



Michigan L50



ENGINE OUTPUT:
82 hp (60 kW) VOLVO
DIRECT-INJECTED
DIESEL

OPERATING WEIGHT:
18,160 lb (8,3 t)

BUCKETS: 1.5 - 2.75 yd³
(1,15 - 2,1 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, 4 cylinder, in-line 4-cycle diesel engine with wet, replaceable cylinder liners.

Make	Volvo	
Model	D 45B	
Max. rating* at	2200 rpm	(36,7 rps)
SAE J1349 (ISO 1585)	90 hp	(66 kW)
Flywheel rating** at	2200 rpm	(36,7 rps)
SAE J1349 (ISO 1585)	82 hp	(60 kW)
DIN 70020/6271	82 hp	(60 kW)
Torque at	1200 rpm	(20 rps)
SAE J1349 (gross)	232 lbf ft	(315 Nm)
SAE J1349 (ISO 1585) (net)	223 lbf ft	(302 Nm)
DIN 70020/6271	223 lbf ft	(302 Nm)
Number of cylinders	4	
Displacement, total	273 in ³	(4,48 dm ³ ,l)
Bore	4.2 in	(105,6 mm)
Stroke	5 in	(128 mm)
Compression ratio	16.5:1	

Air cleaners

1. Cyclone precleaner 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.



ELECTRICAL

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

Central warning: Flashing warning lamp with buzzer for following functions: engine oil pressure, brake pressure, parking brake, engine temperature, transmission temperature.

Voltage	24 V	
Batteries (12 volt)	2	
Battery capacity, ea.	105 Ah	
Cranking capacity, ea.	575 A	
Reserve capacity, ea.	170 min	
Alternator rating	1540/60 W/A	
Starter motor output	7.3 hp	(5,4 kW)



SERVICE REFILL CAPACITIES

Crankcase	2.8 US gal	(10,5 dm ³ ,l)
Fuel tank, usable	38.3 US gal	(145 dm ³ ,l)
Fuel tank, total	42.3 US gal	(160 dm ³ ,l)
Cooling system	7.1 US gal	(27 dm ³ ,l)
Transmission, total	5.8 US gal	(22 dm ³ ,l)
Front axle, total	6.0 US gal	(22,5 dm ³ ,l)
Rear axle, total	6.0 US gal	(22,5 dm ³ ,l)
Hydraulic system, total	33.0 US gal	(125 dm ³ ,l)
Hydraulic tank	22.5 US gal	(85 dm ³ ,l)



DRIVETRAIN

Torque Converter: Single stage, single phase.

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

Axles: 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 (optional) 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.

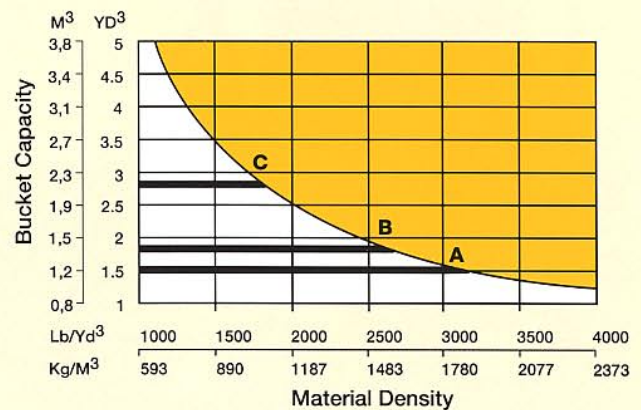
Tires: Tubeless type with nylon cord. Optional tires available for specific applications.

Torque multiplication	3.06 :1	
Transmission make, model	Volvo BM, HT 90	
Speeds, forward/reverse		
1	4.4 mph	(7 km/h)
2	8.0 mph	(13 km/h)
3	15.5 mph	(25 km/h)
4 (forward only)	24.8 mph	(40 km/h)
Measured with tires	15.5-25	
Front axle make	Volvo BM	
Rear axle make	Volvo BM	
Rear axle oscillation, total	24 deg	
.....	13.8 in	(350 mm)
Standard tires	15.5-25 (12PR) L-2	



BUCKETS

- A. Straight Edge General Purpose 1.5 yd³ (1,15 m³)
 B. Straight Edge Material Handling 1.75 yd³ (1,3 m³)
 C. Straight Edge Light Material 2.75 yd³ (2,1 m³)



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, ISO 3450 and EG 71/320.

Service brakes: Full hydraulic system with outboard mounted dry disc brakes. Application of brake pedal applies brakes and also neutralizes transmission when transmission disengaging switch is activated.

Secondary: Dual circuit axle-by-axle system. Actuated by service brake pedal. Visual low pressure alarm. Dead engine braking pressure provided by three nitrogen-charged accumulators.

Parking brake: Disc brake on front axle input shaft. Manually applied and released. A warning lamp lights if the ignition is on when the parking brake is applied. If the gear lever is then placed in forward or reverse, the central warning lamp flashes and a buzzer sounds.

Pump: Fixed displacement gear type, mounted on the torque converter.

Filtration: Full-flow 10 micron filter.

Pressure setting	2180 psi	(15,0 MPa)
Service brake, disc dia.	18.5 in	(470 mm)
thickness	0.86 in	(22 mm)
Brake friction area ea. wheel	30 in ²	(194 cm ²)
Parking brake, disc dia.	13 in	(330 mm)
Parking brake area, total	10.9 in ²	(70 cm ²)



STEERING

Articulated frame. Load-sensing hydrostatic steering.

Pump: Variable flow piston type, mounted on torque converter.

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

Steering cylinders, no.	2	
Bore	2.5 in	(63 mm)
Stroke	16.7 in	(425 mm)
Relief pressure	1885 psi	(13 MPa)
Steer pump output	25.6 US gal/min	(97,0 dm ³ /min)
at pressure	1450 psi	(10,0 MPa)
and engine speed	2200 rpm	(36,7 rps)
Articulation	40 deg	



CAB

Integral ROPS/FOPS Cab meets requirements according to SAE J1040C, SAE J231, ISO 3471-1986, ISO 3449-1980, and SS/ISO 6055. Vibration dampened. Sound-insulating lining. Floor mats. Lockable door. Side and rear window emergency exits. All windows are 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 seat heater.

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



HYDRAULICS

Open center pilot operated system with a vented plate-steel tank. Hydraulic oil is fully filtered and cooled. An access hole is provided in the tank for easy cleaning. An in-tank magnet provides extra protection.

Pumps: One main and one pilot, vane type, mounted on torque converter.

Valve: Split-spool three section valve with built-in pressure relief. Actuated by a manually operated pilot valve, it is mounted on the front frame for easy access.

Lift function: The valve has four positions: raise, hold, lower and float. An optional 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.

Filter: Full-flow 10 micron return filter with magnet, located in hydraulic oil tank.

Main relief pressure	2975 psi	(20,5 MPa)
Main pump output	36 US gal/min	(135 dm ³ /min)
at pressure	1450 psi	(10 MPa)
and engine speed	2200 rpm	(36,7 rps)
Pilot operating pressure	510 psi	(3,5 MPa)
Lift cylinders, no.	2	
Bore	3.5 in	(90 mm)
Stroke	37.6 in	(955 mm)
Tilt cylinders, no.	2	
Bore	3.0 in	(80 mm)
Stroke	37.8 in	(960 mm)
Raising time (loaded)	5.5 s	
Dumping time	0.9 s	
(loaded)		
Lowering time (empty)	1.9 s	
Total cycle time	8.3 s	

ATTACHMENTS

(for further information please contact your local dealer)

Buckets

- Grading
- High-Dump Light Materials
- Light Materials
- Multi-Purpose
- Side Dump
- Spade Nose with Teeth
- Straight Edge
- Straight Edge with Teeth

Fork Equipment

- Breakout Forks
- Fork Carrier Protection Bars
- Fork Tine Extensions
- Forklift Carrier with Hydraulic Top Clamp
- Forklift Carrier with Two Top Clamps
- Pallet Forks
- Pallet Fork with Tine Positioner

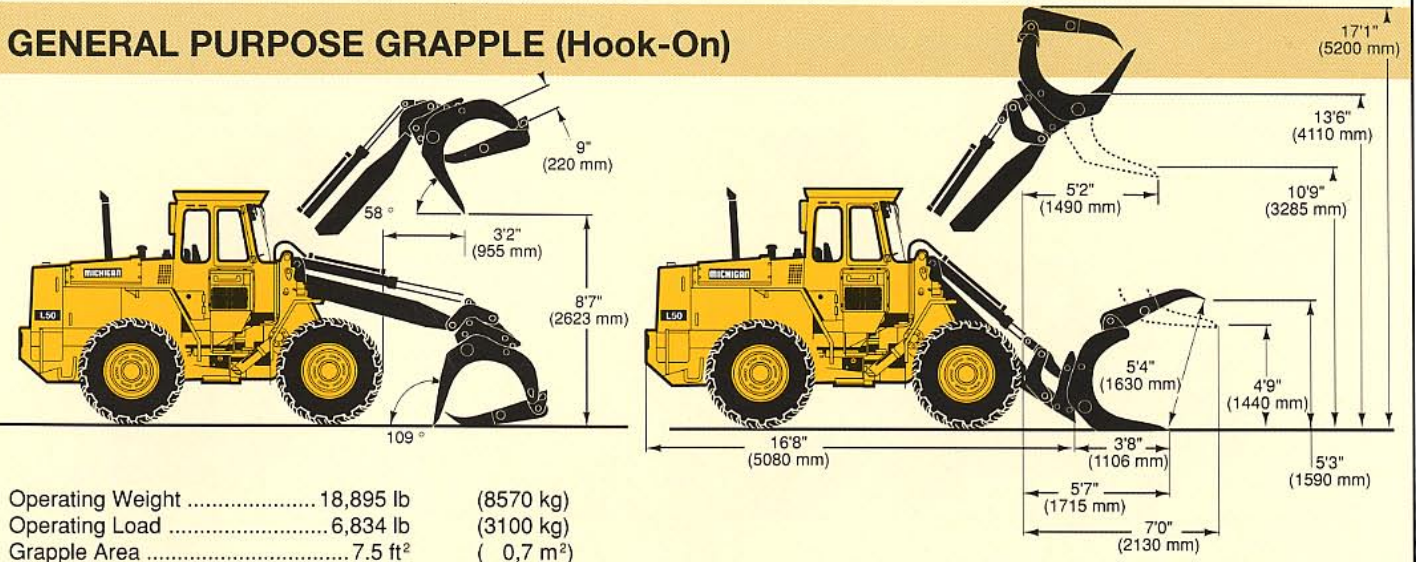
Other Attachments

- Asphalt Cutter
- Attachment Rib Kit (Adapt your existing equipment to the L50)
- Bale Clamp
- Broom
- Diagonal Snow Blade
- Material Handling Arm, Telescopic Manually, Pinned Positions
- Material Handling Arm with Hydraulic Folding, Telescopic Manually, Pinned Positions

Timber Grapples

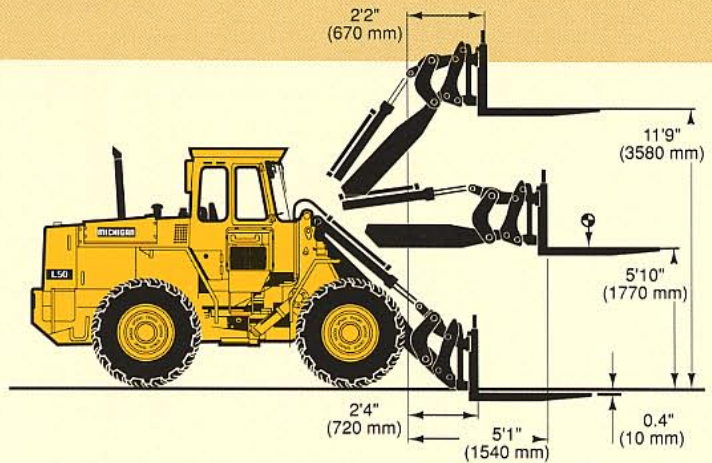
- Requires Hydraulic Control for 3rd Function
- General Purpose Sorting Unloading Heel Kickout for Use Only on the Sorting and Unloading Grapples, Requires Hydraulic Control for 4th Function

GENERAL PURPOSE GRAPPLE (Hook-On)



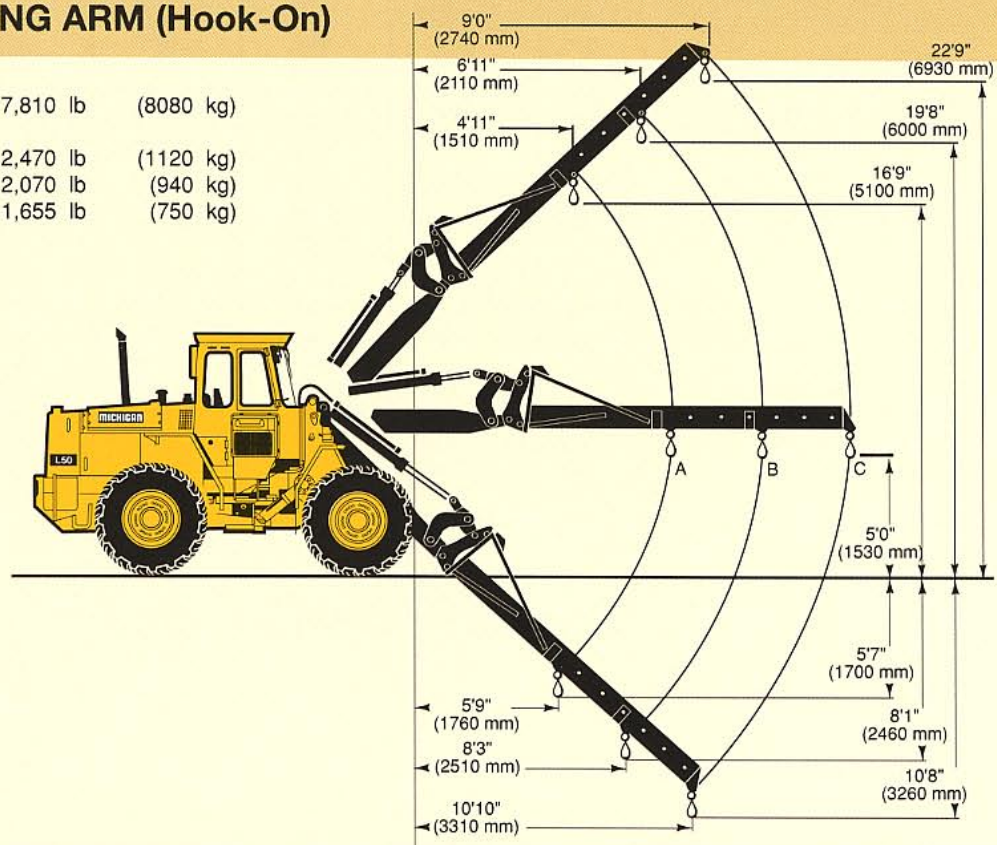
PALLET FORK (Hook-On)

Fork frame with tines		
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 ¹	17,480 lb	(7930 kg)
Safe working load according to SS 3462	6,615 lb	(3000 kg)



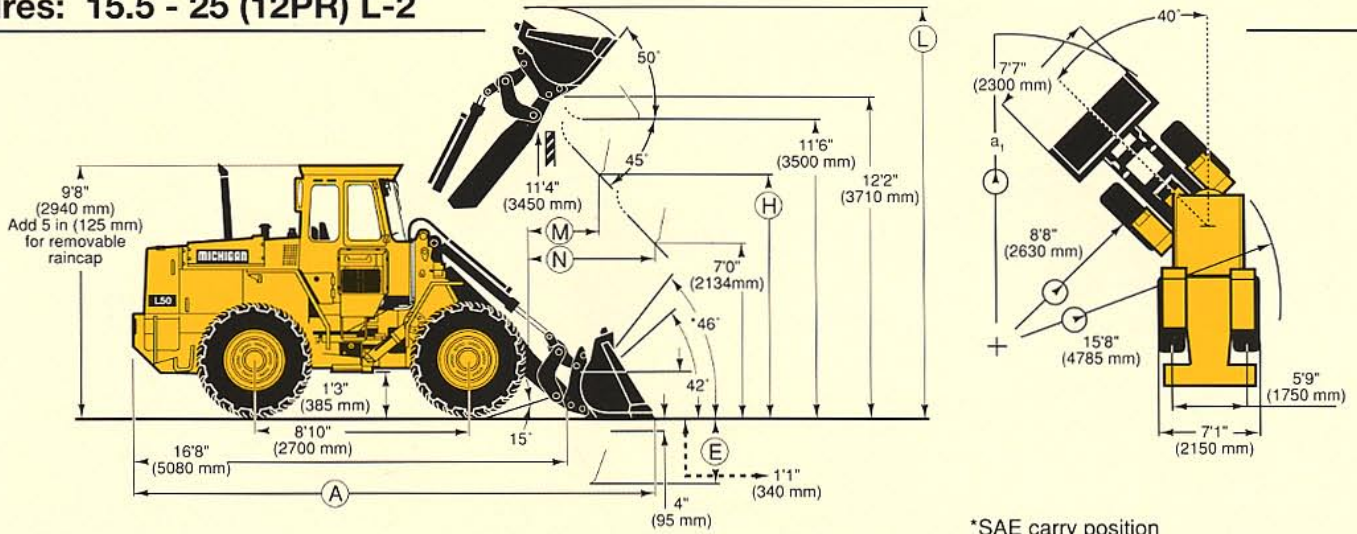
MATERIAL HANDLING ARM (Hook-On)

Operating weight	17,810 lb	(8080 kg)
Operating load position		
A	2,470 lb	(1120 kg)
B	2,070 lb	(940 kg)
C	1,655 lb	(750 kg)



OPERATIONAL DATA MICHIGAN L50

Tires: 15.5 - 25 (12PR) L-2



*SAE carry position

†Mounting/Bucket type		Pin-On	Hook-On	Pin-On	Hook-On	Pin-On	Hook-On
Volume, Heaped	yd ³	1.75	1.75	1.5	1.5	2.75	2.75
	m ³	1,35	1,35	1,15	1,15	2,1	2,1
Struck	yd ³	1.4	1.4	1.2	1.2	2.2	2.2
	m ³	1,1	1,1	0,95	0,95	1,7	2,2
Static tipping load, straight	lb	11,990	11,220	12,170	11,400	11,930	10,800
	kg	5440	5090	5520	5170	5410	4900
	at 35° turn	lb	10,690	9,810	10,870	10,120	10,630
at full turn	kg	4850	4450	4930	4590	4820	4350
	lb	10,290	9,460	10,470	9,740	10,250	9,240
	kg	4670	4320	4750	4420	4650	4200
Breakout force	lbf	15,380	13,960	16,790	15,200	12,070	11,150
	kN	68	62	75	68	54	50
Hydraulic lifting force at ground level	lbf	22,780	22,930	22,780	22,930	23,180	23,340
	kN	101	102	101	102	103	104
	at max. height	lb	7550	7170	7710	7550	7510
	kN	33,6	31,9	34,3	33,6	33,4	31,7
(A)	ft in	20'0"	20'3"	19'9"	20'0"	20'9"	21'0"
	mm	6090	6180	6025	6100	6330	6400
(E)	ft in	2'10"	3'1"	2'7"	2'10"	3'7"	3'10"
	mm	860	940	790	870	1090	1170
(H)	ft in	9'5"	9'2"	9'7"	9'5"	8'10"	8'8"
	mm	2860	2800	2910	2860	2700	2640
(L)	ft in	15'8"	15'9"	15'6"	15'7"	16'4"	16'5"
	mm	4780	4810	4720	4750	4970	5000
(M)	ft in	2'9"	2'11"	2'7"	2'9"	3'3"	3'5"
	mm	830	890	780	840	1000	1050
(N)	ft in	4'11"	5'0"	4'10"	4'11"	5'2"	5'3"
	mm	1500	1530	1470	1500	1580	1600
a ₁ Turning circle over bucket (bucket in carry position)	ft in	34'7"	34'9"	34'5"	34'7"	35'0"	35'1"
	mm	10 530	10 580	10 500	10 540	10 660	10 700
Weight distribution, front	lb	7790	8260	7540	8020	7790	8260
	kg	3530	3750	3420	3640	3530	3750
Weight distribution, rear	lb	10,070	9,900	10,160	9,980	10,070	9,900
	kg	4570	4490	4610	4530	4570	4490
Operating weight	lb	17,860	18,160	17,700	18,000	17,860	18,160
	kg	8100	8240	8030	8170	8100	8240

†Bolt-on Cutting Edge Increases Bucket Capacity By 0.09 yd³ (0.06 m³)

ALTERATION OF OPERATIONAL DATA

Tires:	15.5-25	15.5R25	22/65-25	*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)	+8.39 in (+213 mm)		
Ground clearance		+0.2 in (+5 mm)	-0.55 in (-14 mm)		
Tipping load at full turn	+990 lb (+450 kg)	+186 lb (+81 kg)	+486 lb (+221 kg)	+584 lb (+265 kg)	
Operating weight	+950 lb (+430 kg)	+332 lb (+15 kg)	+864 lb (+392 kg)	+353 lb (+160 kg)	

STANDARD EQUIPMENT

<p>AIR CLEANER, DRY TYPE, DUAL ELEMENT, EXHAUST ASPIRATED PRECLEANER ALTERNATOR, 24V, 60 AMP BATTERY DISCONNECT, LOCKABLE BOOM LEVER DETENTS ATTACHMENT BRACKET, HYDRAULIC ATTACHMENT BRACKET, SEPARATE LOCKING SYSTEM 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</p>	<p>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 Mixture Enrichment DIFFERENTIALS: Front & Rear Conventional DRAWBAR WITH PIN ENGINE COOLANT FILTER EXHAUST RAIN CAP (ELBOW TYPE) FENDERS, FRONT & REAR HYDRAULIC CONTROL LEVER SAFETY LATCH HYDRAULIC PRESSURE TEST PORTS, QUICK CONNECT INSTRUMENTS/GAUGES, Illuminated:</p>	<p>Brake System Pressure Gauge Engine Coolant Temperature Gauge Fuel Gauge Hourmeter Transmission/Converter Fluid Temperature Gauge Sight Gauges: Coolant Level Hydraulic Fluid Level 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 (2-Front, 2-Rear) MIRRORS, REARVIEW (2), EXTERIOR MUFFLER, SPARK ARRESTING NEUTRAL START FEATURE SIDE PANELS, ENGINE HOOD STEERING FRAME LOCK TIRES: 15.5-25 (12PR) L-2 (General) TOOL BOX TRANSMISSION: MODULATED WITH SINGLE LEVER CONTROL, AUTOMATIC POWER-SHIFT, AND OPERATOR</p>	<p>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 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 Engine Intake Manifold Pre-heater High Beam Driving Lights Parking Brake Applied Transmission Oil Pressure</p>
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OPTIONAL EQUIPMENT

<p>Air Conditioner, 19,400 Btu/h (5,7 kW) Alternator, Sealed Attachment Rib Kit (For adapting existing attachments on VME attachment bracket) Beacon, Amber Rotating Boom Kickout, Automatic, Adjustable Bucket Spillguard, Bolt-On Bucket Teeth, Bolt-On, (8) (Not for Use on Light Material Buckets) Cab Filters, Asbestos Protection</p>	<p>Cold Starting Aid, Engine Coolant Preheater (110V-11500W) Cutting Edge, 3 pc. Reversible, Bolt-On (Not for Use on High Tip Buckets) Dual Service Brake Pedals Engine Air Precleaner, Oil Bath Type Engine Fan, Suction Engine, High Altitude Version, Factory Engine, Low Emission Version, Factory Engine Oil Pressure Gauge Engine, Shutdown to Idle Kit</p>	<p>Extra Air Outlets Guards: Headlights, Front Muffler Taillights, Rear Windshield, Front Worklights, Rear Horn, Electric (Extra Loud) Hydraulic Control for 3rd Function Hydraulic Control for 3rd and 4th Functions Hydraulic Oil Cooler Hydraulic Single Acting Control Radiator, Corrosion Resistant Radio Mounting Panel (Includes 2 Speakers, Antenna and 12 Volt Converter)</p>	<p>ROPS/FOPS Canopy (Open Type) Secondary Steering Slow Moving Vehicle Emblem Speedometer/Tachometer Tire Options: 15.5-25 (12 PR) L-3 15.5R25 17R25 22/65-25 (12PR) L-2 Transmission Clutch Pressure Gauge Transmission, 8 Speed Voltmeter Working Lights, Front, Extra Working Lights, Rear, Extra</p>
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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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