



**CUMMINS INC.**  
 Columbus, IN 47201  
 Marine Performance Curves  
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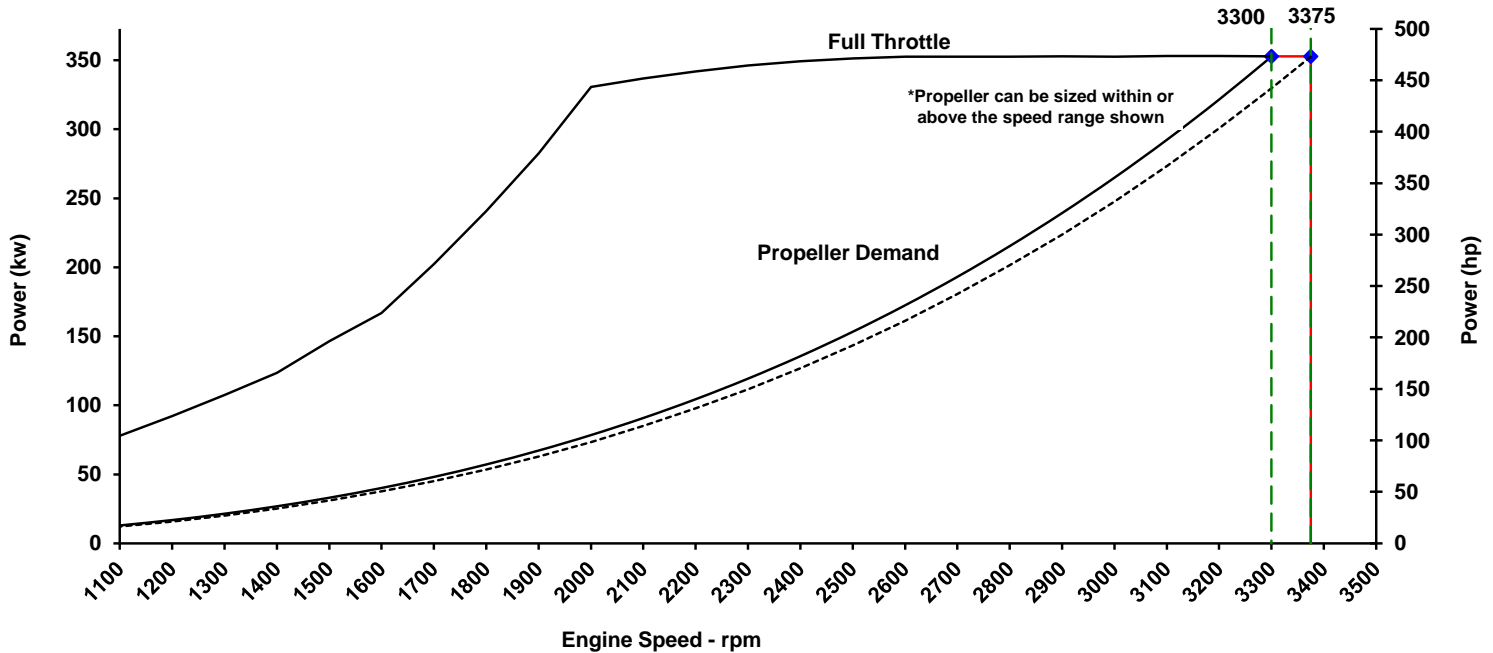
Basic Engine Model  
**QSB 6.7**  
 Engine Configuration  
**D313011MX03**

Curve Number:  
**M-94128**  
 CPL Code: **4191** Date: **2-Oct-13**

Displacement: **6.7 liter [408 in<sup>3</sup>]**  
 Bore: **107 mm [4.21 in]**  
 Stroke: **124 mm [4.88 in]**  
 Fuel System: **HPCR Bosch CRIN 3.0**  
 Cylinders: **6**

Rated Power: **353 kw [473 bhp, 480 mhp]**  
 Rated Speed: **3300 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)  
 EU Stage IIIa - EC Nonroad Mobile Machinery Directive (2004/26/EC)  
 IMO Tier II (Two) NOx requirements of International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13



Speed	Full Throttle				Propeller Demand					
	Power		Torque		Power		Torque		Fuel Consumption	
	rpm	kw (hp)	N·m (ft·lb)	kw (hp)	N·m (ft·lb)	L/hr (gal/hr)				
3375	353 (473)	998 (736)	353 (473.0)	1021 (752.8)	96.2 (25.4)					
3300	353 (473)	1021 (753)	325 (435.3)	969 (714.4)	86.6 (22.9)					
3200	353 (473)	1053 (777)	298 (399.5)	918 (676.9)	78.7 (20.8)					
3100	353 (473)	1087 (802)	273 (365.7)	868 (640.2)	71.2 (18.8)					
3000	353 (473)	1123 (828)	249 (333.7)	819 (604.3)	64.6 (17.1)					
2900	353 (473)	1162 (857)	226 (303.5)	772 (569.3)	58.4 (15.4)					
2800	353 (473)	1203 (887)	185 (248.5)	681 (501.9)	47.9 (12.7)					
2600	353 (473)	1295 (955)	149 (200.2)	594 (438.1)	38.4 (10.1)					
2400	349 (468)	1390 (1025)	118 (158.3)	512 (377.8)	31.1 (8.2)					
2200	342 (459)	1485 (1095)	91 (122.4)	436 (321.3)	24.4 (6.4)					
2000	331 (444)	1580 (1165)	69 (92.1)	364 (268.6)	18.3 (4.8)					
1800	241 (323)	1277 (942)	50 (67.0)	298 (219.9)	13.4 (3.5)					
1600	167 (224)	995 (734)	35 (46.7)	238 (175.2)	9.7 (2.6)					
1400	124 (166)	843 (622)	23 (30.8)	183 (134.8)	6.9 (1.8)					
1200	92 (124)	733 (541)	14 (18.8)	134 (98.9)	4.8 (1.3)					
1000	65 (87)	620 (457)	8 (10.3)	92 (67.7)	3.5 (0.9)					
800	45 (61)	541 (399)	4 (4.7)	56 (41.5)	2.2 (0.6)					
600	31 (42)	500 (369)								

**\* 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 300 RPM of the maximum rated RPM. This power rating is only for use in National, State or Local government non-revenue producing applications.

*[Signature]*  
 CHIEF ENGINEER



# Propulsion Marine Engine Performance Data

Curve No. M-94128  
 DS: D31-MX-2  
 CPL: 4191  
 DATE: 2-Oct-13

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

Intake Manifold Pressure .....	kPa [in Hg]	246 [73]
Intake Air Flow .....	l/sec [cfm]	475 [1007]
Heat Rejection to Ambient .....	kW [Btu/min]	29 [1630]

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

Exhaust Gas Flow .....	l/sec [cfm]	1038 [2,200]
Exhaust Gas Temperature (Turbine Out) .....	°C [°F]	455 [850]
Exhaust Gas Temperature (Manifold) .....	°C [°F]	649 [1,200]

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

NO <sub>x</sub> (Oxides of Nitrogen) .....	g/kw-hr [g/hp-hr]	4.99 [3.72]
HC (Hydrocarbons) .....	g/kw-hr [g/hp-hr]	0.15 [0.11]
CO (Carbon Monoxide) .....	g/kw-hr [g/hp-hr]	0.63 [0.47]
PM (Particulate Matter) .....	g/kw-hr [g/hp-hr]	0.10 [0.07]
CO <sub>2</sub> (Carbon dioxide) .....	g/kw-hr [g/hp-hr]	695.00 [518.26]

## 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]	110 [16]
Max. Coolant Outlet Pressure from the Engine.....	kPa [psi]	414 [60]

### Sea Water Aftercooled Engine (SWAC)

Standard Thermostat Operating Range (Start to Open) .....	°C [°F]	71 [160]
Standard Thermostat Operating Range (Full Open) .....	°C [°F]	83 [182]

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 ± 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.

CUMMINS INC.  
 COLUMBUS, INDIANA

All Data is Subject to Change Without Notice - Consult the following Cummins Web site for the most recent data:

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