



# TORO™ TH663i

## SAFER. STRONGER. SMARTER.





# INCREASED PRODUCTIVITY

## Efficient ore moving and lower costs

Equipment low own weight, 63 tonnes payload capacity and high ramp speeds enable an efficient ore moving process. In addition to boosting productivity, reduced own weight also results in reduced fuel consumption and less tire wear, lowering equipment total operating costs.

## Full utilization of the truck's capacity

With wide range of box options, you can achieve the truck's rated capacity. Sandvik dump boxes are already designed with extra volume when selecting the right box for your broken material density. A built-in 90% fill factor in box selection ensures the truck can be loaded to its true rated capacity and reduces spillage during tramming. The smooth box design improves material flow during dumping, while the reinforced steel structure uses wear resistant steel for extended box lifetime. Optional features include an ejector box for backfilling and unloading in areas of restricted dump height and as well as a spill guard for the front of the dump box to protect machine covers from falling material when loading the dump box.

## Shorter cycle times

Toro™ TH663i truck has a Dana TE-50 transmission that provides easy downhill control and high speeds, contributing to shorter cycle times. The transmission control module has eight gears, fault notifications for the operator, optimized axle ratio, and a quick and smooth lock-up to lock-up shifting for maximum speed and efficiency on varying ramps and with different loads. Key components such as the turbine hub, impeller housing and rear cover are specially designed for longer lifetimes, keeping equipment in production longer by increasing service interval times.

## Production monitoring

To ensure maximum utilization of the rated payload on every trip, the truck can be equipped with Sandvik's Integrated Weighing System (IWS) for trucks. For an accurate result, the IWS considers the environmental temperature and the truck's inclination angle and is equipped with three-point measurement of the loaded weight in the box. Real-time weighing and signal lights – red, orange and green – advise the loader operator to ensure the rated capacity is reached before moving forward. IWS combined with the Vehicle Control System (VCM) features a patented carryback reduction system. The operator is notified when there is material left in the box and can activate a plate to push out the remaining material. This reduces fuel consumption and increases carrying capacity and accuracy of the IWS.

In addition to accurately measuring the payload when loading the box, the IWS records the results to My Sandvik Digital Services Knowledge Box™. The Knowledge Box™ can transfer this production monitoring data through Wi-Fi connection via My Sandvik internet portal. Alternatively, data can be downloaded manually in the operator's compartment onto a USB stick.









# 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 Toro™ TH663i for faster retrofitting later in the truck's lifetime. To maintain a fast retrofit time, the AutoMine® Onboard Package now has one small enclosure and electrical quick connectors for fast installation, and no hydraulic changes are needed. All sensors have increased protection from rock fall. With AutoMine®, a fleet of trucks 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.

## **KNOWLEDGE BOX™**

The Knowledge Box™ onboard Toro™ TH663i transfers monitoring data through a Wi-Fi connection to the My Sandvik internet portal for visualization of fleet health, productivity and utilization. Transferred data can also be used by OptiMine®, an analytics and process optimization suite to improve mining process efficiency.

## **PROXIMITY DETECTION SYSTEM INTERFACE**

A Proximity Detection System (PDS) interface option is also available on the Toro™ TH663i truck 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 truck on the signal from a PDS system.

## **MY SANDVIK DIGITAL SERVICE SOLUTIONS 365**

My Sandvik Digital Service Solutions are designed to help you maximize your productivity, operational efficiency and safety. Once activated, the Knowledge Box™ on board the truck collects and transfers equipment data into easy-to-use knowledge about your fleet's performance in the form of dashboards.





# SUPERIOR OPERATOR ENVIRONMENT & SAFETY



## **CABIN COMFORT**

Comfortable working conditions contribute to utilizing the truck's full capacity, including high ramp speeds. This industry leading cabin offers premium ergonomics with air conditioning, dust and noise resistant upholstery materials, and a significant number of adjustment possibilities.

## **FOR OPERATOR SAFETY**

The ROPS and FOPS certified cabin protects the operator in case of roll over or falling objects. The cabin has 3-layer laminated safety glass windows, illuminated cabin entrance with three-point contact handles and anti-slip steps. The door system features a magnetic interlock switch, which automatically applies brakes when the door is opened.

## **SMOOTH RIDE OVER ROUGH TERRAIN**

The truck front frame suspension provides a smooth ride even on a rough terrain. Easy operation and extremely smooth gear shifting improve comfort, making Toro™ TH663i the operators' preference underground.

## **OPERATOR SPEED ASSIST**

The operator speed assist, a standard feature in the Toro TH663i truck, limits vehicle top speed. It improves mine safety by limiting the maximum driving speeds and helps the operator to keep speed in downhill driving. Further, it allows easier operation and improved focus on driving as well as reduces brakes wear by using the engine brake as a primary speed control device.

## **BEST IN CLASS VISIBILITY**

Flat equipment covers help to improve visibility, supported with LED lights as standard. A 5.7" LCD color display with adjustable contrast and brightness has all the needed information and alarms on one display, giving the operator more time to keep eyes on the road. To further improve visibility, the truck is equipped with reversing and right hand side cameras as standard. In humid conditions heated windows and mirrors keep free of condensed water.

## **COMFORTABLE SEATING**

The operator's seat has low frequency pneumatic suspension, adjustable arm rests and lumbar support, selectable damping and adjustable steering wheel, to name a few of the adjustments. To support efficient and safe training, the cabin incorporates a trainer seat with three-point safety belt, right behind the operator.

## **FIRE SAFETY**

To reduce the risks relating to fire, fire safety has been designed in to the equipment. To name a few solutions, the turbo charger, the double wall exhaust manifold, and the fuel tank are all covered. A remote circuit breaker is located in the cabin for isolating the batteries and electric system.

For fire suppression, Eclipse™ from Sandvik is available as an option. The Eclipse™ equipped with the fluorine-free Sustain agent is a sustainable choice. For conditions where the temperature may drop under zero, the Eclipse™ Extreme provides fire protection.



# MAINTENANCE FRIENDLY

Toro™ TH663i is designed for ground level daily maintenance. When getting to the top of the equipment is required, the access systems provide a steady grip, including 3-point contact high contrast handles and anti-slip steps. The top covers are perforated to reduce risks for slipping, and where perforation is not practical, anti-slip tapes are fitted. Standard features improving safety of maintenance work include lockable main switch, starter isolator switch, articulation lock, box support and wheel chocks, among others. Optionally available safety rails improve safety on top of the equipment, and they are recommended for all conditions. For Toro™ TH663i truck, they are attached to the frame and can be folded up manually.

## SMART MAINTENANCE

To minimize the need to move around the machine or use special tools, Sandvik Intelligent Control System 5.7" touch screen color display provides service information, easy system diagnostics and alarm log files. For example, for identifying the need for a filter change, the control system monitors the condition of engine air filters as well as hydraulic and transmission filters. The transmission includes improved self-diagnostics, integrated fully in the Sandvik Intelligent Control System. Further, an automatic brake test with diagnostics and logging can also be performed from the display.

## EASY FUEL FILTER FILLING

Filling up fuel filters can be easily done by pushing a button instead of doing the work manually. Potential fuel spills are collected on a tray under the filters, from where the fuel can be drained to a container, avoiding spills to the ground.

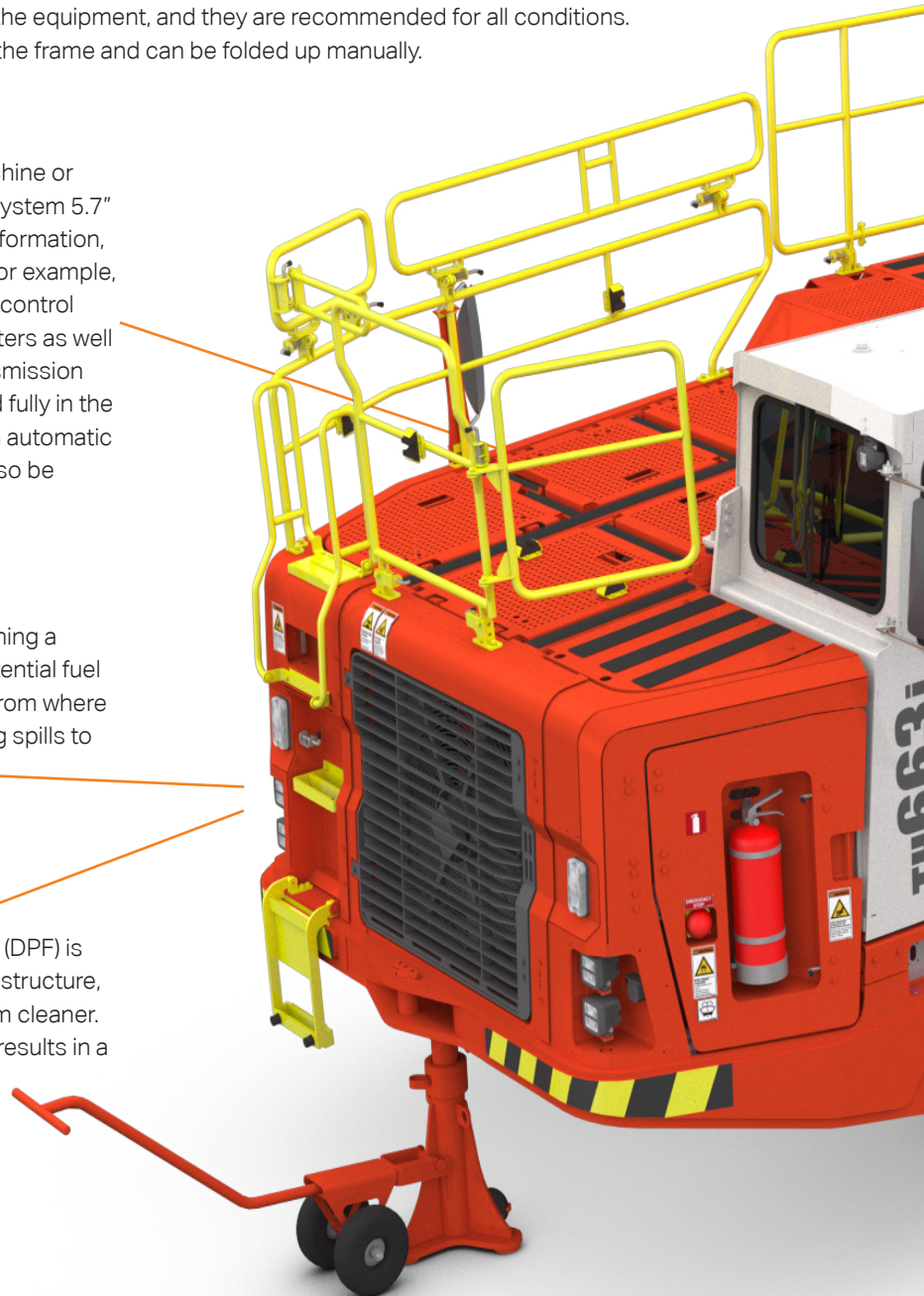
## EASY TO CLEAN DPF FILTER

The optionally available diesel particulate filter (DPF) is made of sintered metal, and has an open filter structure, which makes it easy to clean on site with steam cleaner. Using sintered metal as the DPF material also results in a long service interval.

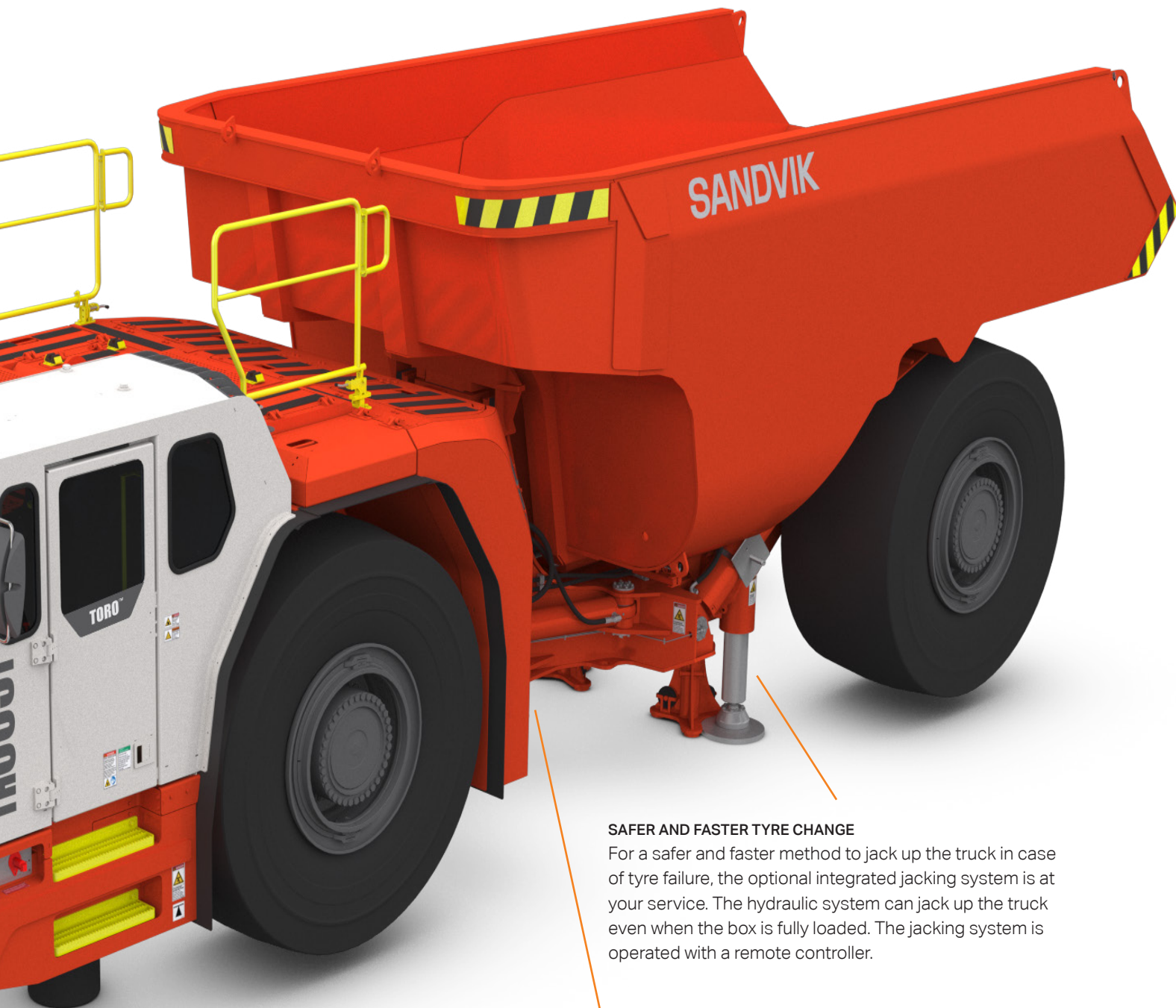
## MAINTENANCE KITS AND PERFORMANCE FLUIDS

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.







#### **LOGLIFE STEEL PIPING**

Extensive use of hydraulic steel piping throughout the truck delivers longer lifetime and easier maintenance access than traditional hydraulic hoses. Stainless steel piping is used extensively for corrosion protection. For harsh conditions, an aggressive water package is available, including water cooled alternator. Zinc aluminum coated fasteners throughout the truck provide corrosion protection and prevent seizing.

#### **SAFER AND FASTER TYRE CHANGE**

For a safer and faster method to jack up the truck in case of tyre failure, the optional integrated jacking system is at your service. The hydraulic system can jack up the truck even when the box is fully loaded. The jacking system is operated with a remote controller.

#### **ACCURATE OIL SAMPLING**

Monitoring the condition of the equipment fluids helps to understand component health and enables informed maintenance decisions to extend the equipment lifetime and reduce total lifecycle cost. Toro™ TH663i live oil sampling option enables taking oil samples when the engine is running, contributing to accurate results. Naturally, all oils are easy to drain with hoses or with the optionally available Wiggins quick fill system.



# LOW COST PER TONNE HAULED

## **FUEL EFFICIENT VOLVO ENGINE WITH LONG ENGINE LIFETIME**

A fuel efficient 565 kW Stage II / Tier 2 Volvo engine offers long engine lifetime and low cost of ownership. Equipment low own weight, efficient engine technology, fast ramp speeds for short cycle times and up to 25% lower fuel consumption compared to competition result in low cost per hauled tonne. Reduced fuel consumption also supports reduction of CO<sub>2</sub> emissions. The heavy-duty, efficient Aluminum cooler is easy to clean, helping to reduce total cost of ownership. The optionally available sintered metal DPF reduces diesel particle emissions by more than 99% (particle count) in the size range of 20–300 nm. The exhaust system is well protected with covers to contribute to long lifetime.

## **STATE OF THE ART STAGE V ENGINE**

When ultra-low Sulphur diesel fuel is available, Sandvik also offers a Stage V engine as an option, meeting the relevant European emission regulations. The exhaust after treatment contains a Selective Catalytic Reduction system (SCR), which uses diesel exhaust fluid to reduce emissions of nitrogen oxides. The SCR reduces NOx emissions without sacrificing performance or fuel efficiency. The common rail injection and dual-stage turbo charging both in use in the 16 litre diesel engine of the Toro™ TH663i truck, provide high power density, low fuel consumption, low noise and low emissions.

## **OPTIMIZED GREASE CONSUMPTION, EXTENDED COMPONENT LIFETIMES**

The standard automatic central lubrication system optimizes grease consumption and extends the life of the bushes and bearings. In addition to extending component lifetime, the central lubrication system improves safety. Activated by Sandvik Intelligent Control System when the parking brake is released, hard to reach areas are well lubricated and service time is reduced.

## **MINIMIZED TRANSMISSION AND BRAKE WEAR**

The truck has a combined engine brake and fully proportional hydraulic retarder which operate simultaneously, minimizing brake and transmission overheating and brake wear. Activated automatically, the engine brake provides smooth and responsive braking to control vehicle speed downhill. The transmission limits the engine revolutions to maximum 2400 rpms, protecting the engine and allowing the operator to focus on driving itself. The transmission robust design is specifically made for heavy off-road application, extending transmission lifetime and lowering total cost of ownership.

## **EFFICIENT COOLING FOR INCREASED PERFORMANCE**

Separate brake, hydraulic, transmission and transfer box cooling provide 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.





# 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™ TH663i

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 a safer, 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 m <sup>3</sup>
Dump box range	24 - 40 m <sup>3</sup>

### SPEEDS (LEVEL/LOADED) WITH

	TIER 2 ENGINE	STAGE V ENGINE
1st gear	6.2 km/h	5.7 km/h
2nd gear	8.0 km/h	7.5 km/h
3rd gear	10.4 km/h	9.7 km/h
4th gear	13.3 km/h	12.4 km/h
5th gear	16.2 km/h	15.1 km/h
6th gear	20.9 km/h	19.9 km/h
7th gear	27.0 km/h	25.5 km/h
8th gear	34.3 km/h	32.4 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





## OPERATIONAL CONDITIONS AND LIMITS

Environmental temperature	From -20°C to +50°C
Standard operating altitude	With engine Volvo TAD1643VE-B from -1500 m to +1000 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: 1,5 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 TAD1643VE-B (Tier 2)
Engine brake	Yes
Output	565 kw (760 hp) @ 1900 rpm
Torque	3260 Nm @ 1200 rpm
Number of cylinders	In-line 6
Displacement	16.1 l
Cooling system	Liquid cooled
Combustion principle	4-stroke, direct injection, turbo, after cooler
Air filtration	Dry type
Electric system	24 V
Emissions	Tier 2, Euro Stage II
Ventilation rate (Ultra low sulphur diesel)	CANMET 54,000 CFM m <sup>3</sup> /s, MSHA 46,000 Ventilation Rate
Particulate index (Ultra low sulphur diesel)	MSHA Particulate Ventilation Index 12,000 CFM
Exhaust system	Catalytic converter with muffler
Fuel tank refill capacity	850 l
Compatible with paraffinic diesel fuel (EN 15940)	Yes

### TRANSMISSION

Fully automatic Dana transmission with electric shifting system and retarder includes converter with lock-up and drop box. Standard Operator Speed Assist helps operators maintain speed control when traveling downhill. Eight gears forward and two reverse. Dana self-diagnostics fully integrated into Sandvik Intelligent Control System.

### UP BOX

Katsa	Ratio 1:1
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## AXLES

Front axle	Kessler D111 series, spring applied hydraulic operated brakes, hydraulic suspension
Rear axle	Kessler D111 series, spring applied hydraulic operated brakes, fixed

## TIRES

Tire size (Tires are application approved. Brand and type subject to availability.)	35/65 R33 -E4
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## OPERATOR'S COMPARTMENT

### 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 as a standard
Cyclone pre-filter for A/C device
Adjustable steering wheel
No high pressure hoses in the operator's compartment
Inclinometers to indicate operating angle
Emergency exit
Illuminated steps to the cabin
Three-point contact access system with replaceable and colour coded handles and steps
12 V output
Remote circuit breaker switch
Mirrors defrost
Trainer's seat (behind operator)

### CONTROL SYSTEM, DASHBOARD AND DISPLAYS

Sandvik Intelligent Control System
Critical warnings and alarms displayed as text and with light, warning and alarm recorded to the control system log
5.7" display with adjustable contrast and brightness
Instrument panel with illuminated switches
My Sandvik Digital Services Knowledge Box™ on-board hardware
AutoMine® Trucking readiness
Supports 3G, 4G, LTE and WLAN data transfer

### OPERATOR'S SEAT

Low frequency suspension
Height adjustment
Adjustment according to the operator's weight
Fore & aft isolator to minimise vibrations in driving direction
Padded and adjustable arm rests
Adjustable lumbar support
Selectable damping
Four-point seat belt on operator's seat
Three-point seat belt on trainer's seat



## MEASURED VIBRATION LEVEL

Whole body vibration was determined while operating the truck 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>] 0.64 (driving with load)

VDV<sub>w</sub> over 15 min period [m/s<sup>1.75</sup>] 5.9 (driving with load)

## 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] 76 dB

Sound power level  
 $L_{WA}$  [dB ew 1 p W] 118 dB

## FRAME

### REAR AND FRONT FRAME

High strength structure with optimized material thicknesses. Reduced own weight for higher overall hauling capacity and long structural lifetime. Welded steel construction.

Central hinge with adjustable lower bearing

Tanks stand alone structures, bolted onto main frame

Automatic central lubrication

Removable belly guards

## HYDRAULICS

Filling pump for hydraulic oil

Filtration

Door interlock for brake hydraulics

Oil cooler for hydraulic and transmission oil, capability up to 55°C ambient temperature

ORFS Fittings

Hydraulic oil tank capacity 280 l

Sight glass for oil level, 2 pcs

### STEERING HYDRAULICS

Fully hydraulic, center articulatad, power steering with two double acting cylinders. Closed-center system with a load sensing piston type pump and pilot operated orbital wheel steering.

Steering main valve Solenoid operated

Steering hydraulic cylinders 140 mm, 2 pcs

Steering pump Variable displacement piston pump

### DUMP BOX HYDRAULICS

Fully hydraulic system, equipped with variable displacement piston pump. Oil flows to box hydraulic system from the steering hydraulics. Oil flow from the brake circuit pump is divided to the brake system and oil cooler motor.

Hydraulic pump Variable displacement piston pump

Control valve Solenoid operated

Main valve Solenoid operated

Cylinders 180 mm, 2 pcs

## BRAKES

Service brakes are spring applied; hydraulically operated multi disc 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, brake activates after 3sec in neutral gear

Automatic brake activation system, ABA

Electrically driven emergency brake release pump

Foot operated brake pedal, fully modulated

Brake oil tank capacity 100 l

## ELECTRICAL EQUIPMENT

### MAIN COMPONENTS

Alternator 28 V, 150 A

Batteries 2 X 12V, 180 Ah

Starter 24 V, 7 kW

Driving lights LED lights:  
4 pcs in front  
4 pcs in rear

Working lights LED lights:  
4 pcs in front  
4 pcs in rear

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

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

Reverse alarm (CE)

Flashing beacon

Reverse camera

### ILLUMINATION

Illuminance  $E_{av}$  with 2 pieces of 50 W led lights at a distance of 20 m in front of the truck:

Head lights, low beam  $E_{av}$  12 lx

Illuminance  $E_{av}$  with 2 pieces of 50 W led lights at a distance of 20 m behind the truck:

Reversing lights, low beam  $E_{av}$  13 lx

Toro™ TH663i 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.

## 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 and other EU languages

## INCLUDED SAFETY FEATURES

### FIRE SAFETY

Portable fire extinguisher, 12 kg (CE)
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, 1 pc in front frame and 2 pcs in rear frame
Pressure release in the radiator cap
Automatic discharge for pressure accumulators (brake system and pilot circuit)
Frame articulation locking device
Mechanical dump box locking device
Wheel chocks and brackets

### OPTIONAL ENGINE

Diesel engine	Volvo TWD1683V
Output	585kW (784 hp) @ 1900 rpm
Engine brake	Yes
Emissions	Euro Stage V (CE)
Ventilation rate (Ultra low sulphur diesel)	CANMET 27 000 CFM MSHA 25 000 CFM
Particulate index (Ultra low sulphur diesel)	MSHA Particulate Ventilation Index CFM 3000
Compatible with paraffinic diesel fuel (EN 15940)	Yes

### AVAILABLE BOXES

Box capacity (m <sup>3</sup> )	32	34	36	38	40	25 ejector	28 ejector
Material broken density with 90% fill factor (t/m <sup>3</sup> )	2.2	2.1	2.0	1.8	1.7	2.2	1.95
Total height (mm)	3254	3361	3492	3582	3591	3167	3402

\* According to SAE 1363/ISO 6483

Note that more boxes can be available, please contact your local Sandvik representative for more information.

## OPTIONS

ANSUL Twin fire suppression system (CE)
Arctic package 120V or 230V (preheater for hydr. oil, brake oil transmission, up-box, drop box, and engine)
AutoMine® Trucking: Onboard Package
Box-up support device
Carryback reduction system
CE Declaration of conformity
Cover grills for lamps
CRN pressure accumulators
Door latch and seat belt monitoring system
DPF exhaust system, HJS
Ducktail for 38 and 40m <sup>3</sup> boxes for improved productivity
Eclipse™ fire suppression system with auto shutdown
Emergency steering (CE)
Harsh Conditions package
Integrated weighing system (IWS)
Integrated weighing system (IWS) with external screens
Integrated jacking system
Jump start interface
Live oil sampling kit
Partial flow DPF exhaust system for > 50 ppm Sulphur content fuel
Proximity Detection System (PDS) Interface
Safety rails
Service stand
Spare rim 33-28.00/3.5 (for tyres 35/65R33)
Tyre Pressure Monitoring System
Water cooled alternator
Wiggins fuel fill system
Wiggins quick filling set for fuel and oils (hydraulic, engine and transmission)





**GRADE PERFORMANCE**

Volvo TAD1643VE-B, 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)	6.2	6.2	6.2	6.2	6.1	6.1	6.1	6.1	6.1	6.0
2nd gear (km/h)	8.1	8.0	8.0	8.0	7.9	7.9	7.9	7.8	7.8	7.8
3rd gear (km/h)	10.5	10.5	10.4	10.4	10.3	10.3	10.2	10.1	10.1	10.0
4th gear (km/h)	13.5	13.4	13.3	13.2	13.1	13.1	12.9	12.9	12.7	12.6
5th gear (km/h)	16.5	16.4	16.2	16.1	16.0	15.8	15.7	15.5	15.3	14.8
6th gear (km/h)	21.4	21.2	20.9	20.7	20.5	20.2	19.8	19.3	17.6	
7th gear (km/h)	27.8	27.4	27.0	26.6	26.2	25.2				
8th gear (km/h)	35.5	34.9	34.2	33.4	31.4					

**Loaded**

Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	6.2	6.1	6.1	6.1	6.0	6.0	5.9	5.9	5.8	5.7
2nd gear (km/h)	8.0	7.9	7.9	7.8	7.7	7.6	7.5	7.5	7.2	6.7
3rd gear (km/h)	10.4	10.3	10.2	10.0	9.9	9.8	9.4	8.8		
4th gear (km/h)	13.3	13.1	12.9	12.7	12.3	11.6				
5th gear (km/h)	16.2	15.9	15.6	15.1	13.7					
6th gear (km/h)	20.9	20.4	19.6							
7th gear (km/h)	27.0	26.0								
8th gear (km/h)	34.3	30.1								

**GRADE PERFORMANCE**

Volvo TWD1683VE, 3 % rolling resistance, with lock-up

**Empty**

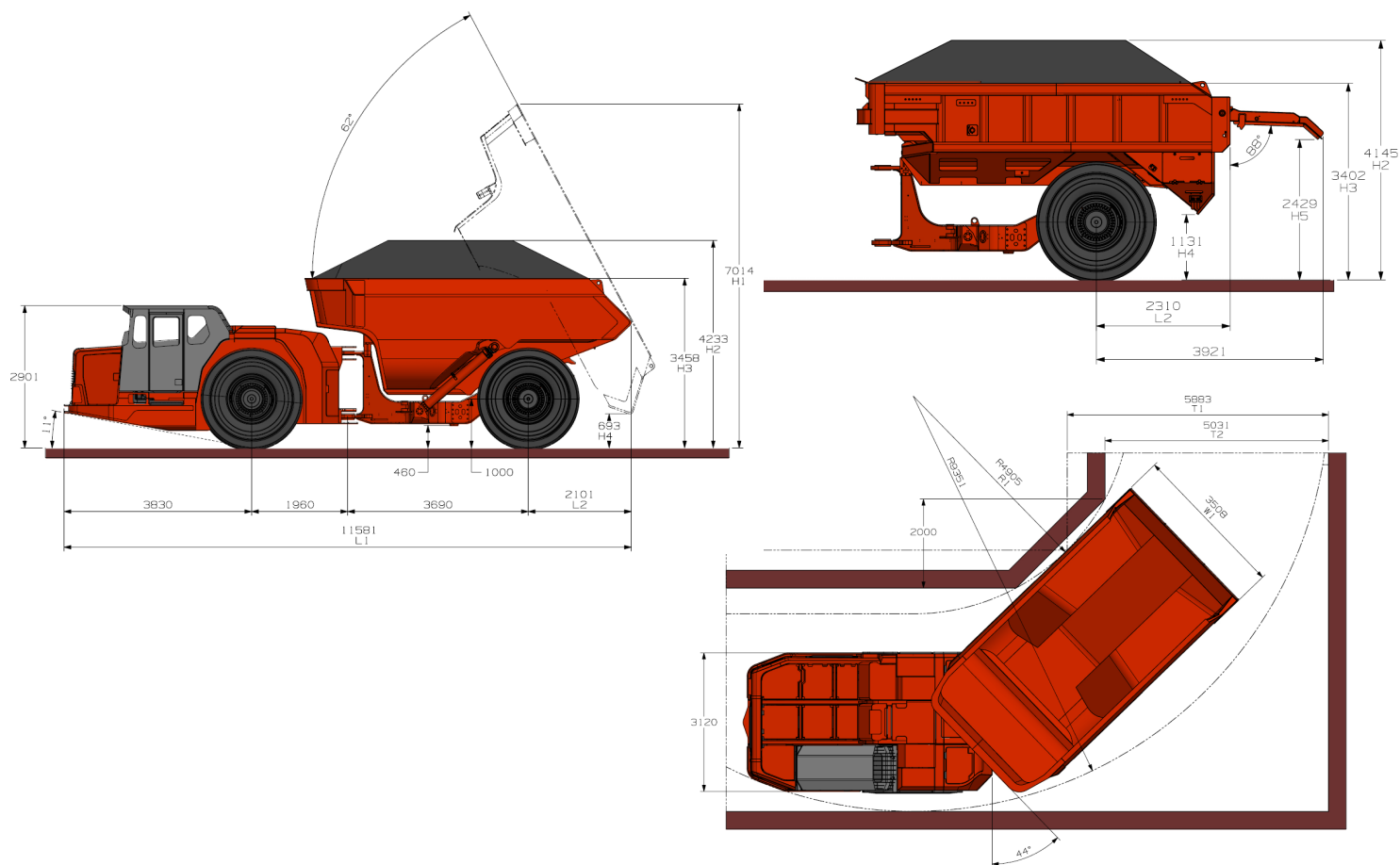
Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	5.7	5.7	5.7	5.7	5.6	5.6	5.6	5.6	5.6	5.6
2nd gear (km/h)	7.5	7.5	7.5	7.5	7.4	7.4	7.4	7.4	7.3	7.3
3rd gear (km/h)	9.8	9.7	9.7	9.6	9.6	9.6	9.5	9.5	9.4	9.4
4th gear (km/h)	12.5	12.4	12.4	12.3	12.2	12.2	12.1	12.0	12.0	11.9
5th gear (km/h)	15.3	15.2	15.1	15.0	14.9	14.8	14.7	14.6	14.5	14.2
6th gear (km/h)	20.2	20.0	19.9	19.7	19.5	19.3	19.1	18.7	17.7	15.9
7th gear (km/h)	26.1	25.8	25.5	25.2	24.9	24.4	22.8	20.9		
8th gear (km/h)	33.4	32.9	32.4	31.9	30.7	27.5				

**Loaded**

Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	5.7	5.6	5.6	5.6	5.6	5.5	5.5	5.5	5.4	5.4
2nd gear (km/h)	7.5	7.4	7.4	7.3	7.3	7.2	7.2	7.1	7.0	6.7
3rd gear (km/h)	9.7	9.6	9.5	9.4	9.3	9.2	9.0	8.8	7.8	
4th gear (km/h)	12.4	12.2	12.1	11.9	11.8	11.3	10.1			
5th gear (km/h)	15.1	14.9	14.7	14.4	13.8	12.0				
6th gear (km/h)	19.9	19.5	19.0	17.1						
7th gear (km/h)	25.5	24.8	22.0							
8th gear (km/h)	32.4	30.2								

## DIMENSIONS WITH 36 M³ BOX (STANDARD)

The dimensions are indicative only



## DIMENSIONS

Dump Boxes		STD	EJECTOR	EJECTOR
Volume SAE heaped 2:1*	(m³)	32	34	36
Maximum material density with fill factor of 90%	(t/m³)	2.1	2.0	1.9
Overall Machine Length	L1 (mm)	11581	11581	11581
Rear Axle to Rear of Machine	L2 (mm)	2101	2101	2101
Dump Position Height Max	H1 (mm)	6884	6952	7014
SAE Heap Height	H2 (mm)	4030	4137	4233
Dumpbox Spillguard	H3 (mm)	3255	3362	3458
Discharge Height	H4 (mm)	693	693	693
Ejector bucket tailgate height	H5 (mm)		2429	2429
Dumpbox width	W1 (mm)	3508	3508	3508
Dumpbox inner turn radius	R1 (mm)	4905	4905	4905
Minimum tunnel width	T1 (mm)	5883	5883	5883
Tunnel width	T2 (mm)	5031	5031	5031

\* According to SAE 1363/ISO 6483



# MATCHING PAIR

## TORO™ LH621i

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

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 m³

### 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

