

Toro[®] LH307

Safer.

Stronger.

Smarter.



Technical specification

Toro[®] LH307

Toro[®] LH307 is a 7 tonne loader developed specifically for narrow-vein underground mines. The loader comes with a Stage III A / Tier 3 fuel efficient Volvo engine with Canmet and MSHA approvals as standard, providing long engine lifetime. Other available engines include a Tier 4f / Stage IV low-emission engine from Volvo for use with Ultra Low Sulphur Diesel fuel.

To improve operator safety and comfort, Toro[®] LH307 can be equipped with a closed, air conditioned cabin. For improved safety of maintenance work, safety rails are available as an option. Camera systems and Proximity Detection System Interface are available for monitoring the loader immediate vicinity.

Toro[®] LH307 is equipped as standard with Sandvik Intelligent Control System and My Sandvik Digital Services Knowledge Box™ on-board hardware. The control system monitors the equipment productivity and health.

Bucket sizes vary from 3 m³ to 3.7 m³, including bare lip, ejector and SHARK™ G.E.T. buckets. The G.E.T. solutions optimize loader productivity and extend bucket service life.



Capacities	
Tramming capacity	7 000 kg
Break out force, lift	14 015 kg
Break out force, tilt	11 690 kg
Standard bucket	3.1 m ³

Speeds forward & reverse (level/loaded) with engine Volvo TAD850VE	
1st gear	4.2 km/h
2nd gear	7.8 km/h
3rd gear	13.0 km/h
4th gear	21.1 km/h

Bucket motion times	
Raising time	6.5 sec
Lowering time	3.9 sec
Dumping time	2.7 sec

Operating weights	
Total operating weight	19 307 kg
Front axle	8 310 kg
Rear axle	10 997 kg

Loaded weights	
Total loaded weight	26 307 kg
Front axle	19 874 kg
Rear axle	7 333 kg

Operational conditions and limits

Environmental temperature	From -20°C to +50°C
Standard operating altitude	With engine Volvo TAD850VE from -1500 m to +3000 m at 25°C without rated power derate

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.
Design based on MDG 15. Guideline for mobile and transportable equipment for use in mines. (Equipment for Australia, achieved with relevant options)
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: 1,5 kg CO ₂ e: 2,145 tons GWP: 1430 Information based on the F Gas Regulation (EU) No 517/2016

Engine

Diesel engine	Volvo TAD850VE
Output	160 kW @ 2200 rpm
Torque	1060 Nm @ 1200 rpm
Engine brake	No
Number of cylinders	In-line 6
Displacement	7.70 l
Cooling system	Liquid cooled
Combustion principle	4-stroke, turbo with intercooler
Air Filtration	Two stage filtration, dry type
Electric system	24 V
Emissions	Euro Stage III A
Ventilation rate (Ultra low sulphur diesel)	CANMET 5.66 m ³ /s MSHA 7,500 CFM
Particulate index (Ultra low sulphur diesel)	MSHA 9,500 CFM
Exhaust system	Catalytic purifier and muffler with Proventia thermal insulation system exhaust pipe
Estimated average fuel consumption at 40 % load	19 l/h
Fuel tank refill capacity	260 l
Compatible with paraffinic diesel fuel (EN 15940)	Yes

Converter

Dana C3000 series

Transmission

Power shift transmission with modulation	Dana RT14, electrical gear shift
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Axles

Front axle	Kessler D91, Spring applied hydraulically released brakes, limited slip differential
Rear axle	Kessler D91, Spring applied hydraulically released brakes, limited slip differential

Tires

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

Door interlock for brakes and boom, bucket, and steering hydraulics
Oil cooler for hydraulic and transmission oil
ORFS fittings
MSHA approved hoses
Hydraulic oil tank capacity 230 l
Sight glass for oil level

Steering hydraulics

Full hydraulic, centre-point articulation, power steering with two double acting cylinders. Steering lock.	Hydraulically operated, center-point articulation, power steering with two double acting cylinders. Steering controlled by electro-hydraulic 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	Gear type

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	140 mm, 2 pcs
Dump cylinder	200 mm, 1 pc
Main valve	Open center type
Pump for bucket hydraulics	Gear type

Brakes

Service brakes are spring applied; hydraulically operated 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.

Neutral brake

Automatic brake activation system, ABA

Emergency brake release pump, electric, 2 kW

Cabin (Cabin option replaces the standard canopy)

ROPS certification according to EN ISO 3471

FOPS certification according to EN ISO 3449

Sealed, air conditioned and heated, over pressurized, noise suppressed closed cabin

Sound absorbent material to reduce noise

Laminated glass windows

Cabin mounted on rubber mounts to the frame to reduce vibrations

Air conditioning unit located outside the cabin to reduce noise inside the cabin

Corner light for accessing cabin

Note: With cabin option, height of the machine will be 2286mm and width will be 2221mm.

Canopy (Standard)

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

12 V output for communication radio connection

Remote circuit breaker switch

Control system, dashboard and displays

Sandvik Intelligent Control System

Critical warnings and alarms displayed as text and with indicator light

7" display with touch screen function an adjustable contrast and brightness

My Sandvik Digital Services Knowledge Box™ on-board hardware

Supports 3G, 4G, LTE and WLAN data transfer

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/s²] 0,62 (with cabin)

VDV_w over 15 min period [m/s^{1.75}] 6,97 (with cabin)

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 TAD850VE.

Sound pressure level
 L_{pa} [dB re 20 μ Pa] 94 dB

Sound power level
 L_{WA} [dB re 1 p W] 115 dB

Rear and front frame

Welded structure, high strength steel

Central hinge with adjustable upper bearing

Rear tanks, hydraulic tanks and cabin base welded to frame

Automatic central lubrication

Illumination

Illuminance E_{av} with 4 pieces of 28 W LED and 1 piece of 17 W LED at a distance of 20 m in front of the loader:

E_{av} 13,66 lx

Illuminance E_{av} with 4 pieces of 28 W LED at a distance of 20 m behind the loader:

E_{av} 26,19 lx

Toro® LH307 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.

Main components

Alternator 28 V, 110 A

Batteries 2 × 12 V, 142 Ah

Starter 5.5 kW, 24 V

Driving and working lights LED lights:
2 pcs in front, 2 pcs in rear,
2 pcs in canopy

Parking, brake and indicator (blinkers) lights LED lights:
2 pcs in front, 2 pcs in rear

Control system 7" color display, 5 modules, inbuilt system diagnostics

Reverse alarm

Flashing beacon

Fire safety

Portable fire extinguisher, 12 kg

Hot side - cold side design

Isolation of combustibles and ignition sources

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

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

ToolMan 2 × USB stick in pdf format, includes all the manuals

Decals English, Finnish, Swedish, Spanish, Russian, French, Polish, Portuguese, Turkish, German, Bulgarian, Estonian, Chinese

Optional engine

Diesel engine Volvo TAD572VE

Output 160 kW @ 2200 rpm

Engine brake No

Emissions Tier 4 Final

Ventilation rate (Ultra low sulphur diesel and AdBlue) CANMET 1.32 m³/s
MSHA 7,000 CFM

Particulate index (Ultra low sulphur fuel, AdBlue) MSHA 1,000 CFM

Compatible with paraffinic diesel fuel (EN 15940) Yes

Options

ANSUL Twin fire suppression system, with or without CHECKFIRE

Arctic package 120V (preheater for hydr. oil tank and engine block)

Arctic package 230V (preheater for hydr. oil tank and engine block)

AutoMine® Loading Onboard Package ACS 2.0 DIO. Electrically compatible with system AVCS 3.0.

AutoMine® Loading readiness

Boom suspension (ride control)

Boom suspension with CRN accumulators for Canadian market

Corrosion resistant cylinder rods

Cover grills for lamps

Diesel Particulate Filter (DPF) exhaust system (for Tier 3)

Disabled 4th gear

Driving direction lights (red / green)

Eclipse™ Fire suppression system with auto shutdown, Sustain or Extreme agent delivered separately

Electrical filling pump for hydraulic oil

Emergency steering

Integrated weighing system for loaders

Jump start interface

Monitoring camera system

Multipurpose bucket for light duty applications

Proximity Detection System Interface

Line of Sight Radio remote control, CAN, complete

Radio remote control interface, analogue, not with automation

Retrieval hook, small (hydraulic brake release by pulling the hook)

Safety cabin, 2-point seatbelt, corner light, ROPS/FOPS and A/C unit and heater, height 2250 mm

Safety rails for workshop use

Sealed alternator

Spare rim 14.00-25/1.5 (for tyres 17.5R25)

Torque converter with lock-up

Traction control system

Tyre pressure monitoring system

Video camera system for radio remote control

Wheel chocks and brackets

Wiggins fuel fill system

Wiggins quick filling set for fuel, coolant and oils (hydraulic, engine and transmission)

Available buckets			
Type	Volume	Width	Max. material density
Bare Lip (standard)	3.1 m ³	2100 mm	2350 kg/m ³
Bare Lip	3.4 m ³	2100 mm	2100 kg/m ³
Bare Lip	3.7 m ³	2100 mm	1850 kg/m ³
Bare Lip Ejector	3.0 m ³	2100 mm	2200 kg/m ³
G.E.T.	3.1 m ³	2153 mm	2200 kg/m ³
G.E.T.	3.4 m ³	2153 mm	1950 kg/m ³
G.E.T. Half Arrow	3.1 m ³	2153 mm	2250 kg/m ³
G.E.T. Half Arrow	3.4 m ³	2153 mm	2000 kg/m ³
G.E.T Half Arrow	3.7 m ³	2153 mm	1750 kg/m ³

Note: Depending on the bucket size and type, the actual payload may deviate from the nominal payload.

Grade performance										
Volvo TAD850VE										
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	4.1	4.1	4.0	3.9	3.9	3.8	3.7	3.7	3.6
2nd gear (km/h)	7.9	7.7	7.4	7.2	7.0	6.8	6.6	6.5	6.1	5.6
3rd gear (km/h)	13.4	12.7	12.1	11.5	10.8	9.7	8.0	6.9	5.4	
4th gear (km/h)	22.1	20.3	17.8	13.6						
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	3.4
2nd gear (km/h)	7.8	7.4	7.2	6.9	6.7	6.4	5.9	5.4	4.6	3.8
3rd gear (km/h)	13.0	12.1	11.4	10.1	8.3	6.5				
4th gear (km/h)	21.1	18.1	12.4							

DIMENSIONS				
Volume SAE heaped 2:1 (m³) *	3.1	3.4	3.7	3.0
Max material broken density with fill factor 100% (kg/m ³)	2350	2100	1850	2200
Lip plate type	Bare Lip (STD)	Bare Lip	Bare Lip	Bare Lip Ejector
L1 (mm)	9327	9437	9556	9437
L2 (mm)	8961	9042	9141	9040
L3 (mm)	8891	8983	9079	8978
L4 (mm)	2175	2256	2355	2254
L5 (mm)	1546	1632	1716	1623
L6 (mm)	2183	2293	2412	2293
L7 (mm)	1589	1654	1732	1663
H1 (mm)	938	997	1068	1006
H2 (mm)	1562	1636	1702	1641
H3 (mm)	1771	1700	1617	1691
H4 (mm)	3101	3107	3106	3096
H5 (mm)	4691	4779	4870	4773
H6 (mm)	4709	4794	4884	4787
H7 (mm)	213	214	213	213
W1 (mm)	2100	2100	2100	2100
W2 (mm)	2232	2232	2232	2232
R1 (mm)	2998	2998	2998	2998
R2 (mm)	5848	5886	5933	5885
T1 (mm)	3728	3765	3812	3765
T2 (mm)	2978	3016	3063	3016

* According to ISO 7546

DIMENSIONS

Volume SAE heaped 2:1 (m³) *	3.1	3.4	3.1	3.4	3.7
Max material broken density with fill factor 100% (kg/m ³)	2200	1950	2250	2000	1750
Lip plate type	G.E.T.	G.E.T.	G.E.T. Half Arrow	G.E.T. Half Arrow	G.E.T. Half Arrow
L1 (mm)	9369	9455	9366	9478	9604
L2 (mm)	8995	9021	9023	9099	9201
L3 (mm)	8872	8956	7132	8956	9062
L4 (mm)	2209	2288	2237	2313	2415
L5 (mm)	1520	1596	1521	1596	1690
L6 (mm)	2197	2301	2144	2302	2430
L7 (mm)	1625	1689	1686	1719	1797
H1 (mm)	974	1033	1506	1064	1135
H2 (mm)	1531	1597	1528	1612	1674
H3 (mm)	1736	1666	1365	1638	1551
H4 (mm)	3066	3068	3025	3032	3031
H5 (mm)	4668	4748	4635	4748	4850
H6 (mm)	4711	4794	4709	4793	4885
H7 (mm)	213	214	213	214	214
W1 (mm)	2153	2153	2153	2153	2153
W2 (mm)	2278	2278	2259	2259	2259
R1 (mm)	2998	2998	2998	2998	2998
R2 (mm)	5928	5966	5958	6010	6041
T1 (mm)	3808	3845	3838	3889	3921
T2 (mm)	3059	3096	3088	3140	3172

* According to ISO 7546

Dimensions

The dimensions are indicative only



