SANDVIK

Toro® LH208L

Safer.
Stronger.
Smarter.



Technical specification

Toro® LH208L

Toro® LH208L is a 7.7 tonne capacity underground loader designed to work in low-profile mining applications. The small envelope size and turning radius enable easy navigation in confined spaces. The loader's low-profile design enables operation in mine sections with headroom as low as 1.8 meters.

Toro® LH208L is equipped with Volvo TAD552VE diesel engine, Dana transmission and Kessler axles. The control system allows for easy troubleshooting and provides alarms and warnings on the display.

The ROPS and FOPS certified operator's compartment provides protection for the operator and efficient LED lights improve visibility. Proximity Detection System Interface for a third-party PDS is available as an option.



Capacities	
Maximum payload capacity	7 700 kg
Break out force, lift	12 230 kg
Break out force, tilt	10 400 kg
Standard bucket	3.3 m³

Speeds forward & reverse (level/loaded) with Volvo TAD552VE	
1st gear	4.1 km/h
2nd gear	7.6 km/h

Bucket motion times	
Raising time	4.0 sec
Lowering time	2.8 sec
Dumping time	4.4 sec

Operating weights	
Total operating weight	20 900 kg
Front axle	8 800 kg
Rear axle	12 100 kg

Loaded weights	
Total loaded weight	28 600 kg
Front axle	20 250 kg
Rear axle	8 350 kg

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
Design based on EN 1889-1. Machines for underground mines. Mobile machines working underground. Safety. Part 1: Rubber tyred vehicles.
Electrical system based on IEC 60204-1. Safety of machinery – Electrical equipment of machines – Part 1: General requirements

Engine	
Diesel engine	Volvo TAD552VE
Output	160 kW @ 2 200 rpm
Torque	910 Nm @ 1 450 rpm
Number of cylinders	In-line 4
Displacement	5.13 l
Cooling system	Liquid cooled
Combustion principle	4-stroke, turbo with intercooler
Air filtration	Two Stage filtration, dry type
Electric system	24 V
Emissions	Tier III
Exhaust system	Double wall exhaust pipe with catalytic purifier/muffler
Average fuel consumption at 40 % load	17 l/h
Fuel tank refill capacity	230 l
Compatible with paraffinic diesel fuel (EN 15940)	Yes

Converter
Dana C3000 series

Transmission	
Power shift transmission with modulation	Dana RT14 series, electrical gear shift control, two gears forward and reverse

Axles	
Front axle	Kessler D91, Spring applied hydraulically released brakes, limited slip differential, fixed
Rear axle	Kessler D91, Spring applied hydraulically released brakes, no-spin differential, oscillating ±4

Tires	
Tire size (Tires are application approved. Brand and type subject to availability.)	17.5 × 25 34 PLY L5S

Hydraulics
Filling pump for hydraulic oil
Door interlock 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 200 l
Sight glass for oil level

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

Bucket hydraulics	
Joystick for bucket and boom control, equipped with piston pump that delivers oil to the bucket hydraulic main valve. The oil flow from steering hydraulic pump is directed to bucket hydraulics when steering is not used.	
Boom system	Straight boom
Lift cylinders	180 mm, 2 pcs
Dump cylinder	180 mm, 1 pc
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.
Automatic brake activation system, ABA
Electric 2,2 kW emergency brake release pump
Neutral brake

Canopy
ROPS certification according to EN ISO 3471
FOPS certification according to EN ISO 3449
Adjustable joysticks
No high pressure hoses in the operator's compartment
Inclinometers to indicate operating angle
Emergency exit
Floor washable with water to reduce dust
Three-point contact access system with replaceable and colour coded handles and steps
Remote circuit breaker switch

Control system, dashboard and displays
Critical warnings and alarms displayed as text and with light
7" display with touch screen function an adjustable contrast and brightness
Supports 3G, 4G, LTE and WLAN data transfer

Operator's seat
Low frequency suspension
Height adjustment
Adjustment according to the operator's weight
Fore-aft isolation
Padded and adjustable arm rests
Adjustable lumbar support
Four-point seat belt with indicator and harness

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]	0.58
VDV_w over 15 min period [$m/s^{1.75}$]	6.45

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 engine Volvo TAD552VE.	
Sound pressure level L_{pA} [dB re 20 µPa]	91 dB
Sound power level L_{WA} [dB re 1 p W]	116 dB

Rear and front frame
Welded steel construction
Central hinge with adjustable upper bearing
Tanks welded to rear frame
Centralized manual lubrication

Illumination	
Illuminance E_{av} with 3 pieces of LED lights at a distance of 20 m in front of the loader:	
E_{av}	21,25 lx
Illuminance E_{av} with 5 pieces of LED at a distance of 20 m behind the loader:	
E_{av}	12,24 lx
Toro® LH208L 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.	

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

Main components	
Alternator	28 V, 110 A
Batteries	2 × 12 V
Starter	5.5 kW, 24 V
Driving lights	LED lights: 2 pcs in front 4 pcs in rear 2 pcs in canopy (1 front, 1 rear)
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, 6 kg
Hot side – cold side design
Heat insulation on exhaust manifold, turbo, and isolated exhaust pipe

Standard manuals	
Operator's Manual	English and other EU languages
Maintenance Manual	English and other EU languages
Parts Manual	English
Service and Repair Manual	English
E-manuals	2 × USB stick in pdf format, includes all the manuals
Decals	English

Options
ANSUL Check Fire
ANSUL LVS Fire suppression system, manual activation and auto engine shut down
Integrated weighing system
Diesel particle filter (DPF) exhaust system
Direct feed for beacon
No-spin front axle (not available with TCS-system)
Proximity Detection System Interface
Spare rim 14.00-25/1.5 (for tyres 17.5R25)
Spare wheel 17.5-25, 34 ply L5S
Starter isolator
Traction control system (TCS)
Wheel chocks

Optional engine	
Diesel engine	Volvo TAD582VE
Output	160 kW @ 2 300 rpm
Torque	925 Nm @ 1 380 rpm
Number of cylinders	In-line 4
Displacement	5.13 l
Cooling system	Liquid cooled
Combustion principle	4-stroke, turbo with intercooler
Air filtration	Two Stage filtration, dry type
Electric system	24 V
Emissions	Stage V
Exhaust system	Double wall exhaust pipe with catalytic purifier/muffler

Available buckets			
Type	Volume	Width	Max. material density
G.E.T. Half Arrow (standard)	3.3 m^3	2676 mm	2330 kg/m^3
G.E.T. Half Arrow	3.5 m^3	2676 mm	2150 kg/m^3
G.E.T. Half Arrow	3.8 m^3	2776 mm	1900 kg/m^3
Ejector	2.8 m^3	2676 mm	3300 kg/m^3

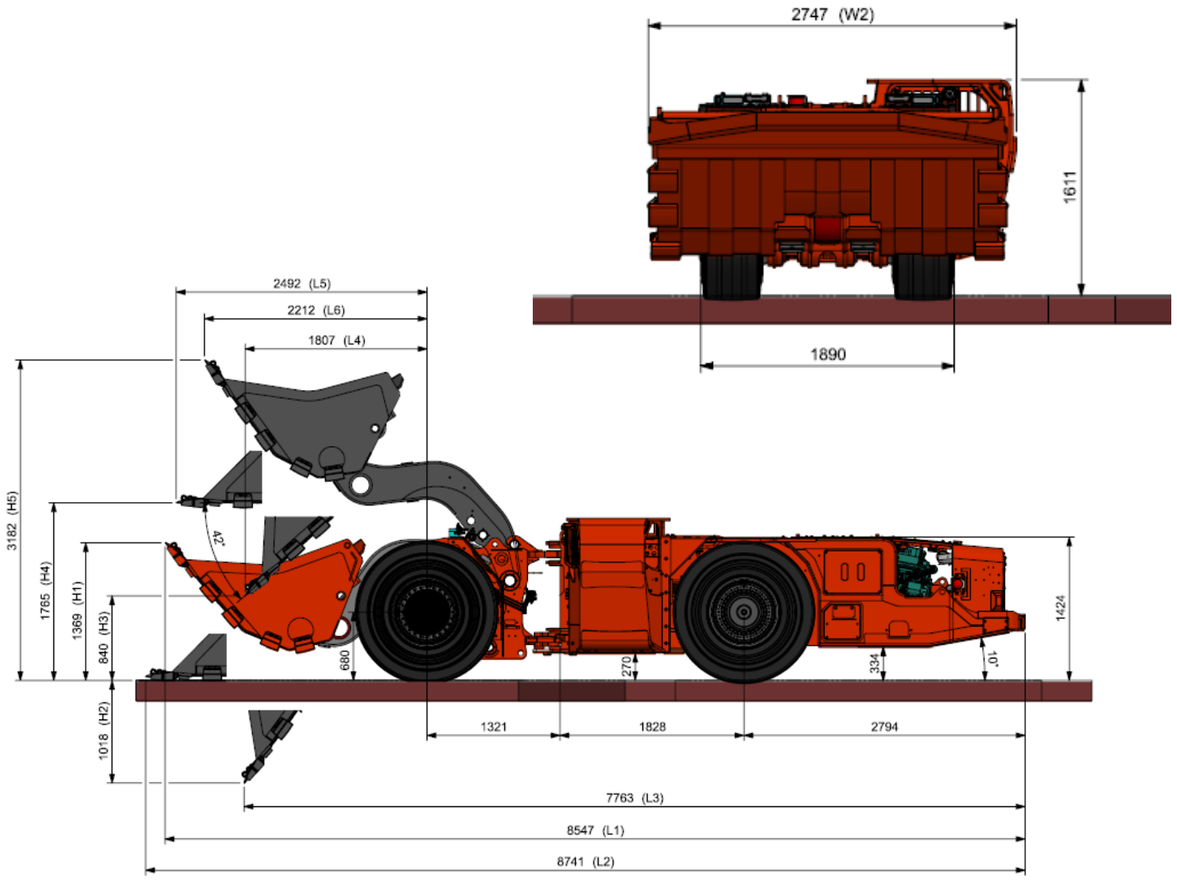
Grade performance										
Volvo TAD552VE Tier III (3% rolling resistance assumed)										
Empty										
Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	4.2	4.0	3.9	3.9	3.8	3.7	3.6	3.6	3.5	3.4
2nd gear (km(h)	7.7	7.4	7.2	6.9	6.7	6.5	6.3	6.2	5.9	5.4
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	3.8	3.7	3.7	3.6	3.5	3.4	3.3	3.3
2nd gear (km(h)	7.6	7.2	6.8	6.6	6.4	6.1	5.7	5.2	4.4	3.6

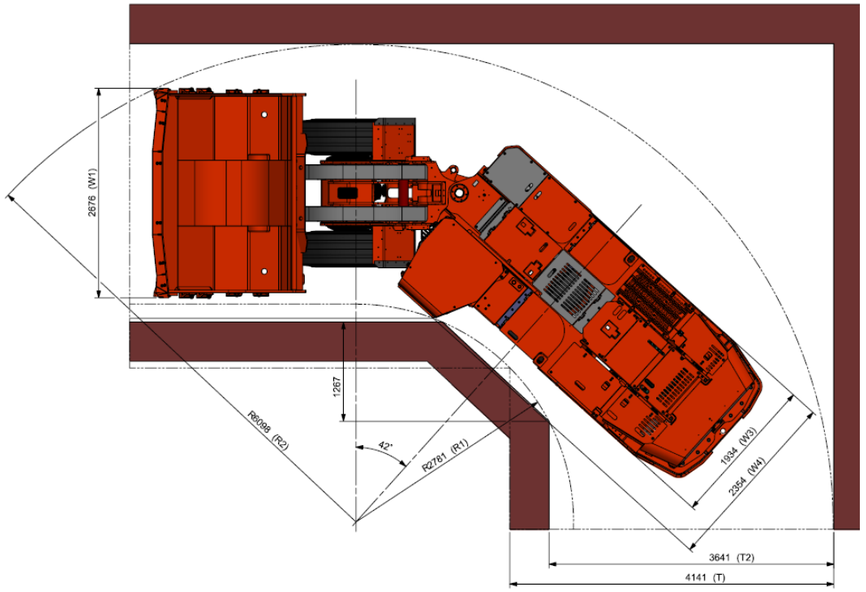
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Grade performance										
Volvo TAD582VE Stage V (3% rolling resistance assumed)										
Empty										
Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	4.2	4.0	4.0	3.9	3.8	3.7	3.7	3.6	3.5	3.4
2nd gear (km(h)	7.7	7.5	7.2	6.9	6.7	6.6	6.4	6.2	5.9	5.5
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	3.6	3.5	3.4	3.4	3.3
2nd gear (km(h)	7.6	7.2	6.9	6.6	6.4	6.2	5.8	5.3	4.6	3.8

Dimensions with 3.3 m³ G.E.T. bucket (standard)

The dimensions are indicative only





Dimensions				
	Standard			
Bucket alternatives (m³)	3.3 m³	3.5 m³	3.8 m³	2.8 m³
Lip plate type	G.E.T. Half Arrow	G.E.T. Half Arrow	G.E.T. Half Arrow	Ejector
L1 (mm)	8547	8569	8573	8569
L2 (mm)	8741	8766	8774	8766
L3 (mm)	7763	7821	7828	7821
L4 (mm)	1807	1934	1942	1934
L5 (mm)	2492	2522	2531	2522
L6 (mm)	2212	2134	2135	2134
H1 (mm)	1369	1403	1410	1403
H2 (mm)	1018	1025	1029	1025
H3 (mm)	840	795	792	795
H4 (mm)	1765	1560	1562	1560
H5 (mm)	3182	3308	3316	3308
W1 (mm)	2676	2676	2776	2676
W2 (mm)	2750	2750	2799	2750
R1, left turn (mm)	2781	2781	2781	2781
R2, left turn (mm)	6098	6107	6151	6107
T, left turn (mm)	4141	4141	4184	4141
R1, right turn (mm)	2994	2994	2946	2994
R2, right turn (mm)	6233	6108	6153	6108
T, right turn (mm)	4126	3990	4070	3990