



Michigan L120



ENGINE OUTPUT:
190 HP (140kW) VOLVO
DIRECT-INJECTED, TURBO-
CHARGED DIESEL

OPERATING WEIGHT:
34,190 LB (15,5 T)

BUCKETS: 3.5 - 6.0 YD³
(2,7 - 4,6 m³)

**AUTOMATIC POWERSHIFT
TRANSMISSION**

**INDUSTRY'S FIRST QUICK
COUPLING ATTACHMENT
BRACKET SYSTEM**

**COMFORT/EFFICIENCY
DESIGNED CAB**

**HIGH LIFT ARM MOUNTING
OFFERS LONG REACH AND
HIGH LIFT HEIGHT**

**PARALLEL LIFT ARMS,
LEVEL FORKS THROUGH
ENTIRE LIFT ARC**

**PILOT OPERATED
"FINGERTIP" HYDRAULICS**

MICHIGAN



ENGINE

Direct-injected, turbocharged 6-cylinder in-line 4-cycle diesel.

Make	Volvo	
Model	TD71G	
Max. rating* at	2200 rpm	(36,7 rps)
SAE J1349 (ISO 1585)	200 hp	(148 kW)
Flywheel rating** at	2200 rpm	(36,7 rps)
SAE J1349 (ISO 1585)	190 hp	(140 kW)
DIN 70020/6271	190 hp	(140 kW)
Max. torque at	1400 rpm	(23,3 rps)
SAE J1349 (ISO 1585)	523.7 lbf ft	(705 Nm)
DIN 70020/6271	523.7 lbf ft	(705 Nm)
Number of cylinders	6	
Displacement, total	409 in ³	(6,7 dm ³)
Bore	4.1 in	(104,77 mm)
Stroke	5.1 in	(130 mm)

Air cleaners

1. Cyclone pre-cleaner with automatic dust ejector.
2. Paper filter with restriction warning light on instrument panel.
3. Replaceable safety filter.

***Max. rating** - Rating of engine equipped only with components essential for engine function, such as injection pump, oil pump and water pump.

****Flywheel rating** - Net rating measured with fan, intake and exhaust system, cooling system and alternator mounted.



ELECTRICAL

The electrical system is well protected by fuses and pre-wired for optional equipment.

Voltage	24 V	
Batteries (12 volt) no.	2	
Battery capacity, ea.	140 Ah	
Cranking capacity, ea.	800 A	
Reserve capacity, ea.	270 min	
Alternator rating	1540/55 W/A	
Starter motor output	7.3 hp	(5,4 kW)



SERVICE REFILL CAPACITIES

Crankcase with filter	5.8 US gal	(22 dm ³ ,l)
Fuel tank	56.8 US gal	(215 dm ³ ,l)
Cooling system	17.2 US gal	(65 dm ³ ,l)
Transmission, total	8.7 US gal	(33 dm ³ ,l)
Drop-box	1.2 US gal	(4,7 dm ³ ,l)
Front axle, total	9.2 US gal	(35 dm ³ ,l)
Rear axle, total	10.0 US gal	(38 dm ³ ,l)
Hydraulic system, total	67.4 US gal	(255 dm ³ ,l)
Hydraulic tank	50.2 US gal	(190 dm ³ ,l)
Brake oil tank	3.4 US gal	(12,7 dm ³ ,l)



DRIVETRAIN

Torque Converter: Single stage, single phase

Transmission: Volvo BM automatic powershift transmission. Countershaft-type with bi-directional clutch modulation. Single lever control. Four speeds forward, three reverse.

Axes: Full-floating axle half-shafts with planetary final gear reduction. Single piece cast axle housings. Fixed front axle and oscillating rear axle.

Differentials: Hypoid gear differentials on front and rear axles. 100% differential lock on front axle controlled by floor switch.

Hub Reduction: Planetary-type final drive reduction with low-friction roller bearings mounted in each wheel hub.

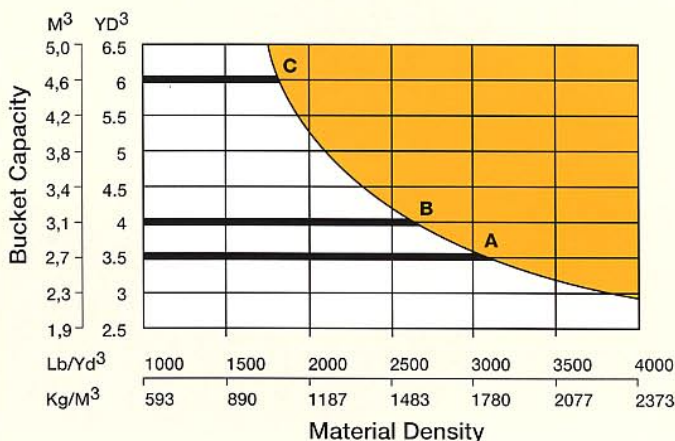
Tires: Tubeless with nylon cord body. Other tires available for different applications.

Torque multiplication	2.33 :1	
Transmission make, model	Volvo BM, HT 131	
Speeds, forward/reverse		
1	4.2 mph	(6,8 km/h)
2	7.9 mph	(12,7 km/h)
3	16.7 mph	(26,9 km/h)
4 (forward only)	24.0 mph	(38,6 km/h)
Measured with tires	23.5 R25*	
Front axle make	Volvo BM	
Rear axle make	Volvo BM	
Rear axle oscillation, total	26"	
	18 in	(450 mm)



BUCKETS

A - Straight Edge General Purpose	3.5 yd ³	2.7 m ³
B - Straight Edge Material Handling	4.0 yd ³	3.1 m ³
C - Straight Edge Light Material	6.0 yd ³	4.6 m ³



Note:

Correct Bucket Selection is determined by consideration of the work application, material density and type of material. Refer to Operational Data for bucket choices. The above graph is to be used as a guideline.

Contact your VME distributor for assistance.



BRAKES

The brake system meets requirements according to SAE J1152, EG 71/320 and ISO 3450.

Service brakes: Hydraulically operated dry disc brakes. Application of brake pedal applies brakes and also neutralizes transmission when transmission disengaging switch is activated.

Secondary: Dual circuit system. Actuated by service brake pedal. Visual low pressure alarm. Dead engine braking pressure provided by accumulators in each circuit.

Parking brake: Disc brake on front output shaft of transmission. Warning lamp for brake applied. Flashing central warning light if gear lever is in forward or reverse.

Brake friction area		
Front wheel (ea.)	126 in ²	(810 cm ²)
Rear wheel (ea.)	62.8 in ²	(405 cm ²)
Reservoirs, no.		
Volume, total	91.5 in ³	(1.5 dm ³ ,l)
Parking brake area, total	15.5 in ²	(100 mm ²)



STEERING

Articulated frame. Load-sensing hydrostatic steering system.

Pump: Variable flow axial piston pump, mounted to a power take-off on the transmission.

Cylinders: Two double-acting cylinders with chrome plated piston rods.

Steering cylinders, no.	2	
Bore	3.2 in	(80 mm)
Rod diameter	2.0 in	(50 mm)
Stroke	17.3 in	(440 mm)
Relief pressure	2744 psi	(19 MPa)
Steer pump output	25.6 US gal/min	(97 dm ³ ,l/min)
at pressure	1450 psi	(10 MPa)
and engine speed	2200 rpm	(36,7 rps)



CAB

Integral ROPS/FOPS Cab meets requirements according to SAE J1040C, SAE J231, ISO 3471-1986, ISO 3449-1980, and SS/ISO 6055. Sound-insulating lining. Floor mats. Lockable door. Side and rear window exits. Tinted safety glass.

Heater, Defroster and Ventilator: A three speed fan provides filtered fresh air and defroster for the front and side windows. Air conditioning optional.

Operator's Seat: Fully adjustable suspension seat with seat belt (SAE #J386) and heater.

Heating capacity	39,600 BTU/h	(11,6 kW)
Air conditioning (optional)	19,400 BTU/h	(5,7 kW)



HYDRAULICS

Open center system pilot-operated and filtered breather on reservoir.

Pumps: Triple vane type, mounted to a power take-off on the transmission.

System Supply: Pumps 1 and 2 supply the main hydraulic functions until the system pressure exceeds 2610 psi (18 MPa), when Pump 2 is diverted to tank. Pump 3 supplies the pilot valve circuit.

Valve: Three-spool valve with built-in pressure relief valve. Activated by a pilot valve, it is mounted on front frame for easy access.

Lift function: The valve has four positions: Raise, hold, lower and float. An automatic kickout detent is adjustable for any position between maximum reach and full lift height.

Tilt function: The valve has three positions: Rollback, hold and dump. Automatic bucket positioner adjustable to any desired loading angle.

Cylinders: Double-acting.

Filters: Full-flow 10 micron return filter with magnetic core, located in hydraulic oil tank.

Load Unit: Hydraulic cylinders mounted in line with lifting arms.

Pump No. 1

Relief pressure	3050 psi	(21 MPa)
Pump output	51.8 US gal/min	(196 dm ³ ,l/min)
at pressure	1450 psi	(10 MPa)
and engine speed	2200 rpm	(36,7 rps)

Pump No. 2

Relief pressure	2600 psi	(18 MPa)
Pump output	21.4 US gal/min	(81 dm ³ ,l/min)
at pressure	1450 psi	(10 MPa)
and engine speed	2200 rpm	(36,7 rps)
Output, pump total	73.2 US gal/min	(277 dm ³ ,l/min)

Lift cylinders, no.	2	
Bore	5.5 in	(140 mm)
Rod diameter	2.8 in	(70 mm)
Stroke	38.6 in	(980 mm)

Tilt cylinders, no.	2	
Bore	4.9 in	(12,5 mm)
Rod diameter	2.8 in	(70 mm)
Stroke	32.7 in	(830 mm)

Raising time (loaded)

Dumping time

(loaded)

Lowering time (empty)

Total cycle time

ATTACHMENTS

(for further information please contact your local dealer)

Buckets

High-Dump Light Materials
Light Materials
Multi-Purpose
Side Dump
Spade Nose with Teeth
Spade Nose without Teeth
Spill Plate
Straight Edge
Straight Edge with Teeth

Fork Equipment

Fork Frame
Fork Tines
Forklift Carrier with
One-Piece Top Clamp
Forklift Carrier with Two
Independent Top Clamps
Forklift Carrier with Tine
Positioner

Other Attachments

Asphalt Cutter
Diagonal Snow Blade
Material Handling Arm,
Telescopic Manually,
Pinned Positions
Material Handling Arm
with Hydraulic Folding,
Telescopic Manually,
Pinned Positions

Timber Grapples

General Purpose
Sorting
Unloading
Heel Kickout
for Use Only on the Sorting
and Unloading Grapples -
Requires Hydraulic Control
for 4th Function
Log Pusher

OPERATIONAL DATA MICHIGAN L120

Tires: 23.5 - 25 (16PR) L-2

†Mounting/Bucket type	Pin-On	Hook-On	Pin-On	Hook-On	Pin-On	Hook-On
Volume, Heaped	4.0 yd ³ 3.1 m ³	4.0 yd ³ 3.1 m ³	3.5 yd ³ 2.7 m ³	3.5 yd ³ 2.7 m ³	6.0 yd ³ 4.6 m ³	6.0 yd ³ 4.6 m ³
Struck	3.3 yd ³ 2.52 m ³	3.3 yd ³ 2.52 m ³	2.9 yd ³ 2.22 m ³	2.9 yd ³ 2.22 m ³	4.9 yd ³ 3.75 m ³	4.9 yd ³ 3.75 m ³
Static tipping load straight	27,980 lb 12 690 kg	27,050 lb 12 280 kg	28,460 lb 12 910 kg	27,490 lb 12 470 kg	26,630 lb 12 080 kg	25,770 lb 11 690 kg
at 35° turn	25,020 lb 11 350 kg	24,180 lb 10 970 kg	25,500 lb 11 570 kg	24,580 lb 11 150 kg	23,770 lb 10 780 kg	22,970 lb 10 420 kg
at full turn 40°	24,170 lb 10 960 kg	23,360 lb 10 600 kg	24,640 lb 11 180 kg	23,750 lb 10 770 kg	22,930 lb 10 400 kg	22,170 lb 10 050 kg
Breakout force	28,420 lbf 126.4 kN	26,590 lbf 118.3 kN	31,120 lbf 138.4 kN	28,900 lbf 128.6 kN	21,715 lbf 96.6 kN	20,590 lbf 91.6 kN
Hydraulic lifting force, ground level	49,850 lbf 221.8 kN	49,960 lbf 222.2 kN	49,910 lbf 222.0 kN	50,020 lbf 222.5 kN	50,020 lbf 222.5 kN	50,130 lbf 223.0 kN
at max. height	19,490 lbf 86.7 kN	19,180 lbf 85.3 kN	19,700 lbf 87.7 kN	19,360 lbf 86.1 kN	19,030 lbf 84.7 kN	18,720 lbf 83.3 kN
(A)	25'4" ft in 7722 mm	25'7" ft in 7800 mm	25'0" ft in 7630 mm	25'3" ft in 7710 mm	26'6" ft in 8090 mm	26'10" ft in 8170 mm
(E)	3'8" ft in 1120 mm	3'11" ft in 1190 mm	3'5" ft in 1040 mm	3'8" ft in 1110 mm	4'8" ft in 1430 mm	4'11" ft in 1500 mm
(H)	9'4" ft in 2840 mm	9'1" ft in 2780 mm	9'7" ft in 2910 mm	9'4" ft in 2850 mm	8'6" ft in 2580 mm	8'3" ft in 2520 mm
(L)	17'8" ft in 5385 mm	17'11" ft in 5450 mm	17'4" ft in 5290 mm	17'7" ft in 5350 mm	18'2" ft in 5540 mm	18'4" ft in 5600 mm
(M)	3'8" ft in 1120 mm	3'10" ft in 1170 mm	3'6" ft in 1050 mm	3'8" ft in 1110 mm	4'6" ft in 1380 mm	4'8" ft in 1430 mm
(N)	5'7" ft in 1700 mm	5'9" ft in 1740 mm	5'6" ft in 1670 mm	5'7" ft in 1700 mm	6'0" ft in 1830 mm	6'1" ft in 1860 mm
a ₁ Turning circle over bucket (bucket in carry position)	40'10" ft in 12 440 mm	40'11" ft in 12 480 mm	40'7" ft in 12 380 mm	40'9" ft in 12 430 mm	41'6" ft in 12 640 mm	41'8" ft in 12 700 mm
Weight distribution, front	13,180 lb 5980 kg	13,490 lb 6120 kg	12,790 lb 5800 kg	13,170 lb 5970 kg	13,780 lb 6250 kg	14,080 lb 6390 kg
rear	21,010 lb 9530 kg	20,920 lb 9490 kg	21,210 lb 9620 kg	21,050 lb 9550 kg	20,750 lb 9410 kg	20,660 lb 9370 kg
Operating weight	34,190 lb 15 510 kg	34,410 lb 15 610 kg	34,000 lb 15 420 kg	34,220 lb 15 520 kg	34,530 lb 15 660 kg	34,740 lb 15 760 kg

†Bolt-on Cutting Edge Increases Bucket Capacity By .18 yd³ (.14 m³)

ALTERATION OF OPERATIONAL DATA

Tires	23.5-25(16PR) L-2	23.5 R25	23.5-25(16PR)L-3	*Counterweight	Wherever applicable, specifications are in accordance with SAE Standards J732 and J742. Changes from the standard configuration may change machine dimensions and operating data. Operating weight is approximate and includes the bucket given in the table and all standard equipment. *Liquid ballast in rear tires/counterweight only recommended for stabilizing purposes in timber and pallet handling on hard and level ground.
Liquid ballast in rear tires	*75% CaCl ₂			N/A	
Width over wheels		±0 in (±0 mm)	+0.4 in (+10 mm)		
Ground clearance		+0 in (+0 mm)	-0.6 in (-15 mm)		
Tipping load at full turn	+3040 lb (+1380 kg)	+330 lb (+150 kg)	+220 lb (+100 kg)	+1455 lb(+660kg)	
Operating weight	+2580 lb (+1170 kg)	+580 lb (+260 kg)	+270 lb (+120 kg)	+882 lb(+400 kg)	

STANDARD EQUIPMENT			
AIR CLEANER, DRY TYPE, DUAL ELEMENT, EXHAUST ASPIRATED PRECLEANER ALTERNATOR, 24V, 55 AMP BATTERY DISCONNECT, LOCKABLE BOOM KICKOUT, AUTOMATIC BRAKES, 4-WHEEL HYDRAULIC, DISC TYPE, DUAL CIRCUIT BRAKE SYSTEM, SECONDARY BUCKET LEVELER, AUTOMATIC WITH POSITION INDICATOR BUCKET LEVER DETENT CAB ACCESS STEPS & HANDRAILS, (SAE J185) CAB: ROPS (SAE J1040C) (ISO 3471) FOPS (SAE J231) (ISO 3449) Acoustical Lining Ash Tray, Cigarette Lighter Door, Lockable (Left Side Access) Electrical System: 24V. Pre-wired for Optional Accessories Environmental Control: Heater/Defroster/Pressurizer 39,600 BTU/h (11,6 kW) with Three-Speed Blower Fan, Filtered air Floor Mat	Hand Throttle Interior Light Interior Rearview Mirror Safety Glass, Tinted Seat Belt (SAE J386) Seat, Suspension, 6-Way, Adjustable, Heated Steering Wheel, Adjustable Tilt Storage Compartment Sun Visor Windshield Washer, Front & Rear Windshield Wiper, Front, Intermittent Windshield Wiper, Rear COLD STARTING AIDS: Engine Intake Manifold Pre-heater (ROPS Cab only) Engine Fuel Enrichment DIFFERENTIALS: Front, Hydraulically operated Differential Lock Rear, Conventional DRAWBAR WITH PIN ENGINE COOLANT FILTER EXHAUST RAIN CAP (ELBOW TYPE) FENDERS, FRONT & REAR FUEL WATER SEPARATOR HYDRAULIC CONTROL LEVER SAFETY LATCH HYDRAULIC OIL COOLER HYDRAULIC PRESSURE TEST PORTS, QUICK CONNECT	INSTRUMENTS/GAUGES, ILLUMINATED: Brake System Pressure Gauge Engine Coolant Temperature Gauge Fuel Gauge Hourmeter Sight Gauges: Brake Fluid Level Coolant Level Hydraulic Fluid Level Transmission/Converter Fluid Temperature Gauge ISOLATION MOUNTS: Cab, Engine, Transmission LIFTING LUGS LIGHTS: Driving (2-Front), Halogen with High/Low Beam, Parking Lights, Side Marker Lights, Stop/Tail Combination (2-Rear) Turn Signals with Hazard Warning Switch MIRRORS, REARVIEW (2), EXTERIOR MUFFLER, SPARK ARRESTING NEUTRAL START FEATURE SIDE PANELS, ENGINE HOOD STEERING FRAME LOCK TIRES: 23.5-25 (16PR) L-2 (General) TRANSMISSION: MODULATED WITH SINGLE LEVER CONTROL, AUTOMATIC POWER SHIFT, AND OPERATOR	CONTROLLED DECLUTCH VALVE, MAIN HYDRAULIC, THREE (3) SPOOL, PILOT OPERATED VANDALISM LOCK, PROVISION FOR: Batteries, Engine Coolant, Engine Oil, Fuel, Hydraulic Fluid, Converter/Transmission Fluid, Tool Box WARNING ALARMS: Central Warning Audible Buzzer Horn, Electric Reverse Alarm (SAE J994) WARNING & MONITORING LIGHTS: Air Cleaner Restriction Alternator Malfunction Central Warning Lamp: Brake System Pressure Engine Coolant Temperature Engine Oil Pressure Parking Brake Applied (Transmission in Forward or Reverse) Transmission Fluid Temperature Differential lock Engine Intake Manifold Pre-heater High Beam Driving Lights Parking Brake Applied Transmission Clutch Pressure
OPTIONAL EQUIPMENT			
Air Conditioner, 19,400 BTU/h (5,7 kW) Air Precleaner, Heavy Duty Oil Bath Type Cyclone, Turbo II Type Air Vents, Extra Attachment Rib Kit Beacon, Amber Rotating Boom Float Kickout, Automatic Bucket Teeth, Bolt-On, (8) (Not for Use on Light Material Buckets) Cold Starting Aid, Engine Coolant Pre-heater (110V-1500W)	Cutting Edge, 3 pc. Reversible, Bolt-On (Not for Use on High Tip Buckets) Dual Service Brake Pedal Engine Fan, Suction Engine, High Altitude Version, Factory Engine, Low Emission Version, Factory Engine, Shutdown to Idle Kit Guards: Belly Plates Headlights, Front Muffler Taillights, Rear Windshield Worklights, Rear	Hydraulic Attachment Bracket with Separate Locking System Hydraulic Control for 3rd Function Hydraulic Control for 3rd and 4th Functions Hydraulic Single Acting Control (Diverts Power Down Pressure to Tank) Instrument/Gauges: Engine Oil Pressure Speedometer/Tachometer Voltmeter Light, Attachment Flood (Halogen) Radiator, Corrosion Resistant Radio Mounting Panel (Includes 2 Speakers, Antenna & Voltage Reducers)	ROPS/FOPS Canopy (Open Type) Secondary Steering Slow Moving Vehicle Emblem Spillguard, Bolt-On (Not for Use on Light Material Buckets) Tire Options: 23.5 R25 23.5-25(16PR)L-3 23.5-25(20PR)L-2 23.5-25(20PR)L-3

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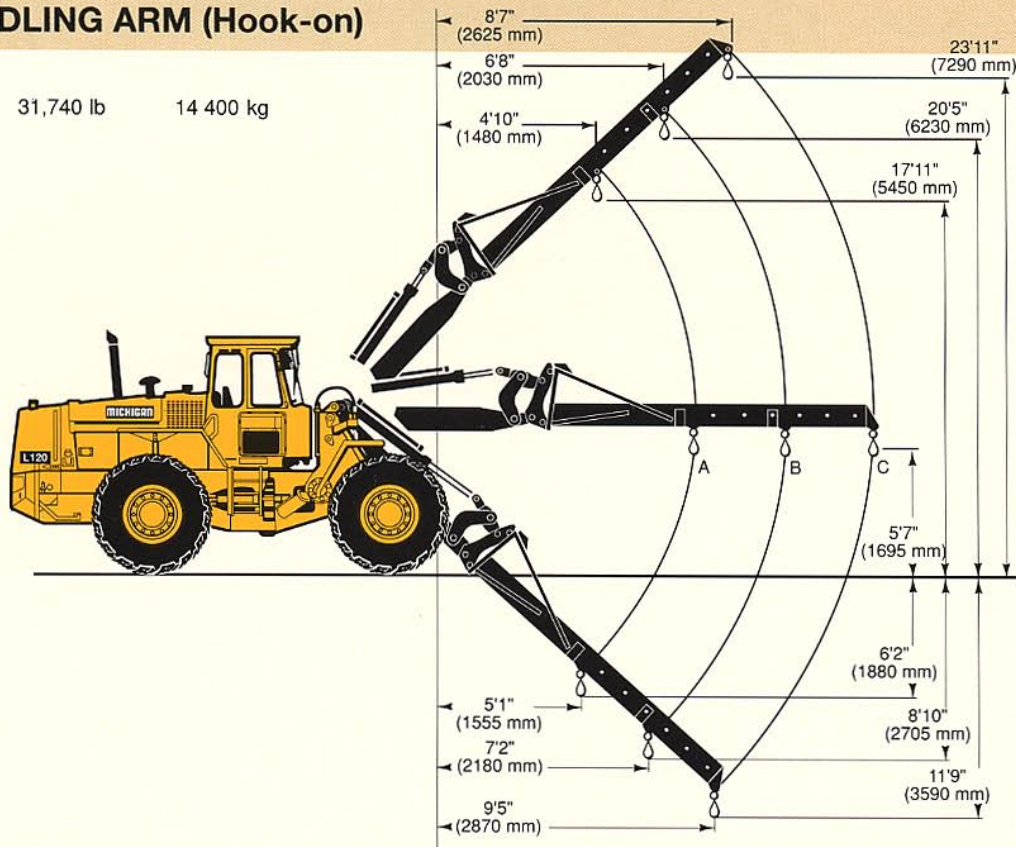
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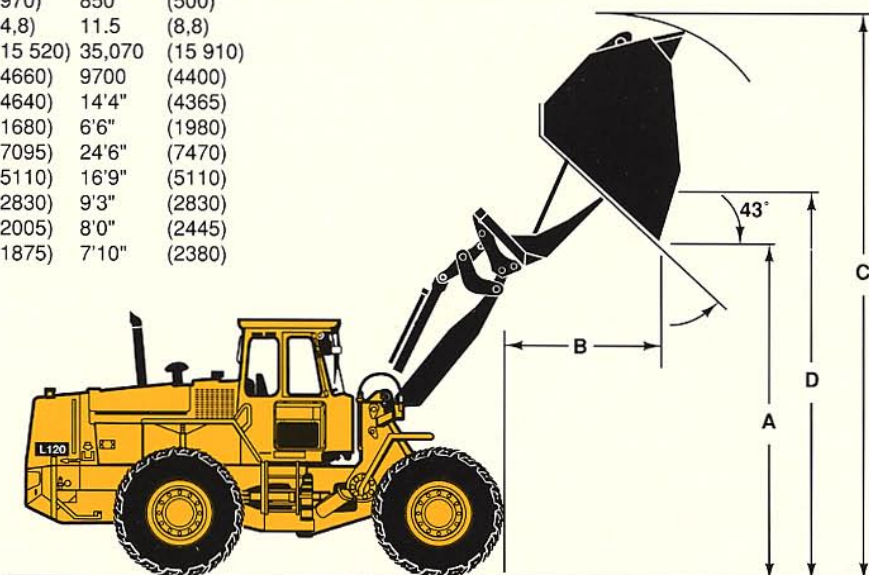
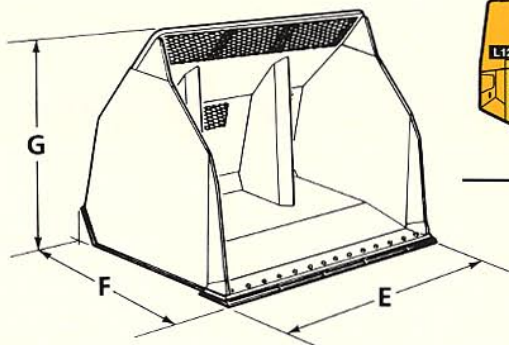
MATERIAL HANDLING ARM (Hook-on)

Operating weight 31,740 lb 14 400 kg



HIGH TIP LIGHT MATERIALS BUCKET (Hook-on)

Material weight	lb/yd ³	(kg/m ³)	1650	(970)	850	(500)
Bucket capacity	yd ³	(m ³)	6.3	(4,8)	11.5	(8,8)
Operating weight	lb	(kg)	34,210	(15 520)	35,070	(15 910)
Operating load	lb	(kg)	10,580	(4660)	9700	(4400)
A	ft in	(mm)	15'3"	(4640)	14'4"	(4365)
B	ft in	(mm)	5'6"	(1680)	6'6"	(1980)
C	ft in	(mm)	23'3"	(7095)	24'6"	(7470)
D	ft in	(mm)	16'9"	(5110)	16'9"	(5110)
E	ft in	(mm)	9'3"	(2830)	9'3"	(2830)
F	ft in	(mm)	6'7"	(2005)	8'0"	(2445)
G	ft in	(mm)	6'2"	(1875)	7'10"	(2380)



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