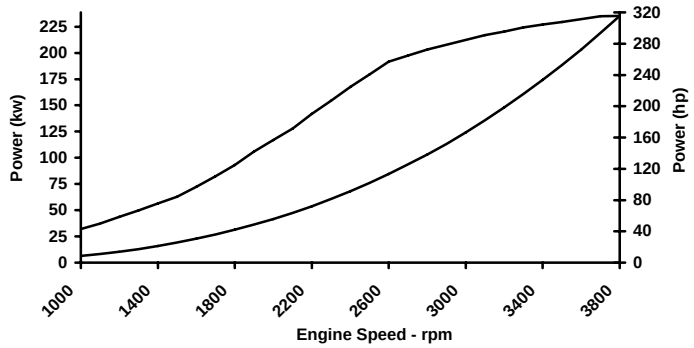
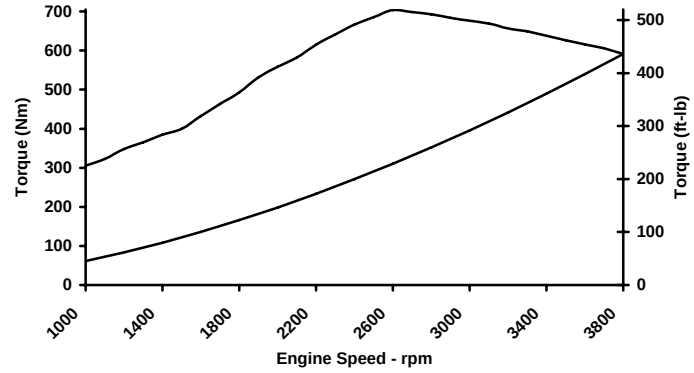
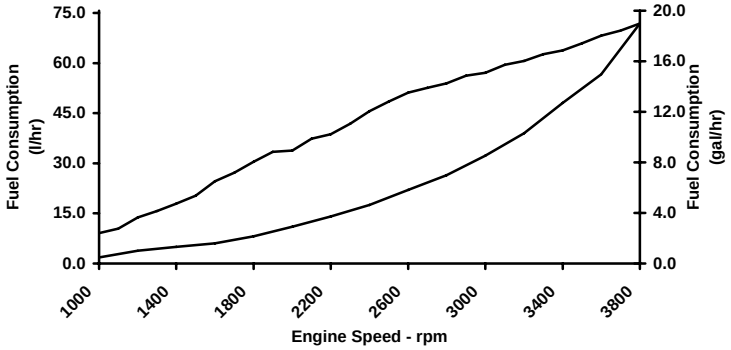
CUMMINS MERCRUISER DIESEL Charleston, SC 29405 Marine Performance Curves	Basic Engine Model QSD4.2-320 HO	Curve Number: BC9152, BC9155	
	Engine Configuration D913003MX03	CPL Code:	Date: 9-Jul-09

Displacement:	**4.2 liter**	**254 in³**		kW [bhp, mhp] @ rpm
Bore:	**94 mm**	**3.70 in**	Advertised Power:	**235 [315, 320] @ 3800**
Stroke:	**100 mm**	**3.94 in**		
Fuel System:	**Bosch Common Rail (CRS 2.0)**		Aspiration:	**Turbocharged/Sea Water Aftercooled**
Cylinders:	**6**		Rating Type:	**High Output**

CERTIFIED: This marine diesel engine is certified to the model year requirements of EPA Marine Tier 2 per 40 CFR 94 and conforms with the NOx requirements of the International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13 as applicable.







RATED POWER OUTPUT CURVE

rpm	kw	bhp
3800	235	315
3600	232	311
3400	227	305
3200	220	295
3000	213	285
2800	203	272
2600	192	257
2200	142	190
1800	93	125
1400	56	76
1200	44	59
1000	32	43

FULL LOAD TORQUE CURVE

rpm	N-m	ft-lb
3800	591	436
3600	616	454
3400	638	471
3200	657	485
3000	676	499
2800	693	511
2600	703	519
2200	615	454
1800	493	364
1400	385	284
1200	348	257
1000	305	225

FUEL CONSUMPTION - PROP CURVE

rpm	l/hr	gal/hr
3800	71.9	19.0
3600	56.7	15.0
3400	48.1	12.7
3200	39.0	10.3
3000	32.3	8.5
2800	26.4	7.0
2600	22.0	5.8
2200	14.1	3.7
1800	8.1	2.1
1400	5.0	1.3
1200	3.8	1.0
1000	1.8	0.5

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 humidy. Power is in accordance with IMCI procedure. Member NMMA.

Rated Curves (upper) represents rated power at the crankshaft for mature gross engine performance capabilities obtained and corrected in accordance with ISO 15550. Propeller Curve (lower) is based on a typical fixed propeller demand curve using a 2.7 exponent. 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].

High Output (HO) Intended for use in variable load applications where full power is limited to one (1) hour out of every eight (8) hours of operation. Also, reduced power must be at or below 400 rpm of the maximum rated rpm. This power rating is for pleasure/non-revenue generating applications that operate 500 hours per year or less.

CHIEF ENGINEER

Propulsion Marine Engine Performance Data

Curve No.	**BC9152, BC9155**
DS :	**D91-MX-1**
CPL :	
DATE:	**9-Jul-09**

General Engine Data

Engine Model		QSD4.2-320 HO
Rating Type		High Output
Rated Engine Power	kW [hp]	235 [315]
Rated Engine Speed	rpm	3800
Rated Power Production Tolerance	±%	5
Rated Engine Torque	N·m [lb·ft]	591 [436]
Peak Engine Torque @ 2600 rpm	N·m [lb·ft]	703 [519]
Brake Mean Effective Pressure	kPa [psi]	1784 [259]
Indicated Mean Effective Pressure	kPa [psi]	1784 [259]
Minimum Idle Speed Setting	rpm	600
Normal Idle Speed Variation	rpm	25
High Idle Speed Range Minimum	rpm	3880
Maximum	rpm	3920
Maximum Allowable Engine Speed	rpm	3900
Compression Ratio		17.5:1
Piston Speed	m/sec [ft/min]	12.7 [2493]
Firing Order		1-5-3-6-2-4
Weight (Dry) - Engine With Heat Exchanger System - Average	kg [lb]	460 [1014]

Fuel System[1]

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle	l/hr [gal/hr]	48.3 [13]
Fuel Consumption at Rated Speed	l/hr [gal/hr]	71.9 [19]
Maximum Allowable Fuel Supply to Pump Temperature	°C [°F]	60.0 [140]
Approximate Fuel Return to Tank Temperature With Cooler	°C [°F]	41.1 [106]

Air System[1]

Intake Manifold Pressure	kPa [in Hg]	190 [56]
Intake Air Flow	l/sec [cfm]	310 [657]

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.**

CUMMINS ENGINE COMPANY, INC

COLUMBUS, INDIANA

Propulsion Marine Engine Performance Data

Curve No.	**BC9152, BC9155**
DS :	**D91-MX-1**
CPL :	
DATE:	**9-Jul-09**

Exhaust System[1]		
Exhaust Gas Flow	l/sec [cfm]	724 [1534]
Exhaust Gas Temperature (Turbine Out)	°C [°F]	545 [1013]
Exhaust Gas Temperature (Manifold)	°C [°F]	628 [1161]
Emissions (ISO 8178 Cycle E5- for Traditional Propulsion Applications)		
NOx (Oxides of Nitrogen)	g/kw·hr [g/hp·hr]	4.21 [3.14]
HC (Hydrocarbons)	g/kw·hr [g/hp·hr]	0.19 [0.14]
CO (Carbon Monoxide)	g/kw·hr [g/hp·hr]	1.43 [1.07]
PM (Particulate Matter)	g/kw·hr [g/hp·hr]	0.30 [0.22]
Cooling System[1]		
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)		
Standard Thermostat Operating Range (Start to Open)	°C [°F]	80 [176]
Standard Thermostat Operating Range (Full Open)	°C [°F]	95 [202]

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COLUMBUS, INDIANA