**CUMMINS MERCRUISER DIESEL**

**Charleston, SC 29405**

**Marine Performance Curves**

**Basic Engine Model:** QSC8.3-540 HO

**Engine Configuration:** D413038MX03

**Curve Number:** M-90996

**CPL Code:** 8017  
**Date:** 15-Dec-04

**Displacement:** 8.3 liter [505 in³]

**Bore:** 114 mm [4.49 in]

**Stroke:** 135 mm [5.31 in]

**Fuel System:** HPCR

**Cylinders:** 6

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

**Aspiration:** Turbocharged / Sea Water Aftercooled

**Rating Type:** High Output

**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

<table>
<thead>
<tr>
<th>rpm</th>
<th>kW</th>
<th>bhp</th>
</tr>
</thead>
<tbody>
<tr>
<td>2600</td>
<td>398</td>
<td>533</td>
</tr>
<tr>
<td>2400</td>
<td>393</td>
<td>527</td>
</tr>
<tr>
<td>2200</td>
<td>383</td>
<td>514</td>
</tr>
<tr>
<td>2000</td>
<td>357</td>
<td>479</td>
</tr>
<tr>
<td>1800</td>
<td>324</td>
<td>434</td>
</tr>
<tr>
<td>1600</td>
<td>289</td>
<td>388</td>
</tr>
<tr>
<td>1400</td>
<td>185</td>
<td>248</td>
</tr>
<tr>
<td>1200</td>
<td>110</td>
<td>148</td>
</tr>
<tr>
<td>1000</td>
<td>75</td>
<td>101</td>
</tr>
<tr>
<td>800</td>
<td>52</td>
<td>70</td>
</tr>
</tbody>
</table>

### FULL LOAD TORQUE CURVE

<table>
<thead>
<tr>
<th>rpm</th>
<th>N-m</th>
<th>ft-lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>2600</td>
<td>1460</td>
<td>1077</td>
</tr>
<tr>
<td>2400</td>
<td>1564</td>
<td>1154</td>
</tr>
<tr>
<td>2200</td>
<td>1663</td>
<td>1226</td>
</tr>
<tr>
<td>2000</td>
<td>1704</td>
<td>1257</td>
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<tr>
<td>1800</td>
<td>1718</td>
<td>1268</td>
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<tr>
<td>1600</td>
<td>1726</td>
<td>1273</td>
</tr>
<tr>
<td>1400</td>
<td>1262</td>
<td>931</td>
</tr>
<tr>
<td>1200</td>
<td>877</td>
<td>647</td>
</tr>
<tr>
<td>1000</td>
<td>718</td>
<td>530</td>
</tr>
<tr>
<td>800</td>
<td>619</td>
<td>457</td>
</tr>
</tbody>
</table>

### FUEL CONSUMPTION - PROP CURVE

<table>
<thead>
<tr>
<th>rpm</th>
<th>l/hr</th>
<th>gal/hr</th>
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<tbody>
<tr>
<td>2600</td>
<td>109.4</td>
<td>28.9</td>
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<tr>
<td>2400</td>
<td>85.4</td>
<td>22.6</td>
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<td>2200</td>
<td>66.6</td>
<td>17.6</td>
</tr>
<tr>
<td>2000</td>
<td>51.7</td>
<td>13.6</td>
</tr>
<tr>
<td>1800</td>
<td>41.6</td>
<td>11.0</td>
</tr>
<tr>
<td>1600</td>
<td>30.7</td>
<td>8.1</td>
</tr>
<tr>
<td>1400</td>
<td>21.0</td>
<td>5.6</td>
</tr>
<tr>
<td>1200</td>
<td>14.3</td>
<td>3.8</td>
</tr>
<tr>
<td>1000</td>
<td>9.1</td>
<td>2.4</td>
</tr>
<tr>
<td>800</td>
<td>5.6</td>
<td>1.5</td>
</tr>
</tbody>
</table>

**Rated Curves (upper):** 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 Rating:** This Rating is 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 operations must be at or below 200 RPM of the maximum rated RPM. This rating is for pleasure/non-revenue generating applications that operate 300 hours per year.

[Signature]

CHIEF ENGINEER
## Marine Engine Performance Data

**Engine Model**: QSC8.3 HO  
**Rating Type**: High Output

### General Engine Data

- **Engine Model**: QSC8.3 HO  
- **Rating Type**: High Output
- **Rated Engine Power**: 398 [533] kW [bhp]
- **Rated Engine Speed**: 2600 rpm
- **Rated HP Production Tolerance**: ±5%  
- **Rated Engine Torque**: 1460 [1077] N•m [ft•lb]  
- **Peak Engine Torque**: 1726 [1273] N•m [ft•lb]  
- **Brake Mean Effective Pressure**: 2219 [322] kPa [psi]  
- **Indicated Mean Effective Pressure**: N.A.
- **Minimum Idle Speed Setting**: 600 rpm  
- **Normal Idle Speed Variation**: ±10 rpm
- **High Idle Speed Range**: 2665 rpm  
- **Maximum Allowable Engine Speed**: 2685 rpm
- **Maximum Torque Capacity from Front of Crank**: 282 [208] N•m [ft•lb]
- **Compression Ratio**: 16.3:1
- **Piston Speed**: 11.7 [2303] m/sec [ft/min]
- **Firing Order**: 1-5-3-6-2-4
- **Firing Order**: 1-5-3-6-2-4
- **Maximum Heat Rejection to Drain Fuel With Cooler**: 40 [104] °C [°F]
- **Maximum Allowable Fuel Supply to Pump Temperature**: 71 [160] °C [°F]
- **Approximate Fuel Flow Return to Tank**: 53 [14] l/hr [gal/hr]
- **Approximate Fuel Flow to Pump**: 163 [43] l/hr [gal/hr]
- **Maximum Heat Rejection to Drain Fuel Without Cooler**: 85 [155] °C [°F]
- **Maximum Allowable Fuel Supply to Pump Temperature**: 71 [160] °C [°F]
- **Approximate Fuel Flow Return to Tank**: 53 [14] l/hr [gal/hr]
- **Approximate Fuel Flow to Pump**: 163 [43] l/hr [gal/hr]
- **Maximum Heat Rejection to Drain Fuel With Cooler**: 1 [70] kW [Btu/min]
- **Fuel Transfer Pump Pressure Range**: N.A.
- **Fuel Rail Pressure**: 209 [61.7] kPa [in Hg]
- **Intake Air Flow**: 468 [991] l/sec [cfm]
- **Heat Rejection to Ambient**: 109 [6200] kW [Btu/min]
- **Maximum Air Cleaner Inlet Temperature Rise Over Ambient**: 17 [30] °C [°F]
- **Exhaust Gas Flow**: 1176 [2492] l/sec [cfm]
- **Exhaust Gas Temperature**: 508 [946] °C [°F]

### Noise and Vibration

- **Average Noise Level – Top**
  - (Idle): 82 dBA @ 1m
  - (Rated): 98 dBA @ 1m
- **Average Noise Level – Right Side**
  - (Idle): 82 dBA @ 1m
  - (Rated): 98 dBA @ 1m
- **Average Noise Level – Left Side**
  - (Idle): 82 dBA @ 1m
  - (Rated): 98 dBA @ 1m
- **Average Noise Level – Front**
  - (Idle): 82 dBA @ 1m
  - (Rated): 98 dBA @ 1m

### Fuel System

- **Average Fuel Consumption – ISO 8178 E3 Standard Test Cycle**: 72 [19] l/hr [gal/hr]
- **Fuel Consumption @ Rated Speed**: 109.5 [28.9] l/hr [gal/hr]
- **Approximate Fuel Flow to Pump**: 163 [43] l/hr [gal/hr]
- **Maximum Allowable Fuel Supply to Pump Temperature**: 71 [160] °C [°F]
- **Approximate Fuel Flow Return to Tank**: 53 [14] l/hr [gal/hr]
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### Air System

- **Intake Air Flow**: 468 [991] l/sec [cfm]
- **Heat Rejection to Ambient**: 109 [6200] kW [Btu/min]
- **Maximum Air Cleaner Inlet Temperature Rise Over Ambient**: 17 [30] °C [°F]

### Exhaust System

- **Exhaust Gas Flow**: 1176 [2492] l/sec [cfm]
- **Exhaust Gas Temperature**: 508 [946] °C [°F]

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1. All Data at Rated Conditions
2. Consult Installation Direction Booklet for Limitations
3. Heat rejection 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.

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All Data is Subject to Change Without Notice - Consult the following Cummins intranet site for most recent data:  
http://www.cummins.com
Marine Engine Performance Data

Emissions (in accordance with ISO 8178 Cycle E3)

<table>
<thead>
<tr>
<th>Emission Type</th>
<th>g/kw·hr [g/hp·hr]</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOx (Oxides of Nitrogen)</td>
<td>5.83 [4.35]</td>
</tr>
<tr>
<td>HC (Hydrocarbons)</td>
<td>0.06 [0.0425]</td>
</tr>
<tr>
<td>CO (Carbon Monoxide)</td>
<td>0.34 [0.2565]</td>
</tr>
<tr>
<td>PM (Particulate Matter)</td>
<td>0.14 [0.1014]</td>
</tr>
</tbody>
</table>

Cooling System

- Sea Water Pump Specifications: MAB 0.08.17-07/16/2001
- Pressure Cap Rating (With Heat Exchanger Option): 103 [15] kPa [psi]

Engines with Standard Aftercooling

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coolant Flow to Engine Heat Exchanger/Keel Cooler</td>
<td>473 [125] l/min [gal/min]</td>
</tr>
<tr>
<td>Standard Thermostat Operating Range</td>
<td>71 [160] °C [°F]</td>
</tr>
<tr>
<td>Full Open</td>
<td>81 [178] °C [°F]</td>
</tr>
<tr>
<td>Heat Rejection to Engine Coolant</td>
<td>254 [14477] kW [Btu/min]</td>
</tr>
</tbody>
</table>

TBD = To Be Decided  N/A = Not Applicable  N.A. = Not Available

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3Heat rejection 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.
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5May not be at rated load and speed. Maximum heat rejection may occur at other than rated conditions.