

**SANDVIK**

# TORO™ LH410 UNDERGROUND LOADER



# BEST IN CLASS PRODUCTION PERFORMANCE

Toro™ LH410 loader from Sandvik builds on the proven parts of its predecessor, the successful Sandvik LH410. Toro™ LH410 offers best in class performance in productivity by means of high ramp speeds and fast bucket filling, and to make truck loading easy, it features superior lift height compared to any other loader of the same size class.

Toro™ LH410 is equipped with similar Sandvik Intelligent Control System as Sandvik i-series loaders, with option offering such as traction control, operator speed assist, integrated weighing system, and AutoMine® compatibility, among others. With all its features, Toro™ LH410 loader truly is an advanced and intelligent equipment, comparable to the large i-series loaders – just in a smaller package.

## High ramp speeds

To achieve short cycle times and superior productivity, our renewed and compact Toro™ LH410 underground loader provides the highest ramp speeds in its size class. The advanced powertrain technology includes a proven transmission with automatic gear shifting and torque converter lock up ensuring fast ramp speeds to quickly clear tunnel headings. Durable axles use limited slip differentials to maintain traction and spring applied hydraulic release brakes for safer braking. Top speed can also be limited to improve safety in narrow tunnels and rough roads.

## Fast bucket filling

Toro™ LH410 smart boom geometry is optimized to provide the highest in its class breakout forces for fast bucket filling and handling of oversized rocks. The superior lift height makes truck loading easy. Powerful boom and bucket hydraulics combined with smart geometry enable simultaneous use of both lift and tilt functions when penetrating the muck pile, making one-pass bucket filling easy and contributing to high fill factors.

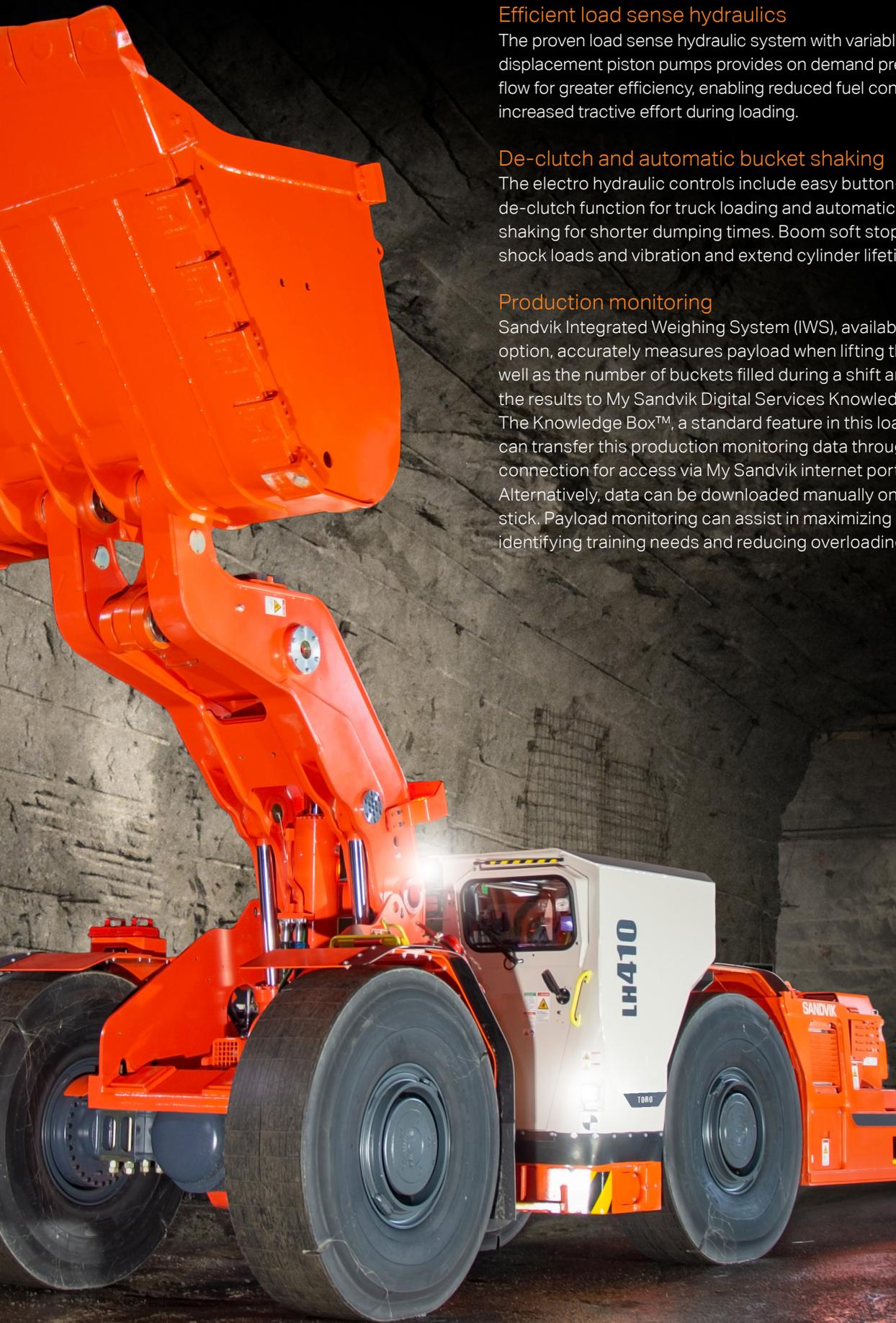
## Full range of engine options

Sandvik offers engine options starting from a powerful Tier 2 and ranging up to the state-of-the-art Stage V technology for Toro™ LH410 loader.

As a standard, the loader comes with a fuel efficient Tier 2 engine, delivering excellent ramp speeds, fuel efficiency and proven performance also at high altitudes. This robust 235kW engine with catalytic purifier and muffler offers long lifetime.

To serve customer and country specific needs in various markets, Sandvik offers a Tier 3A, 210 kW engine option. The Tier 3A engine can operate on diesel fuels with up to 3000 ppm Sulphur content.

When ultra-low Sulphur diesel fuel is available, Sandvik also offers a state-of-the-art Stage V, 210 kW engine as an option, meeting the relevant European emission regulations and delivering low MSHA and CANMET ventilation rates. This engine uses passive DPF regeneration taking place during normal operation, minimizing downtime. The modulating engine brake provides better control of vehicle speed downhill while also minimizing brake and transmission overheating and brake wear.



### Efficient load sense hydraulics

The proven load sense hydraulic system with variable displacement piston pumps provides on demand pressure and flow for greater efficiency, enabling reduced fuel consumption and increased tractive effort during loading.

### De-clutch and automatic bucket shaking

The electro hydraulic controls include easy button-operated de-clutch function for truck loading and automatic bucket shaking for shorter dumping times. Boom soft stops reduce shock loads and vibration and extend cylinder lifetime.

### Production monitoring

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

# SAFETY AND OPERATOR COMFORT

## ROPS/FOPS CERTIFIED

Toro™ LH410 loader is available with a robust ROPS and FOPS certified open canopy or closed cabin, both protecting the operator in case of rolling over or falling objects.

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

## RIDE CONTROL

The optional ride control system dampens the boom and bucket movement by a nitrogen filled accumulator in the hydraulic boom circuit, providing a smoother ride over rough ground and less spillage when carrying loads at high tramming speed.



## ADJUSTABLE JOYSTICK ARMRESTS AND LOW FREQUENCY SUSPENSION SEAT

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

## 7" TOUCH SCREEN COLOR DISPLAY

The 7" color display with advanced touch screen functionality has all the needed information and alarms on one large display 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. The Sandvik Intelligent Control system monitors and warns the operator before failures occur, preventing severe damage and potential loss of production.

## IMPROVED VISIBILITY

Adjustable high-power LED lights are a standard configuration in every Toro™ LH410. All-around operator visibility can be further improved by selecting the optionally available monitoring camera system. The air conditioning includes a cabin heater as a standard, keeping windows clear of ice or mist also in cold conditions.



# AUTOMINE® AND OPTIMINE® COMPATIBILITY

Toro™ LH410 loader has been designed for use with AutoMine®, Sandvik's robust mining automation system for increased safety, productivity and lower costs.

## **AUTOMINE®**

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

## **OPTIMINE®**

Sandvik OptiMine® is the most comprehensive solution for optimizing underground hard rock mining production and processes. It integrates all assets and people – 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 the loader 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.

## **LINE OF SIGHT RADIO REMOTE CONTROL**

Our Toro™ LH410 can be equipped with a line of sight radio remote control option, available with a direct can-bus connection to the Sandvik Intelligent Control System. An additional video camera system is available for improved visibility when loading by radio remote control. A new and improved fully hydraulic retrieval hook option releases equipment brakes by pulling a hook at the rear of the loader to retrieve the equipment from under unsupported roof, in case it is required.

## **PROXIMITY DETECTION SYSTEM INTERFACE**

A Proximity Detection System (PDS) interface option is also available on the Toro™ LH410 loader for mines to interface with their site PDS. The PDS interface offers easy installation and connection to the Sandvik Intelligent Control System with the capability to slow down and stop the loader on the signal from the PDS.



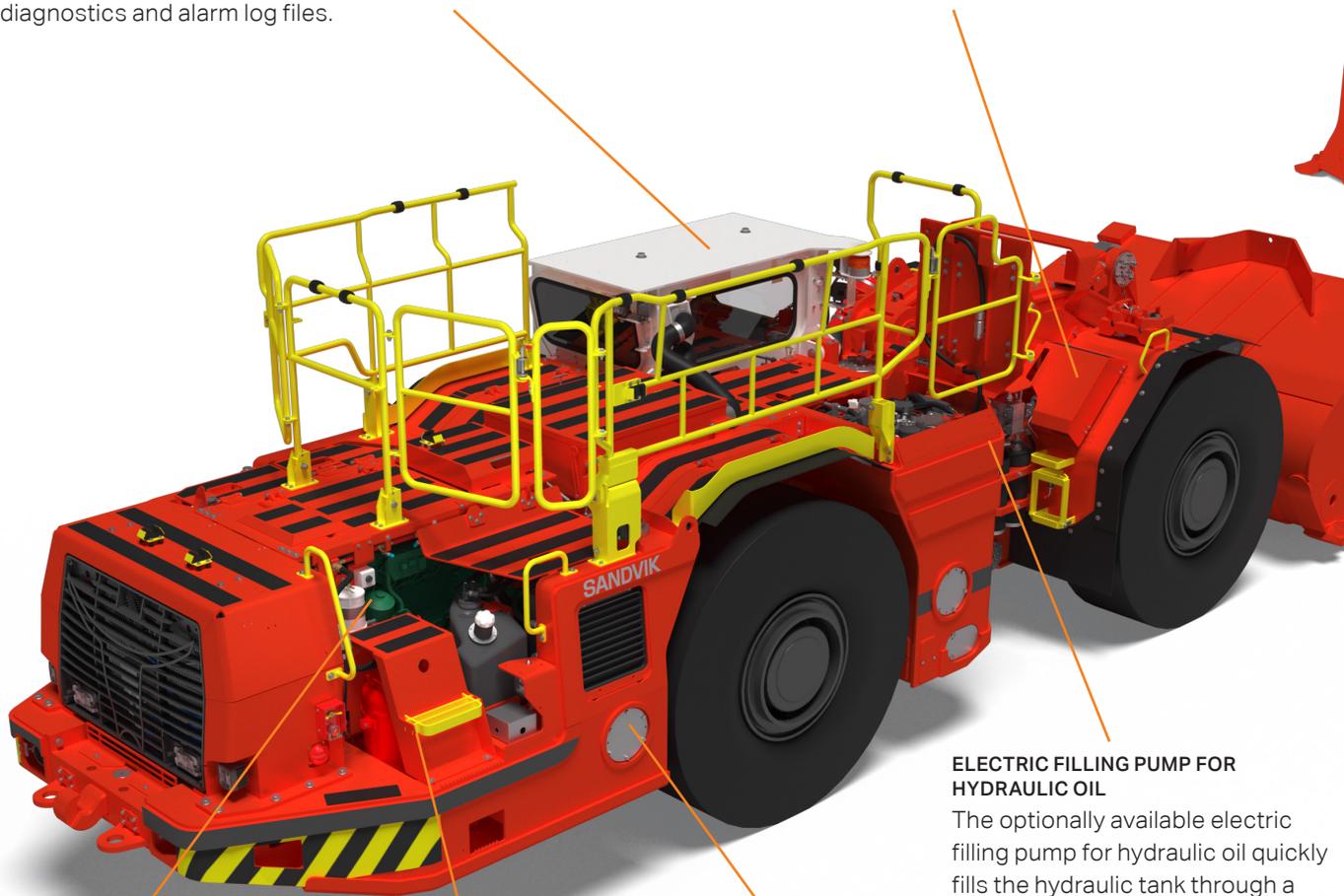
# EASE OF MAINTENANCE & SERVICEABILITY

## SANDVIK INTELLIGENT CONTROL SYSTEM

Sandvik Intelligent Control System with 7" touch screen color display provides service information, easy system diagnostics and alarm log files.

## AUTOMATIC CENTRAL LUBRICATION SYSTEM

Integrated into the Sandvik Intelligent Control System, the standard automatic central lubrication system optimizes grease consumption and extends the life of the bushes and bearings.



## ENGINE FUEL FILTERS

On the cold side, ground level access to the engine fuel filters.

## IMPROVED ACCESS

Access to the top of the loader allows three-point contact and has anti-slip steps and color-coded handles. Optional Eclipse™ fire suppression system container is located under the step.

## ELECTRIC FILLING PUMP FOR HYDRAULIC OIL

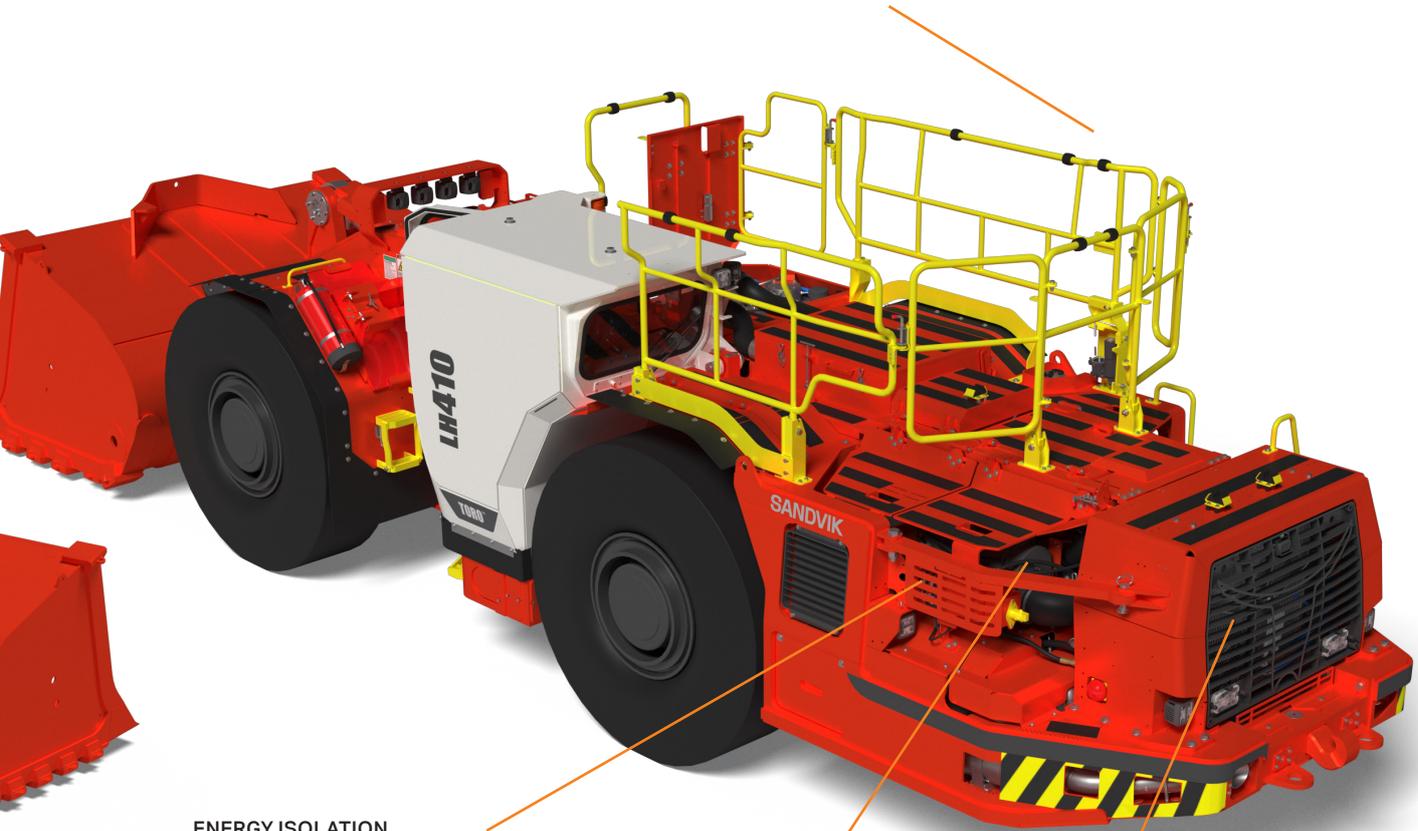
The optionally available electric filling pump for hydraulic oil quickly fills the hydraulic tank through a filter to ensure supply of clean oil.

## QUICK FUEL FILLING

The fuel tank is sized to ensure continuous operation for a full working shift. Optional Wiggins fast filling system for fuel and oils increases equipment availability by reducing fueling time by up to 80%.

#### **SAFETY RAILS**

Optionally available, easy to assemble safety rails reduce risks of falling when working on the top of the loader is necessary.



#### **ENERGY ISOLATION**

Energy isolation can be achieved by means of a starter isolator (option) and lockable main switch, among others, both within ground level reach. Wheel chocks are included in standard delivery.

#### **ENGINE AIR FILTER AND HOT SURFACES HEAT SHIELDING**

The engine side - or the hot side - includes heat shielding for exhaust components. An efficient power core engine air filter is housed well within the frame. Optionally available fire suppression system nozzles are targeted specifically to the hot engine area.

#### **ENGINE COOLER**

The easy-to-clean engine cooler of the Toro™ LH410 loader is made of Aluminum to withstand corrosion. Swing-out fans allow quick and efficient cleaning.

# LOW COST PER TONNE

## Strong resistance to shock loads

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

## Extended tyre lifetime with traction control

The traction control option reduces wheel slipping when penetrating to the muck pile and filling the bucket, extending tyre lifetime by reducing tyre wear. The traction control proves it worth specifically when loading with radio remote control.

## Extensive steel piping

Separate side-mounted brake, hydraulic and transmission cooling provides increased performance in hot conditions underground. A more efficient cooling circuit results in lower oil temperatures, reducing stress on the system, extending component lifetimes and minimizing oil leaks. Extensive use of hydraulic steel piping throughout the loader delivers longer lifetime and easier maintenance access than traditional hydraulic hoses. For an aggressive environment, a harsh conditions package is available as an option.

## Lower bucket maintenance costs and reduced downtime

SHARK™ Ground Engaging Tools (G.E.T.) are available on a wide range of bucket sizes, for optimized 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.



# 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™ LH410

Toro™ LH410 is an underground loader with 10 000 kg payload capacity. It is compact in size, but yet it features advanced technical solutions, common with Sandvik large i-series loaders.

The advanced Toro™ LH410 loader is equipped with Sandvik Intelligent Control System and 7" touch screen display as standard, monitoring equipment productivity and health, and enabling multiple smart solutions. The numerous available options include e.g. a state of the art Stage V Volvo engine, side-tipping and ejector buckets, Integrated Weighing System (IWS), traction control, operator speed assist, and full AutoMine® loading capability.

Toro™ LH410 delivers best in class performance in productivity with its high ramp speeds and fast bucket filling. To make truck loading easy, the loader offers superior lift height compared to any other loader of the same size class.

Toro™ LH410 is a matching pair for threepass loading with the TH430 dump truck.

### CAPACITIES

Maximum tramping capacity	10 000 kg
Break out force, lift	20 390 kg
Break out force, tilt	19 340 kg
Standard bucket	4.0 m <sup>3</sup>

### SPEEDS FORWARD & REVERSE (LEVEL/LOADED) WITH VOLVO TAD11140VE ENGINE

1st gear	5.5 km/h
2nd gear	10.2 km/h
3rd gear	17.5 km/h
4th gear	31.7 km/h

### BUCKET MOTION TIMES

Raising time	6.7 sec
Lowering time	4.3 sec
Dumping time	2.7 sec

### OPERATING WEIGHTS\*

Total operating weight	28 500 kg
Front axle	12 850 kg
Rear axle	15 650 kg

### LOADED WEIGHTS\*

Total loaded weight	38 500 kg
Front axle	28 250 kg
Rear axle	10 250 kg

\* Unit weight depends on selected options.



## OPERATIONAL CONDITIONS AND LIMITS

Environmental temperature	From -20°C to +50°C
Standard operating altitude	With engine Volvo TAD1140VE 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 (closed cabin option) Refrigerant R134a under pressure max 38 bar/550 PSI: Filled weight: 2,0 kg CO2e: 2,860 tons GWP: 1430 Information based on the F Gas Regulation (EU) No 517/2016

## POWER TRAIN

### ENGINE

Diesel engine	Volvo TAD1 140VE
Output	235 kW @ 2100 rpm
Torque	1568 Nm @ 1300 rpm
Number of cylinders	In-line 6
Displacement	10.84 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	CANMET 8,07 m <sup>3</sup> /s MSHA 16,000 CFM
MSHA	16,000 CFM
Particulate index	MSHA 5,500 CFM
Compatible with paraffinic diesel fuel (EN 15940)	Yes
Exhaust system	Catalytic purifier and muffler with Proventia thermal insulation system exhaust pipe
Average fuel consumption at 40% load	26 l/h
Fuel tank refill capacity	280 l

### CONVERTER

Dana C5472	With lock-up
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### TRANSMISSION

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

Front axle, spring applied hydraulic operated brakes. Fixed.	Kessler D102, limited slip differential
Rear axle, spring applied hydraulic operated brakes. Oscillating ± 8°.	Kessler D102, limited slip differential

## TIRES

Tire size (Tires are application approved. Brand and type subject to availability.)	18,00x25 L5S 28 ply
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## OPERATOR'S COMPARTMENT

### CABIN (Cabin option replaces the standard canopy)

ROPS certification according to EN ISO 3471
FOPS certification according to EN ISO 3449
Sealed, noise suppressed and over pressurized cabin with air conditioning and heating
Sound absorbent material to reduce noise
Laminated glass windows
Cabin mounted on rubber mounts to the frame to reduce vibrations
Air conditioning unit located outside the cabin to reduce noise inside the cabin
Cyclone 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

### CANOPY (Standard)

ROPS certification according to EN ISO 3471
FOPS certification according to EN ISO 3449
Adjustable joysticks
No high pressure hoses in the operator's compartment
Inclinometers to indicate operating angle
Emergency exit
Floor washable with water to reduce dust
Three-point contact access system with replaceable and colour coded handles and steps
12 V output
Remote circuit breaker switch

### OPERATOR'S SEAT

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

## CONTROL SYSTEM, DASHBOARD AND DISPLAYS

Sandvik Intelligent Control system
Critical warnings and alarms displayed as text and with light
7" color display with touch screen functionality, adjustable contrast and brightness
Illuminated switches on instrument panel
My Sandvik Digital Services Knowledge Box™ on-board hardware
Supports 3G, 4G, LTE and WLAN data transfer

## MEASURED SOUND LEVEL

The sound pressure level and sound power level at the operator's compartment (open canopy) have been determined in stationary conditions on high idle and at full load, with engine Volvo Penta TAD1140VE Tier 2.

Sound pressure level 94 dB.

Sound power level 118 dB.

## ILLUMINATION

Illuminance $E_{av}$ with 4 pieces of LED lights at a distance of 20 m in front of the loader:	Low beam (28 W): 4 lights $E_{av}$ : 14.04 lx High beam (50W): 2 lights $E_{av}$ : 14.76 lx
Illuminance $E_{av}$ with 4 pieces of LED at a distance of 20 m behind the loader:	Reverse (28W): 3 lights $E_{av}$ : 25.62 lx

Toro™ LH209L 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.

## 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 upper bearing

Rear tanks are bolted to frame, hydraulic tank and cabin base are both bolted and welded to frame

Automatic central lubrication

## HYDRAULICS

Door interlock for brakes and boom, bucket, and steering hydraulics

Oil cooler for hydraulic and transmission oil, capability up to 52°C ambient temperature

ORFS fittings

MSHA approved hoses

Hydraulic oil tank capacity 240 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	160 mm, 2 pcs
Dump cylinder	200 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.

Neutral brake

Automatic brake activation system, ABA

Electrically driven emergency brake release pump

Brake oil tank capacity 75 l

## ELECTRICAL EQUIPMENT

### MAIN COMPONENTS

Alternator	24 V, 150 A
Batteries	2 x 12V, 145 Ah
Starter	24 V, 5,5 kW
Driving lights	LED lights: 4 pcs in front 4 pcs in rear 4 pcs in cabin
Working lights	LED light, 1 pc under boom
Parking, brake and indicator (blinkers) lights	LED lights: 2 pcs in front 2 pcs in rear
Control system with 7" color display, 5 modules, inbuilt system diagnostics	
Reverse alarm	
Flashing beacon	

## INCLUDED SAFETY FEATURES

### FIRE SAFETY

Portable fire extinguisher, 12 kg

Hot side – cold side design

Isolation of combustibles and ignition sources

Heat insulation on exhaust manifold, turbo, and isolated exhaust pipe

### ENERGY ISOLATION

Lockable main switch, ground level access

Emergency stop push buttons according to EN ISO 13850: 1 pc in cabin and 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

## OPTIONS

ANSUL Twin fire suppression system with checkfire (mandatory with RRC) (CE)
ANSUL Twin fire suppression system without checkfire (CE)
Arctic package 120V (preheater for hydr. oil tank and engine block)
Arctic package 230V (preheater for hydr. oil tank and engine block)
AutoMine® Loading Onboard Package
AutoMine® Loading Readiness
Battery isolation switch
Boom suspension (ride control)
CE Declaration of conformity
Cover grills for lamps
Direct feed for beacon
Disabled 3rd / 4th gear
Door latch and seat belt monitoring system
Driving direction lights (red / green)
Eclipse™ Fire suppression system with auto shutdown, Sustain or Extreme agent delivered separately (CE)
Electric loader towing kit
Electrical filling pump for hydraulic oil
Emergency steering (CE)
Harsh condition package
Integrated weighing system for loaders (IWS)
Jump start
Line of sight radio remote control, CAN, complete
Line of sight radio remote control, CAN, complete, with video camera
Monitoring camera system
Proximity Detection System Interface
Radio remote control interface, analogue
Recorder for monitoring camera system
Retrieval hook (hydraulic brake release by pulling the hook)
Safety rails
Spare rim 13.00-25/2.5 (for tyres 18.00 R25)
Starter isolator
Traction control
Tyre Pressure Monitoring System
Wiggins quick filling set for fuel and oils
Wiggins quick filling set for fuel

## OPTIONAL ENGINE

Diesel engine	Volvo TAD882VE
Output	210kW @ 2200 rpm
Engine brake	Yes, modulating engine brake
Emissions	Euro Stage V (CE)
Ventilation rate	CANMET T 4.67 m³/s, MSHA 9,500 CFM
Particulate index	MSHA 500 CFM
Average estimated fuel consumption at 40% load	21 l/h
Compatible with paraffinic diesel fuel (EN 15940)	Yes

## OPTIONAL ENGINE

Diesel engine	Volvo TAD852VE
Output	210 kW & 2200 rpm
Engine brake	No
Emissions	Euro Stage IIIA
Average estimated fuel consumption at 40% load	25 l/h
Compatible with paraffinic diesel fuel (EN 15940)	Yes

## 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 the manuals
Decals	English, Finnish, Swedish, Spanish, Russian, French, Polish, Portuguese, Turkish, German, Norwegian, Estonian, Chinese

## AVAILABLE BUCKETS

Type	Volume SAE heaped (2:1) *	Width	Material broken density with fill factor 100%
G.E.T. (standard)	4.0 m³	2588 mm	2500 kg/m³
G.E.T.	4.6 m³	2588 mm	2100 kg/m³
G.E.T.	5.0 m³	2588 mm	1900 kg/m³
G.E.T.	5.4 m³	2588 mm	1700 kg/m³
G.E.T. Half Arrow	4.6 m³	2700 mm	2000 kg/m³
G.E.T. Half Arrow	5.4 m³	2700 mm	1700 kg/m³
Bare Lip	4.0 m³	2550 mm	2600 kg/m³
Bare Lip	4.6 m³	2550 mm	2200 kg/m³
Bare Lip	5.0 m³	2550 mm	2000 kg/m³
Bare Lip	5.4 m³	2550 mm	1800 kg/m³
Ejector bucket Bare Lip	4.6 m³	2770 mm	1900 kg/m³
Side tipping bucket	4.6 m³	2830 mm (total width) 2550 mm (lip width)	1800 kg/m³

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

**GRADE PERFORMANCE**

Volvo TAD1140VE, EU Stage II, Tier 2 (3% rolling resistance)

**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	
1st gear (km/h)	5.5	5.5	5.5	5.5	5.4	5.4	5.4	5.4	5.4
2nd gear (km/h)	10.2	10.2	10.1	10.0	10.0	9.9	9.9	9.8	9.8
3rd gear (km/h)	17.6	17.4	17.3	17.1	16.9	16.3	14.2	13.1	9.5
4th gear (km/h)	31.9	31.3	30.8	25.7	21.6				

**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	
1st gear (km/h)	5.5	5.5	5.5	5.4	5.4	5.4	5.4	5.3	5.3
2nd gear (km/h)	10.2	10.1	10.0	10.0	9.9	9.8	9.7	9.1	8.1
3rd gear (km/h)	17.5	17.3	17.1	16.9	15.0	13.1			
4th gear (km/h)	31.7	30.9	25.5						

**GRADE PERFORMANCE**

Volvo TAD882VE, EU Stage V (3% rolling resistance)

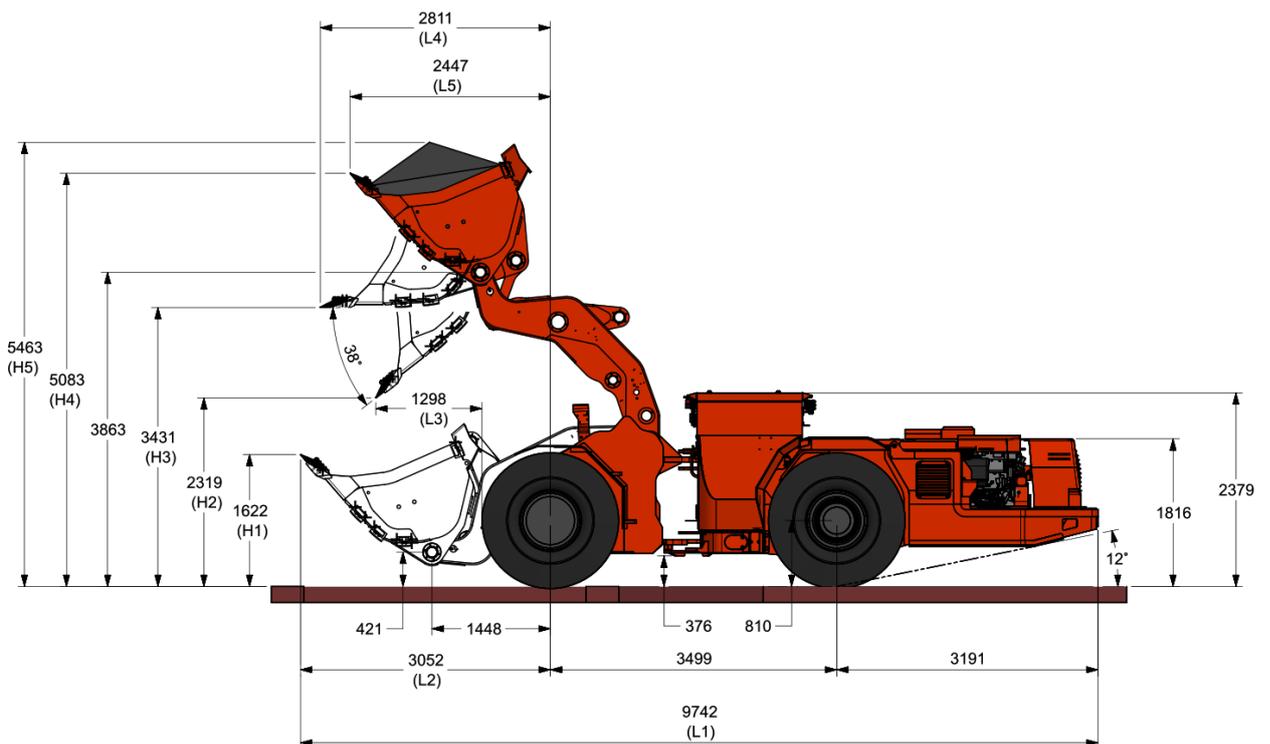
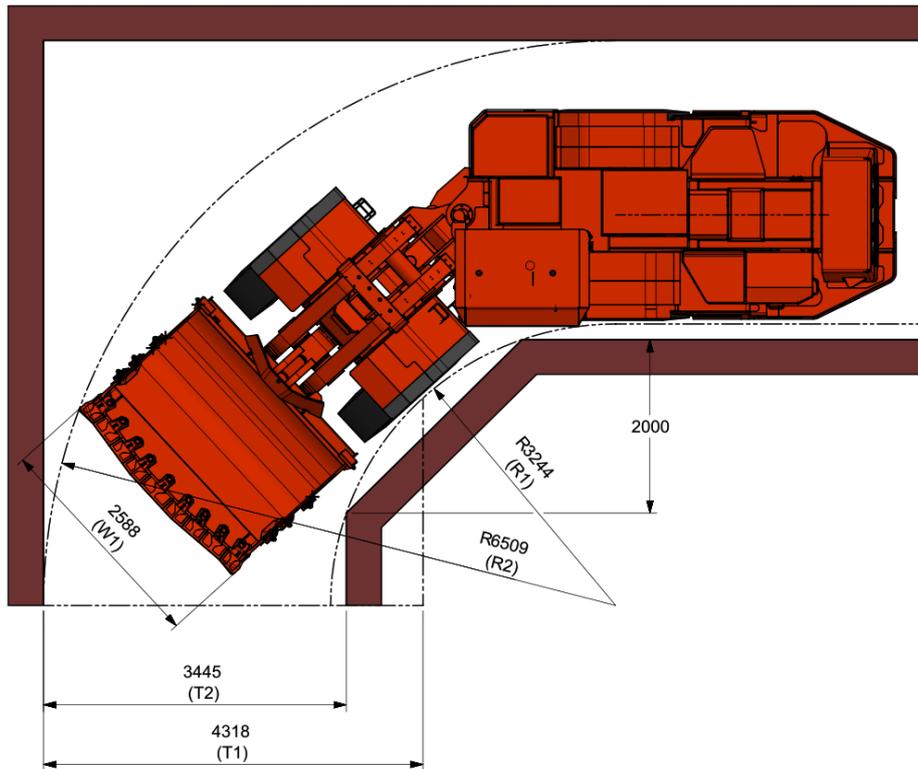
**EMPTY**

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)	6.0	5.9	5.9	5.9	5.8	5.8	5.8	5.7	5.7
2nd gear (km/h)	11.0	10.9	10.8	10.7	10.6	10.4	10.3	10.2	9.4
3rd gear (km/h)	18.8	18.5	18.1	17.8	16.7	14.8	11.7		
4th gear (km/h)	33.6	32.5	27.3						

**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)	5.9	5.9	5.9	5.8	5.8	5.7	5.7	5.6	5.6
2nd gear (km/h)	11.0	10.8	10.6	10.5	10.3	10.0	8.9	8.2	
3rd gear (km/h)	18.6	18.1	17.7	15.2	12.9				
4th gear (km/h)	33.0	27.5							

STANDARD DIMENSIONS (with standard bucket) in the drawing, necessary changing dimensions in a table.



**DIMENSIONS**

Volume SAE heaped 2:1 (m <sup>3</sup> ) *	4.0 (standard)	4.6	5.0	5.4
Max material broken density with fill factor 100% (kg/m <sup>3</sup> )	2500	2100	1900	1700
Lip plate type	GET	GET	GET	GET
L1 (mm)	9742	9830	9869	9961
L2 (mm)	3052	3140	3179	3271
L3 (mm)	1298	1427	1469	1569
L4 (mm)	2811	2968	3023	3155
L5 (mm)	2447	2531	2569	2660
H1 (mm)	1622	1752	1792	1887
H2 (mm)	2319	2233	2196	2109
H3 (mm)	3431	3455	3452	3445
H4 (mm)	5083	5216	5257	5353
H5 (mm)	5463	5541	5610	5704
W1 (mm)	2588	2588	2588	2588
R1 (mm)	3244	3244	3244	3244
R2 (mm)	6509	66550	6568	6606
T1 (mm)	4215	4256	4274	4312
T2 (mm)	3445	3485	3504	3542

**DIMENSIONS**

Volume SAE heaped 2:1 (m <sup>3</sup> ) *	4.0	4.6	5.0	5.4	4.6	5.4
Max material broken density with fill factor 100% (kg/m <sup>3</sup> )	2600	2200	2000	1800	2000	1700
Lip plate type	Bare Lip	Bare Lip	Bare Lip	Bare Lip	Half Arrow	Half Arrow
L1 (mm)	9711	9800	9848	9921	9855	10016
L2 (mm)	3021	3110	3158	3231	3165	3326
L3 (mm)	1280	1437	1488	1567	1415	1910
L4 (mm)	2797	2954	3022	3126	2973	3209
L5 (mm)	2417	2501	2547	2619	2556	2715
H1 (mm)	1635	1763	1812	1887	1738	1910
H2 (mm)	2326	2263	2219	2149	2208	2055
H3 (mm)	3458	3482	3479	3473	3427	3418
H4 (mm)	5092	5226	5276	5353	5203	5377
H5 (mm)	5462	5541	5610	5698	5541	5698
W1 (mm)	2550	2550	2550	2550	2700	2700
R1 (mm)	3244	3244	3244	3244	3244	3244
R2 (mm)	6439	6482	6504	6538	6625	6680
T1 (mm)	4145	4188	4210	4244	4331	4387
T2 (mm)	3375	3418	3439	3473	3560	3616

\* According to ISO 7546

# MATCHING PAIR

## TORO™ TH430

Toro™ TH430 is a reliable, hard-working dump truck specifically designed for underground conditions. With its robust structure, compact size and fit-for-purpose components, the truck is tailored to meet the productivity targets in challenging environments. The truck's new heavy-duty axles, using limited slip differentials to maintain traction, improve availability and reduce total costs of ownership.

The truck is equipped as standard with an enclosed and air conditioned cabin for increased operator safety and comfort. The cabin uses dust and noise resistant upholstery materials and is ROPS and FOPS certified to protect the operator in case of roll over or falling objects.

Equipped with Sandvik Intelligent Control System and a 7" display as standard, Toro™ TH430 dump truck answers to today's demands for data, connectivity and digitalization. The touch screen color display in the cabin provides service information, easy system diagnostics and alarm log files, as the Sandvik Intelligent Control System monitors the equipment health and provides early warnings.

Toro™ TH430 is an ideal choice for:

- Ramp or level production haulage in medium sized mines
- Mine development projects in medium and large mines
- Tunneling projects with restricted headroom
- Three pass loading with LH410 loader

### CAPACITIES

Maximum payload capacity (SAE heaped 2:1)	30 000 kg
Standard dump box	14.5 m <sup>3</sup>
Dump box range	14 - 18 m <sup>3</sup>

### SPEEDS (LEVEL/LOADED) with Volvo TAD1342VE Tier 2

1st gear	6.6 km/h
2nd gear	11.7 km/h
3rd gear	20.5 km/h
4th gear	36.6 km/h

### DUMP BOX MOTION TIMES & MOVEMENTS

Discharging time	14 sec
Dumping angle	61°

### OPERATING WEIGHTS \*

Total operating weight	29 500 kg
Front axle	21 900 kg
Rear axle	7 600 kg

### LOADED WEIGHTS \*

Total loaded weight	59 500 kg
Front axle	29 200 kg
Rear axle	30 300 kg

\* Unit weight is dependent on the selected options

