



# TORO™ LH517i

SAFER. STRONGER. SMARTER.



# LOW COST PER TONNE

## **MINIMIZED IMPACT DAMAGES**

This loader has been developed for demanding conditions to achieve the lowest cost of ownership while maintaining productivity and ease of maintenance.

The heavy duty rear frame and mask with integrated reaction bars minimizes damage from wall impacts. Welded steel box structures used in the frame and boom provide strong resistance to shock loads and are optimized to reduce stresses and extend frame lifetime while ensuring superior strength to weight ratio.

## **RETRIEVAL HOOK**

A fully hydraulic retrieval hook releases the brakes through hydraulic pressure allowing faster, easier and safer stope removal from under unsupported roof. Strong structures in the equipment withstand high pulling forces.

## **EXTENDED COMPONENT LIFETIMES**

Brake, hydraulic and transmission cooling capacity is increased for efficient operation at higher ambient temperatures. A more efficient cooling circuit leads to lower oil temperatures, reducing stress on the system, extending component lifetimes and minimizes oil leaks.

## **OPTIMIZED BRAKING**

The number of brake discs in the spring applied hydraulic release (SAHR) brakes has been optimized for smoother braking along with a simpler brake hydraulic circuit requiring less maintenance and adjustment. The optional Stage V engine comes with an engine brake, which provides better control of downhill speed, and minimizes brake and transmission overheating as well as brake wear. The standard engine Tier 2 / Stage II does not include an engine brake.

## **HEAVY DUTY AXLES**

Toro™ LH517i loader features heavy-duty axles to ensure long axle life in demanding conditions. Increased rear axle oscillation provides greater movement over rough terrain with a re-enforced steel structure to reduce stress.

## **RELIABLE ELECTRICAL HARDWARE**

All electrical hardware is specially designed for demanding conditions with corrosion, heat and water resistance. Increased wiring protection including new shrink mesh engine wiring harnesses improve reliability.

## **TRACTION CONTROL**

The optionally available traction control system reduces wheel spin and slipping when penetrating to the muck pile, extending tyre lifetime and reducing needs for tyre change.

## **DRIVELINE EFFICIENCY**

Automatically activated torque converter lock up increases driveline efficiency for faster ramp speed, reducing transmission heat and improving fuel economy. The electronically controlled powershift transmission allows the operator to choose between manual or automatic shifting. The transmission modulation valve provides smoother shifting and easy access test ports for trouble shooting.

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

SHARK™ Ground Engaging Tools (G.E.T.) are available on a wide range of bucket sizes, optimized for loader productivity and extended bucket service life. Available as either mechanical or weld on systems, Sandvik G.E.T. provides lower overall bucket maintenance costs and reduced downtime. A high productivity 9.1m<sup>3</sup> bucket is available as an option with a Sandvik G.E.T. Half Arrow weld-on lip system and optimized wear package for low specific gravity ore.







# INCREASED PRODUCTIVITY

## **FAST BUCKET FILLING**

Toro™ LH517i loader smart boom geometry is optimized to provide superior hydraulic power for fast bucket filling and handling of oversized rocks. The powerful boom and bucket hydraulics combined with smart geometry enables the use of both lift and tilt functions simultaneous when penetrating the muck pile. This makes one pass bucket filling easy by lifting the boom to increase front wheel traction ensuring fast bucket filling with high fill factors. Heavy duty rear frame with added weight in the rear balances the machine perfectly when lifting and pushing into the muck pile.

## **FUEL EFFICIENT AND LOW EMISSION ENGINES**

The standard engine configuration is a fuel efficient 310kW Tier 2 Volvo engine, delivering powerful thrust for bucket filling and high-speed tramming, all resulting in high productivity with low cost per loaded tonne.

When ultra-low Sulphur diesel fuel is available, Sandvik offers a Volvo Stage V low emission engine option. The Stage V engine meets the relevant European emission regulations and delivers significantly reduced MSHA and CANMET ventilation rates - still maintaining performance and fuel efficiency. The engine brake in the Stage V engine provides better control of vehicle speed downhill, minimizes brake and transmission overheating and brake wear. With the new Stage V engines, the engine oil change interval is extended from 250 to 500 hours, decreasing annual oil consumption, and improving productivity by means of increased availability.

## **REDUCED EMISSIONS WITH RENEWABLE DIESEL**

In addition to traditional diesel fuel, both available engines can use paraffinic diesel fuel meeting the requirements of EN 15940, which reduces emissions of CO, CO<sub>2</sub>, HC, NO<sub>x</sub> and diesel particulates.

## **EFFICIENT AND EASY TO USE**

Toro™ LH517i loader continues to use its predecessors proven load sense hydraulic system with variable displacement piston pumps that provide on demand pressure and flow for increased efficiency, reducing fuel consumption. The boom and bucket hydraulic circuit delivers fast movement through increased flow as well as a bucket shaking functionality for fast dumping times. Improved efficiency is achieved through lower flow resistance and heat generation. Steering control is optimized with a steering valve with integrated pilot pressure. Steering and boom soft stops reduce shock loads and vibration and extend cylinder lifetime.

## **PRODUCTION MONITORING**

Sandvik Integrated Weighing System (IWS) accurately measures payload when lifting the boom - as well as the number of buckets filled during a shift - and records the result to the My Sandvik Knowledge Box onboard.

The My Sandvik Knowledge Box can transfer this production monitoring data through Wi-Fi connection for access via the My Sandvik internet portal. Alternatively, data can be downloaded manually in the operator's compartment onto a USB stick. Monitoring the loader payload can assist in maximizing productivity, identifying needed operator training, and reducing overloading.



Toro™ LH517i



# SUPERIOR OPERATOR ENVIRONMENT

## **PREMIUM COMFORT**

The loader cabin offers premium ergonomics and comfort for long shifts. The cabin uses dust and noise resistant upholstery materials, and new softened paddings are fitted in the arm rests and cabin door. The arm rests and joysticks are adjustable and can be configured to suit the operator. Increased leg space and improved pedal positions improve ergonomics and help to reduce fatigue and get a convenient posture. As a new available option, Toro™ LH517i loader can now be equipped with the same ergonomic seat as the Toro™ LH515i loader; an adjustable low frequency suspension seat with two-point seat belt.

## **SAFETY ON BOARD**

The loader cabin is ROPS and FOPS certified to protect the operator in case of roll over or falling objects. It has 3-layer laminated safety glass windows, emergency escape windows, and illuminated cabin entrance with three-point contact handles and anti-slip steps. The door system features a magnetic interlock switch, which automatically applies brakes and inactivates boom, bucket, and steering when the cabin door is opened. A seat belt and door latch monitoring system is available as an option. During machine start-up, the horn emits a lower audible sound for reduced noise exposure and a different sound during reverse.

## **REDUCED OPERATOR FATIGUE**

A 7" color display with advanced touch screen functionality has all the needed information and alarms on one large display giving the operator more time to keep eyes on the road. Dark background graphics with clear symbols are designed for the underground environment to reduce eye fatigue, and red interior cabin lighting is also designed to not affect night vision during driving.

## **FOR IMPROVED VISIBILITY**

Outstanding all-around visibility is provided with an optional lift kit, additional cabin window, flat rear frame covers, optional right-hand side and rear facing monitoring cameras and adjustable high power LED lights. Illumination is increased by up to 20% over halogen lights, reducing eye fatigue and risk of collision, while longer LED lifetime offers lower cost of ownership.



## **RELIABLE AND EFFICIENT COOLING**

The efficient air conditioning system is directly driven off the engine for increased reliability, and it is independent of other hydraulics for easy troubleshooting. Air is filtered through a pre-filter and two-stage filtration while a centrifugal fan pressurizes the cabin to minimize the ingress of dust. To enable accurate temperature and humidity control for better air quality and operator comfort, the air conditioner is equipped with heating as standard.

Strengthened door hinges and improved door sealing extend the lifetime of the pressurized cabin system and decrease the need for maintenance.

## **SMOOTHER RIDE OVER ROUGH TERRAIN**

To reduce vibrations and balance movements that occur during loader operation, the equipment cabin is mounted with solid rubber mounts to the rear frame. New optimized weight distribution in the equipment further improves stability.

The optionally available ride control system helps to provide an even smoother ride for the operator over rough ground when carrying loads at high tramming speeds. The ride control system includes a boom suspension and floating valve, and the boom and bucket movement is dampened by a nitrogen filled accumulator in the hydraulic boom circuit.

## **OPERATOR SPEED ASSISTANT**

To support specifically in downhill driving and save equipment brakes, the operator speed assist system, available as an option with the Stage V engine, helps the operator to maintain effortlessly desired speed. The speed assist system has several different stages for speed control, including a maximum set speed limit.



# READY FOR DIGITALIZATION

Toro™ LH517i loader has been optimized for use with Sandvik AutoMine® for increased safety, productivity and lower costs.

## AutoMine®

AutoMine® is the industry leader in automation for underground loaders and trucks. This high-performing, comprehensive solution is working around the world, backed by Sandvik experts across the globe.

AutoMine® readiness is built into the loader for faster retrofitting later in the loader's lifetime. To maintain a fast retrofit time of 2 – 3 days, the AutoMine® Onboard Package now has one small enclosure and electrical quick connectors for fast installation, and no significant hydraulic changes are needed. All sensors have increased protection from rock fall.

With AutoMine®, a fleet of loaders is converted into a high performing autonomous production system, providing significant safety and productivity improvements for mine operations.

## OptiMine®

OptiMine® is the most comprehensive solution for optimizing underground hard rock mining production and processes. It integrates all assets and people - including Sandvik and non-Sandvik equipment - delivering descriptive and predictive insights to improve operations.

OptiMine® is interoperable and able to connect to any system and technology, including Newtrax IoT devices, providing a real-time view of mining operations. It is an open and scalable modular suite that gives you flexibility to expand and work with a full range of equipment, systems and networks.

## My Sandvik Digital Service Solutions 365

My Sandvik Digital Service Solutions are designed to help you maximize your productivity, operational efficiency and safety. The Knowledge Box™ onboard the equipment collects, processes and transfers monitoring data into My Sandvik Insight and My Sandvik Productivity dashboards which you can access 24/7 via My Sandvik customer portal for visualization of fleet health, productivity and utilization.

## Proximity Detection System Interface

A Proximity Detection System (PDS) interface option is also available on the loader for mines to interface with their site PDS system. 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 a signal from a PDS.

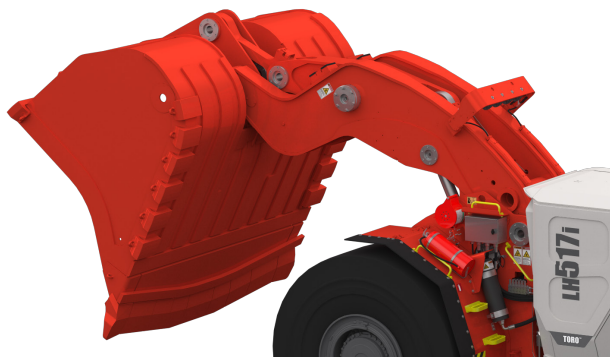








# MAINTENANCE FRIENDLY

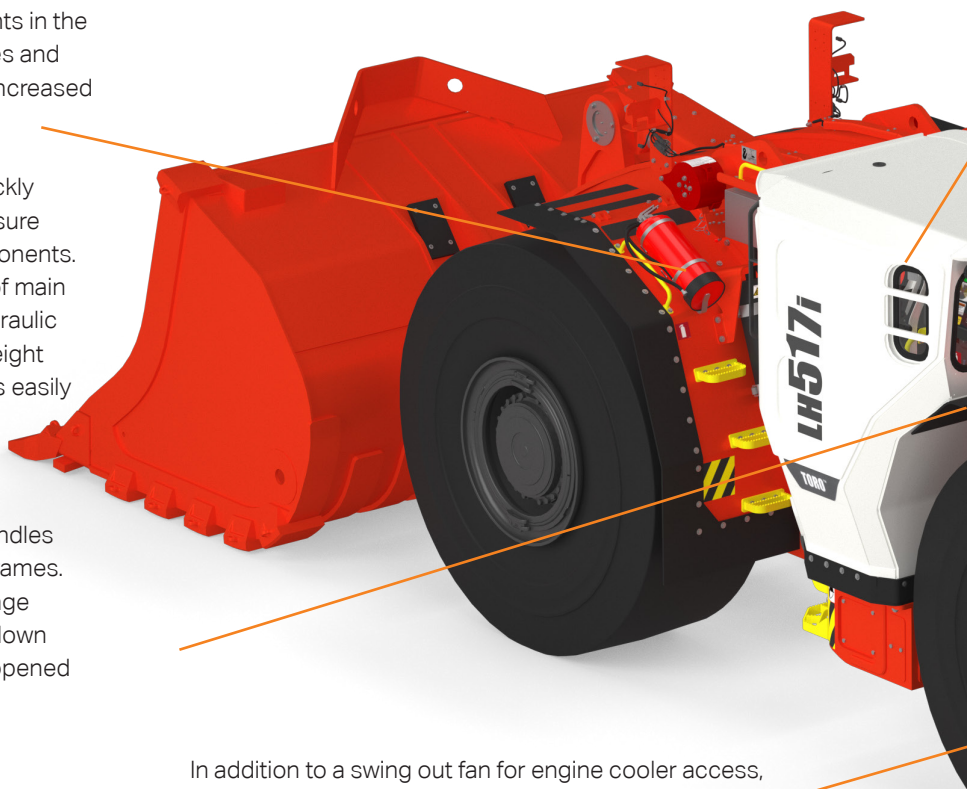


Jacking points on the front and rear frame reduce risks during lifting, while built in tie down and lifting points in the frame and bucket enable safer transportation. Lighter drive shafts with a new sealing design offer longer bearing life and together with lighter construction driveline guards, easier removal and lifting.

The boom lock is integrated into the front frame and allows one handed operation to maintain 3 points of contact when accessing the lock. The boom uses robust solid floating pins with a M30 pull out thread for easier pin removal, along with new bush lip sealings to prevent the ingress of dirt. The loader is equipped with more greasing points in the boom geometry, well protected grease lines and automatic central lubrication system with increased capacity for longer time between refilling.

An electric filling pump for hydraulic oil quickly fills the hydraulic tank through a filter to ensure clean oil to protect hydraulic system components. Live oil sampling offers health monitoring of main components to increase availability. All hydraulic test points are at ground level via a light-weight removable door to the hydraulic tank that is easily accessible.

The maintenance access to the top of the machine includes 3-point high contrast handles and anti-slip steps on both front and rear frames. Safety rails are designed for reduced damage from wall collisions with an improved lock down mechanism. The left side is automatically opened by an actuator for safe rail assembly.



In addition to a swing out fan for engine cooler access, the side coolers for transmission, brakes and hydraulics, each have a swing out fan for easy cleaning. each have a swing out fan for easy cleaning.

The hot side of the loader includes heat shielding of all exhaust components backed up by an optional Eclipse™ Fire Suppression System from Sandvik for increased fire safety.

There are separate battery and starter isolation switches located at ground level for troubleshooting while the engine is locked out for service.



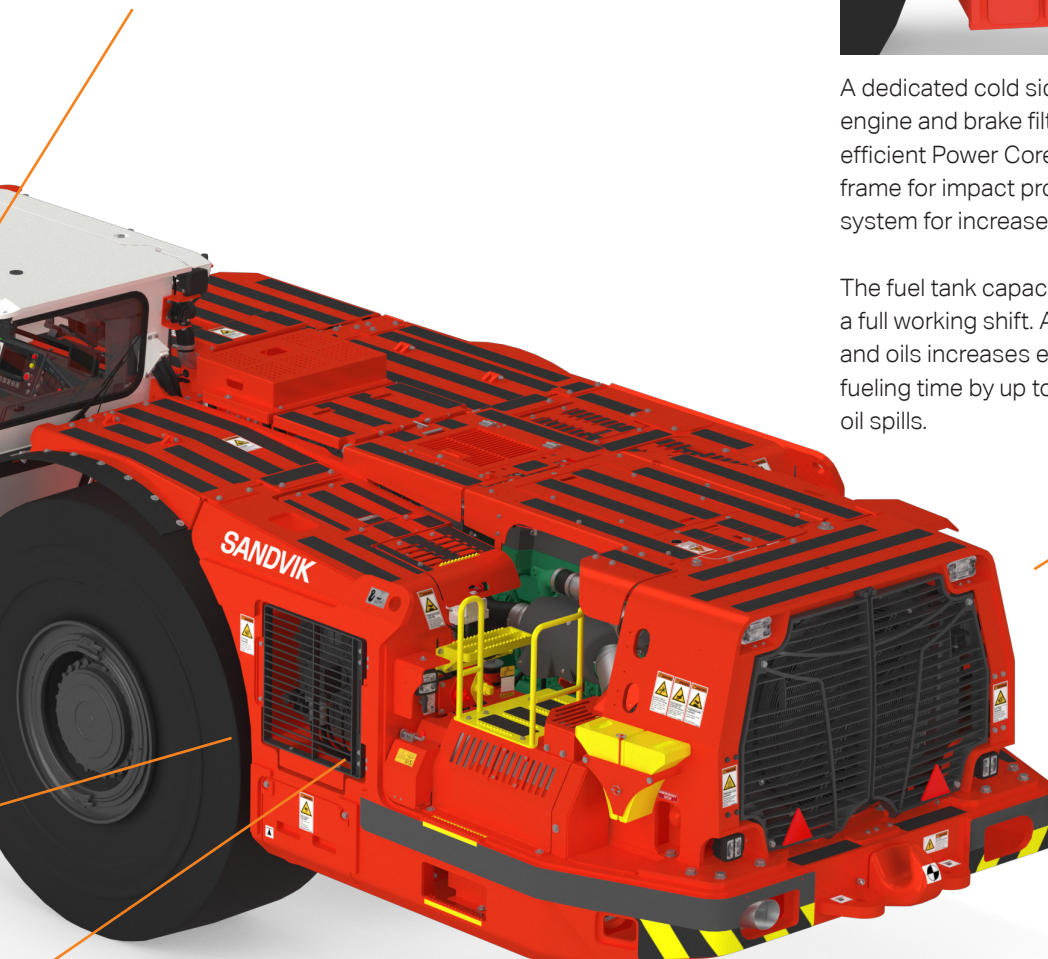


To minimize the need to move around the machine or use special tools, the 7" color display in the operator's compartment provides service information, easy system diagnostics and alarm log files.



A dedicated cold side includes a filter station for all engine and brake filters with easy ground level access. An efficient Power Core engine filter is housed well within the frame for impact protection and utilizes an ejector valve system for increased filter lifetime.

The fuel tank capacity enables 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 fuel and oil spills.



Tailor-made maintenance kits include all relevant parts and other materials for planned maintenance. Sandvik Performance Fluids preserve the machine's high performance. Smooth operation throughout its lifetime can be ensured with Sandvik Long-Life Engine, Transmission and Hydraulic Oils, which are available in different viscosity grades.



# SANDVIK 365 PARTS & SERVICES

## **MAKING A DIFFERENCE THROUGH SERVICE AND DIGITAL EXPERTISE**

You may wonder what you get when choosing Sandvik Parts & Service solutions?

### **PERSONALIZED, PROACTIVE SERVICE AND HIGH QUALITY**

We strive to serving our customers in a personalized manner and we give high emphasis to quality, which is not only about using genuine parts & components, you can also expect consistent service quality from us.

The backbone of our service is a unique mix of skilled people, our system, tools & global infrastructure, our long experience from the field and the great collaboration with our customers.

Instead of just waiting for issues to pop up and reacting only after they have happened, we are able to offer solutions that take the whole lifecycle of the machine into account, which allows us to be supportive in a proactive way.

### **SCALABLE OFFERINGS**

It starts with the basic support at site including operator training, parts availability and of course technical and advisory support to ensure a trouble-free and economical operation.

All major components of your loader can be replaced or repaired. With our solutions, you can expect superior reliability and longer life than with non-OEM alternatives.

We offer different type of service agreements and advisory services which can be adapted to the specific level of support you require – helping you to proactively manage your fleet and to find the optimal maintenance strategy.

### **A UNIQUE COMBINATION: SANDVIK DIGITAL SERVICES + APPLIED OEM KNOWLEDGE**

As an in-house digital services developer, we know the machines and their features through and through. This means that we can tailor our services to offer exactly the information and features the machines, their owners and their operators need. Besides our standard telemetry reporting we also offer assisted & advanced digitalization-based services.

Through analyzing the data and referencing it against our big pool of data, then, combined with our product expertise, we can offer insights into how to get the most out of your equipment. From a sustainability point of view, digital services provide clear insights into fuel consumption and excessive idle time, which can drastically reduce emissions underground. Equipment alerts on speeding, brake violations and freewheeling in neutral are just some examples which improve safety for operators and other staff in the mine.





# TECHNICAL SPECIFICATION

## TORO™ LH517i

Toro™ LH517i is a high capacity loader for 5 x 5 meter mining tunnels. With superior hydraulic power for fast bucket filling and drivetrain power for high ramp speed, the loader is designed to quickly clear tunnel headings for rapid advance rates.

The loader is equipped with fuel efficient 310kW Tier 2 / Stage II engine as standard. 315kW Stage V and Tier 4f low emission engines are available with use of ultra low sulphur diesel fuel. These optional engines come with an engine break.

The intelligent loader features many improvements in operator and maintenance ergonomics. The already high level of safety has been further increased to make the operation and maintenance more fluent.

Higher productivity and profitability is achieved by better balanced machine and larger bucket size. Rebalancing makes the bucket filling easier and reduces tire wear. Combined with unique bucket filling, Toro™ LH517i loader can boost operations to the next level.

The loader has integrated intelligence in the form of Sandvik Intelligent Control system, My Sandvik Digital Services Knowledge Box™ on-board hardware and automation readiness. Additional examples of available options are Integrated weighing system and AutoMine® Loading Onboard Package.

### CAPACITIES

Maximum tramming capacity	17 200 kg
Break out force, lift	35 000 kg
Break out force, tilt	29 450 kg
Standard bucket	7.0 m³

### BUCKET MOTION TIMES

Raising time	8.3 sec
Lowering time	4.3 sec
Dumping time	2.0 sec

### OPERATING WEIGHTS \*

Total operating weight	48 400 kg
Front axle	19 400 kg
Rear axle	29 000 kg

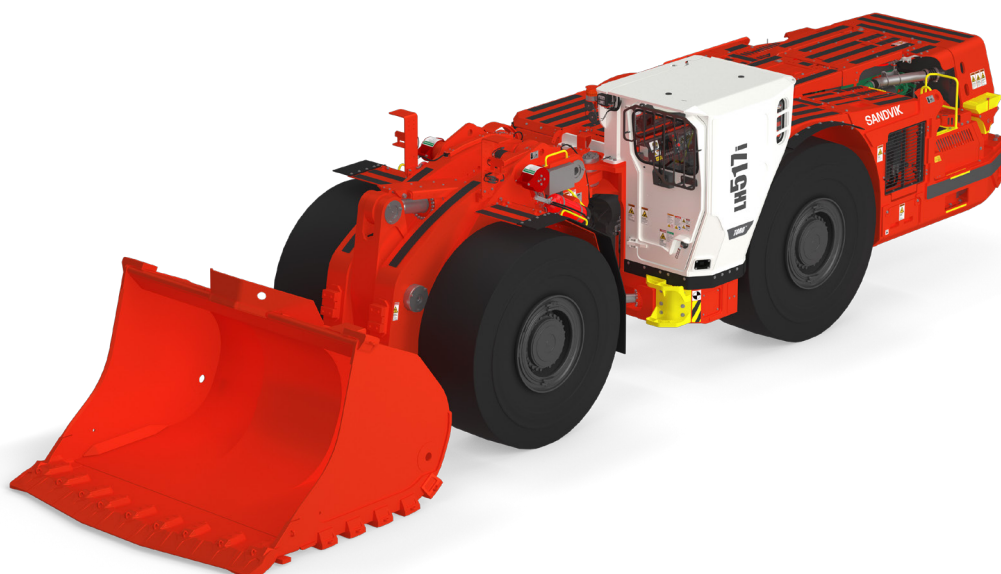
### LOADED WEIGHTS \*

Total loaded weight	65 600 kg
Front axle	46 100 kg
Rear axle	19 500 kg

\* Unit weight is dependent on the selected options

### SPEEDS FORWARD & REVERSE (LEVEL/LOADED, WITH LOCK-UP)

ENGINE	STAGE II / TIER 2	TIER 4F AND STAGE V
1st gear	5.3 km/h	5.4 km/h
2nd gear	9.5 km/h	9.6 km/h
3rd gear	16.5 km/h	16.8 km/h
4th gear	29.2 km/h	29.7 km/h





## OPERATIONAL CONDITIONS AND LIMITS

Environmental temperature	From -10°C to +50°C
Standard operating altitude	With engine Volvo TAD1342VE 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
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 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 Refrigerant R134a under pressure max 38 bar/550 PSI: Filled weight: 1.6 kg CO <sub>2</sub> e: 2.288 tons GWP: 1430 Information based on the F Gas Regulation (EU) No 517/2016

## POWER TRAIN

### ENGINE

Diesel engine	Volvo TAD1342VE Without engine brake
Output	310 kW @ 2 100 rpm
Torque	2 005 Nm @ 1 260 rpm
Number of cylinders	In-line 6
Displacement	12.78 l
Cooling system	Liquid cooled and piston pump driven cooler fan
Combustion principle	4-stroke, direct injection, turbo with intercooler
Air filtration	Two stage filtration, dry type
Electric system	24 V
Emissions	Tier 2, Euro Stage II
Ventilation rate (Ultra low sulphur diesel)	CANMET 12.74 m <sup>3</sup> /s MSHA 18,500 CFM
Particulate index (Ultra low sulphur diesel)	MSHA 10,500 CFM
Exhaust system	Catalytic purifier and muffler, double wall exhaust pipe
Average estimated fuel consumption at 40% load	32 l/h
Fuel tank refill capacity	580 l

### CONVERTER

Dana SOH 9000 series with lock-up

### TRANSMISSION

Power shift transmission with modulation	Dana SOH 6000 series, automatic gear shift control, four gears forward and reverse
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## AXLES

Front axle, spring applied hydraulic operated brakes. Fixed	Kessler D106, limited slip differential
Rear axle, spring applied hydraulic operated brakes. Oscillating ± 8°	Kessler D106, limited slip differential

## TIRES

Tire size (Tires are application approved. Brand and type subject to availability.)	29.5x29 L5S 34 ply
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## HYDRAULICS

Door interlock for brakes, boom, bucket, and steering hydraulics	
Filling pump for hydraulic oil	Electric
Oil cooler for hydraulic and transmission oil	Capability up to 50°C ambient temperature
Fittings	ORFS
Hoses	MSHA approved
Hydraulic oil tank capacity	333 l
Sight glass for oil level	2 pcs

## STEERING HYDRAULICS

Full hydraulic, centre-point articulation, power steering with two double acting cylinders. Steering lock.	Steering controlled by electric joystick
Steering main valve	Open circuit type
Steering hydraulic cylinders	125 mm, 2 pcs
Steering pump	Piston type, LS controlled
Steering and servo hydraulic pumps	Piston 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 (electric), equipped with piston pump that delivers oil to the bucket hydraulic main valve.
Boom system	Z-link
Lift cylinders	180 mm, 2 pcs
Dump cylinder	220 mm, 1 pc
Main valve	Open circuit type
Pump for bucket hydraulics	Piston type, LS controlled

## 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.

Automatic brake activation system, ABA
Electrically driven emergency brake release pump
Brake oil tank capacity 77 l



## OPERATOR'S COMPARTMENT

The cabin offers superior operator ergonomics through well designed leg space and pedal position to reduce operator fatigue. With a slim line dash and greater headroom, the cabin is spacious for the operator's comfort, providing also additional storage for a water bottle and supplies needed for a full shift.

The cabin uses dust and noise resistant upholstery materials, is ROPS/FOPS certified to protect the operator in case of roll over or falling objects, has 3-layer laminated safety glass windows, emergency exits, illuminated cabin entrance with three-point contact handles and anti-slip steps. In addition, the cabin is mounted on oil dampened bushings to reduce whole body vibration.

### CABIN

ROPS certification according to EN ISO 3471
FOPS certification according to EN ISO 3449
Sealed, air conditioned, over pressurized, noise suppressed closed cabin
Sound absorbent material to reduce noise
Laminated glass windows
Cabin mounted on rubber dampers to the frame to reduce vibrations
Air conditioning unit located inside the cabin
Powered pre-filter for A/C device
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
Remote circuit breaker switch

### CONTROL SYSTEM, DASHBOARD AND DISPLAYS

Sandvik Intelligent Control System
Critical warnings and alarms displayed as text and with light
Instrument panel with 7" color display, touch screen function, adjustable contrast and brightness and illuminated switches
My Sandvik Digital Services Knowledge Box™ on-board hardware
AutoMine® Loading readiness

### 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
Selectable damping
Two-point seat belt

## 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 <sup>2</sup> ]	0,97
VDV <sub>w</sub> over 15 min period [m/s <sup>1.75</sup> ]	8,72

## MEASURED SOUND LEVEL

The sound pressure level and sound power level at the operator's compartment have been determined in stationary conditions on high idle and at full load, with engine Volvo TAD1342VE Tier 2.

Sound pressure level $L_{pA}$ [dB re 20 $\mu$ Pa]	73 dB
Sound power level $L_{WA}$ [dB re 1 p W]	119 dB

## FRAME

### REAR AND FRONT FRAME

Central hinge with adjustable upper bearing
Tanks welded to the frame
Automatic central lubrication

## ILLUMINATION

Illuminance  $E_{av}$  with 2 pieces of high and low beam lights and 1 piece of wide flood 50 W led lights at a distance of 20 m in front of the loader:

$E_{av}$ low beam	31 lx
$E_{av}$ high beam	158 lx

Illuminance  $E_{av}$  with 2 pieces of high and low beam lights and 1 piece of wide flood 50 W led lights at a distance of 20 m behind the loader:

$E_{av}$ low beam	35 lx
$E_{av}$ high beam	91 lx

Toro™ LH517i 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, 150 A
Batteries	2 x 12 V, 180 Ah
Starter	7 kW, 24 V
Driving lights	LED lights: 4 pcs in front, rear and cabin
Working lights	LED lights: 1 pc under boom 2 pcs corner light
Parking, brake and indicator (blinkers) lights	LED lights: 2 pcs in front and rear
Control system	5 modules, inbuilt system diagnostics
Dual horn configuration with separate alarms for start and reverse	
Flashing beacon	



## INCLUDED SAFETY FEATURES

### FIRE SAFETY

Portable fire extinguisher, 12 kg (CE requirement)
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
Starter isolator
Emergency stop push buttons according to EN ISO 13850: 1 pc in cabin, 2 pcs in rear
Pressure release in the expansion tank cap
Automatic discharge for pressure accumulators (brake system and pilot circuit)
Frame articulation locking device
Mechanical boom locking device
Wheel chocks and brackets

## 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, Russian
ToolMan	2 x USB stick in pdf format, includes all manuals
Decals	English, Finnish, Swedish, Spanish, Russian, French, Polish, Portuguese, Turkish, German, Norwegian, Estonian, Chinese, Greek

### OPTIONAL ENGINE

Diesel engine	Volvo TAD1372VE
Output	315 kW @ 1 900 rpm
Engine brake	Yes
Emissions	Tier 4 Final
Ventilation rate (Ultra low sulphur fuel, AdBlue)	CANMET 6.61 m³/s, MSHA 13,500 CFM
Particulate index (Ultra low sulphur fuel, AdBlue)	MSHA 2,000 CFM
Average estimated fuel consumption at 40% load	32 l/h

## OPTIONS

Additional cabin heater element for air conditioning
ANSUL Twin fire suppression system (CE requirement)
Arctic package (120V or 230V) Includes cabin heater for new AC unit, hydraulic oil heater, transmission heater, engine heaters and arctic oils
AutoMine® Loading: Onboard Package
Boom suspension (ride control)
Cabin lift kit (150 mm)
CE Declaration of conformity
Cover grills for lamps
Disabled 4th gear
Door latch and seatbelt monitoring system
Driving direction lights (red / green)
Eclipse™ Fire suppression system with auto shutdown, Sustain or Extreme agent delivered separately (CE requirement)
Emergency steering (CE requirement)
Harsh conditions package
High backrest seat with four-point seat belt
Integrated weighing system (IWS)
Jump start interface
Line of Sight Radio remote control HBC CANBUS controlled
Line of Sight Radio remote control HBC CANBUS controlled with Video camera system
Monitoring camera system
Neutral brake
Operator Speed Assist
Proximity detection system (PDS) interface
Retrieval hook (hydraulic brake release by pulling the hook)
Safety rails
Seat: comfort, mid backrest with two-point seat belt
Seat mounted armrests
Spare rim 25.00-29/3.5 (for tyres 29.5R29)
Traction control
Tyre pressure monitoring system
Wiggins quick filling set for fuel, coolant and oils (hydraulic, engine and transmission)

### OPTIONAL ENGINE

Diesel engine	Volvo TAD1382VE
Output	315 kW @ 1 900 rpm
Engine brake	Yes, modulating engine brake
Emissions	Stage V
Average estimated fuel consumption at 40% load	32 l/h



**AVAILABLE BUCKETS**

TYPE	VOLUME	WIDTH	MAX. MATERIAL DENSITY
G.E.T. (standard)	7.0 m <sup>3</sup>	3070 mm	2400 kg/m <sup>3</sup>
G.E.T.	7.6 m <sup>3</sup>	3070 mm	2100 kg/m <sup>3</sup>
G.E.T.	8.6 m <sup>3</sup>	3070 mm	1800 kg/m <sup>3</sup>
G.E.T. Half Arrow	9.1 m <sup>3</sup>	3436 mm	1700 kg/m <sup>3</sup>
Bare Lip Ejector	7.0 m <sup>3</sup>	2830 mm	2200 kg/m <sup>3</sup>
Bare Lip	7.6 m <sup>3</sup>	3000 mm	2200 kg/m <sup>3</sup>
Bare Lip	8.4 m <sup>3</sup>	3000 mm	2000 kg/m <sup>3</sup>
MAKO	8.6 m <sup>3</sup>	3110 mm	1800 kg/m <sup>3</sup>

**GRADE PERFORMANCE**

Volvo TAD1342VE, EU Stage II, Tier 2 (3 % rolling resistance, with lock-up)

**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)	5,3	5,3	5,3	5,3	5,2	5,2	5,2	5,2	5,2	5,1
2nd gear (km/h)	9,5	9,4	9,4	9,3	9,2	9,2	9,1	8,7	7,8	7,1
3rd gear (km/h)	16,6	16,4	16,2	16,0	14,0	12,4				
4th gear (km/h)	29,6	28,9	22,8							

**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)	5,3	5,3	5,3	5,2	5,2	5,2	5,1	5,1	5,1	4,8
2nd gear (km/h)	9,5	9,4	9,3	9,2	9,1	8,5	7,5	6,9		
3rd gear (km/h)	16,5	16,2	15,5	13,0						
4th gear (km/h)	29,2	23,4								

**GRADE PERFORMANCE**

Volvo TAD1382VE, Stage V and Volvo TAD1372VE, Tier 4f (3 % rolling resistance, with lock-up)

**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)	5,4	5,4	5,4	5,4	5,3	5,3	5,3	5,3	5,2	5,2
2nd gear (km/h)	9,7	9,6	9,5	9,5	9,4	9,3	9,2	9,1	8,2	7,3
3rd gear (km/h)	16,9	16,7	16,5	16,3	14,6	12,8				
4th gear (km/h)	30,1	29,4	23,6							

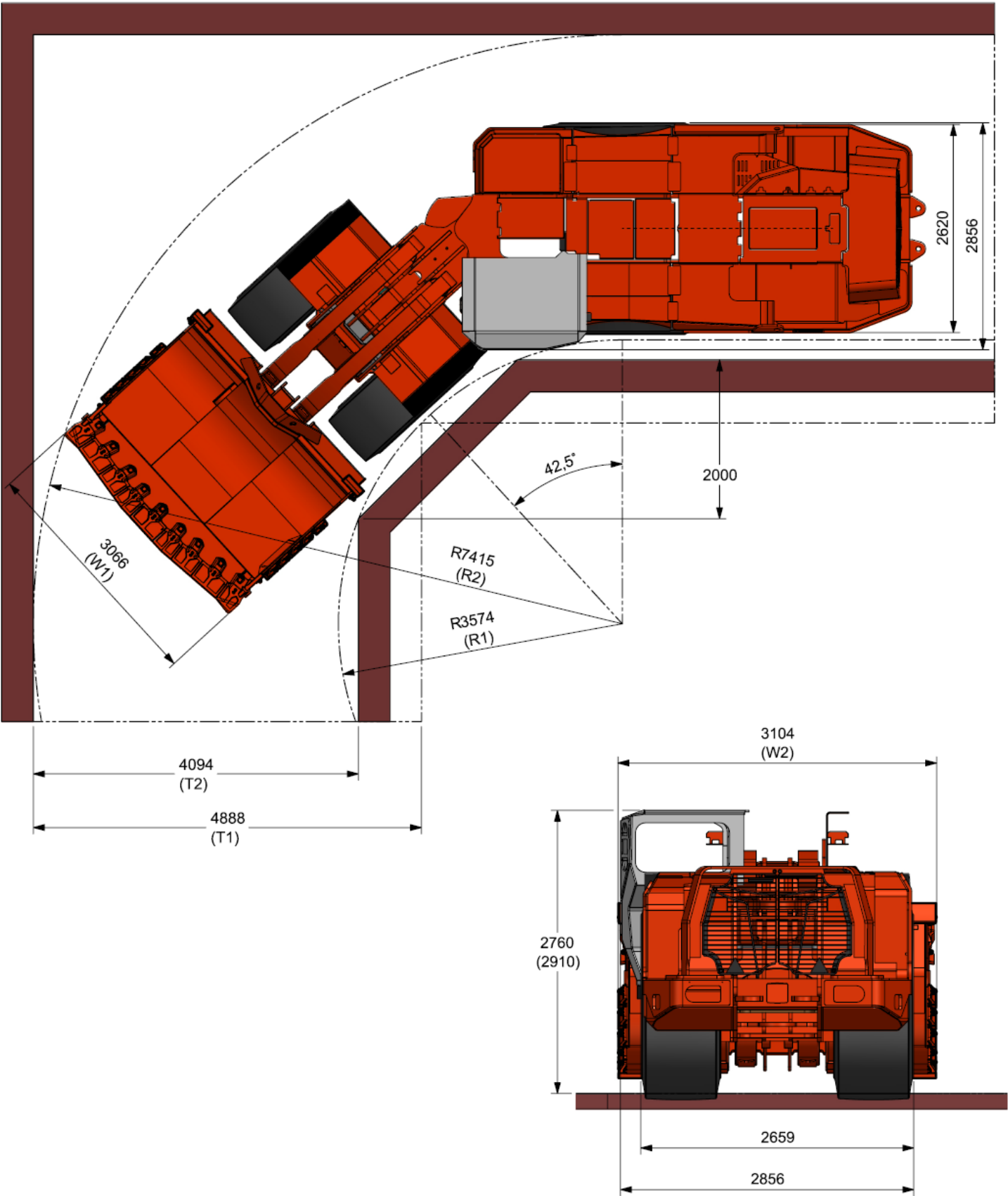
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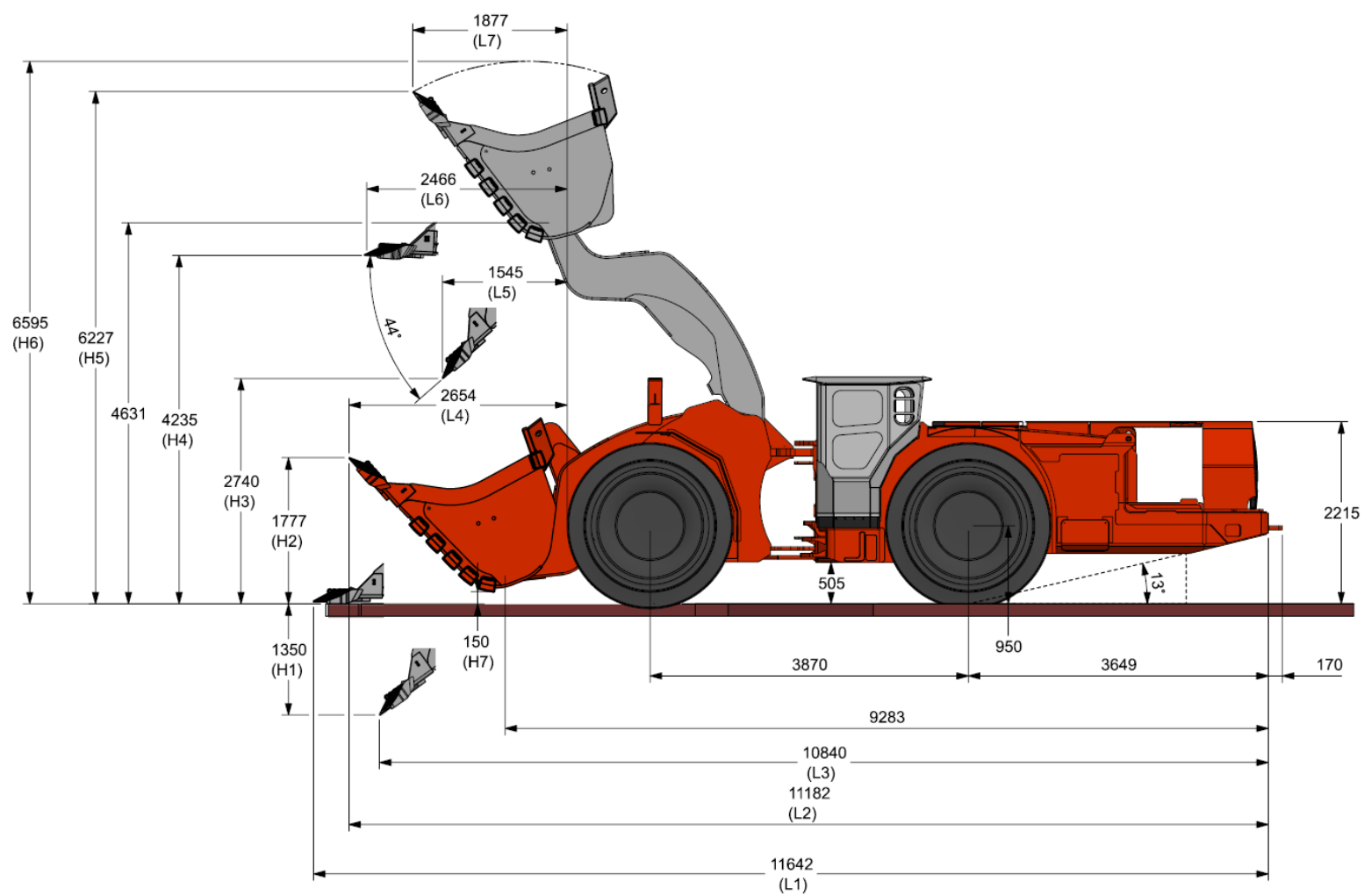
Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	5,4	5,4	5,4	5,3	5,3	5,3	5,2	5,2	5,2	5,1
2nd gear (km/h)	9,6	9,5	9,5	9,4	9,3	8,9	7,8	7,2		
3rd gear (km/h)	16,8	16,5	16,2	13,5						
4th gear (km/h)	29,7	24,3								



DIMENSIONS WITH 7m³ GET BUCKET (STANDARD)

The dimensions are indicative only







**DIMENSIONS**

Volume SAE heaped 2:1 (m³) *	7.0	7.6	8.6
Max material broken density with fill factor 100% (kg/m³)	2400	2100	1800
Lip plate type	G.E.T. (STD)	G.E.T.	G.E.T.
L1 (mm)	11642	11803	11950
L2 (mm)	11182	11292	11392
L3 (mm)	10840	10963	11074
L4 (mm)	2654	2764	2864
L5 (mm)	1545	1658	1761
L6 (mm)	2466	2623	2766
L7 (mm)	1877	1972	2059
H1 (mm)	1350	1448	1530
H2 (mm)	1777	1889	1991
H3 (mm)	2740	2631	2531
H4 (mm)	4235	4236	4236
H5 (mm)	6227	6351	6465
H6 (mm)	6595	6625	6659
H7 (mm)	150	145	147
W1 (mm)	3066	3066	3066
W2 (mm)	3104	3148	3105
R1 (mm)	3574	3574	3574
R2 (mm)	7415	7469	7518
T1 (mm)	4888	4941	4991
T2 (mm)	4094	4148	4197

**DIMENSIONS**

Volume SAE heaped 2:1 (m³) *	7.6	8.4
Max material broken density with fill factor 100% (kg/m³)	2200	1900
Lip plate type	Bare Lip	Bare Lip
L1 (mm)	11802	11949
L2 (mm)	11282	11383
L3 (mm)	11018	11131
L4 (mm)	2754	2855
L5 (mm)	1715	1818
L6 (mm)	2657	2800
L7 (mm)	1955	2042
H1 (mm)	1433	1523
H2 (mm)	1946	2048
H3 (mm)	2641	2541
H4 (mm)	4282	4282
H5 (mm)	6406	6521
H6 (mm)	6636	6674
H7 (mm)	196	196
W1 (mm)	3000	3000
W2 (mm)	3027	3027
R1 (mm)	3574	3574
R2 (mm)	7408	7458
T1 (mm)	4881	4930
T2 (mm)	4087	4137

# MATCHING PAIR

## TORO™ LH517i AND TH551i

Be safer, be stronger, and be smarter – together.

The loader Toro™ LH517i is a matching pair for three-pass loading with dump truck Toro™ TH551i considering the designed payload capacities.

Toro™ TH551i is a high productivity 51 tonne articulated underground dump truck for use in 5 x 5 meter haulage ways.

This intelligent truck is a safer, efficient, high capacity and easy to maintain underground truck for optimized fleet management.

Toro™ TH551i truck features a wide range of intelligence integrated technology, such as Sandvik Intelligent Control system, My Sandvik Digital Services and Automation Readiness as standard, supplemented with Onboard Weighing System option for tracking the payload. With the latest addition of the AutoMine® Trucking Onboard option, the truck enables autonomous haulage for both transfer level and decline ramp application.

Toro™ TH551i offers a reliable and safer solution that can significantly increase the efficiency and productivity of operations while decreasing the cost per tonne, providing smart productivity.

Operator safety, health and comfort are enhanced by the mining focused, sound suppressed, ROPS and FOPS certified cabin.

### CAPACITIES

Maximum payload capacity (SAE heaped 2:1)	51 000 kg
Standard dump box	28.0 m³
Dump box range	24 - 30 m³

### SPEEDS

1st gear	5.8 km/h
2nd gear	7.7 km/h
3rd gear	10.0 km/h
4th gear	12.7 km/h
5th gear	15.6 km/h
6th gear	20.5 km/h
7th gear	26.3 km/h
8th gear	33.4 km/h

### DUMP BOX MOTION TIMES & MOVEMENTS

Discharging time	14 sec
Dumping angle	62°

### OPERATING WEIGHTS \*

Total operating weight	46 870kg
Front axle	32 860 kg
Rear axle	14 010 kg

### LOADED WEIGHTS \*

Total loaded weight	97 870 kg
Front axle	44 470 kg
Rear axle	53 400 kg

\* Unit weight is dependent on the selected options



TS3-LH517i-B-02/ENG/METRIC



