



CUMMINS INC.
Columbus, IN 47201
Marine Performance Curves

Basic Engine Model
QSK60-M T2

Curve Number:
M-6664

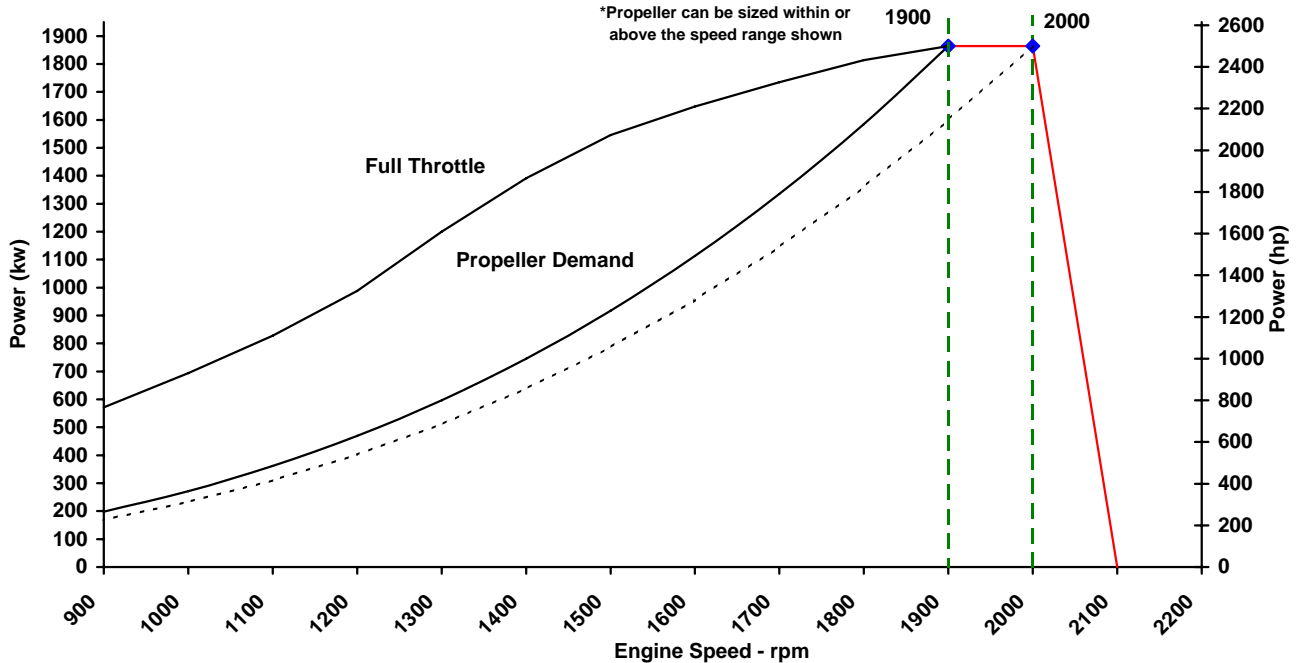
Engine Configuration
D593009MX03

CPL Code:
2704

Date:
15-Feb-10

Displacement: **60.2 liter** [3672 in³] Rated Power: **1864 kw** [2500 bhp]
 Bore: **159 mm** [6.25 in] Rated Speed: **1900 rpm**
 Stroke: **190 mm** [7.48 in] Rating Type: **Medium Duty**
 Fuel System: **MCRS** Aspiration: **Turbocharged/Aftercooled**
 Cylinders: **16**

CERTIFIED: This diesel engine complies with or is certified to the following agencies requirements:
 IMO - NOx requirements of the International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13
 EPA Tier 2 - Model year requirements of the EPA marine regulation (40CFR94)
 EU Stage IIIa - EC Nonroad Mobile Machinery Directive (2004/26/EC)



Speed	Full Throttle- Power		Full Throttle- Torque		Fuel Cons.- Prop. Curve 2.7 Exp.	
	rpm	kw (hp)	N·m (ft·lb)	L/hr (gal/hr)		
2000	1864	(2500)	8902	(6565)		
1900	1864	(2500)	9370	(6911)	467.8	(123.6)
1800	1813	(2432)	9619	(7095)	402.2	(106.2)
1700	1735	(2327)	9747	(7189)	339.0	(89.5)
1600	1647	(2209)	9831	(7251)	291.6	(77.0)
1500	1546	(2073)	9839	(7257)	252.2	(66.6)
1400	1391	(1866)	9491	(7000)	208.0	(55.0)
1300	1200	(1609)	8813	(6500)	171.1	(45.2)
1200	988	(1325)	7864	(5800)	139.8	(36.9)
1100	828	(1110)	7186	(5300)	110.7	(29.2)
1000	694	(931)	6626	(4887)	83.9	(22.2)
900	571	(766)	6059	(4469)	63.6	(16.8)
800	460	(617)	5491	(4050)	47.0	(12.4)

* Cummins Full Throttle Requirements:

- Engine achieves or exceeds rated rpm at full throttle under any steady operating condition
- Engines in variable displacement boats (such as pushboats, tugboats, net druggers, etc.) achieve no less than 100 rpm below rated speed at full throttle during a dead push or bollard pull
- Engine achieves or exceeds rated rpm when accelerating from idle to full throttle

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%.

Full Throttle curve represents power at the crankshaft for mature gross engine performance corrected in accordance with ISO 15550. Propeller Curve represents approximate power demand from a typical propeller. 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.

CHIEF ENGINEER

Propulsion Marine Engine Performance Data

Curve No. M-6664
DS : D59-MX-1
CPL : 2704
DATE: 15-Feb-10

General Engine Data

Engine Model	QSK60-M T2
Rating Type	Medium Duty
Rated Engine PowerkW [hp]	1864 [2500]
Rated Engine Speedrpm	1900
Rated Power Production Tolerance±%	3
Rated Engine TorqueN-m [lb-ft]	9369 [6911]
Peak Engine Torque @ 1500 rpm.....N-m [lb-ft]	9839 [7257]
Brake Mean Effective PressurekPa [psi]	1957 [284]
Indicated Mean Effective Pressure.....kPa [psi]	1957 [284]
Maximum Allowable Engine Speedrpm	2450
Maximum Torque Capacity from Front of Crank ²N-m [lb-ft]	6527 [4814]
Compression Ratio	15
Piston Speedm/sec [ft/min]	12.0 [2369]
Firing Order	2-1-6-5-4-3-10-7-16-15-12-11-14-13-8-9
Weight (Dry) - Engine Only - Averagekg [lb]	8754 [19300]
Weight (Dry) - Engine With Heat Exchanger System - Average.....kg [lb]	9136 [20142]

Governor Settings

Default Droop Value.....	Refer to MAB 2.04.00-03/23/2006 for Droop explanation	5%
Minimum Droop Allowed.....		0%
Maximum Droop Allowed.....		16%
High Speed Governor Break Point.....rpm		2000
Minimum Idle Speed Setting		650
Normal Idle Speed Variation		±rpm 10
High Idle Speed Range Minimum		2000
Maximum		2100

Noise and Vibration

Average Noise Level - Top	(Idle)..	dBa @ 1m	N/A
	(Rated)	dBa @ 1m	107
Average Noise Level - Right Side	(Idle)..	dBa @ 1m	N/A
	(Rated)	dBa @ 1m	106
Average Noise Level - Left Side	(Idle)..	dBa @ 1m	N/A
	(Rated)	dBa @ 1m	106
Average Noise Level - Front	(Idle)..	dBa @ 1m	N/A
	(Rated)	dBa @ 1m	102

Fuel System¹

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle	l/hr [gal/hr]	323.0 [85.3]
Fuel Consumption at Rated Speed	l/hr [gal/hr]	467.8 [123.6]
Approximate Fuel Flow to Pump	l/hr [gal/hr]	964.7 [254.8]
Maximum Allowable Fuel Supply to Pump Temperature	°C [°F]	60.0 [140]
Approximate Fuel Flow Return to Tank	l/hr [gal/hr]	496.9 [131.3]
Approximate Fuel Return to Tank Temperature	°C [°F]	71.2 [160]
Maximum Heat Rejection to Drain Fuel	kW [Btu/min]	7.9 [451]
Fuel Pressure - Pump Out/Rail . Mechanical Gauge	kPa [psi]	150000 [21756]

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.

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COLUMBUS, INDIANA

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<http://marine.cummins.com/>

Propulsion Marine Engine Performance Data

Curve No. M-6664
DS : D59-MX-1
CPL : 2704
DATE: 15-Feb-10

Air System¹

Intake Manifold Pressure	kPa [in Hg]	290 [86]
Intake Air Flow	l/sec [cfm]	2988 [6331]
Heat Rejection to Ambient	kW [Btu/min]	81 [4617]

Exhaust System¹

Exhaust Gas Flow	l/sec [cfm]	6585 [13952]
Exhaust Gas Temperature (Turbine Out)	°C [°F]	399 [750]
Exhaust Gas Temperature (Manifold)	°C [°F]	589 [1092]

Emissions (in accordance with ISO 8178 Cycle E3)

NOx (Oxides of Nitrogen)	g/kw-hr [g/hp-hr]	6.71 [5.01]
HC (Hydrocarbons)	g/kw-hr [g/hp-hr]	0.15 [0.11]
CO (Carbon Monoxide)	g/kw-hr [g/hp-hr]	0.37 [0.27]
PM (Particulate Matter)	g/kw-hr [g/hp-hr]	0.06 [0.04]

Emissions (in accordance with ISO 8178 Cycle E2)

NOx (Oxides of Nitrogen)	g/kw-hr [g/hp-hr]	6.15 [4.58]
HC (Hydrocarbons)	g/kw-hr [g/hp-hr]	0.23 [0.17]
CO (Carbon Monoxide)	g/kw-hr [g/hp-hr]	1.64 [1.23]
PM (Particulate Matter)	g/kw-hr [g/hp-hr]	0.08 [0.06]

Cooling System¹

Sea Water Pump Specifications	MAB 0.08.17-07/16/2001	
Pressure Cap Rating (With Heat Exchanger Option)	kPa [psi]	103 [15]
Max. Pressure Drop Across Any External Cooling System Circuit	kPa [psi]	34 [5]

Engines with Low Temperature Aftercooling (LTA)

Two Loop LTA

Main Engine Circuit

Coolant Flow to Main Cooler (with blocked open thermostat).....	l/min [gal/min]	1301 [344]
Standard Thermostat Operating Range	Start to open.....	82 [180]
	Full open.....	95 [202]
Heat Rejection to Engine Coolant ³	kW [Btu/min]	553 [31455]

Aftercooler (LTA) Circuit

Coolant Flow to LTA Cooler (with blocked open thermostat).....	l/min [gal/min]	545 [144]
LTA Thermostat Operating Range	Start to open.....	46 [115]
	Full open.....	57 [135]
Heat Rejection to Engine Coolant ³	kW [Btu/min]	577 [32819]
Maximum Coolant Inlet Temperature from LTA Cooler.....	°C [°F]	49 [120]

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N/A = Not Applicable

N.A. = Not Available

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