



CUMMINS INC.
Columbus, IN 47201
Marine Performance Curves

Basic Engine Model
KTA50-M2

Curve Number:
M-6277

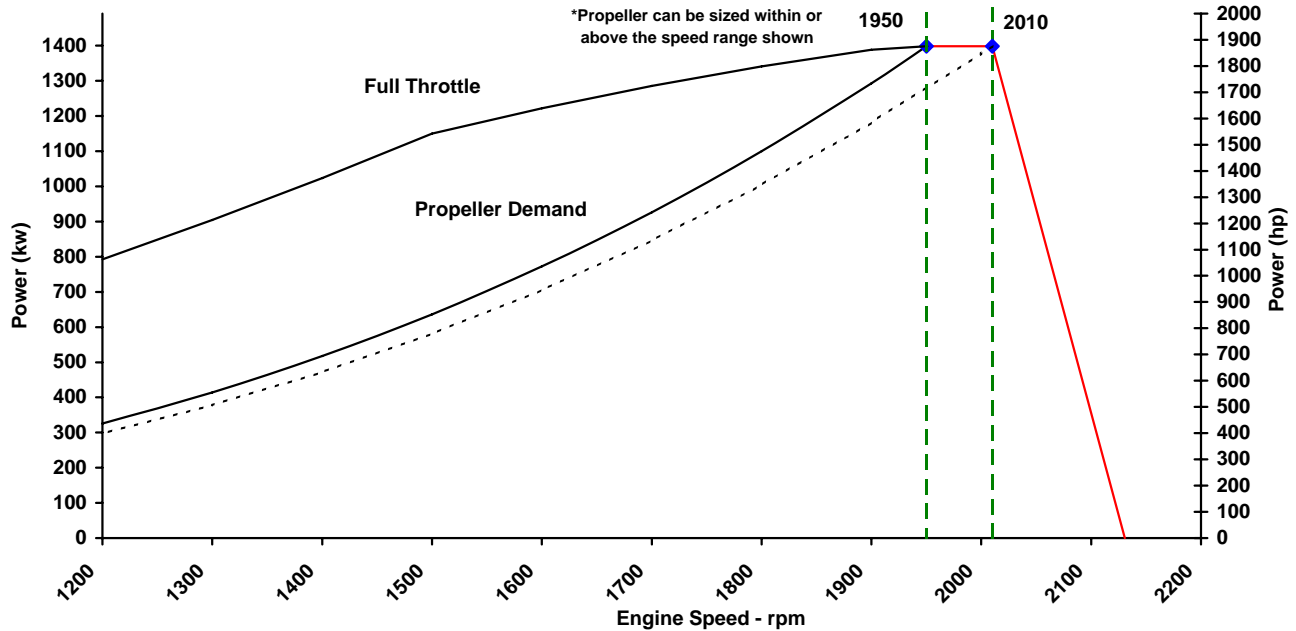
Engine Configuration
D283033MX02

CPL Code:
8063

Date:
21-Sep-09

Displacement: **50 liter [3068 in³]** Rated Power: **1398 kw [1875 bhp]**
 Bore: **159 mm [6.25 in]** Rated Speed: **1950 rpm**
 Stroke: **159 mm [6.25 in]** Rating Type: **Medium Continuous Duty**
 Fuel System: **PT (CENTRY AND V.S.)** Aspiration: **Turbocharged / Low Temperature Aftercooled**
 Cylinders: **16**

CERTIFIED: This diesel engine complies with or is certified to the following agencies requirements:
 IMO - NOx requirements of the International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13



Speed	Full Throttle- Power		Full Throttle- Torque		Fuel Cons.- Prop. Curve 2.7 Exp	
	rpm	kw (hp)	N-m (ft-lb)	L/hr (gal/hr)		
2010	1398	(1875)	6771	(4994)		
1950	1398	(1875)	6847	(5050)	348.0	(91.9)
1900	1389	(1862)	6980	(5148)	311.3	(82.2)
1800	1341	(1799)	7115	(5248)	273.1	(72.1)
1700	1286	(1725)	7224	(5328)	236.8	(62.5)
1600	1222	(1639)	7294	(5380)	202.4	(53.5)
1500	1150	(1543)	7324	(5402)	171.3	(45.3)
1400	1024	(1373)	6982	(5150)	143.3	(37.9)
1300	904	(1213)	6643	(4900)	118.0	(31.2)

* 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. Power is in accordance with IMCI procedure. Member NMMA. Unless otherwise specified, tolerance on all values is +/-5%.

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].

Medium Continuous (MCD): Intended for continuous use in variable load applications where full power is limited to six hours out of every twelve hours of operation. Also, reduced power operations must be at or below 200 rpm of the maximum rated rpm. This rating is an ISO 15550 fuel stop power rating and is for applications that operate less than 3,000 hours per year.

CHIEF ENGINEER

Propulsion Marine Engine Performance Data

Curve No. M-6277
DS : 4998
CPL : 8063
DATE: 21-Sep-09

General Engine Data

Engine Model	KTA50-M2
Rating Type	Medium Continuous Duty
Rated Engine Power	1398 [1875]
Rated Engine Speed	1950
Rated Power Production Tolerance	±% 3
Rated Engine Torque	6847 [5050]
Peak Engine Torque @ 1500 rpm.....	7324 [5402]
Brake Mean Effective Pressure	1711 [248]
Indicated Mean Effective Pressure.....	3435 [498]
Maximum Allowable Engine Speed	2375
Maximum Torque Capacity from Front of Crank ²	4341 [3202]
Compression Ratio	13.9:1
Piston Speed	10.3 [2031]
Firing Order	1R-1L-3R-3L-2R-2L-5R-4L-8R-8L-6R-6L-7R-7L-4R-5L
Weight (Dry) - Engine Only - Average	5166 [11389]
Weight (Dry) - Engine With Heat Exchanger System - Average.....	5742 [12659]
Weight Tolerance (Dry) Engine Only	3xStd Dev(±%) 10.0

Governor Settings

Default Droop Value.....	Refer to MAB 2.04.00-03/23/2006 for Droop explanation	6%
Minimum Droop Allowed.....		N/A
Maximum Droop Allowed.....		N/A
High Speed Governor Break Point.....		2010
Minimum Idle Speed Setting		650
Normal Idle Speed Variation		±rpm 25
High Idle Speed Range Minimum		2010
High Idle Speed Range Maximum		2184

Noise and Vibration

Average Noise Level - Top	(Idle).....	dBa @ 1m	100
	(Rated)	dBa @ 1m	110
Average Noise Level - Right Side	(Idle).....	dBa @ 1m	98
	(Rated)	dBa @ 1m	109
Average Noise Level - Left Side	(Idle).....	dBa @ 1m	99
	(Rated)	dBa @ 1m	108
Average Noise Level - Front	(Idle).....	dBa @ 1m	98
	(Rated)	dBa @ 1m	108

Fuel System¹

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle	l/hr [gal/hr]	248.6 [65.7]
Fuel Consumption at Rated Speed	l/hr [gal/hr]	354.9 [93.8]
Approximate Fuel Flow to Pump	l/hr [gal/hr]	632.2 [167.0]
Maximum Allowable Fuel Supply to Pump Temperature	°C [°F]	60.0 [140]
Approximate Fuel Flow Return to Tank	l/hr [gal/hr]	277.2 [73.2]
Approximate Fuel Return to Tank Temperature	°C [°F]	70.3 [158]
Maximum Heat Rejection to Drain Fuel	kW [Btu/min]	4.3 [245]
Fuel Pressure - Pump Out/Rail . Mechanical Gauge	kPa [psi]	1113 [161]
INSITE Reading	kPa [psi]	1141 [165]

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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Propulsion Marine Engine Performance Data

Curve No. M-6277
DS : 4998
CPL : 8063
DATE: 21-Sep-09

Air System¹

Intake Manifold Pressure	kPa [in Hg]	225 [66]
Intake Air Flow	l/sec [cfm]	1988 [4213]
Heat Rejection to Ambient	kW [Btu/min]	82 [4681]

Exhaust System¹

Exhaust Gas Flow	l/sec [cfm]	4776 [10119]
Exhaust Gas Temperature (Turbine Out)	°C [°F]	453 [847]
Exhaust Gas Temperature (Manifold)	°C [°F]	642 [1186]

Emissions (in accordance with ISO 8178 Cycle E3)

NOx (Oxides of Nitrogen)	g/kw-hr [g/hp-hr]	9.61 [7.17]
HC (Hydrocarbons)	g/kw-hr [g/hp-hr]	0.26 [0.19]
CO (Carbon Monoxide)	g/kw-hr [g/hp-hr]	0.60 [0.45]
PM (Particulate Matter)	g/kw-hr [g/hp-hr]	N.A.

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. Pressure Drop Across Any External Cooling System Circuit	kPa [psi]	34 [5]

Engines with Low Temperature Aftercooling (LTA)

Two Loop LTA

Main Engine Circuit

Coolant Flow to Main Cooler (with blocked open thermostat).....	l/min [gal/min]	1211 [320]
Standard Thermostat Operating Range	Start to open.....	82 [180]
	Full open.....	95 [202]
Heat Rejection to Engine Coolant ³	kW [Btu/min]	538 [30631]

Aftercooler (LTA) Circuit

Coolant Flow to LTA Cooler (with blocked open thermostat).....	l/min [gal/min]	310 [82]
LTA Thermostat Operating Range	Start to open.....	66 [150]
	Full open.....	80 [175]
Heat Rejection to Engine Coolant ³	kW [Btu/min]	276 [15729]
Maximum Coolant Inlet Temperature from LTA Cooler.....	°C [°F]	71 [160]

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