

**SANDVIK**

TORO™ LH307  
PROVEN AND RELIABLE



# BEST IN CLASS PRODUCTION PERFORMANCE

## HIGH RAMP SPEEDS

To achieve shorter cycle times and superior productivity, our renewed and compact Toro™ LH307 underground loader provides high ramp speeds for its size class. The advanced powertrain technology includes a proven transmission with new automatic gear shifting and an optional torque converter lock up ensuring fast ramp speeds to quickly clear tunnel headings. Durable axles use limited slip differentials to maintain traction and spring applied hydraulic release brakes for safer braking.

## FAST BUCKET FILLING AND PROVEN HYDRAULICS

Toro™ LH307 loader has a smart boom geometry that is optimized to provide top breakout forces for fast bucket filling and handling of oversized rocks. Powerful boom and bucket hydraulics enables the use of both lift and tilt functions simultaneously when penetrating to the muck pile, making one-pass bucket filling easy and contributing to high fill factors.

## TWO ENGINE ALTERNATIVES

To serve customer and country specific needs in various markets, Sandvik offers two engine alternatives. The standard engine is an 8-liter Stage III A 160 kW engine by Volvo Penta. The Stage III A engine does not use exhaust gas recirculation (EGR) and can therefore operate on diesel fuels with up to 3000 ppm sulphur content. The optional Stage IV, 160kW engine by Volvo Penta is MSHA and CANMET approved and requires the use

of ultra-low sulphur diesel fuel to operate. The engine exhaust after treatment is a selective catalytic reduction system (SCR), which uses diesel exhaust fluid to reduce emissions of nitrogen oxide. This SCR solution delivers Stage IV (Tier 4 final) emissions compliance without sacrificing performance and fuel efficiency. Both engines can use paraffinic fuel meeting the requirements of the EN 15940 as well as traditional diesel fuel interchangeably.

## DE-CLUTCH AND AUTOMATIC BUCKET SHAKING

The electrohydraulic controls include an easy button-operated de-clutch function for truck loading and automatic bucket shaking for shorter dumping times. Automatic Bucket Shaking is also standard. The control is the same as other VCM3 loaders.

## PRODUCTION MONITORING

Sandvik Integrated Weighing System (IWS), available as an option, accurately measures your payload when lifting the boom as well as the number of buckets filled during a shift and records the results to My Sandvik Digital Services Knowledge Box™. The Knowledge Box™, a standard feature in this loader, can transfer production monitoring data through a Wi-Fi or LTE connection for access via My Sandvik internet portal. Alternatively, data can be downloaded manually onto a USB stick. Payload monitoring can assist in maximizing productivity, identifying training needs and reducing overloading.



# LOW COST PER TONNE

## **STRONG RESISTANCE TO SHOCK LOADS**

The welded steel box structures used in the loader frame and boom provide strong resistance to shock loads and are optimized to reduce stresses as well as extend frame lifetime. Computer designed frames using Finite Element Analysis (FEA) are made of high strength structural steel for superior strength to weight ratio.

## **EXTENDED TYRE LIFETIME**

The traction control system (TCS) option reduces wheel slipping when penetrating to the muck pile and filling the bucket. This extends tyre lifetime by reducing wear and decreases rubber waste. The traction control system proves its worth specifically when loading with radio remote control.

## **LOWER BUCKET MAINTENANCE COSTS AND REDUCED DOWNTIME**

Toro™ LH307 loader has a large variety of available bucket sizes, including different types for many different applications. SHARK™ Ground Engaging Tools (G.E.T.) are available as an option for a wide range of bucket sizes, optimizing productivity and extending bucket service life. Available as either mechanical or weld on systems, G.E.T. solutions provide lower overall bucket maintenance costs and reduced downtime.

## **EFFICIENT COOLING**

A separate side-mounted brake, hydraulic and transmission cooling system provides increased performance in hot conditions underground. A more efficient cooling circuit results in lower oil temperatures, reducing stress on the system, extending component lifetimes and minimizing oil leaks.

## **EXTENSIVE STEEL PIPING**

Extensive use of hydraulic steel piping throughout the loader delivers longer lifetime and easier maintenance access than traditional hydraulic hoses. For example, piping that is less than one meter from the ground are stainless steel for durability as those are most subject to mud and need to withstand the toughest conditions.



# SAFETY AND COMFORT

## ROPS and FOPS certified

Toro™ LH307 loader is available with a robust ROPS and FOPS certified open canopy or closed cabin, both protecting the operator in case of rolling over or falling objects.

The sealed and pressurized cabin, available as an option, is heated, air-conditioned and noise resistant and uses dust resistant upholstery materials, has safety glass windows, emergency exits, an access system with three-point contact handles and anti-slip steps. In addition, the cabin is mounted on rubber dampened bushings to reduce whole body vibration. The cabin door includes a new magnetic interlock switch which automatically applies brakes and inactivates the boom, bucket and steering when the door is opened.

## Smooth ride over rough terrain

The optional ride control system dampens the boom and bucket movement with a nitrogen filled accumulator in the hydraulic boom circuit, providing a smoother ride over rough ground and less spillage when carrying loads at high tramming speed. Vehicle gears can also be limited to improve safety in narrow tunnels and rough roads.

## Adjustable joystick armrests and low frequency suspension seat

This loader is fitted with an adjustable low frequency suspension seat with two-point seat belt. Padded arm rests and adjustable joysticks can be configured to suit the operator. The electric joystick controls for steering and boom movements eliminate hydraulic hoses inside the operator compartment and reduce potential hydraulic hazards.

## 7" Touch screen color display

The 7" color display with advanced touch screen functionality has all the needed information and alarms on one large display allowing the operator to focus on operating the loader. Dark background graphics with clear symbols are designed for the underground environment to reduce eye fatigue. The Sandvik Intelligent Control system monitors and warns the operator to help prevent severe damage and unscheduled downtime.

## Improved visibility

Adjustable high-power LED lights are standard in every Toro™ LH307 loader. All-around operator visibility can be further improved by selecting the optionally available monitoring camera system. A cabin heater and air conditioning unit are standard in closed cabins and keeps windows clear of ice or mist. The closed cabin is optional.





# DATA AND CONNECTIVITY

Toro™ LH307 loader has been designed for use with AutoMine®, Sandvik's robust mining automation system for increased safety, productivity and lower costs.

## AutoMine®

Sandvik AutoMine® is the industry leader in automation for underground loaders and trucks. This high-performing, comprehensive solution is in service around the world, backed by Sandvik experts. The optional Sandvik AutoMine® readiness allows retrofitting of the AutoMine® Onboard Package for autonomous use later during the loader lifetime.

## OptiMine®

Sandvik OptiMine® is the most comprehensive solution for optimizing underground hard rock mining production and processes. It integrates all assets and people, delivering descriptive and predictive insights to improve operations. OptiMine® is interoperable and able to connect to any system and technology. The open and scalable modular suite gives you flexibility to expand and work with a full range of equipment, systems and networks and provides a real-time view of mining operations.

## Knowledge box™

The Knowledge Box™ onboard the loader transfers monitoring data through a Wi-Fi or LTE mobile connection to the My Sandvik internet portal for visualization of fleet health, productivity and utilization. Transferred data can also be used by OptiMine®.

## Line of sight radio remote control

Toro™ LH307 loader can be equipped with a line-of-sight radio remote control option, available with a direct can-bus connection to the Sandvik Intelligent Control System. An additional video camera system is available for improved visibility when loading by radio remote control. A new and improved fully hydraulic retrieval hook option releases equipment brakes by pulling a hook at the rear of the loader to retrieve the equipment from under an unsupported roof if it is required.

## Proximity Detection System interface

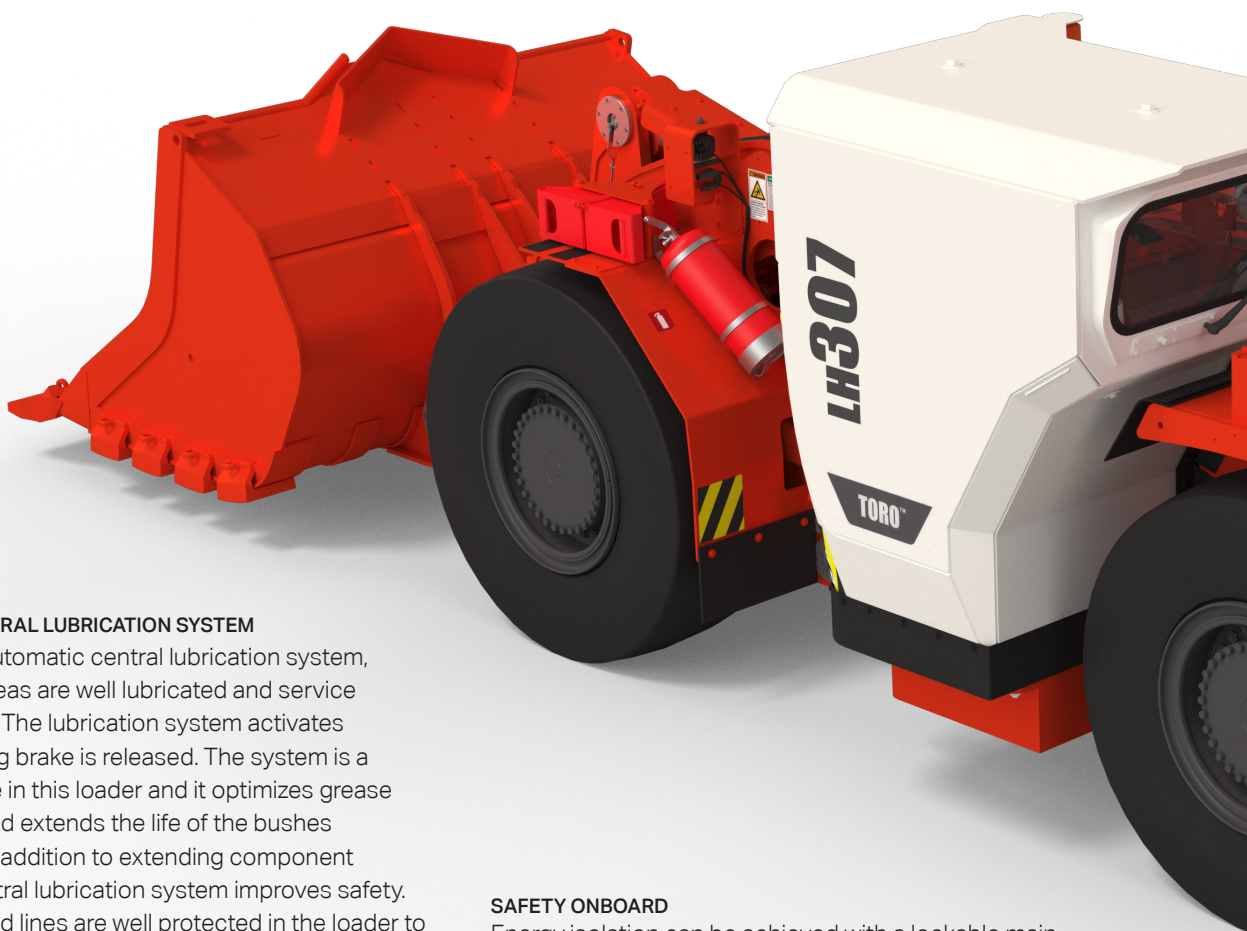
A Proximity Detection System (PDS) interface option is also available on Toro™ LH307 loader for mines to interface with their site PDS. The PDS interface offers easy installation and connection to the Sandvik Intelligent Control System with the capability to slow down and stop the loader on the signal from the PDS.

# EASE OF MAINTENANCE & SERVICEABILITY

## SMART PLACEMENT OF KEY SERVICE AREAS

Naturally, Toro™ LH307 loader has been designed with smart placement of key service areas for safer service access.

- The side hydraulics and transmission cooler have a new layout. Both are now located higher up to avoid clogging. Swing-out fans make cleaning easier. This improves reliability, reduces costs and helps in maintenance.
- The optionally available hydraulic oil electric filling pump quickly fills the hydraulic tank through a filter to ensure clean oil, protecting the hydraulic system components.
- All necessary hydraulic test points are easily and quickly accessible.
- The easy-to-clean radiator and air cooler is made of aluminum to withstand corrosion. The swing-out fan allow for effective cleaning from both sides of the radiator core.
- The transmission filter has ground level access for easy maintenance.



## AUTOMATIC CENTRAL LUBRICATION SYSTEM

Thanks to the automatic central lubrication system, hard to reach areas are well lubricated and service time is reduced. The lubrication system activates when the parking brake is released. The system is a standard feature in this loader and it optimizes grease consumption and extends the life of the bushes and bearings. In addition to extending component lifetime, the central lubrication system improves safety. Components and lines are well protected in the loader to prevent damage.

## SAFETY ONBOARD

Energy isolation can be achieved with a lockable main switch. The starter isolator is available as an option. Optional onboard wheel chocks can be used to ensure the machine remains stationary. The new and improved maintenance accessways from the cold side of the machine to the top of the machine include three-point high contrast handles and anti-slip steps on both front and rear frames.

Safety rails are available as an option to be attached to the rear of the machine during servicing. The top of the machine is very flat to improve safety when working on the equipment, as well as to improve visibility.

### SANDVIK INTELLIGENT CONTROL SYSTEM

To minimize the need to move around the machine or use special tools, the 7" touch screen color display in the operator's compartment provides service information, easy system diagnostics and alarm log files. An automatic brake test with diagnostics and logging can also be performed on the display.

### HOT SIDE – COLD SIDE

The dedicated cold side of the loader includes ground level access to engine fuel filters. An efficient power core engine filter is housed strategically within the frame for impact protection and utilizes an ejector valve system for increased filter lifetime. The fuel tank is sized to ensure continuous operation for a full working shift. An optional fast filling system for fuel and oils increases equipment availability by reducing fueling time by up to 80% as well as eliminating spills.

The hot side includes heat shielding for exhaust components. There is also an optional Eclipse™ fire suppression system available from Sandvik located on the right front corner of the rear frame.



# SANDVIK 365 PARTS & SERVICES

## LIFETIME SUPPORT

Having great equipment is only part of the story. What makes working with Sandvik an unbeatable experience is the blend of lifetime support we can provide through our broad offering of genuine parts & components, services and digital innovations.

At the heart of this package lies a combination of skilled people, integrated processes & systems and a global footprint.

## QUALITY SERVICE TAILORED TO YOUR NEEDS

We offer different type of service agreements and advisory services that can be adapted to suit the support you require – helping you to maintain your fleet in the optimal way.

It's our job to keep your equipment in full health and to make sure that major components of your loader are being replaced or repaired at optimum intervals. With our solutions, you can expect superior reliability and longer life than with non-OEM alternatives.

## DIGITAL SERVICES FROM THE EXPERTS

As a long established and trusted OEM we understand the challenges our customers face in their mines with our equipment. In addition to that, we have the highest number of connected mining equipment.

Our learnings over this time have helped us to understand not only capturing the data but analyzing it to provide insights which deliver tangible value to our customers. Remote Monitoring Service is one example - the service leverages state of the art cloud technologies and AI to convert machine data into actionable information, hence enabling the prevention and prediction of breakdowns before they happen.





# 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 m<sup>3</sup> to 3.7 m<sup>3</sup>, 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 <sup>3</sup>

### 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<sub>2</sub>e: 2,145 tons

GWP: 1430

Information based on the F Gas Regulation (EU) No 517/2016

## POWER TRAIN

### 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 <sup>3</sup> /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 x 25 L5S 34 ply

## 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

## OPERATOR'S COMPARTMENT

### 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

### OPERATOR'S SEAT

Low frequency suspension	In canopy and cabin models
Height adjustment	In canopy and cabin models
Adjustment according to the operator's weight	In canopy and cabin models
Padded and adjustable arm rests	In canopy and cabin models
Two-point seat belt	In canopy and cabin models
Fore-aft isolation	With cabin option only
Adjustable lumbar support	With cabin option only
Selectable damping	With cabin option only



### 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 $a_w$ [ $m/s^2$ ]	0,62 (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 $\mu$ Pa]	94 dB
Sound power level $L_{WA}$ [dB re 1 p W]	115 dB

### FRAME

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

$E_{av}$	26,19 lx
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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.

## ELECTRICAL EQUIPMENT

### MAIN COMPONENTS

Alternator	28 V, 110 A
Batteries	2 x 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	

### INCLUDED SAFETY FEATURES

#### 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

## DOCUMENTATION

### 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 x USB stick in pdf format, includes all the manuals
Decals	English, Finnish, Swedish, Spanish, Russian, French, Polish, Portuguese, Turkish, German, Bulgarian, Estonian, Chinese

## 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)

### 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

## AVAILABLE BUCKETS

TYPE	VOLUME	WIDTH	MAX. MATERIAL DENSITY
Bare Lip (standard)	3.1 m <sup>3</sup>	2100 mm	2350 kg/m <sup>3</sup>
Bare Lip	3.4 m <sup>3</sup>	2100 mm	2100 kg/m <sup>3</sup>
Bare Lip	3.7 m <sup>3</sup>	2100 mm	1850 kg/m <sup>3</sup>
Bare Lip Ejector	3.0 m <sup>3</sup>	2100 mm	2200 kg/m <sup>3</sup>
G.E.T.	3.1 m <sup>3</sup>	2153 mm	2200 kg/m <sup>3</sup>
G.E.T.	3.4 m <sup>3</sup>	2153 mm	1950 kg/m <sup>3</sup>
G.E.T. Half Arrow	3.1 m <sup>3</sup>	2153 mm	2250 kg/m <sup>3</sup>
G.E.T. Half Arrow	3.4 m <sup>3</sup>	2153 mm	2000 kg/m <sup>3</sup>
G.E.T Half Arrow	3.7 m <sup>3</sup>	2153 mm	1750 kg/m <sup>3</sup>

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						

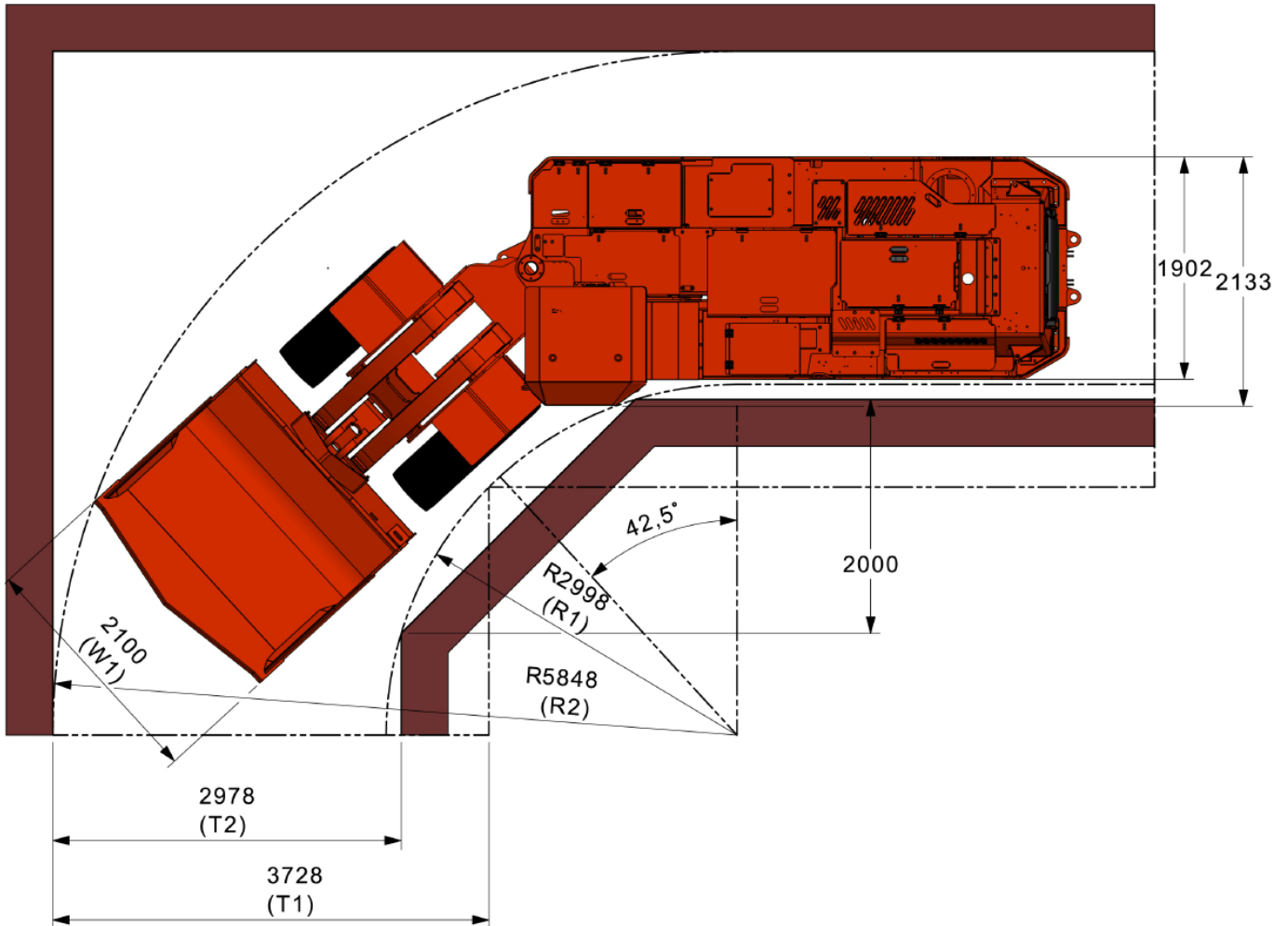
### Loaded

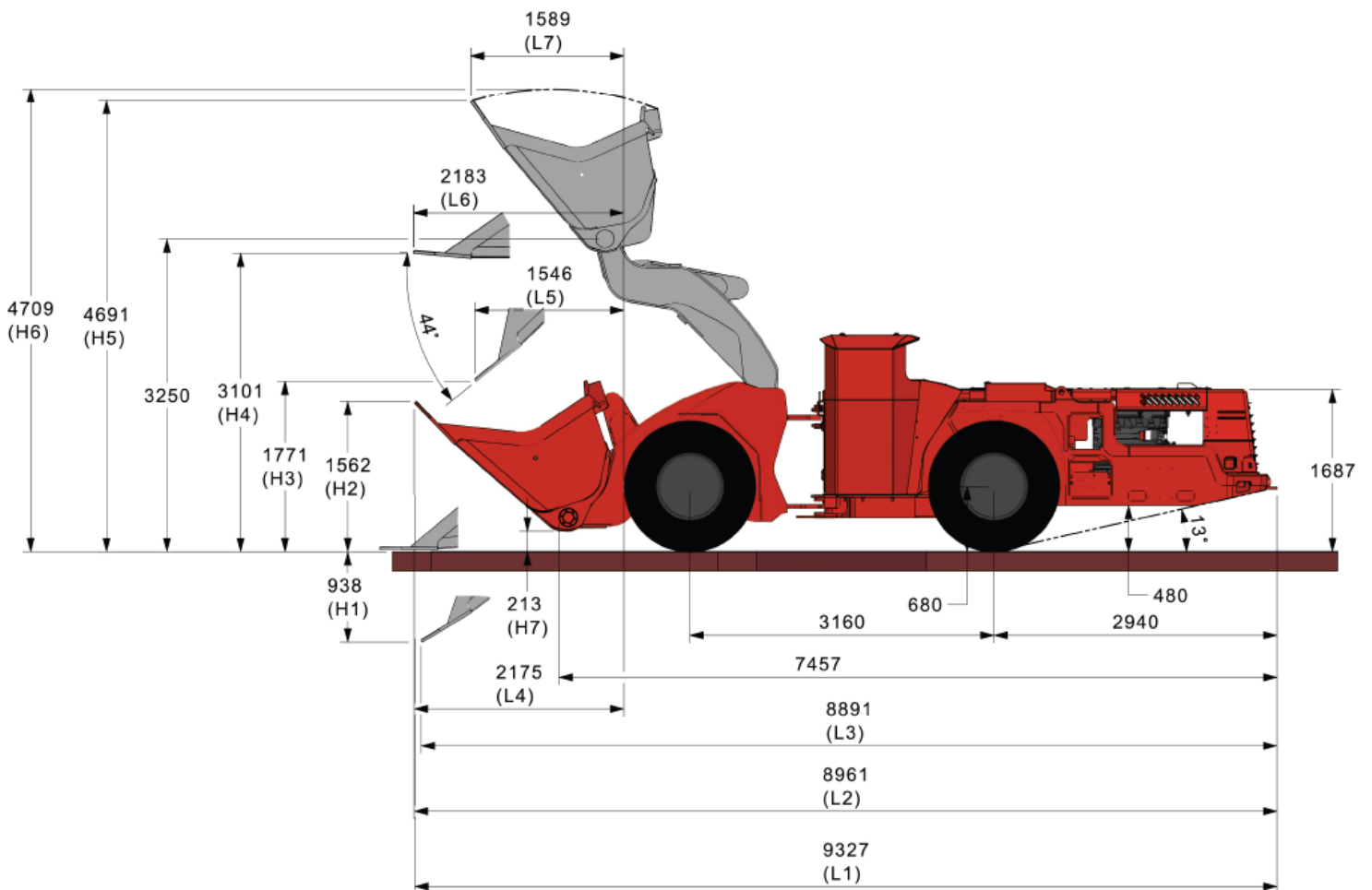
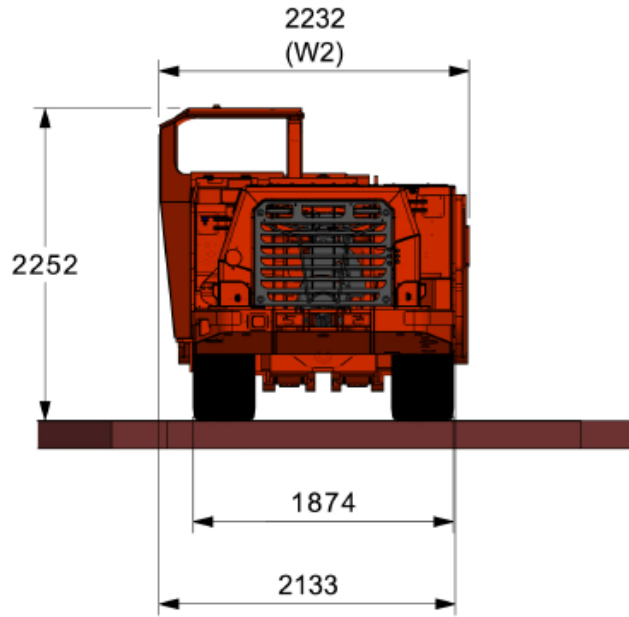
Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	4.2	4.1	4.0	3.9	3.8	3.7	3.6	3.6	3.5	3.4
2nd gear (km/h)	7.8	7.4	7.2	6.9	6.7	6.4	5.9	5.4	4.6	3.8
3rd gear (km/h)	13.0	12.1	11.4	10.1	8.3	6.5				
4th gear (km/h)	21.1	18.1	12.4							



**DIMENSIONS WITH 3.1 M<sup>3</sup> BARE LIP BUCKET (STANDARD)**

The dimensions are indicative only





**DIMENSIONS**

Volume SAE heaped 2:1 (m <sup>3</sup> ) *	3.1	3.4	3.7	3.0
Max material broken density with fill factor 100% (kg/m <sup>3</sup> )	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 (m <sup>3</sup> ) *	3.1	3.4	3.1	3.4	3.7
Max material broken density with fill factor 100% (kg/m <sup>3</sup> )	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



# MATCHING PAIR

## TORO™ TH320

Toro™ TH320 is a narrow 20 metric tonne truck designed for small and medium-sized hard rock mines, fitting in a 3 x 3 meter heading. Despite the relatively high payload capacity, this underground truck has the same overall width as most 15-ton trucks on the market. As with all Sandvik underground mining trucks, it is designed to operate fully loaded and at high speeds on long spiral haulage ways with up to 20% gradients.

Available with a standard forward facing, open operator compartment or with an optional forward facing, fully enclosed and air conditioned cabin, Toro™ TH320 offers superior comfort without compromising visibility.

Advantages:

- Narrow size enables operation in 3x3 meter headings
- Excellent payload capacity reduces the need for additional trucks
- Efficient LED lights reduce eye fatigue and risk of collision, while long LED lifetime offers lower cost of ownership compared to halogen lights
- Ground-level daily maintenance for safer service
- Optional ejector box for tight backfill haulage

### CAPACITIES

Maximum payload capacity (SAE heaped 2:1)	20 000 kg
Standard dump box	10.5 m <sup>3</sup>
Dump box range	10.5–14 m <sup>3</sup>

### SPEEDS (LEVEL/LOADED) WITH VOLVO TAD853VE

1st gear	5.3 km/h
2nd gear	9.3 km/h
3rd gear	16.2 km/h
4th gear	28.4 km/h

### DUMP BOX MOTION TIMES & MOVEMENTS

Discharging time	11 sec
Dumping angle	65°

### OPERATING WEIGHTS\*

Total operating weight	22 600 kg
Front axle	16 800 kg
Rear axle	5 800 kg

### LOADED WEIGHTS\*

Total loaded weight	42 600 kg
Front axle	21 100 kg
Rear axle	21 500 kg

\* Unit weight is dependent on the selected options



