



## Marine Engine Performance Data

Curve No. M-90760

DS-4960

CPL: 8206

DATE: 17Aug04

### General Engine 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.....rpm	± 50
High Idle Speed Range Minimum.....rpm	2808
High Idle Speed Range Maximum.....rpm	2912
Maximum Allowable Engine Speed.....rpm	N/A
Maximum Torque Capacity from Front of Crank <sup>2</sup> .....N·m [ft·lb]	N/A
Compression Ratio.....	16.5:1
Piston Speed.....m/sec [ft/min]	10.4 [2045]
Firing Order.....	1-5-3-6-2-4
Weight (Dry) Engine With Heat Exchanger System - Average.....kg [lb]	508 [1120]

### Exhaust System<sup>1</sup>

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<sup>1</sup>

Fuel Consumption @ Rated Speed.....l/hr [gal/hr]	45.3 [12.0]
Approximate Fuel Flow to Pump.....l/hr [gal/hr]	53 [14]
Maximum Allowable Fuel Supply to Pump Temperature.....°C [°F]	60 [140]
Approximate Fuel Flow Return to Tank.....l/hr [gal/hr]	8 [2]
Approximate Fuel Return to Tank Temperature.....°C [°F]	N.A.
Maximum Heat Rejection to Drain Fuel <sup>5</sup> .....kW [Btu/min]	N.A.
Fuel Transfer Pump Pressure Range.....kPa [psi]	34 [5]

### Air System<sup>1</sup>

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<sup>1</sup>

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]
Standard Thermostat Operating Range Full Open.....°C [°F]	95 [203]
Heat Rejection to Engine Coolant <sup>3</sup> .....kW [Btu/min]	139 [7900]

TBD = To Be Decided

N/A = Not Applicable

N.A. = Not Available

<sup>1</sup>All Data at Rated Conditions<sup>2</sup>Consult Installation Direction Booklet for Limitations<sup>3</sup>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.<sup>4</sup>Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.<sup>5</sup>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>