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^3 (7,2-26,0 yd^3)

- ***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^3)	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/ 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 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.

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 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 (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	0,76-0,90	
	(psi)	(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.

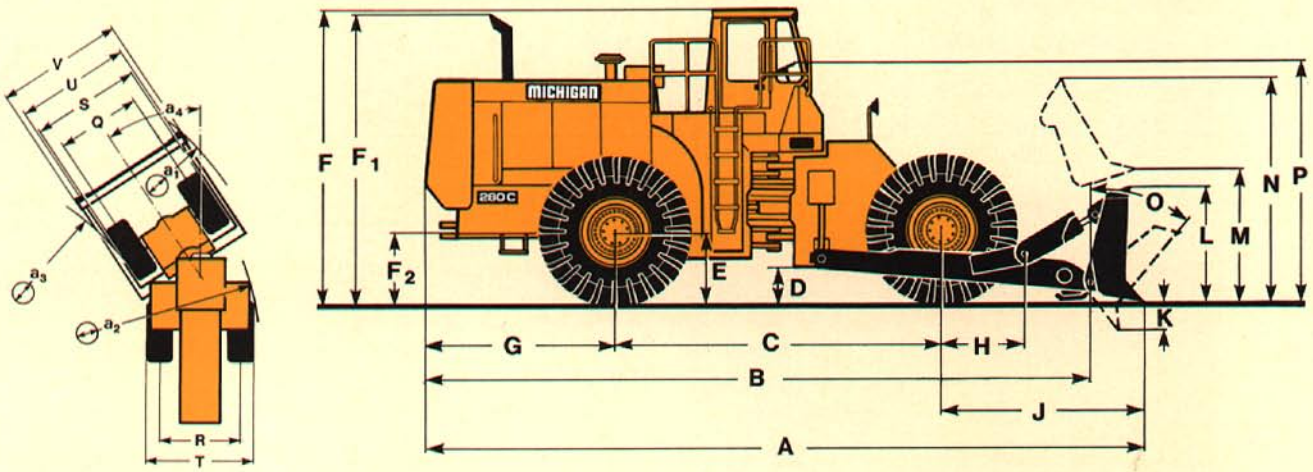
Relief pressure	MPa	(psi)	13,8	(2000)
Output	l/min		257	
	(US gal/min)			(68)
at pressure	MPa	(psi)	6,9	(1000)
and engine speed	r/s	(r/min)	35	(2100)
Lift cylinder			2	
Bore	mm	(in)	152	(6,0)
Stroke	mm	(in)	907	(35,72)
Pitch cylinder			2	
Bore	mm	(in)	114	(4,5)
Stroke	mm	(in)	391	(15,38)
Tilt cylinder			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_1	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_2	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.

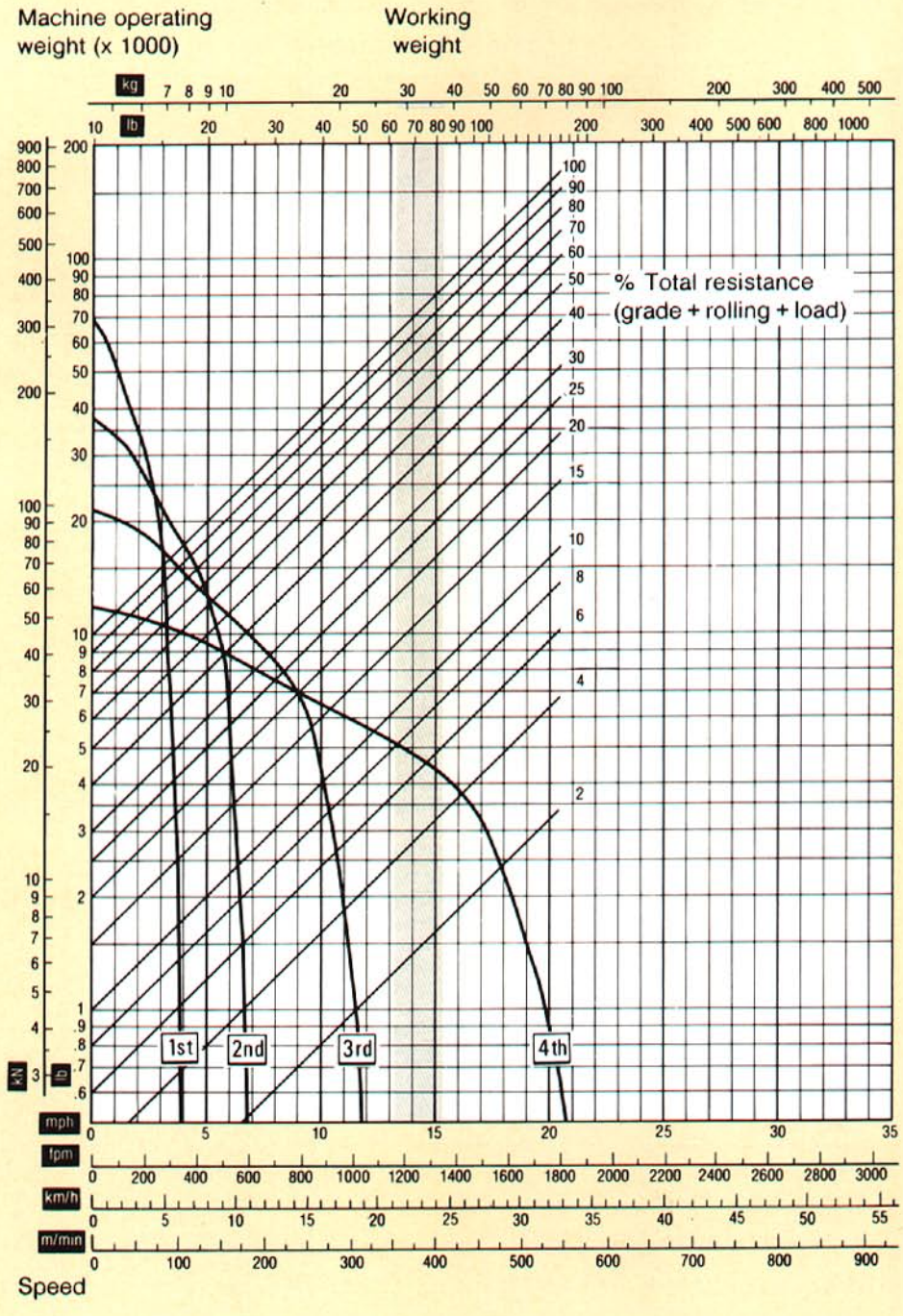
B	mm (ft in)	7722	(25'4")	P	mm (ft in)	2987	(9'9,6")
C	mm (ft in)	3810	(12'6")	Q	mm (ft in)	2388	(7'10")
D	mm (ft in)	447	(1'5,6")	R	mm (ft in)	2591	(8'6")
E	mm (ft in)	894	(2'11,2")	S	mm (ft in)	3236	(10'7,4")
F	mm (ft in)	3825	(12'6,6")	T	mm (ft in)	3439	(11'3,4")
F_1	mm (ft in)	3698	(12'1,6")	U	mm (ft in)	3727	(12'2,75")
F_2	mm (ft in)	904	(2'11,6")	a_2	mm (ft in)	6731	(22'1")
G	mm (ft in)	2286	(7'6")	a_3	mm (ft in)	2743	(9'0")
H	mm (ft in)	980	(3'2,6")	a_4	°	±45	
O	°	40					

Blade type (SAE J1265)		Straight	U	Coal	Woodchip
Capacity, rated	m^3	5,5	7,5	14,9	19,9
	(yd^3)	(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_1	mm	7010	7036	7544	7544
	(ft in)	(23'0")	(23'1")	(24'0")	(24'9")
Machine weight, working (with counterweight & hydroinflation)	kg	37268	36 905	37 676	37 789
	(lb)	(82 160)	(81 360)	(83 060)	(83 310)
Machine weight, working (with hydroinflation)	kg	33 571	33 208	33 919	34 093
	(lb)	(74 010)	(73 210)	(74 910)	(75 160)
Machine weight, working (with counterweight)	kg	32 954	32 591	33 362	33 476
	(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 change only		Front tire & wheel with hydro		Rear tire & wheel with hydro		Total tire & wheel with hydro	
Tire Size									
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 XRDIAT*	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

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