



CUMMINS MERCUISER DIESEL
Charleston, SC 29405
Marine Performance Curves

Basic Engine Model
QSL9-405 MCD

Engine Configuration
D563005MX03

Curve Number:
M-91239

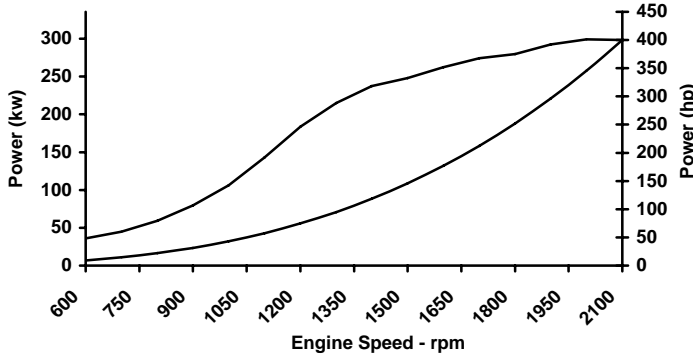
CPL Code:
8419

Date:
26-Mar-09

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

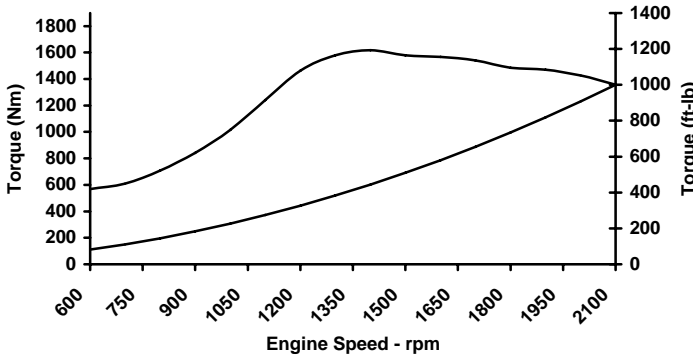
Aspiration: **Turbocharged / Aftercooled**
 Rating Type: **Medium Continuous Duty**
 kW [bhp, mhp] @ rpm
 Advertised Power: **298 [400, 405] @ 2100**

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.



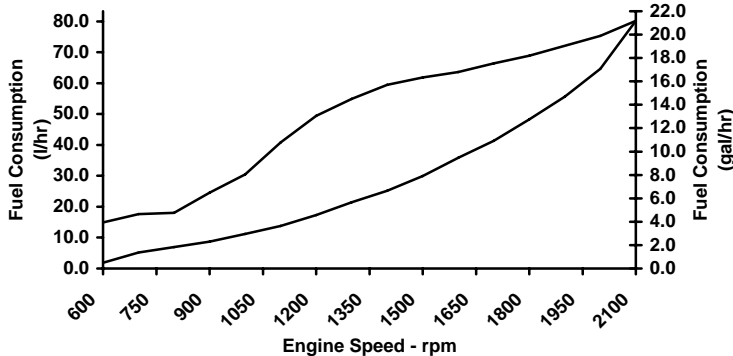
RATED POWER OUTPUT CURVE

rpm	kw	bhp
2100	298	400
1900	293	392
1700	274	368
1600	262	352
1400	237	318
1300	215	288
1200	184	247
1100	143	192
1000	106	143
800	59	80
700	45	60
600	36	48



FULL LOAD TORQUE CURVE

rpm	N-m	ft-lb
2100	1356	1000
1900	1470	1084
1700	1540	1136
1600	1566	1155
1400	1619	1194
1300	1578	1164
1200	1463	1079
1100	1241	915
1000	1015	749
800	708	522
600	569	420



FUEL CONSUMPTION - PROP CURVE

rpm	l/hr	gal/hr
2100	80.2	21.2
1900	55.6	14.7
1700	41.4	10.9
1600	35.9	9.5
1400	25.1	6.6
1300	21.4	5.7
1200	17.3	4.6
1100	13.8	3.6
1000	11.1	2.9
800	6.9	1.8
600	1.9	0.5

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 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].

Medium Continuous (MCD): Intended for continuous use in variable load applications where full power is limited to six hours out of every twelve hours of operation. Also, reduced power operations must be at or below 200 rpm of the maximum rated rpm. This rating is an ISO 15550 fuel stop power rating and is for applications that operate less than 3,000 hours per year.

James D. Kelleher

CHIEF ENGINEER

Propulsion Marine Engine Performance Data

Curve No. M-91239
DS : 4960
CPL : 8419
DATE: 26-Mar-09

General Engine Data

Engine Model	QSL9-405 MCD
Rating Type	Medium Continuous Duty
Rated Engine Power	298 [400] kW [hp]
Rated Engine Speed	2100 rpm
Rated Power Production Tolerance	±% 5
Rated Engine Torque	1356 [1000] N-m [lb-ft]
Peak Engine Torque @ 1400 rpm	1619 [1194] N-m [lb-ft]
Brake Mean Effective Pressure	1919 [278] kPa [psi]
Indicated Mean Effective Pressure	2132 [309] kPa [psi]
Minimum Idle Speed Setting	600 rpm
Normal Idle Speed Variation	10 rpm
High Idle Speed Range Minimum	2165 rpm
High Idle Speed Range Maximum	2185 rpm
Maximum Allowable Engine Speed	2185 rpm
Maximum Torque Capacity from Front of Crank ²	705 [520] N-m [lb-ft]
Compression Ratio	16.6:1
Piston Speed	10.2 [1998] m/sec [ft/min]
Firing Order	1-5-3-6-2-4
Weight (Dry) - Engine Only - Average	901 [1987] kg [lb]
Weight (Dry) - Engine With Heat Exchanger System - Average	977 [2153] kg [lb]
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 System¹

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle	53.0 [14.0] l/hr [gal/hr]
Fuel Consumption at Rated Speed	80.2 [21.2] l/hr [gal/hr]
Approximate Fuel Flow to Pump	117.3 [31.0] l/hr [gal/hr]
Maximum Allowable Fuel Supply to Pump Temperature	60.0 [140] °C [°F]
Approximate Fuel Flow Return to Tank	37.2 [9.8] l/hr [gal/hr]
Approximate Fuel Return to Tank Temperature	85.1 [185] °C [°F]
Maximum Heat Rejection to Drain Fuel	0.9 [49] kW [Btu/min]
Fuel Transfer Pump Pressure Range.....	517.1 [75] kPa [psi]
Fuel Pressure - Pump Out/Rail . INSITE Reading	139998 [20305] kPa [psi]

Air System¹

Intake Manifold Pressure	177 [52] kPa [in Hg]
Intake Air Flow	363 [769] l/sec [cfm]
Heat Rejection to Ambient	79 [4500] kW [Btu/min]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

- ¹ Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.
- ² 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.
- ³ 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.
- ⁴ Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.
- ⁵ 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>

Propulsion Marine Engine Performance Data

Curve No. M-91239
DS : 4960
CPL : 8419
DATE: 26-Mar-09

Exhaust System¹

Exhaust Gas Flow	/sec [cfm]	831 [1760]
Exhaust Gas Temperature (Turbine Out)	°C [°F]	449 [839]
Exhaust Gas Temperature (Manifold)	°C [°F]	623 [1152]

Emissions (in accordance with ISO 8178 Cycle E3)

NOx (Oxides of Nitrogen)	g/kw-hr [g/hp-hr]	6.36 [4.74]
HC (Hydrocarbons)	g/kw-hr [g/hp-hr]	0.09 [0.07]
CO (Carbon Monoxide)	g/kw-hr [g/hp-hr]	0.58 [0.43]
PM (Particulate Matter)	g/kw-hr [g/hp-hr]	0.10 [0.07]

Cooling System¹

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]	178 [47]
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 ³	kW [Btu/min]	264 [15000]
Maximum Coolant Inlet Temperature from LTA Cooler.....	°C [°F]	54 [130]

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