



CUMMINS MERCRUISER DIESEL
 Charleston, SC 29405
Marine Performance Curves

Basic Engine Model
MR704LH

Curve Number:
BC9150

Engine Configuration
D933002MX03

CPL Code:

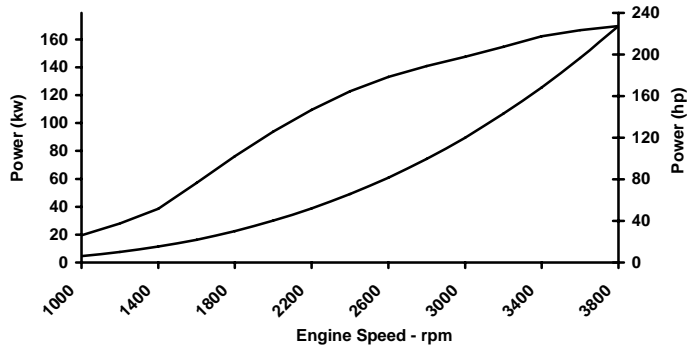
Date:

20-Oct-06

Displacement: **2.8 liter 169 in³** kW [bhp, mhp] @ rpm
 Bore: **94 mm 3.70 in** Advertised Power: **170[227, 230]@3800**
 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**

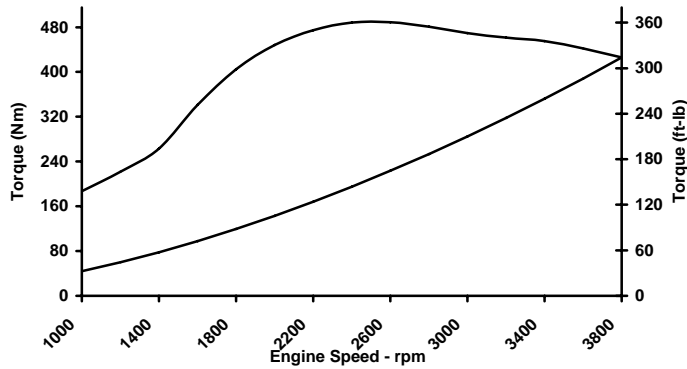
PRELIMINARY

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.



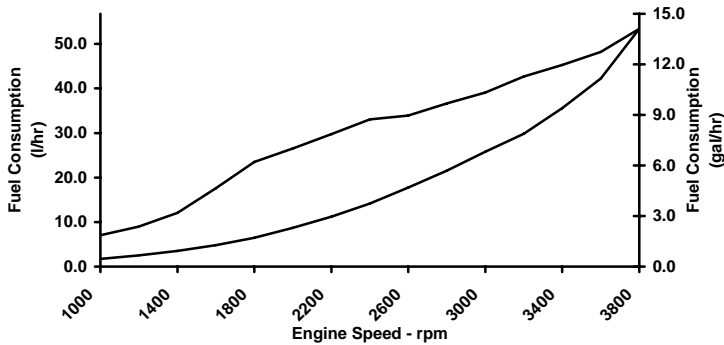
RATED POWER OUTPUT CURVE

rpm	kw	bhp
3800	170	227
3600	167	223
3400	162	217
3200	155	207
3000	147	198
2800	141	189
2600	133	178
2200	109	147
1800	76	102
1400	39	52
1200	28	37
1000	20	26



FULL LOAD TORQUE CURVE

rpm	N-m	ft-lb
3800	426	314
3600	442	326
3400	455	336
3200	462	340
3000	469	346
2800	481	355
2600	489	361
2200	475	350
1800	405	299
1400	263	194
1200	222	164
1000	187	138



FUEL CONSUMPTION - PROP CURVE

rpm	l/hr	gal/hr
3800	53.4	14.1
3600	42.3	11.2
3400	35.6	9.4
3200	29.8	7.9
3000	25.8	6.8
2800	21.6	5.7
2600	17.7	4.7
2200	11.2	3.0
1800	6.5	1.7
1400	3.5	0.9
1200	2.5	0.7
1000	1.7	0.5

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. BC9150
 DS :
 CPL :
 DATE: 20-Oct-06

PRELIMINARY

Exhaust System¹

Exhaust Gas Flow	l/sec [cfm]	[TBD]
Exhaust Gas Temperature (Turbine Out)	°C [°F]	550 [1021]
Exhaust Gas Temperature (Manifold)	°C [°F]	774 [1424]

Emissions (in accordance with ISO 8178 Cycle E3)

NOx (Oxides of Nitrogen)	g/kw-hr [g/hp-hr]	4.45 [3.32]
HC (Hydrocarbons)	g/kw-hr [g/hp-hr]	0.12 [0.09]
CO (Carbon Monoxide)	g/kw-hr [g/hp-hr]	2.41 [1.80]
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]	4.21 [3.14]
HC (Hydrocarbons)	g/kw-hr [g/hp-hr]	0.23 [0.17]
CO (Carbon Monoxide)	g/kw-hr [g/hp-hr]	2.45 [1.83]
PM (Particulate Matter)	g/kw-hr [g/hp-hr]	0.37 [0.28]

Cooling System¹

Sea Water Pump Specifications	MAB 0.08.17-07/16/2001	
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>