### Marine Performance Curve

**Displacement:** 10.8 liter [661 in³]

**Bore:** 125 mm [4.92 in]

**Stroke:** 147 mm [5.79 in]

**Fuel System:** CELECT

**Cylinders:** 6

**Rated Curves (upper) represent rated power at the crankshaft for mature gross engine performance capabilities obtained and corrected in accordance with ISO 3046. 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° API gravity at 16°C [60°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 or less.

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**RATED POWER OUTPUT CURVE**

<table>
<thead>
<tr>
<th>rpm</th>
<th>kW</th>
<th>hp</th>
</tr>
</thead>
<tbody>
<tr>
<td>2300</td>
<td>399</td>
<td>535</td>
</tr>
<tr>
<td>2100</td>
<td>402</td>
<td>539</td>
</tr>
<tr>
<td>1900</td>
<td>402</td>
<td>538</td>
</tr>
<tr>
<td>1700</td>
<td>400</td>
<td>536</td>
</tr>
<tr>
<td>1500</td>
<td>378</td>
<td>507</td>
</tr>
<tr>
<td>1300</td>
<td>344</td>
<td>460</td>
</tr>
<tr>
<td>1100</td>
<td>231</td>
<td>309</td>
</tr>
<tr>
<td>900</td>
<td>141</td>
<td>189</td>
</tr>
</tbody>
</table>

**FULL LOAD TORQUE CURVE**

<table>
<thead>
<tr>
<th>rpm</th>
<th>Nm</th>
<th>ft-lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>2300</td>
<td>1657</td>
<td>1222</td>
</tr>
<tr>
<td>2100</td>
<td>1827</td>
<td>1347</td>
</tr>
<tr>
<td>1900</td>
<td>2018</td>
<td>1488</td>
</tr>
<tr>
<td>1700</td>
<td>2244</td>
<td>1655</td>
</tr>
<tr>
<td>1500</td>
<td>2407</td>
<td>1775</td>
</tr>
<tr>
<td>1300</td>
<td>2522</td>
<td>1860</td>
</tr>
<tr>
<td>1100</td>
<td>2002</td>
<td>1476</td>
</tr>
<tr>
<td>900</td>
<td>1498</td>
<td>1105</td>
</tr>
</tbody>
</table>

**FUEL CONSUMPTION - PROP CURVE**

<table>
<thead>
<tr>
<th>rpm</th>
<th>l/hr</th>
<th>gal/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>2300</td>
<td>101.6</td>
<td>26.9</td>
</tr>
<tr>
<td>2100</td>
<td>75.1</td>
<td>19.8</td>
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<tr>
<td>1900</td>
<td>56.2</td>
<td>14.9</td>
</tr>
<tr>
<td>1700</td>
<td>41.2</td>
<td>10.9</td>
</tr>
<tr>
<td>1500</td>
<td>29.6</td>
<td>7.8</td>
</tr>
<tr>
<td>1300</td>
<td>20.9</td>
<td>5.5</td>
</tr>
<tr>
<td>1100</td>
<td>15.4</td>
<td>4.1</td>
</tr>
<tr>
<td>900</td>
<td>8.9</td>
<td>2.4</td>
</tr>
</tbody>
</table>

**Certification:** This marine diesel engine conforms with the NOx requirements of the International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13 as applicable.

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**CHIEF ENGINEER**
General Engine Data

Engine Model..........................................................QSM11-M
Rating Type ....................................................................High Output
Rated Engine Power ..................................................KW [hp] 399 [535]
Rated Engine Speed .....................................................rpm 2300
Rated HP Production Tolerance ....................................±% 5
Rated Engine Torque ....................................................N·m [ft·lb] 1656 [1222]
Peak Engine Torque @ 1300 rpm.........................N·m [ft·lb] 2522 [1860]
Brake Mean Effective Pressure ..........................kPa [psi] 1923 [279]
Indicated Mean Effective Pressure .........................kPa [psi] N.A.
Minimum Idle Speed Setting .....................................rpm 600
Normal Idle Speed Variation .....................................±rpm 10
High Idle Speed Range - Minimum .........................rpm 2340
High Idle Speed Range - Maximum .........................rpm 2360
Maximum Allowable Engine Speed .........................rpm 2360
Maximum Torque Capacity from Front of Crank2......................N·m [ft·lb] N.A.
Compression Ratio .....................................................15.9:1
Piston Speed ...............................................................m/sec [ft/min] 11.3 [2220]
Firing Order .................................................................1-5-3-6-2-4
Weight (Dry) Engine Only - Average ....................kg [lb] N.A.
Weight (Dry) Engine With Heat Exchanger System - Average..................kg [lb] 1188 [2620]
Weight Tolerance (Dry) Engine Only.............................±% N.A.

Noise and Vibration

Average Noise Level - Top (Idle) ...........................dBA @ 1m 92
Average Noise Level - Right Side (Idle) ...............dBA @ 1m 92
Average Noise Level - Left Side (Idle) ..................dBA @ 1m 92
Average Noise Level - Front (Idle) .........................dBA @ 1m 92

Fuel System1

Average Fuel Consumption - ISO 8178 E3 Standard Test Cycle...................l/hr [gal/hr] 66 [18]
Fuel Consumption @ rated speed..............................l/hr [gal/hr] 102 [27]
Approximate Fuel Flow to Pump .........................l/hr [gal/hr] 280 [74]
Maximum Allowable Fuel Supply to Pump Temperature....................°C [°F] 60 [140]
Approximate Fuel Flow Return to Tank.....................l/hr [gal/hr] 178 [47]
Approximate Fuel Return to Tank Temperature....................°C [°F] 71 [160]
Maximum Heat Rejection to Drain Fuel5....................KW [Btu/min] 3 [162]
Fuel Transfer Pump Pressure Range .......................kPa [psi] 965 - 1241 [140 - 180]
Fuel Rail Pressure - Gauge.................................kPaG [psig] 1138 [165]

Air System1

Intake Manifold Pressure.................................................kPa [in Hg] 290 [89]
Intake Air Flow ..........................................................l/sec [cfm] 594 [1259]
Heat Rejection to Ambient ............................................KW [Btu/min] 21 [1200]

Exhaust System1

Exhaust Gas Flow ..................................................l/sec [cfm] 1251 [2650]
Exhaust Gas Temperature (Turbine Out) ..................°C [°F] 444 [831]
Exhaust Gas Temperature (Manifold) ......................°C [°F] 594 [1100]

Emissions (in accordance with ISO 8178 Cycle E3)

NOx (Oxides of Nitrogen) ..................................g/kw-hr g/hp-hr 7.03 [5.24]
HC (Hydrocarbons) .................................................g/kw-hr g/hp-hr 0.20 [0.15]
CO (Carbon Monoxide)...........................................g/kw-hr g/hp-hr 0.25 [0.19]
PM (Particulate Matter).........................................g/kw-hr g/hp-hr 0.07 [0.05]

1All Data at Rated Conditions
2Consult Installation Directive Booklet for Limitations
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.
4Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.
5May not be at rated load and speed. Maximum heat rejection may occur at other than rated conditions.

CUMMINS ENGINE COMPANY, INC.
COLUMBUS, INDIANA

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Cooling System

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

Engines with Standard Aftercooling

Coolant Flow to Engine Heat Exchanger/Keel Cooler l/min [gal/min] 379 [100]
Standard Thermostat Operating Range (Start to Open) °C [°F] 71 [160]
Standard Thermostat Operating Range (Full Open) °C [°F] 80 [175]
Heat Rejection to Engine Coolant kW [Btu/min] 156 [8,900]

Engines with Low Temperature Aftercooling (if applicable)

Main Cooler

Coolant Flow to Engine Heat Exchanger/Keel Cooler l/min [gal/min] N/A
Standard Thermostat Operating Range (Start to Open) °C [°F] N/A
Standard Thermostat Operating Range (Full Open) °C [°F] N/A
Heat Rejection to Engine Coolant kW [Btu/min] N/A

LTA Cooler

Coolant Flow to LTA Heat Exchanger/Keel Cooler l/min [gal/min] N/A
LTA Thermostat Operating Range (Start to Open) °C [°F] N/A
LTA Thermostat Operating Range (Full Open) °C [°F] N/A
Heat Rejection to LTA Coolant kW [Btu/min] N/A

INSTALLATION DRAWINGS

Heat Exchanger Cooled 3170353

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

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.
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