

**MICHIGAN**

# 280 C



- **Engine output:**  
SAE J1349 Net 225 kW (302 hp)
- **Operating weight:**  
28,9-37,8 t (63 700-83 300 lb)
- **Blades:**  
5,5-19,9 m<sup>3</sup> (7,2-26,0 yd<sup>3</sup>)
- **Ideal weight distribution for different applications** - wide selection of blades, tires and counterweights

**Genuine, robust and reliable wheel dozer - optimized for maximum productivity**

- High rimpull
- Direct-injected, turbocharged and after-cooled Cummins diesel
- Countershaft transmission - quick and smooth shifting between forward and reverse
- Limited slip differential on front axle
- No-spin differential on rear axle

## ENGINE



The engine is a direct-injection, 4-stroke, turbocharged and aftercooled diesel engine.

|                      |                      |             |        |
|----------------------|----------------------|-------------|--------|
| Make                 |                      | Cummins     |        |
| Model                |                      | NTA 855C335 |        |
| Max. rating* at      | r/s (r/min)          | 35          | (2100) |
| SAE J1349            | kW (hp)              | 250         | (335)  |
| Flywheel rating** at | r/s (r/min)          | 35          | (2100) |
| SAE J1349            | kW (hp)              | 225         | (302)  |
| Max. torque at       | r/s (r/min)          | 23          | (1400) |
| SAE J1349            | Nm (lbf ft)          | 1363        | (1005) |
| Number of cylinders  |                      | 6           |        |
| Displacement, total  | l (in <sup>3</sup> ) | 14,0        | (855)  |
| Bore                 | mm (in)              | 140         | (5,50) |
| Stroke               | mm (in)              | 152         | (6,00) |

\* **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 |

## SERVICE REFILL CAPACITIES



|                                   |            |                |
|-----------------------------------|------------|----------------|
| Cooling system                    | l (US gal) | 79,5 (21,00)   |
| Crankcase                         | l (US gal) | 41,6 (11,00)   |
| Torque converter/<br>transmission | l (US gal) | 73,8 (19,50)   |
| Front differential                | l (US gal) | 48,3 (12,75)   |
| Rear differential                 | l (US gal) | 32,6 (8,60)    |
| Front & rear wheel<br>hubs (each) | l (US gal) | 12,3 (3,25)    |
| Fuel tank                         | l (US gal) | 548,9 (145,00) |
| Hydraulic reservoir               | l (US gal) | 416,4 (110,00) |
| Midmount bearing                  | l (US gal) | 5,3 (1,40)     |
| Brake reservoir                   | l (US gal) | 1,3 (0,35)     |

## DRIVE TRAIN



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

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

**Axes:** 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 differential on front; no-spin differential on rear.

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

**Tires:** Alternative tires available for different applications.

|                       |               |                        |
|-----------------------|---------------|------------------------|
| Torque multiplication |               | 3,05:1                 |
| Speeds                |               |                        |
| forward/reverse       |               |                        |
| 1                     | km/h (mile/h) | 6,1 (3,8)              |
| 2                     | km/h (mile/h) | 10,8 (6,7)             |
| 3                     | km/h (mile/h) | 18,5 (11,5)            |
| 4                     | km/h (mile/h) | 31,5 (19,6)            |
| With tires            |               | 29,5-29<br>(22 PR) L-3 |
| Oscillation           | ± °           | 12                     |
|                       | mm (in)       | 533 (21,0)             |

## BRAKE SYSTEM



(SAE J1152) (ISO 3450)

**Service brakes:** Four wheel dry disc type; two self-adjusting calipers per wheel; air-over-hydraulic actuation.

**Secondary:** Axle-by-axle system. Automatically actuated by low air pressure or manually applied through dash-mounted control; audible and visual alarm.

**Parking:** Dry disc type mounted on front differential input shaft; spring-on, air-off with dash-mounted hand valve actuation.

|                     |             |           |           |
|---------------------|-------------|-----------|-----------|
| Air compressor      |             | Cummins   |           |
| Capacity            | l/min (cfm) | 374       | (13,2)    |
| Pressure governed   | MPa (psi)   | 0,76-0,90 | (110-130) |
| Air/hydraulic ratio |             | 1:14,8    |           |
| Service brake disc  |             |           |           |
| Outside diameter    | mm (in)     | 572       | (22,5)    |
| Thickness           | mm (in)     | 16        | (0,625)   |
| Park brake disc     |             |           |           |
| Outside diameter    | mm (in)     | 406       | (16,0)    |
| Thickness           | mm (in)     | 13        | (0,50)    |

## STEERING SYSTEM



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

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

**System supply:** The system is served by two pump sections. A speed sensor feeds flow from one pump to the steering system at low rpm or to the reservoir at high rpm to make more power available for rimpull.

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

|                    |              |         |      |         |
|--------------------|--------------|---------|------|---------|
| Steering cylinders |              |         | 2    |         |
| Bore               | mm           | (in)    | 133  | (5,25)  |
| Stroke             | mm           | (in)    | 1010 | (39,75) |
| Relief pressure    | MPa          | (psi)   | 13,8 | (2000)  |
| Pump output        | l/min        |         | 231  |         |
|                    | (US gal/min) |         |      | (61)    |
| at pressure        | MPa          | (psi)   | 6,9  | (1000)  |
| and engine speed   | r/s          | (r/min) | 35   | (2100)  |

## CAB



Integral ROPS cab (SAE J1040, ISO 3471). Sound insulating lining. Floor mat. Two lockable doors. Self-locking, sliding windows. Tinted safety glass.

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

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

|                         |        |         |      |         |
|-------------------------|--------|---------|------|---------|
| Noise level             |        |         |      |         |
| in cab, max.            | dB (A) |         | 86,3 |         |
| Heating capacity        | kW     | (Btu/h) | 12,9 | (44000) |
| Air conditioning (opt.) | kW     | (Btu/h) | 6,4  | (22000) |

## HYDRAULIC SYSTEM



Closed and pressurized system with a sturdy plate-steel tank. Hydraulic fluid 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 pump mounted on torque converter.

**System supply:** Main pump supplies only the main system.

**Valve:** Three-spool valve with built-in pressure relief cartridge; operated manually by control levers.

**Blade pitch:** Control has three positions - forward, hold and back. Lever is the inner of two mounted on floor to the right of operator's seat.

**Combination blade lift & tilt:** Lift control has four positions - raise, hold, lower (down pressure), and float. Tilt control has three positions - tilt left, hold, and tilt right. Blade lift and tilt lever is the outer of two mounted on floor to right of operator's seat.

**Cylinders:** Double acting.

**Filters:** Full-flow 10 µm return filter (with two elements), located in hydraulic oil tank.

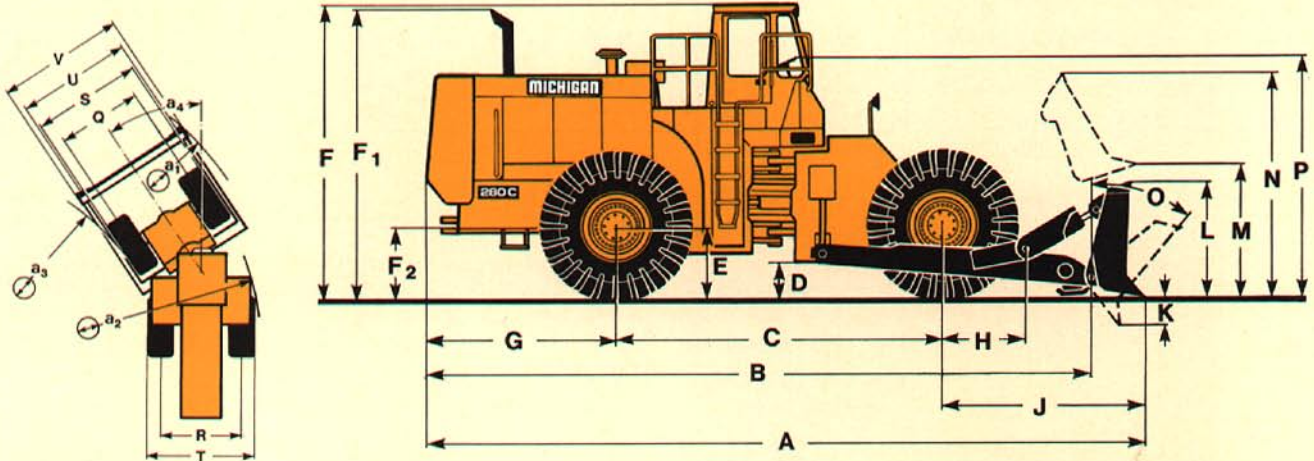
|                  |              |         |      |         |
|------------------|--------------|---------|------|---------|
| Relief pressure  | MPa          | (psi)   | 13,8 | (2000)  |
| Output           | l/min        |         | 257  |         |
|                  | (US gal/min) |         |      | (68)    |
| at pressure      | MPa          | (psi)   | 6,9  | (1000)  |
| and engine speed | r/s          | (r/min) | 35   | (2100)  |
| Lift cylinder    |              |         | 2    |         |
| Bore             | mm           | (in)    | 152  | (6,0)   |
| Stroke           | mm           | (in)    | 907  | (35,72) |
| Pitch cylinder   |              |         | 2    |         |
| Bore             | mm           | (in)    | 114  | (4,5)   |
| Stroke           | mm           | (in)    | 391  | (15,38) |
| Tilt cylinder    |              |         | 1    |         |
| Bore             | mm           | (in)    | 133  | (5,25)  |
| Stroke           | mm           | (in)    | 244  | (9,62)  |
| Blade raise time | s            |         | 4,0  |         |
| Blade lower time | s            |         | 3,2  |         |
| Blade pitch      |              |         |      |         |
| forward          | s            |         | 1,9  |         |
| backward         | s            |         | 1,7  |         |
| Blade tilt       | s            |         | 0,9  |         |

## MACHINE DIMENSIONS WITH OPTIONAL TIRES

| With straight blade | 29.5-29    |               |                |                |                |                |                |                |
|---------------------|------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                     |            | L-2           | L-4            | L-5            | XRAT*          | XRDNAT*        | XRDIAT*        | RL2F**         |
| D                   | mm (ft in) | 432 (1'5")    | 485 (1'7,1")   | 500 (1'7,7")   | 427 (1'4,8")   | 437 (1'5,2")   | 455 (1'5,9")   | 467 (1'6,4")   |
| E                   | mm (ft in) | 879 (2'10,6") | 932 (3'0,7")   | 947 (3'1,3")   | 874 (2'10,4")  | 884 (2'10,8")  | 902 (2'11,5")  | 914 (3'0")     |
| F                   | mm (ft in) | 3810 (12'6")  | 3863 (12'8,1") | 3879 (12'8,7") | 3805 (12'5,8") | 3815 (12'6,2") | 3833 (12'6,9") | 3846 (12'7,4") |
| F <sub>1</sub>      | mm (ft in) | 3683 (12'1")  | 3736 (12'3,1") | 3752 (12'3,7") | 3678 (12'0,8") | 3688 (12'1,2") | 3706 (12'1,9") | 3719 (12'2,4") |
| F <sub>2</sub>      | mm (ft in) | 889 (2'11")   | 942 (3'1,1")   | 958 (3'1,7")   | 884 (2'10,8")  | 894 (2'11,2")  | 912 (2'11,9")  | 925 (3'0,4")   |
| H                   | mm (ft in) | 980 (3'2,6")  | 1001 (3'3,4")  | 1003 (3'3,5")  | 978 (3'2,5")   | 978 (3'2,5")   | 1003 (3'3,5")  | 978 (3'2,5")   |
| K                   | mm (ft in) | 737 (2'5")    | 683 (2'2,9")   | 668 (2'2,3")   | 742 (2'5,2")   | 732 (2'4,8")   | 714 (2'4,1")   | 701 (2'3,6")   |
| M                   | mm (ft in) | 1422 (4'8")   | 1476 (4'10,1") | 1491 (4'10,7") | 1417 (4'7,8")  | 1427 (4'8,2")  | 1445 (4'8,9")  | 1458 (4'9,4")  |
| N                   | mm (ft in) | 2515 (8'3")   | 2568 (8'5,1")  | 2583 (8'5,7")  | 2510 (8'2,8")  | 2520 (8'3,2")  | 2537 (8'3,9")  | 2855 (9'4,4")  |
| P                   | mm (ft in) | 2972 (9'9")   | 3025 (9'11,1") | 3040 (9'11,7") | 2992 (9'9,8")  | 2977 (9'9,2")  | 2995 (9'9,9")  | 3007 (9'10,4") |
| S                   | mm (ft in) | 3226 (10'7")  | 3238 (10'7,5") | 3218 (10'6,7") | 3238 (10'7,5") | 3282 (10'9,2") | 3274 (10'8,9") | 3236 (10'7,4") |
| T                   | mm (ft in) | 3429 (11'3")  | 3442 (11'3,5") | 3421 (11'2,7") | 3442 (11'3,5") | 3485 (11'5,2") | 3477 (11'4,9") | 3439 (11'3,4") |

# DIMENSIONS MICHIGAN 280C

Tires: 29.5-29 (22PR) L-3



Whenever applicable, specifications are in accordance with SAE Standards J732 and J742. Basic machine weight is approximate and includes blade listed, standard tires, ROPS cab, full fuel tank, and 79 kg (175 lb) operator. Changes in the standard configuration may change machine dimensions and operating data.

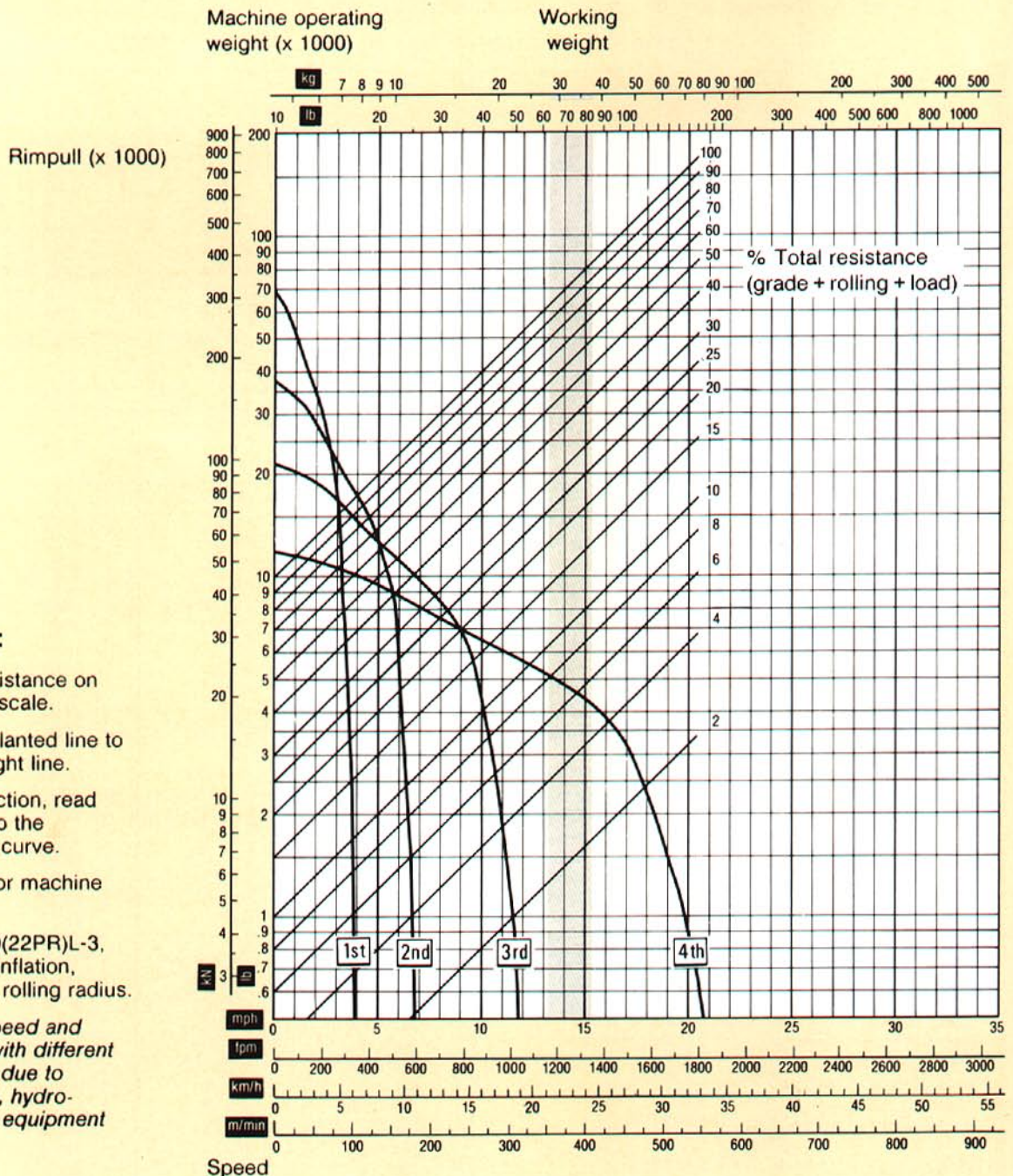
|                |            |      |           |                |            |      |            |
|----------------|------------|------|-----------|----------------|------------|------|------------|
| B              | mm (ft in) | 7722 | (25'4")   | P              | mm (ft in) | 2987 | (9'9,6")   |
| C              | mm (ft in) | 3810 | (12'6")   | Q              | mm (ft in) | 2388 | (7'10")    |
| D              | mm (ft in) | 447  | (1'5,6")  | R              | mm (ft in) | 2591 | (8'6")     |
| E              | mm (ft in) | 894  | (2'11,2") | S              | mm (ft in) | 3236 | (10'7,4")  |
| F              | mm (ft in) | 3825 | (12'6,6") | T              | mm (ft in) | 3439 | (11'3,4")  |
| F <sub>1</sub> | mm (ft in) | 3698 | (12'1,6") | U              | mm (ft in) | 3727 | (12'2,75") |
| F <sub>2</sub> | mm (ft in) | 904  | (2'11,6") | a <sub>2</sub> | mm (ft in) | 6731 | (22'1")    |
| G              | mm (ft in) | 2286 | (7'6")    | a <sub>3</sub> | mm (ft in) | 2743 | (9'0")     |
| H              | mm (ft in) | 980  | (3'2,6")  | a <sub>4</sub> | °          | ± 45 |            |
| O              | °          | 40   |           |                |            |      |            |

| Blade type (SAE J1265)                |                    | Straight | U        | Coal      | Woodchip  |
|---------------------------------------|--------------------|----------|----------|-----------|-----------|
| Capacity, rated                       | m <sup>3</sup>     | 5,5      | 7,5      | 14,9      | 19,9      |
|                                       | (yd <sup>3</sup> ) | (7,2)    | (9,8)    | (19,5)    | (26,0)    |
| Blade weight                          | kg                 | 2313     | 1950     | 2722      | 2835      |
|                                       | (lb)               | (5100)   | (4300)   | (6000)    | (6250)    |
| Blade tilt, maximum                   | mm                 | 318      | 318      | 381       | 381       |
|                                       | (in)               | (12,5)   | (12,5)   | (15,0)    | (15,0)    |
| Blade raise speed, maximum            | mm/s               | 396      | 396      | 396       | 396       |
|                                       | (ft/s)             | (1,3)    | (1,3)    | (1,3)     | (1,3)     |
| A                                     | mm                 | 8407     | 8560     | 8852      | 8852      |
|                                       | (ft in)            | (27'7")  | (28'1")  | (29'0,5") | (29'0,5") |
| J                                     | mm                 | 2311     | 2464     | 2794      | 2794      |
|                                       | (ft in)            | (7'7")   | (8'1")   | (9'2")    | (9'2")    |
| K                                     | mm                 | 721      | 721      | 772       | 772       |
|                                       | (ft in)            | (2'4,4") | (2'4,4") | (2'6,4")  | (2'6,4")  |
| L                                     | mm                 | 1346     | 1295     | 1753      | 2032      |
|                                       | (ft in)            | (4'5")   | (4'3")   | (5'9")    | (6'8")    |
| M                                     | mm                 | 1438     | 1438     | 1336      | 1336      |
|                                       | (ft in)            | (4'8,6") | (4'8,6") | (4'4,6")  | (4'4,6")  |
| N                                     | mm                 | 2530     | 2419     | 2809      | 2809      |
|                                       | (ft in)            | (8'3,6") | (8'1,6") | (9'2,6")  | (9'2,6")  |
| V                                     | mm                 | 4064     | 4013     | 4877      | 4851      |
|                                       | (ft in)            | (13'4")  | (13'2")  | (16'0")   | (15'11")  |
| a <sub>1</sub>                        | mm                 | 7010     | 7036     | 7544      | 7544      |
|                                       | (ft in)            | (23'0")  | (23'1")  | (24'0")   | (24'9")   |
| Machine weight, working               | kg                 | 37268    | 36 905   | 37 676    | 37 789    |
| (with counterweight & hydroinflation) | (lb)               | (82 160) | (81 360) | (83 060)  | (83 310)  |
| Machine weight, working               | kg                 | 33 571   | 33 208   | 33 919    | 34 093    |
| (with hydroinflation)                 | (lb)               | (74 010) | (73 210) | (74 910)  | (75 160)  |
| Machine weight, working               | kg                 | 32 954   | 32 591   | 33 362    | 33 476    |
| (with counterweight)                  | (lb)               | (72 650) | (71 850) | (73 550)  | (73 800)  |
| Machine weight, working (basic)       | kg                 | 29 257   | 28 894   | 29 665    | 29 119    |
|                                       | (lb)               | (64 500) | (63 700) | (65 400)  | (65 650)  |
| Machine weight, shipping              | kg                 | 28 826   | 28 463   | 29 235    | 29 348    |
|                                       | (lb)               | (63 550) | (62 150) | (64 450)  | (64 700)  |

## CHANGE IN WORKING WEIGHT

|                        |         | Tire & wheel<br>change only | Front<br>tire & wheel<br>with hydro | Rear<br>tire & wheel<br>with hydro | Total<br>tire & wheel<br>with hydro |
|------------------------|---------|-----------------------------|-------------------------------------|------------------------------------|-------------------------------------|
| <b>Tire Size</b>       |         |                             |                                     |                                    |                                     |
| 29.5-29 (22PR) L-3 STD | kg (lb) | 0 (0)                       | 2157 (4755)                         | 2157 (4755)                        | 4314 (9 510)                        |
| 29.5-29 (22PR) L-2     | kg (lb) | -485 (-1070)                | 1914 (4220)                         | 1914 (4220)                        | 3828 (8440)                         |
| 29.5-29 (22PR) L-4     | kg (lb) | 653 (1440)                  | 2531 (5580)                         | 2531 (5580)                        | 5062 (11 160)                       |
| 29.5-29 (22PR) L-5     | kg (lb) | 1184 (2610)                 | 2279 (5025)                         | 2279 (5025)                        | 4559 (10 050)                       |
| 29.5 R 29 XRAT*        | kg (lb) | -322 (-710)                 | 2218 (4890)                         | 2218 (4890)                        | 4436 (9780)                         |
| 29.5 R 29 XRDNAT*      | kg (lb) | -7 (-15)                    | 2311 (5240)                         | 2377 (5240)                        | 4754 (10 480)                       |
| 29.5 R 29 XRDIA*       | kg (lb) | 338 (745)                   | 2549 (5620)                         | 2549 (5620)                        | 5098 (11 240)                       |
| 29.5 R 29 RL2F*        | kg (lb) | -263 (-580)                 | 2248 (4955)                         | 2248 (4955)                        | 4495 (9910)                         |

## PERFORMANCE DATA



### Instructions:

- 1 Find total resistance on right vertical scale.
- 2 Read down slanted line to machine weight line.
- 3 From intersection, read horizontally to the performance curve.
- 4 Read down for machine speed.

Based on 29.5-29(22PR)L-3,  
207 kPa (30 psi) inflation,  
922 mm (36.3 in) rolling radius.

*Note: Machine speed and rimpull will vary with different machine weights due to counterweighting, hydro-inflation, optional equipment and tire size.*

## STANDARD EQUIPMENT

### Safety & comfort

Cab access steps & handrails (SAE J185)  
Cab, ROPS (SAE 1040) (ISO 3471)  
Acoustical lining  
Air ducting, built-in  
Doors (2) lockable with self-locking sliding glass windows  
Door hold-open latches (2)  
Environmental control:  
Heater, defroster, pressurizer 12,9 kW (44 000 Btu/h) with three-speed blower fan, filtered air  
Floor mat  
Interior dome lights, red & white  
Safety glass, tinted  
Seat belt, (SAE J386)  
Seat, suspension, 6-way adjustable  
Windshield washer, front  
Windshield wipers, front & rear  
Instruments/gauges:  
Air cleaner restriction indicator  
Air pressure gauge  
Engine coolant temperature gauge

Engine oil pressure gauge  
Hourmeter  
Voltmeter  
Transmission/torque converter fluid temperature gauge  
Warning & monitoring lights / Audible alarms:  
Horn, air operated  
Low air pressure  
Parking brake applied  
Reverse alarm (SAE J994)  
Secondary brake applied  
Sight gauges:  
Hydraulic fluid level  
Transmission fluid level  
Mirrors, rearview (2) exterior  
Central lube centers  
Vandalism lock, provision for:  
Engine coolant  
Fuel  
Hydraulic fluid  
Transmission/torque converter fluid  
Drawbar with pin  
Brakes, 4-wheel air-over-hydraulic, dry disc

Brake system, secondary  
Brake system air dryer  
Pitch cylinder guards  
Side panels, engine hood  
Steering frame lock  
Engine compartment acoustical lining  
Grille, rear swing-out  
Lifting lugs

### Engine & Electrical system

Electrical system: 24 V circuit breaker, protected, pre-wired for optional accessories  
Battery disconnect, lockable  
Alternator, 100 A  
Lights:  
Work (150 W) 4 front  
Stop & tail combination  
Cold start aid, ether injection  
Neutral start feature  
Air cleaner, exhaust-aspirated precleaner

### Drivetrain

Differentials:  
Front, limited slip  
Rear, no-spin  
Drive shaft guard, converter to transmission  
Tires: 29.5-29 (22PR) L-3

### Hydraulic system

"C" frame, hydraulic cylinders & controls  
Hydraulic fluid-to-air cooler, swing-out  
Hydraulic piping guards on "C" frame  
Hydraulic pressure test ports, quick-connect

## OPTIONAL EQUIPMENT

(Standard on certain markets)

### Blade related equipment

Blade pitch struts (fixed)  
"C" frame wear plate kit  
Rock guard

### Engine equipment

Coupler, fast fuel (Wiggins)  
Engine oil evacuation (Wiggins)  
Engine shutdown to idle kit  
For high coolant temp  
Low engine oil pressure  
Engine water & oil pre-heater 110 V  
External starting receptacle  
Radiator sand grid  
Reversible fan

### Cab equipment

Air conditioner  
ROPS canopy  
SAE J1040) (ISO 43471)  
Instrument panel cover  
Spinner knob (steering wheel)  
Warning system (A.I.D.)  
high water temperature,  
low oil pressure

### External equipment

Counterweight, front  
Counterweight, rear  
Fenders, front

### Protection equipment

Secondary steering kit, electric  
Belly guard, front  
Belly guard, rear for use without rear counterweight  
Belly guard, rear for use with rear counterweight  
Bottom transmission guard

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.

# Volvo BM Company

S-63185 ESKILSTUNA SWEDEN

