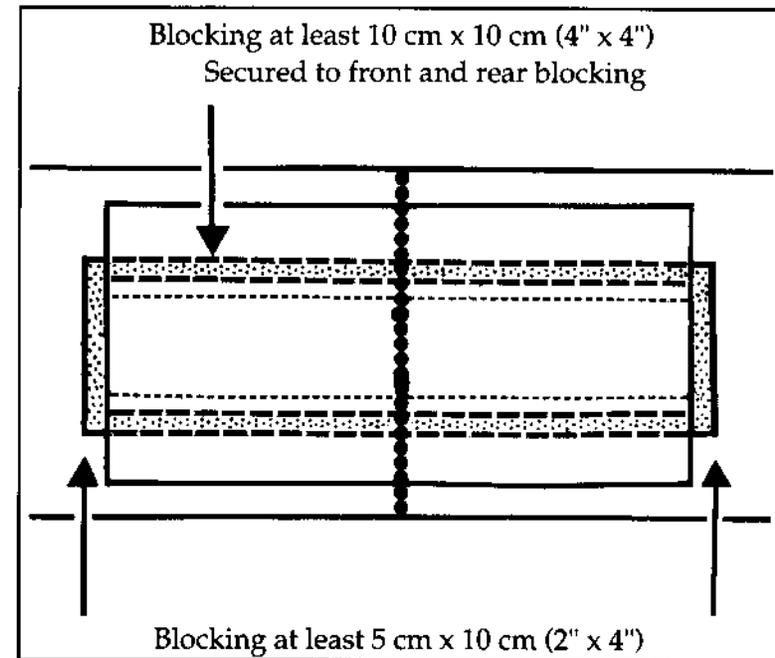
When coils are transported with eyes lengthwise and not in contact with other coils, they must be restrained by timber of at least 10 cm x 10 cm (4" x 4") placed tightly against each side of the coil.

When the coils are in contact in transverse rows, the blocking is only required against the outside of the outer row.

There must be one or more tiedowns over the top of each coil or transverse row of coils.

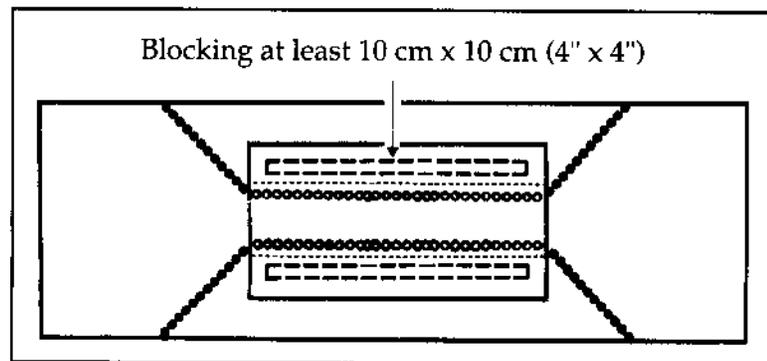
Top view**OR**

When there is only one tiedown over the top of each coil or transverse row, timber of at least 5 cm x 10 cm (2" x 4") must be tightly placed against the front and rear of each coil or row of coils and firmly secured to the longitudinal timber in order to prevent forward and rearward movement.

Top view**OR**

There must be two or more tiedowns through the eye of each coil and they should be arranged so that an equal number of tiedowns have their ends anchored to opposite sides of the vehicle.

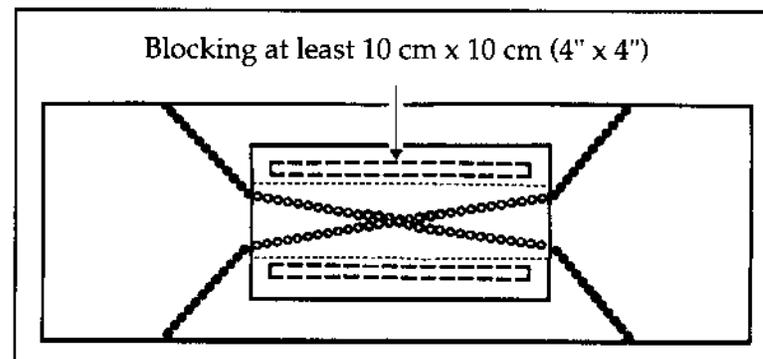
Top view



OR

There must be one or more tiedowns passing diagonally through the eye of the coil and the ends of an individual tiedown must be anchored on opposite sides of the vehicle.

Top view



It is recommended that a tiedown over the top of the coil also be used in those cases where the tiedowns pass through the eye of the coil.

In the case of vehicles transporting coils with eyes crosswise or lengthwise, which are equipped with depressions in the floor or satisfactory alternative restraining devices, timber restraining devices are not mandatory.

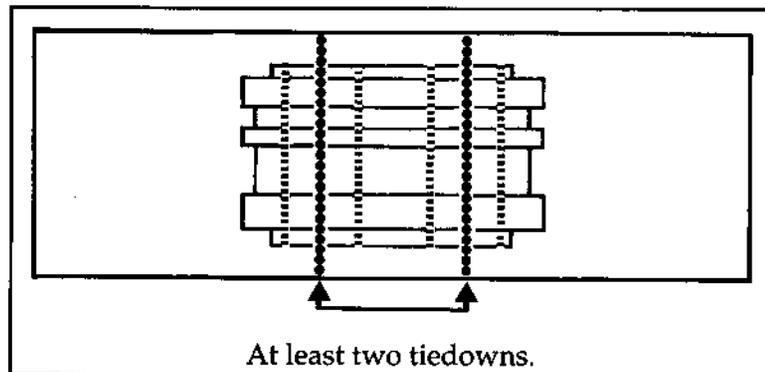
PART V**SCHEDULE B****SECUREMENT OF MISCELLANEOUS METAL ARTICLES**

In this section, miscellaneous metal articles means any of the listed items that individually weigh more than 1,000 kg (2,204 lbs) or when banded or boxed together and handled as a single unit, weigh more than 1,000 kg (2,204 lbs):

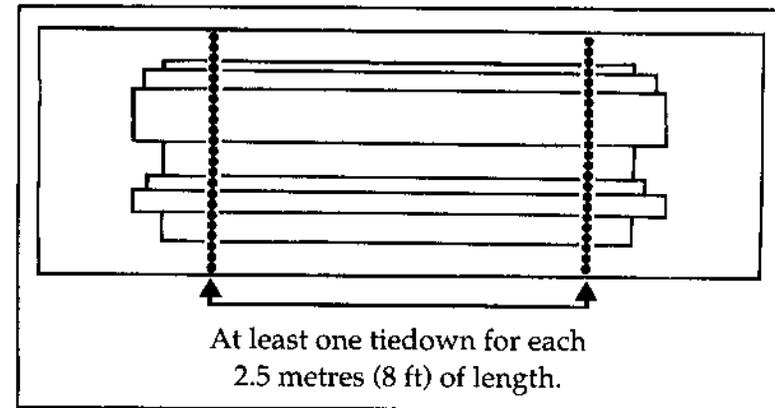
Blooms, plates, ingots, rods, slabs, billets, structural shapes, cut-to-length bars, pipe or tubular products, sheet and tin mill products.

This schedule may be used when transporting the above mentioned; if it is not, Option 1, 2 or 3 must be met.

If articles are banded together and handled as one unit, they must have at least two tiedowns.

ARTICLES BANDED AND HANDLED AS ONE UNIT*Top view*

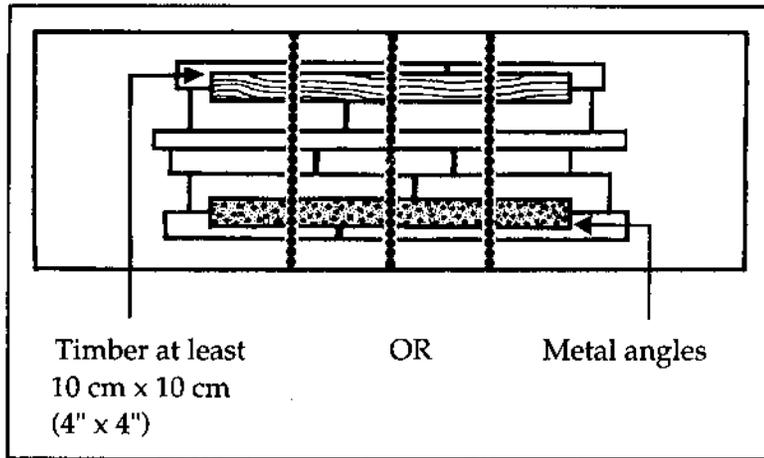
If single articles, combinations of articles, or groups of articles are loaded side by side across the vehicle, they must have at least one tiedown for every 2.5 metres (8 ft) of its or their length.

SINGLE ARTICLES OR GROUPS OF ARTICLES*Top view*

If individual articles have a length of not more than 2.5 metres (8 ft) and are securely butted against each other in a forward and rearward direction, they must be secured by metal angles, or timber of at least 10 cm x 10 cm (4" x 4") placed longitudinally over the articles and secured by tiedowns. These tiedowns must not be located beyond the ends of the articles being secured.

ARTICLES 2.5 METRES (8 FT) OR LESS IN LENGTH

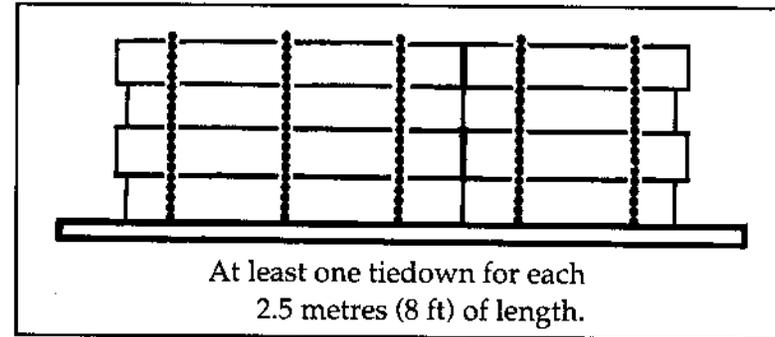
Top view



If the load consists of tiered articles, where each tiered article rests securely on the one beneath it, the tier may be secured in the same manner as a single level of those articles.

TIERED ARTICLES

Side view



PART VI

**ONTARIO REGULATION 614
MADE UNDER THE HIGHWAY TRAFFIC ACT****Load Security****1.** In this regulation,

- (a) "dunnage" means a device or material that distributes the restraining forces of a tiedown assembly or assemblies over a greater portion of the load than it normally would affect;
- (b) "nominal" when used to describe lumber, means commercially dressed sizes generally designated by the dimensions indicated;
- (c) "tiedown assembly" means a fastening device or attachment used to secure a load to the vehicle on which it is being carried so as to prevent the adverse movement of the load in any direction, including but not limited to, chains, cables, steel straps and fibre webbing;
- (d) "working load limit" means the rated capacity assigned by the manufacturer of a tiedown assembly or component thereof representing the maximum load in kilograms that may be applied to that assembly or component during normal service.

2.

- (1) Every commercial motor vehicle or combination of commercial motor vehicle and trailer or trailers carrying a load on a highway shall,
 - (a) have sides, sideboards or stakes and rear stakes, endgate or endboard,
 - (i) securely attached to the vehicle,
 - (ii) strong enough and high enough to ensure that the load that the vehicle is carrying will not shift upon or fall from the vehicle, and
 - (iii) that have no aperture large enough to permit any of the load that the vehicle is carrying to pass through;
 - (b) have at least one tiedown assembly that meets the requirements of section 3 for each three linear metres of lading or fraction thereof, and as many additional tiedown assemblies that meet the requirements of section 3 as are necessary to secure each part of the load being carried, either by,
 - (i) direct contact between the load and the tiedown assemblies, or
 - (ii) dunnage that is in contact with the load and is secured by tiedown assemblies; or
 - (c) have other means of protecting against a shifting or falling load that are similar to, and at least as effective as, those means specified in clause (a) or (b).

- (2) For the purposes of clause (1) (b), a tiedown assembly or dunnage in contact with exterior, topmost items of the load and securely holding each interior and lower item, complies with this requirement.
- (3) Where a commercial motor vehicle or combination of commercial motor vehicle and trailer or trailers on a highway carries a load that may shift in transit, the load shall be blocked, restrained or contained in such a manner that it will not shift in a forward direction when the vehicle decelerates at a rate of six metres per second per second and the load shall be,
- (a) securely blocked or braced against the sides, sideboards or stakes of the vehicle; or
 - (b) secured by devices that conform to the requirements set out in clause (1) (b) or (c).
- (4) This section does not apply to,
- (a) any vehicle or combination of vehicles transporting,
 - (i) containers designed for the transportation of containerized, intermodal cargo, secured to the vehicle in accordance with section 4,
 - (ii) coils of metal secured in accordance with section 5,
 - (iii) a load of miscellaneous metal articles, secured in accordance with section 6, or

- (iv) articles that, because of their size, shape or weight, must be carried on a special-purpose vehicle or must be fastened by special methods, if the articles are securely and adequately fastened to the vehicle;
- (b) a vehicle operating under the authority of a permit issued under section 110 of the Act, where the permit specifically provides for exemption from this Regulation; or
 - (c) a motor vehicle or road-building machines, operated by or on behalf of an authority having jurisdiction and control of a highway, where the vehicle or machine is engaged in construction, maintenance or marking activities on a highway.
- 3.
- (1) Tiedown assemblies used on a commercial motor vehicle or combination of commercial motor vehicle and trailer or trailers to secure a load against movement in any direction shall have an aggregate working load limit equal to at least the weight of the article being secured.
 - (2) Where a tiedown assembly attached to a vehicle,
 - (a) passes over, through or around the load or is attached to the load; and
 - (b) is again attached to the vehicle,
 each tensioned portion of the tiedown assembly acting between the load and the vehicle shall be

considered as a separate tiedown in the determination of the aggregate working load limit.

- (3) The working load limit of a tiedown assembly shall be rated at the working load limit of the weakest component of that assembly.
- (4) Where a tiedown assembly or component thereof is not permanently identified with its grade or working load limit, the working load limit shall be deemed to be that of the lowest grade or classification for that type and size of tiedown assembly or component.
- (5) The strength of,
 - (a) hooks, bolts, welds or other connectors by which a tiedown assembly is attached to a vehicle; and
 - (b) the mounting place and means of mounting the connector,
 shall be at least as strong as the tiedown assembly when the connector is loaded in any direction in which the tiedown assembly may load it.
- (6) No tie down assembly shall be used where,
 - (a) the active portion has knots therein;
 - (b) any component thereof exhibits stretch, deformation, wear or damage beyond the limits specified by the manufacturer; or
 - (c) the tiedown has been repaired or shortened

other than in accordance with the manufacturer's specifications.

- (7) When an "over-the-centre" type of tiedown tensioner is used, the handle shall be locked in place and secured by an adequate secondary means to prevent its inadvertent release.
 - (8) Except in the case of steel, fibre or synthetic strapping that is permanently crimped, tiedown assemblies used on a commercial motor vehicle or combination of commercial motor vehicle and trailer or trailers to secure the load against movement in any direction shall be designed, constructed and maintained in such a manner that the driver of the vehicle can tighten the assembly in transit.
4. Containers designed for the transportation of containerized, intermodal cargo and having integral securement devices shall be fastened to a load-bearing surface of the vehicle with securement devices that prevent the containers from being unintentionally unfastened and restrain the containers from movement under normal operating conditions.
 5. Where a commercial motor vehicle or combination of commercial motor vehicle and trailer or trailers transports on a highway coils of metal that, individually or in a combination that is banded together, weigh 2,300 kilograms or more, the coils may be restrained against movement in relationship to the vehicle in accordance with Schedule A.
 6.
 - (1) In this section, "miscellaneous metal articles" means cut-to-length bars, plates, rods, sheet and tin mill

products, billets, blooms, ingots, slabs, structural shapes, pipe and other tubular products, or any combination thereof.

- (2) Where a commercial motor vehicle or combination of commercial motor vehicle and trailer or trailers transports on a highway a load of miscellaneous metal articles that, individually or in a combination that is banded or boxed together and handled as a single unit, weigh more than 1,000 kilograms, such articles may be restrained against movement in relationship to the vehicle in accordance with Schedule B.

7. Where timber is used for blocking it shall be sound timber.

8. This Regulation came into force on the 1st day of November, 1981.

SCHEDULE A

Securement Requirements for Coiled Metal

1. In this Schedule,

- (a) "coil insert" means a device that when used in conjunction with a tiedown assembly restrains the coil against movement; and
- (b) "eye" means the hole through the centre of a coil.

2.

(1) Where coils of metal are transported with eyes vertical, the coils shall be secured,

- (a) by a tiedown assembly or by blocking placed against the front of a coil where there is only one, or row of coils where the coils are in rows, so as to restrain against forward motion;
- (b) by a tiedown assembly or by blocking placed against the rear of the coil, where there is only one, or row of coils, where the coils are in rows, so as to restrain against rearward motion; and
- (c) by a tiedown assembly over the top of each coil or, where the coils are in transverse rows, over the top of each row, so as to restrain against vertical motion.

(2) Only where a tiedown assembly over the top of a coil or a transverse row of coils is used in conjunction with a coil insert or inserts may the same tiedown assembly be used to comply with more than one requirement of subsection (1).

3.

- (1) Where coils of metal are transported with eyes crosswise, the coils shall be secured,
 - a) by a tiedown assembly, making an angle of less than 45 degrees with the horizontal when viewed from the side of the vehicle, running through the eye of each coil so as to restrain against forward motion;
 - b) by a tiedown assembly, making an angle of less than 45 degrees with the horizontal when

4.

- (1) Where coils of metal are transported with eyes lengthwise, the coils shall be restrained by timber, having a nominal cross section of at least ten centimetres by ten centimetres, tightly placed against the sides of each coil or, where the coils are in transverse rows, against the outboard sides of each row of coils, and the coils shall be secured by,
 - (a) one or more tiedown assemblies over the top of each coil or transverse row of coils;

SCHEDULE B**Securement Requirements for
Miscellaneous Metal Articles****1.**

- (1) Miscellaneous metal articles shall be restrained,
 - (a) in the case of articles banded or otherwise secured together and handled as a single unit, by at least two tiedown assemblies;
 - (b) in the case of a single article, a group of articles or a combination of articles loaded side-by-side across the width of the vehicle, by at least one tiedown assembly over the top of the article or articles for at least every 2.5 metres of its or their length;
 - (c) in the case of articles that individually have a length of not more than 2.5 metres and that are securely butted against each other in the forward and rearward direction,
 - (i) by metal angles secured by tiedown assemblies, or
 - (ii) by timber having a nominal cross section of at least ten centimetres by ten centimetres, placed longitudinally over the articles and secured by tiedown assemblies,

that shall not be located beyond the ends of the articles being secured; or

- (d) in the case of tiered articles where each tiered article rests securely on the one beneath it, by securing the tier in the same manner as a single level of those articles is secured in accordance with this section.

(2) Subsection (1) does not apply to,

- (a) pole trailers that have at least two tiedown assemblies securing the load to the forward bolster and at least two tiedown assemblies securing the load to the rear bolster; or
- (b) vehicles carrying special loads of machinery or fabricated structural items, such as beams, girders, or trusses, that are fastened by special methods provided that such special loads are securely and adequately fastened to the vehicle.