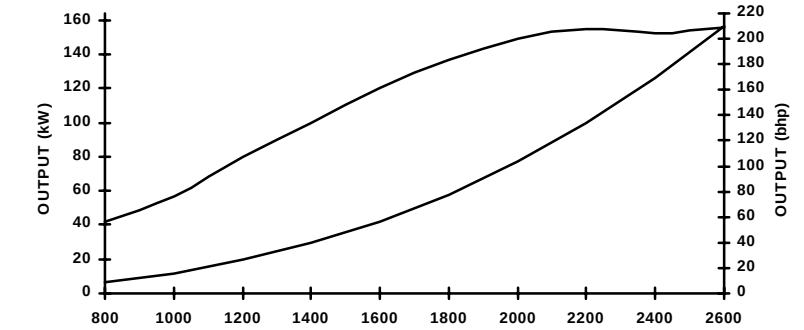
CUMMINS ENGINE COMPANY, INC Columbus, Indiana 47201 **Marine Performance Curve**	Basic Engine Model: **6BT5.9-M**		Curve Number: **M-90761**	*Marine* *Pg. No.* **6B** **31**
	Engine Configuration: **D402013MX02**	CPL Code: **8206**	Date: **28Aug04**	

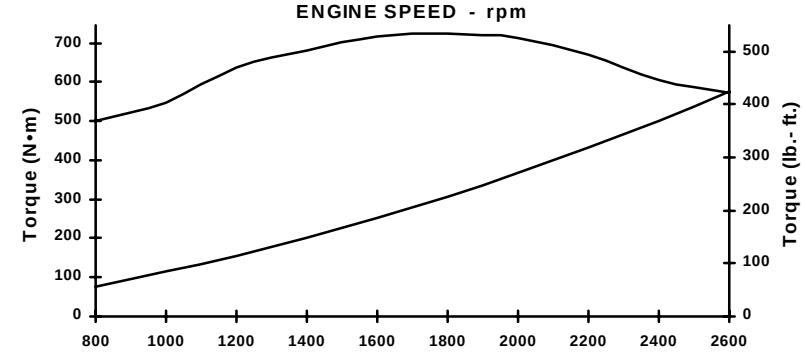
Displacement: **5.9 liters [359 in.^{3}]**
Bore: **102 mm [4.02 in.]**
Stroke: **120 mm [4.72]**
Fuel System: **Lucas CAV**
Cylinders: **6**

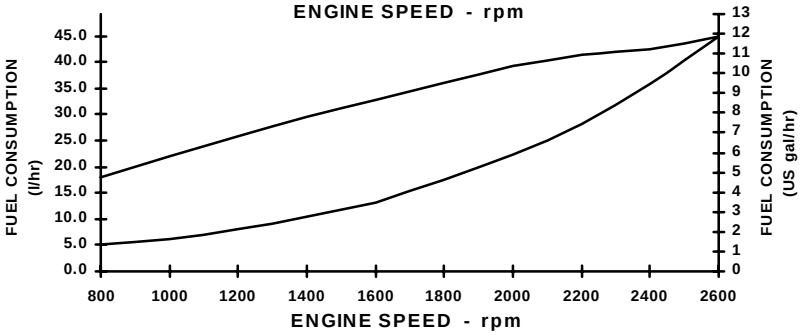
kW [bhp] @ rpm
Advertised Power: **157 [210] @ 2600**

Aspiration: **Turbocharged**
Rating Type: **Intermittent**

CERTIFIED: This marine diesel engine 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
2600	157	210
2400	152	204
2200	155	207
2000	149	200
1800	137	183
1600	121	161
1400	100	134
1200	80	107
1000	57	77
800	42	56

FULL LOAD TORQUE CURVE

rpm	Nm	lb.-ft.
2600	574	423
2400	606	447
2200	671	495
2000	712	525
1800	724	534
1600	719	530
1400	679	501
1200	636	469
1000	547	403
800	500	369

FUEL CONSUMPTION - PROP CURVE

rpm	l/hr	gal/hr
2600	44.9	11.9
2400	35.7	9.4
2200	28.2	7.4
2000	22.2	5.9
1800	17.4	4.6
1600	13.2	3.5
1400	10.4	2.7
1200	8.0	2.1
1000	6.3	1.7
800	5.1	1.3

Rating Conditions: Ratings are based upon ISO 8665 and SAE J1228 reference conditions; air pressure of 100 kPa [29.612 in. Hg], air temperature 25°C [77°F], and 30% relative humidity. Power is rated in accordance with IMCI procedures. Member NMMA.

Rated Curves (upper) represent rated power at the crankshaft. 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° API gravity at 16°C [60°F] having LHV of 42,780 kj/kg [18390 Btu/lb] and weighing 838.9 g/liter [7.001 lb/U.S. gal].

Intermittent Rating: This power rating is intended for Intermittent use in variable load application where full power is limited to two (2) hours out of every eight (8) hours of operation. Also, reduced power operation must be at or below 200 RPM of the maximum rated RPM. This rating is an ISO 3046 fuel stop power rating and is for applications that operate less than 1500 hours per year.

CHIEF ENGINEER

Marine Engine Performance Data

Curve No. M-90761
DS-4960
CPL: 8206
DATE: 28Aug04

General Engine Data

Engine Model		6BT5.9-M
Rating Type		Intermittent
Rated Engine Power	kW [HP]	157 [210]
Rated Engine Speed	rpm	2600
Rated HP Production Tolerance	**%**	**±5**
Rated Engine Torque	Nm [ft/lb]	**603 [444]**
Peak Engine Torque @ 1700 RPM	**Nm [ft/lb]**	**719 [530]**
Brake Mean Effective Pressure	kPa [PSI]	1229 [178]
Minimum Idle Speed Setting	r p m	700
Normal Idle Speed Variation	**r p m**	**±50**
High Idle Speed Range - Minimum	rpm	2808
High Idle Speed Range - Maximum	rpm	2912
Maximum Torque Capacity from Front of Crank[2]	**Nm [ft/lb]**	**N.A.**
Compression Ratio		16.5:1
Piston Speed	m/sec [ft/min]	10.4 [**2045**]
Firing Order		1-5-3-6-2-4
Weight (Dry) Engine Only - Average	kg [lb]	465 [1025]
Weight (Dry) Engine With Heat Exchanger System - Average	kg [lb]	**508 [1120]**

Fuel System[1]

Approximate Fuel Flow to Pump	liter/hr [GPH]	**53** [14]
Maximum Allowable Fuel Supply to Pump Temperature	**°C [°F]**	**60 [140]**
Approximate Fuel Flow Return to Tank	**liter/hr [GPH]**	**8 [2]**
Approximate Fuel Return to Tank Temperature	**°C [°F]**	**N.A.**
Maximum Heat Rejection to Drain Fuel[5]	**kW [BTU/min]**	**N.A.**
Fuel Transfer Pump Pressure	kPa [PSI]	**34 [5]**

Air System[1]

Intake Manifold Pressure	mm Hg [in. Hg]	**1321 [52]**
Intake Air Flow	liter/sec [CFM]	**236 [500]**
Heat Rejection to Ambient	kW [BTU/min]	21 [1200]

Exhaust System[1]

Exhaust Gas Flow	liter/sec [CFM]	**543 [1150]**
Exhaust Gas Temperature **(Turbine Out)**	°C [°F]	**438 [820]**
Exhaust Gas Temperature **(Manifold)**	°C [°F]	**155 [310]**

Emissions (in accordance with ISO8178 Cycle E3)

NOx (Oxides of Nitrogen)	**g/kw-hr [g/bhp-hr]**	**8.23 [6.14]**
HC (Hydrocarbons)	**g/kw-hr [g/bhp-hr]**	**0.78 [0.58]**
CO (Carbon Monoxide)	**g/kw-hr [g/bhp-hr]**	**1.84 [1.37]**
PM (Particulate Matter)	**g/kw-hr [g/bhp-hr]**	**N.A.**

Cooling System[1]

Coolant Flow to Engine Heat Exchanger/Keel Cooler	liter/min [GPM]	174 [46]
Standard Thermostat Operating Range (Min.)	**°C [°F]**	**83 [181]**
Standard Thermostat Operating Range (Max.)	**°C [°F]**	**95 [203]**
Heat Rejection to **Engine** Coolant[3]	kW [BTU/min]	139 [7,900]
Sea Water Flow **(With Heat Exchanger Option)**[4]	liter/min [GPM]	83 [22]
Pressure Cap Rating **(With Heat Exchanger Option)**	kPa [PSI]	103 [15]

INSTALLATION DRAWINGS

With Twin Disc MG 502-1 Marine Gear	3884426-A
With Twin Disc MG 5011-A Marine Gear	3884826
With ZF IRM-220A Marine Gear	3884425-A

TBD = To Be Decided **N/A = Not Applicable** **N.A. = Not Available**

[1]All Data at Rated Conditions

[2]Consult Installation Direction Booklet for Limitations

[3]Heat rejection 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