



# Michigan L160 High-Lift



**ENGINE OUTPUT:**  
252 hp (185 kW) VOLVO  
DIRECT-INJECTED,  
TURBOCHARGED DIESEL

**OPERATING WEIGHT:**  
52,710 lb (23,9 t)

**GRAPPLES:** 24-42 ft<sup>2</sup>  
(2,25 - 3,9 m<sup>2</sup>)

**AUTOMATIC POWERSHIFT  
TRANSMISSION**

**VME MANUFACTURED,  
DESIGNED, ENGINEERED  
FRONT CARRIER LINKAGE**

**COMFORT/EFFICIENCY  
DESIGNED CAB**

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

**360° GRAPPLE ROTATION**

**CENTRAL LUBRICATION  
STANDARD EQUIPMENT**

**PILOT OPERATED  
"FINGERTIP" HYDRAULICS**

## MICHIGAN



## ENGINE

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

<b>Make</b>	<b>Volvo</b>	
<b>Model</b>	<b>TD102GB</b>	
Max. rating* at .....	2200 rpm	(36,7 rps)
SAE J1349 (ISO 1585) .....	264 hp	(194 kW)
Flywheel rating** at .....	2200 rpm	(36,7 rps)
SAE J1349 (ISO 1585) .....	252 hp	(185 kW)
DIN 70020/6271 .....	252 hp	(185 kW)
Max. torque at .....	1400 rpm	(23,3 rps)
SAE J1349 (ISO 1585) .....	710 lbf ft	(962 Nm)
DIN 70020/6271 .....	710 lbf ft	(962 Nm)
Number of cylinders .....	6	
Displacement, total .....	586 in <sup>3</sup>	(9,6 dm <sup>3</sup> ,l)
Bore .....	4.75 in	(120,65 mm)
Stroke .....	5.5 in	(140 mm)

### Air cleaners

1. Cyclone precleaner 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. 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 .....	1540/60 W/A	
Starter motor output .....	9 hp	(6,6 kW)



## SERVICE REFILL CAPACITIES

Crankcase, with filter .....	8.2 US gal	(31 dm <sup>3</sup> ,l)
Fuel tank .....	89.8 US gal	(340 dm <sup>3</sup> ,l)
Cooling system .....	18.5 US gal	(70 dm <sup>3</sup> ,l)
Transmission, total .....	12.4 US gal	(47 dm <sup>3</sup> ,l)
Front axle, total .....	11.9 US gal	(45 dm <sup>3</sup> ,l)
Rear axle, total .....	14.8 US gal	(56 dm <sup>3</sup> ,l)
Hydraulic system, total .....	84.5 US gal	(320 dm <sup>3</sup> ,l)
Hydraulic tank .....	60.8 US gal	(230 dm <sup>3</sup> ,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.

**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 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 .....

Transmission make, model .....

Speeds, forward/reverse

1 .....	4.5 mph	(7,3 km/h)
2 .....	8.4 mph	(13,5 km/h)
3 .....	16.6 mph	(26,7 km/h)
4 (forward only) .....	24.8 mph	(39,9 km/h)

Measured with tires .....

Front axle make .....

Rear axle make .....

Rear axle oscillation, total .....

..... 23.6 in (600 mm)



## BRAKES

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

**Service brakes:** Air-hydraulically operated 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 air reservoir in each circuit.

**Parking brake:** Wet multi-disc type in transmission case on output shaft. Spring applied, hydraulically released; actuated by a control to operator's left. 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 <sup>2</sup>	(810 cm <sup>2</sup> )
Rear wheel (ea.) .....	126 in <sup>2</sup>	(810 cm <sup>2</sup> )
Reservoirs, no. ....	3	
Volume, total .....	1830 in <sup>3</sup>	(30 dm <sup>3</sup> ,l)
Parking brake area, total .....	240 in <sup>2</sup>	(1547 cm <sup>2</sup> )



## STEERING

Articulated frame. Hydrostatic steering system with amplified hydraulics flow.

**Pump:** Vane type, mounted to a power take-off on the transmission.

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

Steering cylinders, no. ....	2	
Bore .....	4.3 in	(110 mm)
Stroke .....	16.7 in	(423 mm)
Relief pressure .....	2175 psi	(15 MPa)
Steer pump output .....	50 US gal/min	(190 dm <sup>3</sup> ,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)  
 Ventilation ..... 353 cfm (10,0 m<sup>3</sup>/min)



## HYDRAULICS

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

**Pump:** Pump 1: Twin vane pump (for operation of lift, tilt and grapple grip). Pump 2: Double gear pump (for operation of load leveling, rotation and pilot hydraulics).

**Valve:** Two pilot operated actuating valves.

Valve 1 serves: Lift, tilt and grip cylinders.

Valve 2 serves: Rotator and load leveling cylinder.

**Filters:** Two full-flow 10 micron return filters with magnetic core, located in hydraulic oil tank.

### Pump No. 1

Relief pressure ..... 2465 psi (17,0 MPa)  
 Pump output ..... 84.5 US gal/min (320 dm<sup>3</sup>/min)  
 at pressure ..... 1450 psi (10 MPa)  
 and engine speed ..... 2200 rpm (36,7 rps)

### Pump No. 2

Relief pressure ..... 2030 psi (14,0 MPa)  
 Pump output ..... 13.7 US gal/min (52 dm<sup>3</sup>/min)  
 at pressure ..... 1450 psi (10 MPa)  
 and engine speed ..... 2200 rpm (36,7 rps)

Lift cylinders, no. .... 2  
 Bore ..... 4.9 in (125 mm)  
 Rod dia. .... 3.5 in (90 mm)  
 Stroke ..... 81.5 in (2070 mm)

Tilt cylinders, no. .... 2  
 Bore ..... 5.5 in (140 mm)  
 Rod dia. .... 2.75 in (70 mm)  
 Stroke ..... 23.6 in (600 mm)

Grapple, load leveling  
 cylinders, no. .... 1  
 Bore ..... 3.9 in (100 mm)  
 Rod dia. .... 2 in (50 mm)  
 Stroke ..... 25.2 in (640 mm)

Grapple grip cylinders, no. .... 2  
 Bore ..... 4.9 in (125 mm)  
 Rod dia. .... 2.4 in (60 mm)  
 Stroke ..... 16.1 in (410 mm)

Lifting time (empty) ..... 8.0 s  
 Lowering time (empty) ..... 5.0 s  
 Forward tilt ..... 2.5 s  
 Backward tilt ..... 3.5 s  
 Grapple (close) ..... 2.2 s  
 Grapple (open) ..... 2.4 s

## ALTERNATE EQUIPMENT\*

Cross-beam  
 Cross-beam with 13.8 in (350 mm) Lowered Grapple Mount  
 Grapple Arms for Forest Waste, Sugar Cane and Bamboo  
 42 ft<sup>2</sup> (3,9 m<sup>2</sup>)  
 Guards For Piston Rods  
 Rotator

\* Standard equipped machine does not include grapple, cross-beam or rotator. For further information please contact your local dealer.

Tires:  
 26.5-25 (20PR) L-3  
 26.5-25 (20PR) L-4  
 26.5-25 (20PR) L-5  
 26.5R25 XRDNA★  
 26.5R25 RL2F★  
 30/65R29

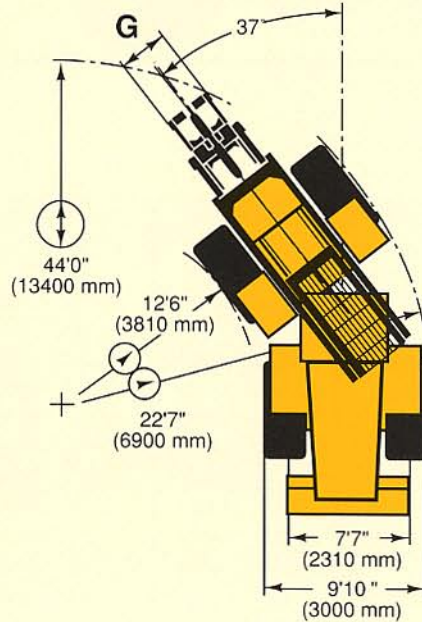
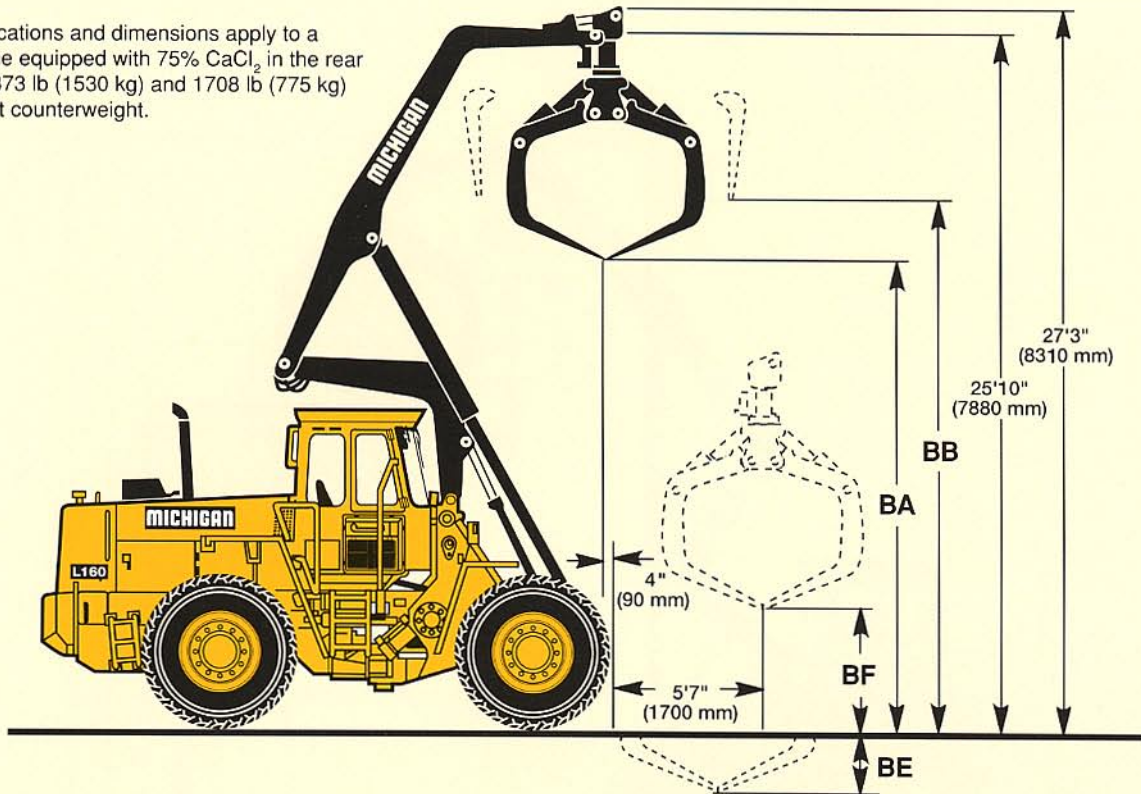


Grapple Arms with Hydraulic Log Clamps		Grapple Arms with Cinch Chain	
30 ft <sup>2</sup>	(2,8 m <sup>2</sup> )	42 ft <sup>2</sup>	(3,9 m <sup>2</sup> )
2.2-24 ft <sup>2</sup>	(0,2-2,25 m <sup>2</sup> )	35 ft <sup>2</sup>	(3,25 m <sup>2</sup> )
		30 ft <sup>2</sup>	(2,8 m <sup>2</sup> )
		24 ft <sup>2</sup>	(2,25 m <sup>2</sup> )

## DIMENSIONS - MICHIGAN L160 HIGH-LIFT

**Tires: 26.5R25XRA L-3★**

Specifications and dimensions apply to a machine equipped with 75% CaCl<sub>2</sub> in the rear tires 3373 lb (1530 kg) and 1708 lb (775 kg) High-lift counterweight.



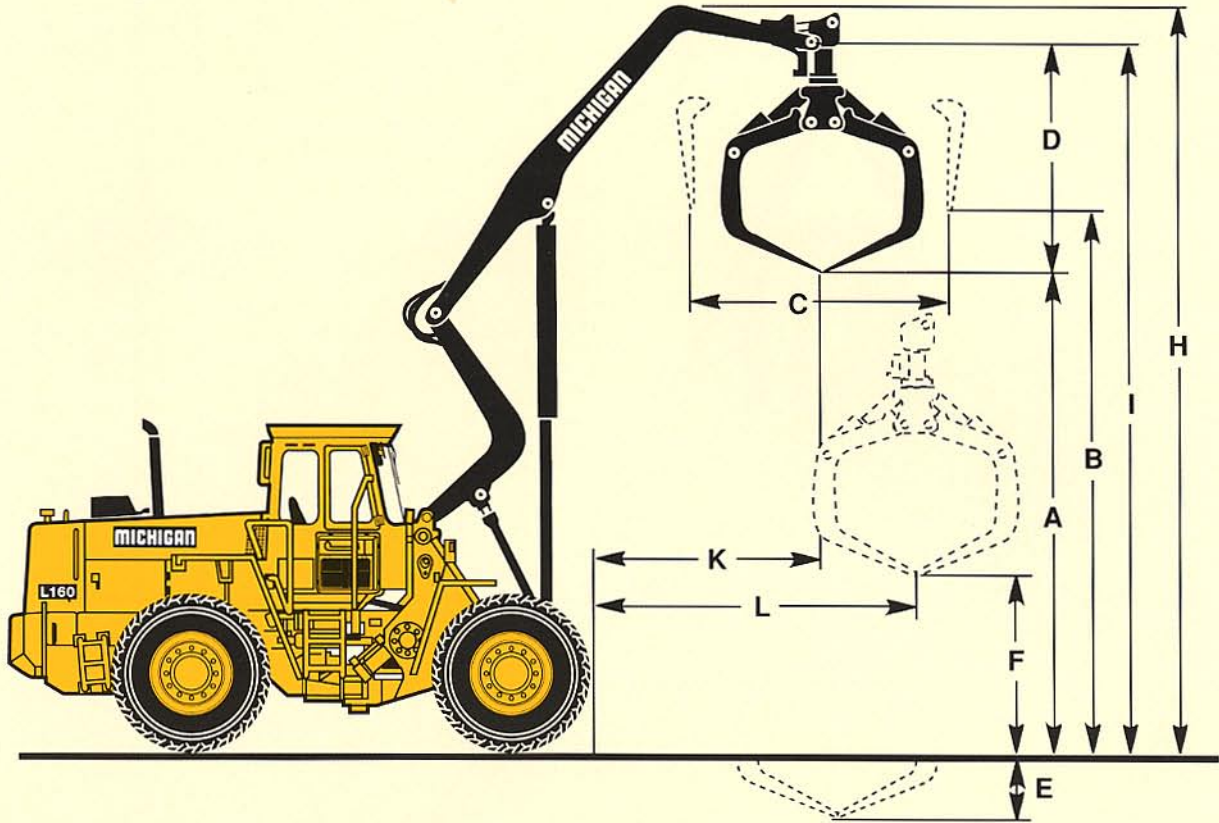
BA	ft in (mm)	15'5" (4700)	16'6" (5020)	17'5" (5320)	17'5" (5320)	17'3" (5250)
BB	ft in (mm)	18'8" (5680)	19'3" (5860)	19'9" (6020)	19'9" (6020)	19'6" (5950)
BE	ft in (mm)	4'3" (1290)	3'2" (960)	2'2" (660)	2'2" (660)	2'5" (730)
BF	ft in (mm)	2'4" (715)	3'5" (1050)	4'5" (1340)	4'5" (1340)	4'2" (1270)
G	ft in (mm)	35" (900)	35" (900)	35" (900)	45" (1150)	45" (1150)

SEE ALTERNATE EQUIPMENT FOR GRAPPLE SELECTION.

## DIMENSIONS - MICHIGAN L160 HIGH-LIFT

**Tires: 26.5R25XRA L-3★**

Specifications and dimensions apply to a machine equipped with 75% CaCl<sub>2</sub> in the rear tires 3373 lb (1530 kg) and 1708 lb (775 kg) High-lift counterweight.



Grip area	ft <sup>2</sup> (m <sup>2</sup> )	42 (3,9)	35 (3,25)	24 (2,25)	2.2-24 (0,2-2,25)	2.2-30 (0,2-2,8)
Log length	ft in (m)	6'7" (2)	9'10" (3)	14'9"-15'9" (4,5-4,8)	-50" (-15)	-33" (-10)
Density	lb/yd <sup>3</sup> (kg/m <sup>3</sup> )	950 (560)	950 (560)	930 (550)	840 (500)	840 (500)
Machine weight	lb (kg)	52,820 (23 960)	52,710 (23 910)	52,340 (23 740)	52,890 (23 990)	53,020 (24 050)
*Static tipping load						
straight	lb (kg)	19,620 (8900)	19,730 (8950)	20,060 (9100)	19,510 (8850)	19,400 (8800)
full turn	lb (kg)	17,660 (8010)	17,770 (8060)	18,140 (8230)	17,590 (7980)	17,420 (7900)
Operating load	lb (kg)	12,015 (5450)	12,125 (5500)	12,460 (5650)	11,900 (5400)	11,680 (5300)
A	ft in (mm)	15'5" (4700)	16'6" (5020)	17'5" (5320)	17'5" (5320)	17'3" (5250)
B	ft in (mm)	18'8" (5680)	19'3" (5860)	19'9" (6020)	19'9" (6020)	19'6" (5950)
C	ft in (mm)	13'5" (4100)	11'6" (3500)	10'0" (3050)	10'0" (3050)	11'4" (3450)
D	ft in (mm)	10'5" (3180)	9'5" (2860)	8'5" (2560)	8'5" (2560)	8'8" (2630)
E	ft in (mm)	4'10" (1480)	3'9" (1150)	2'9" (850)	2'9" (850)	3'0" (920)
F	ft in (mm)	5'0" (1530)	6'1" (1850)	7'0" (2150)	7'0" (2150)	6'10" (2080)
G	ft in (mm)	35" (900)	35" (900)	35" (900)	45" (1150)	45" (1150)

\*With grapple in position for max. reach.

SEE ALTERNATE EQUIPMENT FOR GRAPPLE SELECTION.

STANDARD EQUIPMENT			
<p>AIR CLEANER, DRY TYPE, DUAL ELEMENT, EXHAUST ASPIRATED PRECLEANER ALTERNATOR, 24V, 55 AMP AUTOMATIC LUBRICATION SYSTEM</p> <p>BATTERY DISCONNECT, LOCKABLE</p> <p>BRAKES, 4-WHEEL AIR OVER HYDRAULIC, DRY DISC, DUAL CIRCUIT</p> <p>BRAKE SYSTEM, SECONDARY</p> <p>CAB ACCESS STEPS &amp; HANDRAILS (SAE J185)</p> <p>CAB: ROPS (SAE J1040C) (ISO 3471)</p> <p>FOPS (SAE J231) (ISO 3449)</p> <p>Acoustical Lining</p> <p>Ash Tray, Cigar Lighter</p> <p>Door, Lockable (Left Side Access)</p> <p>Electrical System: 24V Pre-wired for Optional Accessories</p> <p>Environmental Control: Heater/Defroster/Pressurizer 39,600 Btu/h (11,6 kW) with Three-Speed Blower Fan, Filtered Air</p> <p>Floor Mat</p> <p>Hand Throttle</p> <p>Interior Light</p> <p>Interior Rearview Mirror</p> <p>Safety Glass, Tinted</p> <p>Seat Belt (SAE J386)</p>	<p>Seat, Suspension, 6-Way Adjustable, Heated</p> <p>Steering Wheel, Adjustable Tilt</p> <p>Storage Compartment</p> <p>Sun Visor</p> <p>Windshield Washer, Front &amp; Rear</p> <p>Windshield Wiper, Front, Intermittent</p> <p>Windshield Wiper, Rear</p> <p>COLD STARTING AIDS: Engine Intake Manifold Preheater</p> <p>Engine Fuel Mixture Enrichment</p> <p>COUNTERWEIGHT, HIGH-LIFT 1708 lb (775 kg)</p> <p>DIFFERENTIALS: Front, Air Operated Differential Lock Rear, Conventional</p> <p>DRAWBAR WITH PIN</p> <p>ENGINE COOLANT FILTER</p> <p>EXHAUST RAIN CAP (ELBOW TYPE)</p> <p>FENDERS, FRONT &amp; REAR</p> <p>HYDRAULIC CONTROL LEVER SAFETY LATCH</p> <p>HYDRAULIC OIL COOLER</p> <p>HYDRAULIC PRESSURE TEST PORTS, QUICK CONNECT</p> <p>INSTRUMENTS/GAUGES, ILLUMINATED: Brake System (Dual Indicator) Air Pressure Gauge Engine Coolant Temperature Gauge</p>	<p>Fuel Gauge</p> <p>Hourmeter</p> <p>Sight Gauges: Coolant Level Hydraulic Fluid Level Transmission/Converter Fluid Temperature Gauge</p> <p>ISOLATION MOUNTS: Cab, Engine, Transmission, Radiator</p> <p>LIFTING LUGS</p> <p>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)</p> <p>MIRRORS, REARVIEW (2), EXTERIOR</p> <p>MUFFLER, SPARK ARRESTING</p> <p>NEUTRAL START FEATURE</p> <p>PROTECTIVE GRILLES FOR FRONT &amp; REAR WINDOWS AS WELL AS ROOF</p> <p>SIDE PANELS, ENGINE HOOD</p> <p>STEERING FRAME LOCK</p> <p>TIRES: 26.5-25 (20PR) L-3</p> <p>TRANSMISSION: MODULATED, WITH SINGLE LEVER CONTROL,</p>	<p>AUTOMATIC POWER-SHIFT &amp; OPERATOR CONTROLLED DECLUTCH VALVE, MAIN HYDRAULIC, THREE (3) SPOOL, PILOT OPERATED</p> <p>VANDALISM LOCK, PROVISION FOR: Batteries, Engine Coolant, Engine Oil, Fuel, Hydraulic Fluid, Converter/Transmission Fluid</p> <p>WARNING ALARMS: Horn, Electric Reverse Alarm (SAE J994)</p> <p>WARNING &amp; MONITORING LIGHTS: Air Cleaner Restriction Alternator Malfunction Central Warning Lamp: Brake System Air 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</p>
OPTIONAL EQUIPMENT			
<p>Air Conditioner, 19,400 Btu/h (5,7 kW)</p> <p>Beacon, Amber Rotating</p> <p>Cold Starting Aid, Engine Coolant Preheater (110V-1500W)</p> <p>Dual Service Brake Pedals</p> <p>Engine, Air Precleaner</p> <p>Engine Fan, Suction</p>	<p>Engine, High Altitude Version, Factory</p> <p>Engine Shutdown to Idle Kit</p> <p>Guards: Muffler Worklights, Front Worklights, Rear</p> <p>Horn, Air</p> <p>Light, Attachment Flood (Halogen)</p>	<p>Radio Mounting Panel (Includes 2 Speakers and Antenna)</p> <p>ROPS/FOPS Canopy (Open Type)</p> <p>Secondary Steering</p> <p>Slow Moving Vehicle Emblem</p> <p>Speedometer/Tachometer</p>	<p>Tire Options: 26.5-25(20PR)L-4 26.5-25(20PR)L-5 26.5R25XRDNA★ 26.5R25RL2F★ 30/65R29 Worklight, Extra Front Worklight, Extra Rear</p>

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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