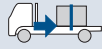


## SECTION K

## Tables

CONTENTS			
1	C.3	<b>MAXIMUM WEIGHT RESTRAINED BY ONE LASHING</b>	<b>258</b>
2	C.4	<b>TYPICAL LASHING CAPACITY</b>	<b>259</b>
3	F.2	<b>AVERAGE PRE-TENSION</b>	<b>260</b>
4	F.3	<b>MAXIMUM WEIGHT EACH 10 OR 12 mm ROPE CAN RESTRAIN (USING SINGLE HITCH)</b>	<b>261</b>
5	F.4	<b>MAXIMUM WEIGHT EACH 10 OR 12 mm ROPE CAN RESTRAIN (USING DOUBLE HITCH)</b>	<b>262</b>
6	F.5	<b>MAXIMUM WEIGHT EACH 50 mm WEBBING STRAP CAN RESTRAIN</b>	<b>263</b>
7	F.6	<b>MAXIMUM WEIGHT EACH 8 mm CHAIN CAN RESTRAIN</b>	<b>264</b>
8	F.7	<b>MINIMUM LASHING CAPACITY – DIRECT RESTRAINT FORWARDS (0.8W) USING TWO CHAINS</b>	<b>265</b>
9	F.8	<b>MINIMUM LASHING CAPACITY – DIRECT RESTRAINT SIDEWAYS OR REARWARDS (0.5W) USING TWO CHAINS</b>	<b>266</b>

**1 Table C.3**

MAXIMUM WEIGHT RESTRAINED BY ONE LASHING (with no load shift)				
FRONT OF LOAD BLOCKED?	NO		YES	
HOW MUCH FRICTION?	MEDIUM <small>(Smooth Steel on Timber) <math>\mu = 0.4</math></small>	HIGH <small>(Rubber Load Mat) <math>\mu = 0.6</math></small>	MEDIUM <small>(Smooth Steel on Timber) <math>\mu = 0.4</math></small>	HIGH <small>(Rubber Load Mat) <math>\mu = 0.6</math></small>
 <p><math>H+L = 0.85</math> or more</p>	<p>Lashing angle <math>60^\circ</math> or more to horizontal</p>			
<b>ROPE - Single Hitch</b> <small>(50 kg average tension)</small>	85 kg	255 kg	340 kg	425 kg
<b>ROPE - Double Hitch</b> <small>(100 kg average tension)</small>	170 kg	510 kg	680 kg	850 kg
<b>WEBBING STRAP</b> <small>(300 kg average tension)</small>	510 kg	1530 kg	2040 kg	2550 kg
<b>CHAIN</b> <small>(750 kg average tension)</small>	1275 kg	3825 kg	5100 kg	6375 kg

(See Figure C.27 on page 81 for single and double hitch)

2 Table C.4

TYPICAL LASHING CAPACITY		
Lashing	Lashing Capacity (LC)	
12 mm synthetic (silver) rope	300 kg	
25 mm webbing	250 kg	
35 mm webbing	1.0 tonne	
50 mm webbing	2.0 tonnes	
chain*	with claw hooks or 'winged' grab hooks	with grab hooks or edge contact
6 mm transport chain	2.3 tonnes	1.7 tonnes
7.3 mm transport chain	3.0 tonnes	2.3 tonnes
8 mm transport chain	4.0 tonnes	3.0 tonnes
10 mm transport chain	6.0 tonnes	4.5 tonnes
13 mm transport chain	9.0 tonnes	6.7 tonnes
13 mm Grade 'T' chain **	10.0 tonnes	7.5 tonnes
16 mm Grade 'T' chain **	16.0 tonnes	12.0 tonnes

\* Note: Different hooks have different lashing capacities and chains that pass over sharp edges such as coaming rails have reduced lashing capacity (see Section C 6.5).

\*\* Note: Grade 'T' lifting chain is also referred to as Grade 80 or 'Herc-alloy'.

3 Table F.2





AVERAGE PRE-TENSION			
Lashing	Size	Tensioner	Pre-tension
Rope	10 mm & 12 mm	Single Hitch	50 kg
		Double Hitch	100 kg
Webbing Strap	25 mm	Hand Ratchet	100 kg
	35 mm	Hand Ratchet	250 kg
	50 mm	Truck Winch	300 kg
	50 mm	Hand Ratchet (push up)	300 kg
	50 mm	Hand Ratchet (pull down)	600 kg
Chain	7 mm & above	Dog	750 kg
		Turnbuckle	1000 kg

(See Figure C.27 on page 81 for single and double hitch)

Note 1: some 75 and 100 mm strap tensioners may not achieve 300 kg average pre-tension even though their lashing capacity is greater. Check their rating with the manufacturer.

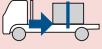
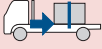

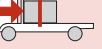
Note 2: the pre-tension achieved with chain tensioners is approximately the same for 7 mm, 8 mm, 10 mm and 13 mm chains.

4 Table F.3

MAXIMUM WEIGHT EACH 10 OR 12 mm ROPE CAN RESTRAIN (USING SINGLE HITCH)					
FRONT OF LOAD BLOCKED?		NO		YES	
HOW MUCH FRICTION?		MEDIUM $\mu = 0.4$ (Smooth Steel on Timber)	HIGH $\mu = 0.6$ (Rubber Load Mat)	MEDIUM $\mu = 0.4$ (Smooth Steel on Timber)	HIGH $\mu = 0.6$ (Rubber Load Mat)
Minimum average rope tension 50 kg.					
ROPE ANGLE	ANGLE EFFECT (E)				
90°	1.0	100 kg	300 kg	400 kg	500 kg
approx. 60° to 90°	0.85 to 1.0	85 kg	255 kg	340 kg	425 kg
approx. 45° to 60°	0.70 to 0.84	70 kg	210 kg	280 kg	350 kg
approx. 30° to 45°	0.50 to 0.69	50 kg	150 kg	200 kg	250 kg
approx. 15° to 30°	0.25 to 0.49	25 kg	75 kg	100 kg	125 kg

(See Figure C.27 on page 81 for single and double hitch)

5 Table F.4

MAXIMUM WEIGHT EACH 10 OR 12 mm ROPE CAN RESTRAIN (USING DOUBLE HITCH)					
FRONT OF LOAD BLOCKED?		NO		YES	
HOW MUCH FRICTION?		MEDIUM $\mu = 0.4$ (Smooth Steel on Timber)	HIGH $\mu = 0.6$ (Rubber Load Mat)	MEDIUM $\mu = 0.4$ (Smooth Steel on Timber)	HIGH $\mu = 0.6$ (Rubber Load Mat)
Minimum average rope tension 100 kg.					
ROPE ANGLE	ANGLE EFFECT (E)				
90°	1.0	200 kg	600 kg	800 kg	1000 kg
approx. 60° to 90°	0.85 to 1.0	170 kg	510 kg	680 kg	850 kg
approx. 45° to 60°	0.70 to 0.84	140 kg	420 kg	560 kg	700 kg
approx. 30° to 45°	0.50 to 0.69	100 kg	300 kg	400 kg	500 kg
approx. 15° to 30°	0.25 to 0.49	50 kg	150 kg	200 kg	250 kg

(See Figure C.27 on page 81 for single and double hitch)

6 Table F.5

MAXIMUM WEIGHT EACH 50 mm WEBBING STRAP CAN RESTRAIN					
FRONT OF LOAD BLOCKED?		NO		YES	
HOW MUCH FRICTION?		MEDIUM $\mu = 0.4$ (Smooth Steel on Timber)	HIGH $\mu = 0.6$ (Rubber Load Mat)	MEDIUM $\mu = 0.4$ (Smooth Steel on Timber)	HIGH $\mu = 0.6$ (Rubber Load Mat)
Minimum average strap tension 300 kg.					
STRAP ANGLE	ANGLE EFFECT (E)				
90°	1.0	600 kg	1800 kg	2400 kg	3000 kg
approx. 60° to 90°	0.85 to 1.0	510 kg	1530 kg	2040 kg	2550 kg
approx. 45° to 60°	0.70 to 0.84	420 kg	1260 kg	1680 kg	2100 kg
approx. 30° to 45°	0.50 to 0.69	300 kg	900 kg	1200 kg	1500 kg
approx. 15° to 30°	0.25 to 0.49	150 kg	450 kg	600 kg	750 kg

**7 Table F.6**

MAXIMUM WEIGHT EACH 8 mm CHAIN CAN RESTRAIN					
FRONT OF LOAD BLOCKED?		NO		YES	
HOW MUCH FRICTION?		MEDIUM $\mu = 0.4$ (Smooth Steel on Timber)	HIGH $\mu = 0.6$ (Rubber Load Mat)	MEDIUM $\mu = 0.4$ (Smooth Steel on Timber)	HIGH $\mu = 0.6$ (Rubber Load Mat)
Minimum average chain tension 750 kg.					
CHAIN ANGLE	ANGLE EFFECT (E)				
90°	1.0	1500 kg	4500kg	6000 kg	7500 kg
approx. 60° to 90°	0.85 to 1.0	1275 kg	3825 kg	5100 kg	6375 kg
approx. 45° to 60°	0.70 to 0.84	1050 kg	3150 kg	4200 kg	5250 kg
approx. 30° to 45°	0.50 to 0.69	750 kg	2250 kg	3000 kg	3750 kg
approx. 15° to 30°	0.25 to 0.49	375 kg	1125 kg	1500 kg	1875 kg

8 Table F.7

<b>MINIMUM LASHING CAPACITY - DIRECT RESTRAINT FORWARDS (0.8W) USING TWO CHAINS</b>			
<b>Mass of Load (kilograms)</b>	<b>Minimum Lashing Capacity</b>		
	<b>E = 0.85 to 1.0</b>	<b>E = 0.70 to 0.84</b>	<b>E = 0.50 to 0.69</b>
100	48	58	80
200	95	115	160
300	142	172	240
400	189	229	320
500	236	286	400
750	353	429	600
1000	471	572	800
1500	706	958	1200
2000	942	1143	1600
<b>(tonnes)</b>			
3	1.5	1.8	2.4
4	1.9	2.3	3.2
5	2.4	2.9	4.0
6	2.9	3.5	4.8
7	3.3	4.0	5.6
8	3.8	4.6	6.4
9	4.3	5.2	7.2
10	4.8	5.8	8.0
11	5.2	6.3	8.8
12	5.7	6.9	9.6
13	6.2	7.5	10.4
14	6.6	8.0	11.2
15	7.1	8.6	12.0
16	7.6	9.2	12.8
17	8.0	9.8	13.6
18	8.5	10.3	14.4
19	9.0	10.9	15.2
20	9.5	11.5	16.0
21	9.9	12.0	16.8
22	10.4	12.6	17.6
23	10.9	13.2	18.4
24	11.3	13.8	19.2
25	11.8	14.3	20.0
26	12.3	14.9	20.8
27	12.8	15.5	21.6
28	13.2	16.0	22.4
29	13.7	16.6	23.2
30	14.2	17.2	24.0

9 Table F.8

MINIMUM LASHING CAPACITY - DIRECT RESTRAINT SIDEWAYS OR REARWARDS (0.5W) USING TWO CHAINS			
Mass of Load (kilograms)	Minimum Lashing Capacity		
	E = 0.85 to 1.0	E = 0.70 to 0.84	E = 0.50 to 0.69
100	30	36	50
200	59	72	100
300	89	108	150
400	118	143	200
500	148	179	250
750	221	268	375
1000	295	358	500
1500	442	536	750
2000	589	715	1000
(tonnes)			
3	0.9	1.1	1.5
4	1.2	1.5	2.0
5	1.5	1.8	2.5
6	1.8	2.2	3.0
7	2.1	2.5	3.5
8	2.4	2.9	4.0
9	2.7	3.3	4.5
10	3.0	3.6	5.0
11	3.3	4.0	5.5
12	3.6	4.3	6.0
13	3.9	4.7	6.5
14	4.2	5.0	7.0
15	4.5	5.4	7.5
16	4.8	5.8	8.0
17	5.0	6.1	8.5
18	5.3	6.5	9.0
19	5.6	6.8	9.5
20	5.9	7.2	10.0
21	6.2	7.5	10.5
22	6.5	7.9	11.0
23	6.8	8.3	11.5
24	7.1	8.6	12.0
25	7.4	9.0	12.5
26	7.7	9.3	13.0
27	8.0	9.7	13.5
28	8.3	10.0	14.0
29	8.6	10.4	14.5
30	8.9	10.8	15.0



This driver and passenger used a good load restraint method on themselves by wearing a seat belt. They were able to walk away from the truck after it rolled over at speed on a country road. The same forces that move the load and the truck are also applied to you. Seat belts save lives.

The security of your load,  
your life and the life of others  
relies on proper  
load restraint

