



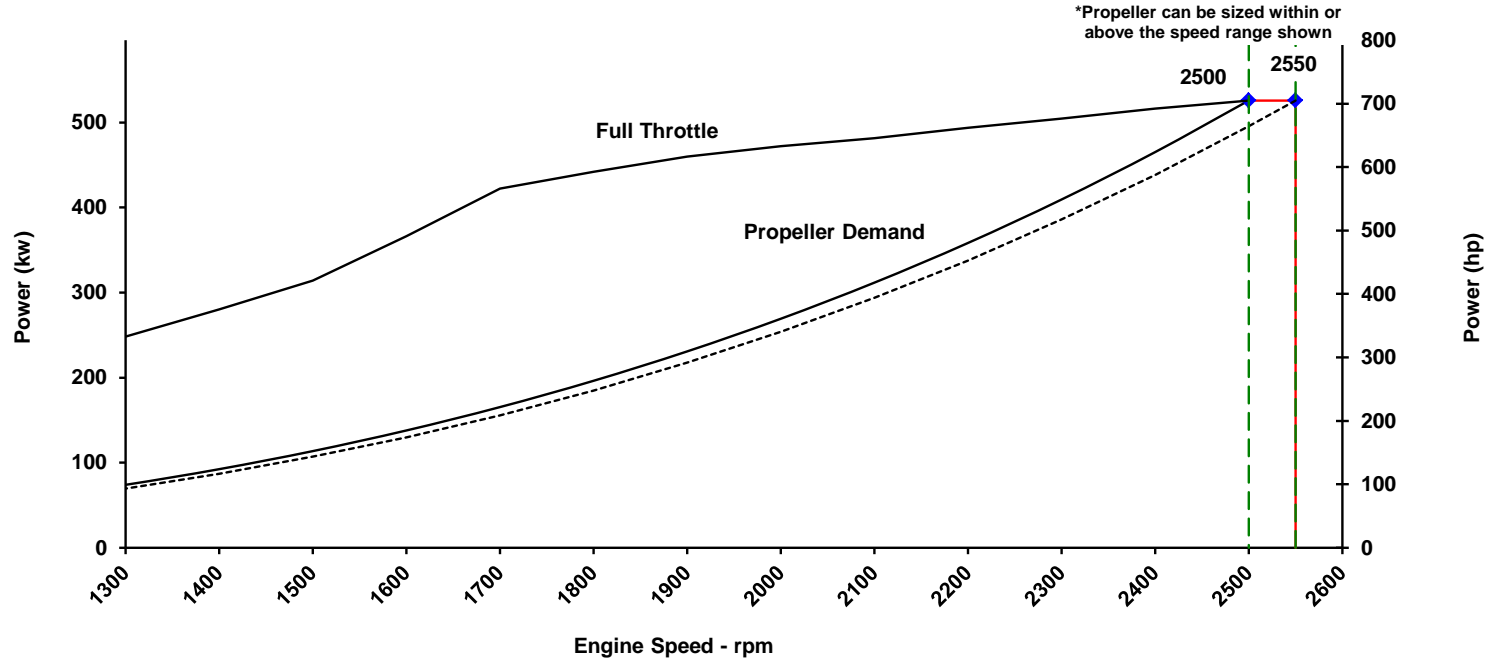
CUMMINS INC.
 Charleston, SC 29405
 Marine Performance Curves
marine.cummins.com

Basic Engine Model QSM11-M	Curve Number: M-20573	
Engine Configuration D353013MX03	CPL Code: 1794	Date: 15-May-14

Displacement: **10.8 liter [661 in³]**
 Bore: **125 mm [4.92 in]**
 Stroke: **147 mm [5.79 in]**
 Cylinders: **6**
 Fuel System: **CELECT**

Rated Power: **526 Kw [705 bhp, 715 mhp]**
 Rated Speed: **2500 rpm**
 Rating Type: **Government Service**
 Aspiration: **Turbocharged / Sea Water Aftercooled**

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



Speed rpm	Full Throttle				Propeller Demand					
	Power		Torque		Power		Torque		Fuel Consumption	
	kw	(hp)	N·m	(ft·lb)	kw	(hp)	N·m	(ft·lb)	L/hr	(gal/hr)
2550	526	(705)	1969	(1452)						
2500	526	(705)	2008	(1481)	526	(705.0)	2008	(1,481.1)	139.2	(36.8)
2400	516	(692)	2054	(1515)	465	(623.7)	1851	(1,364.9)	119.8	(31.6)
2300	505	(677)	2095	(1545)	409	(549.0)	1700	(1,253.6)	102.9	(27.2)
2200	494	(662)	2142	(1580)	358	(480.4)	1555	(1,146.9)	87.6	(23.1)
2100	482	(646)	2190	(1615)	312	(417.9)	1417	(1,045.0)	75.6	(20.0)
2000	472	(633)	2255	(1663)	269	(361.0)	1285	(947.9)	65.4	(17.3)
1900	460	(617)	2312	(1705)	231	(309.5)	1160	(855.5)	56.0	(14.8)
1800	442	(593)	2346	(1730)	196	(263.1)	1041	(767.8)	47.8	(12.6)
1700	422	(566)	2373	(1750)	165	(221.7)	929	(684.8)	41.1	(10.9)
1600	366	(491)	2186	(1613)	138	(184.8)	822	(606.6)	34.8	(9.2)
1500	314	(421)	2000	(1475)	114	(152.3)	723	(533.2)	28.7	(7.6)
1400	280	(376)	1912	(1410)	92	(123.8)	630	(464.5)	23.6	(6.2)
1300	248	(333)	1824	(1345)	74	(99.1)	543	(400.5)	19.2	(5.1)
1200	213	(285)	1691	(1248)	58	(78.0)	463	(341.2)	15.3	(4.0)
1100	180	(241)	1559	(1150)	45	(60.1)	389	(286.7)	12.2	(3.2)
1000	142	(191)	1359	(1003)	34	(45.1)	321	(237.0)	9.5	(2.5)
900	109	(147)	1159	(855)	25	(32.9)	260	(191.9)	7.4	(2.0)
800	89	(119)	1058	(780)	17	(23.1)	206	(151.7)	5.6	(1.5)
700	70	(94)	956	(705)	12	(15.5)	157	(116.1)	4.3	(1.1)
600	0	(0)	0	(0)	7	(9.7)	116	(85.3)	2.5	(0.7)

*** Cummins Full Throttle Requirements:**

- Engine achieves or exceeds rated rpm at full throttle under any steady operating condition
- 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. Member NMMA. Unless otherwise specified, tolerance on all values is +/-5%. Values from engine control modules and displayed on instrument panels are not absolute. Tolerance varies, but is generally less than +/-5% when operating within 30% of rated power.

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].

Government Service (GS): Intended for use in variable load applications where full power is limited to one hour out of every eight hours of operation. Also reduced power must be at or below 200 RPM of the maximum rated RPM. This power rating is only for use in National, State or Local government non-revenue producing applications.

Propulsion Marine Engine Performance Data

Curve No. M-20573
 DS: DS3021
 CPL: 1794
 DATE: 15-May-14

General Engine Data

Engine Model	QSM11-M
Rating Type	Government Service
Rated Engine Power	526 [705]
Rated Engine Speed	2500
Rated Power Production Tolerance	±5%
Rated Engine Torque	2008 [1481]
Peak Engine Torque @ 1500 rpm.....	2373 [1750]
Brake Mean Effective Pressure	2331 [338]
Indicated Mean Effective Pressure.....	2600 [377]
Maximum Allowable Engine Speed	2560

Maximum Continuous Torque Capacity from Front of Crank Specifications

Maximum Torque Capacity from Front of Crank ²	0 [0]
Compression Ratio	16.3:1
Piston Speed	12.3 [2411]
Firing Order	1-5-3-6-2-4
Weight (Dry) - Engine With Heat Exchanger System - Average.....	1188 [2620]

Governor Settings

Default Droop Value.....	0%
High Speed Governor Break Point.....	2550
Minimum Idle Speed Setting	600
Normal Idle Speed Variation	±10
High Idle Speed Range Minimum	2550
High Idle Speed Range Maximum	2570

Noise and Vibration

Average Noise Level - Top	(Idle)..	dBa @ 1m	TBD
	(Rated)	dBa @ 1m	TBD
Average Noise Level - Right Side	(Idle)..	dBa @ 1m	TBD
	(Rated)	dBa @ 1m	TBD
Average Noise Level - Left Side	(Idle)..	dBa @ 1m	TBD
	(Rated)	dBa @ 1m	TBD
Average Noise Level - Front	(Idle)..	dBa @ 1m	TBD
	(Rated)	dBa @ 1m	TBD

Fuel System¹

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle	92.6 [24.5]
Fuel Consumption at Rated Speed	139.2 [36.8]
Approximate Fuel Flow to Pump	302.8 [80.0]
Maximum Allowable Fuel Supply to Pump Temperature	60.0 [140]
Approximate Fuel Flow Return to Tank	159.0 [42.0]
Approximate Fuel Return to Tank Temperature	93.4 [200]
Maximum Heat Rejection to Drain Fuel	4.3 [247]
Fuel Pressure - Pump Out/Rail . Mechanical Gauge	1151 [167]

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.

CUMMINS INC.
 COLUMBUS, INDIANA

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Air System¹

Intake Manifold Pressure	kPa [in Hg]	295 [87]
Intake Air Flow	l/sec [cfm]	723 [1533]
Heat Rejection to Ambient	kW [Btu/min]	43 [2446]

Exhaust System¹

Exhaust Gas Flow	l/sec [cfm]	1871 [3,964]
Exhaust Gas Temperature (Turbine Out)	°C [°F]	544 [1,010]
Exhaust Gas Temperature (Manifold)	°C [°F]	732 [1,349]

Emissions (in accordance with ISO 8178 Cycle E3)

NOx (Oxides of Nitrogen)	g/kw-hr [g/hp-hr]	3.88 [2.89]
HC (Hydrocarbons)	g/kw-hr [g/hp-hr]	0.20 [0.15]
CO (Carbon Monoxide)	g/kw-hr [g/hp-hr]	0.71 [0.53]
PM (Particulate Matter)	g/kw-hr [g/hp-hr]	0.11 [0.08]
CO ₂ (Carbon dioxide)	g/kw-hr [g/hp-hr]	644.00 [480.23]
CH ₄ (Methane)	g/kw-hr [g/hp-hr]	0.00 [0.00]

Emissions (in accordance with ISO 8178 Cycle E2)

NOx (Oxides of Nitrogen)	g/kw-hr [g/hp-hr]	0.00 [0.00]
HC (Hydrocarbons)	g/kw-hr [g/hp-hr]	0.00 [0.00]
CO (Carbon Monoxide)	g/kw-hr [g/hp-hr]	0.00 [0.00]

Cooling System¹

Sea Water Pump Specifications	MAB 0.08.17-07/16/2001	
Pressure Cap Rating	kPa [psi]	103 [15]
Max. Coolant Outlet Pressure from the Engine.....	kPa [psi]	0 [0]
Max. Pressure Drop Across Any External Cooling System Circuit	kPa [psi]	0 [0]

Engines with Low Temperature Aftercooling (LTA)

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

Main Engine Circuit

Coolant Flow to Main Cooler (with blocked open thermostat).....	l/min [gal/min]	0 [0]
Standard Thermostat Operating Range	Start to open.....	-18 [0]
	Full open.....	-18 [0]
Heat Rejection to Engine Coolant ³	kW [Btu/min]	0 [0]

Aftercooler (LTA) Circuit

Coolant Flow to LTA Cooler (with blocked open thermostat).....	l/min [gal/min]	0 [0]
LTA Thermostat Operating Range	Start to open.....	-18 [0]
	Full open.....	-18 [0]
Heat Rejection to Engine Coolant ³	kW [Btu/min]	0 [0]
Maximum Coolant Inlet Temperature from LTA Cooler.....	°C [°F]	N.A.

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