



CUMMINS MERCURISER DIESEL
 Charleston, SC 29405
 Marine Performance Curves

Basic Engine Model:
2.8L ES-EJ 170
 Engine Configuration:
D933001MX03

Curve Number:
BC9109

Sterndrive
 Date:
9-Jan-06

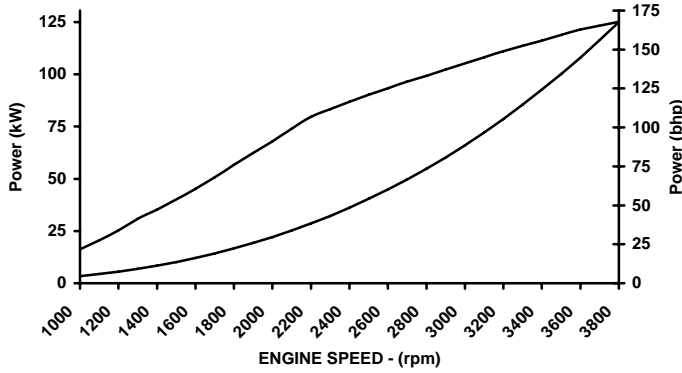
Displacement: **2.8 liter** [169 in³]
 Bore: **94 mm** [3.7 in]
 Stroke: **100 mm** [3.94 in]
 Fuel System: **Bosch VP37**
 Cylinders: **4**

Advertised Power: **125 [168, 170] @ 3800**
 kW [bhp, mhp] @ rpm

Aspiration: **Turbocharged / Sea Water Aftercooled**
 Rating Type: **High Output**

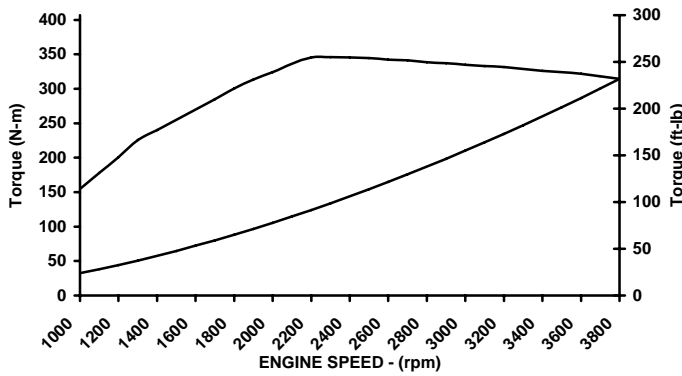
CERTIFIED: This marine diesel engine conforms with the NOx requirements of the International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13 as applicable.

RATED POWER OUTPUT CURVE



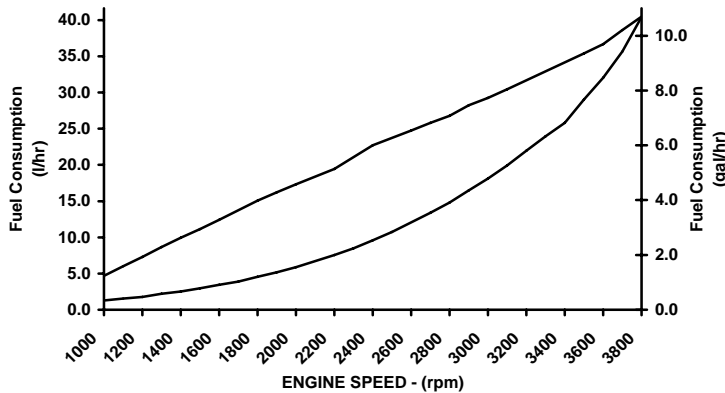
rpm	kW	bhp
3800	125	168
3600	121	163
3400	116	156
3200	111	149
3000	105	141
2800	99	133
2600	93	125
2400	87	116
2200	80	107
2000	68	91
1800	57	76
1500	40	54
1000	16	22

FULL LOAD TORQUE CURVE



rpm	N-m	ft-lb
3800	314	232
3600	322	237
3400	326	241
3200	331	244
3000	335	247
2800	339	250
2600	342	253
2400	345	255
2200	345	255
2000	324	239
1800	300	222
1500	255	188
1000	154	114

FUEL CONSUMPTION - PROP CURVE



rpm	l/hr	gal/hr
3800	40.4	10.7
3600	32.1	8.5
3400	25.8	6.8
3200	22.0	5.8
3000	18.1	4.8
2800	14.8	3.9
2600	12.1	3.2
2400	9.6	2.5
2200	7.6	2.0
2000	5.9	1.6
1800	4.5	1.2
1500	3.0	0.8
1000	1.3	0.3

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.

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 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.

James D. Kahlisch

CHIEF ENGINEER

Marine Engine Performance Data

Curve No.: BC9109

DATE: 09Jan06

General Engine Data

Engine Model.....		2.8L ES 170
Rating Type		High Output
Rated Engine Power..... kW [bhp]		125 [168]
Rated Engine Speed..... rpm		3800
Rated HP Production Tolerance	±%	5
Rated Engine Torque.....N•m [ft•lb]		314 [232]
Peak Engine Torque @ 2200 rpm	N•m [ft•lb]	345 [255]
Brake Mean Effective Pressure	kPa [psi]	948 [138]
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	4220
	Maximum	4280
Maximum Allowable Engine Speed	rpm	4280
Maximum Torque Capacity from Front of Crank ²	N•m [ft•lb]	0
Compression Ratio		17:1
Piston Speed	m/sec [ft/min]	12.7 [2493]
Firing Order.....		1-3-4-2
Weight (Dry) Engine With Heat Exchanger System - Average.....	kg [lb]	335 [738]

Fuel System¹

Fuel Consumption @ Rated Speed.....	l/hr [gal/hr]	40.5 [10.7]
Approximate Fuel Flow to Pump.....	l/hr [gal/hr]	67 [18]
Maximum Allowable Fuel Supply to Pump Temperature.....	°C [°F]	60 [140]
Approximate Fuel Flow Return to Tank.....	l/hr [gal/hr]	18 [5]
Approximate Fuel Return to Tank Temperature	°C [°F]	70 [158]
Maximum Heat Rejection to Drain Fuel ⁵	kW [Btu/min]	1 [68]
Fuel Transfer Pump Pressure Range.....	kPa [psi]	N.A.

Air System¹

Intake Manifold Pressure	kPa [in Hg]	170 [50.3]
Intake Air Flow.....	l/sec [cfm]	180 [381]
Heat Rejection to Ambient	kW [Btu/min]	22 [1250]
Maximum Air Cleaner Inlet Temperature Rise Over Ambient.....	°C [°F]	17 [30]

Exhaust System¹

Exhaust Gas Flow.....	l/sec [cfm]	366 [775]
Exhaust Gas Temperature	Turbine Out.....°C [°F]	500 [932]
	Manifold	N.A.

Cooling System¹

Sea Water Pump Specifications	Restriction.....kPa [in.Hg]	17 [5]
	Flow.....l/min [gal/min]	114 [30]
Pressure Cap Rating (With Heat Exchanger Option)	kPa [psi]	103 [15]
Coolant Flow to Engine Heat Exchanger/Keel Cooler	l/min [gal/min]	226 [60]
Standard Thermostat Operating Range	Start to Open.....°C [°F]	80 [176]
	Full Open	95 [202]
Heat Rejection to Engine Coolant ³	kW [Btu/min]	119 [6775]

TBD = To Be Decided

N/A = Not Applicable

N.A. = Not Available

¹All Data at Rated Conditions

²Consult Installation Direction 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

All Data is Subject to Change Without Notice - Consult the following Cummins intranet site for most recent data:

<http://www.cummins.com>