



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

Basic Engine Model

**QSL9-330 HO**

Engine Configuration

**D563005MX03**

Curve Number:

**M-91397**

CPL Code:

**8419**

Date:

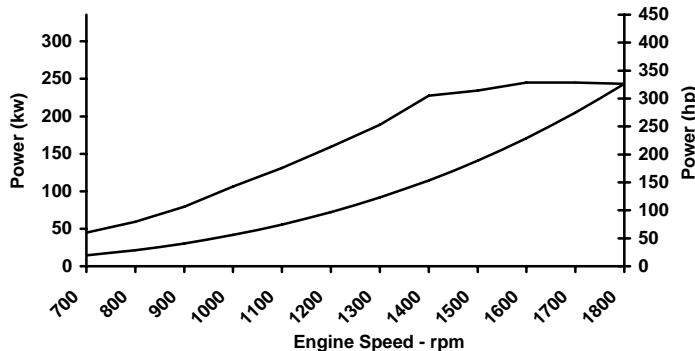
**26-Mar-09**

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**

kW [bhp, mhp] @ rpm  
 Advertised Power: **243 [326, 330] @ 1800**  
 Aspiration: **Turbocharged / Aftercooled**  
 Rating Type: **High Output**

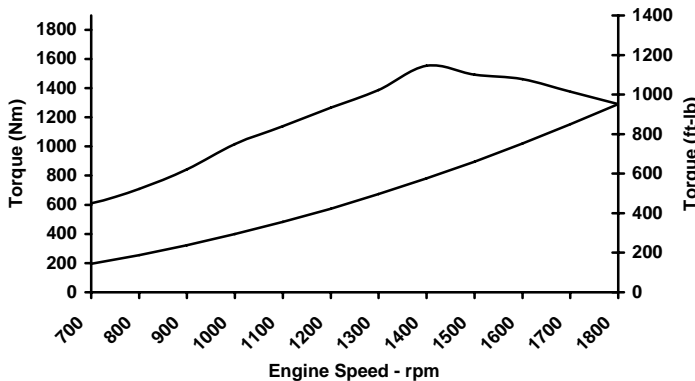
CERTIFIED: This marine diesel engine is certified to the model year requirements of EPA Marine Tier 2 per 40 CFR 94 and conforms with the NOx requirements of the International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13 as applicable.

**RATED POWER OUTPUT CURVE**



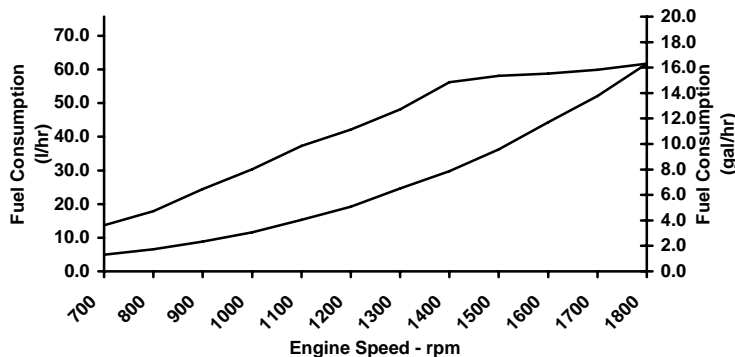
rpm	kw	bhp
1800	243	326
1700	245	328
1600	245	329
1500	234	314
1400	228	305
1300	189	253
1200	159	213
1100	131	176
1000	106	143
900	79	106
800	59	80
700	45	60

**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
700	610	450

**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
700	5.0	1.3

Rated Conditions: Ratings are based upon ISO 15550 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. Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.

Rated Curves (upper) represents rated power at the crankshaft for mature gross engine performance capabilities obtained and corrected in accordance with ISO 15550. 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]

**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.

*James D. Kuhlman*

CHIEF ENGINEER

# Propulsion Marine Engine Performance Data

**Curve No.** M-91397  
**DS :** 4960  
**CPL :** 8419  
**DATE:** 26-Mar-09

## General Engine Data

Engine Model .....	QSL9-330 HO
Rating Type .....	High Output
Rated Engine Power .....	243 [326]
Rated Engine Speed .....	1800
Rated Power Production Tolerance .....	±% 5
Rated Engine Torque .....	1291 [952]
Peak Engine Torque @ 1400 rpm .....	1552 [1145]
Brake Mean Effective Pressure .....	1827 [265]
Indicated Mean Effective Pressure .....	190 [28]
Minimum Idle Speed Setting .....	600
Normal Idle Speed Variation .....	10
High Idle Speed Range Minimum .....	1865
Maximum .....	1885
Maximum Allowable Engine Speed .....	1885
Maximum Torque Capacity from Front of Crank <sup>2</sup> .....	705 [520]
Compression Ratio .....	16.6:1
Piston Speed .....	8.7 [1713]
Firing Order .....	1-5-3-6-2-4
Weight (Dry) - Engine Only - Average .....	kg [lb] N.A. [N.A.]
Weight (Dry) - Engine With Heat Exchanger System - Average .....	kg [lb] 977 [2153]
Weight Tolerance (Dry) Engine Only .....	3xStd Dev( ±%) 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>

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle .....	l/hr [gal/hr]	42.1 [11.1]
Fuel Consumption at Rated Speed .....	l/hr [gal/hr]	61.7 [16.3]
Approximate Fuel Flow to Pump .....	l/hr [gal/hr]	99.6 [26.3]
Maximum Allowable Fuel Supply to Pump Temperature .....	°C [°F]	60.0 [140]
Approximate Fuel Flow Return to Tank .....	l/hr [gal/hr]	37.9 [10.0]
Approximate Fuel Return to Tank Temperature .....	°C [°F]	85.1 [185]
Maximum Heat Rejection to Drain Fuel .....	kW [Btu/min]	0.9 [50]
Fuel Pressure - Pump Out/Rail . Mechanical Gauge .....	kPa [psi]	N/A [N/A]
INSITE Reading .....	kPa [psi]	113998 [16534]

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

Intake Manifold Pressure .....	kPa [in Hg]	171 [51]
Intake Air Flow .....	l/sec [cfm]	306 [648]
Heat Rejection to Ambient .....	kW [Btu/min]	61 [3480]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

- <sup>1</sup> Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.
- <sup>2</sup> No rear loads can be applied when the FPTO is fully loaded. Max PTO torque is contingent on torsional analysis results for the specific drive system. Consult Installation Direction Booklet for Limitations.
- <sup>3</sup> 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.
- <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>

# Propulsion Marine Engine Performance Data

**Curve No.**    **M-91397**  
**DS :**            **4960**  
**CPL :**          **8419**  
**DATE:**         **26-Mar-09**

**Exhaust System<sup>1</sup>**

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

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

NOx (Oxides of Nitrogen) .....	g/kw-hr [g/hp-hr]	6.40 [4.77]
HC (Hydrocarbons) .....	g/kw-hr [g/hp-hr]	0.08 [0.06]
CO (Carbon Monoxide) .....	g/kw-hr [g/hp-hr]	0.53 [0.40]
PM (Particulate Matter) .....	g/kw-hr [g/hp-hr]	0.09 [0.07]

**Cooling System<sup>1</sup>**

**Sea Water After Cooled Engine**

Sea Water Pump Specifications .....	MAB 0.08.17-07/16/2001	
Pressure Cap Rating.....	kPa [psi]	103 [15]
Thermostat Operating Range (Start to Open).....	°C [°F]	71 [160]
Thermostat Operating Range(Full Open).....	°C [°F]	81 [178]

**Engines with Single Loop Keel Cooling**

Coolant Flow to Keel Cooler (with blocked open thermostat).....	l/min [gal/min]	152 [40]
LTA Thermostat Operating Range (Start to Open) .....	°C [°F]	66 [150]
LTA Thermostat Operating Range (Full Open) .....	°C [°F]	80 [175]
Heat Rejection to Engine Coolant <sup>3</sup> .....	kW [Btu/min]	211 [12000]
Maximum Coolant Inlet Temperature from LTA Cooler.....	°C [°F]	54 [130]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

- <sup>1</sup> Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.
- <sup>2</sup> No rear loads can be applied when the FPTO is fully loaded. Max PTO torque is contingent on torsional analysis results for the specific drive system. Consult Installation Direction Booklet for Limitations.
- <sup>3</sup> 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.
- <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>