

V O L V O



Volvo Wheel Loaders 20.0-21.0 t

# L120H ELECTRIC CONVERSION

Volvo Construction Equipment

# L120H ELECTRIC CONVERSION

With the L120H Electric Conversion we are meeting your needs of a more sustainable solution in the mid-size range.



# An electric powerhouse

Strong, versatile and now available as an electric powerhouse. L120H Electric Conversion is providing a solution ready to fit into your work site today. The 20-ton machine uses conventional machine as the base, delivering the same performance with the upside of doing so emission free, with near silent operation and a much more comfortable work environment.



## Leading the charge

- Powered by 237 kWh batteries
- Runtime of 4-5 hours in light to medium duty applications
- Integrated on-board charger
- Fast charger (150 kW DC, CCS2 interface) up to 1.5 hours 0-100%
- Overnight charger (22kW AC) 10-12 hours 0-100%



## Standard features

- Comfort Drive Control
- Load Assist with On-Board Weighing
- Radar detection with Collision Mitigation System
- Supported by dedicated electromobility applications



## Serviceability

- Maintenance-free electric motor
- No engine-related components and maintenance requirements
- Ground-level service access



## A clean, smart choice

- No engine-related consumables
- A zero-emission, quiet power source that can work in low carbon zones
- Ability to work indoor and noise sensitive areas
- Work a full shift thanks to good autonomy and fast charge time

# Volvo L120H Electric Conversion in detail

## Electric / Electronic control system

<b>600 V system.</b> Electric conversion with 237 kWh battery pack.		
Electric motor		Parker GVM310
Max power	kW	203
Max torque	Nm	1 330
Battery type		Lithium-Ion NMC
Battery voltage	V	600
Battery capacity	kWh	237
	Ah	444
AC Charging capacity	kW	22
DC Charging capacity	kW	150

## Electrical System

<b>24 V Electrical system.</b> <b>Central warning system:</b> Co-Pilot and Contronic electrical system with central warning light and buzzer for following functions: - Serious high voltage system fault - Low steering system pressure - Interruption in communication (computer fault) Central warning light and buzzer with the gear engaged for the following functions. - Low coolant level - High coolant temperature - Low transmission oil pressure - High transmission oil temperature - Low brake pressure - Engaged parking brake - Fault on brake charging - Low hydraulic oil level - High hydraulic oil temperature - Overspeeding in engaged gear - High brake cooling oil temperature front and rear axles - Inverter temperature - Electric motor temperature - Main battery SOC - Main battery discharge warning.		
24 Volt System	V	24
Batteries	V	2 x 12
Battery capacity	Ah	2 x 170

## Drivetrain

<b>Torque converter:</b> Single-stage. <b>Transmission:</b> Volvo countershaft transmission with single lever control. Fast and smooth shifting of gears with Pulse Width Modulation (PWM) valve. <b>Transmission:</b> Volvo Automatic Power Shift (APS) with fully automatic shifting 1-4 and mode selector with 4 different gear shifting programs, including AUTO. Also equipped with Rimpull control to avoid wheel spin and optimize bucket filling. OptiShift transmission is also available as an option. <b>Axles:</b> Volvo fully floating axle shafts with planetary hub reductions and cast steel axle housing. Fixed front axle and oscillating rear axle. 100% differential lock on the front axle. Optional: Limslip rear.		
Transmission	Volvo	HTE 206C
Torque multiplication, stall ratio		2.47:1
Maximum speed, forward/reverse		
1st gear	km/h	7
2nd gear	km/h	13.5
3rd gear	km/h	28
4th gear	km/h	40
Note: 4th gear limited by ECU		
Measured with tires		750 / 65R25
Front axle/rear axle		AWB 31 / AWB 30
Rear axle oscillation	± °	13
Ground clearance	mm	460
at oscillation	°	130

## Steering System

<b>Steering system:</b> Load-sensing hydrostatic articulated steering. <b>System supply:</b> The steering system has priority feed from a load-sensing axial piston pump with variable displacement. <b>Steering cylinders:</b> Two double-acting cylinders.		
Steering cylinders		2
Cylinder bore	mm	80
Rod diameter	mm	50
Stroke	mm	486
Working pressure	MPa	21
Maximum flow	l/min	120
Maximum articulation	± °	40

## Cab

<b>Instrumentation:</b> All important information is centrally located in the operator's field of vision. Display for Contronic monitoring system. <b>Heater and defroster:</b> Heater coil with filtered fresh air and fan with auto and manual(11 speed) setting. Defroster vents for all window areas. <b>Operator's seat:</b> Operator's seat with adjustable suspension and retractable seatbelt. The seat is mounted on a bracket on the rear cab wall and floor. The forces from the retractable seatbelt are absorbed by the seat rails. <b>Standard:</b> The cab is tested and approved according to ROPS (ISO 3471, SAE J1040), FOPS (ISO 3449). The cab meets with requirements according to ISO 6055 (Operator overhead protection - Industrial trucks) and SAE J386 ("Operator Restraint System"). Refrigerant of the type R134a is used when this machine is equipped with air conditioning. Contains fluorinated greenhouse gas R134a, Global Warming Potential 1.430 t CO <sub>2</sub> -eq.		
Emergency exit: Use emergency hammer to break window		
Ventilation	m <sup>3</sup> /min	9
Heating capacity	kW	16
Automatic air conditioning	kW	7.5

## Service Refill

<b>Service accessibility:</b> Electrically openable engine hood with large opening angle giving excellent access to the electric powertrain compartment. A quick-fit adapter on the hydraulic tank provides faster hydraulic oil fill. Possibility to monitor, log and analyze data to facilitate troubleshooting.		
Hydraulic oil tank	l	133
Transmission oil	l	38
Axle oil front	l	36
Axle oil rear	l	41



### Hydraulic system

**System supply:** Two load-sensing axial piston pumps with variable displacement. The steering system always has priority.  
**Valves:** Double-acting 2-spool valve. The main valve is controlled by a 2-spool pilot valve.  
**Lift function:** The valve has four positions; raise, hold, lower and floating position. Inductive/magnetic automatic boom kickout can be switched on and off and is adjustable to any position between maximum reach and full lifting height.  
**Tilt function:** The valve has three functions including rollback, hold and dump. Inductive/magnetic automatic tilt can be adjusted to the desired bucket angle.  
**Cylinders:** Double-acting cylinders for all functions  
**Filter:** Full flow filtration through 10 micron (absolute) filter cartridge.

Working pressure maximum, pump 1 for working hydraulic system	MPa	29.0 ± 0.5
Flow at	l/min MPa	128 10
Working pressure maximum, pump 2 for steering-, brake-, pilot- and working hydraulic system	MPa	31.0 ± 0.5
Flow at	l/min MPa	128 10
Pilot system, working pressure	MPa	3.5
<b>Cycle times</b>		
Lift	s	5.4
Tilt	s	2.1
Lower, empty	s	2.5
Total cycle time	s	10

### Lift Arm System

Torque Parallel linkage (TP-linkage) with high breakout torque and parallel movement throughout the entire lifting range.

Lift cylinders		2
Cylinder bore	mm	150
Piston rod diameter	mm	80
Stroke	mm	676
Tilt cylinder		1
Cylinder bore	mm	210
Piston rod diameter	mm	110
Stroke	mm	412

### Brake system

**Service brake:** Volvo dual-circuit system with nitrogen charged accumulators. Outboard mounted hydraulically operated, fully sealed oil circulation cooled wet disc brakes. The operator can select automatic declutch of the transmission when braking by selecting the setting in the contronics.

**Parking brake:** Fully sealed, wet multi-disc brake built into the transmission. Applied by spring force and disengaged by external hydraulic pressure. The parking brake is activated and deactivated through a switch in the dashboard.

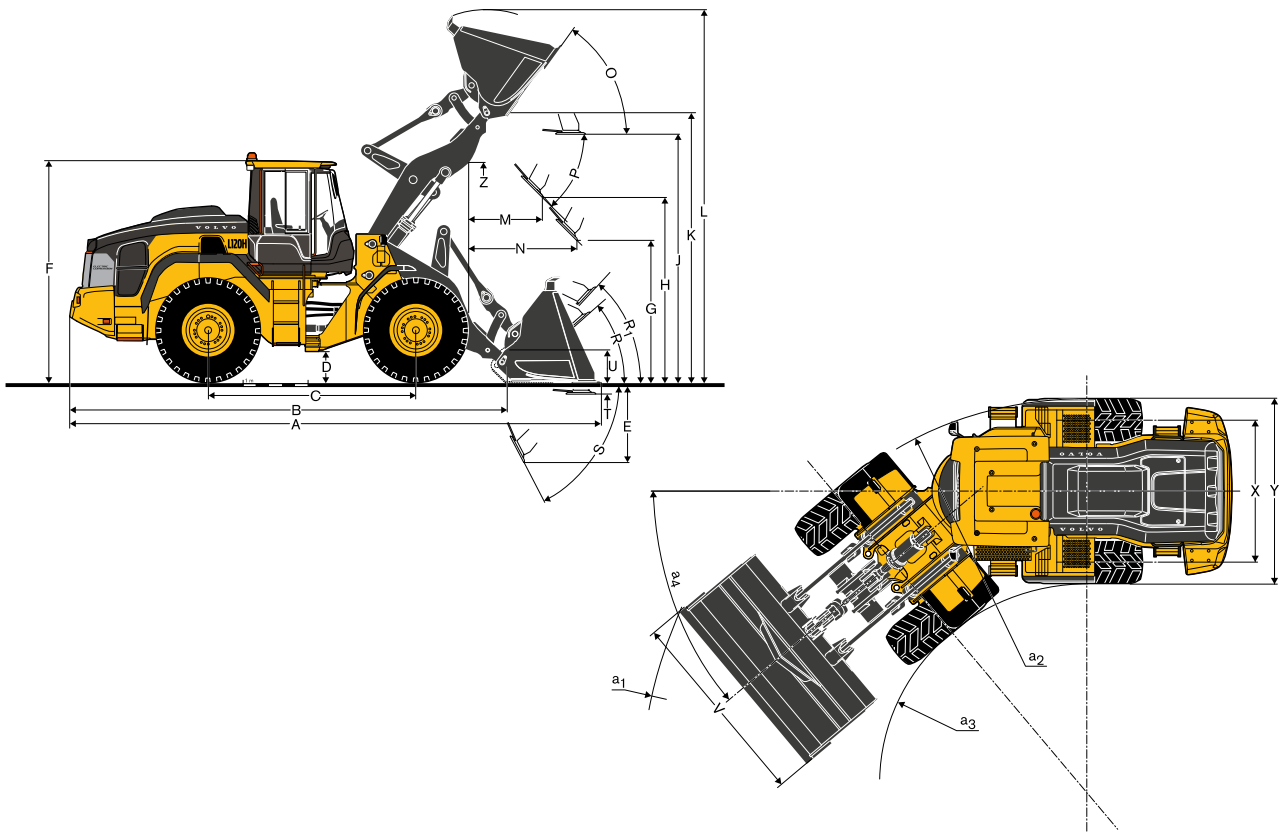
**Secondary brake:** Dual brake circuits with rechargeable accumulators. One circuit or the parking brake fulfills all safety requirements.

**Standard:** The brake system complies with the requirements of ISO 3450.

Number of brake discs per wheel front		1
Accumulators	l	3 x 10



# Specifications










Dimensions		L120H	
Tires 23.5 R25 L3		Standard boom	Long boom
B	mm	6 580	7 070
C	mm	3 200	3 200
D	mm	440	440
F	mm	3 380	3 380
G	mm	2 132	2 133
J	mm	3 760	4 310
K	mm	4 100	4 630
O	°	54	55
P <sub>max</sub>	°	50	49
R	°	42	42
R <sub>1</sub> *	°	45	50
S	°	68	64
T	mm	119	127
U	mm	450	640
X	mm	2 070	2 070
Y	mm	2 670	2 670
Z	mm	3 340	3 720
a <sub>2</sub>	mm	5 730	5 730
a <sub>3</sub>	mm	3 060	3 060
a <sub>4</sub>	±°	40	40

Standard boom with 3.3 m<sup>3</sup> STE H T bucket  
 Long boom with 2.6 m<sup>3</sup> STE P BOE bucket

\* Carry position SAE

Where applicable, specifications and dimensions are according to ISO 7131, SAE J732, ISO 7546, SAE J742, ISO 14397, SAE J818.






**L120H**

Tires 23.5R25 XHA2 L3		GENERAL PURPOSE				LIGHT MATERIAL		LONG BOOM*
								
		3.3 m³ STE P T	3.3 m³ STE H T	3.6 m³ STE P BOE	3.6 m³ STE H BOE	5.5 m³ LM H	9.5 m³ LM H	3.0 m³ STE H T
Volume, heaped ISO/SAE	m³	3.3	3.3	3.6	3.6	5.5	9.5	3.0
Volume at 110% fill factor	m³	3.6	3.6	4.0	4.0	6.1	10.5	3.3
Static tipping load, straight	kg	14 800	14 450	14 810	14 080	13 010	13 120	-2 680
at 35° turn	kg	13 120	12 790	13 110	12 430	11 440	11 510	-2 440
at full turn	kg	12 630	12 300	12 610	11 950	10 980	11 040	-2 370
Breakout force	kN	189.2	173.5	172.9	159.6	121.6	106.0	0
A	mm	8 230	8 340	8 050	8 160	8 610	8 910	+460
E	mm	1 380	1 480	1 230	1 330	1 730	1 990	-20
H	mm	2 780	2 700	2 900	2 830	2 480	2 270	+560
L	mm	5 700	5 760	5 750	5 820	5 900	6 070	+520
M	mm	1 310	1 390	1 190	1 280	1 560	1 760	-50
N	mm	1 840	1 880	1 800	1 840	1 890	1 910	+450
V	mm	3 000	3 000	3 000	3 000	3 000	3 400	0
a <sub>1</sub> clearance circle	mm	12 890	12 950	12 800	12 850	13 130	13 660	+410
Operating weight	kg	19 280	19 460	19 420	19 640	19 900	20 120	+240

\* Based on 3.0 m³ STE H T bucket

**Bucket Selection Chart**

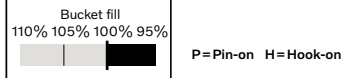
The chosen bucket is determined by the density of the material and the expected bucket fill factor. The actual bucket volume is often larger than the rated capacity, due to the features of the TP linkage, including an open bucket design, good rollback angles in all positions and good bucket filling performance. The example represents a standard boom configuration. Example: Sand and gravel. Fill factor ~ 105%. Density 1.6 t/m³. Result: The 3.4 m³ bucket carries 3.6 m³. For optimum stability always consult the bucket selection chart.

Material	Bucket fill, %		Material density, t/m³	ISO/SAE bucket volume, m³	Actual volume, m³
Earth/Clay	~ 110		1.8	3.3	3.6
			1.6	3.6	3.9
Sand/Gravel	~ 105		1.8	3.3	3.5
			1.6	3.6	3.8
Aggregate	~ 100		1.8	3.8	3.8
			1.6	3.8	3.8
Rock	≤100		1.7	3.0	3.0

The size of rock buckets is optimized for optimal penetration and filling capability rather than the density of the material.

Type of boom	Type of bucket	ISO/SAE Bucket volume	L120H Material density (t/m³)								
			0.8	1.0	1.2	1.4	1.6	1.8	2.0		
Standard boom	General purpose	P 3.3 m³									
		H 3.3 m³									
		P 3.6 m³									
		H 3.6 m³									
Standard boom	Light material	H 5.5 m³									
		H 9.5 m³									
Long boom	General purpose	P 3.3 m³									
		P 3.6 m³									
	Light material	H 5.5 m³									

How to read bucket fill factor



# Equipment

## STANDARD EQUIPMENT

### Wheels and tires

23.5R25\* BR VJT L3

Rims 25-19,50/2,5 3-piece

### Drivetrain

Rimpull control

Steering, secondary

Optishift with lockup, RBB

Hand throttle control

### Electrical System

#### Lighting:

LED Power Package

Reverse warning light, Strobe

Warning Beacon, LED

Working lights, Attachment LED

Headlights, asymmetrical, Right LED

Side marker lamps

Warning Beacon, LED

Reverse alarm, White noise

Rearview mirrors, el. adjusted & heated

Max Boom height

Emergency Stop

#### Co-Pilot:

Co-Pilot including Camera & On-Board Weighing Hardware

On-Board Weighing Software

Radar Detect System

Collision Mitigation System (CMS)

Operator Coaching Start

Operator Coaching Advanced

### Hydraulic System

Hydraulic 3rd functions

Separate attachment locking, Std boom

Boom Suspension System, BSS

### Brake system

Oil cool and filter, front/rear axle

### Cab

Automatic Climate Control, ACC with standard condenseur

Operator's seat, Premium Comfort ISRI 3-point seat belt

DAB Radio

Subwoofer

Timer cab heating

Comfort Drive Control, CDC

Remote door opener

Steering wheel knob

Parking brake alarm, audible

Anchorage manual

## STANDARD EQUIPMENT

### Service and maintenance

Lube System for Attachment bracket

Lube System

CareTrack, Global

CareTrack Subscription

Tool kit

Wheel nut wrench kit

### Protective equipment

Cover Plates, rear frame

Cover Plate front/rear axle

### External equipment

Attachment bracket VAB-STD cast

Footsteps front frame

Mudguards, full cover, rear for 80-serie

Mudguards, full cover, steel front 80 pro

Mudflap kit, full cover 80 pro

### Other equipment

Noise reduction kit, EU excl. Decal

License plate holder, lighting

Sign, 50 km/h

Sound decal, EU

CE-marking

On road plate EU

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