



Michigan L90



ENGINE OUTPUT:
145 HP (107kW) VOLVO
DIRECT-INJECTED, TURBO-
CHARGED DIESEL

OPERATING WEIGHT:
28,540 LB (12.9 T)

BUCKETS: 2.75 - 5.00 YD³
(2,10 - 3,82 m³)

**AUTOMATIC POWER SHIFT
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	TD61G	
Max. rating* at	2200 rpm	(36,7 rps)
SAE J1349 (ISO 1585)	156 hp	(115 kW)
Flywheel rating** at	2200 rpm	(36,7 rps)
SAE J1349 (ISO 1585)	145 hp	(107 kW)
DIN 70020	145 hp	(107 kW)
Max. torque at	1400 rpm	(23,3 rps)
SAE J1349 (ISO 1585)(net)	405 lbf ft	(550 Nm)
DIN 70020	405 lbf ft	(550 Nm)
Number of cylinders	6	
Displacement, total	334 in ³	(5,48 dm ³ ,l)
Bore	3.88 in	(98,4 mm)
Stroke	4.72 in	(120 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 element.

***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.



DRIVETRAIN

Torque Converter: Single stage, single phase

Transmission: Volvo BM automatic powershift transmission. Countershaft-type with bi-directional powershift clutch modulation.

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. Engagement and disengagement by means of switch on cab floor.

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

Tires: Tubeless type with nylon cord. Optional tires available for specific applications.

Torque multiplication	2.66 :1
Transmission make, model	Volvo BM, HT131
Speeds, forward/reverse	
1	4.4 mph (7,0 km/h)
2	8.7 mph (14,0 km/h)
3	18.0 mph (29,0 km/h)
4 (forward only)	24.9 mph (40,0 km/h)
Measured with tires	20.5R25*
Front axle make	Volvo BM
Rear axle make	Volvo BM
Rear axle oscillation, total	30 deg
	20.7 in (525 mm)
Standard tires	20.5-25 (12PR) L-2



ELECTRICAL

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

Voltage	24 V	
Batteries (12 volt)	2	
Battery capacity, ea.	105 Ah	
Cranking capacity, ea.	575 A	
Reserve capacity, ea.	170 min	
Alternator rating	1540/55 W/A	
Starter motor output	7.3 hp	(5,4 kW)



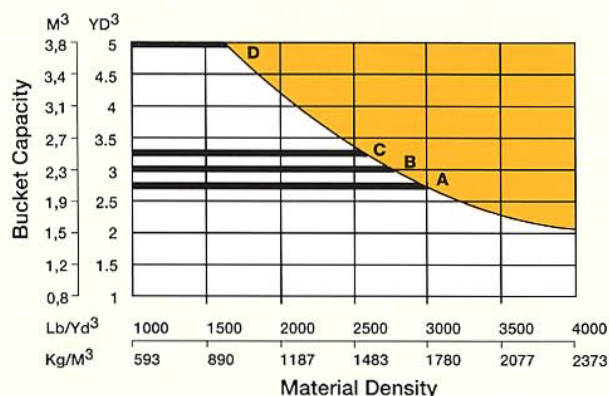
SERVICE REFILL CAPACITIES

Crankcase	4.49 US gal	(17,0 dm ³ ,l)
Fuel tank (usable)	47.0 US gal	(178 dm ³ ,l)
Fuel tank (total)	48.9 US gal	(185 dm ³ ,l)
Cooling system	14.0 US gal	(53,0 dm ³ ,l)
Transmission, total	8.72 US gal	(33,0 dm ³ ,l)
Front axle, total	8.59 US gal	(32,5 dm ³ ,l)
Rear axle, total	7.79 US gal	(29,5 dm ³ ,l)
Brake oil tank	2.64 US gal	(10,0 dm ³ ,l)
Hydraulic system, total	37.0 US gal	(140 dm ³ ,l)
Hydraulic tank	27.7 US gal	(105 dm ³ ,l)



BUCKETS

A - Straight Edge General Purpose	2.75 yd ³	2.10 m ³
B - Straight Edge General Purpose	3.00 yd ³	2.29 m ³
C - Straight Edge Material Handling	3.25 yd ³	2.48 m ³
D - Straight Edge Light Material	5.00 yd ³	3.82 m ³

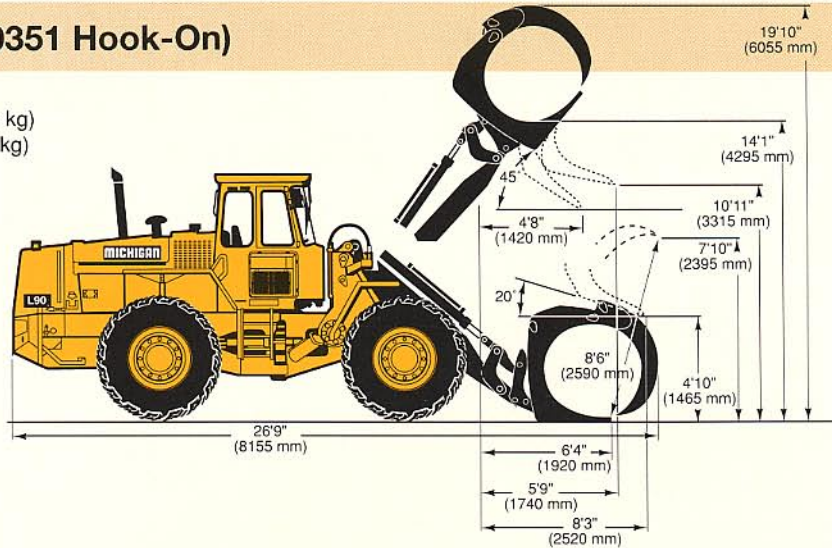


Note: Correct Bucket Selection is determined by consideration of the work application, material density and type of material. Refer to Operational Data for bucket choices. The above graph is to be used as a guideline.

Contact your VME Distributor for assistance.

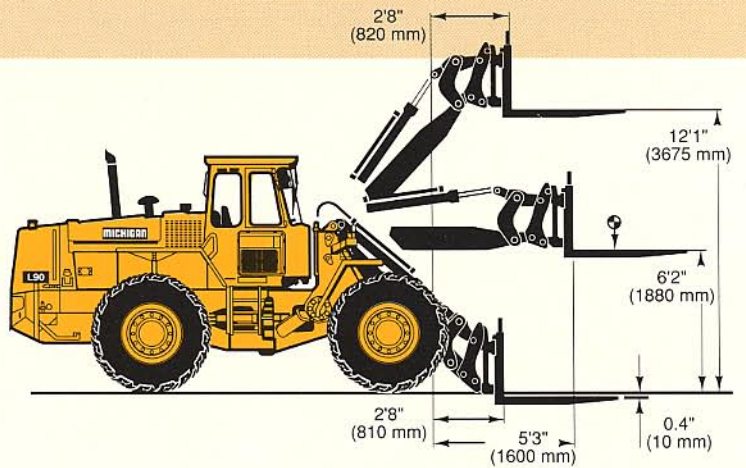
SORTING GRAPPLE (90351 Hook-On)

Operating Weight .. 29,960 lb (13 590 kg)
 Operating Load 9,480 lb (4 300 kg)



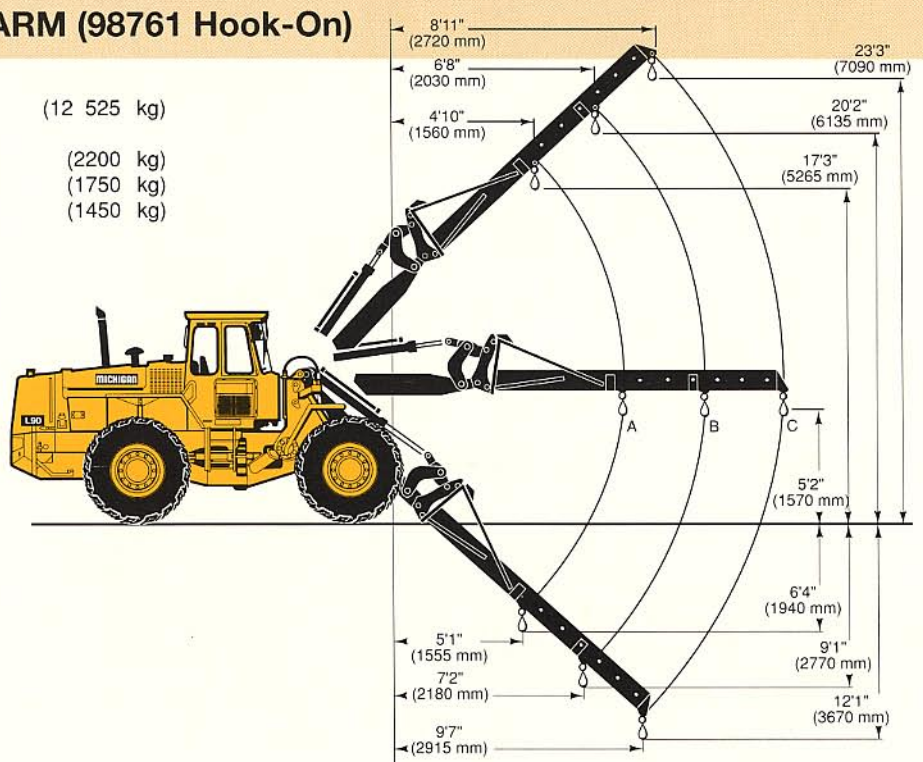
PALLET FORK (Hook-On)

Fork frame (98386)
 with tines (98390)
 Tine length 4'0" (1225 mm)
 Frame width 4'11" (1500 mm)
 Distance to center of
 gravity, fork tines level 2'0" (600 mm)
 Operating weight 27,870 lb (12 640 kg)
 Safe working load
 according to SS 3462 11,020 lb (5000 kg)



MATERIAL HANDLING ARM (98761 Hook-On)

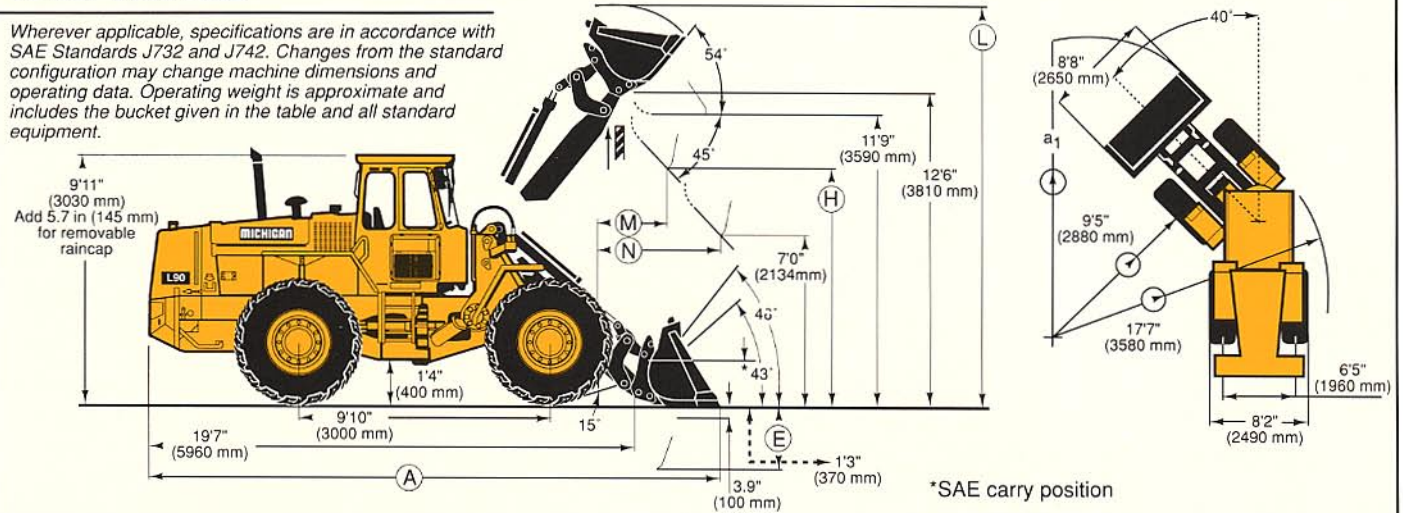
Operating weight 27,610 lb (12 525 kg)
 Operating load at position
 A 4850 lb (2200 kg)
 B 3860 lb (1750 kg)
 C 3200 lb (1450 kg)



OPERATIONAL DATA MICHIGAN L90

Tires: 20.5 R25

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.



†Mounting/Bucket Type		Pin-On	Hook-On	Pin-On	Hook-On	Pin-On	Hook-On	Pin-On	Hook-On
Volume, heaped	yd ³	3.00	3.00	2.75	2.75	3.25	3.25	5.00	5.00
	m ³	2,29	2,29	2,10	2,10	2,48	2,48	3,82	3,82
Struck	yd ³	2.40	2.40	2.28	2.28	2.69	2.69	4.12	4.12
	m ³	1,84	1,84	1,74	1,74	2,06	2,06	3,15	3,15
Static tipping load, straight	lb	21,760	20,960	21,760	20,940	21,270	20,550	20,330	19,620
	kg	9 870	9 510	9 870	9 500	9 650	9 320	9 220	8 900
at 35° turn	lb	19,430	18,690	19,440	18,690	18,960	18,300	18,100	17,460
	kg	8 820	8 480	8 820	8 478	8 600	8 300	8 210	7 920
at full turn	lb	18,750	18,220	18,760	18,020	18,290	17,640	17,440	16,830
	kg	8 510	8 270	8 510	8 180	8 300	8 000	7 910	7 630
Breakout force	lbf	26,760	24,680	26,800	24,710	23,990	22,310	17,840	16,830
	kN	119,0	109,8	119,3	109,9	106,7	99,2	79,4	75,0
Hyd. lifting force, ground level	lbf	36,320	36,350	36,420	36,440	36,330	36,350	36,550	36,570
	kN	161,6	161,7	162,0	162,1	161,6	161,7	162,6	162,7
at max. height	lbf	14,200	13,900	14,240	13,930	14,020	13,730	13,760	13,470
	kN	63,2	61,8	63,4	62,0	62,4	61,1	61,2	59,9
A	ft in	23'6"	23'9"	23'6"	23'9"	23'11"	24'2"	25'2"	25'6"
	mm	7 170	7 250	7 170	7 250	7 280	7 360	7 680	7 760
E	ft in	3'4"	3'7"	3'4"	3'7"	3'8"	3'10"	4'9"	4'11"
	mm	1 010	1 080	1 010	1 080	1 180	1 180	1 440	1 510
H	ft in	9'3"	9'0"	9'3"	9'0"	8'11"	8'9"	8'0"	7'10"
	mm	2 810	2 750	2 810	2 750	2 730	2 670	2 450	2 390
L	ft in	16'9"	16'11"	16'6"	16'7"	16'10"	17'0"	17'5"	17'6"
	mm	5 120	5 150	5 040	5 060	5 130	5 170	5 300	5 340
M	ft in	3'5"	3'8"	3'5"	3'8"	3'9"	3'11"	4'8"	4'9"
	mm	1 050	1 110	1 050	1 110	1 130	1 190	1 410	1 460
N	ft in	5'4"	5'5"	5'4"	5'5"	5'5"	5'7"	5'10"	5'11"
	mm	1 620	1 650	1 620	1 650	1 650	1 690	1 780	1 800
a, Turning circle over bucket (bucket in carry position)	ft in	38'3"	38'5"	38'3"	38'5"	38'6"	38'8"	39'3"	39'5"
	mm	11 670	11 720	11 670	11 720	11 730	11 780	11 960	12 010
Weight distribution, front	lb	11,390	11,770	11,240	11,640	11,660	11,990	11,930	12,260
	kg	5 170	5 340	5 100	5 280	5 290	5 440	5 410	5 560
Weight distribution, rear	lb	17,150	16,990	17,220	17,040	17,000	16,890	16,860	16,750
	kg	12 950	13 050	12 910	13 010	13 000	13 100	13 060	13 160
Operating weight	lb	28,540	28,760	28,460	28,680	28,660	28,880	28,790	29,010
	kg	12 950	13 050	12 910	13 010	13 000	13 100	13 060	13 160

†Bolt-on Cutting Edge Increases Bucket Capacity By 0.15 yd³ (0.11 m³)

ALTERATION OF OPERATIONAL DATA

Tires	20.5-R25	20.5-25(12PR)L-2	20.5-25(12PR)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	*75% CaCl ₂			N/A	*Liquid ballast in rear tires/ counterweight only recommended for stabilizing purposes in timber and pallet handling on hard and level ground.
Width over wheels		±0 in (±0 mm)	±0 in (±0 mm)		
Ground Clearance		-1 in (-25mm)	+0.6 in (+15 mm)		
Tipping Load at full turn	+2050 lb (+930 kg)	-220 lb (-100 kg)	-200 lb (-91 kg)	+1014 lb(+460 kg)	
Operating weight	+1820 lb (+825 kg)	-485 lb (-220 kg)	-441 lb (-200 kg)	+661 lb(+300 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, DRY DISC, DUAL CIRCUIT
 BRAKE SYSTEM, SECONDARY
 BUCKET LEVELER, AUTOMATIC WITH POSITION INDICATOR
 CAB ACCESS STEPS & HANDRAILS, (SAE J185)
 CAB: ROPS (SAE J1040C) (ISO 3471) FOPS (SAE J231) (ISO 3449)
 Acoustical Lining
 Ash Tray, Cigar 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
 Engine Fuel Mixture Enrichment
 DIFFERENTIALS:
 Front, Hydraulic Differential Lock
 Rear, Conventional
 DRAWBAR WITH PIN
 ENGINE COOLANT FILTER
 EXHAUST RAIN CAP (ELBOW TYPE)
 FENDERS, FRONT & REAR
 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

Transmission/ Converter Fluid
 Temperature Gauge
 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
 Work Lights, Halogen (4-Front, 4-Rear)
 MIRRORS, REARVIEW (2), EXTERIOR
 MUFFLER, SPARK ARRESTING
 NEUTRAL START FEATURE
 SIDE PANELS, ENGINE HOOD
 STEERING FRAME LOCK
 TIRES: 20.5-25 (12PR) 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
 WARNING ALARMS:
 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
 Preheater
 High Beam Driving Lights
 Parking Brake Applied
 Transmission Clutch Pressure

OPTIONAL EQUIPMENT

Air Conditioner, 19,400 Btu/h (5,7 kW)
 Beacon, Amber Rotating
 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:
 Headlights, Front
 Muffler
 Taillights, Rear
 Worklights, Rear
 Hydraulic Attachment Bracket
 Hydraulic Control for 3rd Function
 Hydraulic Control for 3rd and 4th Functions

Hydraulic Single Acting Control
 Light, Attachment Flood (Halogen)
 Radio Mounting Panel
 (Includes 2 Speakers and Antenna)
 ROPS/FOPS Canopy (Open Type)
 Secondary Steering
 Slow Moving Vehicle Emblem
 Speedometer/Tachometer

Tire Options:
 20.5R25
 20.5-25(12PR)L-2
 20.5-25(12PR)L-3
 25/65R25

Under our policy of continuous product improvement, we reserve the right to change specifications and design without prior notice. The illustrations do not necessarily show the standard version of the machine.

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