

Wheel Loader

L 538

Speeder

Generation

6

Tipping load

9,800 kg

Engine

Stage V



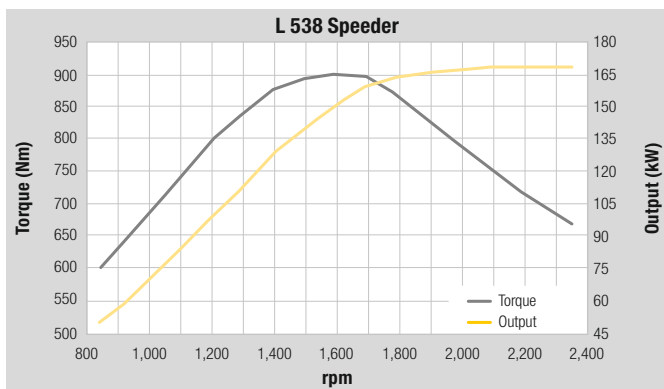
LIEBHERR

Technical Data



Engine

Diesel engine	6068HB551
Design	Water-cooled turbocharged in-series engine with cooled exhaust gas recirculation
Cylinder inline	6
Fuel injection process	Electronic Common Rail high-pressure injection
Output	
to ISO 9249 ~ SAE J1349	kW/HP 164/223 at RPM 2,400
Rated output	
to ISO 14396/ ECE-R.120	kW/HP 168/228
Nominal speed	at RPM 2,400
Max. torque	Nm 900
to ISO 14396	at RPM 1,600
Displacement	litres 6.8
Bore/Stroke	mm 106/127
Stage V	
Harmful emissions values	According to regulation (EU) 2016/1628
Emission control	SCR technology and closed diesel particle filter system
Fuel tank (plastic design)	litres 205
Fuel tank (steel version, optional)	litres 205
DEF tank	litres 20
Air cleaner system	Dry type filter with main and safety element, pre-cleaner, service indicator on the Liebherr display
Electrical system	
Operating voltage	V 24
Battery	Ah 2 x 135
Alternator	V/A 24/100
Starter	V/kW 24/7.8



Driveline

Continuous hydrostatic driveline – Speeder	
Design	Swash plate type variable flow pump and two variable axial piston motors in closed loop circuit and axle transfer case. Direction of travel is reversed by changing the flow-direction of the variable-displacement pump
Filtration	Suction return line filter for closed circuit
Control	By travel and inching pedal. The inching pedal makes it possible to control the tractive and thrust forces steplessly at full engine speed. The Liebherr control lever is used to control forward and reverse travel
Travel speed range	Speed range 1 _____ 0 – 8 km/h Speed range A1 – 2 _____ 0 – 16 km/h Speed range A1 – 3 _____ 0 – 40 km/h forward and reverse Speeds quoted apply with the tyres indicated as standard on loader model.



Brakes

Wear-free service brake	Self-locking of the hydrostatic driveline (acting on all four wheels) and additional pump-accumulator brake system with wet multi-disc brakes located in the differential housing (two separate brake circuits)
Parking brake	Electro-hydraulically actuated spring-loaded disc brake system on the front axle

The braking system meets the requirements of the ISO 3450.

Axles

Four-wheel drive	
Front axle	Fixed
Rear axle	Centre pivot, with 10° oscillating angle to each side
Height of obstacles which can be driven over	mm 470 with all four wheels remaining in contact with the ground
Differentials	Automatic limited-slip differentials with 45 % locking action in both axles
Reduction gear	Planetary final drive in wheel hubs
Track width	1,900 mm with all types of tyres



Steering

Design	"Load-sensing" swash plate type variable flow pump with pressure cut-off and flow control. Central pivot with two double-acting steering cylinders
Angle of articulation	40° to each side
Emergency steering	Electro-hydraulic emergency steering system



Attachment Hydraulics

Design	"Load-sensing" variable axial piston pump with output and flow control, and pressure cut-off in the control block
Cooling	Hydraulic oil cooling using thermostatically controlled fan and oil cooler
Filtration Control	Return line filter in the hydraulic reservoir Liebherr control lever, electro-hydraulically operated
Lifting function	Lifting, neutral, lowering Float position controlled by Liebherr control lever with detent
Tilt function	Tilt back, neutral, dump Automatic bucket return to dig
Max. flow	l/min. 228
Max. pressure	
Z-bar linkage	bar 350
Parallel linkage	bar 350



Attachment

Geometry variants		
Optional	Powerful Z-bar linkage with tilt cylinder, hydraulic quick hitch optional Parallel linkage with two tilt cylinders, hydraulic quick hitch as standard	
Bearings		
Sealed		
Cycle time at nominal load		
	ZK	PK
Lifting	s 5.7	5.7
Dumping	s 2.9	4.3
Lowering (empty)	s 4.7	4.7



Operator's Cab

Design	Elastic mounted, noise-proof cab ROPS roll over protection per EN ISO 3471 / EN 474-1 FOPS falling objects protection per EN ISO 3449 / EN 474-1, Cat. II Comfort safety door with 180° opening angle with rigid window, right side sliding side window, front windscreen made of laminated safety glass, green tinted as standard, side panels with single-pane safety glass ESG, green tinted, heated rear window ESG. Continuously adjustable steering column
Liebherr operator's seat	6 way adjustable, vibration-damped operator's seat "Comfort" with seat, depth and incline adjustment as standard (air-cushioned with seat heating adjustable to operator's weight), Liebherr control lever mounted into the operator's seat as standard
Cab heating and ventilation	2-level air control, cooling water heating, defroster and air conditioning via manual nozzle position or electronic valve control for head and front area, as well as electronic fresh/ recirculated air control, electrically heated rear window, filter system with pre-filter, fresh air filter and recirculated air filter, easily replaced, air condition/automatic air conditioning system with new improved cooling output optional



Sound Level

Sound pressure level to ISO 6396	
L _{pA} (inside cab)	dB(A) 69
Sound power level to 2000/14/EC	
L _{WA} (surround noise)	dB(A) 104

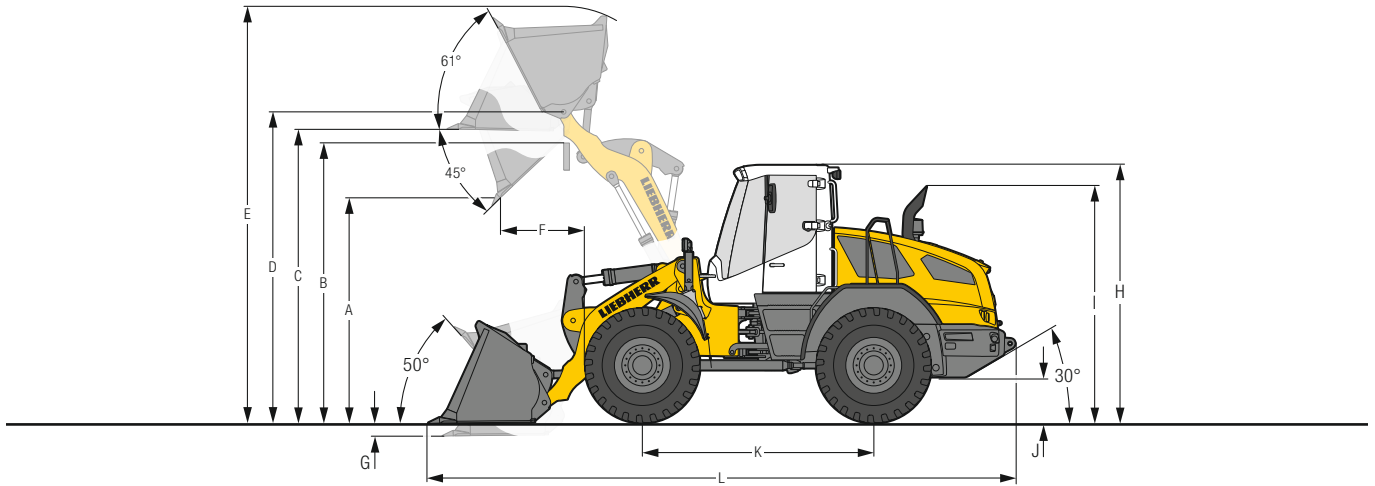


Capacities

Engine oil (inclusive filter change)	l 18
Transmission	l 2.5
Coolant	l 26.5
Front axle/wheel hubs	l 19/3.5
Rear axle/wheel hubs	l 19/3.5
Hydraulic tank	l 95
Hydraulic system, total	l 180

Dimensions

Z-bar Linkage



Excavation Bucket

		ZK	ZK-QH
Geometry		ZK	ZK-QH
Cutting tools		T	T
Lift arm length	mm	2,500	2,500
Bucket capacity according to ISO 7546**	m ³	2.6	2.3
Specific material density	t/m ³	1.8	1.8
Bucket width	mm	2,500	2,500
A Dumping height at max. lift height and 45° discharge	mm	2,845	2,760
B Dump-over height	mm	3,480	3,480
C Max. height of bucket bottom	mm	3,680	3,680
D Max. height of bucket pivot point	mm	3,930	3,930
E Max. operating height	mm	5,220	5,270
F Reach at max. lift height and 45° discharge	mm	1,040	1,060
G Digging depth	mm	40	40
H Height above operator's cab¹⁾	mm	3,250	3,250
I Height above exhaust	mm	2,950	2,950
J Ground clearance	mm	490	490
K Wheelbase	mm	2,975	2,975
L Overall length	mm	7,530	7,610
Turning circle radius over outside bucket edge	mm	6,000	6,050
Breakout force (SAE)	kN	110	100
Tipping load, straight*	kg	11,200	10,600
Tipping load, fully articulated*	kg	9,800	9,400
Operating weight*	kg	13,850	14,100
Tyre size		20.5R25 L3	

* The figures shown include the above tyres, all lubricants, a full fuel tank, the ROPS/FOPS cab and the operator. Different tyres and optional equipment will change the operating weight and tipping load. (Tipping load, fully articulated according to ISO 14397-1)

** Actual bucket capacity may be approx. 10% larger than the calculation according to ISO 7546 standard. The degree to which the bucket can be filled depends on the material – see page 9.

¹⁾ The "Comfort safety door (open through 180°)" increases the value "H" to 130 mm when the door is open.

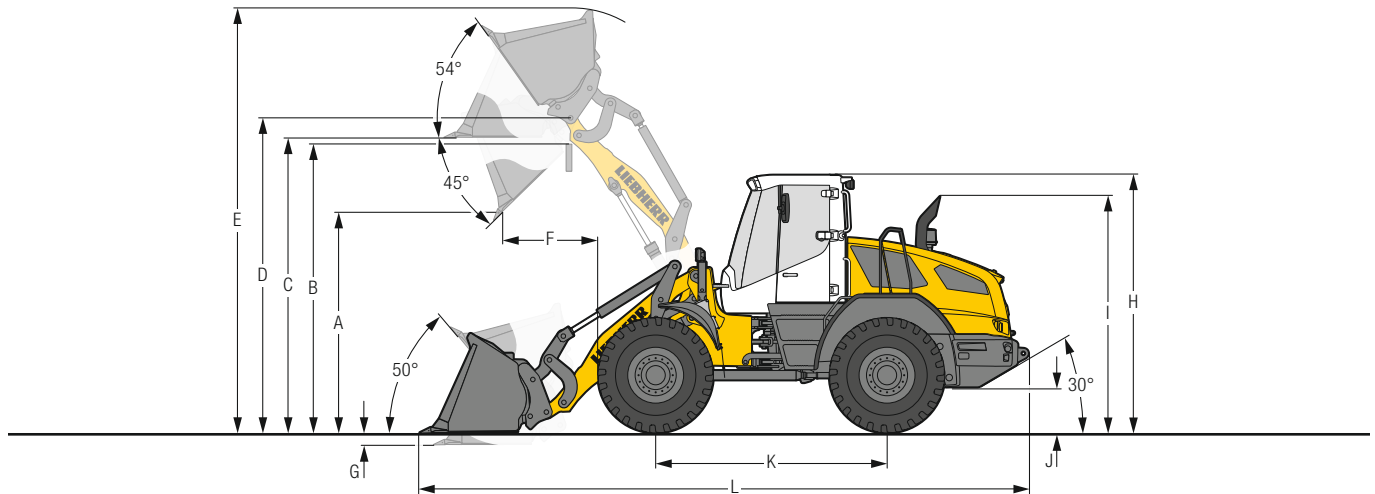
ZK = Z-bar linkage

ZK-QH = Z-bar linkage incl. quick hitch

T = Welded-on tooth holder with add-on teeth

Dimensions

Parallel Linkage



Excavation Bucket



		STD	HL
Geometry		PK-QH	PK-QH
Cutting tools		T	T
Lift arm length	mm	2,570	3,000
Bucket capacity according to ISO 7546**	m ³	2.3	2.3
Specific material density	t/m ³	1.8	1.5
Bucket width	mm	2,500	2,500
A Dumping height at max. lift height and 45° discharge	mm	2,790	3,350
B Dump-over height	mm	3,480	4,040
C Max. height of bucket bottom	mm	3,680	4,260
D Max. height of bucket pivot point	mm	3,930	4,510
E Max. operating height	mm	5,290	5,860
F Reach at max. lift height and 45° discharge	mm	1,110	1,030
G Digging depth	mm	55	25
H Height above operator's cab ¹⁾	mm	3,250	3,250
I Height above exhaust	mm	2,950	2,950
J Ground clearance	mm	490	490
K Wheelbase	mm	2,975	2,975
L Overall length	mm	7,720	8,260
Turning circle radius over outside bucket edge	mm	6,090	6,370
Breakout force (SAE)	kN	108	108
Tipping load, straight*	kg	10,500	8,600
Tipping load, fully articulated*	kg	9,300	7,600
Operating weight*	kg	14,100	14,350
Tyre size		20.5R25 L3	

* The figures shown include the above tyres, all lubricants, a full fuel tank, the ROPS/FOPS cab and the operator. Different tyres and optional equipment will change the operating weight and tipping load. (Tipping load, fully articulated according to ISO 14397-1)

** Actual bucket capacity may be approx. 10% larger than the calculation according to ISO 7546 standard. The degree to which the bucket can be filled depends on the material – see page 9.

¹⁾ The "Comfort safety door (open through 180°)" increases the value "H" to 130 mm when the door is open.

STD = Standard lift arm length

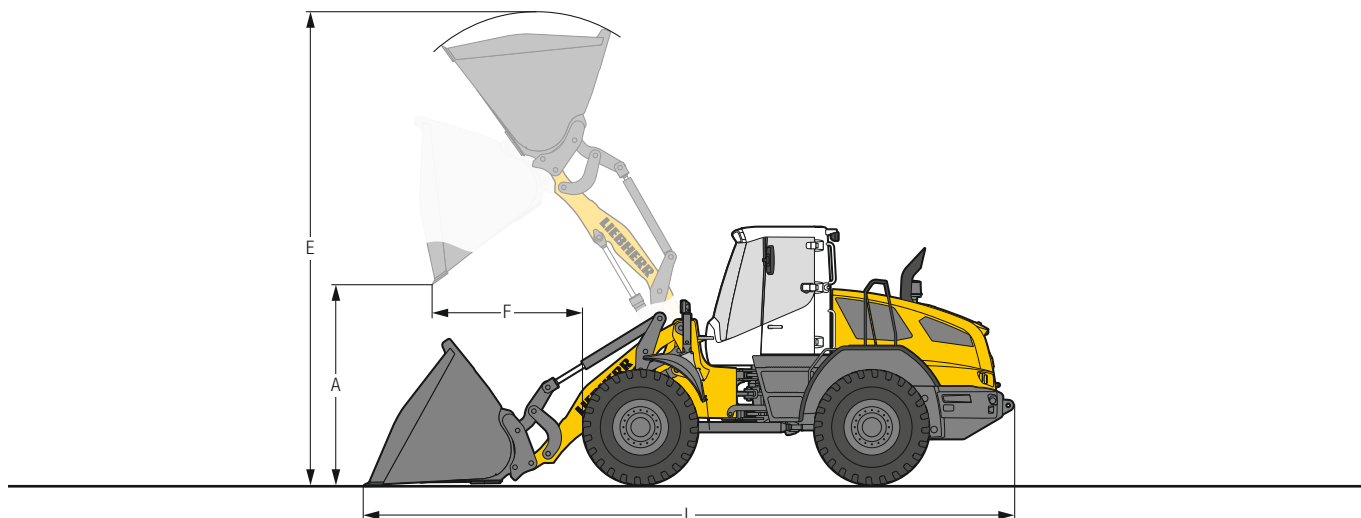
HL = High Lift

PK-QH = Parallel linkage incl. quick hitch

T = Welded-on tooth holder with add-on teeth

Attachment

Light Material Bucket



Heavy Material Density



		STD	HL
Geometry		PK-QH	PK-QH
Cutting tools		BOCE	BOCE
Bucket capacity	m ³	4.0	3.5
Specific material density	t/m ³	1.0	1.0
Bucket width	mm	2,700	2,700
A Dumping height at max. lift height	mm	2,490	3,140
E Max. operating height	mm	5,585	6,020
F Reach at maximum lift height	mm	1,360	1,230
L Overall length	mm	7,955	8,450
Tipping load, straight*	kg	10,000	8,200
Tipping load, fully articulated*	kg	8,900	7,300
Operating weight*	kg	14,300	14,650
Tyre size		20.5R25 L3	

Light Material Density



		STD	HL
Geometry		PK-QH	PK-QH
Cutting tools		BOCE	BOCE
Bucket capacity	m ³	6.5	5.5
Specific material density	t/m ³	0.5	0.5
Bucket width	mm	2,700	2,700
A Dumping height at max. lift height	mm	2,160	2,845
E Max. operating height	mm	5,995	6,410
F Reach at maximum lift height	mm	1,670	1,520
L Overall length	mm	8,420	8,860
Tipping load, straight*	kg	9,600	7,900
Tipping load, fully articulated*	kg	8,500	6,900
Operating weight*	kg	14,880	14,950
Tyre size		20.5R25 L3	

* The figures shown include the above tyres, all lubricants, a full fuel tank, the ROPS/FOPS cab and the operator. Different tyres and optional equipment will change the operating weight and tipping load. (Tipping load, fully articulated according to ISO 14397-1)

STD = Standard lift arm length

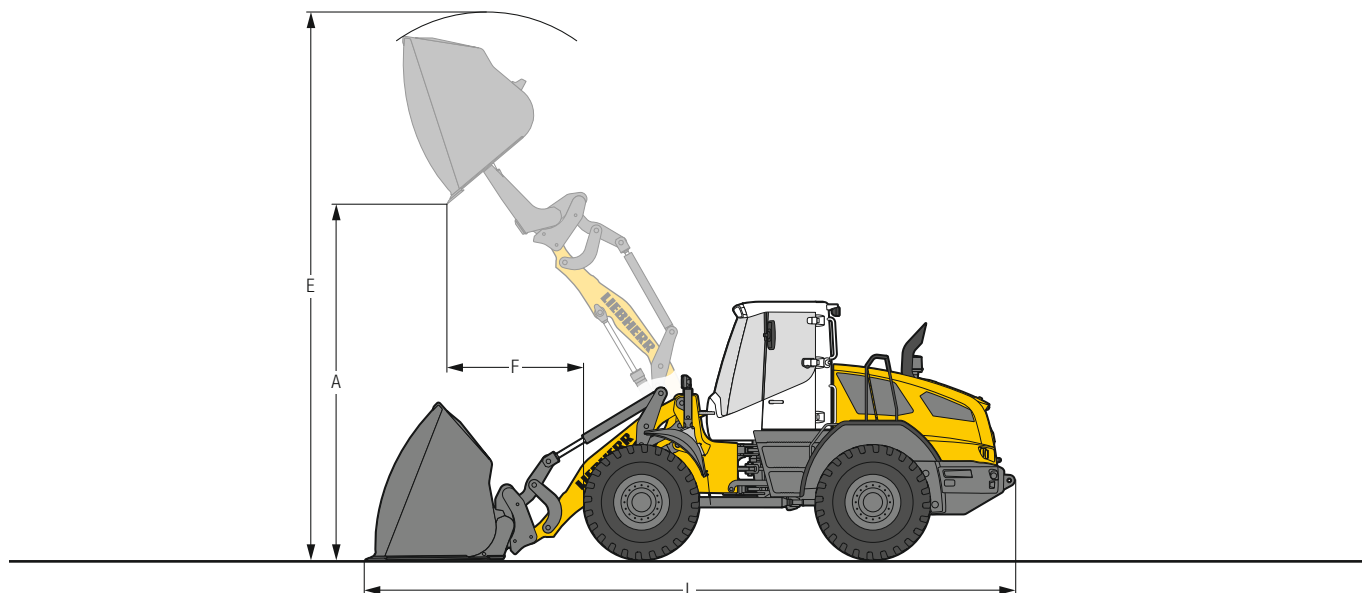
HL = High Lift

PK-QH = Parallel linkage incl. quick hitch

BOCE = Bolt-on cutting edge

Attachment

High-Dump Bucket



Heavy Material Density



		STD	HL
Geometry		PK-QH	PK-QH
Cutting tools		BOCE	BOCE
Bucket capacity	m ³	3.5	3.0
Specific material density	t/m ³	1.0	1.0
Bucket width	mm	2,700	2,700
A Dumping height at max. lift height	mm	4,560	5,320
E Max. operating height	mm	6,420	6,985
F Reach at maximum lift height	mm	1,460	1,250
L Overall length	mm	8,080	8,590
Tipping load, straight*	kg	9,000	7,300
Tipping load, fully articulated*	kg	7,900	6,500
Operating weight*	kg	15,130	15,290
Tyre size		20.5R25 L3	

Light Material Density



		STD	HL
Geometry		PK-QH	PK-QH
Cutting tools		BOCE	BOCE
Bucket capacity	m ³	6.0	5.0
Specific material density	t/m ³	0.5	0.5
Bucket width	mm	2,700	2,700
A Dumping height at max. lift height	mm	4,430	5,245
E Max. operating height	mm	6,880	7,325
F Reach at maximum lift height	mm	1,700	1,460
L Overall length	mm	8,305	8,760
Tipping load, straight*	kg	9,300	7,400
Tipping load, fully articulated*	kg	8,200	6,500
Operating weight*	kg	15,200	15,390
Tyre size		20.5R25 L3	

* The figures shown include the above tyres, all lubricants, a full fuel tank, the ROPS/FOPS cab and the operator. Different tyres and optional equipment will change the operating weight and tipping load. (Tipping load, fully articulated according to ISO 14397-1)

STD = Standard lift arm length

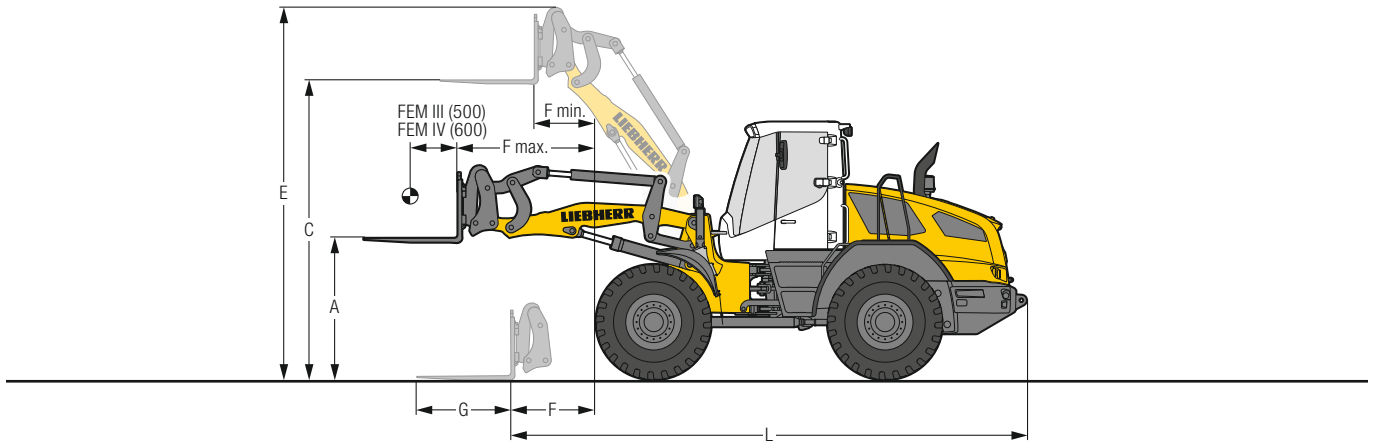
HL = High Lift

PK-QH = Parallel linkage incl. quick hitch

BOCE = Bolt-on cutting edge

Attachment

Fork Carrier and Fork



Fork Carrier and Fork

	Fork	FEM III	FEM III	FEM IV	FEM IV	
	Geometry	ZK-QH	PK-QH	ZK-QH	PK-QH	
	Lift arm length	mm	2,500	2,570	2,500	2,570
A	Lifting height at max. reach	mm	1,780	1,740	1,740	1,700
C	Max. lifting height	mm	3,740	3,740	3,700	3,705
E	Max. operating height	mm	4,664	4,664	4,695	4,700
F	Reach at loading position	mm	965	1,060	995	1,080
F max.	Max. reach	mm	1,660	1,700	1,640	1,680
F min.	Reach at max. lifting height	mm	710	735	690	715
G	Fork length	mm	1,200	1,200	1,200	1,200
L	Length – basic machine	mm	6,510	6,590	6,530	6,620
	Tipping load, straight*	kg	8,100	8,300	8,000	8,300
	Tipping load, fully articulated*	kg	7,200	7,400	7,100	7,300
	Recommended payload for uneven ground = 60% of tipping load, articulated¹⁾	kg	4,050	4,320	4,000	4,270
	Recommended payload for smooth surfaces = 80% of tipping load, articulated¹⁾	kg	5,000 ³⁾	5,000 ³⁾	5,200 ²⁾	5,700
	Operating weight*	kg	13,600	13,600	13,850	13,850
	Tyre size		20.5R25 L3		20.5R25 L3	

* The figures shown include the above tyres, all lubricants, a full fuel tank, the ROPS/FOPS cab and the operator. Different tyres and optional equipment will change the operating weight and tipping load. (Tipping load, fully articulated according to ISO 14397-1)

¹⁾ According to EN 474-3

²⁾ Payload is limited by tilt cylinder of Z-bar linkage

³⁾ Payload is limited by FEM III fork carrier and forks to 5,000 kg

ZK-QH = Z-bar linkage incl. quick hitch

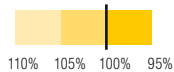
PK-QH = Parallel linkage incl. quick hitch

Bucket Selection

L 538 Speeder

Lift arm	Bucket	Capacity (m³)	Material density (t/m³)								
			0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
ZK	GPB	2.6 m³								2.9	2.6
	ZK-QH	GPB	2.3 m³							2.5	2.3
PK-QH	GPB	2.3 m³								2.5	2.3
	LMB	4.0 m³			4.4	4.0					
		6.5 m³	6.5								
	HDB	3.5 m³			3.9	3.5					
		6.0 m³	6.0								
	PK-QH-HL	GPB	2.3 m³						2.5	2.3	
LMB		3.5 m³			3.9	3.5					
		5.5 m³	5.5								
HDB		3.0 m³			3.3	3.0					
		5.0 m³	5.0								

Bucket Filling Factor



Lift Arm

ZK	Z-bar linkage, standard lift arm length
ZK-QH	Z-bar linkage with quick hitch, standard lift arm length
PK-QH	Parallel linkage with quick hitch, standard lift arm length
PK-QH-HL	Parallel linkage with quick hitch, High Lift

Bucket

GPB	General purpose bucket (Excavation bucket)
LMB	Light material bucket
HDB	High-dump bucket

Bulk Material Densities and Bucket Filling Factors

		t/m³	%			t/m³	%			t/m³	%
Gravel	moist	1.9	105	Earth	dry	1.3	115	Glass waste	broken	1.4	100
	dry	1.6	105		wet excavated	1.6	110		solid	1.0	100
	crushed stone	1.5	100	Topsoil		1.1	110	Compost	dry	0.8	105
Sand	dry	1.5	105	Basalt		1.95	100		wet	1.0	110
	wet	1.9	110	Granite		1.8	95	Wood chips/Saw dust		0.5	110
Gravel and Sand	dry	1.7	105	Sandstone		1.6	100	Paper	shredded/loose	0.6	110
	wet	2.0	100	Slate		1.75	100		recovered paper/cardboard	1.0	110
Sand/Clay		1.6	110	Bauxite		1.4	100	Coal	heavy material density	1.2	110
Clay	natural	1.6	110	Limestone		1.6	100		light material density	0.9	110
	dry	1.4	110	Gypsum	broken	1.8	100	Waste	domestic waste	0.5	100
Clay/Gravel	dry	1.4	110	Coke		0.5	110		bulky waste	1.0	100
	wet	1.6	100	Slag	broken	1.8	100				

Tipping Load



What is tipping load?

Load at centre of gravity of working equipment, so that the wheel loader just begins to tip over the front axle.

This is the most unfavourable static-load position for the wheel loader. Lifting arms horizontal, wheel loader fully articulated at centre pivot.

Pay load.

The pay load must not exceed 50% of the tipping load when articulated.

This is equivalent to a static stability-margin factor of 2.0.

Bucket capacity.

The bucket volume is determined from the pay load.

$$\text{Pay load} = \frac{\text{Tipping load, articulated}}{2}$$

$$\text{Bucket capacity} = \frac{\text{Pay load (t)}}{\text{Specific bulk weight of material (t/m}^3\text{)}}$$

Tyres



Tyre Types

	Size and tread code		Change of operating weight kg	Width over tyres mm	Change in vertical dimensions* mm	Use
L 538 Speeder						
Bridgestone	20.5R25 VJT	L3	17	2,480	8	Bulk material (firm ground conditions)
Continental	20.5R25 EM-Master	L3	156	2,480	26	Bulk material (firm ground conditions)
Goodyear	20.5R25 TL-3A+	L3	156	2,500	11	Sand, Gravel, Earthworks, Clay (all ground conditions)
Goodyear	20.5R25 RT-3B	L3	11	2,490	16	Gravel (all ground conditions)
Michelin	20.5R25 XTLA	L2	- 121	2,510	- 7	Gravel, Earthworks, Clay (all ground conditions)
Michelin	20.5R25 XHA2	L3	0	2,480	0	Sand, Gravel (all ground conditions)
Michelin	620/70R26 CereXBib 2		- 364	2,620	11	Green area (agricultural tractor)
Michelin	620/75R26 MegaXBib		- 318	2,600	68	Green area (agricultural tractor)
Michelin	750/65R26 MegaXBib		- 22	2,850	81	Green area (agricultural tractor)
Mitas	750/65R26 SFT		- 62	2,880	76	Green area (agricultural tractor)
Nokian	20.5R25 Hakkapeliitta	L2	- 114	2,490	6	Winter tyres, Gravel, Asphalt (all ground conditions)
Trelleborg	620/75R26 TM2000	L3	- 153	2,640	72	Green area (agricultural tractor)

* The stated values are theoretical and may deviate in practice.

Before operating the vehicle with tyre foam filling or tyre protection chains, please discuss this with the Liebherr-Werk Bischofshofen GmbH.

The Liebherr Wheel Loaders

Wheel Loader



		L 538 Speeder
Tipping load	kg	9,800
Bucket capacity	m³	2.6
Operating weight	kg	13,850
Engine output	kW / HP	168 / 228

10.20

Equipment



Basic Wheel Loader

Automatic central lubrication system	+
Battery main switch (lockable)	+
Electronic tractive force regulation for difficult ground conditions	•
Exhaust tail pipe in stainless steel	+
Travel light on front section halogen	•
Travel light on front section LED	+
Ride control	+
Parking brake	•
Fire extinguisher 6 kg	+
Fluff trap for radiator	+
Speed limitation 20 km/h as a factory preset	+
Speed limitation V_{max} adjustable key on the control unit	•
DEF tank	•
Pre-heat system for cold starting	•
Rear license panel light	+
Combined inching-braking system	•
Mudguard in plastic design	•
Steel mudguard	+
Steel fuel tank	+
Fuel pre-filter	•
Fuel pre-filter with pre-heating	+
Large-mesh radiator	+
Cooling water pre-heating 230 V	+
Multi-disc limited slip differentials in both axles	•
Liebherr biodegradable hydraulic oil	+
Reversible fan drive	+
Automatic delayed engine stop	+
Widening for mudguard	+
Guard for headlights	+
SCR technology incl. diesel particle filter	•
Auxiliary heater (Additional heating with engine preheating)	+
Lockable doors and engine hood	•
Air pre-cleaner TOP AIR	+
Toolbox with toolkit	+
Liebherr weighing system with "Truck Payload Assist" (cannot be calibrated)	+
Towing hitch	•



Equipment

Working hydraulics lockout	•
Automatic bucket return programmable	•
Stroke limit damping	+
Fork carrier and pallet forks	+
High-dump bucket	•
Automatic lift arm position and lowering programmable	•
Lift arm parallel linkage	+
Lift arm parallel linkage High Lift	+
Lift arm Z-bar linkage	•
Hydraulic quick hitch	+
Hydraulic quick hitch LIKJFIX	+
Adjustable tipping speed	•
Tilt cylinder protection	+
Loading buckets incl. a range of cutting tools	+
Light material bucket	+
Load holding valves	+
Float position	•
Visualisation of the equipment position	•
1st and 2nd electro-hydraulic, proportional additional function, adjustable delivery flow	+
1st and 2nd additional electro-hydraulic function for continuous sweeper and snow blower operation	+

Equipment



Operator's Cab

Adapter plate for additional fastening on the multi-function rail	•
Adaptive working lighting	+
Access assistance to facilitate cleaning windshield	•
Exterior mirror, electrical adjustable, with heating	+
Exterior mirror, tiltable and adjustable	•
Fold-out window left	+
Operating hour meter (integrated in display unit)	•
Operating hour meter (mechanic)	+
Electronical theft protection with code	+
Electronical theft protection with key with/without driver identification	+
Operator's cab without steering wheel/steering column (not available as street legal) – joystick steering only	+
Operator seat "Comfort" – air sprung with seat heating	•
Operator seat "Premium" – active air-suspension with seat air-condition, seat heating and headrest	+
Particle filter F7	•
Fire extinguisher in cab 2 kg	+
Rear window heated electrically	•
Audible horn control integrated into Liebherr control lever	+
Interior mirror left	+
Integral tyre pressure monitoring system	+
Joystick steering	+
Floor mat	•
Clothes hook	•
Air conditioning system	+
Automatic air conditioning system	+
Comfort safety door (open through 180°)	•
Cool box	+
Steering column height-adjustable	+
Steering column folding	•
LiDAT total use 1 year (for free)	•
Liebherr control lever with mini-joystick for 1st and 2nd electro-hydraulic, proportional additional function moving with operator's seat	+
Liebherr control lever moving with operator's seat (incl. travel direction)	•
Liebherr multi-lever control system moving with operator's seat (incl. travel direction)	+
Premiumdisplay (Touchscreen), with height adjustment and tilting function	•
Preparation for radio installation	+
Radio Liebherr "Comfort" (USB/AUX/BLUETOOTH/handsfree set)	+
Radio Liebherr "Standard" (USB/AUX)	+

- = Standard
- + = Option
- = not available



Operator's Cab

Amber beacon swiveling LED	+
Soundproof ROPS/FOPS cab	•
Bucket return with button integrated into Liebherr control lever	+
Wipe and wash system	•
Windscreen wiper single-sweep function with button	+
Headlights rear, single design, halogen/LED	+
Headlights rear, double design, halogen/LED	+
Headlights rear, triple design, LED	+
Headlights front, double design, halogen	•
Headlights front, double design, LED	+
Headlights activation (on the cab) for reverse travel	+
Sliding window right	•
Slipcover for operator seat	+
Sunblind front/rear	+
Power socket 12 V	•
Power socket USB	•
First aid kit	+
Preparation for protective ventilation and dust filtrating device	+
Wide angle mirror	+
Cigarette lighter	•
2-in-1 steering – changeable	+



Safety

Active personnel detection at the rear	+
Roof camera for front area monitoring (with Liebherr camera via Liebherr display)	+
Country-specific versions	+
Emergency steering system	•
Reversing obstruction detector	+
Back-up alarm acoustical/visual	+
Rear space monitoring with camera (with Liebherr camera via Liebherr display)	•
Skyview 360°	+

Here you can download our wheel loader brochures:



Further information can be found in the brochure "Assistance systems for wheel loaders" or you can find here:

