



CUMMINS INC.  
Columbus, IN 47201  
Marine Performance Curves  
[marine.cummins.com](http://marine.cummins.com)

Basic Engine Model  
**QSM11-M-405 CON**  
Engine Configuration  
**D353021MX03**

Curve Number:  
**M-20918**  
CPL Code:  
**4334**  
Date:  
**3-Oct-16**

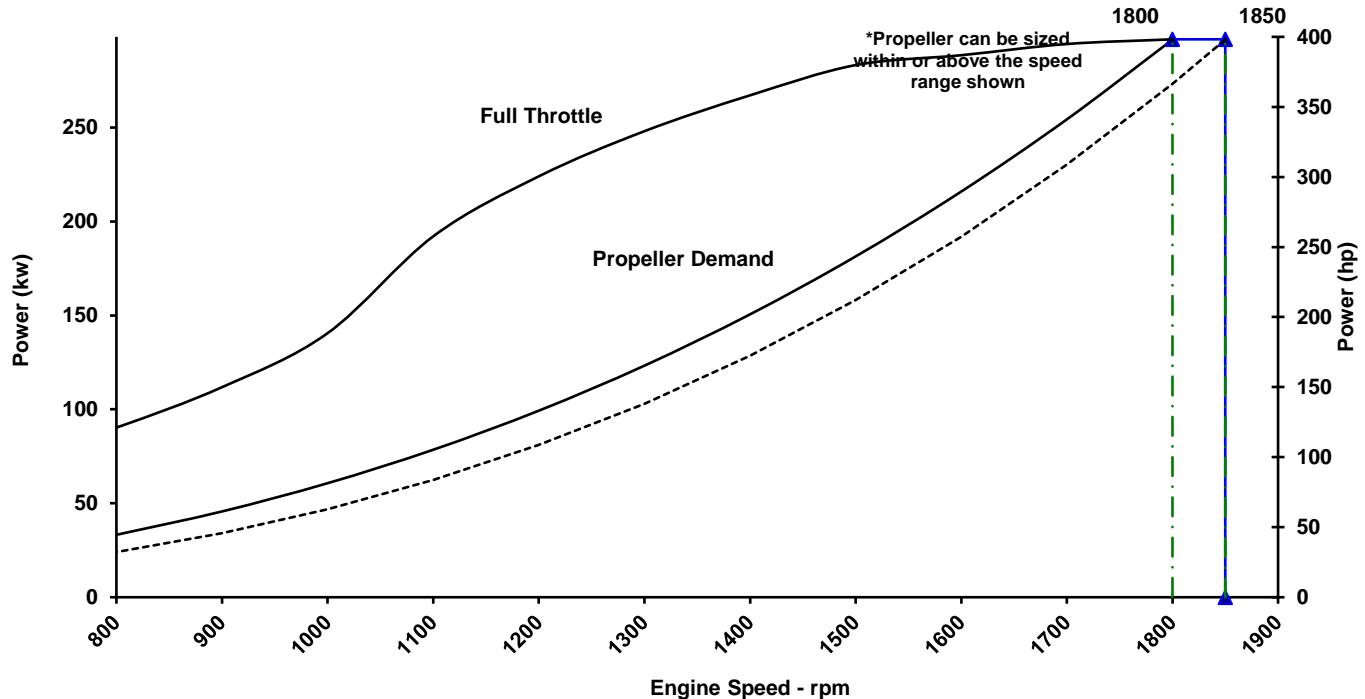
Displacement: **10.8 liter [661 in³]** Rated Power: **297 kw [398 bhp, 405 mhp]**  
Bore: **125 mm [4.92 in]** Rated Speed: **1800 rpm**  
Stroke: **147 mm [5.79 in]** Rating Type: **Continuous Duty**  
Fuel System: **CELECT** Aspiration: **Turbocharged / Low Temperature Aftercooled**  
Cylinders: **6**

CERTIFIED: This diesel engine complies with or is certified to the following agencies requirements:

EPA Tier 3 - Model year requirements of the EPA marine regulation (40CFR1042)

EU Stage IIIa - EC Nonroad Mobile Machinery Directive (2004/26/EC)

IMO Tier II - Tier 2 (Two) NOx requirements of International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13



	Speed	Full Throttle- Power		Full Throttle- Torque		Fuel Cons.- Prop. Curve 3.0 Exp.	
	rpm	kw	(hp)	N·m	(ft·lb)	L/hr	(gal/hr)
	1850	297	(398)	1533	(1131)		
	1800	297	(398)	1575	(1162)	80.4	(21.2)
	1700	294	(395)	1654	(1220)	64.8	(17.1)
	1600	289	(387)	1722	(1270)	54.7	(14.5)
	1500	283	(380)	1803	(1330)	43.5	(11.5)
	1400	267	(358)	1822	(1344)	36.3	(9.6)
	1300	248	(333)	1822	(1344)	29.2	(7.7)
	1200	224	(300)	1783	(1315)	22.8	(6.0)
	1100	192	(258)	1668	(1230)	17.7	(4.7)

\* 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 dragners, 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, tolerance on all values is +/-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].

Continuous Rating (CON): Intended for continuous use in applications requiring uninterrupted service at full power. This rating is an ISO 15550 standard power rating.

TECHNICAL DEPT.

CHIEF ENGINEER

# Propulsion Marine Engine Performance Data

Curve No. M-20918  
DS : 3075  
CPL : 4334  
DATE: 3-Oct-16

## General Engine Data

Engine Model .....	QSM11-M-405 CON
Rating Type .....	Continuous Duty
Rated Engine Power .....	297 [398]
Rated Engine Speed .....	1800
Rated Power Production Tolerance .....	5
Rated Engine Torque .....	1574 [1161]
Peak Engine Torque @ 1300 rpm.....	1822 [1344]
Brake Mean Effective Pressure .....	1828 [265]
Indicated Mean Effective Pressure.....	2007 [291]
Maximum Allowable Engine Speed .....	1860
Maximum Torque Capacity from Front of Crank <sup>2</sup> .....	847 [625]
Compression Ratio .....	15.9:1
Piston Speed .....	8.8 [1736]
Firing Order .....	1-5-3-6-2-4
Weight (Dry) - Engine Only - Average .....	1118 [2464]
Weight (Dry) - Engine With Heat Exchanger System - Average.....	1184 [2610]

## Governor Settings

High Speed Governor Break Point.....	1850
Minimum Idle Speed Setting .....	600
Normal Idle Speed Variation .....	10
High Idle Speed Range    Minimum .....	1840
Maximum .....	1860

## Noise and Vibration

Average Noise Level - Top	(Idle)..	dBA @ 1m	80
	(Rated) .....	dBA @ 1m	95
Average Noise Level - Right Side	(Idle)..	dBA @ 1m	80
	(Rated) .....	dBA @ 1m	95
Average Noise Level - Left Side	(Idle)..	dBA @ 1m	80
	(Rated) .....	dBA @ 1m	95
Average Noise Level - Front	(Idle)..	dBA @ 1m	80
	(Rated) .....	dBA @ 1m	95

## Fuel System<sup>1</sup>

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle .....	54.2 [14.3]
Fuel Consumption at Rated Speed .....	80.4 [21.2]
Approximate Fuel Flow to Pump .....	230.9 [61.0]
Maximum Allowable Fuel Supply to Pump Temperature .....	60.0 [140]
Approximate Fuel Flow Return to Tank .....	150.5 [39.8]
Approximate Fuel Return to Tank Temperature .....	71.2 [160]
Maximum Heat Rejection to Drain Fuel .....	2.4 [137]
Fuel Pressure - Pump Out/Rail . Mechanical Gauge .....	1103 [160]

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  $\pm 5\%$ .

<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.

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COLUMBUS, INDIANA

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

Intake Manifold Pressure .....	kPa [in Hg]	201 [59]
Intake Air Flow .....	l/sec [cfm]	427 [905]
Heat Rejection to Ambient .....	kW [Btu/min]	23 [1287]

## Exhaust System<sup>1</sup>

Exhaust Gas Flow .....	l/sec [cfm]	939 [1990]
Exhaust Gas Temperature (Turbine Out) .....	°C [°F]	423 [793]
Exhaust Gas Temperature (Manifold) .....	°C [°F]	627 [1160]

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

NOx (Oxides of Nitrogen) .....	g/kw·hr [g/hp·hr]	4.95 [3.69]
HC (Hydrocarbons) .....	g/kw·hr [g/hp·hr]	0.26 [0.20]
CO (Carbon Monoxide) .....	g/kw·hr [g/hp·hr]	0.46 [0.34]
PM (Particulate Matter) .....	g/kw·hr [g/hp·hr]	0.04 [0.03]

## Cooling System<sup>1</sup>

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

## Engines without Low Temperature Aftercooling (LTA )

### Sea Water Aftercooled Engine (SWAC)

Coolant Flow to Engine Heat Exchanger .....	l/min [gal/min]	181 [47.9]
Standard Thermostat Operating Range (Start to Open) .....	°C [°F]	71 [160]
Standard Thermostat Operating Range (Full Open) .....	°C [°F]	80 [175]
Heat Rejection to Engine Coolant <sup>3</sup> .....	kW [Btu/min]	311 [17700]

## Engines with Low Temperature Aftercooling (LTA )

### Single Loop LTA

Coolant Flow to Cooler (with blocked open thermostat).....	l/min [gal/min]	169 [45]
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]	269 [15302]
Maximum Coolant Inlet Temperature from LTA Cooler.....	°C [°F]	54 [130]

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<sup>1</sup> Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.

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