



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

Basic Engine Model:

**QSL9 - 330 HD**

Engine Configuration:

**D563005MX03**

Curve Number:

**M-91391**

CPL Code

**8419**

Date:

**3-Jan-07**

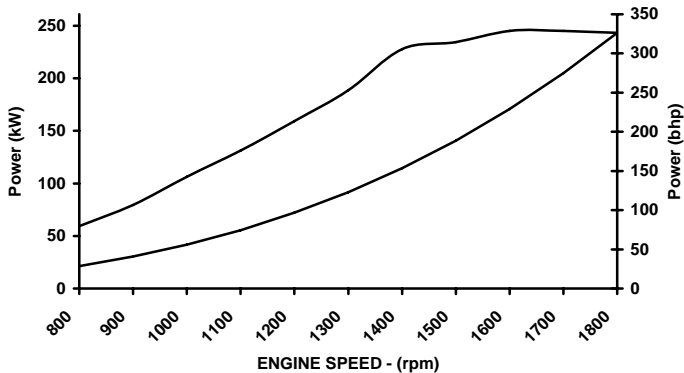
Displacement: **8.9 liter** [542 in<sup>3</sup>]  
 Bore: **114 mm** [4.49 in]  
 Stroke: **145 mm** [5.71 in]  
 Fuel System: **HPCR**  
 Cylinders: **6**

Advertised Power: **243 [326, 330] @ 1800**  
 kW [bhp, mhp] @ rpm

Aspiration: **Turbocharged / Sea Water Aftercooled**  
 Rating Type: **Heavy Duty**

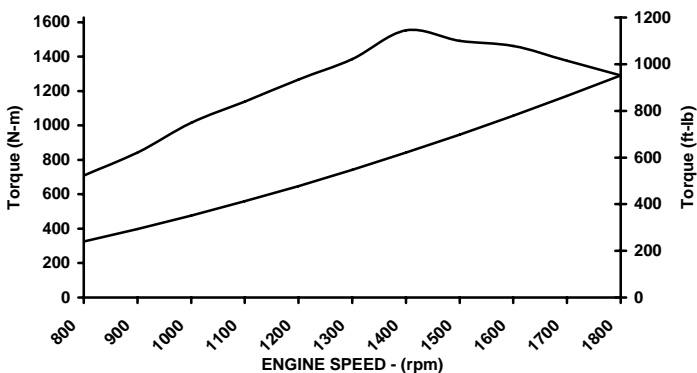
CERTIFIED: This marine diesel engine is certified to the model year requirements of EPA Marine Tier 2 per 40 CFR 94 and conforms with the NOx requirements of the International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13 as applicable.

**RATED POWER OUTPUT CURVE**



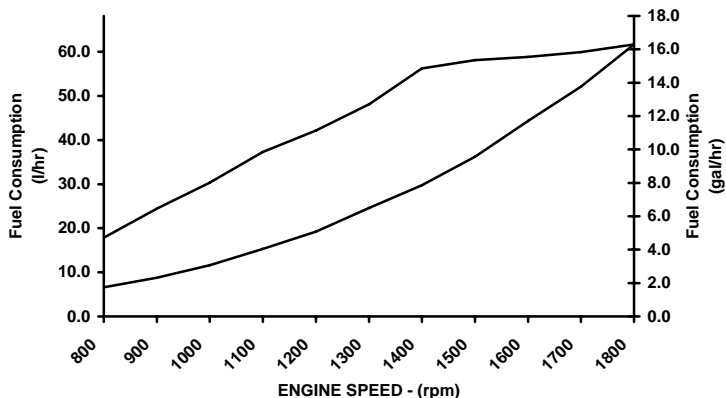
rpm	kW	bhp
1800	243	326
1700	245	328
1600	245	329
1500	234	314
1400	228	305
1300	189	253
1200	159	213
1100	131	176
1000	106	143
900	79	106
800	59	80

**FULL LOAD TORQUE CURVE**



rpm	N-m	ft-lb
1800	1291	952
1700	1376	1015
1600	1462	1078
1500	1492	1100
1400	1553	1145
1300	1386	1022
1200	1266	934
1100	1139	840
1000	1015	749
900	842	621
800	708	522

**FUEL CONSUMPTION - PROP CURVE**



rpm	l/hr	gal/hr
1800	61.7	16.3
1700	52.1	13.8
1600	44.3	11.7
1500	36.2	9.6
1400	29.8	7.9
1300	24.6	6.5
1200	19.2	5.1
1100	15.3	4.1
1000	11.6	3.1
900	8.8	2.3
800	6.6	1.7

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 3.0 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].

**Heavy Duty Rating:** This power rating is intended for continuous use in variable load applications where full power is limited to eight (8) hours out of ten (10) hours of operation. Reduced power operations must be at or below 200 RPM of the maximum rated RPM. This is an ISO 3046 Fuel Stop Power Rating and is for applications that operate less than 5,000 hours per year.

*James D. Kuhlensch*

CHIEF ENGINEER

# Marine Engine Performance Data

**Curve No.: M-91391**  
**DS-3038**  
**DATE: 3Jan07**

## General Engine Data

Engine Model.....		QSL9 – 330 HD
Rating Type .....		Heavy Duty
Rated Engine Power..... kW [bhp]		243 [326]
Rated Engine Speed..... rpm		1800
Rated HP Production Tolerance .....	±%	5
Rated Engine Torque.....N•m [ft•lb]		1291 [952]
Peak Engine Torque @ 1400 rpm .....	N•m [ft•lb]	1552 [1145]
Brake Mean Effective Pressure .....	kPa [psi]	1827 [265]
Indicated Mean Effective Pressure .....	kPa [psi]	2017 [293]
Minimum Idle Speed Setting..... rpm		600
Normal Idle Speed Variation.....	±rpm	10
High Idle Speed Range	Minimum .....	1865
	Maximum .....	1885
Maximum Allowable Engine Speed .....	rpm	1885
Maximum Torque Capacity from Front of Crank <sup>2</sup> .....	N•m [ft•lb]	705 [520]
Compression Ratio .....		16.6:1
Piston Speed .....	m/sec [ft/min]	8.7 [1713]
Firing Order.....		1-5-3-6-2-4
Weight (Dry) Engine only - Average.....	kg [lb]	901 [1987]
Weight (Dry) Engine With Heat Exchanger System - Average.....	kg [lb]	977 [2153]
Weight Tolerance (Dry) Engine only - Average.....	kg [lb]	N.A.

## Noise and Vibration

Average Noise Level – Top	(Idle).....	dBa @ 1m	84
	(Rated).....	dBa @ 1m	96
Average Noise Level – Right Side	(Idle).....	dBa @ 1m	84
	(Rated).....	dBa @ 1m	96
Average Noise Level – Left Side	(Idle).....	dBa @ 1m	84
	(Rated).....	dBa @ 1m	96
Average Noise Level – Front	(Idle).....	dBa @ 1m	84
	(Rated).....	dBa @ 1m	96

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

Average Fuel Consumption – ISO 8178 E3Standard Test Cycle.....	l/hr [gal/hr]	42.14 [11.1]	
Fuel Consumption @ Rated Speed.....	l/hr [gal/hr]	62 [16.13]	
Approximate Fuel Flow to Pump.....	l/hr [gal/hr]	100 [26]	
Maximum Allowable Fuel Supply to Pump Temperature.....	°C [°F]	60 [140]	
Approximate Fuel Flow Return to Tank .....	l/hr [gal/hr]	38 [10]	
Approximate Fuel Return to Tank Temperature	Without Cooler.....	°C [°F]	85.1 [185]
	With Cooler.....	°C [°F]	40 [104]
Maximum Heat Rejection to Drain Fuel <sup>5</sup> .....	kW [Btu/min]	1 [50]	
Fuel Transfer Pump Pressure Range.....	kPa [psi]	N/A	
Fuel Rail Pressure	INSITE.....	kPa [psi]	113,998 [16,534]

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

Intake Manifold Pressure .....	kPa [in Hg]	171 [50.6]
Intake Air Flow.....	l/sec [cfm]	306 [648]
Heat Rejection to Ambient .....	kW [Btu/min]	61 [3480]
Maximum Air Cleaner Inlet Temperature Rise Over Ambient.....	°C [°F]	17 [30]

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

Exhaust Gas Flow.....	l/sec [cfm]	660 [1399]	
Exhaust Gas Temperature	Turbine Out.....	°C [°F]	385 [724]
	Manifold .....	°C [°F]	512 [952]

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

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

<http://www.cummins.com>

# Marine Engine Performance Data

Curve No.: M-91391  
DS-3038  
DATE: 3Jan07

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

NOx (Oxides of Nitrogen) .....	g/kw-hr [g/hp-hr]	6.40 [4.772]
HC (Hydrocarbons).....	g/kw-hr [g/hp-hr]	0.08 [0.06]
CO (Carbon Monoxide).....	g/kw-hr [g/hp-hr]	0.53 [0.398]
PM (Particulate Matter).....	g/kw-hr [g/hp-hr]	0.09 [0.066]

## 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]	360 [95]
Standard Thermostat Operating Range Start to Open.....	°C [°F]	71 [160]
Full Open .....	°C [°F]	81 [178]
Heat Rejection to Engine Coolant <sup>3</sup> .....	kW [Btu/min]	167 [9500]

### Single Loop Low Temperature Aftercooling

Coolant Flow to LTA Heat Exchanger/Keel Cooler .....	l/min [gal/min]	152 [40]
LTA Thermostat Operating Range Start to Open.....	°C [°F]	66 [150]
Full Open .....	°C [°F]	80 [175]
Heat Rejection to LTA Coolant <sup>3</sup> .....	kW [Btu/min]	211 [12,000]

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>