SANDVIK

SANDVIK LH410
MASS MINING LOADERS

TECHNICAL SPECIFICATION

Sandvik LH410 represents state of the art performance in difficult applications, enhanced operator ergonomics and several built-in safety features. High breakout forces, compact and lightweight unique design together with reliable structure ensures economical and reliable productivity. LH410 features a high lift boom enabling fast and accurate three-pass loading into the Sandvik TH430 truck.

CAPACITIES	
Tramming capacity	10 000 kg
Break out force, lift	20 390 kg
Break out force, tilt	19 340 kg
Tipping load	23 400 kg
Standard bucket	4.0 m³

SPEEDS FORWARD & REVERSE (LEVEL/LOADED)	
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

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 FLOURINATED 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

POWER TRAIN

ENGINE	
Diesel engine	Volvo TAD1140VE
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 m3/s, MSHA 16000 CFM
Particulate index	MSHA 5500 CFM
Exhaust system	Catalytic purifier and muffler with Proventia thermal insulation system exhaust pipe
Average fuel consumption at 50% load	32.0 l/h
Fuel tank capacity	310 l

CONVERTER	
Dana C5472	With lock-up

TRANSMISSION	
Power shift transmission with modulation	Dana RT33425, automatic gear shift control, four gears forward and reverse

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

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, air conditioned, over pressurized, noise suppressed closed cabin
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	Standard
Height adjustment	Standard
Adjustment according to the operator's weight	Standard
Fore-aft isolation	With cabin option only
Padded and adjustable arm rests	Standard
Adjustable lumbar support	With cabin option only
Selectable damping	With cabin option only
Two-point seat belt	Standard

CONTROL SYSTEM, DASHBOARD AND DISPLAYS

Sandvik Intelligent Control system	Standard
Critical warnings and alarms	Displayed as text and with light
Instrument Panel	5.7" Display with adjustable contrast and brightness
Instrument Panel	Illuminated switches
My Sandvik Digital Services Knowledge Box™ on-board hardware	Standard

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	Adjustable upper bearing
Tanks	Rear tanks are bolted to frame, hydraulic tank and cabin base are both bolted and welded to frame
Automatic central lubrication	Standard

HYDRAULICS

Filling pump for hydraulic oil	Electrical (Option)
Door interlock for brakes and boom, bucket, and steering hydraulics	Standard
Oil cooler for hydraulic and transmission oil	Capability up to 52°C ambient temperature
Fittings	ORFS
Hoses	MSHA approved
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 center type, LS controlled
Steering hydraulic cylinders	125 mm, 2 pcs
Steering pump	Piston type
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 center 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	Standard
Automatic brake activation system, ABA	Standard
Electrically driven emergency brake release pump	Standard
Brake oil tank capacity	75 l

ELECTRICAL EQUIPMENT

MAIN COMPONENTS

Alternator	24 V, 100 A
Batteries	2 x 12V, 145 Ah
Starter	24 V, 5,5 kW
Driving lights	2 pcs in front 65W 4 pcs in rear 65W 4 pcs in cabin 65W
Working lights	1 pc under boom, 65W
Parking, brake and indicator (blinkers) lights	2 pcs in front, LED lights 2 pcs in rear, LED lights
Control system	5,7 " Color display, 5 modules, inbuilt system diagnostics
Lockable main switch	Standard
Reverse alarm (CEN)	Standard
Flashing beacon	Standard

INCLUDED SAFETY FEATURES

FIRE SAFETY

Portable fire extinguisher	12 kg (CEN)
Hot side - cold side design	Standard
Isolation of combustibles and ignition sources	Standard
Heat insulation on exhaust manifold, turbo, and isolated exhaust pipe	Standard

ENERGY ISOLATION

Lockable main switch, ground level access	Standard
Emergency stop push buttons according to EN ISO 13850	1 pc in cabin 2 pcs in rear
Pressure release in the radiator cap	Standard
Automatic discharge for pressure accumulators (brake system and pilot circuit)	Standard
Frame articulation locking device	Standard
Mechanical boom locking device	Standard
Wheel chocks and brackets	Standard

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, Russia
ToolMan	2 x CD and 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

OPTIONS

SAFETY OPTIONS

Safety cabin, 2-point seatbelt, corner light, ROPS/FOPS and air condition unit, height 2385 mm
Disabled 4th gear (mandatory in EU)
Radio remote control HBC CAN
Radio remote control interface HBC, analoque, not with automation
Recovery kit (brake release by radio signal)
Video camera system for Radio remote control
Proximity Detection Interface
Driving direction lights (red / green)
LED lights (Replaces standard driving lights)
Fire suppression system ANSUL, 2 tanks, 8 nozzles (CEN), including auto shutdown (not for automation)
Fire suppression system ANSUL, 2 tanks, 8 nozzles (CEN), CHECKFIRE, including auto shutdown
Fire suppression system Sandvik FS1000 with auto shutdown, Eclipse foam delivered separately
Safety rails
Video recorder for monitoring camera system
Emergency steering (CEN)
AutoMine™ Onboard Package
AutoMine™ Loading, readiness

ALTERNATIVE ENGINES

Engine Volvo TAD 872VE, 210 kW, 2200 rpm, Euro Stage IV or MSHA, Canmet (US & Can only) (Tier 4f). Alternator 130A. Applicable from -1500 m to +2500 m at 25 °C without rated power derate. Ultra low sulphure fuel and AdBlue required. CANMET ventilation rate 4,34 m3/s. MSHA ventilation rate 9000 CFM, and particulate index 1000 CFM. Average fuel consumption at 50 % load 27 l/h.
Engine Mercedes-Benz OM926LA, 220 kW, Euro Stage III, no lock-up. Alternator 100 A. Applicable from -1500 m to +2750 m at 25 °C without rated power derate. Average fuel consumption at 50 % load 26 l/h.

ELECTRICAL OPTIONS

Jump start interface
Monitoring camera system

OTHER OPTIONS
Additional cabin heater element for air conditioning
Cover grills for lamps
Mesabi copper radiator with changeable tubes for Volvo Penta TAD1140VE engine
Converter with lock-up, for Mercedes-Benz OM926LA engine
Spare rim 13.00-25/2.5 (for tyres 18.00 R25)
Boom suspension (ride control)
Aggressive water package
Electrical filling pump for hydraulic oil
Wiggins quick filling set for fuel and oils (hydraulic, engine and transmission)
Integrated weighing system
Electric loader towing kit
Accordance with CE-norms (CEN)

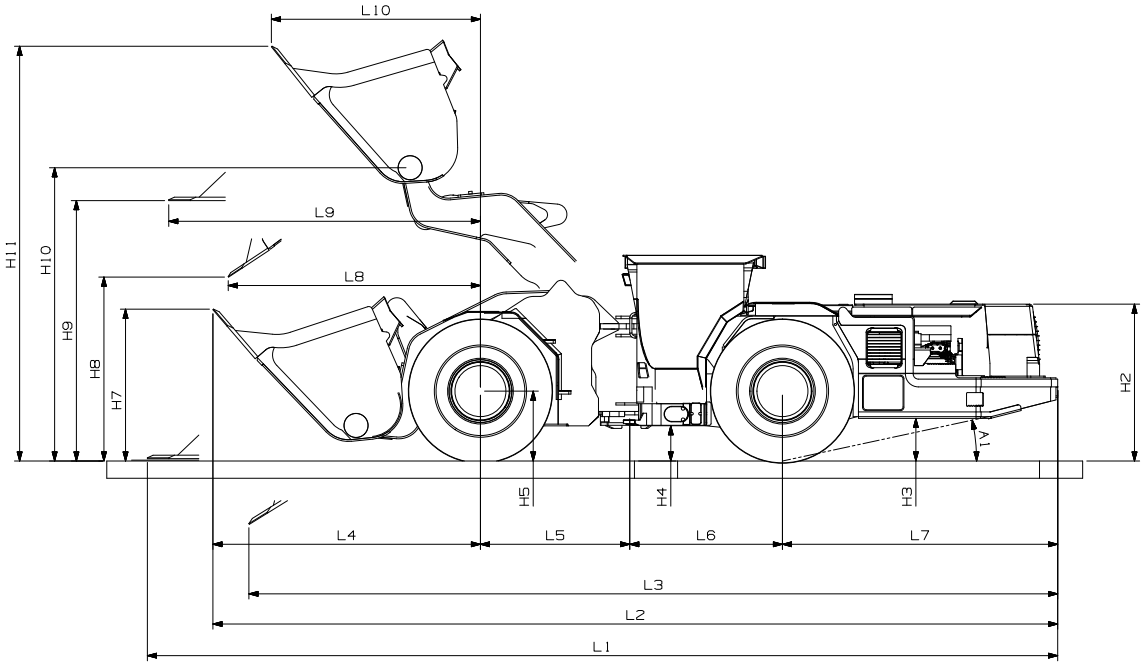
GRADE PERFORMANCE
Volvo TAD1140VE

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						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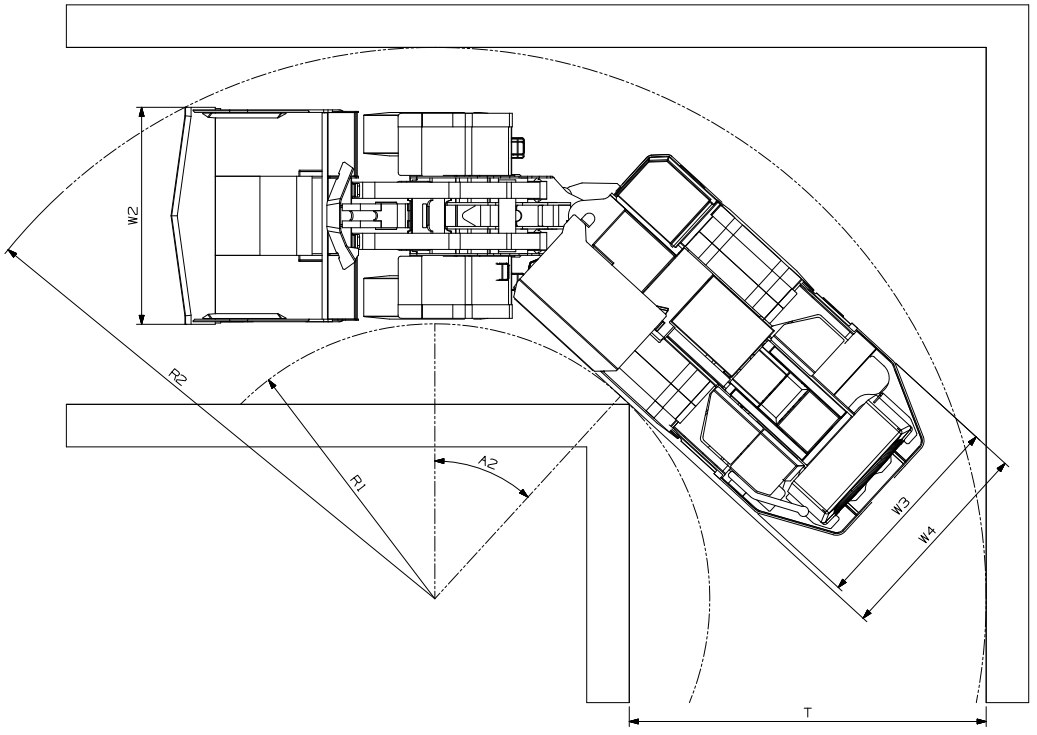
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R2
R1
A2
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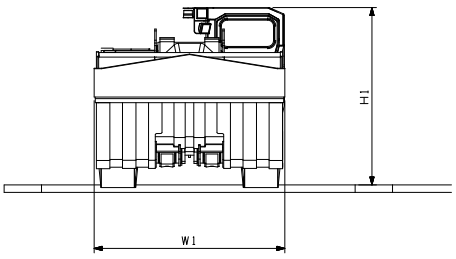
H1
W1

DIMENSIONS

Bucket alternatives (m³)	4.0m³	4.6m³	5.0m³	5.4m³
Material broken density (kg/m³)	max. 2600 kg/m³	max. 2200 kg/m³	max. 2000 kg/m³	max. 1800 kg/m³
Lip plate type	Bare Lip	Bare Lip	Bare Lip	Bare Lip
L1 (mm)	10073	10230	10298	10398
L2 (mm)	9706	9791	9838	9926
L3 (mm)	9574	9712	9776	9846
L4 (mm)	3016	3101	3148	3236
L5 (mm)	1750	1750	1750	1750
L6 (mm)	1750	1750	1750	1750
L7 (mm)	3190	3190	3190	3190
L8 (mm)	2258	2402	2457	2524
L9 (mm)	2797	2954	3022	3122
L10 (mm)	2384	2463	2508	2594
H1 (mm)	2384	2384	2384	2384
H2 (mm)	1818	1818	1818	1818
H3 (mm)	494	494	494	494
H4 (mm)	409	409	409	409
H5 (mm)	810	810	810	810
H6 (mm)	956	1018	1057	1135
H7 (mm)	1625	1760	1809	1866
H8 (mm)	2455	2389	2348	2268
H9 (mm)	3458	3482	3479	3449
H10 (mm)	3863	3863	3863	3863
H11 (mm)	5134	5265	5322	5382
W1 (mm)	2544	2550	2550	2550
W2 (mm)	2550	2550	2550	2550
W3 (mm)	2400	2400	2400	2400
W4 (mm)	2469	2469	2469	2469
A1	13°	13°	13°	13°
A2	42.5°	42.5°	42.5°	42.5°
R1, left turn (mm)	3231	3231	3231	3231
R2, left turn (mm)	6479	6479	6501	6479
T, left turn (mm)	4194	4194	4216	4194
R1, right turn (mm)	3300	3300	3300	3300
R2, right turn (mm)	6441	6479	6501	6541
T, right turn (mm)	4108	4146	4167	4207

DIMENSIONS

	Standard			
Bucket alternatives (m^3)	4.0m^3	4.6m^3	5.0m^3	5.4m^3
Material broken density (kg/m^3)	max. 2500 kg/m^3	max. 2100 kg/m^3	max. 1900 kg/m^3	max. 1700 kg/m^3
Lip plate type	GET	GET	GET	GET
L1 (mm)	10082	10244	10299	10431
L2 (mm)	9736	9720	9859	9952
L3 (mm)	9569	9712	9760	9868
L4 (mm)	3046	3131	3169	3262
L5 (mm)	1750	1750	1750	1750
L6 (mm)	1750	1750	1750	1750
L7 (mm)	3190	3190	3190	3190
L8 (mm)	2252	2396	2440	2545
L9 (mm)	2811	2968	3023	3155
L10 (mm)	2414	2493	2530	2620
H1 (mm)	2384	2384	2384	2384
H2 (mm)	1818	1818	1818	1818
H3 (mm)	494	494	494	494
H4 (mm)	409	409	409	409
H5 (mm)	810	810	810	810
H6 (mm)	987	1049	1081	1158
H7 (mm)	1615	1749	1789	1883
H8 (mm)	2425	2245	2325	2245
H9 (mm)	3431	3455	3452	3443
H10 (mm)	3863	3863	3863	3863
H11 (mm)	5124	5262	5303	5401
W1 (mm)	2667	2667	2667	2667
W2 (mm)	2588	2588	2588	2588
W3 (mm)	2400	2400	2400	2400
W4 (mm)	2469	2469	2469	2469
A1	13°	13°	13°	13°
A2	42.5°	42.5°	42.5°	42.5°
R1, left turn (mm)	3231	3231	3231	3231
R2, left turn (mm)	6506	6545	6563	6607
T, left turn (mm)	4222	4261	4278	4323
R1, right turn (mm)	3300	3300	3300	3300
R2, right turn (mm)	6506	6545	6563	6607
T, right turn (mm)	4173	4212	4230	4274

DIMENSIONS

Bucket alternatives (m^3)	$4.6m^3$	$5.4m^3$
Material broken density (kg/m^3)	max. 2000 kg/m^3	max. 1700 kg/m^3
Lip plate type	Half Arrow	Half Arrow
L1 (mm)	10247	10485
L2 (mm)	9843	10006
L3 (mm)	9703	9901
L4 (mm)	3153	3316
L5 (mm)	1750	1750
L6 (mm)	1750	1750
L7 (mm)	3190	3190
L8 (mm)	2384	2577
L9 (mm)	2381	3209
L10 (mm)	2517	2672
H1 (mm)	2384	2384
H2 (mm)	1818	1818
H3 (mm)	494	494
H4 (mm)	409	409
H5 (mm)	810	810
H6 (mm)	2333	1207
H7 (mm)	1734	1908
H8 (mm)	2333	2195
H9 (mm)	3427	3418
H10 (mm)	3863	3863
H11 (mm)	5247	5247
W1 (mm)	2700	2700
W2 (mm)	2700	2700
W3 (mm)	2400	2400
W4 (mm)	2469	2469
A1	13°	13°
A2	42.5°	42.5°
R1, left turn (mm)	3231	3231
R2, left turn (mm)	6621	6677
T, left turn (mm)	4337	4392
R1, right turn (mm)	3300	3300
R2, right turn (mm)	6621	6677
T, right turn (mm)	4288	4343

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