



CUMMINS INC.
Columbus, IN 47201
Marine Performance Curves

Basic Engine Model

TDI4.2-350 HO

Curve Number:

BC9532, BC9533

Engine Configuration

DOX3001MX03

CPL Code:

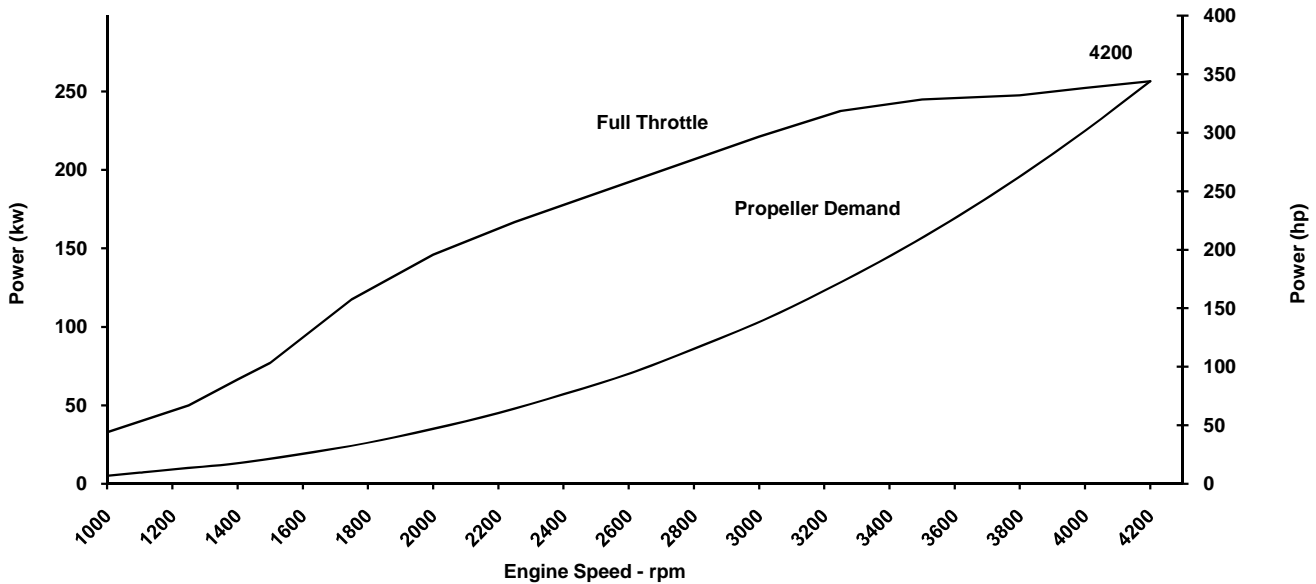
N/A

Date:

27-Apr-11

Displacement: **4.1 liter [252 in³]** Rated **256 kw [344 bhp, 350 mhp]**
 Bore: **83 mm [3.27 in]** Rated **4200 rpm**
 Stroke: **96 mm [3.76 in]** Rating Type: **High Output**
 Fuel System: **HPCR** Aspiration: **Turbocharged / Sea Water Aftercooled**
 Cylinders: **8**

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)
4200	257	344	583	430	4200	257	344	583	430	N.A.	N.A.
4000	252	338	602	444	4000	225	301.7	537	396	N.A.	N.A.
3800	248	332	622	459	3800	196	262.8	492	363	N.A.	N.A.
3500	245	328	668	493	3600	169	226.6	449	331	N.A.	N.A.
3250	238	319	698	515	3400	145	194.4	407	300	N.A.	N.A.
3000	221	297	704	519	3200	123	164.9	367	271	N.A.	N.A.
2750	203	272	705	520	3000	103	138.1	329	243	N.A.	N.A.
2500	185	248	706	521	2800	86	115.3	293	216	N.A.	N.A.
2250	167	224	708	522	2600	70	93.9	258	190	N.A.	N.A.
2000	146	196	697	514	2400	57	76.4	225	166	N.A.	N.A.
1750	118	158	641	473	2000	35	46.9	165	122	N.A.	N.A.
1500	77	103	491	362	1600	19	25.5	113	83	N.A.	N.A.
1400	66	89	453	334	1200	9	12.1	69	51	N.A.	N.A.

* **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.

CHIEF ENGINEER

Propulsion Marine Engine Performance Data

Curve No. BC9532, BC9533

DS : D0X-MX-1

CPL : N/A

DATE: 27-Apr-11

General Engine Data

Engine Model		TDI4.2-350 HO
Rating Type		High Output
Rated Engine Power	kW [hp]	256 [344]
Rated Engine Speed	rpm	4200
Rated Power Production Tolerance	±%	5
Rated Engine Torque	N·m [lb·ft]	583 [430]
Peak Engine Torque @ 2250 rpm.....	N·m [lb·ft]	708 [522]
Brake Mean Effective Pressure	kPa [psi]	1772 [257]
Indicated Mean Effective Pressure.....	kPa [psi]	N.A. [N.A.]
Maximum Allowable Engine Speed	rpm	4400
Compression Ratio		16.4
Piston Speed	m/sec [ft/min]	13.4 [2632]
Firing Order		1-5-4-8-6-3-7-2
Weight (Dry) - Engine Only - Average	kg [lb]	N.A. [N.A.]
Weight (Dry) - Engine With Heat Exchanger System - Average.....	kg [lb]	367 [810]
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	5%
Minimum Droop Allowed.....		0%
Maximum Droop Allowed.....		16%
High Speed Governor Break Point.....	rpm	4400
Minimum Idle Speed Setting	rpm	650
Normal Idle Speed Variation	±rpm	25
High Idle Speed Range Minimum	rpm	4400
Maximum	rpm	4600

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]	73.5 [19.4]
Approximate Fuel Flow to Pump	l/hr [gal/hr]	121.1 [32.0]
Maximum Allowable Fuel Supply to Pump Temperature	°C [°F]	60.0 [140]
Approximate Fuel Flow Return to Tank	l/hr [gal/hr]	34.1 [9.0]
Approximate Fuel Return to Tank Temperature	°C [°F]	90.1 [194]
Maximum Heat Rejection to Drain Fuel	kW [Btu/min]	0.9 [50]
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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COLUMBUS, INDIANA

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 DATE: 27-Apr-11

Air System¹

Intake Manifold Pressure	kPa [in Hg]	159 [47]
Intake Air Flow	l/sec [cfm]	286 [605]
Heat Rejection to Ambient	kW [Btu/min]	TBD [TBD]

Exhaust System¹

Exhaust Gas Flow	l/sec [cfm]	300 [635]
Exhaust Gas Temperature (Turbine Out)	°C [°F]	520 [968]
Exhaust Gas Temperature (Manifold)	°C [°F]	720 [1,327]

Emissions (in accordance with ISO 8178 Cycle E5)

NOx (Oxides of Nitrogen)	g/kw-hr [g/hp-hr]	5.44 [4.06]
HC (Hydrocarbons)	g/kw-hr [g/hp-hr]	0.08 [0.06]
CO (Carbon Monoxide)	g/kw-hr [g/hp-hr]	2.25 [1.68]
PM (Particulate Matter)	g/kw-hr [g/hp-hr]	0.38 [0.28]

Cooling System¹

Sea Water Pump Specifications	MAB 0.08.17-07/16/2001	
Pressure Cap Rating (With Heat Exchanger Option)	kPa [psi]	103 [15]
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]	300 [79.25]
Standard Thermostat Operating Range (Start to Open)	°C [°F]	70 [158]
Standard Thermostat Operating Range (Full Open)	°C [°F]	85 [185]
Heat Rejection to Engine Coolant ³	kW [Btu/min]	TBD [TBD]

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