

# MICHIGAN

# L190



## **MICHIGAN L190— HIGH PRODUCTIVITY, HIGH CAPACITY**

*The Michigan L190 is built with Michigan's years of experience and state-of-the-art technology. With 216 kW (290 hp), optional boom lengths, and bucket capacities from 3,8m<sup>3</sup> (5.0 yd<sup>3</sup>) to 6,9m<sup>3</sup> (9.0 yd<sup>3</sup>), the L190 can be matched to any working environment. The standard boom provides a dump height of 3251mm (10' 8") with an operating weight of 27 071 kg (59,680 lb), and the long boom has a dump height of 3759mm (12' 4") with an operating weight of 28 735 kg (63,350 lb).*

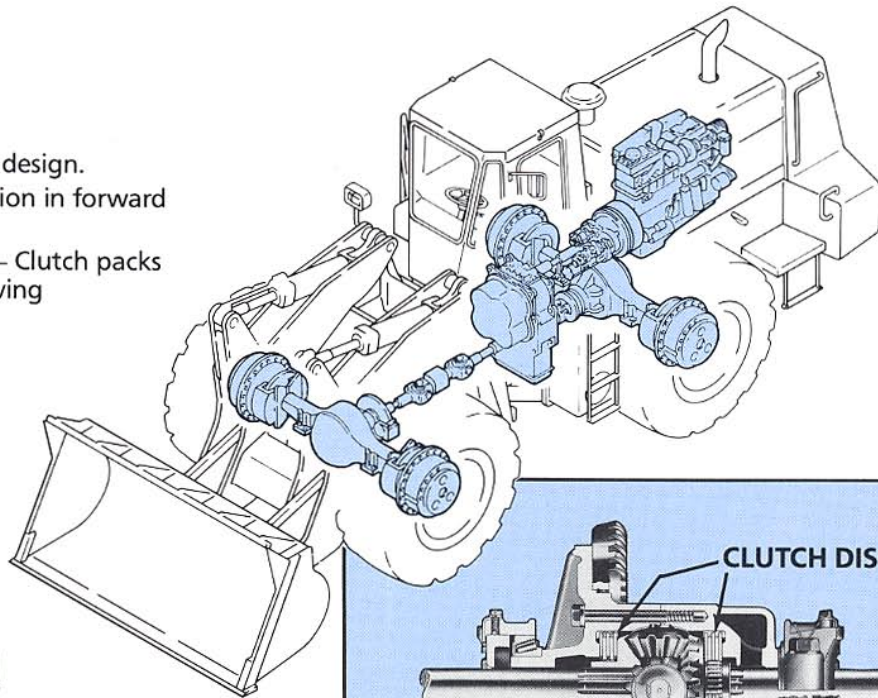
*Truck loading, aggregate handling, load and carry, excavation, and primary production feeding*

*in crushing and sorting operations are examples of applications where the L190 is an excellent choice. The hydraulic system is designed to use only the power required to move the load. This, coupled with the optimum balance between hydraulics, engine, and transmission results in excellent fuel consumption and power availability for traction. The operator controls the L190 from a state-of-the-art integral ROPS cab which is ergonomically designed to allow the operator to work at his highest efficiency.*

### **DRIVETRAIN**

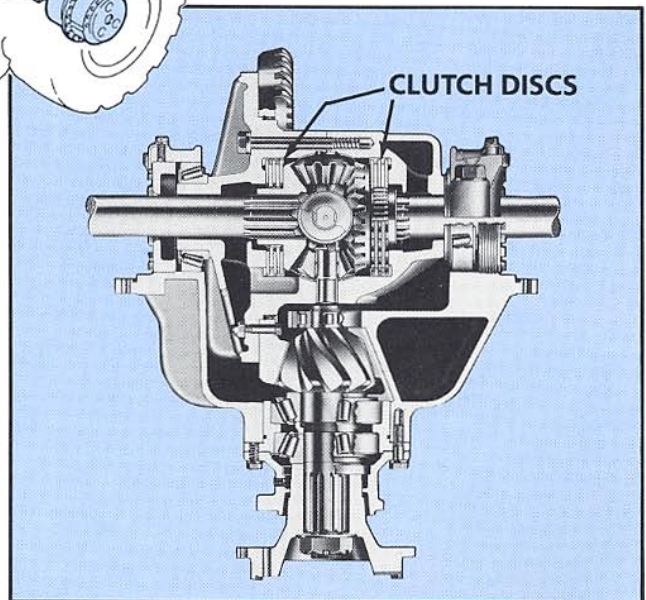
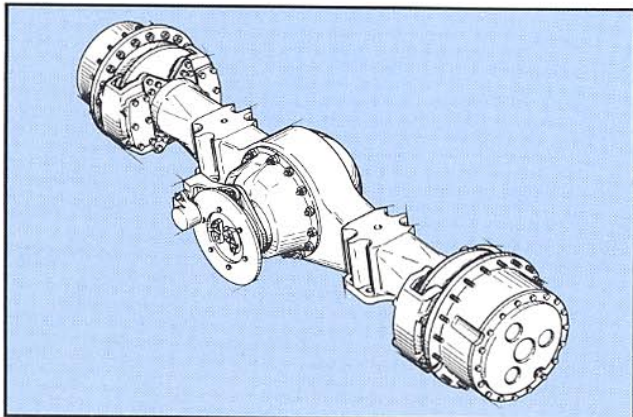
Transmission – Powershift.

- 4 Speeds forward – 4 reverse.
- Constant mesh – countershaft design.
- Full directional clutch modulation in forward and reverse for faster cycles.
- Reliable and easy to maintain – Clutch packs can be serviced without removing transmission from frame.



### **AXLES – STRONG AND PROVEN**

- Single piece cast housings for high strength – long life.
- Outboard mounted final drives with needle bearings, to minimize friction and power loss.



### **LIMITED SLIP DIFFERENTIALS**

Limited slip differentials are standard in both axles. Limited slip proportions power to the wheel with the best traction minimizing wheel spin and ensuring the best traction under adverse conditions.

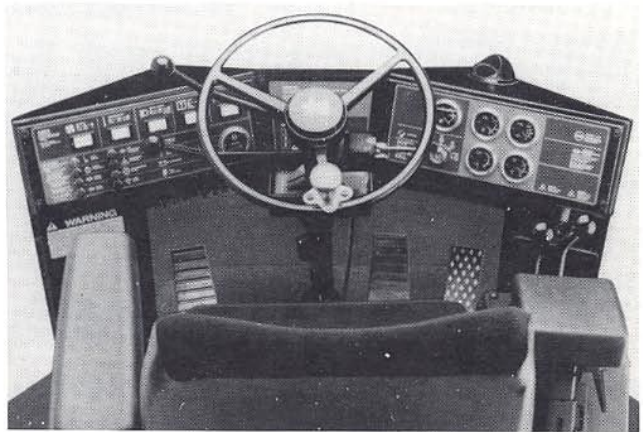
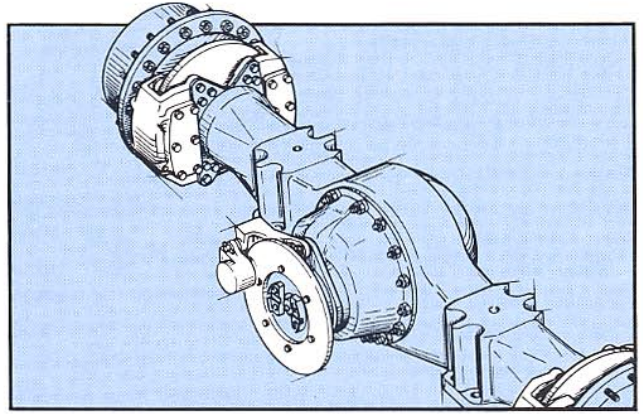
## **BRAKES**

- Service brakes are outboard mounted, all-hydraulic dry disc type. Secondary braking is provided by the dual circuit axle-by-axle system and dead-engine braking is provided by nitrogen charged accumulators.
- Parking brake is mounted on the front axle input shaft. It is spring applied, hydraulically released. An interlock with the service brakes prevents the machine being moved with parking brake applied, and engine running.

## **INSTRUMENTS & CONTROLS**

### **VISIBLE & ACCESSIBLE**

The instrument panel has all of the instruments and controls located directly in front of the operator, with the boom and bucket controls located within easy reach to the operator's right. Instruments on the right monitor fuel level, engine oil pressure, engine coolant temperature, transmission oil temperature and electrical system voltage. The ignition switch and parking brake release are located on the right side panel. On the left panel are switches for fan speed, temperature control, working lights, cold start and a test switch for secondary steering (optional). A lamp warning system monitors brake circuit pressure front and rear, parking brake applied and other machine functions.



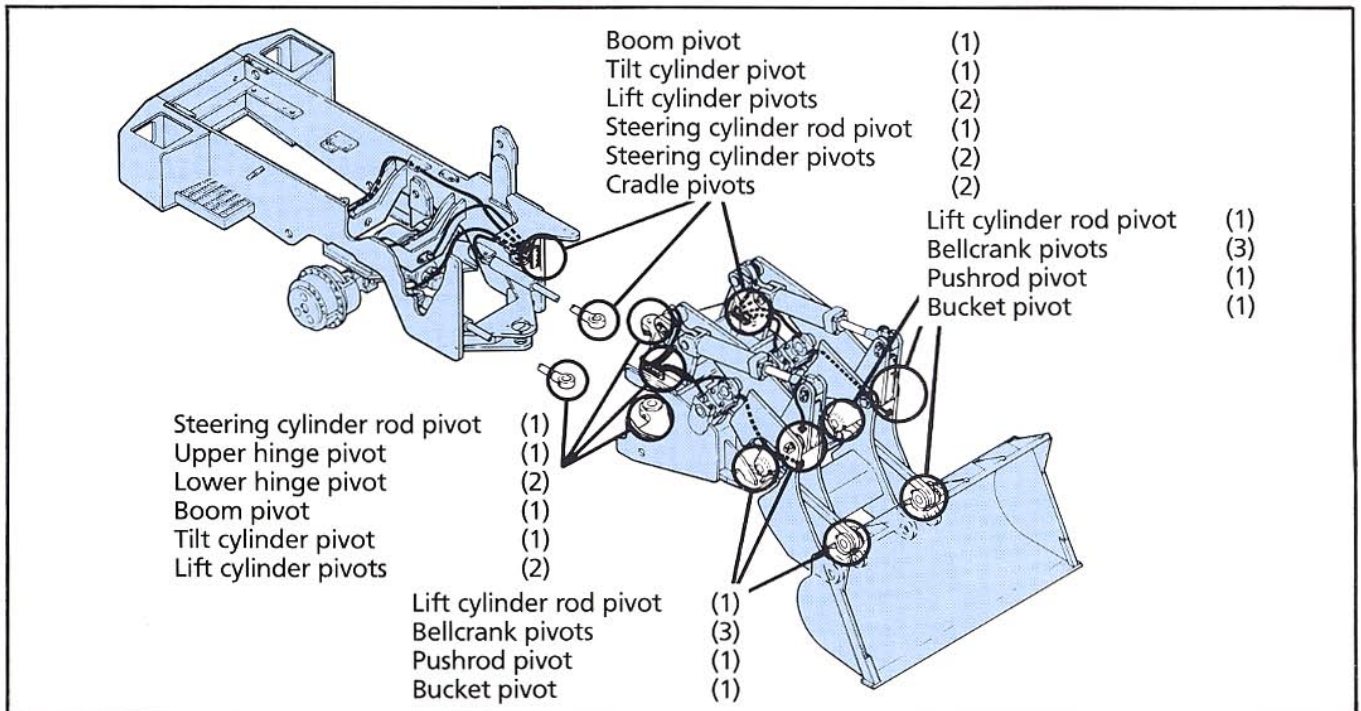
## **SERVICEABILITY**

- Grouping of lube points permits ground level lubrication at all lube points at the recommended 100 hour interval.
- Sight-gauges permit easy checking of oil levels.
- Quick-connect hydraulic test ports permit easy checking of machine functions.

## **CAB**

### **QUIET AND COMFORTABLE**

The integral ROPS/FOPS cab is ergonomically designed to provide high operator comfort and efficiency. A six-way adjustable suspension seat and air conditioner/heater/pressurizer are standard equipment for maximum operator comfort.





## ENGINE

Direct-injected, turbocharged and after-cooled 6 cylinder, inline, 4-cycle diesel.

| Make                 | Cummins             |                 |       |      |
|----------------------|---------------------|-----------------|-------|------|
| Model                | NTA 855C335         |                 |       |      |
| Max. rating* at      | rps                 | rpm             | 32    | 1900 |
| SAE J1349 (ISO 1585) | kW                  | hp              | 240   | 322  |
| Flywheel rating** at | rps                 | rpm             | 32    | 1900 |
| SAE J1349 (ISO 1585) | kW                  | hp              | 216   | 290  |
| DIN 70020/6271       | kW                  | hp              | 216   | 290  |
| Max. torque at       | rps                 | rpm             | 23    | 1400 |
| SAE J1349 (ISO 1585) | Nm                  | lbf ft          | 1364  | 1006 |
| DIN 70020/6271       | Nm                  | lbf ft          | 1335  | 985  |
| Number of cylinders  | 6                   |                 |       |      |
| Displacement, total  | dm <sup>3</sup> , l | in <sup>3</sup> | 14,01 | 855  |
| Bore                 | mm                  | in              | 140   | 5.50 |
| Stroke               | mm                  | in              | 152   | 6.00 |

### Air cleaner

1. Cyclone precleaner with automatic dust ejector.
2. Paper filter with indicator.
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 SYSTEM

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

|                         |     |      |
|-------------------------|-----|------|
| Voltage                 | V   | 24   |
| Alternator              | A   | 100  |
| Batteries (12 volt)     |     | 4    |
| Battery capacity, total | CCA | 1250 |
| Cranking capacity, ea.  | CCA | 625  |



## DRIVETRAIN

**Torque converter:** Clark, high-efficiency single-stage.

**Transmission:** Clark countershaft-type powershift transmission with directional clutch modulation.

**Axles:** Clark fully-floating axle shafts with planetary-type hub reductions. Single-piece cast axle housing. Fixed front axle and oscillating rear axle.

**Differential:** Clark limited slip differentials in front and rear axles.

**Hub reduction:** Clark planetary drive with low-friction roller bearings in each wheel hub.

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

|                              |                       |     |      |      |
|------------------------------|-----------------------|-----|------|------|
| Torque converter make, model | Clark, C-5602-202     |     |      |      |
| Torque multiplication        | 3.05:1                |     |      |      |
| Transmission make, model     | Clark, 4425-200       |     |      |      |
| Speeds, forward/reverse      |                       |     |      |      |
| 1                            | km/h                  | mph | 7,6  | 4.7  |
| 2                            | km/h                  | mph | 12,1 | 7.5  |
| 3                            | km/h                  | mph | 22,5 | 14.0 |
| 4                            | km/h                  | mph | 35,9 | 22.3 |
| Measured with tires          | 29.5-25<br>(22PR) L-3 |     |      |      |
| Front axle make, model       | Clark, 19D-2748       |     |      |      |
| Rear axle make, model        | Clark, 19D-2748       |     |      |      |
| Rear axle oscillation, total | deg                   |     | 22   |      |
|                              | mm                    | in  | 457  | 18   |



## BRAKE SYSTEM

(SAE J1152) (ISO 3450)

**Service brakes:** Full hydraulic system. Outboard mounted dry disc brakes on each wheel.

Application of left pedal switches transmission from forward to neutral.

**Secondary:** Dual circuit axle-by-axle system. Actuated by service brake pedal. Audible and visual low pressure alarm. Dead engine braking capability provided by two nitrogen-charged accumulators.

**Parking brake:** Dry disc type mounted on front axle input shaft. Spring applied, hydraulically released; actuated by dash-mounted hand valve.

Transmission interlock applies service brakes if shifted into forward or reverse to prevent moving machine when parking brake is applied.

**Pump:** Piston pump, pressure compensated.

**Filtration:** Full flow, 10 micron filter.

|                          |     |     |       |       |
|--------------------------|-----|-----|-------|-------|
| Pressure setting         | MPa | psi | 20,7  | 3000  |
| Service brake, disc dia. | mm  | in  | 473,7 | 18.65 |
| thickness                | mm  | in  | 15,9  | .625  |
| Parking brake, disc dia. | mm  | in  | 457   | 18    |
| thickness                | mm  | in  | 12,7  | .5    |



## STEERING SYSTEM

Articulated frame. Fully hydraulic steering system with speed sensor hydraulics.

**Pump:** Tandem gear-type, mounted on the torque converter.

**Supply system:** The system is served by a large pump section and a smaller secondary main/steer pump section which is rpm and pressure sensitive and feeds either the main hydraulic or the steering system, or dumps to tank.

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

|                            |                      |            |       |      |
|----------------------------|----------------------|------------|-------|------|
| Steering cylinders, number |                      |            | 2     |      |
| Bore                       | mm                   | in         | 114   | 4.5  |
| Stroke                     | mm                   | in         | 462   | 18.2 |
| Relief pressure            | MPa                  | psi        | 17,2  | 2500 |
| Primary pump               |                      |            |       |      |
| output                     | dm <sup>3</sup> /min | US gal/min | 166,5 | 44   |
| at pressure                | MPa                  | psi        | 69,0  | 1000 |
| and engine speed           | rps                  | rpm        | 14    | 850  |
| Secondary pump             |                      |            |       |      |
| output                     | dm <sup>3</sup> /min | US gal/min | 148   | 39   |
| at pressure                | MPa                  | psi        | 69,0  | 1000 |
| and engine speed           | rps                  | rpm        | 26    | 1580 |



## HYDRAULIC SYSTEM

Closed and pressurized load-sensing system with a sturdy 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.

**Pump:** Single gear-type, mounted on the torque converter.

**Supply system:** Main pump continuously serves main hydraulic system. Second section of steer pump can feed main hydraulic system when required.

**Valve:** Split-pool valve with built-in pressure relief valve. Actuated 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 two elements), located in hydraulic oil tank.

|                          |       |            |       |      |
|--------------------------|-------|------------|-------|------|
| Relief pressure          | MPa   | psi        | 19,0  | 2750 |
| Output                   | l/min | US gal/min | 135   | 35.5 |
| at                       | MPa   | psi        | 6,9   | 1000 |
| and engine speed         | rps   | rpm        | 26    | 1580 |
| Lift cylinders, no.      |       |            | 2     |      |
| Bore                     | mm    | in         | 177,8 | 7.0  |
| Stroke                   | mm    | in         | 1084  | 42.7 |
| Tilt cylinders, no.      |       |            | 2     |      |
| Bore                     | mm    | in         | 152,4 | 6.0  |
| Stroke                   | mm    | in         | 704,6 | 27.7 |
| Raising time (with load) | s     |            | 7.0   |      |
| Dumping time (with load) | s     |            | 3.0   |      |
| Lowering time (empty)    | s     |            | 5.0   |      |
| Total cycle time         | s     |            | 15.0  |      |



## CAB

Integral ROPS/FOPS cab (SAE J1040, ISO 3471) with two lockable doors. Sound-insulating lining. Sliding self-locking windows. Tinted safety glass.

**Heater and defroster:** Heater provides filtered (10 microns) fresh air and has a three-speed fan and a defroster for the front and side windows. Air conditioning is standard.

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

|                          |       |       |      |        |
|--------------------------|-------|-------|------|--------|
| Noise level in cab, max. | dB(A) |       | 83   |        |
| Heating capacity         | kW    | BTU/h | 13,2 | 45,000 |
| Air conditioning         | kW    | BTU/h | 6,3  | 21,500 |



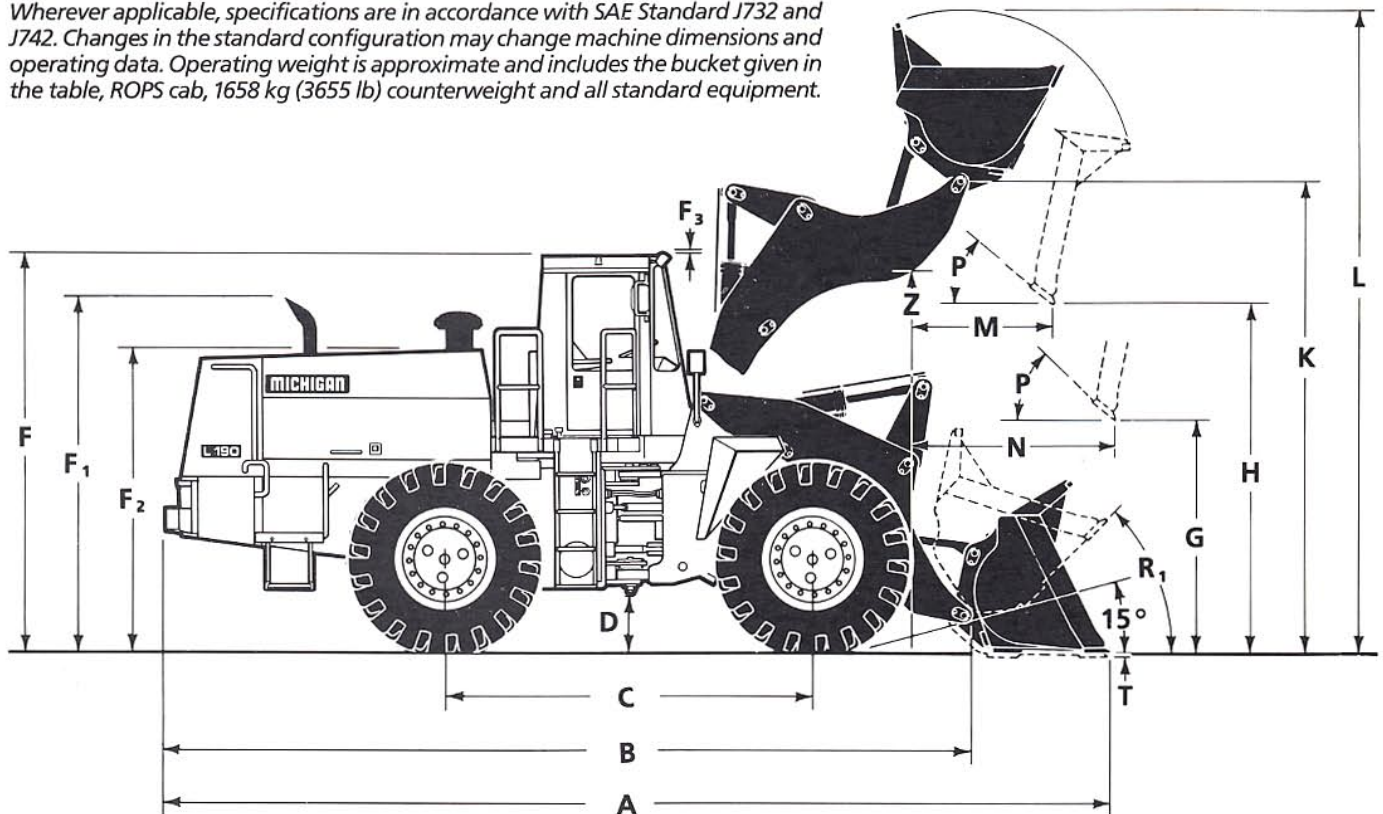
## SERVICE REFILL CAPACITIES

|                         |                     |        |       |      |
|-------------------------|---------------------|--------|-------|------|
| Crankcase               | dm <sup>3</sup> , l | US gal | 34,1  | 9.0  |
| Fuel tank (usable)      | dm <sup>3</sup> , l | US gal | 409   | 108  |
| Fuel tank (total)       | dm <sup>3</sup> , l | US gal | 436   | 115  |
| Cooling system          | dm <sup>3</sup> , l | US gal | 75,7  | 20   |
| Transmission, total     | dm <sup>3</sup> , l | US gal | 47,3  | 12.5 |
| Front wheel hubs, ea.   | dm <sup>3</sup> , l | US gal | 4,7   | 1.25 |
| Rear wheel hubs, ea.    | dm <sup>3</sup> , l | US gal | 4,7   | 1.25 |
| Front differential      | dm <sup>3</sup> , l | US gal | 34,1  | 9.0  |
| Rear differential       | dm <sup>3</sup> , l | US gal | 34,1  | 9.0  |
| Midmount bearing        | dm <sup>3</sup> , l | US gal | 1,9   | 0.5  |
| Hydraulic system, total | dm <sup>3</sup> , l | US gal | 322   | 85   |
| Hydraulic tank          | dm <sup>3</sup> , l | US gal | 238,4 | 63   |

## DIMENSIONS – MICHIGAN L190 (Standard Boom)

Tires: 29.5-25 (22PR) L-3

Wherever applicable, specifications are in accordance with SAE Standard J732 and J742. Changes in the standard configuration may change machine dimensions and operating data. Operating weight is approximate and includes the bucket given in the table, ROPS cab, 1658 kg (3655 lb) counterweight and all standard equipment.



### MACHINE DIMENSIONS THAT DO NOT CHANGE REGARDLESS OF CONFIGURATION

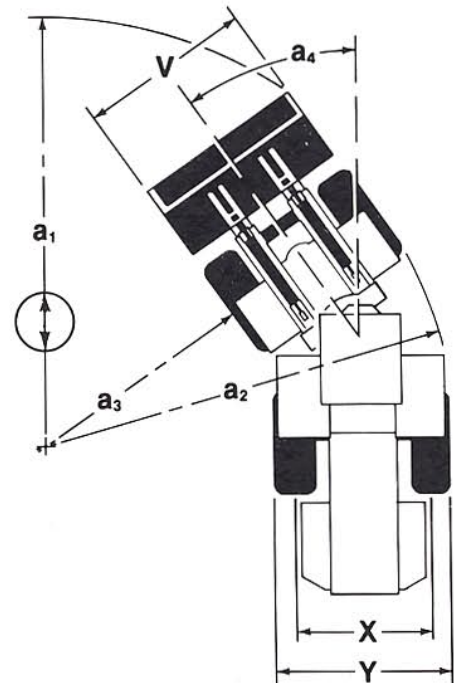
|                    |     |       |                 |        |
|--------------------|-----|-------|-----------------|--------|
| C                  | mm  | ft in | 3505            | 11' 6" |
| F <sub>3</sub>     | mm  | ft in | 64              | 2.5"   |
| G                  | mm  | ft in | 2134            | 7' 0"  |
| P                  | deg |       | 45°             |        |
| X                  | mm  | ft in | 2260            | 7' 5"  |
| a <sub>4</sub>     | deg |       | 35°             |        |
| Max. grading angle | deg |       | 46° (Std. Boom) |        |

### BUCKETS

|                    |                    |                      |
|--------------------|--------------------|----------------------|
| Straight edge rock | 4,0 m <sup>3</sup> | 5.25 yd <sup>3</sup> |
| Spade-nose rock    | 4,0 m <sup>3</sup> | 5.25 yd <sup>3</sup> |
| General purpose    | 4,4 m <sup>3</sup> | 5.75 yd <sup>3</sup> |
| Material handling  | 4,8 m <sup>3</sup> | 6.25 yd <sup>3</sup> |
| Light materials    | 6,9 m <sup>3</sup> | 9.0 yd <sup>3</sup>  |

### BUCKET TEETH AND BOLT ON CUTTING EDGE

|                      |        |          |
|----------------------|--------|----------|
| Model 27R (8)        | 136 kg | 300 lbs. |
| Model 27ARL (8)      | 136 kg | 300 lbs. |
| Bolt on cutting edge | 240 kg | 530 lbs. |



- Deduct 76 mm (3 in) for bolt on cutting edge
- ⊖ Deduct 178 mm (7 in) for bucket teeth
- Add 51 mm (2 in) for bolt on cutting edge
- ⊕ Add 119 mm (4.7 in) for bucket teeth
- ⊗ Add 32 mm (1.25 in) for bolt on cutting edge

## STANDARD BOOM

| MACHINE INFORMATION                                                       |                    | BUCKET TYPE           |                    |                    |                      |                    |
|---------------------------------------------------------------------------|--------------------|-----------------------|--------------------|--------------------|----------------------|--------------------|
|                                                                           |                    | Straight<br>Edge Rock | Spade-Nose<br>Rock | General<br>Purpose | Material<br>Handling | Light<br>Materials |
| Volume heaped                                                             | m <sup>3</sup>     | 4,0                   | 4,0                | 4,4                | 4,8                  | 6,9                |
|                                                                           | yd <sup>3</sup>    | 5.25                  | 5.25               | 5.75               | 6.25                 | 9.0                |
| struck                                                                    | m <sup>3</sup>     | 3,5                   | 3,3                | 3,7                | 4,0                  | 5,8                |
|                                                                           | yd <sup>3</sup>    | 4.54                  | 4.3                | 4.86               | 5.21                 | 7.6                |
| Material weight                                                           | kg/m <sup>3</sup>  | 1790                  | 1790               | 1624               | 1488                 | 1035               |
|                                                                           | lb/yd <sup>3</sup> | 3000                  | 3000               | 2740               | 2520                 | 1750               |
| Bucket weight                                                             | kg                 | 2041                  | 2268               | 2087               | 2177                 | 2449               |
|                                                                           | lb                 | 4500                  | 5000               | 4600               | 4800                 | 5400               |
| Operating capacity                                                        | kg                 | 7144                  | 7144               | 7144               | 7144                 | 7144               |
|                                                                           | lb                 | 15,750                | 15,750             | 15,750             | 15,750               | 15,750             |
| Static tipping load, straight                                             | kg                 | 19 545                | 19 260             | 19 169             | 18 711               | 18 570             |
|                                                                           | lb                 | 43,090                | 42,460             | 42,260             | 41,250               | 40,940             |
| Full Turn                                                                 | kg                 | 17 532                | 17 259             | 17 200             | 16 788               | 16 665             |
|                                                                           | lb                 | 38,650                | 38,050             | 37,920             | 37,010               | 36,740             |
| Breakout force                                                            | kN                 | 275,8                 | 226,9              | 260,5              | 238,4                | 216,4              |
|                                                                           | lbf                | 62,000                | 51,000             | 58,550             | 53,590               | 48,640             |
| A                                                                         | mm                 | 9042                  | 9322               | 9119               | 9246                 | 9677               |
|                                                                           | ft in              | 29'8"                 | 30'7"              | 29'11"             | 30'4"                | 31'9"              |
| B                                                                         | mm                 | 7569                  | 7569               | 7569               | 7569                 | 7569               |
|                                                                           | ft in              | 24'10"                | 24'10"             | 24'10"             | 24'10"               | 24'10"             |
| D                                                                         | mm                 | 584                   | 584                | 584                | 584                  | 584                |
|                                                                           | ft in              | 1'11"                 | 1'11"              | 1'11"              | 1'11"                | 1'11"              |
| F                                                                         | mm                 | 3759                  | 3759               | 3759               | 3759                 | 3759               |
|                                                                           | ft in              | 12'4"                 | 12'4"              | 12'4"              | 12'4"                | 12'4"              |
| F <sub>1</sub>                                                            | mm                 | 3416                  | 3416               | 3416               | 3416                 | 3416               |
|                                                                           | ft in              | 11'2.5"               | 11'2.5"            | 11'2.5"            | 11'2.5"              | 11'2.5"            |
| F <sub>2</sub>                                                            | mm                 | 2972                  | 2972               | 2972               | 2972                 | 2972               |
|                                                                           | ft in              | 9'9"                  | 9'9"               | 9'9"               | 9'9"                 | 9'9"               |
| H                                                                         | mm                 | 3251 ○                | 3048 ○             | 3200 ○             | 3099 ○               | 2997               |
|                                                                           | ft in              | 10'8" ⊖               | 10'0" ⊖            | 10'6" ⊖            | 10'2" ⊖              | 9'10"              |
| K                                                                         | mm                 | 4458                  | 4458               | 4458               | 4458                 | 4458               |
|                                                                           | ft in              | 14'7.5"               | 14'7.5"            | 14'7.5"            | 14'7.5"              | 14'7.5"            |
| L                                                                         | mm                 | 5918                  | 5944               | 5918               | 5918                 | 6070               |
|                                                                           | ft in              | 19'5"                 | 19'6"              | 19'5"              | 19'5"                | 19'11"             |
| M                                                                         | mm                 | 1348 □                | 1549 □             | 1397 □             | 1499 □               | 1600               |
|                                                                           | ft in              | 4'5" ⊕                | 5'1" ⊕             | 4'7" ⊕             | 4'11" ⊕              | 5'3"               |
| N                                                                         | mm                 | 1880                  | 2083               | 1930               | 2032                 | 2134               |
|                                                                           | ft in              | 6'2"                  | 6'10"              | 6'4"               | 6'8"                 | 7'0"               |
| R <sub>1</sub>                                                            | deg                | 45                    | 45                 | 45                 | 45                   | 45                 |
| T                                                                         | mm                 | 101,6 ☒               | 101,6 ☒            | 101,6 ☒            | 76,0 ☒               | 76,0               |
|                                                                           | ft in              | 4"                    | 4"                 | 4"                 | 3"                   | 3"                 |
| V                                                                         | mm                 | 3302                  | 3302               | 3302               | 3302                 | 3924               |
|                                                                           | ft in              | 10'10"                | 10'10"             | 10'10"             | 10'10"               | 12'10.5"           |
| Y                                                                         | mm                 | 3124                  | 3124               | 3124               | 3124                 | 3124               |
|                                                                           | ft in              | 10'3"                 | 10'3"              | 10'3"              | 10'3"                | 10'3"              |
| Z                                                                         | mm                 | 3581                  | 3581               | 3581               | 3581                 | 3581               |
|                                                                           | ft in              | 11'9"                 | 11'9"              | 11'9"              | 11'9"                | 11'9"              |
| a <sub>1</sub> Turning circle (over bucket)<br>(bucket in carry position) | mm                 | 15 316                | 15 316             | 15 316             | 15 316               | 15 570             |
|                                                                           | ft in              | 50'3"                 | 50'3"              | 50'3"              | 50'3"                | 51'1"              |
| Operating weight                                                          | kg                 | 27 071                | 27 298             | 27 116             | 27 207               | 27 479             |
|                                                                           | lb                 | 59,680                | 60,180             | 59,780             | 59,980               | 60,580             |

## STANDARD BOOM

| SUPPLEMENTAL OPERATING DATA             |       | Change in operating weight |        | Change in static tipping load straight |        | Change in static tipping load at full turn |        |
|-----------------------------------------|-------|----------------------------|--------|----------------------------------------|--------|--------------------------------------------|--------|
| Bucket Teeth (27R)                      | kg lb | + 136                      | + 300  | - 154                                  | - 340  | - 136                                      | - 300  |
| Bucket Teeth (27ARL)                    | kg lb | + 136                      | + 300  | - 154                                  | - 340  | - 136                                      | - 300  |
| Bucket Teeth (27TFP)                    | kg lb | + 136                      | + 300  | - 154                                  | - 340  | - 136                                      | - 300  |
| Bolt on Cutting Edge                    | kg lb | + 240                      | + 530  | - 218                                  | - 480  | - 195                                      | - 430  |
| Counterweight                           | kg lb | + 907                      | + 2000 | + 1914                                 | + 4220 | + 1681                                     | + 3705 |
| ROPS, 4 Post Open (in lieu of ROPS Cab) | kg lb | - 295                      | - 650  | - 259                                  | - 570  | - 227                                      | - 500  |
| Std. ROPS Cab Removal                   | kg lb | - 748                      | - 1650 | - 699                                  | - 1540 | - 617                                      | - 1360 |
| Fenders, Front                          | kg lb | + 113                      | + 250  | 0                                      | 0      | 0                                          | 0      |
| 3rd Hydraulic Control                   | kg lb | + 52                       | + 115  | 0                                      | 0      | 0                                          | 0      |
| Secondary Steering                      | kg lb | + 45                       | + 100  | + 77                                   | + 170  | + 68                                       | + 150  |
| Air Conditioning Removal                | kg lb | - 45                       | - 100  | - 68                                   | - 150  | - 61                                       | - 135  |
| Alternative tires (Set of four):        |       |                            |        |                                        |        |                                            |        |
| 26.5-25 (20PR) L-2                      | kg lb | - 839                      | - 1850 | - 581                                  | - 1280 | - 522                                      | - 1150 |
| 26.5-25 (20PR) L-3                      | kg lb | - 440                      | - 970  | - 304                                  | - 670  | - 272                                      | - 600  |
| 26.5-25 (20PR) L-4                      | kg lb | + 36                       | + 80   | + 27                                   | + 60   | + 23                                       | + 50   |
| 26.5-25 (20PR) L-5                      | kg lb | + 327                      | + 720  | + 227                                  | + 500  | + 204                                      | + 450  |
| 26.5-25 (26PR) L-3                      | kg lb | - 440                      | - 970  | - 304                                  | - 670  | - 272                                      | - 600  |
| 26.5R25 XRA*                            | kg lb | - 658                      | - 1450 | - 458                                  | - 1010 | - 413                                      | - 910  |
| 26.5R25 XRDNA*                          | kg lb | - 536                      | - 1180 | - 372                                  | - 820  | - 336                                      | - 740  |
| 26.5R25 XRD1A*                          | kg lb | - 186                      | - 410  | - 127                                  | - 280  | - 114                                      | - 250  |
| 26.5R25 RL-2F* L-2                      | kg lb | - 631                      | - 1390 | - 436                                  | - 960  | - 390                                      | - 860  |
| 29.5-25 (16PR) L-3                      | kg lb | - 73                       | - 160  | - 50                                   | - 110  | - 45                                       | - 100  |
| 29.5-25 (22PR) L-2                      | kg lb | - 368                      | - 810  | - 254                                  | - 560  | - 227                                      | - 500  |
| 29.5-25 (22PR) L-3 (Std.)               | kg lb | 0                          | 0      | 0                                      | 0      | 0                                          | 0      |
| 29.5-25 (22PR) L-4                      | kg lb | + 735                      | + 1620 | + 508                                  | + 420  | + 459                                      | + 1010 |
| 29.5-25 (28PR) L-4                      | kg lb | + 885                      | + 1950 | + 613                                  | + 1350 | + 554                                      | + 1220 |
| 29.5R25 XRA*                            | kg lb | - 50                       | - 110  | - 36                                   | - 80   | - 32                                       | - 70   |
| 29.5R25 RL-2F* L-2                      | kg lb | - 50                       | - 110  | - 36                                   | - 80   | - 32                                       | - 70   |

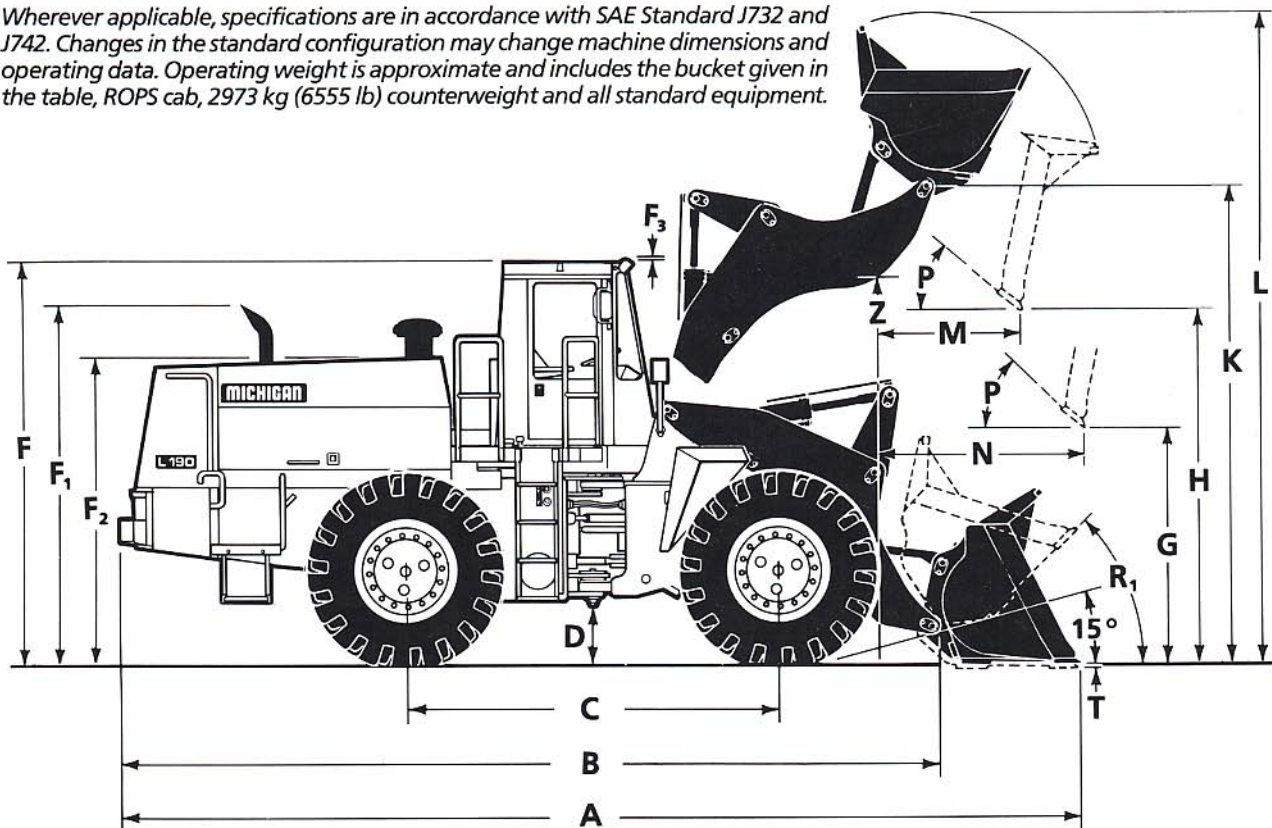
## DIMENSIONS AFFECTED BY TIRE SIZE

| MACHINE DIMENSIONS |          | 26.5-25 (L-2, L-3) | 26.5-25 (L-4) | 26.5-25 (L-5) | 29.5-25 (L-2, L-3) | 29.5-25 (L-4) |
|--------------------|----------|--------------------|---------------|---------------|--------------------|---------------|
| D                  | mm ft in | - 51 - 2"          | - 25 - 1"     | - 25 - 1"     | 0                  | + 25 + 1"     |
| F                  | mm ft in | - 51 - 2"          | - 25 - 1"     | - 25 - 1"     | 0                  | + 25 + 1"     |
| F <sub>1</sub>     | mm ft in | - 51 - 2"          | - 25 - 1"     | - 25 - 1"     | 0                  | + 25 + 1"     |
| F <sub>2</sub>     | mm ft in | - 51 - 2"          | - 25 - 1"     | - 25 - 1"     | 0                  | + 25 + 1"     |
| H                  | mm ft in | - 51 - 2"          | - 25 - 1"     | - 25 - 1"     | 0                  | + 25 + 1"     |
| K                  | mm ft in | - 51 - 2"          | - 25 - 1"     | - 25 - 1"     | 0                  | + 25 + 1"     |
| L                  | mm ft in | - 51 - 2"          | - 25 - 1"     | - 25 - 1"     | 0                  | + 25 + 1"     |
| M                  | mm ft in | + 51 + 2"          | + 25 + 1"     | + 25 + 1"     | 0                  | - 25 - 1"     |
| N                  | mm ft in | + 51 + 2"          | + 25 + 1"     | + 25 + 1"     | 0                  | - 25 - 1"     |
| T                  | mm ft in | + 51 + 2"          | + 25 + 1"     | + 25 + 1"     | 0                  | - 25 - 1"     |
| Y                  | mm ft in | - 76 - 3"          | - 76 - 3"     | - 76 - 3"     | 0                  | 0             |
| Z                  | mm ft in | - 51 - 2"          | - 25 - 1"     | - 25 - 1"     | 0                  | + 25 + 1"     |
| a <sub>2</sub>     | mm ft in | 7137 23' 5"        | 7137 23' 5"   | 7137 23' 5"   | 7188 23' 7"        | 7188 23' 7"   |
| a <sub>3</sub>     | mm ft in | 4039 13' 3"        | 4039 13' 3"   | 4039 13' 3"   | 3988 13' 1"        | 3988 13' 1"   |

## DIMENSIONS – MICHIGAN L190 (Long Boom)

Tires: 29.5-25 (22PR) L-3

Wherever applicable, specifications are in accordance with SAE Standard J732 and J742. Changes in the standard configuration may change machine dimensions and operating data. Operating weight is approximate and includes the bucket given in the table, ROPS cab, 2973 kg (6555 lb) counterweight and all standard equipment.

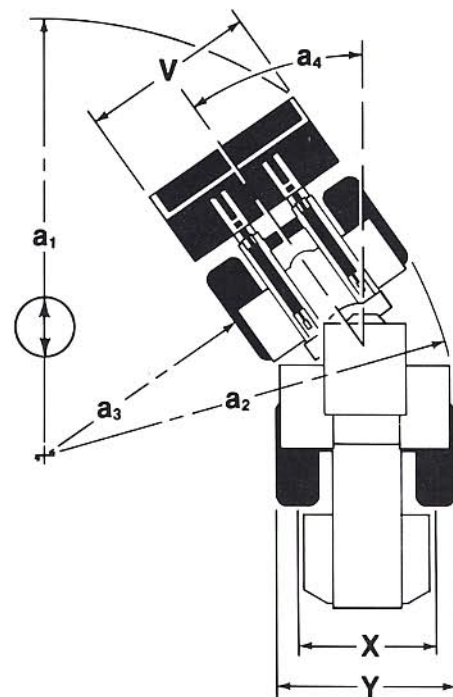


### MACHINE DIMENSIONS THAT DO NOT CHANGE REGARDLESS OF CONFIGURATION

|                    |     |       |                 |        |
|--------------------|-----|-------|-----------------|--------|
| C                  | mm  | ft in | 3505            | 11' 6" |
| F <sub>3</sub>     | mm  | ft in | 64              | 2.5"   |
| G                  | mm  | ft in | 2134            | 7' 0"  |
| P                  | deg |       | 45°             |        |
| X                  | mm  | ft in | 2260            | 7' 5"  |
| a <sub>4</sub>     | deg |       | 35°             |        |
| Max. grading angle | deg |       | 66° (Long Boom) |        |

### BUCKETS

|                                              |                    |                      |
|----------------------------------------------|--------------------|----------------------|
| Straight edge rock                           | 3,8 m <sup>3</sup> | 5.0 yd <sup>3</sup>  |
| General purpose                              | 4,0 m <sup>3</sup> | 5.25 yd <sup>3</sup> |
| Light materials                              | 6,9 m <sup>3</sup> | 9.0 yd <sup>3</sup>  |
| <b>BUCKET TEETH AND BOLT ON CUTTING EDGE</b> |                    |                      |
| Model 27                                     | 136 kg             | 300 lbs.             |
| Model 27ARL                                  | 136 kg             | 300 lbs.             |
| Bolt on cutting edge                         | 240 kg             | 530 lbs.             |



## LONG BOOM

| MACHINE INFORMATION                                                      |                   |                    | BUCKET TYPE        |         |                 |         |                 |          |
|--------------------------------------------------------------------------|-------------------|--------------------|--------------------|---------|-----------------|---------|-----------------|----------|
|                                                                          |                   |                    | Straight Edge Rock |         | General Purpose |         | Light Materials |          |
| Volume, heaped                                                           | m <sup>3</sup>    | yd <sup>3</sup>    | 3,8                | 5.0     | 4,0             | 5.25    | 6,9             | 9.0      |
| struck                                                                   | m <sup>3</sup>    | yd <sup>3</sup>    | 3,2                | 4.2     | 3,3             | 4.3     | 5,8             | 7.6      |
| Material weight                                                          | kg/m <sup>3</sup> | lb/yd <sup>3</sup> | 1790               | 3000    | 1703            | 2860    | 988             | 1670     |
| Bucket weight                                                            | kg                | lb                 | 2014               | 4440    | 2041            | 4500    | 2449            | 5400     |
| Operating capacity                                                       | kg                | lb                 | 6804               | 15,000  | 6804            | 15,000  | 6804            | 15,000   |
| Static tipping load, straight                                            | kg                | lb                 | 18 647             | 41,110  | 18 366          | 40,490  | 17 731          | 39,090   |
| Full turn                                                                | kg                | lb                 | 16 729             | 36,880  | 16 370          | 36,090  | 15 962          | 35,190   |
| Breakout force                                                           | kN                | lbf                | 224,6              | 50,500  | 224,6           | 50,500  | 176,0           | 39,600   |
| A                                                                        | mm                | ft in              | 9627               | 31'7"   | 9627            | 31'7"   | 10 058          | 33'0"    |
| B                                                                        | mm                | ft in              | 8230               | 27'0"   | 8230            | 27'0"   | 8230            | 27'0"    |
| D                                                                        | mm                | ft in              | 584                | 1'11"   | 584             | 1'11"   | 584             | 1'11"    |
| F                                                                        | mm                | ft in              | 3759               | 12'4"   | 3759            | 12'4"   | 3759            | 12'4"    |
| F <sub>1</sub>                                                           | mm                | ft in              | 3416               | 11'2.5" | 3416            | 11'2.5" | 3416            | 11'2.5"  |
| F <sub>2</sub>                                                           | mm                | ft in              | 2972               | 9'9"    | 2972            | 9'9"    | 2972            | 9'9"     |
| H                                                                        | mm                | ft in              | 3759 ○             | 12'4" ⊖ | 3759 ○          | 12'4" ⊖ | 3454            | 11'4"    |
| K                                                                        | mm                | ft in              | 5004               | 16'5"   | 5004            | 16'5"   | 5004            | 16'5"    |
| L                                                                        | mm                | ft in              | 6452               | 21'2"   | 6452            | 21'2"   | 6604            | 21'8"    |
| M                                                                        | mm                | ft in              | 1397 □             | 4'7" ⊕  | 1397 □          | 4'7" ⊕  | 1702            | 5'7"     |
| N                                                                        | mm                | ft in              | 2337               | 7'8"    | 2337            | 7'8"    | 2642            | 8'8"     |
| R <sub>1</sub>                                                           |                   | deg                |                    | 50°     |                 | 50°     |                 | 45°      |
| T                                                                        | mm                | ft in              | 102 ☒              | 4"      | 102 ☒           | 4"      | 76              | 3"       |
| V                                                                        | mm                | ft in              | 3302               | 10'10"  | 3302            | 10'10"  | 3924            | 12'10.5" |
| Y                                                                        | mm                | ft in              | 3124               | 10'3"   | 3124            | 10'3"   | 3124            | 10'3"    |
| Z                                                                        | mm                | ft in              | 3962               | 13'0"   | 3962            | 13'0"   | 3962            | 13'0"    |
| a <sub>1</sub> Turning circle (over bucket<br>(bucket in carry position) | mm                | ft in              | 16002              | 52'6"   | 16002           | 52'6"   | 16256           | 53'4"    |
| Operating weight                                                         | kg                | lb                 | 28735              | 63,350  | 28763           | 63,410  | 29 103          | 64,160   |

○ Deduct 76 mm (3 in) for bolt on cutting edge

□ Add 51 mm (2 in) for bolt on cutting edge

⊖ Deduct 178 mm (7 in) for bucket teeth

⊕ Add 119 mm (4.7 in) for bucket teeth

☒ Add 32 mm (1.25 in) for bolt on cutting edge

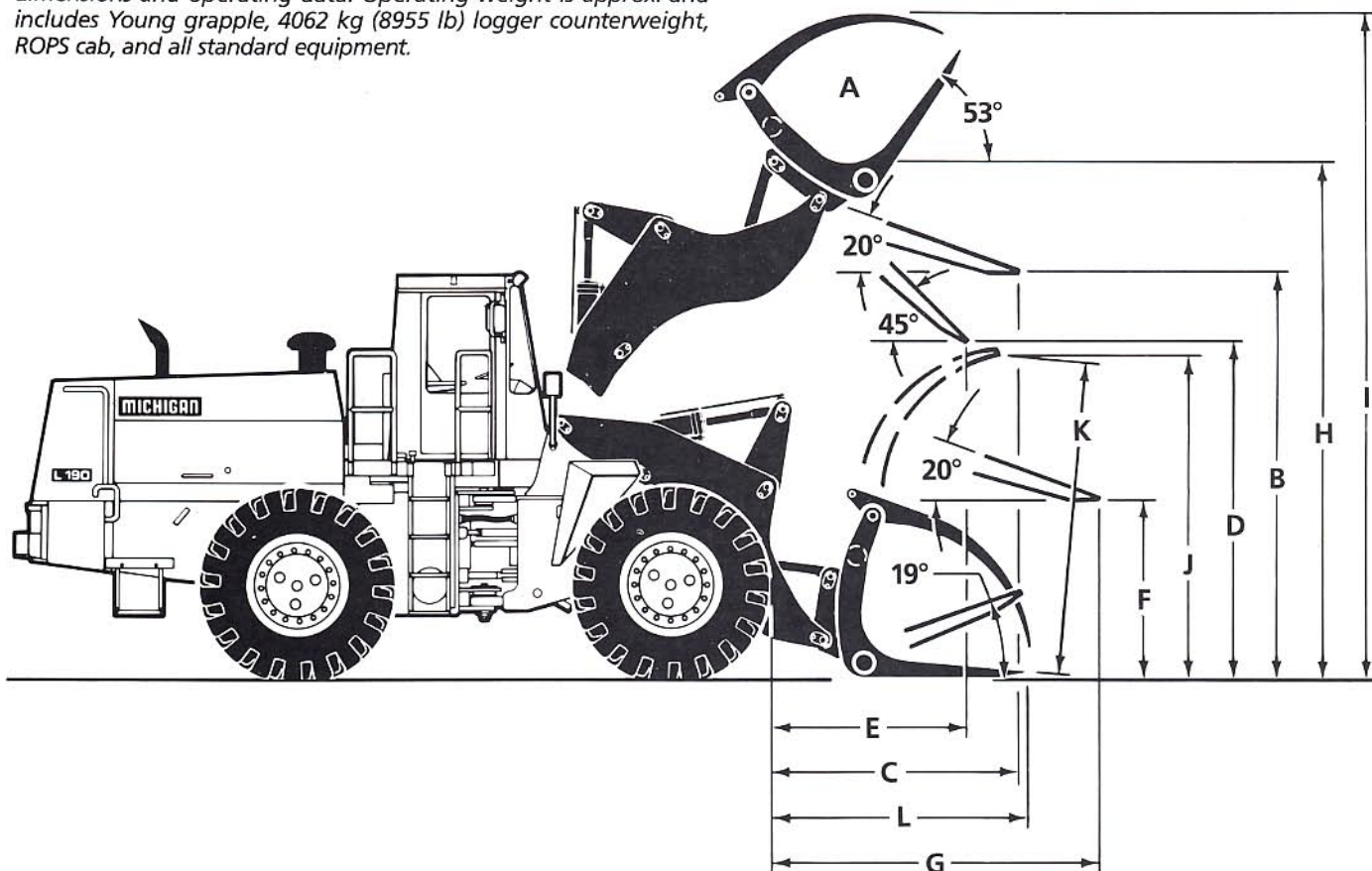
## DIMENSIONS AFFECTED BY TIRE SIZE

| MACHINE DIMENSIONS |          | 26.5-25<br>(L-2, L-3) | 26.5-25<br>(L-4) | 26.5-25<br>(L-5) | 29.5-25<br>(L-2, L-3) | 29.5-25<br>(L-4) |
|--------------------|----------|-----------------------|------------------|------------------|-----------------------|------------------|
| D                  | mm ft in | -51 -2"               | -25 -1"          | -25 -1"          | 0                     | +25 +1"          |
| F                  | mm ft in | -51 -2"               | -25 -1"          | -25 -1"          | 0                     | +25 +1"          |
| F <sub>1</sub>     | mm ft in | -51 -2"               | -25 -1"          | -25 -1"          | 0                     | +25 +1"          |
| F <sub>2</sub>     | mm ft in | -51 -2"               | -25 -1"          | -25 -1"          | 0                     | +25 +1"          |
| H                  | mm ft in | -51 -2"               | -25 -1"          | -25 -1"          | 0                     | +25 +1"          |
| K                  | mm ft in | -51 -2"               | -25 -1"          | -25 -1"          | 0                     | +25 +1"          |
| L                  | mm ft in | -51 -2"               | -25 -1"          | -25 -1"          | 0                     | +25 +1"          |
| M                  | mm ft in | +51 +2"               | +25 +1"          | +25 +1"          | 0                     | -25 -1"          |
| N                  | mm ft in | +51 +2"               | +25 +1"          | +25 +1"          | 0                     | -25 -1"          |
| T                  | mm ft in | +51 +2"               | +25 +1"          | +25 +1"          | 0                     | -25 -1"          |
| Y                  | mm ft in | -76 -3"               | -76 -3"          | -76 -3"          | 0                     | 0 0              |
| Z                  | mm ft in | -51 -2"               | -25 -1"          | -25 -1"          | 0                     | +25 +1"          |
| a <sub>2</sub>     | mm ft in | 7137 23'5"            | 7137 23'5"       | 7137 23'5"       | 7188 23'7"            | 7188 23'7"       |
| a <sub>3</sub>     | mm ft in | 4039 13'3"            | 4039 13'3"       | 4039 13'3"       | 3988 13'1"            | 3988 13'1"       |

## DIMENSIONS – MICHIGAN L190 LOG GRAPPLE

Tires: 29.5-25 (28PR) L-4

Changes from the standard configuration may change machine dimensions and operating data. Operating weight is approx. and includes Young grapple, 4062 kg (8955 lb) logger counterweight, ROPS cab, and all standard equipment.



## LOG GRAPPLE

| MACHINE DIMENSIONS |                                | 29.5-25 (L-4) |       |
|--------------------|--------------------------------|---------------|-------|
| A                  | m <sup>2</sup> ft <sup>2</sup> | 1.5           | 16    |
| B                  | mm ft in.                      | 3794          | 12'6" |
| C                  | mm ft in.                      | 2130          | 7'0"  |
| D                  | mm ft in.                      | 3127          | 10'3" |
| E                  | mm ft in.                      | 1705          | 5'7"  |
| F                  | mm ft in.                      | 1686          | 5'6"  |
| G                  | mm ft in.                      | 2889          | 9'6"  |
| H                  | mm ft in.                      | 4797          | 15'9" |
| I                  | mm ft in.                      | 6206          | 20'4" |
| J                  | mm ft in.                      | 3157          | 10'4" |
| K                  | mm ft in.                      | 2997          | 9'10" |
| L                  | mm ft in.                      | 2257          | 7'5"  |

## COUNTERWEIGHT

1089 kg  
(2400 lb)

1658 kg  
(3655 lb)

Includes basic counterweight of 1658 kg (3655 lb) plus added counterweight of 2404 kg (5300 lb).

1315 kg  
(2900 lb)

## LOG GRAPPLE

| MACHINE INFORMATION                                 |          |       |        |        |
|-----------------------------------------------------|----------|-------|--------|--------|
| Grapple, make                                       | Young    |       |        |        |
| model                                               | LP60-108 |       |        |        |
| weight                                              | kg       | lb    | 2268   | 5000   |
| Overall width                                       | mm       | ft in | 2743   | 9'0"   |
| Tine, length (top surface level)                    | mm       | ft in | 1560   | 5'1"   |
| width                                               | mm       | ft in | 127    | 5"     |
| centers                                             | mm       | ft in | 2616   | 8'7"   |
| Minimum closure                                     | mm       | ft in | 914    | 3'0"   |
| Turn. circle over tines,<br>(grapple in carry pos.) | mm       | ft in | 7713   | 25'4"  |
| Logger counterweight                                | kg       | lb    | 2404   | 5300   |
| Operating wt. (approx.)                             | kg       | lb    | 30 412 | 67,045 |

| HYDRAULIC SPEEDS, EMPTY, SEC |       |      |       |      |
|------------------------------|-------|------|-------|------|
| Raise                        | Lower | Dump | Close | Open |
| 6.2                          | 4.0   | 5.0  | 2.3   | 2.5  |

Contact your Michigan dealer for availability of alternate grapples.

| LOAD INFORMATION                                                |    |    |        |        |
|-----------------------------------------------------------------|----|----|--------|--------|
| MAX. RECOMMENDED LOAD: 12 928 kg 28,500 lb                      |    |    |        |        |
| MAX. HEIGHT – FORKS ROLLED BACK                                 |    |    |        |        |
| *Tip load, straight                                             | kg | lb | 40 547 | 89,389 |
| *Tip load, full turn                                            | kg | lb | 36 147 | 79,688 |
| Hyd. lifting force                                              | kg | lb | 16 998 | 37,475 |
| MAX. REACH – FORKS LEVEL                                        |    |    |        |        |
| *Tip load, straight                                             | kg | lb | 20 063 | 44,230 |
| *Tip load, full turn                                            | kg | lb | 17 795 | 39,232 |
| Hyd. lifting force                                              | kg | lb | 16 330 | 36,000 |
| GROUND POSITION – FORKS LEVEL                                   |    |    |        |        |
| *Tip load, straight                                             | kg | lb | 26 045 | 59,623 |
| *Tip load, full turn                                            | kg | lb | 24 068 | 53,060 |
| Hyd. lifting force                                              | kg | lb | 23 132 | 50,996 |
| *Static tip loads are based on estimated load center of gravity |    |    |        |        |

| SUPPLEMENTAL OPERATING DATA          |       | Change in operating weight |      | Change in static tipping load straight |      | Change in static tipping load at full turn |      |
|--------------------------------------|-------|----------------------------|------|----------------------------------------|------|--------------------------------------------|------|
| Belly Guard, Front                   | kg lb | +327                       | +720 | +76                                    | +171 | +76                                        | +171 |
| Belly Guard, Rear                    | kg lb | +127                       | +280 | +171                                   | +377 | +152                                       | +336 |
| Grille Guard                         | kg lb | +82                        | +180 | +149                                   | +328 | +130                                       | +286 |
| ROPS Canopy<br>(in lieu of ROPS Cab) | kg lb | –295                       | –650 | –210                                   | –464 | –202                                       | –444 |
| Secondary Steering                   | kg lb | +45                        | +100 | +36                                    | +78  | +34                                        | +74  |
| Transmission Guard                   | kg lb | +141                       | +310 | +111                                   | +244 | +104                                       | +230 |
| Windshield Guard                     | kg lb | +90                        | +200 | +43                                    | +95  | +43                                        | +95  |

## LOG VOLUME & WEIGHTS TABLES

To determine the estimated weight of logs to be handled, first, determine the volume of the logs, then, multiply the volume by the lb/ft<sup>3</sup> figure of the specie involved from the "Weights of Wood" table. To determine the volume of the logs:

1. Measure the diameter of large end of log, above flare taper.
2. Measure the diameter of small end of log.
3. Pick out length of log across top of table, closest to the length to be handled.
4. Drop down the column to the horizontal lines from the two diameters.
5. Add these two values together, then, divide by two for the average log volume.

### LOG VOLUMES (in Cubic Feet\*)

| Log Diameter (Inches) | LOG LENGTH (FEET) |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|-----------------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|                       | 8                 | 12  | 16  | 20  | 24  | 28  | 32  | 36  | 40  | 50  | 60   | 70   | 80   | 90   | 100  |
| 4                     | 0.7               | 1   | 1.4 | 1.7 | 2.1 | 2.4 | 2.8 | 3.1 | 3.5 | 4.3 | 5.2  | 6.1  | 7    | 7.8  | 8.7  |
| 6                     | 1.6               | 2.4 | 3.1 | 3.9 | 4.7 | 5.5 | 6.3 | 7.1 | 7.8 | 9.7 | 12   | 13   | 16   | 18   | 20   |
| 8                     | 2.8               | 4.2 | 5.6 | 7   | 8.4 | 9.8 | 11  | 13  | 14  | 16  | 21   | 24   | 28   | 31   | 35   |
| 10                    | 4.4               | 6.5 | 8.7 | 11  | 13  | 15  | 17  | 20  | 22  | 27  | 33   | 38   | 44   | 49   | 55   |
| 12                    | 6.3               | 9.4 | 13  | 16  | 19  | 22  | 25  | 28  | 31  | 39  | 47   | 55   | 63   | 71   | 79   |
| 14                    | 8.5               | 13  | 17  | 21  | 26  | 30  | 34  | 39  | 43  | 53  | 64   | 74   | 86   | 96   | 101  |
| 16                    | 11                | 17  | 22  | 28  | 34  | 39  | 45  | 50  | 56  | 70  | 84   | 98   | 112  | 126  | 140  |
| 18                    | 14                | 21  | 28  | 35  | 42  | 49  | 57  | 64  | 71  | 88  | 106  | 124  | 141  | 159  | 177  |
| 20                    | 17                | 26  | 35  | 44  | 52  | 61  | 70  | 79  | 87  | 109 | 131  | 153  | 175  | 196  | 218  |
| 22                    | 21                | 32  | 42  | 53  | 63  | 74  | 85  | 95  | 106 | 132 | 158  | 185  | 211  | 238  | 264  |
| 24                    | 25                | 38  | 50  | 63  | 75  | 88  | 101 | 113 | 126 | 157 | 189  | 220  | 251  | 283  | 314  |
| 26                    | 29                | 44  | 59  | 74  | 89  | 103 | 118 | 133 | 147 | 184 | 221  | 258  | 295  | 332  | 369  |
| 28                    | 34                | 51  | 68  | 86  | 103 | 120 | 137 | 154 | 171 | 213 | 256  | 299  | 342  | 385  | 428  |
| 30                    | 39                | 59  | 79  | 98  | 118 | 137 | 157 | 177 | 196 | 245 | 295  | 344  | 393  | 442  | 491  |
| 32                    | 45                | 67  | 89  | 118 | 134 | 156 | 179 | 201 | 223 | 279 | 335  | 391  | 447  | 503  | 559  |
| 34                    | 50                | 76  | 101 | 126 | 151 | 177 | 202 | 227 | 252 | 315 | 378  | 441  | 504  | 567  | 631  |
| 36                    | 57                | 85  | 113 | 141 | 170 | 198 | 226 | 255 | 282 | 353 | 424  | 495  | 566  | 637  | 707  |
| 38                    | 63                | 95  | 126 | 158 | 189 | 220 | 252 | 284 | 315 | 394 | 473  | 551  | 630  | 709  | 788  |
| 40                    | 70                | 105 | 140 | 175 | 210 | 244 | 279 | 314 | 349 | 436 | 524  | 611  | 698  | 785  | 873  |
| 50                    | 109               | 164 | 218 | 273 | 327 | 382 | 436 | 491 | 545 | 677 | 818  | 955  | 1091 | 1227 | 1364 |
| 60                    | 157               | 234 | 314 | 393 | 471 | 550 | 628 | 707 | 785 | 982 | 1178 | 1374 | 1571 | 1767 | 1964 |

\*Metric conversion: Cubic ft. x 0.028317 = cubic meter.

### WEIGHTS OF WOOD (Green)

| SPECIES              | kg/m <sup>3</sup> | lb/ft <sup>3</sup> | SPECIES            | kg/m <sup>3</sup> | lb/ft <sup>3</sup> | SPECIES         | kg/m <sup>3</sup> | lb/ft <sup>3</sup> |
|----------------------|-------------------|--------------------|--------------------|-------------------|--------------------|-----------------|-------------------|--------------------|
| Alder, Red           | 737               | 46                 | Gum, Black         | 721               | 45                 | Pine, Jack      | 801               | 50                 |
| Ash, White           | 769               | 48                 | Blue               | 1121              | 70                 | Loblolly        | 993               | 62                 |
| Aspen                | 689               | 43                 | Red                | 801               | 50                 | Lodgepole       | 625               | 39                 |
| Baldcypress          | 817               | 51                 | Tupelo             | 897               | 56                 | Long Leaf       | 993               | 62                 |
| Basswood             | 673               | 42                 | Hemlock, Eastern   | 801               | 50                 | Norway (Red)    | 673               | 42                 |
| Beech                | 865               | 54                 | Western            | 961               | 60                 | Short Leaf      | 993               | 62                 |
| Birch, Paper         | 801               | 50                 | Hickory, Pecan     | 993               | 62                 | Slash           | 993               | 62                 |
| Yellow               | 929               | 58                 | True               | 1009              | 63                 | Sugar           | 817               | 51                 |
| Cedar, Alaska        | 577               | 36                 | Larch, Western     | 769               | 48                 | Western Yellow, | 721               | 45                 |
| Incense              | 721               | 45                 | Locust, Black      | 929               | 58                 | (Ponderosa)     |                   |                    |
| Northern, White      | 449               | 28                 | Magnolia, Cucumber | 785               | 49                 | White (Western) | 561               | 35                 |
| Port-Orford          | 897               | 56                 | Maple, Big Leaf    | 753               | 47                 | White (Eastern) | 577               | 36                 |
| Western Red          | 433               | 27                 | Black              | 865               | 54                 | Poplar, Yellow  | 609               | 38                 |
| Cherry, Black        | 721               | 45                 | Red                | 801               | 50                 | Redwood         | 801               | 50                 |
| Cottonwood, Eastern  | 785               | 49                 | Silver             | 721               | 45                 | Spruce, Black   | 513               | 32                 |
| Douglas Fir, (Coast) | 881               | 55                 | Sugar              | 897               | 56                 | Engleman        | 625               | 39                 |
| (Inland Empire)      | 577               | 36                 | Oak, Black         | 1009              | 63                 | Red             | 545               | 34                 |
| Elm, American        | 865               | 54                 | Chestnut           | 977               | 61                 | Sitka           | 529               | 33                 |
| Fir, Alpine          | 449               | 28                 | Red                | 1009              | 63                 | White           | 545               | 34                 |
| Balsam               | 721               | 45                 | Red, Swamp         | 1073              | 67                 | Sweetgum        | 801               | 50                 |
| Nobel                | 481               | 30                 | Swamp Chestnut     | 1041              | 65                 | Sycamore        | 833               | 52                 |
| Red                  | 769               | 48                 | White              | 993               | 62                 | Tamarack        | 753               | 47                 |
| Silver               | 577               | 36                 | White, Swamp       | 1105              | 69                 | Walnut, Black   | 929               | 58                 |
| White                | 753               | 47                 |                    |                   |                    | Willow, Black   | 801               | 50                 |

## STANDARD EQUIPMENT

AIR CLEANER, DRY TYPE,  
DUAL ELEMENT  
ALTERNATOR, 24V, 100 AMP  
BATTERY DISCONNECT, LOCKABLE  
BOOM AND BUCKET CONTROL  
LEVERS, DASH MOUNTED  
BOOM KICKOUT, AUTOMATIC  
BRAKES, 4-WHEEL HYDRAULIC  
DRY DISC  
BRAKE SYSTEM, SECONDARY  
BUCKET LEVELER, AUTOMATIC  
CAB ACCESS STEPS AND  
HAND RAILS, (SAE J185)  
CAB, ROPS (SAE J1040) (ISO 3471)  
Acoustical Lining  
Airducting, Built-In  
Doors (2); Lockable with Self-  
Locking, Sliding Glass Windows  
Door Hold-Open Struts (2)  
Electrical System: 24V,  
Circuit Breaker Protection  
Pre-wired for Optional  
Accessories  
Environmental Control:  
Air Conditioner 6,3 kW  
(21,500 Btu/hr)  
Heater/Defroster/Pressurizer  
13,2 kW (45,000 Btu/hr) with  
Three-Speed Blower Fan,  
Filtered Air  
Floor Mat and Sound Barriers  
Interior Work Lights, Red and White  
Interior Rearview Mirror  
Safety Glass, Tinted

Seat Belt (SAE J386)  
Seat, Suspension, 6-way adjustable  
Steering Wheel Spinner Knob  
Sun Visor  
Windshield Washer & Wipers,  
Front & Rear  
COLD START AID, ETHER  
DIFFERENTIALS, LIMITED SLIP,  
FRONT & REAR  
DRAWBAR WITH PIN  
GRILLE, REAR SWING-OUT  
HYDRAULIC FLUID TO AIR COOLER  
HYDRAULIC PRESSURE TEST PORTS,  
QUICK CONNECT  
INSTRUMENTS/GAUGES:  
Air Cleaner Restriction Indicator  
Engine Coolant Temperature  
Gauge  
Engine Oil Pressure Gauge  
Fuel Gauge  
Hourmeter  
Sight Gauges:  
Engine Coolant Level  
Hydraulic Fluid Level  
Transmission Fluid Level  
Transmission/Torque Converter  
Fluid Temperature Gauge  
Voltmeter  
ISOLATION MOUNTS:  
Cockpit  
Engine  
Radiator  
Transmission  
LIFTING LUGS

LIGHTS:  
Work Lights, Halogen  
2 Front, 200,000 Candlepower Spots  
2 Front, 40,000 Candlepower Floods  
4 Rear, 40,000 Candlepower Floods  
Stop and Tail combination, 2 Rear  
Turn Signals with Hazard  
Warning Switch  
LUBRICATION SYSTEM, MANIFOLD  
TYPE, GROUND ACCESSIBLE  
MIRRORS, REARVIEW (2), EXTERIOR  
NEUTRAL START FEATURE  
REMOTE DRAIN FOR ENGINE OIL  
SIDE PANELS, ENGINE HOOD  
STEERING FRAME LOCK  
TIRES: 29.5-25 (22PR) L-3 (General)  
TRANSMISSION: POWERSHIFT, WITH  
DIRECTIONAL CLUTCH MODULATION  
TRANSMISSION DECLUTCH  
VANDALISM LOCK, PROVISION FOR:  
Batteries  
Engine Coolant  
Fuel  
Hydraulic Fluid  
Transmission/Torque Converter Fluid  
WARNING ALARMS:  
Horn, Electric  
Reverse Alarm (SAE J994)  
WARNING & MONITORING LIGHTS:  
Air Conditioner Malfunction  
Brake Pump/Differential Pressure  
Brake System, Front  
Brake System, Rear  
Parking Brake Applied  
Transmission Filter Restriction

## OPTIONAL EQUIPMENT

Accessory Power Kit, 12V/6 Amp  
Air Pre-cleaner Kit  
Beacon, Amber Rotating  
Belly Guard, Front  
Belly Guard, Rear  
Cold Starting Aid, Engine  
Water & Oil Pre-heater  
\*Counterweight, 907 kg (2000 lb)  
Coupler, Fast Fuel (Wiggins)  
Engine Oil Fill &  
Evacuation (Wiggins)  
Engine Shutdown to Idle Kit  
Fenders and Mud Flaps, Front  
Grille Guard  
Hydraulic Control, 3rd  
Hydraulic Fluid Fill &  
Evacuation  
Instrument Cover Kit (ROPS Canopy)  
Radiator, L&M  
Radiator Sand Grid Kit  
Reversible Fan  
ROPS Canopy  
Secondary Steering (Electrical)  
Transmission Guard  
Warning & Monitor Lights  
Low Engine Oil Pressure  
Low Engine Coolant Level  
High Engine Coolant Temperature  
Windshield Guard

Tires  
26.5-25 (20PR) L-2  
26.5-25 (20PR) L-3  
26.5-25 (20PR) L-4  
26.5-25 (20PR) L-5  
26.5-25 (26PR) L-3  
26.5R25 XRA★  
26.5R25 XRDNA★  
26.5R25 XRD1A★  
26.5R25 RL-2F★ L-2  
29.5-25 (16PR) L-3  
29.5-25 (22PR) L-2  
29.5-25 (22PR) L-4  
29.5-25 (28PR) L-4  
29.5R25 XRA★  
29.5R25 RL-2F★ L-2

\*Standard Boom Loader Only

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.

## VME Americas Inc.

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