

Toro[®] LH209L

Safer.

Stronger.

Smarter.



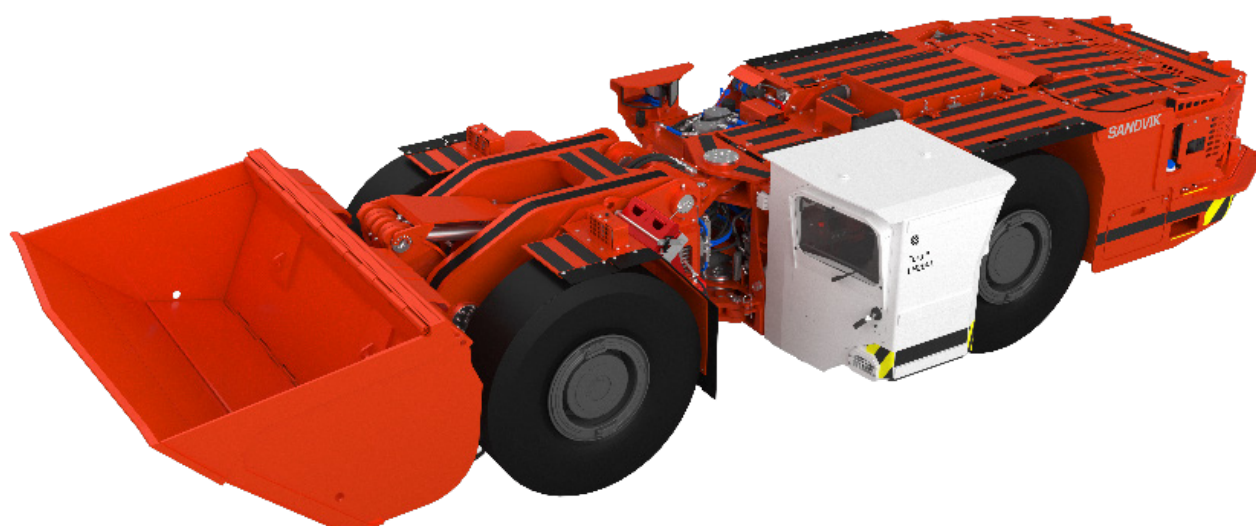
Technical specification

Toro® LH209L

Toro® LH209L loader by Sandvik is a low profile loader with the largest payload capacity, 9 600 kg. Toro® LH209L is a proven and reliable loader, providing excellent performance in low profile applications, as the 1690 mm canopy height enables operations at 1.8 meter working heights.

Toro® LH209L focuses on operator safety and features an enhanced boom support system, which is optimized to provide the highest in class breakout forces for easy loading and fast bucket filing and handling of oversized rocks.

To reduce emissions and increase operator comfort, Toro® LH209L can be equipped with a Euro Stage V engine by Volvo Penta and a closed cabin.



Capacities	
Maximum tramming capacity	9 600 kg
Break out force, lift	20 160 kg
Break out force, tilt	17 540 kg
Standard bucket	4.6 m ³

Speeds forward & reverse (level/loaded) with Volvo Tier 3 engine	
1st gear	4.1 km/h
2nd gear	7.6 km/h
3rd gear	12.8 km/h
4th gear	20.8 km/h

Bucket motion times	
Raising time	6.5 sec
Lowering time	4 sec
Dumping time	1.5 sec

Operating weights*	
Total operating weight	25 800 kg
Front axle	12 200 kg
Rear axle	13 600 kg

Loaded weights*	
Total loaded weight	35 400 kg
Front axle	26 600 kg
Rear axle	8 800 kg

*Unit weight depends on selected options

Operational conditions and limits

Environmental temperature	From -20°C to +50°C
Standard operating altitude	Below 2 500 m

Requirements and compliance

Compliance with 2006/95/EC Low voltage directive
Compliance with 2004/108/EC Electromagnetic compatibility directive
Compliance with 2006/42/EC Machinery directive (Equipment for EU area, achieved with relevant options)
Design based on EN 1889-1. Machines for underground mines. Mobile machines working underground. Safety. Part 1: Rubber tired vehicles.
Electrical system based on IEC 60204-1. Safety of machinery – Electrical equipment of machines – Part 1: General requirements
Contains fluorinated greenhouse gases (closed cabin option) Refrigerant R134a under pressure max 38 bar/550 PSI: Filled weight: 2,000 kg CO ₂ e: 2,860 tons GWP: 1430 Information based on the F Gas Regulation (EU) No 517/2016

Standard engine

Diesel engine	Volvo TAD851VE Euro Stage 3A
Output	185 kW @ 2200 rpm
Torque	1160 Nm @ 1350 rpm
Number of cylinders	6
Displacement	8 l
Cooling system	Nissens Cooler
Combustion principle	Compression Ignition
Air filtration	Donaldson Powercore
Electric system	24 V
Emissions	Euro Stage III A
Exhaust system	Muffler integrated DOC Diesel Oxidation Catalyst
Average fuel consumption at 40 % load	21.4 l/h
Fuel tank refill capacity	308 l
Compatible with paraffinic diesel fuel (EN 15940)	Yes

Converter

Dana C5000 Series

Transmission

Power shift transmission with modulation.	Dana RT14, with integrated speed sensor, electrical gear shift control, four gears forward and reverse
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Axles

Front axle	Kessler D101, Spring applied hydraulically released brakes, Limited-slip differential, fixed
Rear axle	Kessler D101, Spring applied hydraulically released brakes, Limited-slip differential, oscillating

Tires

Tire size (Tires are application approved. Brand and type subject to availability.)	20.5 R25
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Hydraulics

Magnetic door switch for brakes and boom, bucket, and steering hydraulics
Oil cooler for hydraulic and transmission oil
ORFS and SAE fittings and hoses
Hydraulic oil tank capacity, 320 l
Sight glass for oil level, 2 pcs

Steering hydraulics

Hydraulically operated, center-point articulation, power steering with two double acting cylinders. Steering controlled by electro-hydraulic joystick. Interlock protection.	
Steering hydraulic cylinders	100 mm, 2 pcs
Steering main valve	Open center type
Steering pump	Gear type
Steering and servo hydraulic pumps	No additional steering pump or separate servo hydraulic pump

Bucket hydraulics

The oil flow from steering hydraulic pump is directed to bucket hydraulics when steering is not used.	Joystick bucket and boom control (electro-hydraulic), equipped with gear pump that delivers oil to the bucket hydraulic main valve.
Boom system	z-link
Lift cylinders	180 mm, 2 pcs
Dump cylinder	160 mm, 2 pcs
Main valve	Open center type
Pump for bucket hydraulics	Gear type

Brakes

Service brakes are spring applied; hydraulically released multidisc wet brakes on all wheels. Two independent circuits: one for the front and one for the rear axle. Service brakes also function as an emergency and parking brake. Brake system performance complies with requirements of EN ISO 3450, AS2958.1 and SABS 1589.	
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Automatic brake activation system, ABA
Bosch Rexroth brake block
Neutral brake
Electric 2,2 kW emergency brake release pump

Cabin (Cabin option replaces the standard canopy)

7" display
Adjustable joysticks
Air conditioning unit located outside the cabin to reduce noise inside the cabin
Cabin mounted on rubber mounts to the frame to reduce vibrations
Laminated glass windows
Magnetic door switch
ROPS certification according to EN ISO 3471
FOPS certification according to EN ISO 3449
Sealed, air conditioned, over pressurized, noise suppressed closed cabin
Seat belt indicator
Sound absorbent material to reduce noise

Canopy (Standard)

7" display
12 V output for communication radio connection
Adjustable joysticks
Emergency exit
Floor washable with water to reduce dust
Inclinometers to indicate operating angle
ROPS certification according to EN ISO 3471
FOPS certification according to EN ISO 3449
Magnetic door switch
Remote circuit breaker switch
Seat belt indicator
Three-point contact access system with replaceable and colour coded handles and steps

Operator's seat

Adjustment according to the operator's weight
Adjustable lumbar support
Height adjustment
Mechanical seat suspension
Padded and adjustable arm rests
Two-point seat belt

Control system, dashboard and displays

Symbols, critical alarms and warning lights in display
Instrument panel with 7" Epec display, adjustable contrast and brightness and illuminated switches

Measured vibration level

Whole body vibration was determined while operating the loader in a simulated working cycle consisting of loading, unloading and driving with and without load. The value is determined applying standards EN 1032 and ISO 2631-1.

Maximum r.m.s.value a_w [m/s ²]	0.48
VDV _w over 15 min period [m/s ^{1.75}]	5.3

Measured sound level

The sound pressure level and sound power level at the operator's compartment (open canopy) have been determined in stationary conditions on high idle and at full load, with Stage 3 engine by Volvo.

Sound pressure level L_{pa} [db re 20 μ pa]	81dB
Sound power level L_{WA} [dB re 1 p W]	119 dB

Illumination

Illuminance E_{av} with 4 pieces of LED lights at a distance of 20 m in front of the loader:	Low beam (28 W): 3 lights E_{av} : 14.04 lx
	High beam (50W): 1 light E_{av} : 14.76 lx
Illuminance E_{av} with 4 pieces of LED at a distance of 20 m behind the loader:	Reverse (28W): 4 lights E_{av} : 25.62 lx

Toro® LH209L is compliant with South African Mine health and safety act 29 of 1996, because average light intensity in the direction of travel is more than 10 lux at a distance of 20 m.

Rear and front frame

Welded structure, high strength steel
Central hinge with adjustable upper bearing
Centralized automatic lubrication

Options

ANSUL® Fire suppression system
CE Declaration of Conformity
Diesel Particulate Filter (DPF) Exhaust System
Direct Feed for Beacon
Electric filling pump
Proximity Detection System Interface (stand alone)
Rear tanks with wear plates
Spare rim 14.00-25/1.5 (for tires 17.5R25)
Spare wheel 17.5-25, 20 ply L5S
Starter motor isolator
Wheel chocks in front left mudguard

Optional engine	
Diesel Engine	Volvo TAD881VE Euro Stage V
Output	185 kW @ 2200 rpm
Emissions	Euro Stage V
Ventilation Rate (Ultra low sulphur fuel, AdBlue)	CANMET 4,2 m ³ /s MSHA 8,500 CFM
Particulate Index (Ultra low sulphur fuel, AdBlue)	MSHA 500 CFM
Average estimated fuel consumption at 40% load	19 l/h
Compatible with paraffinic diesel fuel (EN 15940)	Yes

Standard manuals	
Operator's Manual	English and other EU languages*
Maintenance Manual	English and other EU languages
MySandvik	Electronic manual interface
Parts Manual	English
Service and Repair Manual	English
ToolMan	2 × USB sticks in pdf format, includes all the manuals
Safety labels	English

* Some languages require a software update to install

Main components	
Alternator	28 V, 110 A
Batteries	2 × 12V
Starter	5.5 kW, 24 V
Driving and working lights	LED lights: 4 pcs in front (1 mounted to canopy) 4 pcs in rear (1 mounted to canopy)
Parking, brake and indicator (blinkers) lights	LED lights: 2 pcs in front 2 pcs in rear
Reverse alarm	
Flashing beacon	

Fire safety	
Portable fire extinguisher, 12 kg	
Hot side - cold side design	
Heat insulation on exhaust manifold, turbo, and isolated exhaust pipe	

Energy isolation	
Lockable main switch, ground level access	
Emergency stop push buttons according to EN ISO 13850	
Pressure release in the radiator cap	
Automatic discharge for pressure accumulators (brake system and pilot circuit)	
Frame articulation locking device	
Mechanical boom locking device	
Wheel chocks and brackets	

Available buckets			
Type	Volume	Width	Max. material density
G.E.T. (standard)*	4.6 m ³	3000 mm	1950 kg/m ³
G.E.T. **	4.6 m ³	3110 mm	1950 kg/m ³
Ejector with G.E.T.***	4.0 m ³	2960 mm	2050 kg/m ³

*Shark Series 2 Blue Pointer G.E.T. abrasion system

**Half Arrow

***Bare Lip

Grade performance *3% rolling resistance assumed**Volvo TAD851VE Stage 3A 185kW/2200 rpm****Empty**

Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	4.2	4.1	4.0	3.9	3.9	3.8	3.7	3.7	3.6	3.5
2nd gear (km/h)	7.8	7.5	7.3	7.1	6.9	6.7	6.5	6.3	5.9	5.4
3rd gear (km/h)	13.1	12.5	11.9	11.3	10.5	9.4	7.7	6.7		
4th gear (km/h)	21.8	19.9	17.2	13.1						

Loaded

Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	4.1	4.0	3.9	3.8	3.7	3.7	3.6	3.5	3.4	3.3
2nd gear (km/h)	7.6	7.3	7.1	6.8	6.5	6.2	5.7	5.2	4.4	3.6
3rd gear (km/h)	12.8	12.0	11.1	9.7	8.0	6.3				
4th gear (km/h)	20.8	17.4	12.0							

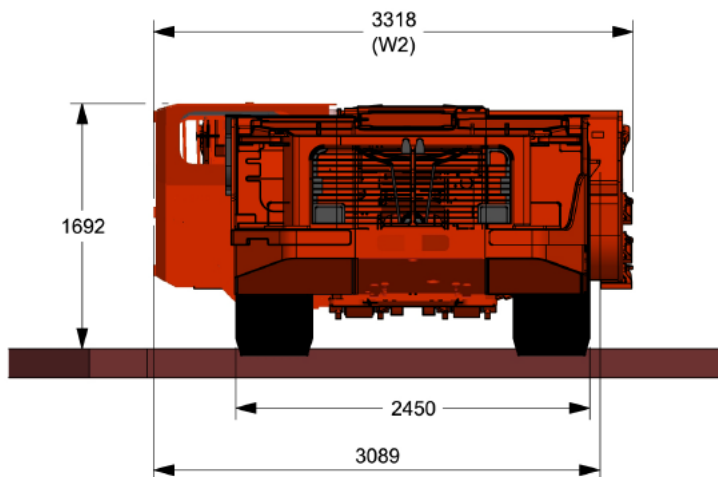
Grade performance *3% rolling resistance assumed**Volvo TAD881VE Stage 5 185kW22 rpm****Empty**

Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	4.3	4.2	4.1	4.0	3.9	3.9	3.8	3.7	3.7	3.6
2nd gear (km/h)	8.0	7.7	7.4	7.2	7.0	6.8	6.5	6.3	5.9	5.4
3rd gear (km/h)	13.4	12.6	12.0	11.3	10.5	9.4	7.7	6.7		
4th gear (km/h)	22.0	20.0	17.2	13.1						

Loaded

Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	4.2	4.1	4.0	3.9	3.8	3.7	3.6	3.6	3.5	3.3
2nd gear (km/h)	7.8	7.4	7.1	6.9	6.6	6.2	5.7	5.2	4.4	3.6
3rd gear (km/h)	13.0	12.0	11.1	9.7	7.9	6.3				
4th gear (km/h)	20.9	17.4	12.0							

Dimensions			
	Standard		
Bucket alternatives (m³)	4.6 m³	4.6m³	4.0 m³
	G.E.T.	Half Arrow	Ejector
	1.9 t/m ³	1.9 t/m ³	2.0 t/m ³
L1 (mm)	9800	9916	9721
L2 (mm)	9361	9464	9344
L3 (mm)	9389	9472	9364
L4 (mm)	2208	2310	2190
L5 (mm)	1424	1487	1382
L6 (mm)	2179	2288	2120
L7 (mm)	2055	2160	1989
H1 (mm), canopy	898	970	839
H2 (mm)	1636	1683	1578
H3 (mm)	1702	1612	1744
H4 (mm)	3113	3095	3125
H5 (mm)	4046	4078	4063
H6 (mm)	4691	4705	4635
H7 (mm)	204	202	206
W1 (mm)	3000	3116	2960
W2 (mm)	3318	3255	3275
R1, innter turn radius (mm)	3053	3053	3053
R2, outer turn radius (mm)	6897	6994	6851
T1, min. tunnel width (mm)	4738	4835	4692
T2, tunnel width (mm)	3983	4081	3938



Dimensions

The dimensions are indicative only

