



CUMMINS INC.
Columbus, Indiana 47201
Marine Performance Curve

Basic Engine Model:
QSK60-D(M)

Curve Number:
D(M)-6440a

Engine Configuration:
D593005MX03

CPL Code:
8456

Date:
23Aug06

Displacement: **59.9 liter [3673 in.³]**
Bore: **159 mm [6.25 in.]**
Stroke: **190 mm [7.48 in.]**
Fuel System: **Direct Injection Cummins HPI-PT**
Cylinders: **16**

Prime Power Rating:

kW [bhp] @ rpm
1900 [2547] @ 1800

Aspiration:
Exhaust:

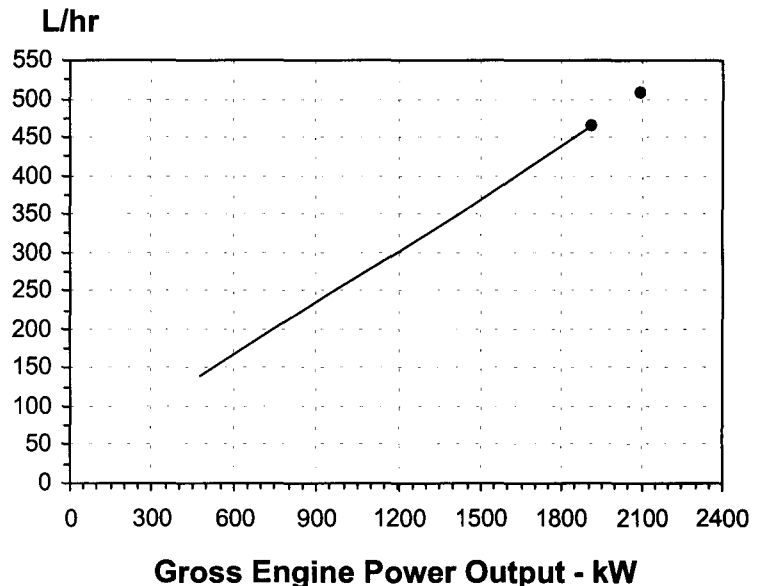
Turbocharged/Low Temperature Aftercooled Dry

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.

Engine Speed rpm	Overload Capacity		Prime Power		Continuous Power	
	kW	bhp	kW	bhp	kW	bhp
1800	2090	2802	1900	2547	N/A	N/A

Engine Performance Data @ 1800 rpm

OUTPUT POWER			FUEL CONSUMPTION			
%	kW	bhp	kg/ kW-hr	lb/ bhp-hr	l/hr	U.S. gal/hr
10% OVERLOAD CAPACITY						
110	2090	2802	0.207	0.341	509.6	134.6
PRIME POWER						
100	1900	2547	0.206	0.340	461.4	121.9
75	1425	1910	0.209	0.344	349.5	92.4
50	950	1274	0.219	0.361	245.1	64.8
25	475	637	0.250	0.412	139.9	37.0
CONTINUOUS POWER						
100	N/A	N/A	N/A	N/A	N/A	N/A



Rating Conditions: Ratings are in accordance with ISO 3046 reference conditions; air pressure at 100 kPa (29.61 in Hg), air temperature 25°C (77°F), and 30% relative humidity. The fuel consumption data is based on No. 2 diesel fuel weight at 0.85 kg/liter (7.1 lb/U.S. gal).

Power output curves are based on the engine operating with fuel system, water pump and lubricating oil pump; not included are battery charging alternator, fan, optional equipment and driven components.

Operation at elevated temperatures for sustained operation above 40°C (104°F), derate 2% per 11°C (1% per 10°F).

Prime Power Rating is applicable for supplying continual electrical power at varied load. The following are the Prime Rating parameters:

- * Prime Power is available for an unlimited number of hours per year in a variable load application. Variable load should not exceed a 70% average of the Prime Power rating during any operating period of 250 hours.

- * The total operating time at 100% Prime Power shall not exceed 500 hours per year.

- * There is a 10% overload capability for a period of 1 hour within a 12 hour period of operation. Total operating time at 10% overload shall not exceed 25 hours per year.

Continuous Power Rating is applicable for supplying continual power at a constant 100% load for an unlimited number of hours per year. There is no overload capability for this rating.

CHIEF ENGINEER

TECHNICAL DATA DEPT.

Auxiliary Marine Engine Performance Data

Curve No. D(M)-6440a

DS : 3003

CPL : 8456

DATE: 23-Aug-06

General Engine Data

Engine Model	QSK60-D(M)	
Rating Type	Prime Power	Overload
Rated Engine PowerkW [hp]	1900 [2547]	2090 [2802]
Governed Engine Speedrpm	1800	
Rated HP Production Tolerance	±3	
Rated Engine TorqueN·m [lb·ft]	10076 [7432]	11084 [8176]
Low Idle Speed Rangerpm	635-665	
Brake Mean Effective PressurekPa [psi]	2104 [305]	2314 [336]
Compression Ratio	14.5:1	
Piston Speedm/sec [ft/min]	11.4 [2244]	
Firing Order	1R-1L-3R-3L-2R-2L-5R-4L-8R-8L-6R-6L-7R-7L-4R-5L	
Friction PowerkW [hp]	207 [277]	
Steady State Stability Band at Constant Load	±.25	
Weight Dry - Engine Onlykg [lb]	N.A.	
Weight Dry - Engine With Heat Exchanger	N.A.	

Noise and Vibration

Average Noise Level - Top	(Idle).....	dBA @ 1m	N.A.
	(Rated)	dBA @ 1m	106.5
Average Noise Level - Right Side	(Idle).....	dBA @ 1m	N.A.
	(Rated)	dBA @ 1m	106.5
Average Noise Level - Left Side	(Idle).....	dBA @ 1m	N.A.
	(Rated)	dBA @ 1m	106.3

Fuel System¹

Approximate Fuel Flow to Pump	l/hr [gal/hr]	1700 [449]	1700 [449]
Maximum Allowable Fuel Supply to Pump Temperature	°C [°F]	71 [160]	71 [160]
Approximate Fuel Flow Return to Tank	l/hr [gal/hr]	1238 [327]	1190 [314]
Approximate Fuel Return to Tank Temperature	°C [°F]	71 [160]	71 [160]
Maximum Heat Rejection to Drain Fuel	kW [Btu/min]	21 [1200]	21 [1200]
Fuel Rail Pressure	kPa [psi]	985 [142.8]	1120 [162.4]

Air System¹

Intake Manifold Pressure	kPa [in Hg]	276 [81.5]	292 [86.1]
Intake Air Flow	l/sec [cfm]	2765 [5859]	2938 [6226]
Heat Rejection to Ambient	kW [Btu/min]	108 [6132]	119 [6746]

Exhaust System¹

Exhaust Gas Flow	l/sec [cfm]	5992 [12697]	6371 [13499]
Exhaust Gas Temperature (Turbine Out)	°C [°F]	425 [797]	440 [824]
Exhaust Gas Temperature (Manifold)	°C [°F]	580 [1076]	620 [1148]
Heat Rejection to Exhaust	kW [Btu/min]	1466 [83423]	1565 [89058]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

¹ All Data at Rated Conditions.

² 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.

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<http://www.cummins.com>

Auxiliary Marine Engine Performance Data

Curve No. D(M)-6440a

DS : 3003

CPL : 8456

DATE: 23-Aug-06

Emissions (in accordance with ISO 8178 Cycle D2)

NOx (Oxides of Nitrogen)	g/kw-hr [g/bhp-hr]	7.82 [5.80]	
HC (Hydrocarbons)	g/kw-hr [g/bhp-hr]	0.27 [0.20]	
CO (Carbon Monoxide)	g/kw-hr [g/bhp-hr]	0.38 [0.30]	
PM (Particulate Matter)	g/kw-hr [g/bhp-hr]	N.A.	
CO2 (Carbon Dioxide)	g/kw-hr [g/bhp-hr]	N.A.	

Emissions (in accordance with ISO 8178 Cycle E2)

NOx (Oxides of Nitrogen)	g/kw-hr [g/bhp-hr]	8.39 [6.30]	
HC (Hydrocarbons)	g/kw-hr [g/bhp-hr]	0.18 [0.10]	
CO (Carbon Monoxide)	g/kw-hr [g/bhp-hr]	0.29 [0.20]	
PM (Particulate Matter)	g/kw-hr [g/bhp-hr]	N.A.	
CO2 (Carbon Dioxide)	g/kw-hr [g/bhp-hr]	N.A.	

Cooling System¹

Sea Water Pump Specifications.....	Refer to MAB 0.08.17-07/16/2001		
Pressure Cap Rating (With Heat Exchanger Option)	kPa [psi]	103 [15]	

Engines with Low Temperature Aftercooling (LTA)

Two Loop LTA (For both 1 & 2 pump systems)

Main Engine Circuit

Coolant Flow to Main Cooler (Blocked open thermostat).....	l/min [gal/min]	946 [250]	
Standard Thermostat Operating Range	Start to open.....	82 [180]	
	Full open.....	95 [202]	
Heat Rejection to Engine Coolant ²	kW [Btu/min]	586 [33377]	645 [36714]

Aftercooler (LTA) Circuit

Coolant Flow to LTA Cooler (Blocked open thermostat).....	l/min [gal/min]	511 [135]	
LTA Thermostat Operating Range	Start to open.....	46 [115]	
	Full open.....	57 [135]	
Heat Rejection to Engine Coolant ²	kW [Btu/min]	496 [28243]	546 [31067]
Maximum Coolant Inlet Temperature from LTA Cooler.....	°C [°F]	49 [120]	

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