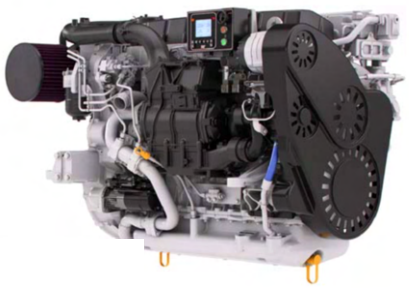
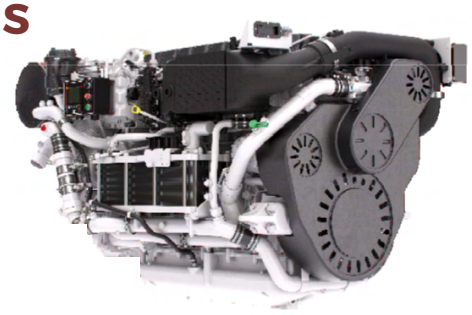
ACE Marine Diesel, Inc.

# TECHNICAL DATA SHEETS



CAT



## Directory:




FOR MORE INFORMATION, CALL OR EMAIL US DIRECTLY USING THE INFORMATION BELOW:

PHONE- 772-564-7070

EMAIL- INFO@ACEMARINEDIESEL.COM

# C18 ACERT™

## MARINE PROPULSION ENGINE

| | | |
|---|---|---|
| **1015 mhp** | **(1001 bhp)** | **2300 rpm** |
| **1150 mhp** | **(1136 bhp)** | **2300 rpm** |

Image shown may not reflect actual engine

## SPECIFICATIONS

**I-6, 4-Stroke-Cycle-Diesel**

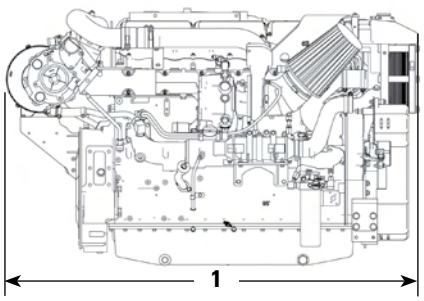
- EPA Tier 3 Recreational/IMO II compliant
- 18.0 L (1098 cu in) displacement
- 2300 rpm rated engine speed
- 145 mm (5.7 in) bore x 183 mm (7.2 in) stroke
- Turbocharged and aftercooled aspiration
- Electronically governed
- Heat exchanger cooled
- Refill capacity
  - Cooling system: 45 L (12 gal)
  - Lube oil system: 49 L (13 gal)
- 250-hour oil change interval
- Caterpillar Diesel Engine Oil 10W30 or 15W40
- SAE No. 1 flywheel housing with SAE No. 14 flywheel (113 teeth)
- Counterclockwise rotation from flywheel end

## STANDARD ENGINE EQUIPMENT

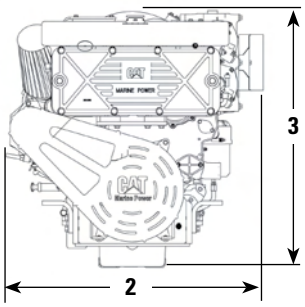
- Corrosion-resistant sea water aftercooler
- Air cleaner/fumes disposal (closed system)
- Crankcase breather
- Titanium plate heat exchanger with integral fuel cooler
- Coolant recovery system
- Sea water pump and jacket water pump
- Front- and rear-down aftercooler condensate drains
- Watercooled exhaust manifold and turbochargers
- Round flanged exhaust outlet
- Engine oil cooler and oil filler
- Center sump oil pan
- Oil filter and dipstick, RH or LH service
- MEUI fuel system
- Fuel filter RH or LH service
- Fuel transfer and priming pumps
- Hybrid fuel lines
- Electronic fuel/air ratio control
- Front support adjustable mounting system
- SAE A hydraulic pump drive
- Two-groove crankshaft pulley
- Front damper guard
- Customer wiring and service tool connector

## DIMENSIONS

Right Side




Front




| ENGINE DIMENSIONS & WEIGHT | | |
|---|---|---|
| **(1) Length** | 1931 mm | 76.0 in |
| **(2) Width** | 1204 mm | 47.4 in |
| **(3) Height** | 1198 mm | 47.2 in |
| **Weight, Net Dry (approx)** | 1814 kg | 4,000 lb |

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

# C18 ACERT™

**MARINE PROPULSION ENGINE**

## MARINE ENGINE PERFORMANCE

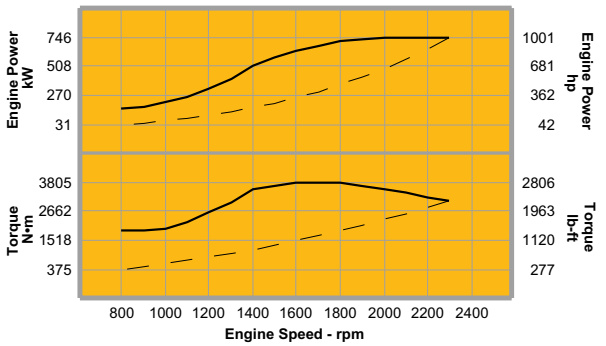
### Max Power

| | E Rating – EM0261 | | | | E Rating – EM0260 | | | |
|---|---|---|---|---|---|---|---|---|
| rpm | bhp | g/hr | bkW | g/bkW-hr | bhp | g/hr | bkW | g/bkW-hr |
| 2300 | 1001 | 53.8 | 747 | 228.9 | 1136 | 58.6 | 847 | 219.8 |
| 1900 | 973 | 46.6 | 725 | 203.8 | 1115 | 54.9 | 831 | 210.0 |
| 1500 | 775 | 36.1 | 578 | 198.3 | 874 | 41.4 | 651 | 201.9 |
| 1100 | 341 | 16.7 | 255 | 209.0 | 385 | 19.0 | 287 | 209.8 |
| 800 | 218 | 10.9 | 162 | 212.5 | 227 | 11.6 | 169 | 218.0 |

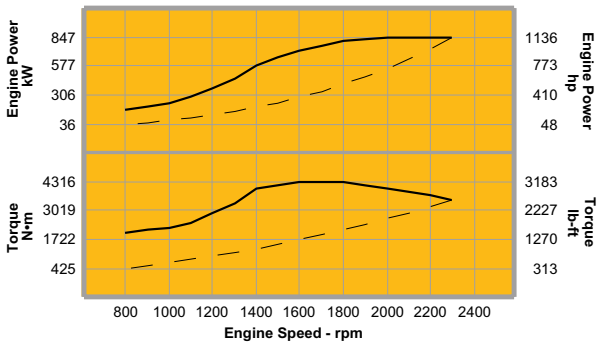
### Prop Demand

| | E Rating – EM0261 | | | | E Rating – EM0260 | | | |
|---|---|---|---|---|---|---|---|---|
| rpm | bhp | g/hr | bkW | g/bkW-hr | bhp | g/hr | bkW | g/bkW-hr |
| 2300 | 1001 | 53.8 | 747 | 228.9 | 1136 | 58.6 | 847 | 219.8 |
| 1900 | 564 | 29.1 | 421 | 219.8 | 640 | 33.1 | 478 | 220.2 |
| 1500 | 278 | 14.5 | 207 | 222.9 | 315 | 16.2 | 235 | 218.4 |
| 1100 | 110 | 5.8 | 82 | 223.5 | 124 | 6.4 | 93 | 221.0 |
| 800 | 42 | 2.4 | 31 | 242.2 | 48 | 2.7 | 36 | 241.7 |

**1015 mhp (747 bkW) @ 2300 rpm**




**1150 mhp (847 bkW) @ 2300 rpm**




Maximum Power ——— Prop Demand — — —

## OPTIONAL EQUIPMENT

- Sea water pump – vertical inlet
- Battery charger 10 amp
- Charging alternator 24V 105 amp
- Primary fuel/water separator
- Primary fuel filter
- Fuel cooler, flexible fuel lines
- Transmission oil cooler
- Electric starting motor – 24V LH service
- Battery sets – 24V 950-1300 CCA
- MECP I control panel
- OEM wiring harness – 30,50,80 foot lengths
- Engine-to-engine wiring harness – 15, 30 foot lengths
- Transmission sensors – pressure, temperature
- Five-groove pulley stack (8-inch diameter)



U.S. Sourced
LEHM0087-03 (11-13)

# C8.7

MARINE PROPULSION ENGINE

**478 bkW (641 bhp) @ 2300 rpm E Rating (High Performance)**
**Heat Exchanger Cooled-Sea Water Aftercooled**

## GENERAL ENGINE SPECIFICATIONS

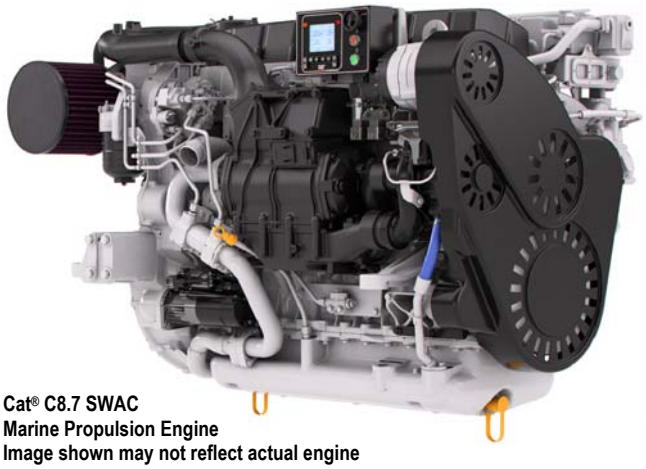
### Basic Engine Specifications

I-6, 4-Stroke-Cycle-Diesel

| | |
|---|---|
| Displacement | 8.71 L (531.5 $in^3$) |
| Rated engine speed | 2300 rpm |
| High idle speed | 2530 rpm |
| Low idle speed (programmable) | 600 rpm |
| Peak torque | 2332 N•m @ 1700 rpm |
| Bore | 117 mm (4.61 in) |
| Stroke | 135 mm (5.31 in) |
| Aspiration | Supercharged-Turbocharged-Aftercooled |
| Governor | ECU |
| Fuel system type | Common Rail |
| Length | 1200 mm (47.2 in) |
| Width | 887 mm (34.9 in) |
| Height | 983 mm (38.7 in) |
| Weight, net dry (approx.) | 1071 kg (2361 lb) |
| Rotation (from flywheel end) | Counterclockwise |
| Flywheel housing/flywheel | SAE No. 01M |
| Flywheel teeth | 149 |

### Tolerances

| | |
|---|---|
| Power | +/- 3% |
| Exhaust Stack Temperature | +/- 8% |
| Inlet Air Flow | +/- 5% |
| Intake Manifold Pressure | +/- 10% |
| Exhaust Flow | +/- 6% |
| Specific Fuel Consumption | +/- 3% |
| Heat Rejection | +/- 5% |
| Fuel Rate | +/- 5% |



**Cat® C8.7 SWAC**
**Marine Propulsion Engine**
**Image shown may not reflect actual engine**

### Emission Compliance

**Recreational**

EPA Tier 3 (E5 Cycle – Recreational Only)
IMO II (EPA, GLSeeBG)
Recreational Craft Directive (EU) RCD

**Commercial**

EU Stage IIIA
IMO II (GL, SeeBG)
CCNR Stage II through reciprocity with EU Stage IIIA

### Power Output Considerations

Power produced at the flywheel will be within standard tolerances up to 45°C (113°F) combustion air temperature measured at the turbocharger air compressor inlet, sea water temperature up to 32°C (89.6°F), and fuel temperature up to 50°C (122°F) measured at the engine inlet. Power rated in accordance with NMMA procedure as crankshaft power.

**General Remarks**

- For installation instructions refer to Project Guide LEBM0034.
- For general dimensions refer to drawing 468-1067.
- For detailed information about fuel, oil, and cooling water treatment, please refer to “Caterpillar Commercial Diesel Engine Fluids Recommendations” (SEBU6251).

## AIR SYSTEM

### Combustion Air Inlet System

| | |
|---|---|
| Intake combustion air flow | 29.8 $m^3$/min (1052.4 cfm) |
| Intake combustion air temperature up to | 45°C (113°F) |
| Max. allowable intake air restriction | 5.0 kPa (20 in H2O) |

### Engine Room Ventilation Air

| | |
|---|---|
| Heat rejection to atmosphere | 20.2 kW (1149 BTU/min) @ 25°C (77°F) ambient temperature |

## COOLING SYSTEM

### Jacket Water Cooling System

| | |
|---|---|
| Cooling water refill capacity | 41 L (10.8 gal) |
| Coolant medium | Cat® Extended Life Coolant (ELC) or equal |
| Expansion tank pressure cap | 100 kPa (14.5 psi) |

### Raw Water Cooling System (SWAC)

| | |
|---|---|
| Heat rejection to raw water cooling system | 95.9 kW (5,454 BTU/min) |
| Flow raw water pump 442-7488 – max. | 360 L/min @ 1.3 m $H_2O$ |
| min. | 294 L/min @ 9.7 m $H_2O$ |
| Raw water pump maximum inlet restriction. | 3 m (9.8 ft) $H_2O$ |
| Raw water temperature engine out to gear oil cooler (max.) | 51.9°C (125°F) |
| Raw water temperature from gear oil cooler 448-9439 if equipped (max.) | 52.4°C (126°F) |
| Gear oil cooler 448-9439 heat rejection capability | 10.4 kW (591.4 BTU/min) |
| Raw water connection engine inlet | 63 mm (2.50 inch) SAE J1231 Hose Connection |
| Raw water connection engine outlet | 50 mm (1.97 inch) SAE J1231 Hose Connection |
| Sea water strainer mesh hole diameter (max) | 1.6 mm (0.063 in) |

## EXHAUST SYSTEM

### Exhaust Gas Data

| | |
|---|---|
| Exhaust gas flow (total) | 2,048.3 kg/hr (4,515.7 lb/hr) |
| Exhaust stack temperature | 504°C (939°F) |
| Engine exhaust connection V-band clamp | 150 mm (5.91 in) |
| Max. allowable system backpressure | 10 kPa (40.1 in $H_2O$) |
| Max. allowable static weight on turbine outlet | 0 kg (0 lb) |
| Max. allowable static bending moment on turbine outlet | 0 Nm (0 ft-lbs) |

*Specified system backpressure shall not be exceeded in any circumstances. Caterpillar advises to limit value of maximum allowable backpressure to 50% for new (clean) installations. Minimum diameter of customer piping should be according to "Customer piping diameter overview for Caterpillar engines."*

# C8.7

MARINE PROPULSION ENGINE

## FUEL SYSTEM

| | |
|---|---|
| Fuel flow supply line (max) | 220 L/hr (58.1 gal/hr) |
| Fuel flow return line (max) | 125 L/hr (33.0 gal/hr) |
| Fuel rate at rated speed | 123.8 L/hr (32.7 gal/hr) |
| Total fuel supply restriction (max.) | 30 kPa (8.9 in Hg) (4.4 psi) |
| Fuel restriction across priming pump and clean filter | 15 kPa (4.4 in Hg) (2.2 psi) |
| Allowable fuel restriction of OEM supplied components | 15 kPa (4.4 in Hg) (2.2 psi) |
| Fuel temperature engine inlet (max.) | 50°C (122°F) |
| Fuel return line restriction (max.) | 20 kPa (5.9 in Hg) (2.9 psi) |
| Fuel supply/return connection | 3/4-16 SAE J514 (-8), 37° FLARE |
| Minimum fuel supply line inside diameter | SAE -10 (15.9mm) (5/8 in) |
| Electric fuel priming pump inlet/outlet connection | 7/8-14 SAE J1926-1 (No. 10) STOR |
| Diesel fuel grade | US Diesel #2 / EN590 / Biodiesel 7% max |

## LUBE SYSTEM

| | |
|---|---|
| Sump type | Center Sump |
| Sump capacity | 34 L (9.0 gal) |
| Oil change interval | 250 Hr |
| | *(may be modified by S•O•S℠ testing)* |
| Max. installation angle (fore-aft) | 10 degrees |
| Max. operating angle (fore-aft) | 20 degrees |
| Max. operating angle (athwart ship) | 22.5 degrees |
| Quality diesel engine oil (min.) | CI-4 10W30 or 15W40 |
| | *(compliant with Caterpillar specification ECF-2)* |

## STARTING SYSTEM

### Electrical Starting System (24V)

| | |
|---|---|
| Electrical starting motor | 24 VDC |
| Cold starting | 670 CCA |
| | *[at 0°C (32°F) ambient temperature]* |
| Recommended battery capacity | 2 x 88 Ah, series |

### Electrical Starting System (12V)

| | |
|---|---|
| Electrical starting motor | 12 VDC |
| Cold starting | 670 CCA |
| | *[at 0°C (32°F) ambient temperature]* |
| Recommended battery capacity | 2 x 88 Ah, parallel |

## SOUND DATA

**Exhaust Sound Power Level Overall – Grade 3 environment**

128.1 dB(A)

**Mechanical Sound Pressure Level Overall – grade 3 environment**

| | |
|---|---|
| At distance 1.0 m (3.28 ft) | 101.4 dB(A) |

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 45°C (113°F) combustion air temperature measured at the air cleaner inlet, and fuel temperature up to 50°C (122°F) measured at the engine inlet. Power rated in accordance with NMMA procedure as crankshaft power. Reduce crankshaft power by 3% for propeller shaft power.



Performance No : EM0870

LEHM0179-00

# C12.9

MARINE PROPULSION ENGINE

## 1000 mhp (985 bhp) 735 bkW @ 2300 rpm E Rating (High Performance) Heat Exchanger Cooled Separate Circuit Aftercooler (SCAC)

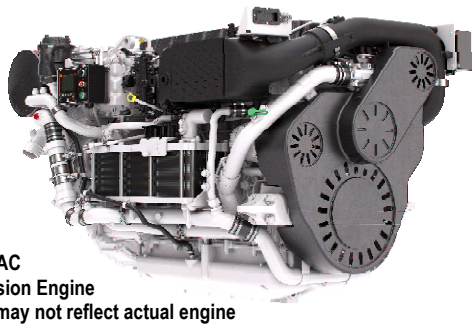
Reference Data Only: Always consult your Caterpillar Marine Dealer for the latest information from TMI prior to determining vessel specific calculations.

## GENERAL ENGINE SPECIFICATIONS

### Basic Engine Specifications

I-6, 4-Stroke-Cycle-Diesel

| | |
|---|---|
| Displacement | 12.88 L ($in^3$) |
| Rated engine speed | 2300 rpm |
| High idle speed | 2530 rpm |
| Low idle speed (programmable) | 550 rpm |
| Peak torque | 3,355 N•m @ 1200 rpm |
| Bore | 135 mm (in) |
| Stroke | 150 mm (in) |
| Aspiration | Supercharged-Turbocharged-Aftercooled |
| Governor | ECU |
| Fuel system type | Common Rail |
| Length | 1960 mm (77.1 in) |
| Length to flywheel housing | 1476 mm (58.1 in) |
| Width | 1195 mm (47.0 in) |
| Height | 1117 mm (43.9 in) |
| Weight, net dry (approx.) | 1672 kg (3686 lb) |
| Rotation (from flywheel end) | Counterclockwise |
| Flywheel housing/flywheel | SAE No. 01M |
| Flywheel teeth | 155 |



**Cat® C12.9 SCAC**
**Marine Propulsion Engine**
**Image shown may not reflect actual engine**

### Tolerances

| | |
|---|---|
| Power | +/- 3% |
| Exhaust Stack Temperature | +/- 8% |
| Inlet Air Flow | +/- 5% |
| Intake Manifold Pressure | +/- 10% |
| Exhaust Flow | +/- 6% |
| Specific Fuel Consumption | +/- 3% |
| Heat Rejection | +/- 5% |
| Fuel Rate | +/- 5% |

### Power Output Considerations

Power produced at the flywheel will be within standard tolerances up to 45°C (113°F) combustion air temperature measured at the turbocharger air compressor inlet, sea water temperature up to 32°C (89.6°F), and fuel temperature up to 50°C (122°F) measured at the engine inlet. Power rated in accordance with NMMA procedure as crankshaft power.

### Emission Compliance

**Recreational**

EPA Tier 3 (E5 Cycle – Recreational Only)
IMO II (EPA, GLSeeBG)
Recreational Craft Directive (EU) RCD

**Commercial**

EU Stage IIIA
IMO II (GL, SeeBG)
CCNR Stage II through reciprocity with EU Stage IIIA

**General Remarks**

- For installation instructions refer to Project Guide LEBM0049.
- For general dimensions refer to drawing 498-5630.
- For detailed information about fuel, oil, and cooling water treatment, please refer to “Caterpillar Commercial Diesel Engine Fluids Recommendations” (SEBU6251).

## AIR SYSTEM

### Combustion Air Inlet System

| | |
|---|---|
| Intake combustion air flow | 45.7 $m^3$/min (1612.6 cfm) |
| Intake combustion air temperature up to | 45°C (113°F) |
| Max. allowable intake air restriction | 5.0 kPa (20 in H2O) |

### Engine Room Ventilation Air

| | |
|---|---|
| Heat rejection to atmosphere | 29.8 kW (1696 BTU/min) @ 25°C (77°F) ambient temperature |

## COOLING SYSTEM

### SCAC Cooled Engine. One cooling medium, two separate circuits

| | |
|---|---|
| Cooling water refill capacity | 60 L (15.9 gal) |
| Coolant medium | Cat® Extended Life Coolant (ELC) or equal |
| Expansion tank pressure cap | 100 kPa (14.5 psi) |

### Raw Water Cooling System

| | | |
|---|---|---|
| Flow raw water pump 447-3071 at rated 2300 RPM | max | 560 L/min @ 3.4 m $H_2O$ |
| | min. | 411 L/min @ 23.4 m $H_2O$ |
| Raw water pump maximum inlet restriction. | | 3 m (9.8 ft) $H_2O$ |
| Raw water temperature engine out to gear oil cooler (max.) | | 51.9°C (125°F) |
| Raw water temperature from gear oil cooler 474-7150 if equipped (max.) | | 52.4°C (126°F) |
| Gear oil cooler 474-7150 heat rejection capability | | 10.4 kW (591.4 BTU/min) |
| Raw water connection engine inlet | | 76 mm (2.99 inch) SAE J1231 Hose Connection |
| Raw water connection engine outlet | | 63 mm (2.48 inch) SAE J1231 Hose Connection |
| Gear oil cooler inlet and outlet connections | | 63 mm (2.48 inch) SAE J1231 Hose Connection |
| Sea water strainer mesh hole diameter (max) | | 1.6 mm (0.063 in) |

## EXHAUST SYSTEM

### Exhaust Gas Data

| | |
|---|---|
| Exhaust gas flow (total) | 3,903.4 kg/hr (8,605.4 lb/hr) |
| Exhaust stack temperature | 491.1°C (916°F) |
| Engine exhaust connection V-band clamp | 131 mm (5.16 in) |
| Max. allowable system backpressure | 10 kPa (40.1 in $H_2O$) |
| Max. allowable static weight on turbine outlet | 0 kg (0 lb) |
| Max. allowable static bending moment on turbine outlet | 0 Nm (0 ft-lbs) |

*Specified system backpressure shall not be exceeded in any circumstances. Caterpillar advises to limit value of maximum allowable backpressure to 50% for new (clean) installations. Minimum diameter of customer piping should be according to "Customer piping diameter overview for Caterpillar engines."*

# C12.9

MARINE PROPULSION ENGINE

## FUEL SYSTEM

| | |
|---|---|
| Fuel flow supply line (max) | 870 L/hr (229.8 gal/hr) |
| Fuel flow return line (max) | 850 L/hr (224.5 gal/hr) |
| Fuel rate at rated speed | 191.8 L/hr (50.7 gal/hr) |
| Total fuel supply restriction (max.) | 60 kPa (17.7 in Hg) (7.3 psi) |
| Fuel restriction across priming pump and clean filter | 15 kPa (4.3 in Hg) (2.2 psi) |
| Allowable fuel restriction of OEM supplied components | 45 kPa (13.4 in Hg) (5.1 psi) |
| Fuel temperature engine inlet (max.) | 50°C (122°F) |
| Fuel return line restriction (max.) | 50 kPa (14.8 in Hg) (7.3 psi) |
| Fuel supply connection | 7/8-14 SAE J514 (-10), 37° FLARE |
| Fuel return connection | 3/4-16 SAE J514 (-8), 37° FLARE |
| Minimum fuel supply line inside diameter | SAE -10 (15.9mm) (5/8 in) |
| Electric fuel priming pump inlet/outlet connection | 7/8-14 SAE J1926-1 (No. 10) STOR |
| Diesel fuel grade | US Diesel #2 / EN590 / Biodiesel 7% max |

## LUBE SYSTEM

| | |
|---|---|
| Sump type | Center Sump |
| Sump capacity | 47 L (12.4 gal) |
| Oil change interval | 250 Hr |
| Max. installation angle (fore-aft) | 10 degrees |
| Max. operating angle (fore-aft) | 20 degrees |
| Max. operating angle (athwart ship) | 22.5 degrees |
| Quality diesel engine oil (min.) | CI-4 10W30 or 15W40 |
| | *(compliant with Caterpillar specification ECF-2)* |

## STARTING SYSTEM

### Electrical Starting System (24V)

| | |
|---|---|
| Electrical starting motor | 24 VDC |
| Cold starting | 670 CCA |
| | *[at 0°C (32°F) ambient temperature]* |
| Recommended battery capacity | 2 x 88 Ah, series |

### Electrical Starting System (12V)

| | |
|---|---|
| Electrical starting motor | 12 VDC |
| Cold starting | 670 CCA |
| | *[at 0°C (32°F) ambient temperature]* |
| Recommended battery capacity | 2 x 88 Ah, parallel |

## SOUND DATA

**Exhaust Sound Power Level Overall – Grade 3 environment**

130 dB(A)

**Mechanical Sound Pressure Level Overall – grade 3 environment**

At distance 1.0 m (3.28 ft) ..... 122 dB(A)

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 45°C (113°F) combustion air temperature measured at the air cleaner inlet, and fuel temperature up to 50°C (122°F) measured at the engine inlet. Power rated in accordance with NMMA procedure as crankshaft power. Reduce crankshaft power by 3% for propeller shaft power.



Performance No : EM0872

LEHM0222-00 (12-15)

# C12.9

MARINE PROPULSION ENGINE

## 850 mhp (838 bhp) 625 bkW @ 2300 rpm E Rating (High Performance) Heat Exchanger Cooled Separate Circuit Aftercooler (SCAC)

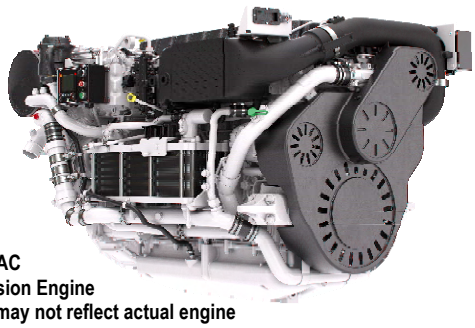
Reference Data Only: Always consult your Caterpillar Marine Dealer for the latest information from TMI prior to determining vessel specific calculations.

## GENERAL ENGINE SPECIFICATIONS

### Basic Engine Specifications

I-6, 4-Stroke-Cycle-Diesel

| | |
|---|---|
| Displacement | 12.88 L ($in^3$) |
| Rated engine speed | 2300 rpm |
| High idle speed | 2530 rpm |
| Low idle speed (programmable) | 550 rpm |
| Peak torque | 2881 N•m @ 1200 rpm |
| Bore | 135 mm (in) |
| Stroke | 150 mm (in) |
| Aspiration | Series Turbocharged-Aftercooled |
| Governor | ECU |
| Fuel system type | Common Rail |
| Length | 1960 mm (77.1 in) |
| Length to flywheel housing | 1476 mm (58.1 in) |
| Width | 1195 mm (47.0 in) |
| Height | 1117 mm (43.9 in) |
| Weight, net dry (approx.) | 1649 kg (3686 lb) |
| Rotation (from flywheel end) | Counterclockwise |
| Flywheel housing/flywheel | SAE No. 01M |
| Flywheel teeth | 155 |



**Cat® C12.9 SCAC**
**Marine Propulsion Engine**
**Image shown may not reflect actual engine**

### Tolerances

| | |
|---|---|
| Power | +/- 3% |
| Exhaust Stack Temperature | +/- 8% |
| Inlet Air Flow | +/- 5% |
| Intake Manifold Pressure | +/- 10% |
| Exhaust Flow | +/- 6% |
| Specific Fuel Consumption | +/- 3% |
| Heat Rejection | +/- 5% |
| Fuel Rate | +/- 5% |

### Power Output Considerations

Power produced at the flywheel will be within standard tolerances up to 45°C (113°F) combustion air temperature measured at the turbocharger air compressor inlet, sea water temperature up to 32°C (89.6°F), and fuel temperature up to 50°C (122°F) measured at the engine inlet. Power rated in accordance with NMMA procedure as crankshaft power.

### Emission Compliance

**Recreational**

EPA Tier 3 (E5 Cycle – Recreational Only)
IMO II (EPA, GLSeeBG)
Recreational Craft Directive (EU) RCD

**Commercial**

EU Stage IIIA
IMO II (GL, SeeBG)
CCNR Stage II through reciprocity with EU Stage IIIA

**General Remarks**

- For installation instructions refer to Project Guide LEBM0049.
- For general dimensions refer to drawing 498-5630.
- For detailed information about fuel, oil, and cooling water treatment, please refer to “Caterpillar Commercial Diesel Engine Fluids Recommendations” (SEBU6251).

## AIR SYSTEM

### Combustion Air Inlet System

| | |
|---|---|
| Intake combustion air flow | 44.4 $m^3$/min (1568 cfm) |
| Intake combustion air temperature up to | 45°C (113°F) |
| Max. allowable intake air restriction | 5.0 kPa (20 in H2O) |

### Engine Room Ventilation Air

| | |
|---|---|
| Heat rejection to atmosphere | 23.8 kW (1355 BTU/min) @ 25°C (77°F) ambient temperature |

## COOLING SYSTEM

### SCAC Cooled Engine. One cooling medium, two separate circuits

| | |
|---|---|
| Cooling water refill capacity | 60 L (15.9 gal) |
| Coolant medium | Cat® Extended Life Coolant (ELC) or equal |
| Expansion tank pressure cap | 100 kPa (14.5 psi) |

### Raw Water Cooling System

| | | |
|---|---|---|
| Flow raw water pump 447-3071 at rated 2300 RPM | max | 560 L/min @ 3.4 m $H_2O$ |
| | min. | 411 L/min @ 23.4 m $H_2O$ |
| Raw water pump maximum inlet restriction. | | 3 m (9.8 ft) $H_2O$ |
| Raw water temperature engine out to gear oil cooler (max.) | | 51.9°C (125°F) |
| Raw water temperature from gear oil cooler 483-3074 if equipped (max.) | | 52.4°C (126°F) |
| Gear oil cooler 483-3074 heat rejection capability | | 10.4 kW (591.4 BTU/min) |
| Raw water connection engine inlet | | 76 mm (2.99 inch) SAE J1231 Hose Connection |
| Raw water connection engine outlet | | 63 mm (2.48 inch) SAE J1231 Hose Connection |
| Gear oil cooler inlet and outlet connections | | 63 mm (2.48 inch) SAE J1231 Hose Connection |
| Sea water strainer mesh hole diameter (max) | | 1.6 mm (0.063 in) |

## EXHAUST SYSTEM

### Exhaust Gas Data

| | |
|---|---|
| Exhaust gas flow (total) | 3,745 kg/hr (8256 lb/hr) |
| Exhaust stack temperature | 439.2°C (823°F) |
| Engine exhaust connection V-band clamp | 131 mm (5.16 in) |
| Max. allowable system backpressure | 10 kPa (40.1 in $H_2O$) |
| Max. allowable static weight on turbine outlet | 0 kg (0 lb) |
| Max. allowable static bending moment on turbine outlet | 0 Nm (0 ft-lbs) |

*Specified system backpressure shall not be exceeded in any circumstances. Caterpillar advises to limit value of maximum allowable backpressure to 50% for new (clean) installations. Minimum diameter of customer piping should be according to "Customer piping diameter overview for Caterpillar engines."*

# C12.9

MARINE PROPULSION ENGINE

## FUEL SYSTEM

| | |
|---|---|
| Fuel flow supply line (max) | 870 L/hr (229.8 gal/hr) |
| Fuel flow return line (max) | 850 L/hr (224.5 gal/hr) |
| Fuel rate at rated speed | 163.9 L/hr (43.3 gal/hr) |
| Total fuel supply restriction (max.) | 60 kPa (17.7 in Hg) (7.3 psi) |
| Fuel restriction across priming pump and clean filter | 15 kPa (4.3 in Hg) (2.2 psi) |
| Allowable fuel restriction of OEM supplied components | 45 kPa (13.4 in Hg) (5.1 psi) |
| Fuel temperature engine inlet (max.) | 50°C (122°F) |
| Fuel return line restriction (max.) | 50 kPa (14.8 in Hg) (7.3 psi) |
| Fuel supply connection | 7/8-14 SAE J514 (-10), 37° FLARE |
| Fuel return connection | 3/4-16 SAE J514 (-8), 37° FLARE |
| Minimum fuel supply line inside diameter | SAE -10 (15.9mm) (5/8 in) |
| Electric fuel priming pump inlet/outlet connection | 7/8-14 SAE J1926-1 (No. 10) STOR |
| Diesel fuel grade | US Diesel #2 / EN590 / Biodiesel 7% max |

## LUBE SYSTEM

| | |
|---|---|
| Sump type | Center Sump |
| Sump capacity | 47 L (12.4 gal) |
| Oil change interval | 250 Hr |
| Max. installation angle (fore-aft) | 10 degrees |
| Max. operating angle (fore-aft) | 20 degrees |
| Max. operating angle (athwart ship) | 22.5 degrees |
| Quality diesel engine oil (min.) | CI-4 10W30 or 15W40 |
| | *(compliant with Caterpillar specification ECF-2)* |

## STARTING SYSTEM

### Electrical Starting System (24V)

| | |
|---|---|
| Electrical starting motor | 24 VDC |
| Cold starting | 670 CCA |
| | *[at 0°C (32°F) ambient temperature]* |
| Recommended battery capacity | 2 x 88 Ah, series |

### Electrical Starting System (12V)

| | |
|---|---|
| Electrical starting motor | 12 VDC |
| Cold starting | 670 CCA |
| | *[at 0°C (32°F) ambient temperature]* |
| Recommended battery capacity | 2 x 88 Ah, parallel |

## SOUND DATA

**Exhaust Sound Power Level Overall – Grade 3 environment**

127 dB(A)

**Mechanical Sound Pressure Level Overall – grade 3 environment**

At distance 1.0 m (3.28 ft) ..... 121 dB(A)

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 45°C (113°F) combustion air temperature measured at the air cleaner inlet, and fuel temperature up to 50°C (122°F) measured at the engine inlet. Power rated in accordance with NMMA procedure as crankshaft power. Reduce crankshaft power by 3% for propeller shaft power.

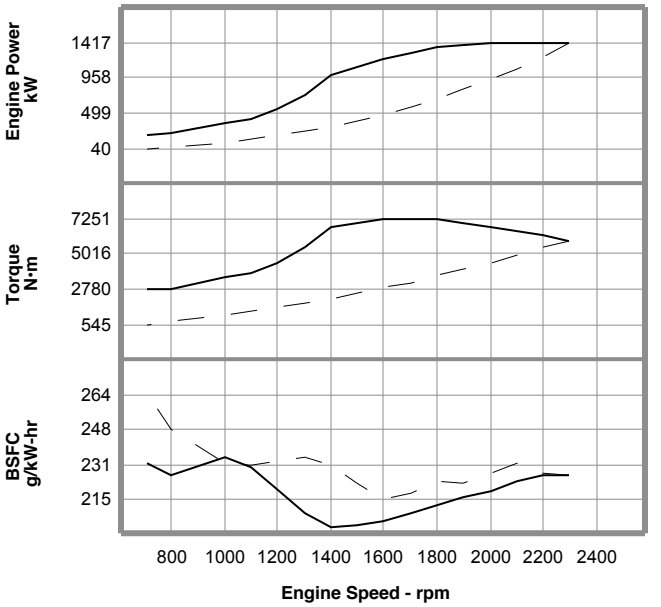


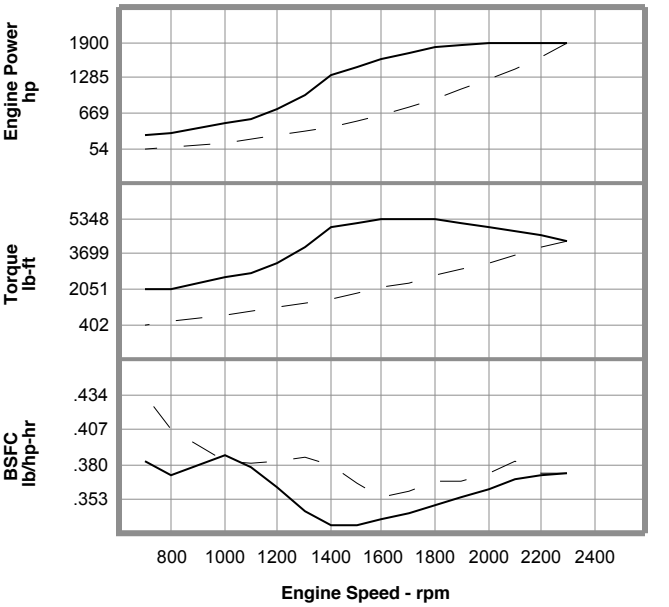
Performance No : EM0871

LEHM0223-00 (12-15)

# Marine Engine Performance
# C32 DITA
## 1417 kW (1900 hp) @ 2300 rpm
**E-RATING - DM9451-01**

CATERPILLAR®




**Metric** | Maximum Power — | Prop Demand — — | **1417 kW**

### Performance Data

| | Engine Speed rpm | Engine Power kW | Engine Torque N•m | BSFC g/kW-hr | Fuel Rate L/hr |
|---|---|---|---|---|---|
| **Maximum Power Data** | 2300 | 1417.0 | 5883 | 227.2 | 383.8 |
| | 2200 | 1417.0 | 6151 | 226.9 | 383.2 |
| | 2100 | 1417.0 | 6444 | 223.4 | 377.4 |
| | 1900 | 1388.0 | 6976 | 215.4 | 356.4 |
| | 1800 | 1352.0 | 7173 | 211.7 | 341.2 |
| | 1600 | 1215.0 | 7251 | 204.7 | 296.5 |
| | 1500 | 1097.0 | 6984 | 202.4 | 264.6 |
| | 1300 | 736.0 | 5406 | 208.4 | 182.8 |
| | 1100 | 430.0 | 3733 | 230.6 | 118.2 |
| | 800 | 229.0 | 2733 | 226.9 | 61.9 |
| | 700 | 204.0 | 2783 | 232.6 | 56.6 |
| **Prop Demand Data** | 2300 | 1417.0 | 5883 | 227.2 | 383.8 |
| | 2200 | 1240.1 | 5383 | 227.7 | 336.6 |
| | 2100 | 1078.6 | 4905 | 232.6 | 299.0 |
| | 1900 | 798.8 | 4015 | 222.6 | 211.9 |
| | 1800 | 679.2 | 3603 | 223.0 | 180.5 |
| | 1600 | 477.0 | 2847 | 214.9 | 122.2 |
| | 1500 | 393.1 | 2502 | 222.2 | 104.1 |
| | 1300 | 255.9 | 1880 | 234.6 | 71.5 |
| | 1100 | 155.0 | 1346 | 231.8 | 42.8 |
| | 800 | 59.6 | 712 | 248.3 | 17.6 |
| | 700 | 39.9 | 545 | 264.1 | 12.6 |

Cubic prop demand curve with 3.0 exponent for displacement hulls only.

**English** | Maximum Power — | Prop Demand — — | **1900 hp**

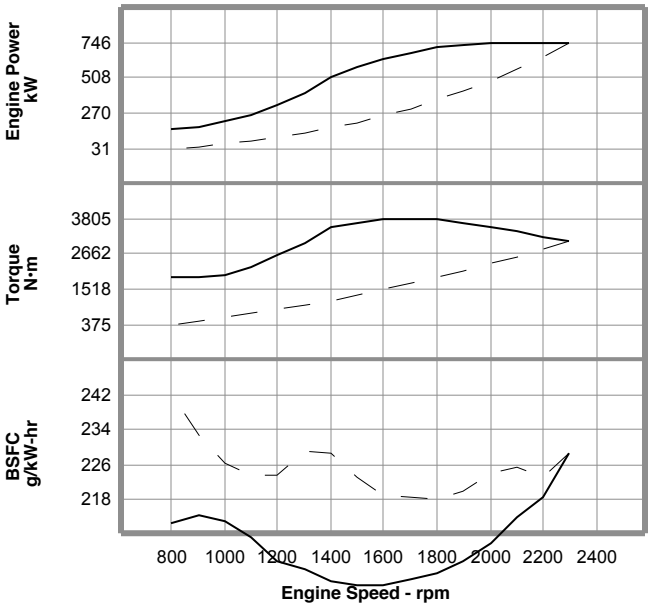
### Performance Data

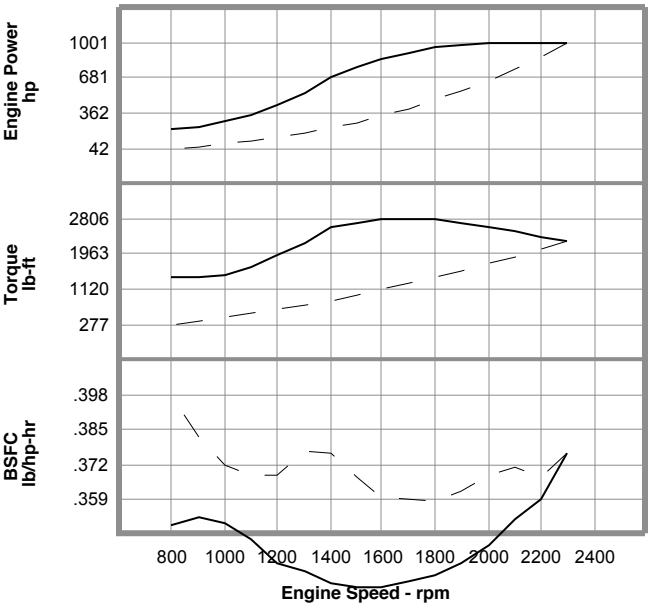
| | Engine Speed rpm | Engine Power hp | Engine Torque lb-ft | BSFC lb/hp-hr | Fuel Rate gph |
|---|---|---|---|---|---|
| **Maximum Power Data** | 2300 | 1900.2 | 4339 | .374 | 101.4 |
| | 2200 | 1900.2 | 4536 | .373 | 101.2 |
| | 2100 | 1900.2 | 4753 | .367 | 99.7 |
| | 1900 | 1861.3 | 5145 | .354 | 94.2 |
| | 1800 | 1813.1 | 5290 | .348 | 90.1 |
| | 1600 | 1629.3 | 5348 | .337 | 78.3 |
| | 1500 | 1471.1 | 5151 | .333 | 69.9 |
| | 1300 | 987.0 | 3987 | .343 | 48.3 |
| | 1100 | 576.6 | 2753 | .379 | 31.2 |
| | 800 | 307.1 | 2016 | .373 | 16.4 |
| | 700 | 273.6 | 2053 | .382 | 15.0 |
| **Prop Demand Data** | 2300 | 1900.2 | 4339 | .374 | 101.4 |
| | 2200 | 1663.0 | 3970 | .374 | 88.9 |
| | 2100 | 1446.4 | 3618 | .382 | 79.0 |
| | 1900 | 1071.2 | 2961 | .366 | 56.0 |
| | 1800 | 910.8 | 2657 | .367 | 47.7 |
| | 1600 | 639.7 | 2100 | .353 | 32.3 |
| | 1500 | 527.2 | 1845 | .365 | 27.5 |
| | 1300 | 343.2 | 1387 | .386 | 18.9 |
| | 1100 | 207.9 | 993 | .381 | 11.3 |
| | 800 | 79.9 | 525 | .408 | 4.6 |
| | 700 | 53.5 | 402 | .434 | 3.3 |

Power produced at the flywheel will be within standard tolerances up to 50°C (122°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.

# Marine Engine Performance
# C18 DITA
## 747 kW (1001 hp) @ 2300 rpm
**E-RATING - EM0261-00**

CATERPILLAR®




**Metric** | Maximum Power — | Prop Demand — — | **747 kW**

**English** | Maximum Power — | Prop Demand — — | **1001 hp**

### Performance Data

| | Engine Speed rpm | Engine Power kW | Engine Torque N•m | BSFC g/kW-hr | Fuel Rate L/hr |
|---|---|---|---|---|---|
| **Maximum Power Data** | 2300 | 746.5 | 3099 | 228.9 | 203.7 |
| | 2200 | 740.7 | 3215 | 218.3 | 192.7 |
| | 2100 | 741.9 | 3374 | 213.5 | 188.8 |
| | 1900 | 725.4 | 3646 | 203.8 | 176.3 |
| | 1800 | 712.1 | 3778 | 201.2 | 170.8 |
| | 1600 | 637.5 | 3805 | 198.4 | 150.8 |
| | 1500 | 577.7 | 3677 | 198.3 | 136.6 |
| | 1300 | 406.9 | 2989 | 201.9 | 98.0 |
| | 1100 | 254.6 | 2210 | 209.0 | 63.4 |
| | 900 | 178.8 | 1897 | 214.2 | 45.6 |
| | 800 | 162.4 | 1938 | 212.5 | 41.1 |
| **Prop Demand Data** | 2300 | 746.5 | 3099 | 228.9 | 203.7 |
| | 2200 | 653.3 | 2836 | 222.9 | 173.6 |
| | 2100 | 568.2 | 2584 | 225.6 | 152.8 |
| | 1900 | 420.8 | 2115 | 219.8 | 110.3 |
| | 1800 | 357.8 | 1898 | 217.6 | 92.8 |
| | 1600 | 251.3 | 1500 | 218.7 | 65.5 |
| | 1500 | 207.1 | 1318 | 222.9 | 55.0 |
| | 1300 | 134.8 | 990 | 229.2 | 36.8 |
| | 1100 | 81.7 | 709 | 223.5 | 21.8 |
| | 900 | 44.7 | 475 | 232.6 | 12.4 |
| | 800 | 31.4 | 375 | 242.2 | 9.1 |

Cubic prop demand curve with 3.0 exponent for displacement hulls only.

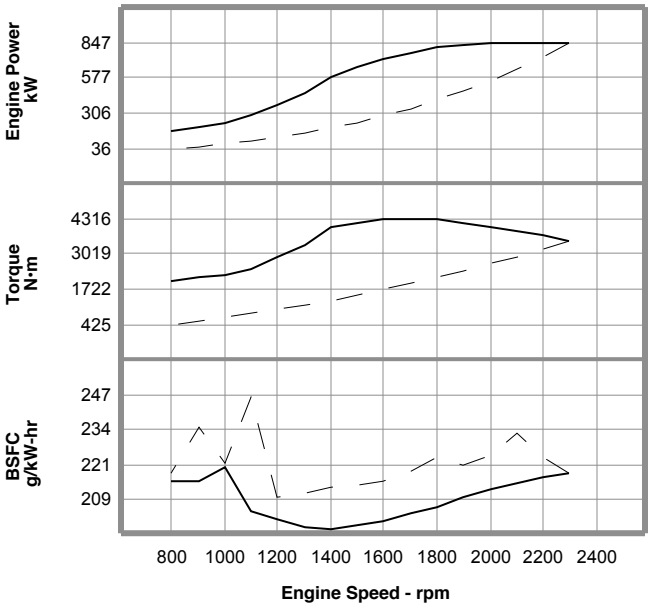
### Performance Data

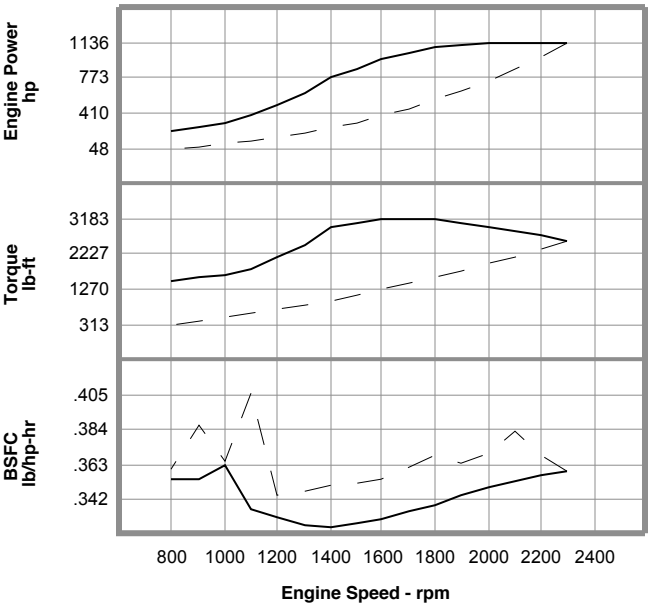
| | Engine Speed rpm | Engine Power hp | Engine Torque lb-ft | BSFC lb/hp-hr | Fuel Rate gph |
|---|---|---|---|---|---|
| **Maximum Power Data** | 2300 | 1001.1 | 2286 | .376 | 53.8 |
| | 2200 | 993.3 | 2371 | .359 | 50.9 |
| | 2100 | 994.9 | 2488 | .351 | 49.9 |
| | 1900 | 972.8 | 2689 | .335 | 46.6 |
| | 1800 | 954.9 | 2786 | .331 | 45.1 |
| | 1600 | 854.9 | 2806 | .326 | 39.8 |
| | 1500 | 774.7 | 2712 | .326 | 36.1 |
| | 1300 | 545.7 | 2204 | .332 | 25.9 |
| | 1100 | 341.4 | 1630 | .344 | 16.7 |
| | 900 | 239.8 | 1399 | .352 | 12.0 |
| | 800 | 217.8 | 1429 | .349 | 10.9 |
| **Prop Demand Data** | 2300 | 1001.1 | 2286 | .376 | 53.8 |
| | 2200 | 876.1 | 2092 | .366 | 45.9 |
| | 2100 | 762.0 | 1906 | .371 | 40.4 |
| | 1900 | 564.3 | 1560 | .361 | 29.1 |
| | 1800 | 479.8 | 1400 | .358 | 24.5 |
| | 1600 | 337.0 | 1106 | .360 | 17.3 |
| | 1500 | 277.7 | 972 | .366 | 14.5 |
| | 1300 | 180.8 | 730 | .377 | 9.7 |
| | 1100 | 109.6 | 523 | .367 | 5.8 |
| | 900 | 59.9 | 350 | .382 | 3.3 |
| | 800 | 42.1 | 277 | .398 | 2.4 |

Power produced at the flywheel will be within standard tolerances up to 50°C (122°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.

# Marine Engine Performance
# C18 DITA
## 847 kW (1136 hp) @ 2300 rpm
**E-RATING - EM0260-01**

CATERPILLAR®




**Metric** | Maximum Power — | Prop Demand — — | **847 kW**

**English** | Maximum Power — | Prop Demand — — | **1136 hp**

### Performance Data

| | Engine Speed rpm | Engine Power kW | Engine Torque N•m | BSFC g/kW-hr | Fuel Rate L/hr |
|---|---|---|---|---|---|
| **Maximum Power Data** | 2300 | 847.0 | 3517 | 218.6 | 220.8 |
| | 2200 | 847.0 | 3676 | 216.3 | 218.4 |
| | 2100 | 847.0 | 3852 | 214.5 | 216.5 |
| | 1900 | 831.2 | 4178 | 209.3 | 207.4 |
| | 1800 | 809.0 | 4292 | 205.5 | 198.2 |
| | 1600 | 723.1 | 4316 | 200.6 | 172.9 |
| | 1500 | 651.4 | 4147 | 199.0 | 154.5 |
| | 1300 | 456.8 | 3355 | 198.3 | 108.0 |
| | 1100 | 286.9 | 2491 | 204.4 | 69.9 |
| | 900 | 201.0 | 2133 | 214.9 | 51.5 |
| | 800 | 169.3 | 2021 | 214.9 | 43.4 |
| **Prop Demand Data** | 2300 | 847.0 | 3517 | 218.6 | 220.8 |
| | 2200 | 741.3 | 3217 | 224.6 | 198.5 |
| | 2100 | 644.7 | 2932 | 232.9 | 179.0 |
| | 1900 | 477.5 | 2400 | 221.4 | 126.0 |
| | 1800 | 406.0 | 2154 | 224.2 | 108.5 |
| | 1600 | 285.1 | 1702 | 215.2 | 73.1 |
| | 1500 | 234.9 | 1496 | 213.6 | 59.8 |
| | 1300 | 152.9 | 1123 | 210.7 | 38.4 |
| | 1100 | 92.7 | 804 | 246.6 | 27.2 |
| | 900 | 50.7 | 538 | 235.6 | 14.3 |
| | 800 | 35.6 | 425 | 219.0 | 9.3 |

Cubic prop demand curve with 3.0 exponent for displacement hulls only.

### Performance Data

| | Engine Speed rpm | Engine Power hp | Engine Torque lb-ft | BSFC lb/hp-hr | Fuel Rate gph |
|---|---|---|---|---|---|
| **Maximum Power Data** | 2300 | 1135.8 | 2594 | .359 | 58.3 |
| | 2200 | 1135.8 | 2711 | .356 | 57.7 |
| | 2100 | 1135.8 | 2841 | .353 | 57.2 |
| | 1900 | 1114.7 | 3081 | .344 | 54.8 |
| | 1800 | 1084.9 | 3165 | .338 | 52.4 |
| | 1600 | 969.7 | 3183 | .330 | 45.7 |
| | 1500 | 873.5 | 3058 | .327 | 40.8 |
| | 1300 | 612.6 | 2474 | .326 | 28.5 |
| | 1100 | 384.7 | 1837 | .336 | 18.5 |
| | 900 | 269.5 | 1573 | .353 | 13.6 |
| | 800 | 227.0 | 1491 | .353 | 11.5 |
| **Prop Demand Data** | 2300 | 1135.8 | 2594 | .359 | 58.3 |
| | 2200 | 994.1 | 2373 | .369 | 52.4 |
| | 2100 | 864.6 | 2162 | .383 | 47.3 |
| | 1900 | 640.3 | 1770 | .364 | 33.3 |
| | 1800 | 544.5 | 1589 | .369 | 28.7 |
| | 1600 | 382.3 | 1255 | .354 | 19.3 |
| | 1500 | 315.0 | 1103 | .351 | 15.8 |
| | 1300 | 205.0 | 828 | .346 | 10.1 |
| | 1100 | 124.3 | 593 | .405 | 7.2 |
| | 900 | 68.0 | 397 | .387 | 3.8 |
| | 800 | 47.7 | 313 | .360 | 2.5 |

Power produced at the flywheel will be within standard tolerances up to 50°C (122°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.