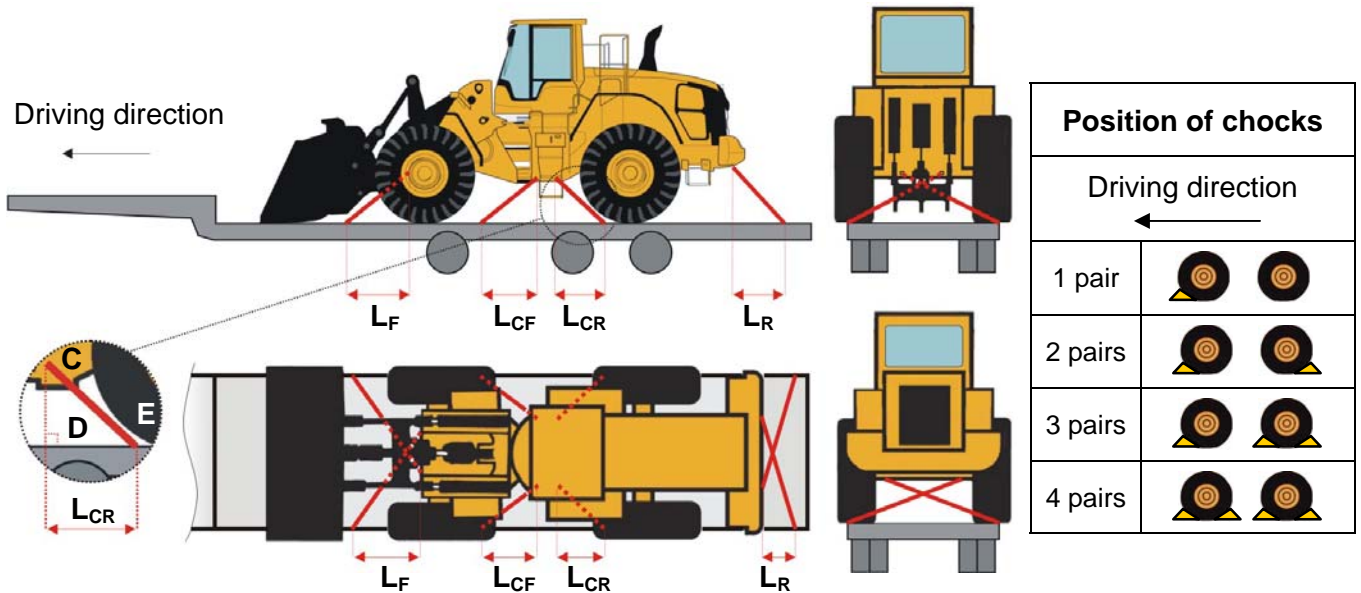


CARGO SECURING INSTRUCTION

ROAD TRANSPORT - MACHINE LOADED WITH THE FRONT FORWARD



L_{CR} is the distance between the points D and E. D is the projected point, laterally at a right angle towards the edge of the platform from lashing point C on the wheel loader. E is the lashing point on the platform. The relationship for L_F and L_R are the same.

Friction surfaces		Chocks or Blocking ¹		Permissible distance intervals of the lashings in metres							
				Chain min. class 8 Ø10 mm MBL 12 tonnes, LC 60 kN (6 tonnes)				Chain min. class 8 Ø13 mm MBL 20 tonnes, LC 100 kN (10 tonnes)			
				L_F (cross)	L_{CF}	L_{CR}	L_R (cross)	L_F (cross)	L_{CF}	L_{CR}	L_R (cross)
Rubber, pine, birch with rubber (dry or wet) $\mu = 0.5$	Chocks	None	No permitted alternatives				Not permitted alternative				
		1 pair	No permitted alternatives				0.6 – 1.6	0.4 – 1.4	0.2 – 0.6	1.9 – 2.9	
		2 pairs	No permitted alternatives				0.5 – 1.6	*1	0.2 – 0.6	1.9 – 2.9	
		3 pairs	0.5 – 1.6	0.0 – 1.4	0.0 – 0.6	1.2 – 2.9	0.5 – 1.6	*1	0.0 – 0.6	0.6 – 2.9	
	4 pairs	0.5 – 1.6	0.0 – 1.4	0.0 – 0.6	1.2 – 2.9	0.5 – 1.6	*1	0.0 – 0.6	0.6 – 2.9		
	Blocking	Forward (Fwd)	1.0 – 1.6	0.8 – 1.4	0.0 – 0.6	0.5 – 2.9	0.6 – 1.6	0.4 – 1.4	*2	0.5 – 2.9	
		Sideways (Sw)	Not permitted alternative				Not permitted alternative				
Fwd & Sw		1.0 – 1.6	0.8 – 1.4	0.0 – 0.6	0.5 – 2.9	0.6 – 1.6	0.4 – 1.4	*2	0.5 – 2.9		
Frost, ice, snow, mud, birch without rubber $\mu = 0.2$	Chocks	None	No permitted alternatives				Not permitted alternative				
		1 pair	No permitted alternatives				0.8 – 1.6	0.6 – 1.4	0.4 – 0.6	2.0 – 2.9	
		2 pairs	No permitted alternatives				0.5 – 1.6	*1	0.4 – 0.6	2.0 – 2.9	
		3 pairs	No permitted alternatives				0.5 – 1.6	*1	0.0 – 0.6	1.1 – 2.9	
	4 pairs	No permitted alternatives				0.5 – 1.6	*1	0.0 – 0.6	1.1 – 2.9		
	Blocking	Forward (Fwd)	No permitted alternatives				0.8 – 1.6	0.6 – 1.4	*2	0.5 – 1.8	
		Sideways (Sw)	No permitted alternatives				Not permitted alternative				
Fwd & Sw		No permitted alternatives				0.8 – 1.6	0.6 – 1.4	*2	0.5 – 1.8		

1) Please see page 3 for detailed instructions

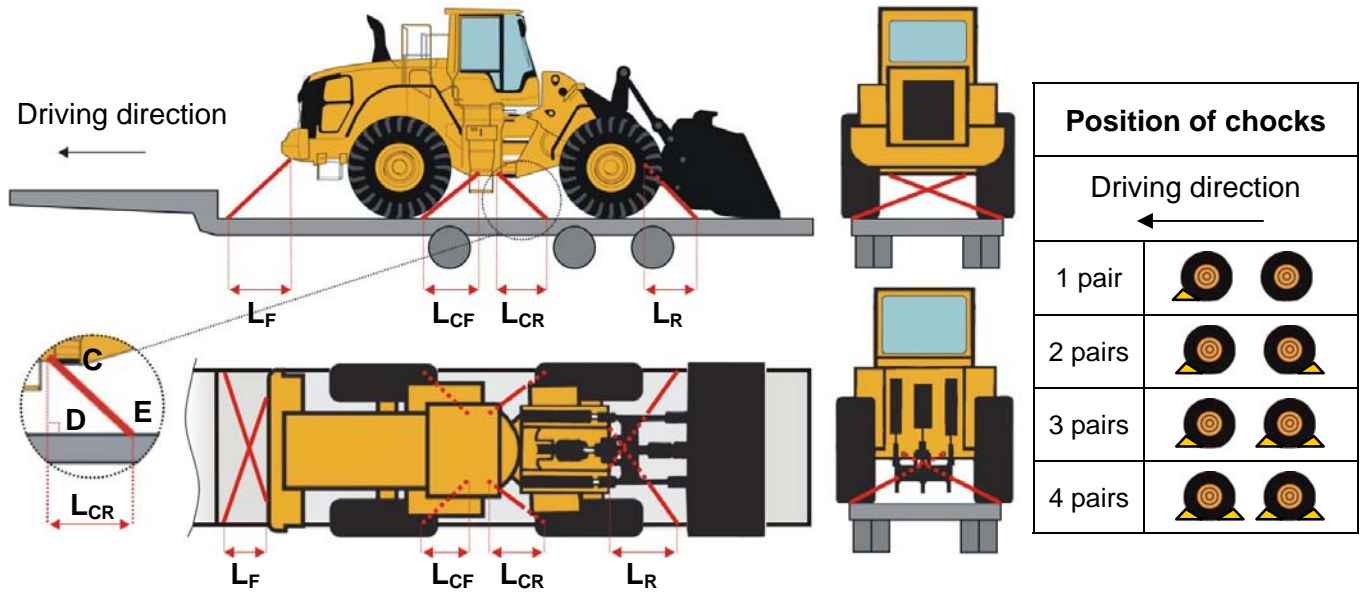
*1 Not required lashing (if used permitted intervall 0.0 – 1.4 m)

*2 Not required lashing (if used permitted intervall 0.0 – 0.6 m)

The instructions are valid when the conditions on page 3 are met

CARGO SECURING INSTRUCTION

ROAD TRANSPORT - MACHINE LOADED WITH THE BACK FORWARD



L_{CR} is the distance between the points **D** and **E**. **D** is the projected point, laterally at a right angle towards the edge of the platform from lashing point **C** on the wheel loader. **E** is the lashing point on the platform. The relationship for L_F and L_R are the same.

Friction surfaces		Chocks or Blocking ¹		Permissible distance intervals of the lashings in metres							
				Chain min. class 8 Ø10 mm MBL 12 tonnes, LC 60 kN (6 tonnes)				Chain min. class 8 Ø13 mm MBL 20 tonnes, LC 100 kN (10 tonnes)			
				L_F (cross)	L_{CF}	L_{CR}	L_R (cross)	L_F (cross)	L_{CF}	L_{CR}	L_R (cross)
Rubber, pine, birch with rubber (dry or wet) $\mu = 0.5$	Chocks	None	No permitted alternatives				Not permitted alternative				
		1 pair	No permitted alternatives				1.2 – 2.5	0.1 – 0.6	0.5 – 1.4	1.8 – 2.9	
		2 pairs	No permitted alternatives				0.5 – 2.5	*2	0.5 – 1.4	1.8 – 2.9	
		3 pairs	0.5 – 2.5	0.0 – 0.6	0.4 – 1.4	0.8 – 2.9	0.5 – 2.5	*2	0.0 – 1.4	0.8 – 2.9	
	4 pairs	0.5 – 2.5	0.0 – 0.6	0.4 – 1.4	0.8 – 2.9	0.5 – 2.5	*2	0.0 – 1.4	0.8 – 2.9		
	Blocking	Forward (Fwd)	1.8 – 2.5	0.4 – 0.6	0.0 – 1.4	0.8 – 2.9	1.2 – 2.5	0.1 – 0.6	*1	0.8 – 2.9	
		Sideways (Sw)	Not permitted alternative				Not permitted alternative				
Fwd & Sw		1.8 – 2.5	0.4 – 0.6	0.0 – 1.4	0.8 – 2.9	1.2 – 2.5	0.1 – 0.6	*1	0.8 – 2.9		
Frost, ice, snow, mud, birch without rubber $\mu = 0.2$	Chocks	None	No permitted alternatives				Not permitted alternative				
		1 pair	No permitted alternatives				1.8 – 2.5	0.2 – 0.6	0.8 – 1.4	2.2 – 2.9	
		2 pairs	No permitted alternatives				0.5 – 2.5	0.0 – 0.6	0.8 – 1.4	2.2 – 2.9	
		3 pairs	0.5 – 1.4	*2	0.3 – 1.4	0.8 – 2.0	0.5 – 1.4	*2	0.3 – 1.4	0.8 – 2.0	
	4 pairs	0.5 – 1.4	*2	0.3 – 1.4	0.8 – 2.0	0.5 – 1.4	*2	0.3 – 1.4	0.8 – 2.0		
	Blocking	Forward (Fwd)	1.8 – 2.5	0.2 – 0.6	*1	0.8 – 2.0	1.8 – 2.5	0.2 – 0.6	*1	0.8 – 2.0	
		Sideways (Sw)	Not permitted alternative				Not permitted alternative				
Fwd & Sw		1.8 – 2.5	0.2 – 0.6	*1	0.8 – 2.0	1.8 – 2.5	0.2 – 0.6	*1	0.8 – 2.0		

1) Please see page 3 for detailed instructions

*1 Not required lashing (if used permitted intervall 0.0 – 1.4 m)

*2 Not required lashing (if used permitted intervall 0.0 – 0.6 m)

The instructions are valid when the conditions on page 3 are met

CARGO SECURING INSTRUCTION

The instructions are valid for Volvo Wheel loaders model L220G when the following conditions are met:

Design acceleration data

1. The loader is subjected to max accelerations of; 0.8 g forward, 0.5 g rearward, 0.5 g sideways and 0.2 g upward.
2. The accelerations forward, rearward and sideways are acting individually and they are combined with 1 g downward.
3. The upward acceleration is not combined with other accelerations.
4. (A safety factor of 1.25 has been used to take account for uneven distribution of forces in the lashings. The arrangement can also withstand an acceleration of 1 g forward without safety factor.)

National requirements

5. The above design acceleration data fulfil the basic requirements in almost all road regulations and standards however in some countries national rules and guidelines may require alternative or additional blocking and / or lashing.

Wheel Loader data

6. The loader (with or without fitted equipment) is from Volvo Construction Equipment.
7. The weight of the loader does not exceed 39,500 kg.
8. The loader has new or normally worn rubber wheels or wood-fitted rims of pine or birch. If the wood-fitted rims comprise of birch wood, a rubber friction pad must be placed between the wood surface of the rim and the platform to achieve a friction level of 0.5, else the friction level is assumed to be 0.2 only.

Loading and securing on transport carrier

9. The loader is positioned laterally centred (± 5 cm) with the support of at least half of the width of the tyres.
10. The parking brake is applied and in working order and able to keep the loader stationary on inclines up to 14°.
11. The articulated steering frame lock is applied.
12. The loader is loaded and secured in such a way that no parts such as painted surfaces and tyres are damaged.

Transport carrier

13. The loader is loaded on a vehicle with a platform of wood, plywood, grooved aluminium, unpainted or painted steel.
14. The lateral distance between the lashing attachments on the vehicle is about 2500 mm.
15. The lashing attachments on the trailer have at least the same breaking load as the lashings.

Lashings

16. The lashings are tensioned to at least 4000 N (400 kg) during the entire transport.
17. The lashings are placed symmetrically, in pairs and are fixed to the designated lashing points on the loader. Only one lashing shall be attached to each lashing point.
18. It should not be possible for the lashing hooks to come loose if the lashing becomes slack.
19. The maximum securing load (MSL/LC/SWL) of the chain is at least 50 % of the minimum breaking load (MBL).
20. When short and vertical lashings are used, on machines fitted with rubber tyres, shock absorbers should be used to reduce the risk of jerks in the lashings.

If chocks or blocking is used the following conditions shall be met:

21. The chocks are; firmly attached, have an angle of inclination of 37° (3:4:5), are at least 25 cm in height and are placed in pairs, 1, 2, 3 or 4 pairs according to position of chocks-tables.
22. If rubber wheels or wood-fitted rims are supported by wheel grooves, these may be considered to be the equivalent of chocks.
23. Blocking of bucket, lifting unit, rear of the wheel loader or the wheel pairs turned in driving direction up to at least the wheel radius against goose-neck or corresponding in forward direction prevents forward movements.
24. Blocking with adequate height acting on the inside or outside of all four wheels prevents sideways movements.

These instructions have been worked out by:

Volvo Construction Equipment AB
Global Laws & Regulations
Dept. 74200, TCA 17
SE-631 85 Eskilstuna, Sweden
www.volvo.com

MariTerm AB
P.O. Box 74,
SE-26321 Höganäs, Sweden
info@mariterm.se
www.mariterm.se