



CUMMINS INC.
Columbus, IN 47201
Marine Performance Curves

Basic Engine Model
TD11.9-75 HO

Curve Number:
BC9525, BC9738

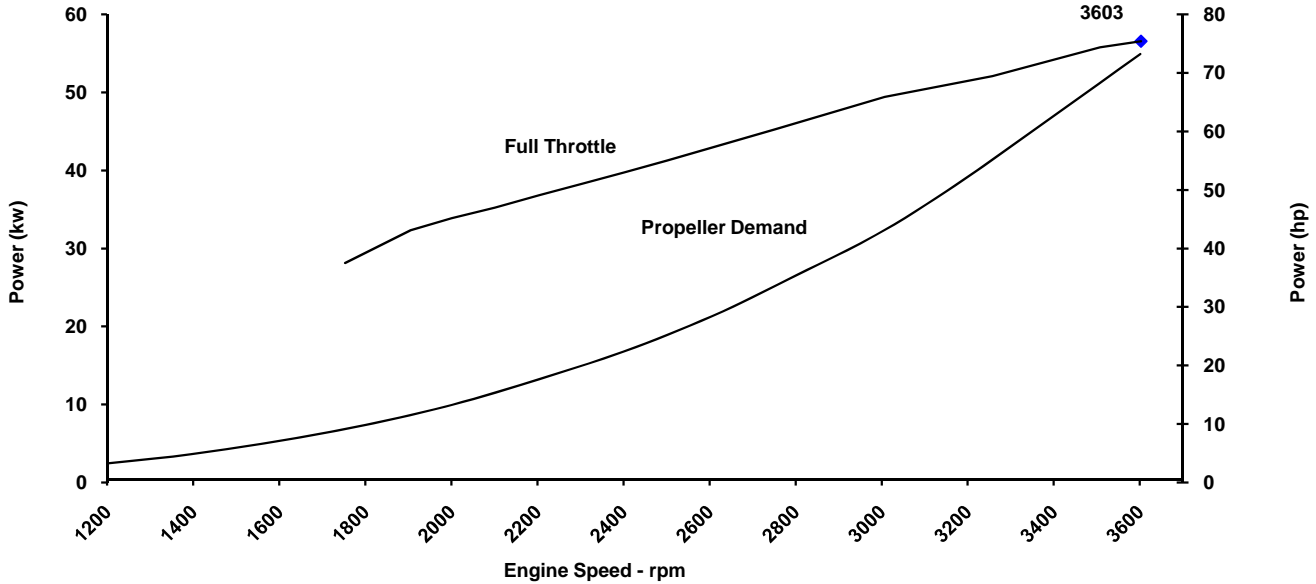
Engine Configuration
DOV2002MX03

CPL Code:
N/A

Date:
25-Jan-11

Displacement:	1.9 liter [116 in³]	Rated	56 kw [75 bhp, 76 mhp]
Bore:	80 mm [3.13 in]	Rated	3600 rpm
Stroke:	96 mm [3.76 in]	Rating Type:	High Output
Fuel System:	Distributor Injection Pump	Aspiration:	Turbocharged
Cylinders:	4		

CERTIFIED: This diesel engine complies with or is certified to the following agencies requirements:
 IMO Tier I (One) NOx requirements of International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13
 EPA Tier 2 - Model year requirements of the EPA marine regulation (40CFR94)
 RCD - meets the requirements of the Recreational Craft Directive 94/25/EC as amended by 2003/44/EC in accordance with ISO 8178-1
 BSO-SAV II- Emissions requirements for vessels operating on Lake Constance (German: Bodensee) or Swiss Lakes (other than Lake Constance)



Full Throttle					Propeller Demand						
Speed	Power		Torque		Speed	Power		Torque		Fuel Consumption	
rpm	kw	(hp)	N-m	(ft-lb)	rpm	kw	(hp)	N-m	(ft-lb)	L/hr	(gal/hr)
3603	56	75	149	110	3601	55	73	145	107	16.2	4.3
3507	55	74	151	111	3405	47	63	131	97	13.4	3.5
3258	52	69	152	112	3201	39	52	116	86	11.1	2.9
3007	49	66	156	115	3005	32	43	102	75	9.2	2.4
2754	45	60	156	115	2801	26	35	89	66	7.7	2.0
2501	41	55	157	115	2605	21	28	77	57	6.2	1.6
2401	40	53	157	116	2401	16	22	65	48	5.0	1.3
2305	38	51	158	116	2205	13	17	56	41	4.0	1.1
2205	37	49	159	117	2001	10	13	46	34	3.1	0.8
2101	35	47	159	117	1801	7	9	37	28	2.4	0.6
2001	34	45	161	119	1604	5	7	30	22	1.9	0.5
1905	32	43	161	119	1403	3	4	23	17	1.4	0.4
1753	28	37	152	112	1202	2	3	17	12	1.1	0.3

- * 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. 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].

High Output (HO): 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 for pleasure/non-revenue generating applications that operate 500 hours per year or less.

Propulsion Marine Engine Performance Data

Curve No. BC9525, BC9738
 DS : D0V-MX-2
 CPL : N/A
 DATE: 25-Jan-11

General Engine Data

Engine Model		TDI1.9-75 HO
Rating Type		High Output
Rated Engine Power	kW [hp]	56 [75]
Rated Engine Speed	rpm	3600
Rated Power Production Tolerance	±%	5
Rated Engine Torque	N·m [lb·ft]	149 [110]
Peak Engine Torque @ 1900 rpm.....	N·m [lb·ft]	161 [119]
Brake Mean Effective Pressure	kPa [psi]	988 [143]
Indicated Mean Effective Pressure.....	kPa [psi]	N.A. [N.A.]
Maximum Allowable Engine Speed	rpm	3700
Compression Ratio		19.5
Piston Speed	m/sec [ft/min]	11.5 [2256]
Firing Order		1-3-4-2
Weight (Dry) - Engine Only - Average	kg [lb]	N.A. [N.A.]
Weight (Dry) - Engine With Heat Exchanger System - Average.....	kg [lb]	210 [463]
Weight Tolerance (Dry) Engine Only	3xStd Dev(±%)	N.A.

Governor Settings

Default Droop Value.....	Refer to MAB 2.04.00-03/23/2006 for Droop explanation	11%
Minimum Droop Allowed.....		0%
Maximum Droop Allowed.....		16%
High Speed Governor Break Point.....	rpm	3700
Minimum Idle Speed Setting	rpm	900
Normal Idle Speed Variation	±rpm	25
High Idle Speed Range Minimum	rpm	3700
Maximum	rpm	4100

Noise and Vibration

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

Fuel System¹

Avg. Fuel Consumption - ISO 8178 E5 Standard Test Cycle	l/hr [gal/hr]	N.A.
Fuel Consumption at Rated Speed	l/hr [gal/hr]	16.9 [4.5]
Approximate Fuel Flow to Pump	l/hr [gal/hr]	N.A.
Maximum Allowable Fuel Supply to Pump Temperature	°C [°F]	60.0 [140]
Approximate Fuel Flow Return to Tank	l/hr [gal/hr]	N.A.
Approximate Fuel Return to Tank Temperature	°C [°F]	N.A.
Maximum Heat Rejection to Drain Fuel	kW [Btu/min]	N.A.
Fuel Transfer Pump Pressure Range.....	kPa [psi]	N.A.
Fuel Pressure - Pump Out/Rail . Mechanical Gauge	kPa [psi]	N.A.
INSITE Reading	kPa [psi]	N.A.

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.

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 DATE: 25-Jan-11

Air System¹

Intake Manifold Pressure	kPa [in Hg]	N.A.
Intake Air Flow	l/sec [cfm]	N.A.
Heat Rejection to Ambient	kW [Btu/min]	TBD [TBD]

Exhaust System¹

Exhaust Gas Flow	l/sec [cfm]	N.A.
Exhaust Gas Temperature (Turbine Out)	°C [°F]	N.A.
Exhaust Gas Temperature (Manifold)	°C [°F]	N.A.

Emissions (in accordance with ISO 8178 Cycle E5)

NOx (Oxides of Nitrogen)	g/kw-hr [g/hp-hr]	TBD
HC (Hydrocarbons)	g/kw-hr [g/hp-hr]	TBD
CO (Carbon Monoxide)	g/kw-hr [g/hp-hr]	TBD
PM (Particulate Matter)	g/kw-hr [g/hp-hr]	TBD

Cooling System¹

Sea Water Pump Specifications	MAB 0.08.17-07/16/2001	
Pressure Cap Rating (With Heat Exchanger Option)	kPa [psi]	152 [22]
Max. Coolant Outlet Pressure from the Engine.....	kPa [psi]	N.A.
Max. Pressure Drop Across Any External Cooling System Circuit	kPa [psi]	34 [5]

Engines without Low Temperature Aftercooling (LTA)

Sea Water Aftercooled Engine (SWAC)

Coolant Flow to Engine Heat Exchanger	l/min [gal/min]	TBD [TBD]
Standard Thermostat Operating Range (Start to Open)	°C [°F]	80 [176]
Standard Thermostat Operating Range (Full Open)	°C [°F]	TBD [TBD]
Heat Rejection to Engine Coolant ³	kW [Btu/min]	TBD [TBD]

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