



# TORO™ LH209L LOW PROFILE LOADER



# STRONG AND RELIABLE LOW PROFILE LOADER

## Designed for low profile applications

Toro™ LH209L loader by Sandvik is a low profile loader with the largest payload capacity, 9 600 kg. Toro™ LH209L is a proven and reliable loader, providing excellent performance in low profile applications, as the 1690 mm canopy height enables operations at 1.8 meter working heights. With its robust reinforced structure, compact size, high payload capacity and fit-for-purpose components, the loader is tailored to meet the productivity targets in the environment where the working height is extremely limited.

## Stage 3A engine

Toro™ LH209L is equipped with a standard 185 kW Stage 3A engine by Volvo Penta. It has low fuel consumption for increase productivity and a lower overall costs.

## Declutch and automatic bucket shaking

This loader The electrohydraulic controls include an easy button-operated de-clutch function for truck loading and automatic bucket shaking for shorter dumping times.

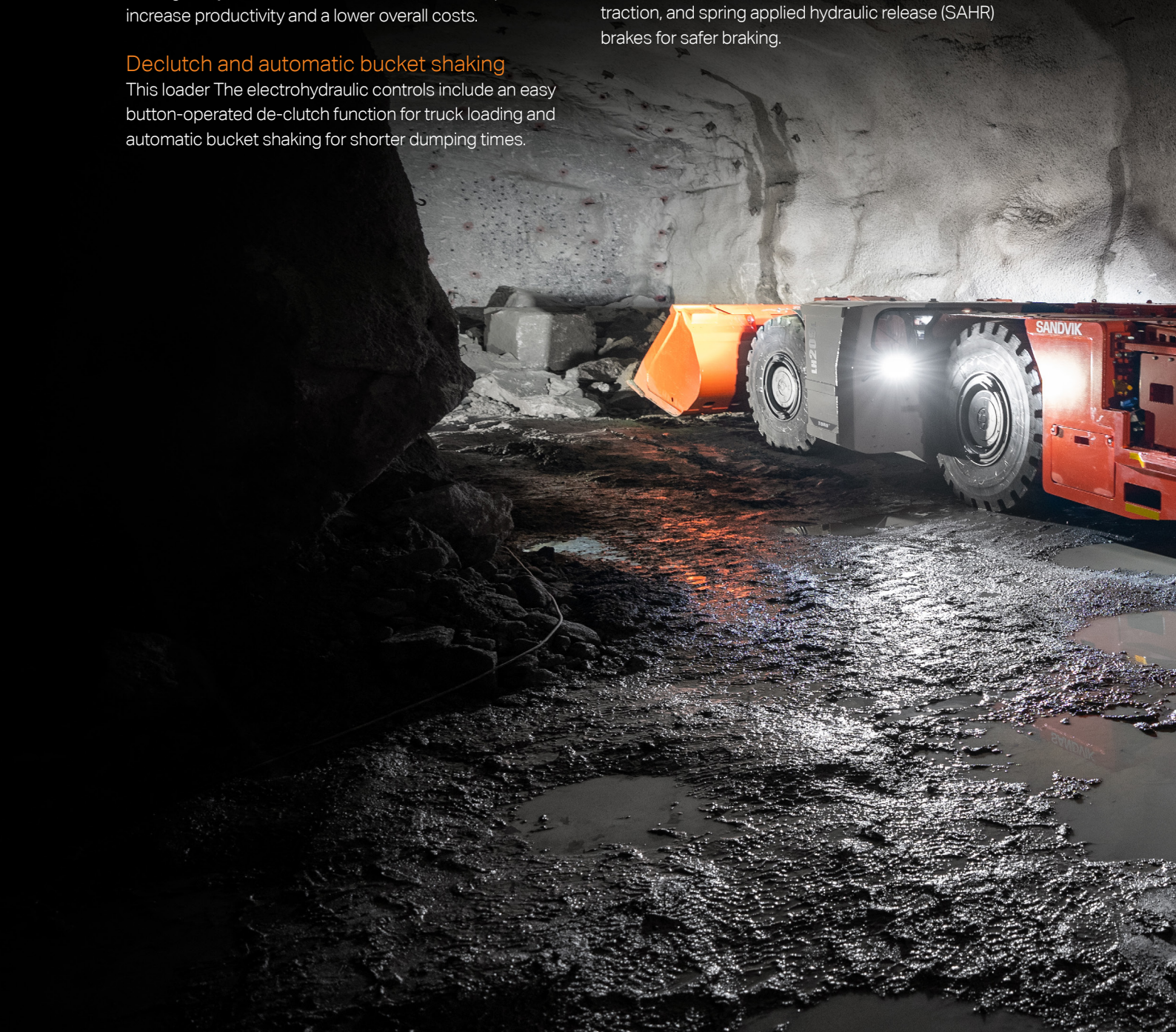
Automatic Bucket Shaking is also standard. The control is the same as other VCM3 loaders.

## Efficient bucket filling

Toro™ LH209L loader has enhanced boom design, which is optimized to provide the highest in class breakout forces for fast bucket filling and handling of oversized rocks.

## Advanced powertrain technology

Toro™ LH209L has advanced powertrain technology, which includes a proven energy efficient transmission with speed sensors and simplified hydraulics. The transmission and hydraulics are configured in an efficient horizontal way. Durable axles use limited slip differentials to maintain traction, and spring applied hydraulic release (SAHR) brakes for safer braking.



# OPERATOR SAFETY AND ERGONOMICS

## ROPS and FOPS certified

Toro™ LH209L comes with a ROPS and FOPS certified canopy or closed cabin, protecting the operator in case of rolling over or falling objects. The canopy is mounted on bushings to reduce whole body vibration. The canopy door includes a magnetic door switch which automatically applies brakes and inactivates boom, bucket and steering when the door is opened.

## Efficient brakes

The loader is equipped with a simplified brake circuit, which also includes an automatic brake activation (ABA) functionality and neutral brake as standard features. Additionally, the loader meets the South African braking performance requirements as specified in the SABS 1589.

## For better visibility

Adjustable high-power LED lights are a standard configuration in every Toro™ LH209L. All-around operator visibility is further improved with a monitoring camera system including front and rear cameras as standard. The control system has clear symbols with all the needed information in one display, such as engine, transmission and air filter information, allowing the operator to focus on navigating the truck.

## Adjustable joystick armrests and low frequency suspension seat

To improve operator ergonomics in the demanding low-profile environment, Toro™ LH209L is fitted with an adjustable low frequency suspension seat with two-point seat belt, with indicator, as standard. Padded arm rests and adjustable joysticks can be configured to suit the operator. The electrohydraulic joystick controls for steering and boom movements and hydraulic hoses inside the operator's compartment are sleeved to reduce potential hydraulic hazards.

## Proximity Detection System interface

A stand-alone Proximity Detection System (PDS) interface option is available on Toro™ LH209L for mines to interface with their site PDS system. The PDS interface offers easy installation and connection to the equipment control system with the capability to slow down and stop the loader on the signal from the PDS.



# EASE OF MAINTENANCE

## Safety on board

On Toro™ LH209L, all required daily checks can be done conveniently on the ground level. When getting to the top of the equipment is necessary, the access ways provide a steady grip, with three-point contact high contrast handles and anti-slip steps. For energy isolation during maintenance work, the loader is equipped with several standard features such as lockable main switch, mechanical boom locking device, center articulation locking pin and onboard wheel chocks. An example of available local adaptations is a wire rope at the center articulation, limiting access to this area.

## System diagnostics

To minimize the need to move around the machine or use special diagnostic tools, the control system has a 7" display in the operator's compartment which provides engine information and fault codes, speed and distance, transmission, air filter and fuel and gear information. The loader can perform its own status checks and inform the operator.

## Easy-to-clean coolers

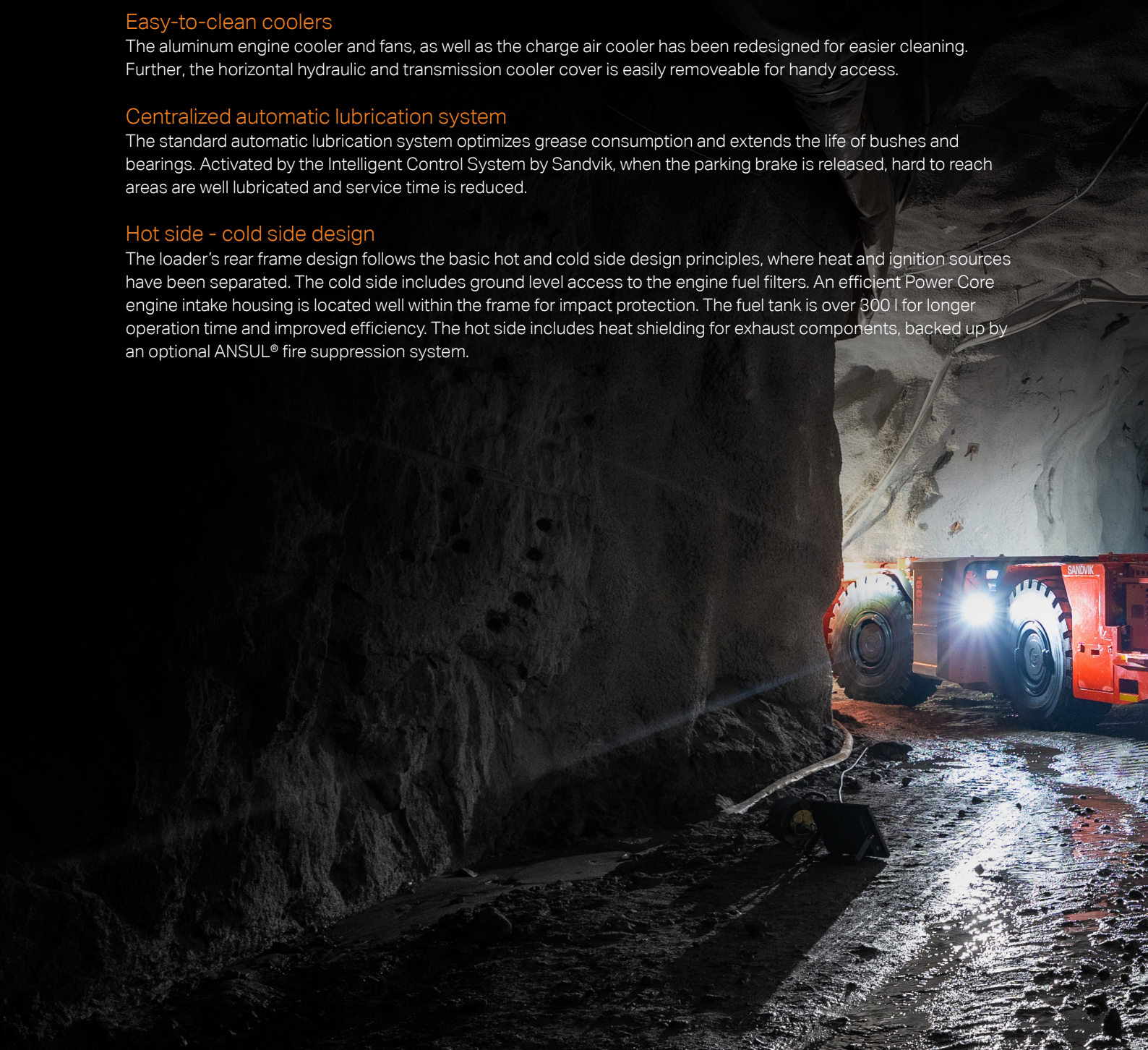
The aluminum engine cooler and fans, as well as the charge air cooler has been redesigned for easier cleaning. Further, the horizontal hydraulic and transmission cooler cover is easily removeable for handy access.

## Centralized automatic lubrication system

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

## Hot side - cold side design

The loader's rear frame design follows the basic hot and cold side design principles, where heat and ignition sources have been separated. The cold side includes ground level access to the engine fuel filters. An efficient Power Core engine intake housing is located well within the frame for impact protection. The fuel tank is over 300 l for longer operation time and improved efficiency. The hot side includes heat shielding for exhaust components, backed up by an optional ANSUL® fire suppression system.



# LOW COST OF OWNERSHIP

## Reinforced frames for low profile demands

Toro™ LH209L frames are reinforced to withstand ground and roof impacts that are typical in low profile operation. The welded steel box structures used in the 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.

## Simple and reliable hydraulics

The proven hydraulic system with fixed displacement gear pumps provides pressure and flow for greater efficiency, enabling increased tractive effort during loading. The hydraulic system is simple and reliable, contributing to ease of maintenance and lower total cost of ownership. Further, Toro™ LH209L has a simple brake circuit in the SAHR brakes that reduces the need for service and maintenance.

## Purpose designed control system

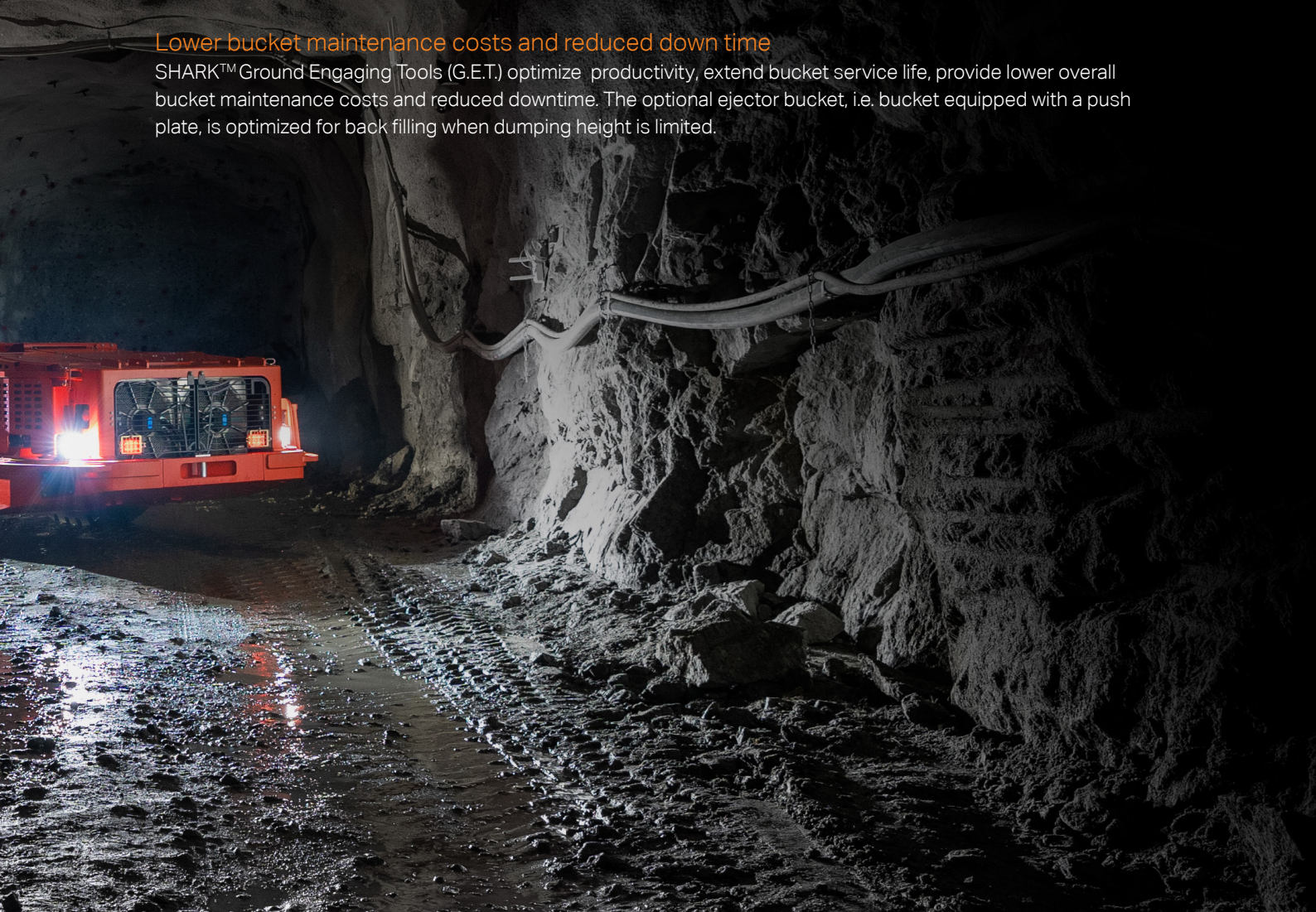
The control system features cautions and alarms, has a 7" screen in the canopy and cabin to monitor the machine's engine and transmission diagnostics to warn the operator before failures occur, preventing severe damage and reducing downtime.

## 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. Optimized use of hydraulic steel piping throughout the loader delivers longer lifetime and easier maintenance access than traditional hydraulic hoses.

## Lower bucket maintenance costs and reduced down time

SHARK™ Ground Engaging Tools (G.E.T.) optimize productivity, extend bucket service life, provide lower overall bucket maintenance costs and reduced downtime. The optional ejector bucket, i.e. bucket equipped with a push plate, is optimized for back filling when dumping height is limited.



# SANDVIK 365 PARTS & SERVICES

## **PROUDLY KEEPING YOU ON TRACK!**

Sandvik 365 Parts & Services offer a variety of possibilities to enhance your loader's performance. As an OEM, we provide the best-suited choices to preserve your machine's high performance throughout its lifetime. These consist of highly skilled service specialists supporting you 365 days a year, all using Sandvik Genuine parts and components complemented by a range of robust tools. In addition, you get to enjoy the benefits of advanced digital services and a global infrastructure dedicated to keeping your Sandvik fleet on track.

## **BENEFIT FROM OUR 365 SOLUTIONS**

Our Sandvik 365 Parts & Service solutions will enable your equipment to function safely at peak condition and allow you to achieve the most demanding production targets. Our aftermarket portfolio attends all possible needs throughout your equipment's lifecycle, ranging from the most basic and traditional offerings to the most sophisticated ones.

## **YOUR EQUIPMENT UPTIME IS OUR FOCUS – SANDVIK 365 COMPONENT SOLUTIONS**

We have all your key components available to you under our various commercial offerings to suit your needs. Whether you have an ad-hoc failure or you are planning your maintenance in advance – we can assist, manage your components to maximize your uptime.

## **MAXIMIZE YOUR PRODUCT LIFETIME WITH SANDVIK 365 REBUILD SOLUTIONS**

One of the most effective ways to optimize equipment lifecycle lies in the quality and range of the Sandvik Rebuild Solutions. Planning and executing rebuilds at optimal intervals helps you keeping your equipment's operating cost and productivity on track. A rebuild by the manufacturer can optimize your total cost of ownership (TCO) and increase the level of predictability around our fleet lifecycle.

## **CHOOSE FROM OUR RANGE OF SERVICE AGREEMENTS**

With Sandvik Service Agreements, you can improve productivity and minimize unplanned downtime by making use of our expertise, systems and processes. They can be adapted to the specific level of support you require – helping you proactively manage your fleet and avoid any unexpected surprises.

## **GAIN PRODUCTIVITY THROUGH CONNECTIVITY**

365 My Sandvik Digital Service solutions will provide you with visualization of fleet utilization, productivity, safety and health on 24/7 basis. The digital service dashboards can be accessed through the My Sandvik customer portal, where you can subscribe to My Sandvik Insight or Productivity. This way, My Sandvik Digital Service Solutions enable you to minimize unplanned downtime and set exact targets for improvement.



# TECHNICAL SPECIFICATION

## TORO™ LH209L

Toro™ LH209L loader by Sandvik is a low profile loader with the largest payload capacity, 9 600 kg. Toro™ LH209L is a proven and reliable loader, providing excellent performance in low profile applications, as the 1690 mm canopy height enables operations at 1.8 meter working heights.

Toro™ LH209L focuses on operator safety and features an enhanced boom support system, which is optimized to provide the highest in class breakout forces for easy loading and fast bucket filling and handling of oversized rocks.

To reduce emissions and increase operator comfort, Toro™ LH209L can be equipped with a Euro Stage V engine by Volvo Penta and a closed cabin.

### CAPACITIES

Maximum tramming capacity	9 600 kg
Break out force, lift	20,160 kg
Break out force, tilt	17,540 kg
Standard bucket	4.6 m³

### SPEEDS FORWARD & REVERSE (LEVEL/LOADED) WITH VOLVO TIER 3 ENGINE

1st gear	4.1 km/h
2nd gear	7.6 km/h
3rd gear	12.8 km/h
4th gear	20.8 km/h

### BUCKET MOTION TIMES

Raising time	6.5 sec
Lowering time	4 sec
Dumping time	1.5 sec

### OPERATING WEIGHTS\*

Total operating weight	25,800 kg
Front axle	12,200 kg
Rear axle	13,600 kg

### LOADED WEIGHTS\*

Total loaded weight	35,400 kg
Front axle	26,600 kg
Rear axle	8,800 kg

\*Unit weight depends on selected options



## OPERATIONAL CONDITIONS AND LIMITS

Environmental temperature	From -20°C to +50°C
Standard operating altitude	Below 2 500 m

## 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 tired vehicles.
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: 2,000 kg CO2e: 2,860 tons GWP: 1430 Information based on the F Gas Regulation (EU) No 517/2016

## POWERTRAIN

### STANDARD ENGINE

Diesel engine	Volvo TAD851VE Euro Stage 3A
Output	185 kW @ 2200 rpm
Torque	1160 Nm @ 1350 rpm
Number of cylinders	6
Displacement	8 l
Cooling system	Nissens Cooler
Combustion principle	Compression Ignition
Air filtration	Donaldson Powercore
Electric system	24 V
Emissions	Euro Stage III A
Exhaust system	Muffler integrated DOC Diesel Oxidation Catalyst
Average fuel consumption at 40 % load	21.4 l/h
Fuel tank refill capacity	308 l

### CONVERTER

Dana C5000 Series
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## TRANSMISSION

Power shift transmission with modulation.	Dana RT14, with integrated speed sensor, electrical gear shift control, four gears forward and reverse
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## AXLES

Front axle	Kessler D101, Spring applied hydraulically released brakes, Limited-slip differential, fixed
Rear axle	Kessler D101, Spring applied hydraulically released brakes, Limited-slip differential, oscillating

## TIRES

Tire size (Tires are application approved. Brand and type subject to availability.)	20.5 R25
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## BRAKES

Service brakes are spring applied; hydraulically released 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
Bosch Rexroth brake block
Neutral brake
Electric 2,2 kW emergency brake release pump

## OPERATOR'S COMPARTMENT

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

7" display
Adjustable joysticks
Air conditioning unit located outside the cabin to reduce noise inside the cabin
Cabin mounted on rubber mounts to the frame to reduce vibrations
Laminated glass windows
ROPS certification according to EN ISO 3471
FOPS certification according to EN ISO 3449
Sealed, air conditioned, over pressurized, noise suppressed closed cabin
Seat belt indicator
Sound absorbent material to reduce noise

## CANOPY (Standard)

7" display
12 V output for communication radio connection
Adjustable joysticks
Emergency exit
Floor washable with water to reduce dust
Inclinometers to indicate operating angle
Magnetic door switch
ROPS certification according to EN ISO 3471
FOPS certification according to EN ISO 3449
Remote circuit breaker switch
Seat belt indicator
Three-point contact access system with replaceable and colour coded handles and steps

## CONTROL SYSTEM, DASHBOARD AND DISPLAYS

Symbols, critical alarms and warning lights in display
Instrument panel with 7" Epec display, adjustable contrast and brightness and illuminated switches

## OPERATOR'S SEAT

Adjustment according to the operator's weight
Adjustable lumbar support
Height adjustment
Mechanical seat suspension
Padded and adjustable arm rests
Two-point seat belt

## HYDRAULICS

Magnetic door switch for brakes and boom, bucket, and steering hydraulics
Oil cooler for hydraulic and transmission oil
ORFS and SAE fittings and hoses
Hydraulic oil tank capacity, 200 l
Sight glass for oil level, 2 pcs

## STEERING HYDRAULICS

Hydraulically operated, center-point articulation, power steering with two double acting cylinders. Steering controlled by electro-hydraulic joystick. Interlock protection.

Steering hydraulic cylinders	100 mm, 2 pcs
Steering main valve	Open center type
Steering pump	Gear type
Steering and servo hydraulic pumps	No additional steering pump or separate servo hydraulic pump

## BUCKET HYDRAULICS

The oil flow from steering hydraulic pump is directed to bucket hydraulics when steering is not used.	Joystick bucket and boom control (electro-hydraulic), equipped with gear pump that delivers oil to the bucket hydraulic main valve.
Boom system	z-link
Lift cylinders	180 mm, 2 pcs
Dump cylinder	160 mm, 2 pcs
Main valve	Open center type
Pump for bucket hydraulics	Gear type

## OPTIONAL ENGINE

Diesel Engine	Volvo TAD881VE Euro Stage V
Output	185 kW @ 2200 rpm
Emissions	Euro Stage V
Ventilation Rate (Ultra low sulphur fuel, AdBlue)	CANMET 4,2 m <sup>3</sup> /s MSHA 8,500 CFM
Particulate Index (Ultra low sulphur fuel, AdBlue)	MSHA 500 CFM
Average estimated fuel consumption at 40% load	19 l/h

## FRAME

### REAR AND FRONT FRAME

Welded structure, high strength steel
Central hinge with adjustable upper bearing
Centralized automatic lubrication

## OPTIONS

ANSUL® Fire suppression system
CE Declaration of Conformity
Diesel Particulate Filter (DPF) Exhaust System
Direct Feed for Beacon
Proximity Detection System Interface (stand alone)
Rear tanks with wear plates
Spare rim 14.00-25/1.5 (for tires 17.5R25)
Spare wheel 17.5-25, 20 ply L5S
Starter motor isolator
Wheel chocks in front left mudguard

## MEASURED VIBRATION LEVEL

Whole body vibration was determined while operating the loader in a simulated working cycle consisting of loading, unloading and driving with and without load. The value is determined applying standards EN 1032 and ISO 2631-1.

Maximum r.m.s.value $a_w$ [m/s <sup>2</sup> ]	0.48
VDV <sub>w</sub> over 15 min period [m/s <sup>1.75</sup> ]	5.3

## 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 Stage 3 engine by Volvo.

Sound pressure level $L_{pA}$ [dB re 20 $\mu$ Pa]	81dB
Sound power level $L_{WA}$ [dB re 1 p W]	119 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): 3 lights $E_{av}$ : 14.04 lx High beam (50W): 1 light $E_{av}$ : 14.76 lx
Illuminance $E_{av}$ with 4 pieces of LED at a distance of 20 m behind the loader:	Reverse (28W): 4 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.	

## ENERGY ISOLATION

Lockable main switch, ground level access
Emergency stop push buttons according to EN ISO 13850
Pressure release in the radiator cap
Automatic discharge for pressure accumulators (brake system and pilot circuit)
Frame articulation locking device
Mechanical boom locking device
Wheel chocks and brackets

## AVAILABLE BUCKETS

TYPE	VOLUME	WIDTH	MAX. MATERIAL DENSITY
G.E.T. (standard)*	4.6 m <sup>3</sup>	3000 mm	1950 kg/m <sup>3</sup>
G.E.T. **	4.6 m <sup>3</sup>	3110 mm	1950 kg/m <sup>3</sup>
Ejector with G.E.T.***	4.0 m <sup>3</sup>	2960 mm	2050 kg/m <sup>3</sup>

\*Shark Series 2 Blue Pointer G.E.T. abrasion system

\*\*Half Arrow

\*\*\*Bare Lip

## ELECTRICAL EQUIPMENT

### MAIN COMPONENTS

Alternator	28 V, 110 A
Batteries	2 X 12V
Starter	5.5 kW, 24 V
Driving and working lights	LED lights: 4 pcs in front (1 mounted to canopy) 4 pcs in rear (1 mounted to canopy)
Parking, brake and indicator (blinkers) lights	LED lights: 2 pcs in front 2 pcs in rear
Reverse alarm	
Flashing beacon	

## INCLUDED SAFETY FEATURES

### FIRE SAFETY

Portable fire extinguisher, 12 kg
Hot side - cold side design
Heat insulation on exhaust manifold, turbo, and isolated exhaust pipe

## 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 sticks in pdf format, includes all the manuals
Decals	English

**GRADE PERFORMANCE** \*3% rolling resistance assumed

Volvo TAD851VE Stage 3A 185kW/2200 rpm

**Empty**

Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	4.2	4.1	4.0	3.9	3.9	3.8	3.7	3.7	3.6	3.5
2nd gear (km/h)	7.8	7.5	7.3	7.1	6.9	6.7	6.5	6.3	5.9	5.4
3rd gear (km/h)	13.1	12.5	11.9	11.3	10.5	9.4	7.7	6.7		
4th gear (km/h)	21.8	19.9	17.2	13.1						

**Loaded**

Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	4.1	4.0	3.9	3.8	3.7	3.7	3.6	3.5	3.4	3.3
2nd gear (km/h)	7.6	7.3	7.1	6.8	6.5	6.2	5.7	5.2	4.4	3.6
3rd gear (km/h)	12.8	12.0	11.1	9.7	8.0	6.3				
4th gear (km/h)	20.8	17.4	12.0							

**GRADE PERFORMANCE** \*3% rolling resistance assumed

Volvo TAD881VE Stage 5 185kW22 rpm

**Empty**

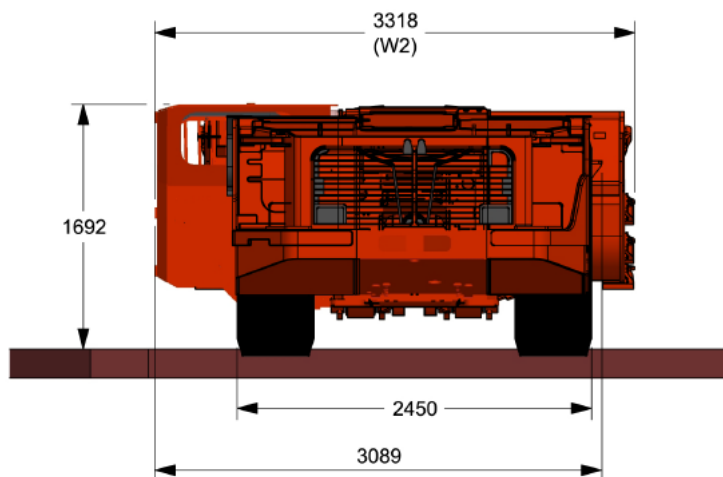
Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	4.3	4.2	4.1	4.0	3.9	3.9	3.8	3.7	3.7	3.6
2nd gear (km/h)	8.0	7.7	7.4	7.2	7.0	6.8	6.5	6.3	5.9	5.4
3rd gear (km/h)	13.4	12.6	12.0	11.3	10.5	9.4	7.7	6.7		
4th gear (km/h)	22.0	20.0	17.2	13.1						

**Loaded**

Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	4.2	4.1	4.0	3.9	3.8	3.7	3.6	3.6	3.5	3.3
2nd gear (km/h)	7.8	7.4	7.1	6.9	6.6	6.2	5.7	5.2	4.4	3.6
3rd gear (km/h)	13.0	12.0	11.1	9.7	7.9	6.3				
4th gear (km/h)	20.9	17.4	12.0							

## DIMENSIONS

	Standard		
Bucket alternatives (m³)	4.6 m³	4.6m³	4.0 m³
	G.E.T.	Half Arrow	Ejector
	1.9 t/m³	1.9 t/m³	2.0 t/m³
L1 (mm)	9800	9916	9721
L2 (mm)	9361	9464	9344
L3 (mm)	9389	9472	9364
L4 (mm)	2208	2310	2190
L5 (mm)	1424	1487	1382
L6 (mm)	2179	2288	2120
L7 (mm)	2055	2160	1989
H1 (mm), canopy	898	970	839
H2 (mm)	1636	1683	1578
H3 (mm)	1702	1612	1744
H4 (mm)	3113	3095	3125
H5 (mm)	4046	4078	4063
H6 (mm)	4691	4705	4635
H7 (mm)	204	202	206
W1 (mm)	3000	3116	2960
W2 (mm)	3318	3255	3275
R1, innter turn radius (mm)	3053	3053	3053
R2, outer turn radius (mm)	6897	6994	6851
T1, min. tunnel width (mm)	4738	4835	4692
T2, tunnel width (mm)	3983	4081	3938



## DIMENSIONS WITH 3.3 M³ G.E.T. BUCKET (STANDARD)

The dimensions are indicative only

