

Toro[®] LH203

Safer.
Stronger.
Smarter.



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

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
Compatible with paraffinic diesel fuel (EN 15940)	Yes

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 × 20 L5S, 20 ply
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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
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Instrument panel	Electric gauges
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Instrument panel	Illuminated switches
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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
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Hoses	JIC
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Hydraulic oil tank capacity	120 l
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Sight glass for oil level	2 pcs
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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

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	

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

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 3 rd gear
Eclipse™ fire suppression system with auto shutdown, Sustain or Extreme agent delivered separately
Electrical gear shift control
Emergency steering (CE requirement), N/A for Australia
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

Available buckets			
Type	Volume	Width	Max. material density
Bare Lip (standard)	1,5 m³	1480 mm	2330 kg/m³
Bare Lip	1,5 m³	1690 mm	2330 kg/m³
Bare Lip	1,75 m³	1690 mm	2000 kg/m³
G.E.T. Half Arrow	1,5 m³	1480 mm	2300 kg/m³
Ejector bucket	1,5 m³	1690 mm	2130 kg/m³

Grade performance									
Deutz BF6L914, 71.5 kW									
Calculated with 2% rolling resistance									
Wihout 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						

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



