



TORO™ LH208L LOW PROFILE LOADER



STRONG AND RELIABLE LOW PROFILE LOADER

Designed for low profile applications

Toro™ LH208L loader is a strong and reliable workhorse for low profile mining, specifically designed for the toughest of conditions. With its robust structure, compact size, high payload capacity and components that are designed to perform in the mine environment, the loader is tailored to meet the productivity targets in the applications where the working height is extremely limited.

Efficient bucket filling

The loader smart boom geometry is optimized to provide highest in class breakout forces for fast bucket filling and handling of oversized rocks. The powerful boom and bucket hydraulics combined with smart geometry enable the use of both lift and tilt functions simultaneously when penetrating to the muck pile, making one-pass bucket filling easy and contributing to high fill factors.

Advanced powertrain technology

The advanced powertrain technology includes a proven power shift transmission with modulation and electrical gear shift control. The transmission and hydraulics are equipped with an efficient horizontal cooler. Durable axles use no-spin and limited slip differentials to maintain traction, and spring applied hydraulic release (SAHR) brakes for safer braking.



Stage II engine with DPF option

As standard, the loader is equipped with a robust 140 kW Stage II (Tier 2) engine from Deutz, with catalytic purifier and muffler. The proven and well-known technology delivers long engine lifetime. The optionally available diesel particulate filter (DPF) is made of sintered metal, is field serviceable and can be cleaned with a high-pressure washer or steam cleaner. Using sintered metal as the DPF material also results in a long service interval. A separate display for monitoring the DPF condition is located on the operator position, indicating e.g. filter service needs. If the loader's engine is equipped with a DPF, ultra-low sulfur fuel with maximum of 15 ppm sulfur must be used.

Reduced emissions with paraffinic diesel fuel

In addition to traditional diesel fuel, another possible fuel type to be used with this Deutz engine is paraffinic diesel fuel meeting the requirements of EN 15940, which reduces emissions of CO, CO₂, HC, NO_x and diesel particulates. The engine can also run on biofuel blends (such as FAME) meeting requirements of EN590. Further, higher biofuel blends may also be used, but always contact your Sandvik representative prior to using any other blends.



LOW COST OF OWNERSHIP

Robust frames for low profile demands

Toro™ LH208L loader frames are designed to resist ground and roof impacts that may happen in a 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. The frame is designed to withstand a twisting load by means of high torsional strength. Computer designed frames using Finite Element Analysis (FEA) are made of high strength structural steel for superior strength to weight ratio.

Extended tyre lifetime

The traction control option reduces wheel slipping when penetrating to the muck pile and filling the bucket, extending tyre lifetime by reducing tyre wear.

Easy 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 easy and reliable, contributing to ease of maintenance and lower total cost of ownership. Further, the loader's brake circuit in the SAHR brakes reduces the need for service and maintenance.

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 a 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 loader productivity and extend bucket service life as well as provide lower overall bucket maintenance costs and reduced downtime. The optional ejector bucket, i.e. a bucket equipped with a push plate, is optimized for back filling and truck loading when dumping height is limited.





SAFETY AND ERGONOMICS

ROPS and FOPS certified

Toro™ LH208L loader comes with a ROPS and FOPS certified canopy, protecting the operator in case of rolling over or falling objects. To reduce whole body vibration, the canopy is mounted on bushings. The canopy door includes a door lock and latch mechanism with an interlock switch which automatically applies brakes and inactivates boom, bucket and steering when the door is opened.

Improved visibility

For better visibility from the operator's position, adjustable high-power LED lights are a standard configuration in every unit. All-around operator visibility is further improved with a standard monitoring camera system including front and rear cameras.

Reduced operator fatigue

A 7" color display with advanced touch screen functionality has all the needed information and alarms on one large display giving the operator more time to keep eyes on the road. Dark background graphics with clear symbols are designed for the underground environment to reduce eye fatigue.

Efficient brakes

The loader is equipped with spring applied hydraulic release brakes, including 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 SABES 1589.

Adjustable joystick armrests and low frequency suspension seat

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

EASE OF MAINTENANCE & SERVICEABILITY

SAFETY ONBOARD

All required daily checks can be done conveniently on the ground level. When getting to the top of the equipment is necessary, the access systems 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.



HOT SIDE - COLD SIDE DESIGN

The loader rear frame design follows the basic hot and cold side design principles, where heat and ignition sources have been separated as well as is possible. The cold side includes ground level access to the engine fuel filters. An efficient Power Core engine intake air filter is housed well within the frame for impact protection. The fuel tank is sized to ensure continuous operation for a full working shift. The hot side includes heat shielding for exhaust components, backed up by an optional Ansul LVS fire suppression system.

EASY-TO-CLEAN COOLERS

The engine cooler with swing-out fans allows for effective cleaning from both sides of the radiator core. The charge air cooler has a detachable section which can be lifted out of the equipment for easier cleaning. Further, the horizontal, hydraulic and transmission cooler cover is easily removeable for handy access.

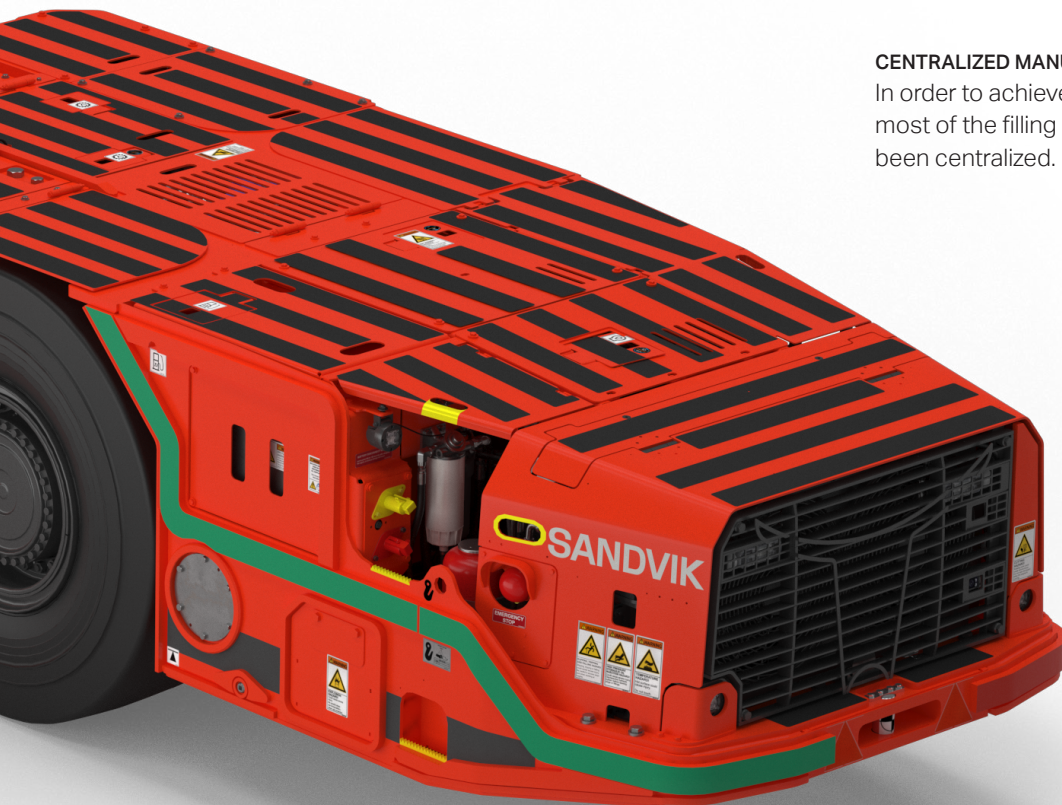


SMART MAINTENANCE

To minimize the need to move around the machine or use special tools, the control system with its 7" display in the operator's compartment provides service information, easy system diagnostics and alarm log files. An automatic brake test with diagnostics and logging can also be performed on the display.

CENTRALIZED MANUAL LUBRICATION SYSTEM

In order to achieve quick and effortless maintenance, most of the filling points of the lubrication system have been centralized.



DATA AND CONNECTIVITY

LOADER HEALTH MONITORING

Toro™ LH208L loader control system is purpose designed to support the operator and maintenance personnel in monitoring the loader health. The control system continuously monitors the equipment condition and warns the operator before failures occur, preventing severe damage and downtime.

PRODUCTION MONITORING WITH INTEGRATED WEIGHING SYSTEM

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.

PROXIMITY DETECTION SYSTEM INTERFACE

A Proximity Detection System (PDS) interface option is available on Toro™ LH208L loader 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.



SANDVIK 365 PARTS & SERVICES

MAKING A DIFFERENCE THROUGH SERVICE AND DIGITAL EXPERTISE

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

PERSONALIZED, PROACTIVE SERVICE AND HIGH QUALITY

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

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

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

SCALABLE OFFERINGS

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

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

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

A UNIQUE COMBINATION: SANDVIK DIGITAL SERVICES + APPLIED OEM KNOWLEDGE

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

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



TECHNICAL SPECIFICATION

TORO™ LH208L

Toro™ LH208L is a 7.7 tonne capacity underground loader designed to work in low-profile mining applications. The small envelope size and turning radius enable easy navigation in confined spaces. The loader's low-profile design enables operation in mine sections with headroom as low as 1.8 meters.

Toro™ LH208L is equipped with Deutz BF6M2012C diesel engine, Dana transmission and Kessler axles. The control system allows for easy troubleshooting and provides alarms and warnings on the display.

The ROPS and FOPS certified operator's compartment provides protection for the operator, and efficient LED lights improve visibility. Proximity Detection System Interface for a third-party PDS is available as an option.

CAPACITIES

Maximum tramming capacity	7 700 kg
Break out force, lift	12 100 kg
Break out force, tilt	12 400 kg
Standard bucket	3.3 m ³

SPEEDS FORWARD & REVERSE (LEVEL/LOADED) WITH DEUTZ BF6M2012C

1st gear	4.4 km/h
2nd gear	8.3 km/h

BUCKET MOTION TIMES

Raising time	4.0 sec
Lowering time	3.0 sec
Dumping time	3.7 sec

OPERATING WEIGHTS

Total operating weight	20 800 kg
Front axle	9 300 kg
Rear axle	11 500 kg

LOADED WEIGHTS

Total loaded weight	28 500 kg
Front axle	20 800 kg
Rear axle	7 700 kg



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

Design based on EN 1889-1. Machines for underground mines. Mobile machines working underground. Safety. Part 1: Rubber tyred vehicles.

Electrical system based on IEC 60204-1. Safety of machinery – Electrical equipment of machines – Part 1: General requirements

POWER TRAIN

ENGINE

Diesel engine	Deutz BF6M2012C
Output	140 kW @ 2 500 rpm
Torque	671 Nm @ 1 500 rpm
Number of cylinders	In-line 6
Displacement	6.06 l
Cooling system	Liquid cooled
Combustion principle	4-stroke, turbo with intercooler
Air filtration	Two stage filtration, dry type
Electric system	24 V
Emissions	Tier 2, Euro Stage II
Exhaust system	Double wall exhaust pipe with catalytic purifier/muffler
Average fuel consumption at 40 % load	15 l/h
Fuel tank refill capacity	219 l
Compatible with paraffinic diesel fuel (EN 15940)	Yes

CONVERTER

Dana SOH C3000 series

TRANSMISSION

Power shift transmission with modulation	Dana RT14 series, electrical gear shift control, two gears forward and reverse
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AXLES

Front axle	Kessler D91, Spring applied hydraulically released brakes, limited slip differential, fixed
Rear axle	Kessler D91, Spring applied hydraulically released brakes, no-spin differential, oscillating

TIRES

Tire size (Tires are application approved. Brand and type subject to availability.)	17.5 x 25 34 PLY L5S
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HYDRAULICS

Filling pump for hydraulic oil
Door interlock 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

STEERING HYDRAULICS

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

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

BUCKET HYDRAULICS

Joystick bucket and boom control, equipped with gear pump that delivers oil to the bucket hydraulic main valve.

Boom system	Straight boom
Lift cylinders	180 mm, 2 pcs
Dump cylinder	160 mm, 1 pc
Main valve	Open center type
Pump for bucket hydraulics	Gear type

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.

Neutral brake
Automatic brake activation system, ABA
Electric 2,2 kW emergency brake release pump

OPERATOR'S COMPARTMENT

CANOPY

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
Remote circuit breaker switch

CONTROL SYSTEM, DASHBOARD AND DISPLAYS

Critical warnings and alarms displayed as text and with light
7" display with touch screen function an adjustable contrast and brightness

OPERATOR'S SEAT

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

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 ²]	0,82
VDV _w over 15 min period [m/s ^{1.75}]	8,89

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 Deutz BFM2012C.

Sound pressure level L_{pA} [dB re 20 µPa]	97 dB
Sound power level L_{WA} [dB re 1 p W]	119 dB



FRAME

REAR AND FRONT FRAME

Welded structure, high strength steel
Central hinge with adjustable upper bearing
Tanks welded to rear frame
Centralized manual lubrication

ILLUMINATION

Illuminance E_{av} with 3 pieces of LED lights at a distance of 20 m in front of the loader:

E_{av}	21,25 lx
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Illuminance E_{av} with 5 pieces of LED at a distance of 20 m behind the loader:

E_{av}	13,24 lx
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Toro™ LH208L 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

ELECTRICAL EQUIPMENT

MAIN COMPONENTS

Alternator	28 V, 80 A
Batteries	2 X 12V
Starter	4 kW, 24 V
Driving lights	LED lights: 2 pcs in front 4+1 pcs in rear 2 pcs in canopy (1 front, 1 rear)
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, 6 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 stick in pdf format, includes all the manuals
Decals	English

OPTIONS

ANSUL LVS Fire suppression system, manual activation
Integrated weighing system
Diesel particle filter (DPF) exhaust system
Direct feed for beacon
No-spin front axle (not available with TCS-system)
Proximity Detection System Interface
Spare rim 14.00-25/1.5 (for tyres 17.5R25)
Spare wheel 17.5-25, 34 ply L5S
Starter isolator
Traction control system (TCS)
Wheel chocks

AVAILABLE BUCKETS

TYPE	VOLUME	WIDTH	MAX. MATERIAL DENSITY
G.E.T. Half Arrow (standard)	3.3 m ³	2676 mm	2330 kg/m ³
G.E.T. Half Arrow	3.5 m ³	2776 mm	2150 kg/m ³
Ejector	2.6 m ³	2676 mm	2330 kg/m ³

GRADE PERFORMANCE

Deutz BF6M2012C

Empty

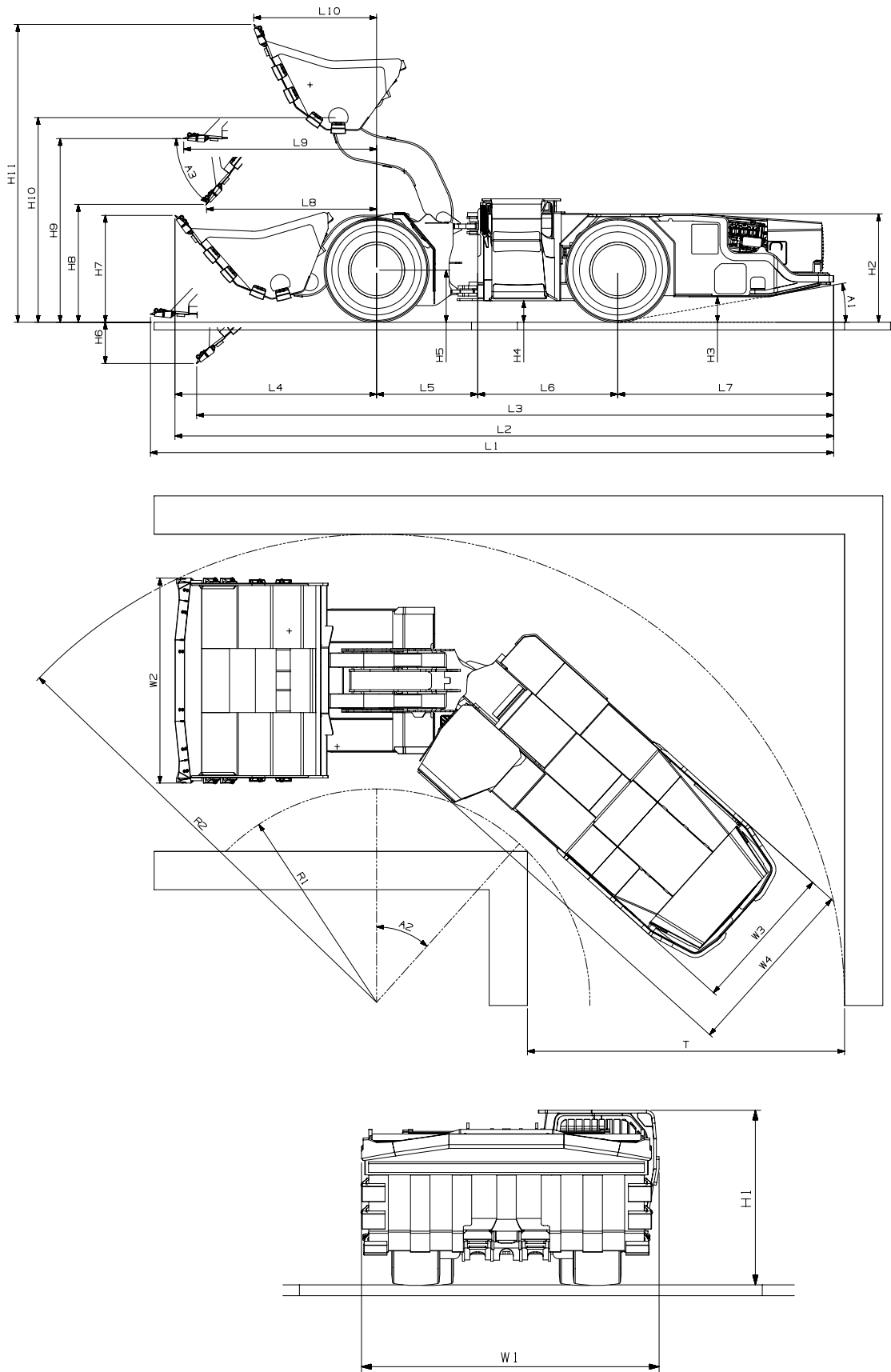
Percent grade	0.0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17.0	20.0
Ratio					1:12	1:10	1:8	1:7	1:6	1:5
1st gear (km/h)	4.4	4.4	4.3	4.2	4.2	4.1	4.1	4.0	4.0	3.9
2nd gear (km/h)	8.4	8.1	8.0	7.8	7.7	7.3	6.7	6.3	5.7	5.0

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)	4.4	4.3	4.2	4.2	4.1	4.0	4.0	3.9	3.6	3.4
2nd gear (km/h)	8.3	8.0	7.8	7.4	6.8	6.2	5.4	4.8	4.0	

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

The dimensions are indicative only



DIMENSIONS

	Standard		
Bucket alternatives (m³)	3.3 m³	3.5 m³	2.6 m³
Lip plate type	G.E.T. Half Arrow	G.E.T. Half Arrow	Ejector
L1 (mm)	8792	8793	8792
L2 (mm)	8600	8615	8600
L3 (mm)	7848	7836	7848
L4 (mm)	2630	2646	2630
L5 (mm)	1321	1321	1321
L6 (mm)	1829	1829	1829
L7 (mm)	2819	2819	2819
L8 (mm)	1919	1911	1919
L9 (mm)	2569	2573	2569
L10 (mm)	2118	2135	2118
H1 (mm), canopy	1610	1610	1610
H2 (mm)	1415	1415	1415
H3 (mm)	332	332	332
H4 (mm)	281	281	281
H5 (mm)	680	680	680
H6 (mm)	1069	1082	1069
H7 (mm)	1383	1374	1383
H8 (mm)	776	761	776
H9 (mm)	1689	1672	1689
H10 (mm)	2130	2130	2130
H11 (mm)	3323	3318	3323
W1 (mm)	2747	2797	2747
W2 (mm)	2676	2776	2676
W3 (mm)	1937	1937	1937
W4 (mm)	2378	2378	2378
A1	10 °	10 °	10 °
A2	42 °	42 °	42 °
A3	40 °	40 °	40 °
R1, left turn (mm)	2786	2786	2786
R2, left turn (mm)	6114	6161	6114
T, left turn (mm)	4142	4191	4142
R1, right turn (mm)	2997	2950	2997
R2, right turn (mm)	6112	6161	6112
T, right turn (mm)	3993	4075	3993

