



# TORO™ LH621i

## SAFER. STRONGER. SMARTER.





# INCREASED PRODUCTIVITY



Toro™ LH621i is engineered for rapid mine development and large-scale underground production. With superior hydraulic power for fast bucket filling and drivetrain power for high ramp speeds, this loader can quickly clear tunnel headings for rapid advance rates.

Designed with operator and maintenance safety in mind, the rugged loader offers long component lifetimes and low cost per tonne.

## Fast bucket filling

The loader's 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. 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

A fuel efficient 352kW Tier 2 engine delivers powerful thrust for fast bucket filling and high speed tramming for high productivity.

When ultra low Sulphur diesel fuel is available, Sandvik offers Volvo Stage V and Tier 4f low emission engine options. The Stage V engine meets the relevant European emission regulations whereas the Tier 4f delivers significantly reduced MSHA and CANMET ventilation rates - still maintaining loader performance and fuel efficiency. The engine brake both in the Tier 4f and 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.





### Efficient and easy to use

Continuing the proven load sense hydraulics of its predecessors, the loader reduces fuel consumption with variable displacement piston pumps that provide on-demand pressure and increased efficiency. The boom and bucket hydraulic circuit delivers fast movement through increased flow, as well as a bucket shaking functionality for fast dumping times. 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 Digital Services Knowledge Box™. The Knowledge Box™ can transfer this production monitoring data through Wi-Fi connection for customer access via My Sandvik internet portal. Alternatively, data can be downloaded manually in the operator's compartment onto a USB stick.



# SUPERIOR OPERATOR ENVIRONMENT



## **PREMIUM ERGONOMICS**

The cabin offers premium operator ergonomics and comfort following the same design philosophy as the industry leading cabin in Toro™ TH663i truck. The cabin uses dust and noise resistant upholstery materials, is ROPS and FOPS certified to protect the operator in case of roll over or falling objects, has 3-layer laminated safety glass windows, emergency escape windows, and illuminated cabin entrance with three-point contact handles and anti-slip steps.

To improve safety, 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 have been designed to reduce eye fatigue

in the underground environment. Increased leg space and improved pedal positions improve ergonomics and help to reduce fatigue.

## **RELIABLE AND EFFICIENT COOLING**

The efficient air conditioning and filtration system is directly driven off the engine for increased reliability and 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.

## **SMOOTH RIDE OVER ROUGH TERRAIN**

A ride control system is available as an option for Toro™ LH621i. The boom and bucket movement is dampened by a nitrogen filled accumulator in the hydraulic boom circuit to provide a smoother operator ride over rough ground when carrying loads at high tramming speeds.

## **SPEED CONTROL**

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



# LOW COST OF OWNERSHIP

The tremendous carrying capacity of Toro™ LH621i loader ensures a low cost per tonne and maximizes the gained value of using Sandvik equipment.

## MINIMIZED IMPACT DAMAGES

The loader's robust structure has been developed for demanding conditions and 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 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 equipment brakes through hydraulic pressure allowing faster, easier and safer stope removal from under unsupported roof. Strong structures withstand high pulling forces.

## EXTENDED COMPONENT LIFETIMES

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

The number of brake discs has been optimized for smoother braking along with a simpler brake hydraulic circuit requiring less maintenance. The engine brake, available on the Stage V and Tier 4f engines, provides better control of downhill speed, and minimizes brake and transmission overheating as well as brake wear.

Toro™ LH621i 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.

## TRACTION CONTROL

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

## 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, G.E.T. solutions provide lower overall bucket maintenance costs and reduced downtime.





# READY FOR DIGITALIZATION

## 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.

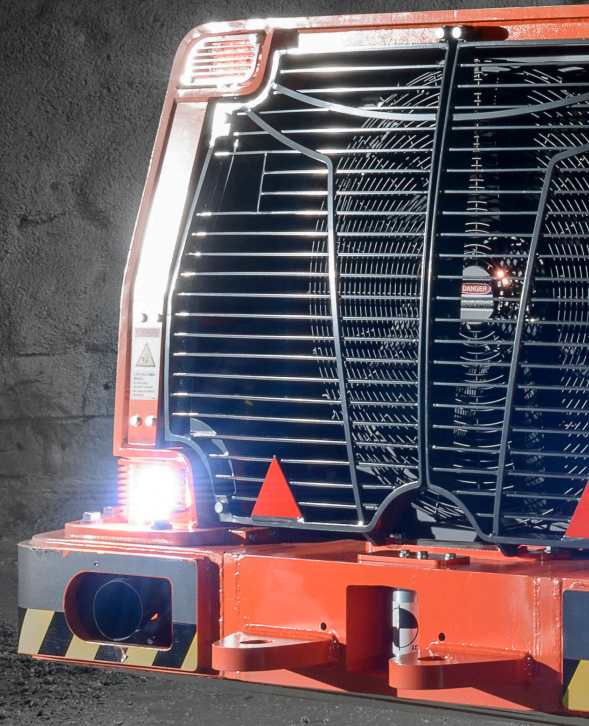
OptiMine® is interoperable and able to connect to any system and technology, including Newtrax IoT devices, providing a real-time view of mining operations. It is an open and scalable modular suite that gives you flexibility to expand and work with a full range of equipment, systems and networks.

## 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 collects, processes and transfers monitoring data into My Sandvik Insight and My Sandvik Productivity dashboard 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 Toro™ LH621i 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.

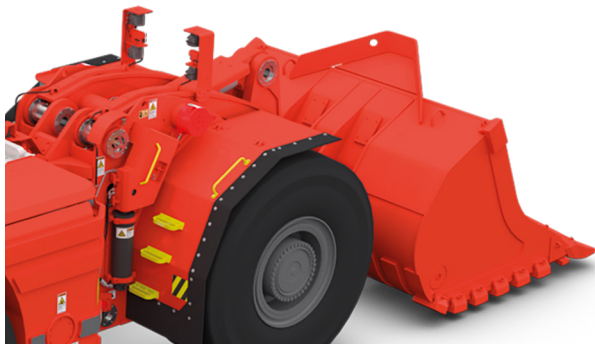








# MAINTENANCE FRIENDLY



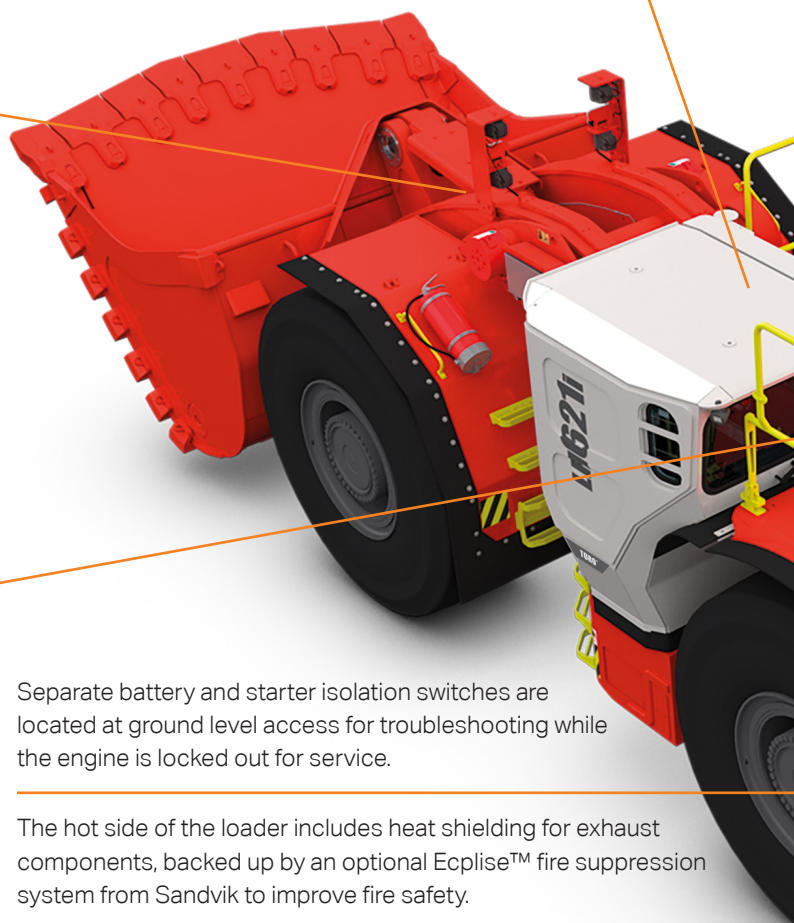
Improved boom locking mechanism enables one-handed operation and maintaining 3-point contact. The boom uses robust solid floating pins with a M30 pull out thread for easier pin removal, along with new bush lip sealings to prevent the ingress of dirt, reducing wear. The loader is equipped with more greasing points in the boom geometry, well protected grease lines and automatic central lubrication system with increased capacity for longer time between refilling.



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.

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

Safety rails improve safety of maintenance work. The first rail is opened from the ground level for safer assembly. Maintenance access to the top of the machine includes 3-point contact high contrast handles and anti-slip steps.



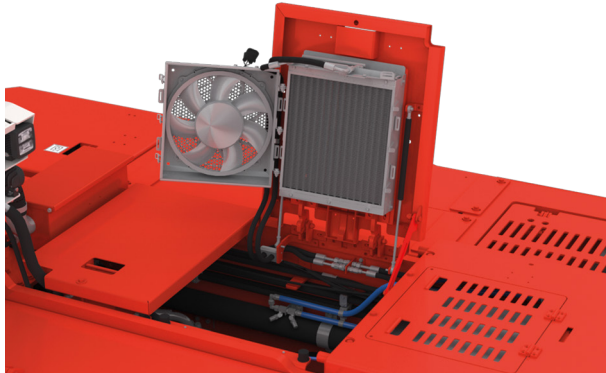
Separate battery and starter isolation switches are located at ground level access for troubleshooting while the engine is locked out for service.

The hot side of the loader includes heat shielding for exhaust components, backed up by an optional Eclipse™ fire suppression system from Sandvik to improve fire safety.

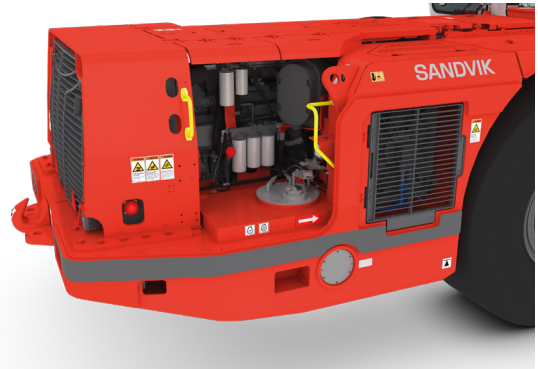
In addition to a swing out fan for engine coolers, the side coolers for transmission, brakes and hydraulics, each have a swing out fan for easy cleaning.





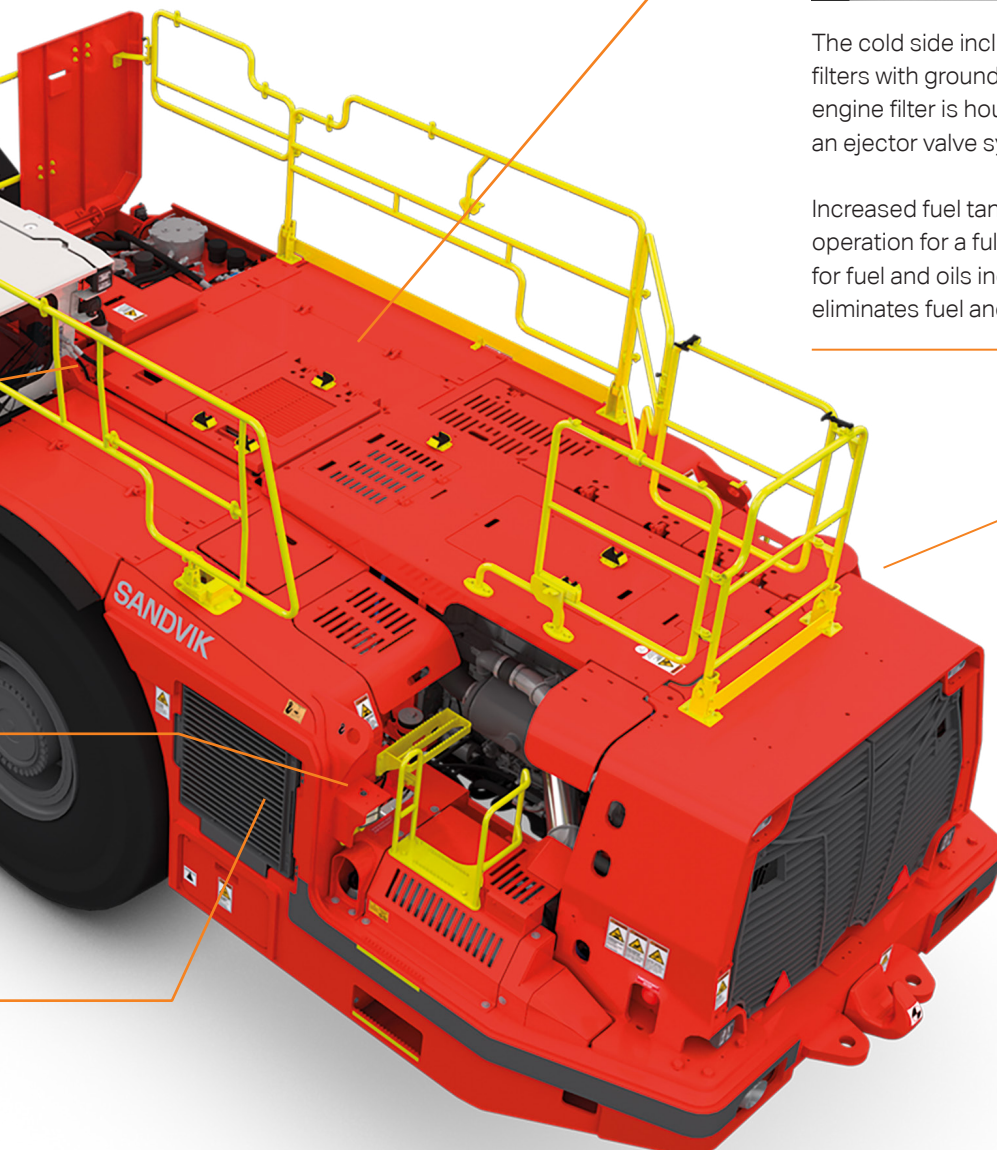


The air conditioning system is directly driven off the engine for increased reliability and it is independent of other hydraulics for easy troubleshooting.



The cold side includes a filter station for engine and brake filters with ground level access. An efficient Power Core engine filter is housed well within the frame, and it utilizes an ejector valve system for increased filter lifetime.

Increased fuel tank capacity enables continuous operation for a full shift. An optional fast filling system for fuel and oils increases equipment availability and eliminates 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

## **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™ LH621i

Toro™ LH621i is a 21 tonne loader for rapid mine development and large scale underground production. 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.

Toro™ LH621i is equipped with a fuel efficient 352kW Tier 2 / Stage II engine as standard. A Tier 4f and a Stage V state-of-the-art low emission engine options are available with the use of Ultra Low Sulphur Diesel fuel. These optional engines come with an engine break.

The equipment cabin offers superior operator ergonomics and comfort through slim line dash board, 7" color touch screen display, greater headroom, increased leg space and improved pedal positions. To improve maintainability and serviceability, the loader has been designed with smarter placement of key service areas and safer service access.

In the area of digitalization and intelligence, Toro™ LH621i loader features multiple smart solutions such as Sandvik Intelligent Control System, My Sandvik Digital Services The Knowledge Box™ on-board hardware and AutoMine® readiness as standard. The Integrated Weighing System (IWS) is optionally available for measuring payload in the bucket as well as the number of buckets filled during a shift.

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.

### CAPACITIES

Maximum tramming capacity	21 000 kg
Break out force, lift	38 500 kg
Break out force, tilt	35 100 kg
Standard bucket	8.0 m <sup>3</sup>

### BUCKET MOTION TIMES

Raising time	8.4 sec
Lowering time	4.5 sec
Dumping time	1.8 sec

### OPERATING WEIGHTS \*

Total operating weight	58 800 kg
Front axle	25 400 kg
Rear axle	33 400 kg

### LOADED WEIGHTS \*

Total loaded weight	79 800 kg
Front axle	58 100 kg
Rear axle	21 700 kg

\* Unit weight is dependent on the selected options

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

ENGINE	STAGE II / TIER 2	STAGE V AND TIER 4F
1st gear	4.7 km/h	5.0 km/h
2nd gear	8.4 km/h	9.0 km/h
3rd gear	14.5 km/h	15.6 km/h
4th gear	25.9 km/h	27.8 km/h



## OPERATIONAL CONDITIONS AND LIMITS

Environmental temperature	From -20°C to +50°C
Standard operating altitude	With engine Volvo TAD1344VE from -1500 m to +2000 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

### STANDARD ENGINE

Diesel engine	Volvo TAD1344VE
Output	352 kW @ 2 100 rpm
Engine brake	No
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	Euro Stage II, Tier 2
Ventilation rate (Ultra low sulphur diesel)	CANMET 13.54 m <sup>3</sup> /s MSHA 21,000 CFM
Particulate index (Ultra low sulphur diesel)	MSHA 12,500 CFM
Exhaust system	Catalytic purifier and muffler, double wall exhaust pipe
Average fuel consumption at 50% load	45.0 l/h
Fuel tank refill capacity	760 l

### CONVERTER

Dana SOH 9000 series with lock-up

### TRANSMISSION

Power shift transmission with modulation. Dana SOH 8000 series, automatic gear shift control, four gears forward and reverse.

## AXLES

Front axle, spring applied hydraulic operated brakes. Fixed.	Kessler D116, limited slip differential
Rear axle, spring applied hydraulic operated brakes. Oscillating ± 8°.	Kessler D116, limited slip differential

## TIRES

Tire size 35/65 R33 L5\*\* (Tires are application approved. Brand and type subject to availability.)

## HYDRAULICS

Electric filling pump for hydraulic oil
Door interlock for brakes, boom, bucket, and steering hydraulics
Oil cooler for hydraulic and transmission oil capability up to 50°C ambient temperature
ORFS fittings
MSHA approved hoses
Hydraulic oil tank capacity 480 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, LS controlled
Steering hydraulic cylinders	125 mm, 2 pcs
Steering pump	Piston type
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	200 mm, 2 pcs
Dump cylinder	250 mm, 1 pc
Main valve	Open circuit type
Pump for bucket hydraulics	Piston type, ED 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 120 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 mounts to the frame to reduce vibrations
Air conditioning and heating 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

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 mining environment to reduce eye fatigue, while red interior cabin lighting is also designed to not affect night vision during driving.

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

### OPERATOR'S SEAT

The cabin is fitted with an adjustable low frequency suspension seat with two-point seat belt or optional high back seat with four-point seat belt. New softer padded arm rests and adjustable joysticks can be configured either on the cabin wall or fixed to the 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> ]	1
VDV <sub>w</sub> over 15 min period [m/s <sup>1.75</sup> ]	8,99

### 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 TAD1374VE Tier 2.

Sound pressure level $L_{pA}$ [dB re 20 $\mu$ Pa]	75 dB
Sound power level $L_{WA}$ [dB re 1 p W]	120 dB



## FRAME

### REAR AND FRONT FRAME

The heavy duty rear frame with added weight in the rear of the loader balances the machine perfectly when lifting and pushing into the muck pile. Heavy duty rear frame and mask with integrated reaction bars minimize damages from wall impacts.

High strength structure with optimized material thicknesses and reduced own weight contribute to higher overall hauling capacity and long structural lifetime.

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.

Adjustable upper bearing in central hinge

Tanks welded to the frame

Automatic central lubrication

## ELECTRICAL EQUIPMENT

### MAIN COMPONENTS

Alternator	24 V, 150 A
Batteries	2 x 12 V, 180 Ah
Starter	9 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 lights
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	

## ILLUMINATION

Illuminance Eav with 2 pieces of 50 W led lights at a distance of 20 m in front of the loader:

Head lights, high beam $E_{av}$	132 lx
Head lights, low beam $E_{av}$	33 lx

Illuminance Eav with 2 pieces of 50 W led lights at a distance of 20 m behind the loader:

Reversing lights, high beam $E_{av}$	105 lx
Reversing lights, low beam $E_{av}$	37 lx

Toro™ LH621i is compliant with the South African Mine health and safety act 29 of 1996, as the average light intensity in the direction of travel is more than 10 lux at a distance of 20 m.

## 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

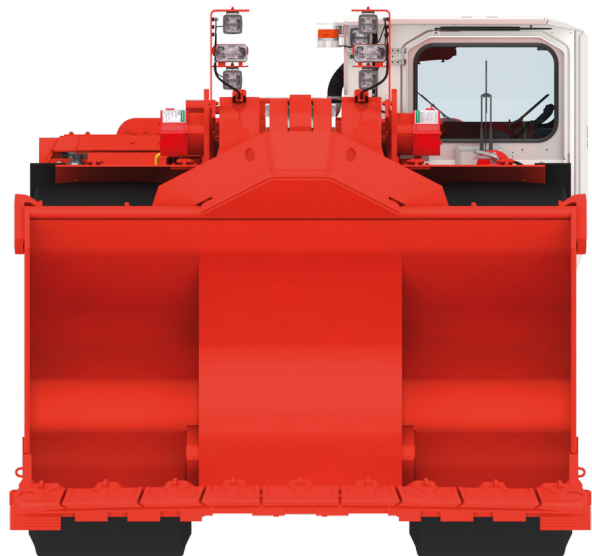
### ENERGY ISOLATION

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





## OPTIONS

Additional cabin heater element for air conditioning
ANSUL Twin fire suppression system (CE requirement)
AutoMine® Loading: Onboard Package
Boom suspension (ride control)
Cabin lift kit (150 mm)
CE Declaration of conformity (CE requirement)
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)
High back rest seat with four point seatbelt
Integrated weighing system
Jump start interface
Line of sight radio remote control system
Monitoring camera system
Neutral brake
Proximity Detection System (PDS) interface
Retrieval hook (hydraulic brake release by pulling the hook)
Safety rails
Seat comfort, mid backrest with two-point set belt
Spare rim 28.00-33/3.5 (for tyres 35/65R33)
Tyre pressure monitoring system
Traction control
Wiggins quick filling set for fuel, coolant and oils (hydraulic, engine and transmission)

## OPTIONAL ENGINE

Diesel engine	Volvo TAD1374VE
Output	375 kW @ 1 900 rpm
Engine brake	Yes
Emissions	Tier 4 Final
Ventilation rate (Ultra low sulphur diesel and AdBlue)	CANMET 7.74 m³/s, MSHA 15,500 CFM
Particulate index (Ultra low sulphur fuel, AdBlue)	MSHA 2,500 CFM
Average fuel consumption at 50% load	46l/h

## OPTIONAL ENGINE

Diesel engine	Volvo TAD1384VE
Output	375 kW @ 1 900 rpm
Engine brake	Yes
Emissions (Ultra low sulphur fuel, AdBlue)	Euro Stage V
Average fuel consumption at 50% load	46l/h

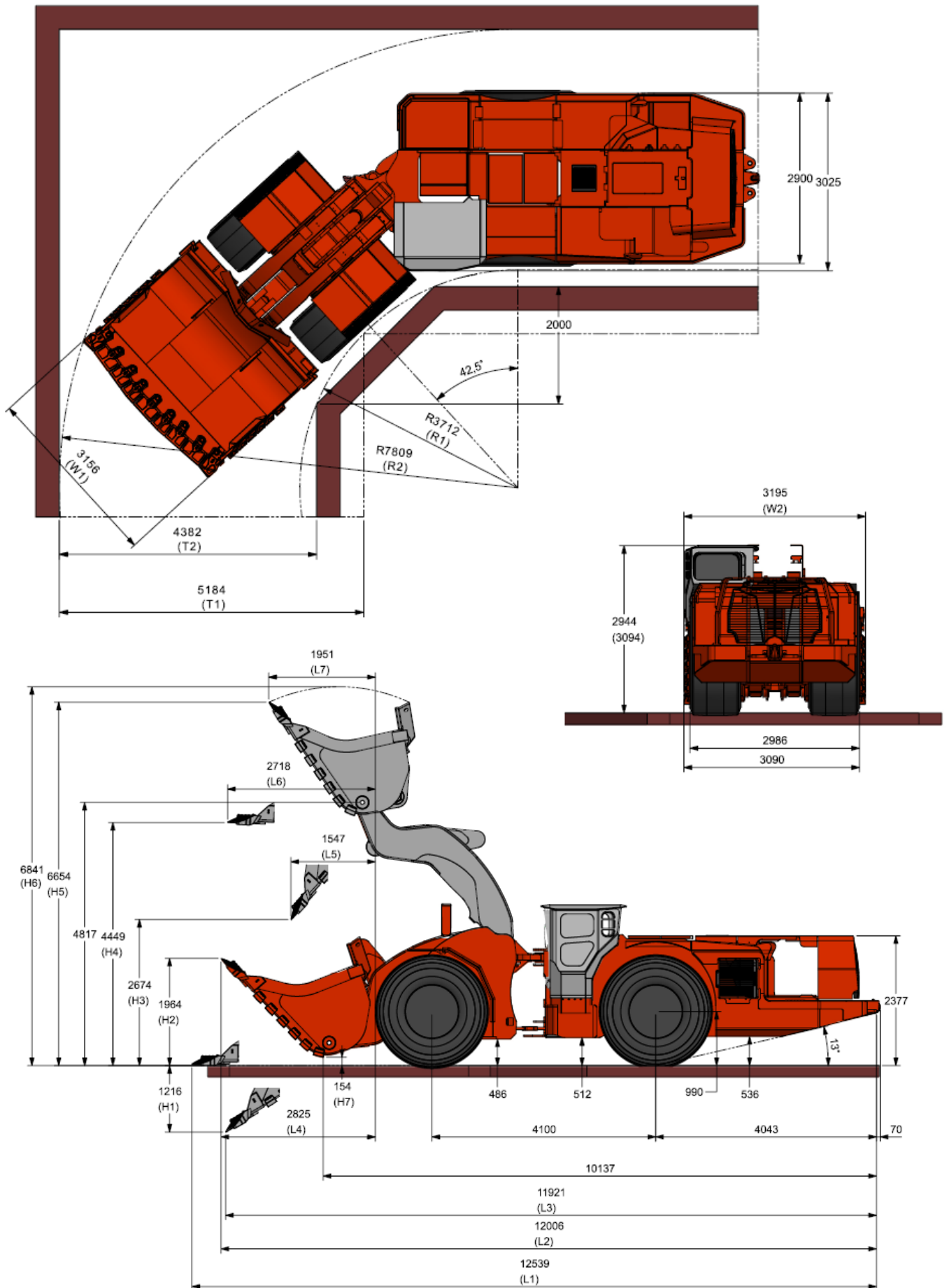
## AVAILABLE BUCKETS

TYPE	VOLUME	WIDTH	MAX. MATERIAL DENSITY
G.E.T. (standard)	8.0 m³	3160 mm	2400 kg/m³
G.E.T.	9.0 m³	3170 mm	2100 kg/m³
G.E.T.	10.7 m³	3370 mm	1700 kg/m³
G.E.T. Half Arrow	11.2 m³	3690 mm	1700 kg/m³
Bare Lip	8.0 m³	3100 mm	2600 kg/m³
Bare Lip	9.0 m³	3300 mm	2200 kg/m³
Bare Lip	10.7 m³	3300 mm	1800 kg/m³
MAKO	10.7 m³	3400 mm	1700 kg/m³



# DIMENSIONS WITH 8m³ GET BUCKET (STANDARD)

The dimensions are indicative only





**DIMENSIONS**

Volume SAE heaped 2:1 (m³) *	8.0	9.0	10.7
Max material broken density with fill factor 100% (kg/m³)	2400	2100	1700
Lip plate type	G.E.T. (STD)	G.E.T.	G.E.T.
L1 (mm)	12539	12741	12588
L2 (mm)	12006	12717	12039
L3 (mm)	11921	12086	11961
L4 (mm)	2825	2961	2860
L5 (mm)	1547	1674	1577
L6 (mm)	2718	2915	2765
L7 (mm)	1951	2062	1978
H1 (mm)	1216	1324	1242
H2 (mm)	1964	2106	1994
H3 (mm)	2674	2523	2638
H4 (mm)	4449	4450	4449
H5 (mm)	6654	6816	6692
H6 (mm)	6841	7036	6915
H7 (mm)	154	169	140
W1 (mm)	3156	3156	3356
W2 (mm)	3195	3195	3395
R1 (mm)	3712	3712	3712
R2 (mm)	7809	7876	7915
T1 (mm)	5184	5252	5290
T2 (mm)	4382	4450	4488

**DIMENSIONS**

Volume SAE heaped 2:1 (m³) *	8.0	9.0	10.7
Max material broken density with fill factor 100% (kg/m³)	2600	2200	1800
Lip plate type	Bare Lip	Bare Lip	Bare Lip
L1 (mm)	12539	12590	12921
L2 (mm)	11999	12031	12256
L3 (mm)	11966	12008	12277
L4 (mm)	2819	2851	3076
L5 (mm)	1595	1624	1830
L6 (mm)	2747	2797	3119
L7 (mm)	1937	1963	2146
H1 (mm)	1201	1229	1405
H2 (mm)	2010	2050	2279
H3 (mm)	2675	2637	2389
H4 (mm)	4486	4486	4486
H5 (mm)	6699	6740	7005
H6 (mm)	6860	6924	7201
H7 (mm)	197	197	192
W1 (mm)	3100	3300	3300
W2 (mm)	3125	3300	3300
R1 (mm)	3712	3712	3712
R2 (mm)	7759	7862	7969
T1 (mm)	5134	5237	5345
T2 (mm)	4332	4435	4543



**GRADE PERFORMANCE**

Volvo TAD1344VE Euro 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
Ratio					1:12	1:10	1:8	1:7	1:6
1st gear (km/h)	4.7	4.7	4.6	4.6	4.6	4.6	4.6	4.6	4.5
2nd gear (km/h)	8.4	8.3	8.3	8.2	8.2	8.1	8.1	8.0	7.4
3rd gear (km/h)	14.6	14.4	14.3	14.1	13.1	11.6	9.0		
4th gear (km/h)	26.2	25.6	21.3						

**Loaded**

Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0
Ratio					1:12	1:10	1:8	1:7	1:6
1st gear (km/h)	4.7	4.6	4.6	4.6	4.6	4.6	4.5	4.5	4.5
2nd gear (km/h)	8.4	8.3	8.2	8.2	8.1	7.9	7.0	6.5	5.7
3rd gear (km/h)	14.5	14.3	14.1	12.1	10.3				
4th gear (km/h)	25.9	21.8							

**GRADE PERFORMANCE**

Engine Volvo TAD1384VE , Stage V and Volvo TAD1374VE, Tier 4 f (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
Ratio					1:12	1:10	1:8	1:7	1:6
1st gear (km/h)	5.1	5.0	5.0	5.0	5.0	5.0	4.9	4.9	4.9
2nd gear (km/h)	10.4	9.0	8.9	8.9	8.8	8.7	8.7	8.6	8.1
3rd gear (km/h)	15.7	15.6	15.4	15.2	14.5	12.7			
4th gear (km/h)	28.2	27.6	23.5						

**Loaded**

Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0
Ratio					1:12	1:10	1:8	1:7	1:6
1st gear (km/h)	5.0	5.0	5.0	5.0	4.9	4.9	4.9	4.9	4.8
2nd gear (km/h)	9.0	8.9	8.9	8.8	8.7	8.7	7.7	7.1	
3rd gear (km/h)	15.6	15.4	15.1	13.3	11.2	11.2			
4th gear (km/h)	27.8	24.0							



# MATCHING PAIR

## TORO™ LH621i AND TH663i

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

The loader Toro™ LH621i is a matching pair for three-pass loading with dump truck Toro™ TH663i considering the designed payload capacities.

Toro™ TH663i is a high productivity 63 tonne articulated underground dump truck for use in 6 x 6 meter haulage ways. This next generation intelligent truck is an efficient, high capacity and easy to maintain underground truck for optimized fleet management.

Toro™ TH663i 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™ TH663i 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)	63 000 kg
Standard dump box	36.0 m³
Dump box range	24 - 40 m³

### SPEEDS LEVEL/LOADED

1st gear	5.5 km/h
2nd gear	7.3 km/h
3rd gear	9.5 km/h
4th gear	12.1 km/h
5th gear	14.9 km/h
6th gear	19.7 km/h
7th gear	25.5 km/h
8th gear	32.6 km/h

### DUMP BOX MOTION TIMES & MOVEMENTS

Discharging time	16 sec
Dumping angle	62°

### OPERATING WEIGHTS \*

Total operating weight	48 440 kg
Front axle	33 400 kg
Rear axle	15 040 kg

### LOADED WEIGHTS \*

Total loaded weight	111 440 kg
Front axle	48 520 kg
Rear axle	62 920 kg

\* Unit weight is dependent on the selected options



