Basic Engine Model: 220B
Engine Configuration: D402013MX02
CPL Code: 8206
Date: 17-Aug-04

Displacement: 5.9 liter [359 in³]
Bore: 102 mm [4.02 in]
Stroke: 120 mm [4.72 in]
Fuel System: Lucas CAV
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 °C [77°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. Rated Power Output Curve (below) 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 °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: 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 300 hours per year or less.
# Marine Engine Performance Data

**Engine Model**: 220B  
**Rating Type**: High Output  
**Rated Engine Power**: kW [bhp] 157 [210]  
**Rated Engine Speed**: rpm 2600  
**Rated HP Production Tolerance**: % ± 5  
**Rated Engine Torque**: N•m [ft•lb] 575 [424]  
**Peak Engine Torque @ 1800 rpm**: N•m [ft•lb] 726 [535]  
**Brake Mean Effective Pressure**: kPa [psi] 1227 [178]  
**Indicated Mean Effective Pressure**: kPa [psi] N.A.  
**Minimum Idle Speed Setting**: rpm 700  
**Normal Idle Speed Variation**: ± 50  
**High Idle Speed Range**: Minimum rpm 2808  
**Maximum**: rpm 2912  
**Maximum Allowable Engine Speed**: rpm N/A  
**Compression Ratio**: 16.5:1  
**Firing Order**: 1-5-3-6-2-4  
**Weight (Dry) Engine With Heat Exchanger System - Average**: kg [lb] 508 [1120]  

## Exhaust System

- **Exhaust Gas Flow**: l/sec [cfm] 506 [1072]  
- **Exhaust Gas Temperature (Turbine Out)**: °C [°F] 446 [836]  
- **Exhaust Gas Temperature (Manifold)**: °C [°F] N/A

## Fuel System

- **Fuel Consumption @ Rated Speed**: l/hr [gal/hr] 45.3 [12.0]  
- **Approximate Fuel Flow to Pump**: l/hr [gal/hr] 53 [14]  
- **Approximate Fuel Flow Return to Tank Temperature**: °C [°F] 60 [140]  
- **Approximate Fuel Return to Tank Temperature**: °C [°F] N/A.  
- **Maximum Heat Rejection to Drain Fuel**: kW [Btu/min] N.A.  
- **Fuel Transfer Pump Pressure Range**: kPa [psi] 34 [5]

## Air System

- **Intake Manifold Pressure**: kPa [in Hg] 176 [52]  
- **Intake Air Flow**: l/sec [cfm] 236 [500]  
- **Heat Rejection to Ambient**: kW [Btu/min] 21 [1200]

## Emissions (in accordance with ISO 8178 Cycle E3)

- **NOx (Oxides of Nitrogen)**: g/kw·hr [g/hp·hr] 8.23 [6.14]  
- **HC (Hydrocarbons)**: g/kw·hr [g/hp·hr] 0.78 [0.58]  
- **CO (Carbon Monoxide)**: g/kw·hr [g/hp·hr] 1.84 [1.37]  
- **PM (Particulate Matter)**: g/kw·hr [g/hp·hr] N.A.

## Cooling System

- **Sea Water Pump Specifications**: 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] 174 [46]  
- **Standard Thermostat Operating Range Start to Open**: °C [°F] 83 [181]  
- **Full Open**: °C [°F] 95 [203]  
- **Heat Rejection to Engine Coolant**: kW [Btu/min] 139 [7900]

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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.

**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](http://www.cummins.com)