



**CUMMINS MERCURISER DIESEL**  
**Charleston, SC 29405**  
**Marine Performance Curves**

Basic Engine Model:

**QSC8.3-540 HO**

Engine Configuration:

**D413038MX03**

Curve Number:

**M-90996**

CPL Code

**8017**

Date:

**15-Dec-04**

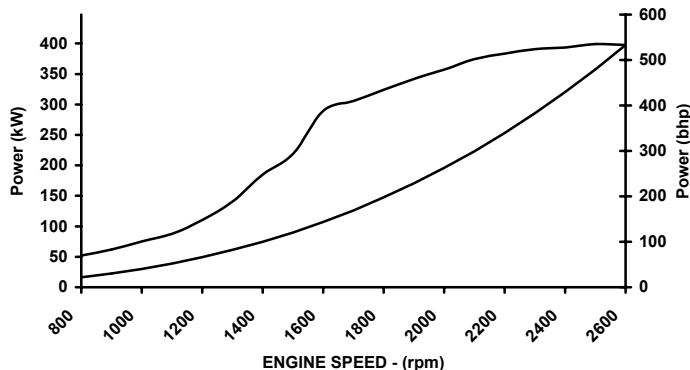
Displacement: **8.3 liter** [505 in<sup>3</sup>]  
 Bore: **114 mm** [4.49 in]  
 Stroke: **135 mm** [5.31 in]  
 Fuel System: **HPCR**  
 Cylinders: **6**

Advertised Power: **398 [533, 540] @ 2600**  
 kW [bhp, mhp] @ rpm

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

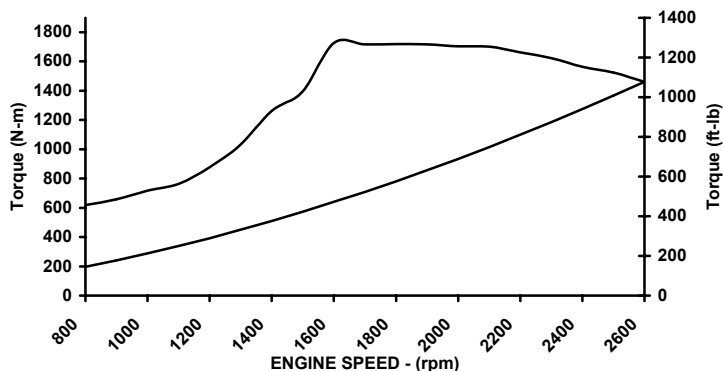
CERTIFIED: This marine diesel engine conforms with the NOx requirements of the International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13 as applicable.

**RATED POWER OUTPUT CURVE**



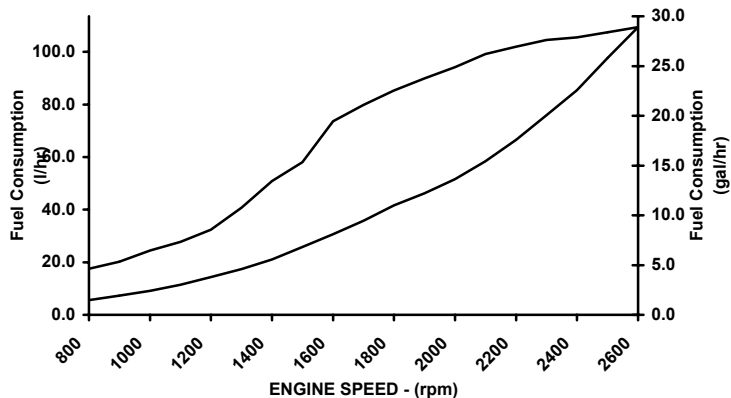
rpm	kW	bhp
2600	398	533
2400	393	527
2200	383	514
2000	357	479
1800	324	434
1600	289	388
1400	185	248
1200	110	148
1000	75	101
800	52	70

**FULL LOAD TORQUE CURVE**



rpm	N-m	ft-lb
2600	1460	1077
2400	1564	1154
2200	1663	1226
2000	1704	1257
1800	1718	1268
1600	1726	1273
1400	1262	931
1200	877	647
1000	718	530
800	619	457

**FUEL CONSUMPTION - PROP CURVE**



rpm	l/hr	gal/hr
2600	109.4	28.9
2400	85.4	22.6
2200	66.6	17.6
2000	51.7	13.6
1800	41.6	11.0
1600	30.7	8.1
1400	21.0	5.6
1200	14.3	3.8
1000	9.1	2.4
800	5.6	1.5

Rated Conditions: Ratings are based upon ISO 8665 and SAE J1228 reference conditions; air pressure of 100 kPa [29.612 in Hg], air temperature 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. Kahlert*

CHIEF ENGINEER

# Marine Engine Performance Data

**Curve No.: M-90996**  
**DS-3038**  
**DATE: 15Dec04**

## General Engine Data

Engine Model.....		QSC8.3 HO
Rating Type .....		High Output
Rated Engine Power..... kW [bhp]		398 [533]
Rated Engine Speed..... rpm		2600
Rated HP Production Tolerance .....	±%	5
Rated Engine Torque..... N•m [ft•lb]		1460 [1077]
Peak Engine Torque @ 1600 rpm .....	N•m [ft•lb]	1726 [1273]
Brake Mean Effective Pressure .....	kPa [psi]	2219 [322]
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 .....	2665
	Maximum .....	2685
Maximum Allowable Engine Speed .....	rpm	2685
Maximum Torque Capacity from Front of Crank <sup>2</sup> .....	N•m [ft•lb]	282 [208]
Compression Ratio .....		16.3:1
Piston Speed .....	m/sec [ft/min]	11.7 [2303]
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]	896 [1975]
Weight Tolerance (Dry) Engine only - Average.....	kg [lb]	N.A.

## Noise and Vibration

Average Noise Level – Top	(Idle).....	dBA @ 1m	82
	(Rated).....	dBA @ 1m	98
Average Noise Level – Right Side	(Idle).....	dBA @ 1m	82
	(Rated).....	dBA @ 1m	98
Average Noise Level – Left Side	(Idle).....	dBA @ 1m	82
	(Rated).....	dBA @ 1m	98
Average Noise Level – Front	(Idle).....	dBA @ 1m	82
	(Rated).....	dBA @ 1m	98

## Fuel System<sup>1</sup>

Average Fuel Consumption – ISO 8178 E3 Standard Test Cycle.....	l/hr [gal/hr]	72 [19]
Fuel Consumption @ Rated Speed.....	l/hr [gal/hr]	109.5 [28.9]
Approximate Fuel Flow to Pump.....	l/hr [gal/hr]	163 [43]
Maximum Allowable Fuel Supply to Pump Temperature.....	°C [°F]	71 [160]
Approximate Fuel Flow Return to Tank .....	l/hr [gal/hr]	53 [14]
Approximate Fuel Return to Tank Temperature	Without Cooler..... °C [°F]	85 [185]
	With Cooler..... °C [°F]	40 [104]
Maximum Heat Rejection to Drain Fuel <sup>5</sup> .....	kW [Btu/min]	1 [70]
Fuel Transfer Pump Pressure Range.....	kPa [psi]	N/A
Fuel Rail Pressure	INSITE.....	160,000 [23,206]

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

Intake Manifold Pressure .....	kPa [in Hg]	209 [61.7]
Intake Air Flow.....	l/sec [cfm]	468 [991]
Heat Rejection to Ambient .....	kW [Btu/min]	109 [6200]
Maximum Air Cleaner Inlet Temperature Rise Over Ambient.....	°C [°F]	17 [30]

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

Exhaust Gas Flow.....	l/sec [cfm]	1176 [2492]
Exhaust Gas Temperature	Turbine Out..... °C [°F]	508 [946]
	Manifold .....	702 [1294]

BD = 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

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<http://www.cummins.com>

# Marine Engine Performance Data

**Curve No.: M-90996**  
**DS-3038**  
**DATE: 15Dec04**

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

NOx (Oxides of Nitrogen) .....	g/kw-hr [g/hp-hr]	5.83 [4.35]
HC (Hydrocarbons).....	g/kw-hr [g/hp-hr]	0.06 [0.0425]
CO (Carbon Monoxide).....	g/kw-hr [g/hp-hr]	0.34 [0.2565]
PM (Particulate Matter).....	g/kw-hr [g/hp-hr]	0.14 [0.1014]

**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]	473 [125]
Standard Thermostat Operating Range	Start to Open.....	°C [°F]
	Full Open .....	°C [°F]
Heat Rejection to Engine Coolant <sup>3</sup> .....	kW [Btu/min]	254 [14477]

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.**

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