



CUMMINS MERCUISER DIESEL
Charleston, SC 29405
Marine Performance Curves

Basic Engine Model

MR704LH

Curve Number:

BC9148

Engine Configuration

D933002MX03

CPL Code:

Date:

20-Oct-06

Displacement: **2.8 liter** **169 in³**
 Bore: **94 mm** **3.70 in**
 Stroke: **100 mm** **3.94 in**
 Fuel System: **Bosch Common Rail (CRS 2.0)** Aspiration: **Turbocharged/Sea Water Aftercooled**
 Cylinders: **4** Rating Type: **High Output**

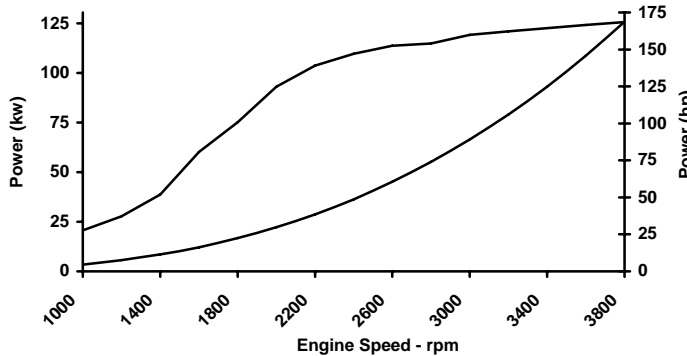
kW [bhp, mhp] @ rpm

Advertised Power: **125[169, 170] @ 3800**

PRELIMINARY

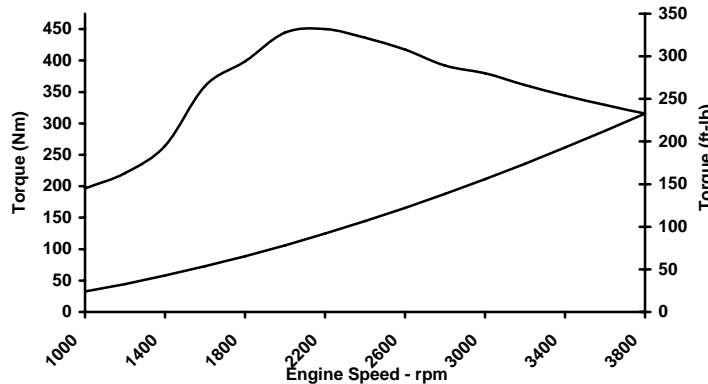
CERTIFIED: This marine diesel engine is certified to the model year requirements of EPA Marine Tier 2 per 40 CFR 94 and conforms with the NOx requirements of the International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13 as applicable.

RATED POWER OUTPUT CURVE



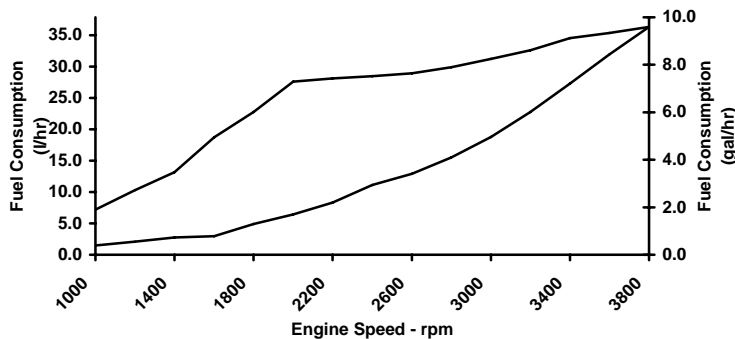
| rpm | kw | bhp |
|------|-----|-----|
| 3800 | 126 | 169 |
| 3600 | 124 | 167 |
| 3400 | 123 | 164 |
| 3200 | 121 | 162 |
| 3000 | 119 | 160 |
| 2800 | 115 | 154 |
| 2600 | 114 | 152 |
| 2400 | 110 | 147 |
| 1800 | 75 | 101 |
| 1600 | 60 | 81 |
| 1200 | 28 | 37 |
| 1000 | 21 | 28 |

FULL LOAD TORQUE CURVE



| rpm | N-m | ft-lb |
|------|-----|-------|
| 3800 | 316 | 233 |
| 3600 | 329 | 243 |
| 3400 | 344 | 254 |
| 3200 | 361 | 266 |
| 3000 | 380 | 280 |
| 2800 | 392 | 289 |
| 2600 | 418 | 308 |
| 2400 | 437 | 322 |
| 1800 | 399 | 294 |
| 1600 | 359 | 265 |
| 1200 | 221 | 163 |
| 1000 | 197 | 145 |

FUEL CONSUMPTION - PROP CURVE



| rpm | l/hr | gal/hr |
|------|------|--------|
| 3800 | 36.3 | 9.6 |
| 3600 | 32.0 | 8.4 |
| 3400 | 27.3 | 7.2 |
| 3200 | 22.8 | 6.0 |
| 3000 | 18.8 | 5.0 |
| 2800 | 15.5 | 4.1 |
| 2600 | 12.9 | 3.4 |
| 2400 | 11.1 | 2.9 |
| 1800 | 4.9 | 1.3 |
| 1600 | 3.0 | 0.8 |
| 1200 | 2.1 | 0.6 |
| 1000 | 1.5 | 0.4 |

Rated Conditions: Ratings are based upon ISO 8665 and SAE J1228 reference conditions; air pressure of 100 kPa [29.612 in Hg], air temperature 25deg. C [77 deg. F] and 30% relative humidity. Power is in accordance with IMCI procedure. Member NMMA.

Rated Curves (upper) represents rated power at the crankshaft for mature gross engine performance capabilities obtained and corrected in accordance with ISO 3046. Propeller Curve (lower) is based on a typical fixed propeller demand curve using a 2.7 exponent. Propeller Shaft Power is approximately 3% less than rated crankshaft power after typical reverse/reduction gear losses and may vary depending on the type of gear or propulsion system used.

Fuel Consumption is based on fuel of 35 deg. API gravity at 16 deg C [60 deg. F] having LHV of 42,780 kJ/kg [18390 Btu/lb] and weighing 838.9 g/liter [7.001 lb/U.S. gal].

High Output (HO) Intended for use in variable load applications where full power is limited to one (1) hour out of every eight (8) hours of operation. Also, reduced power must be at or below 200 rpm of the maximum rated rpm. This power rating is for pleasure/non-revenue generating applications that operate 500 hours per year or less.

Propulsion Marine Engine Performance Data

Curve No. BC9148
 DS :
 CPL :
 DATE: 20-Oct-06

PRELIMINARY

Exhaust System¹

| | | |
|---|-------------|------------|
| Exhaust Gas Flow | l/sec [cfm] | [TBD] |
| Exhaust Gas Temperature (Turbine Out) | °C [°F] | 410 [770] |
| Exhaust Gas Temperature (Manifold) | °C [°F] | 589 [1092] |

Emissions (in accordance with ISO 8178 Cycle E3)

| | | |
|--------------------------------|-------------------|-------------|
| NOx (Oxides of Nitrogen) | g/kw-hr [g/hp-hr] | 3.85 [2.87] |
| HC (Hydrocarbons) | g/kw-hr [g/hp-hr] | 0.27 [0.20] |
| CO (Carbon Monoxide) | g/kw-hr [g/hp-hr] | 1.22 [0.91] |
| PM (Particulate Matter) | g/kw-hr [g/hp-hr] | [TBD] |

Emissions (ISO 8178 Cycle E5 - for Traditional Propulsion Applications)

| | | |
|--------------------------------|-------------------|-------------|
| NOx (Oxides of Nitrogen) | g/kw-hr [g/hp-hr] | 3.87 [2.89] |
| HC (Hydrocarbons) | g/kw-hr [g/hp-hr] | 0.53 [0.40] |
| CO (Carbon Monoxide) | g/kw-hr [g/hp-hr] | 2.36 [1.76] |
| PM (Particulate Matter) | g/kw-hr [g/hp-hr] | 0.24 [0.18] |

| | | |
|--|-----------|----------|
| Pressure Cap Rating (With Heat Exchanger Option) | kPa [psi] | 103 [15] |
|--|-----------|----------|

Engines without Low Temperature Aftercooling (LTA)

Sea Water Aftercooled Engine (SWAC)

| | | |
|---|---------|----------|
| Standard Thermostat Operating Range (Start to Open) | °C [°F] | 80 [176] |
| Standard Thermostat Operating Range (Full Open) | °C [°F] | 95 [202] |

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

- ¹ All Data at Rated Conditions.
- ² Consult Installation Direction Booklet for Limitations.
- ³ Heat rejection to coolant values are based on 50% water/50% ethylene glycol mix and do NOT include fouling factors. If sourcing your own cooler, a service fouling factor should be applied according to the cooler manufacturer's recommendation.
- ⁴ Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.
- ⁵ May not be at rated load and speed. Maximum heat rejection may occur at other than rated conditions.

CUMMINS ENGINE COMPANY, INC
 COLUMBUS, INDIANA

All Data is Subject to Change Without Notice - Consult the following Cummins intranet site for most recent data:

<http://www.cummins.com>