



CUMMINS MERCURISER DIESEL
 Charleston, SC 29405
 Marine Performance Curves

Basic Engine Model:
QSL9 - 330 HD
 Engine Configuration:
D563005MX03

Curve Number:
M-91391

CPL Code: **8419**
 Date: **15-Dec-04**

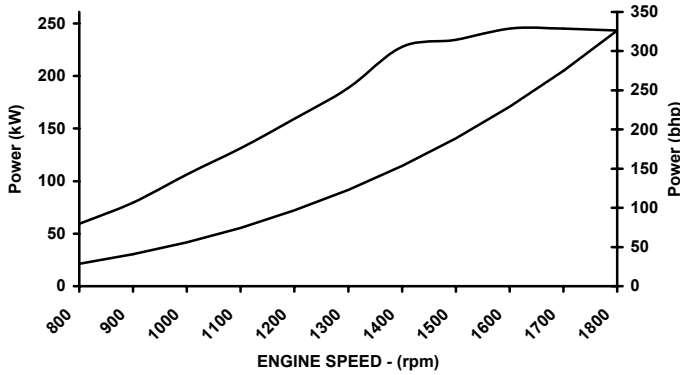
Displacement: **8.9 liter** [542 in³]
 Bore: **114 mm** [4.49 in]
 Stroke: **145 mm** [5.71 in]
 Fuel System: **HPCR**
 Cylinders: **6**

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

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

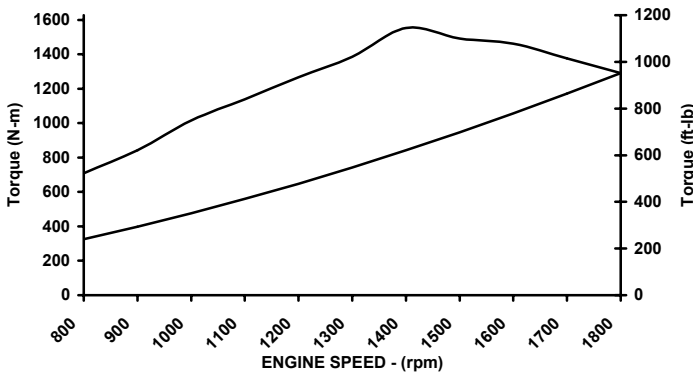
CERTIFIED: This marine diesel engine is certified to the model year requirements of EPA Marine Tier 2 per 40 CFR 94 and conforms with the NOx requirements of the International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13 as applicable.

RATED POWER OUTPUT CURVE



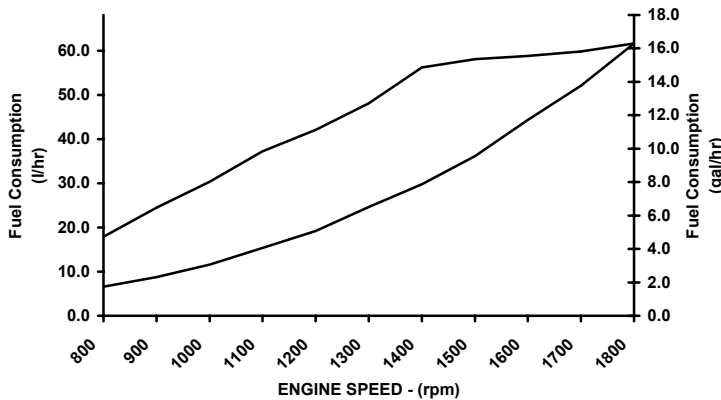
rpm	kW	bhp
1800	243	326
1700	245	328
1600	245	329
1500	234	314
1400	228	305
1300	189	253
1200	159	213
1100	131	176
1000	106	143
900	79	106
800	59	80

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. Kahlert

CHIEF ENGINEER

Marine Engine Performance Data

Curve No.: M-91391
DS-3038
DATE: 15Dec04

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	rpm 1865
	Maximum	rpm 1885
Maximum Allowable Engine Speed	rpm	1885
Maximum Torque Capacity from Front of Crank ²	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]	N.A.
Weight (Dry) Engine With Heat Exchanger System - Average.....	kg [lb]	907 [2000]
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 System¹

Average Fuel Consumption – ISO 8178 E3 Standard 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 ⁵	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 System¹

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 System¹

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

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

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<http://www.cummins.com>

Marine Engine Performance Data

Curve No.: M-91391
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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 System¹

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.....	71 [160]
	Full Open	81 [178]
Heat Rejection to Engine Coolant ³	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.....	66 [150]
	Full Open	80 [175]
Heat Rejection to LTA Coolant ³	kW [Btu/min]	211 [12,000]

TBD = To Be Decided

N/A = Not Applicable

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4Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.

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