

SANDVIK

TORO™ LH203 NARROW VEIN LOADER



COMPACT AND PRODUCTIVE FOR NARROW VEIN APPLICATIONS

Toro™ LH203 loader by Sandvik is a capable and reliable workhorse for narrow-vein mining applications, specifically designed for underground conditions. With its robust structure, compact size and 3.5 tonne payload capacity, the loader is tailored to meet productivity targets in challenging environments. The machine width is 1.4 m and can be used in tunnels that are less than 2 m wide.

In addition to underground narrow vein mines, Toro™ LH203 loader is well suited for tunneling. It is a perfect fit for civil engineering and small-scale construction sites or building new and improving existing infrastructure. Due to its relatively light weight and the possibility to disassemble the equipment for transport, Toro™ LH203 is fit for small-dimensioned construction sites, even if located in remote areas with challenging access.



Fast bucket filling

Toro™ LH203 loader by Sandvik has bucket hydraulics combined with smart geometry to enable the use of both lift and tilt functions simultaneously when penetrating the muck pile, making one-pass bucket filling easy and contributing to high fill factors. The front frame and lift arm have been reinforced to be more durable and reliable. The bucket shape has been modified so that the lip and bottom angle improves the filling of the bucket and makes it easier to do secondary work such as road maintenance.

High tramming speeds

Toro™ LH203 loader has a high power to weight ratio, providing higher productivity. The advanced mechanical powertrain and powershift transmission has 3 gears. Durable axles use limited slip differential on the front of the loader to maintain traction and spring applied hydraulic release (SAHR) brakes for safer braking. Vehicle top speed can also be limited to improve safety in narrow tunnels and on rough roads.

Two engine options from Deutz

Toro™ LH203 loader offers two engine options from Deutz: Tier 3/Stage III A and Tier 2/Stage II. As a standard, Toro™ LH203 loader comes with a robust, reliable and well-known 71,5 kW air-cooled turbocharged direct injection diesel Tier 2 engine from Deutz, with catalytic purifier and muffler. The design requires a smaller number of parts, which means less maintenance, lower operating costs and a longer engine life. Pistons and liners can be changed without major disassembly. The cooling system of air-cooled engines require less maintenance than water cooled engines. The conventional inline fuel injection pump can tolerate a variety of fuel qualities.

Reduced emissions with paraffinic fuels

In addition to traditional fossil diesel fuel, the Deutz engine can use paraffinic diesel fuels meeting the requirements of EN 15940, which reduces emissions of CO, CO₂, HC, NO_x and diesel particulates. Further, these engines can also use biofuel blends (such as FAME) meeting requirements of EN 590. Higher biofuel blends may also be used (EN14214), but always contact your Sandvik representative prior to using any higher blends.



OPERATOR SAFETY

Safety onboard

All required daily checks can be done from the ground level. Energy isolation can be achieved with a lockable main switch, and optional onboard wheel chocks can be used to ensure the machine remains stationary. Easy maintenance access to the top of the machine includes three-point high contrast handles and anti-slip steps.

ROPS and FOPS certified

Toro™ LH203 is equipped with a ROPS and FOPS certified open canopy protecting the operator in case of rolling over or falling objects. The canopy is located in the front of the equipment. Standard canopy and optional wide canopy are available.

Safer operation

Access to the operator's position is reached with clearly marked three-point contact handles. Toro™ LH203 has an arm rest that functions as a gate. It includes a latch mechanism with an interlock switch which automatically applies brakes and inactivates the boom, bucket and steering when the door is opened. Further, the neutral brake and ABA functional brakes are standard features in Toro™ LH203 loader.

Operator's compartment with adjustable armrests and low frequency suspension seat

This loader is fitted with a standard, low frequency suspension seat with two-point seat belt and padded arm rests. LH203 has hydraulic levers for steering and boom/bucket controls. Warning light warn the operator of critical system malfunctions or actions needed from maintenance.

Reduced risk of hydraulic leakage

Toro™ LH203 loader features pilot-operated low-pressure hydraulic controls for steering, boom and bucket and is designed with the minimum number of hydraulic hoses inside the operator's compartment to reduce potential hydraulic hazards.





Improved visibility

Adjustable high-power LED lights are standard configuration in every Toro™ LH203 loader. The lights can be equipped with additional cover grills to provide protection against hits and rocks. Warning lights warn the operator of critical system malfunctions or actions needed from maintenance.

Line of sight radio remote control

Toro™ LH203 loader can be equipped with a line-of-sight radio remote control, available with an analogue connection. A recovery kit option releases equipment brakes by radio signal to retrieve the equipment from under unsupported roof if it is required.

Fire safety

Toro™ LH203 loader features two fire suppression options.

Eclipse® fire suppression system by Sandvik is a foam-based fire suppression system which cuts off oxygen supply and acts as a vapor seal over the fuel. The water content in the foam cools the area, which reduces the risk of re-ignition. It offers two variants to suit all applications. Eclipse™ SUSTAIN version uses a foam concentrate, mixed with water and the Eclipse™ EXTREME version is suitable for subzero climates down to -40°C. Both variants are environmentally friendly, supplied standard with automatic detection, activation and engine shutdown. The firefighting liquid arrests the fire's oxygen supply, acts as a vapor seal over burning fuel and rapidly cools the area reducing risk of re-ignition.

Ansul® LVS fire suppression system is an alternative liquid system. The liquid cuts off oxygen supply to the fire and provides cooling for equipment with super-heated surface areas, reducing risk to people by providing rapid fire knockdown and reduces risk of machine loss. Automatic activation is a standard feature and the rapid cooling effect reduces the risk of re-ignition.

EASE OF MAINTENANCE

HOT SIDE – COLD SIDE

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 practicable. The hot side includes heat shielding for exhaust components. The brake and transmission filters have been relocated so that all filters can be changed on the ground level.

The cold side includes ground level access to the engine fuel filters. Hydraulic hoses are secure behind steel plates. An efficient Donaldson powercore engine air filter is housed well within the frame for impact protection, and it utilizes an ejector valve system for increased filter lifetime. This is available for the Stage 3A engine only.

ENGINE COOLER

Toro™ LH203 loaders feature air-cooled engines with extra free space between the engine and cooler and an easy to open rear mask.

LARGE FUEL TANK

The fuel tank is sized at 110 L to ensure continuous operation for a full 12-hour working shift. An optional Wiggins fast filling system for fuel increases equipment availability by reducing refueling time by up to 80% as well as eliminating fuel and oil spills.

LOW COST OF OWNERSHIP

STRONG RESISTANCE TO SHOCK LOADS

Toro™ LH203 loader's 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 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.



LH203

TORO™

SANDVIK

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™ LH203

Toro™ LH203 is a compact and lightweight underground loader for narrow vein mining applications. The robust loader is a productive and strong unit with a best-in-class power to weight ratio, featuring a tramming capacity of 3.5 metric tons.

Toro™ LH203 loader offers two engine alternatives; a Tier 3 / Stage III A and a Tier 2 / Stage II, both from Deutz. The unit uses Kessler axles, equipped with spring applied, hydraulically released brakes. The bucket alternatives include traditional bare lip buckets and an ejector bucket.

The operator's compartment is ROPS and FOPS certified to improve safety underground, and efficient LED lights improve visibility. Safety can be further improve by equipping the loader with a fire suppression system, radio remote control and recovery kit.

CAPACITIES

Maximum tramming capacity	3 500 kg
Break out force, lift	6 220 kg
Break out force, tilt	5 610 kg
Standard bucket	1.5 m ³

SPEEDS FORWARD & REVERSE (LEVEL/LOADED) WITH DEUTZ BF6L914

1st gear	5.5 km/h
2nd gear	10.3 km/h
3rd gear	25.5 km/h

BUCKET MOTION TIMES

Raising time	5.5 sec
Lowering time	2.9 sec
Dumping time	3.0 sec

OPERATING WEIGHTS

Total operating weight	9 300 kg
Front axle	4 100 kg
Rear axle	5 200 kg

LOADED WEIGHTS

Total loaded weight	12 800 kg
Front axle	9 200 kg
Rear axle	3 600 kg



OPERATIONAL CONDITIONS AND LIMITS

Environmental temperature	From -20° C to +50° C
Standard operating altitude	Below 3 000 m

REQUIREMENTS AND COMPLIANCE

Compliance with 2006/95/EC Low voltage directive

Design based on ISO 19296-1. 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

POWER TRAIN

ENGINE

Diesel engine	Deutz BF6L914
Output	71.5 kW @ 2 300 rpm
Torque	400 Nm @ 1 650 rpm
Number of cylinders	In-line 6
Displacement	6.47 l
Cooling system	Air cooled
Combustion principle	4-stroke, turbo, direct injection
Air 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	8.5 l/h
Fuel tank refill capacity	110 l

CONVERTER

Dana SOH C2000 series

TRANSMISSION

Power shift transmission with modulation	Dana SOH RT20000 series, power shift (mechanical control) transmission with modulation. Manual electrical gear shift control as option.
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AXLES

Front axle	Kessler D71, spring applied hydraulically released brakes, limited-slip differential
Rear axle	Kessler D71, spring applied hydraulically released brakes, limited-slip differential

TIRES

Tire size	12.00 x 20 L5S, 20 ply
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OPERATOR'S COMPARTMENT

OPEN CANOPY

ROPS certification according to EN ISO 3471

FOPS certification according to EN ISO 3449

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

OPERATOR'S SEAT

Low frequency suspension

Adjustment according to the operator's weight

Fore-aft isolation

Padded and adjustable arm rests

Adjustable lumbar support

Two-point seat belt

DASHBOARD AND DISPLAYS

Critical warnings and alarms	Audible and visible alarms
Instrument panel	Electric gauges
Instrument panel	Illuminated switches

FRAME

REAR AND FRONT FRAME

Welded structure, high strength steel, optimized material thickness

Central hinge with adjustable lower bearing

Tanks welded to the rear frame

Automatic central lubrication

HYDRAULICS

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

Cooler for transmission oil

Fittings JIC

Hoses JIC

Hydraulic oil tank capacity 120 l

Sight glass for oil level 2 pcs

STEERING HYDRAULICS

Full hydraulic, centre-point articulation, power steering with one double acting cylinder. Steering controlled by stick. Emergency steering is optional.

Steering main valve Open center type

Steering hydraulic cylinders 100 mm, 1 pcs

Steering pump Gear type

Steering and servo hydraulic pumps Gear type

BUCKET HYDRAULICS

Dual stick bucket and boom control. Full hydraulic, mechanically controlled system, equipped with one gear type pump.

Boom system	Straight boom
Lift cylinders	180 mm, 1 pcs
Dump cylinder	140 mm, 1 pcs
Main valve	Open center type
Pump for bucket hydraulics	Gear type

BRAKES

Service brakes are hydraulically operated multidisc wet brakes on all wheels. Two independent circuits: one for the front and one for the rear axle. Parking brake is spring applied, hydraulically released dry disk brake affecting on the front axles drive line. In case of a sudden pressure drop in brake hydraulics the parking brake functions as an emergency brake. Brake system performance complies with requirements of EN ISO 3450, ISO 19296 and SABS 1589.

Neutral brake

Automatic brake activation system, ABA

Electric emergency brake release pump

ELECTRICAL EQUIPMENT

MAIN COMPONENTS

Alternator	24 V, 55 A
Batteries	2 x 12 V, 70 Ah
Starter	4 kW, 24 V
Driving lights	LED lights: 2 pcs in front 2 pcs in 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

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

Automatic discharge for pressure accumulators (brake system and pilot circuit)

Frame articulation locking device

Mechanical boom locking device

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, Finnish, Swedish, Spanish, Russian, French, Polish, Portuguese, German, Bulgarian

OPTIONS

ANSUL LVS fire suppression system, with or without CHECKFIRE

Arctic package (preheater for engine, hydraulic oil tank and glow plug)

Cover grills for lamps

Disabled 3rd gear

Eclipse™ fire suppression system with auto shutdown, Sustain or Extreme agent delivered separately

Electrical gear shift control

Emergency steering

Line of sight radio remote control HBC, analogue, including electrical gear shift

Radio remote control interface HBC, analogue, including electrical gear shift, not with automation

Recovery kit (brake release by radio signal)

Spare rim 8.5 - 20 (for tyres 12.00 R20)

Wheel chocks and brackets, Checkers

Wider canopy, ROPS/FOPS approved, width 1015 mm, height 1990 mm

Wiggins fuel fill system

OPTIONAL ENGINE

Diesel engine	Deutz TCD914 L06
Output	72 kW @ 2300 rpm
Emissions	Euro Stage III A (Tier 3)
Average estimated fuel consumption at 40% load	10 l/h

GRADE PERFORMANCE

Deutz BF6L914, 71.5 kW

Calculated with 2% rolling resistance

Without lock-up

Empty

Percent grade	0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17
Ratio					1:12	1:10	1:8	1:7	
1st gear(km/h)	5.6	5.4	5.3	5.2	5.1	5.0	4.9	4.8	4.7
2nd gear(km/h)	10.6	10.2	9.8	9.4	9.1	8.7	8.1	7.6	6.9
3rd gear(km/h)	27.0	23.9	19.4	14.4	10.0				

Loaded

Percent grade	0	2.0	4.0	6.0	8.0	10.0	12.5	14.3	17
Ratio					1:12	1:10	1:8	1:7	
1st gear(km/h)	5.5	5.3	5.2	5.0	4.9	4.8	4.6	4.5	4.3
2nd gear(km/h)	10.3	9.8	9.3	8.8	8.1	7.3	6.3	5.5	4.5
3rd gear(km/h)	25.2	19.4	12.6						

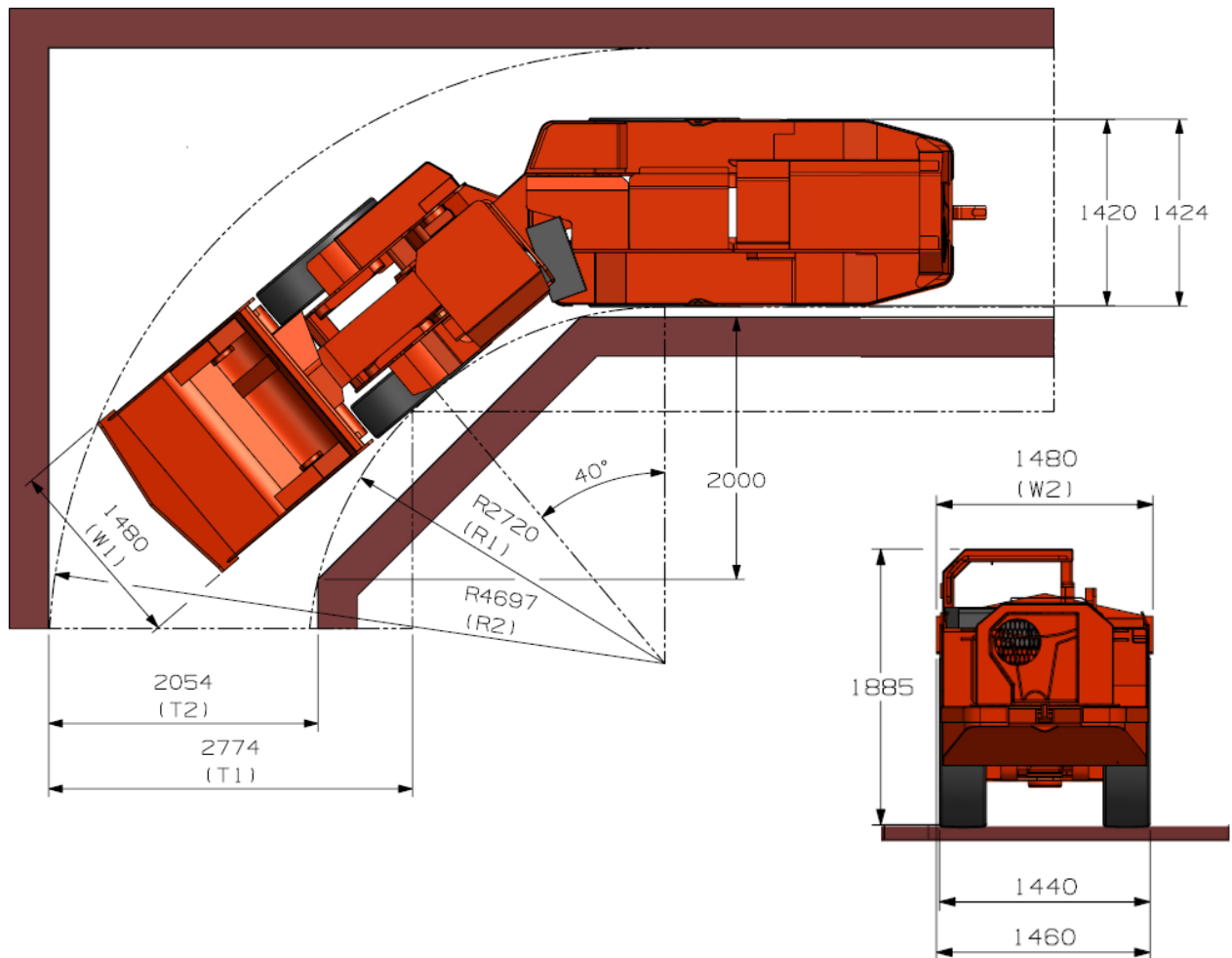
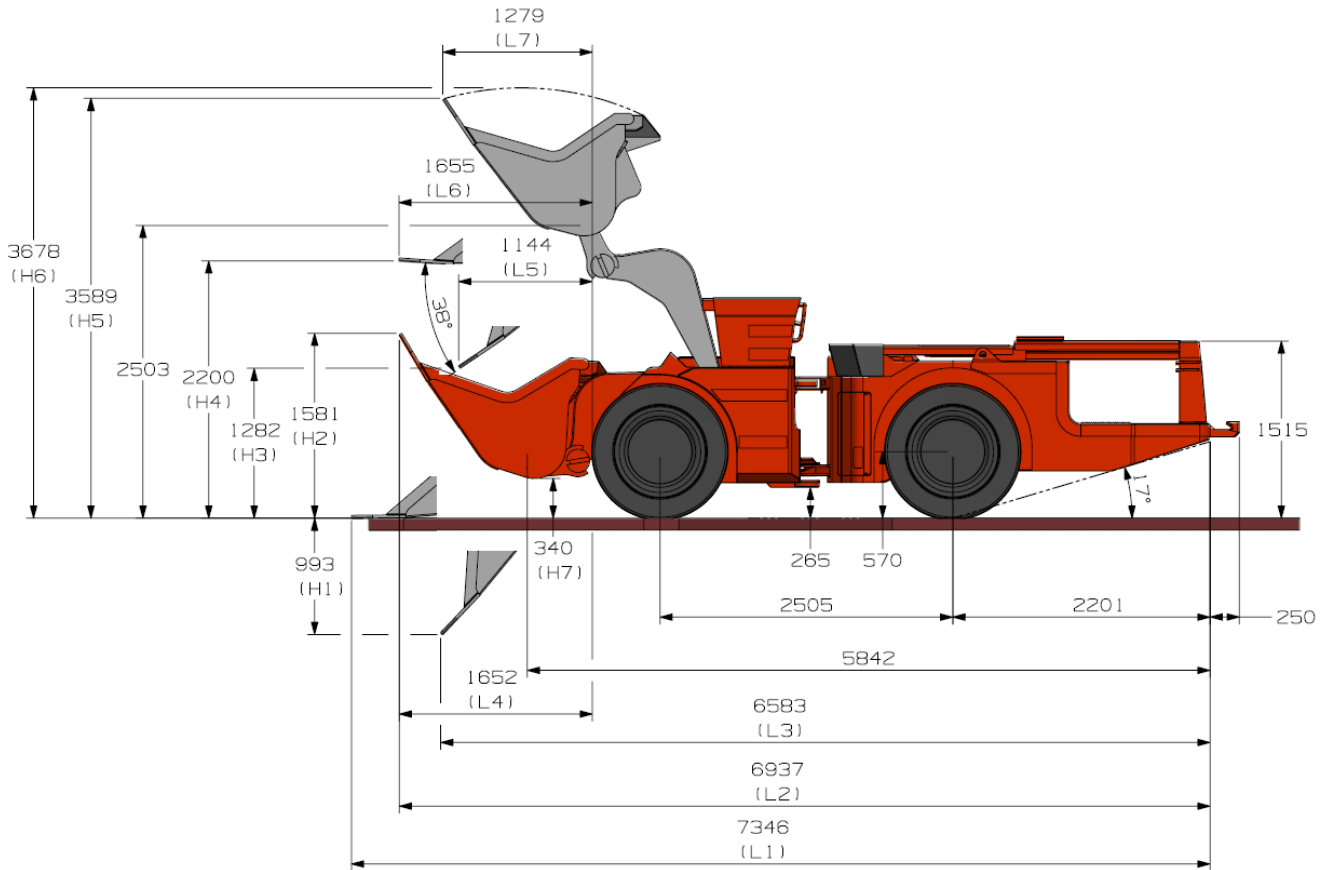
AVAILABLE BUCKETS

Type	Volume	Width	Max. material density
Bare Lip (standard)	1,5 m ³	1480 mm	2330 kg/m ³
Bare Lip	1,5 m ³	1690 mm	2330 kg/m ³
Bare Lip	1,75 m ³	1690 mm	2000 kg/m ³
G.E.T. Half Arrow	1,5 m ³	1480 mm	2300 kg/m ³
Ejector bucket	1,5 m ³	1690 mm	2130 kg/m ³

DIMENSIONS

		Standard				
Bucket alternatives		1.5 m ³	1.5 m ³	1.75 m ³	1.5 m ³	1.5 m ³
Lip plate type		Bare lip	Bare lip	Bare lip	Half Arrow	Ejector
Maximum material density	(t/m ³)	2.33	2.33	2.0	2.3	2.13
Overall machine length	L1 (mm)	7346	7322	7345	7300	7318
Bucket, default pos. to rear of machine	L2 (mm)	6937	6961	6936	6965	6945
Lowered bucket pos. to rear of machine	L3 (mm)	6583	6600	6572	6526	6589
Front tyre to bucket default pos.	L4 (mm)	1652	1676	1651	1686	1660
Front tyre to raised bucket, tipped	L5 (mm)	1144	1220	1135	1150	1212
Front tyre to raised bucket, straight	L6 (mm)	1655	1647	1654	1605	1647
Front tyre to raised bucket, up	L7 (mm)	1279	1242	1279	1246	1242
Bucket low pos.	H1 (mm)	993	953	993	944	953
Bucket, default pos.	H2 (mm)	1581	1518	1573	1447	1526
Bucket, tipped	H3 (mm)	1282	1392	1282	1384	1392
Bucket, straight	H4 (mm)	2200	2335	2200	2292	2335
Bucket raised, up	H5 (mm)	3589	3590	3580	3519	3581
Bucket raised up, rock shield arch	H6 (mm)	3678	3740	3682	3721	3735
Bucket ground clearness	H7 (mm)	340	327	340	326	329
Bucket width	W1 (mm)	1480	1480	1690	1491	1690
Machine width	W2 (mm)	1480	1480	1690	1491	1690
Inner turn radius	R1 (mm)	2720	2720	2691	2720	2689
Outer turn radius	R2 (mm)	4697	4697	4790	4741	4789
Minimum tunnel width	T1 (mm)	2774	2774	2887	2817	2888
Tunnel width	T2 (mm)	2054	2054	2171	2098	2181

DIMENSIONS



TS3-LH203-27/ENG/METRIC

