

Shown with
Accessory Equipment

SPECIFICATIONS

V-16, 4-Stroke-Cycle-Diesel

| | |
|------------------------------|-----------------------------------|
| Emissions | IMO II/EPA Tier 2 compliant |
| Displacement | 296 L (18,062 cu. in.) |
| Low Idle Speed | 350 rpm |
| Rated Speed | 1000 rpm |
| Bore | 280 mm (11.0 in.) |
| Stroke | 300 mm (11.8 in.) |
| Compression Ratio | 13:1 |
| Aspiration | Turbocharged-Aftercooled Governor |
| Cooling System | Electronic Keel or Heat Exchanger |
| Weight, Dry | 28,500 kg (62,832 lbs) |
| Refill Capacities | |
| Cooling System | 1660-1835 L (439-485 gal) |
| Lube Oil System | 1057 L (279 gal) |
| Oil Change Interval* | 600 hours |
| Rotation (from flywheel end) | CCW or CW |
| Serial Number Prefix | NKB |

*A new S•O•SSM analysis must be done to determine actual oil change intervals.

STANDARD ENGINE EQUIPMENT

Air Intake and Exhaust System

Charge air cooler, air inlet shutoff, high flow turbocharger, dry manifold with soft or hard shielding

Basic Engine Arrangement

Vee engine with one-piece grey iron cylinder block, individual cylinder heads with four intake/exhaust valves, right- or left-hand service side available

Control System

Dual ADEM™ A3 electronic engine control unit (ECU) with electronic unit injector fuel system, rigid wiring harness (10 amp, 24 volt power required to drive ECU)

Cooling System

Single or combined system, engine mounted freshwater and seawater pumps, engine coolant water drains

Fuel System

Engine operates on MDO; fuel injection system consists of engine-driven fuel transfer pump and an electronic unit injector for each cylinder, engine-mounted duplex fuel filters, and flexible connections

Lube Oil System

Top-mounted crankcase breather, three centrifugal oil filters with single shutoff, gear-driven pump, duplex oil filter, crankcase explosion relief, oil filler and dipstick

Monitoring, Alarm, and Safety Control System

Alarms and shutdowns provided as required by marine society for unmanned machinery spaces. Marine Monitoring System II [listed as Programmable Logic Control (PLC) in the Price List] or Engine Control Panel are available; systems include temperature, pressure, and speed sensors; optional: cylinder pressure relieve valves (for cold weather operation); oil mist detector or particle detector available

ECU Functions

Key-switch, desired engine speed, programmable low idle, SAE J1939 data link, Cat® data link, Messenger (displays engine data, diagnostics, etc.), diagnostics, general alarm, programmable parameters (system, application, and tattletales), Cat ET service tool interface, remote shutdown, shutdown notify, load feedback, overspeed shutdown, overspeed verify, engine power correction, droop, dual dynamics

General

Four lifting eyes mounted to cylinder heads, Cat yellow paint, parts books and maintenance manuals, shrink wrap

Optional Supplied Equipment

Torsional coupling, fresh water heat exchanger, fuel cooler, expansion tank, emergency pumps and connections, jacket water heater, flexible connections, and anti-vibration isolators

MARINE ENGINE PERFORMANCE

C280-16

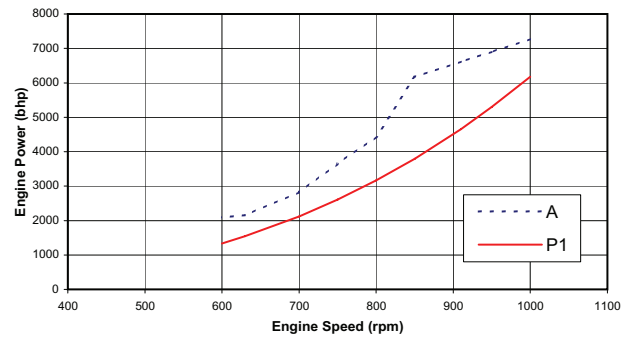
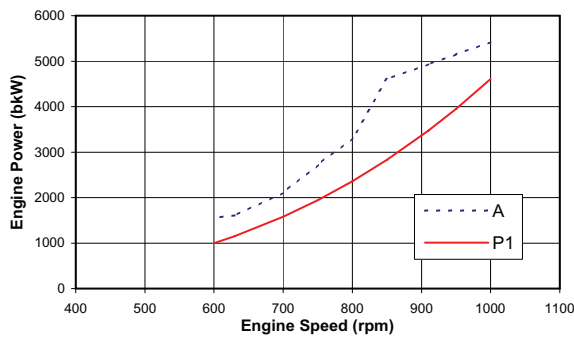
DIESEL ENGINE TECHNICAL DATA



RATED SPEED (RPM): 1000
 RATED POWER¹ (bkW): 5420
 BMEP @ 100% LOAD (kPa): 2201
 COMPRESSION RATIO: 13:1
 AFTERCOOLER WATER (°C): 32
 JACKET WATER INLET (°C): 90
 IGNITION SYSTEM: EUI
 FIRING PRESSURE, MAXIMUM (kPa): 17300

ENGINE RATING: **Marine MCR**
 CERTIFICATION⁵: IMO II/EPA MARINE TIER II
 TURBOCHARGER PART #: 284-8276
 COMBUSTION: DI
 FUEL TYPE: Distillate
 EXHAUST MANIFOLD: DRY
 MEAN PISTON SPEED (m/s): 10

Engine Performance



| | | ZONE LIMIT DATA | | | | | | |
|------------------|-----------|--------------------------------|----------------|-----------------------|--------------------------------|---------------------|------------------|-------------------|
| Engine Speed rpm | Power bkW | Fuel Cons ³ g/kW-hr | Fuel Rate L/hr | Boost Press kPa Gauge | Air Flow ⁴ cu m/Min | Exh Temp to Turbo C | Exh Stack Temp C | Exh Flow cu m/min |
| 1000 | 5420 | 203 | 1312.7 | 271 | 546.9 | 543 | 373 | 1169.8 |
| 950 | 5149 | 203 | 1245.8 | 273 | 528.6 | 537 | 361 | 1110.1 |
| 910 | 4932 | 203 | 1193.8 | 263 | 499.8 | 543 | 370 | 1064.0 |
| 850 | 4607 | 204 | 1118.7 | 233 | 439.9 | 573 | 410 | 996.5 |
| 800 | 3302 | 210 | 827.1 | 135 | 306.2 | 585 | 460 | 745.7 |
| 750 | 2721 | 213 | 692.3 | 92 | 230.2 | 619 | 505 | 597.4 |
| 700 | 2105 | 219 | 550.7 | 55 | 168.5 | 638 | 536 | 456.1 |
| 630 | 1612 | 226 | 434.3 | 31 | 123.8 | 645 | 545 | 339.7 |
| 600 | 1559 | 228 | 423.5 | 28 | 114.6 | 668 | 561 | 321.2 |
| 500 | 1159 | 236 | 326.2 | 14 | 80.0 | 661 | 545 | 220.9 |

| | | PROPELLER DEMAND DATA | | | | | | |
|------------------|-----------|--------------------------------|----------------|-----------------------|--------------------------------|---------------------|------------------|-------------------|
| Engine Speed rpm | Power bkW | Fuel Cons ³ g/kW-hr | Fuel Rate L/hr | Boost Press kPa Gauge | Air Flow ⁴ cu m/Min | Exh Temp to Turbo C | Exh Stack Temp C | Exh Flow cu m/min |
| 1000 | 4608 | 208 | 1142.5 | 244 | 510.5 | 523 | 367 | 1080.8 |
| 950 | 3951 | 210 | 989.0 | 207 | 462.1 | 526 | 375 | 988.5 |
| 910 | 3472 | 208 | 861.0 | 165 | 387.4 | 531 | 398 | 859.8 |
| 850 | 2830 | 211 | 711.8 | 107 | 283.9 | 551 | 442 | 673.5 |
| 800 | 2359 | 214 | 601.8 | 73 | 219.2 | 571 | 475 | 545.6 |
| 750 | 1944 | 218 | 505.2 | 49 | 172.5 | 584 | 496 | 442.1 |
| 700 | 1581 | 222 | 418.3 | 32 | 138.6 | 579 | 495 | 355.1 |
| 630 | 1152 | 227 | 311.8 | 17 | 103.6 | 532 | 453 | 251.1 |
| 600 | 995 | 229 | 271.7 | 12 | 91.8 | 502 | 426 | 213.9 |
| 500 | 576 | 235 | 161.4 | 3 | 63.9 | 383 | 320 | 125.7 |

| | | ZONE LIMIT DATA | | | | | | |
|------------------|-----------|---------------------------------|------------------|-------------------------|---------------------------|---------------------|------------------|--------------|
| Engine Speed rpm | Power bhp | Fuel Cons ³ lb/hp-hr | Fuel Rate gal/hr | Boost Press in Hg-Gauge | Air Flow ⁴ cfm | Exh Temp to Turbo F | Exh Stack Temp F | Exh Flow cfm |
| 1000 | 7268 | 0.335 | 346.6 | 80 | 19312 | 1009 | 703 | 41310 |
| 950 | 6905 | 0.334 | 328.9 | 81 | 18666 | 999 | 682 | 39202 |
| 910 | 6614 | 0.334 | 315.2 | 78 | 17651 | 1009 | 697 | 37574 |
| 850 | 6178 | 0.335 | 295.4 | 69 | 15535 | 1063 | 770 | 35193 |
| 800 | 4428 | 0.346 | 218.4 | 40 | 10814 | 1085 | 859 | 26333 |
| 750 | 3649 | 0.351 | 182.8 | 27 | 8130 | 1146 | 941 | 21096 |
| 700 | 2823 | 0.361 | 145.4 | 16 | 5950 | 1181 | 997 | 16107 |
| 630 | 2162 | 0.372 | 114.7 | 9 | 4373 | 1194 | 1013 | 11997 |
| 600 | 2090 | 0.375 | 111.8 | 8 | 4047 | 1234 | 1041 | 11344 |
| 500 | 1554 | 0.389 | 86.1 | 4 | 2825 | 1222 | 1013 | 7803 |

| | | PROPELLER DEMAND DATA | | | | | | |
|------------------|-----------|---------------------------------|------------------|-------------------------|---------------------------|---------------------|------------------|--------------|
| Engine Speed rpm | Power bhp | Fuel Cons ³ lb/hp-hr | Fuel Rate gal/hr | Boost Press in Hg-Gauge | Air Flow ⁴ cfm | Exh Temp to Turbo F | Exh Stack Temp F | Exh Flow cfm |
| 1000 | 6179 | 0.342 | 301.7 | 72 | 18030 | 974 | 693 | 38167 |
| 950 | 5298 | 0.346 | 261.1 | 61 | 16318 | 978 | 707 | 34910 |
| 910 | 4657 | 0.342 | 227.3 | 49 | 13681 | 988 | 749 | 30364 |
| 850 | 3795 | 0.347 | 187.9 | 32 | 10027 | 1023 | 828 | 23786 |
| 800 | 3164 | 0.352 | 158.9 | 22 | 7742 | 1059 | 887 | 19267 |
| 750 | 2607 | 0.359 | 133.4 | 15 | 6091 | 1083 | 925 | 15612 |
| 700 | 2120 | 0.366 | 110.4 | 10 | 4894 | 1074 | 923 | 12540 |
| 630 | 1545 | 0.374 | 82.3 | 5 | 3660 | 990 | 848 | 8869 |
| 600 | 1335 | 0.377 | 71.7 | 4 | 3242 | 936 | 798 | 7553 |
| 500 | 772 | 0.387 | 42.6 | 1 | 2257 | 721 | 608 | 4440 |

Heat Rejection @ 100% Load and 25° C Air

| | | |
|-----------------------------------|----------------|-----------------|
| Lube Oil Cooler | kW (Btu/min) | 567 (32289) |
| Jacket Water | kW (Btu/min) | 1074 (61104) |
| AfterCooler | kW (Btu/min) | 1561 (88832) |
| Total Heat Rejection to Raw Water | kW (Btu/min) | 3203 (182225) |
| Exhaust Gas ² | kW (Btu/min) | 4122 (234542) |
| Radiation | kW (Btu/min) | 262 (14908) |

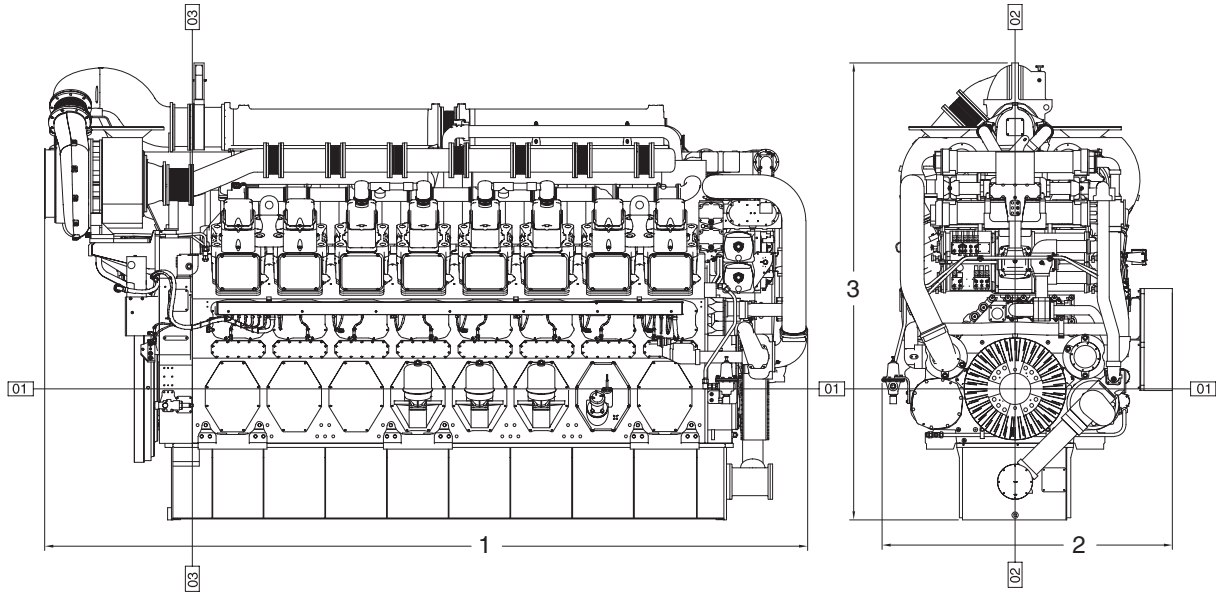
Notes

- 1 Ratings are based on ISO 3046/1 and SAEJ1995 Jan 90 standard reference conditions of 100 kPa, 25° C, and 30% relative humidity at the stated aftercooler water temperature.
- 2 Exhaust Heat rejection is based on fuel LHV and is not normally recoverable in total
- 3 At 100% load with JW and Oil pumps, without seawater pump, +/- 3%. Performance and fuel consumption are based on 35 API, 16° C fuel having a lower heating value of 42,780 kJ/kg used at 29° C with a density of 838.9 g/liter.
- 4 Air flows are shown for 25° C air inlet to the turbocharger and 32° C cooling water to the charge air cooler.
- 5 This engine's exhaust emissions are in compliance with the INTERNATIONAL MARINE ORGANIZATION'S (IMO) standard as described in REGULATION 13 of ANNEX VI of MARPOL 73/78 and ISO 8178 for measuring HC, CO, PM, and NOx.

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ENGINE DIMENSIONS



| Engine Dimensions | | |
|---------------------------|---------|-----------|
| (1) Overall Length | 5685 mm | 223.8 in. |
| (2) Overall Width | 2038 mm | 80.2 in. |
| (3) Overall Height | 3406 mm | 134.1 in. |

Note: Do not use for installation design. See general dimension drawings for detail.

| Engine Weights | | |
|-----------------------------|-----------|-----------|
| Engine Dry Weight | 28,500 kg | 62,832 lb |
| Shipped Loose Items | | |
| Torsional Coupling | 480 kg | 1,058 lb |
| Plate-Type Heat Exchanger | 475 kg | 1,045 lb |
| Instrument/Alarm Panel | 200 kg | 440 lb |
| Fluids | | |
| Lube Oil | 961 kg | 2,119 lb |
| Jacket Water | 1,060 kg | 2,337 lb |
| Heat Exchanger (FW, SW, LO) | 133 kg | 293 lb |

RATING DEFINITIONS AND CONDITIONS

Maximum Continuous Rating — 8% of the engine operating hours at 100% of rated power, 92% of the engine operating hours at 90% of rated power.

Ratings are based on SAE J1995/ISO3046 standard conditions of 100 kPa (29.61 in. Hg), 25°C (77°F), and 30% relative humidity at the stated charge air cooler water temperature. Ratings also meet classification society maximum temperature requirements of 45°C (113°F) air temperature to the turbocharger and 32°C (90°F) seawater temperature without derate.

Additional ratings may be available for specific customer requirements. Consult your Cat representative for additional information.

Fuel rates are based on 35° API, 16°C (60°F) fuel used at 29°C (85°F) with a density of 838.9 g/liter (7.001 lbs/U.S. gal). Lower Heat Value (LHV) of 42 780 kJ/kg (18,390 Btu/lb). Tolerance is +5%. Includes all engine mounted pumps. BSFC without pumps is 3% less.

Marine Certification — Ratings are marine classification society approved by ABS, BV, CCS, DnV, GL, KR, LRS, NKK, RINA, and RS. These societies have also granted C280 factory line production approval which eliminates requirement for society surveyor witness test.

Performance data is calculated in accordance with tolerances and conditions stated in this specification sheet and is only intended for purposes of comparison with other manufacturers' engines. Actual engine performance may vary according to the particular application of the engine and operating conditions beyond Caterpillar's control.

Power produced at the flywheel will be within standard tolerances up to 49°C (120°F) combustion air temperature measured at the air cleaner inlet, and fuel temperature up to 52°C (125°F) measured at the fuel filter base. Power rated in accordance with NMMA procedure as crankshaft power. Reduce crankshaft power by 3% for propeller shaft power.

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