



**CUMMINS INC.**  
Columbus, IN 47201  
Marine Performance Curves

Basic Engine Model  
**KTA38-M2**

Curve Number:  
**M-6909**

Engine Configuration  
**D233034MX02**

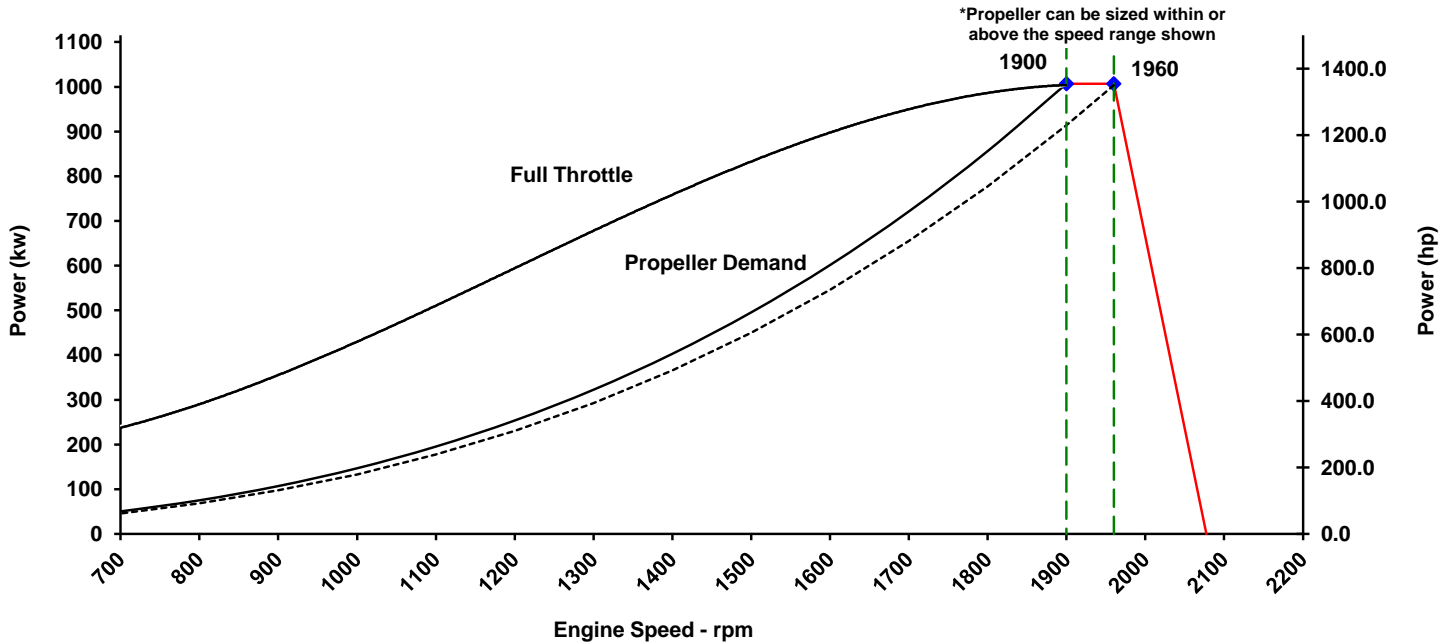
CPL Code:  
**3763**

Date:  
**9-Dec-13**

Displacement: **38 liter [2297 in<sup>3</sup>]**  
Bore: **159 mm [6.26 in]**  
Stroke: **158 mm [6.22 in]**  
Cylinders: **12**  
Fuel System: **PT (CENTRY AND V.S.)**

Rated Power: **1007 kw [1350 bhp]**  
Rated Speed: **1900 rpm**  
Rating Type: **Heavy Duty**  
Aspiration: **Turbocharged / Low Temp. Aftercooler**

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



Speed	Full Throttle				Propeller Demand						
	Power		Torque		Power		Torque		Fuel Consumption		
	rpm	kw	(hp)	N-m	(ft-lb)	kw	(hp)	N-m	(ft-lb)	L/hr	(gal/hr)
1960	1007	(1350)	4905	(3618)							
1900	1007	(1350)	5060	(3732)	1007	(1350)	5059	(3732)	260.3	(68.8)	
1800	972	(1304)	5159	(3805)	856	(1148)	4541	(3349)	220.4	(58.2)	
1700	932	(1250)	5235	(3861)	721	(967)	4050	(2987)	186.3	(49.2)	
1600	886	(1188)	5289	(3901)	601	(806)	3588	(2646)	158.7	(41.9)	
1500	837	(1123)	5330	(3931)	495	(664)	3153	(2326)	133.4	(35.2)	
1400	746	(1000)	5086	(3751)	403	(540)	2747	(2026)	111.8	(29.5)	
1300	659	(883)	4839	(3569)	322	(432)	2369	(1747)	92.7	(24.5)	
1200	593	(796)	4722	(3483)	254	(340)	2018	(1489)	68.6	(18.1)	
1100	515	(691)	4473	(3299)	195	(262)	1696	(1251)	53.5	(14.1)	
1000	409	(548)	3902	(2878)	147	(197)	1402	(1034)	40.9	(10.8)	
900	338	(454)	3590	(2648)	107	(143)	1135	(837)	30.7	(8.1)	
800	294	(394)	3507	(2587)	75	(101)	897	(662)	22.1	(5.8)	
700	240	(322)	3272	(2413)	50	(68)	687	(507)	15.8	(4.2)	

**\* 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. 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 [7.0011 lb/U.S. gal].

Heavy Duty (HD): Intended for continuous use in variable load applications where full power is limited to eight (8) hours out of every ten (10) hours of operation. Also, reduced power operations must be at or below 200 rpm of the maximum rated rpm. This is an ISO 15550 fuel stop power rating and is for applications that operate 5,000 hours per year or less.

TECHNICAL DATA DEPT.

*Nabeel A. Khan*  
CHIEF ENGINEER

# Propulsion Marine Engine Performance Data

**Curve No. M-6909**  
**DS : 4983**  
**CPL : 3763**  
**DATE: 9-Dec-13**

## General Engine Data

Engine Model .....	KTA38-M2
Rating Type .....	Heavy Duty
Rated Engine Power .....	1007 [1350] kW [hp]
Rated Engine Speed .....	1900 rpm
Rated Power Production Tolerance .....	±3%
Rated Engine Torque .....	5059 [3732] N·m [lb·ft]
Peak Engine Torque @ 1500 rpm.....	5330 [3931] N·m [lb·ft]
Brake Mean Effective Pressure .....	1689 [245] kPa [psi]
Indicated Mean Effective Pressure.....	N.A. [N.A.] kPa [psi]
Maximum Allowable Engine Speed .....	2375 rpm

## Maximum Continuous Torque Capacity from Front of Crank Specifications

Maximum Torque Capacity from Front of Crank <sup>2</sup> .....	4341 [3202] N·m [lb·ft]
Compression Ratio .....	13.9:1
Piston Speed .....	10.0 [1970] m/sec [ft/min]
Firing Order .....	1R-6L-5R-2L-3R-4L-6R-1L-2R-5L-4R-3L
Weight (Dry) - Engine Only - Average .....	4354 [9600] kg [lb]
Weight (Dry) - Engine With Heat Exchanger System - Average.....	4538 [10005] kg [lb]
Weight Tolerance (Dry) Engine Only .....	±10.2% (3xStd Dev)

## Governor Settings

Default Droop Value.....	Refer to MAB 2.04.00-03/23/2006 for Droop explanation	6%
Maximum Droop Allowed.....		N/A
High Speed Governor Break Point.....		1960 rpm
Minimum Idle Speed Setting .....		650 rpm
Normal Idle Speed Variation .....		±25 rpm
High Idle Speed Range   Minimum .....		1960 rpm
Maximum .....		2078 rpm

## Fuel System<sup>1</sup>

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle .....	181.4 [47.9] l/hr [gal/hr]
Fuel Consumption at Rated Speed .....	260.5 [68.8] l/hr [gal/hr]
Approximate Fuel Flow to Pump .....	461.8 [122.0] l/hr [gal/hr]
Maximum Allowable Fuel Supply to Pump Temperature .....	60.0 [140] °C [°F]
Approximate Fuel Flow Return to Tank .....	201.3 [53.2] l/hr [gal/hr]
Approximate Fuel Return to Tank Temperature .....	72.3 [162] °C [°F]
Maximum Heat Rejection to Drain Fuel .....	3.3 [190] kW [Btu/min]
Fuel Pressure - Pump Out/Rail . Mechanical Gauge .....	1055 [153] kPa [psi]
INSITE Reading .....	1076 [156] kPa [psi]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

- <sup>1</sup> Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.
- <sup>2</sup> 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.
- <sup>3</sup> 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.
- <sup>4</sup> Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.
- <sup>5</sup> 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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<http://marine.cummins.com>

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**Air System<sup>1</sup>**

Intake Manifold Pressure .....	kPa [in Hg]	203 [60]
Intake Air Flow .....	l/sec [cfm]	1398 [2961]
Heat Rejection to Ambient .....	kW [Btu/min]	79 [4511]

**Exhaust System<sup>1</sup>**

Exhaust Gas Flow .....	l/sec [cfm]	3470 [7,353]
Exhaust Gas Temperature (Turbine Out) .....	°C [°F]	470 [877]
Exhaust Gas Temperature (Manifold) .....	°C [°F]	629 [1,164]

**Emissions (in accordance with ISO 8178 Cycle E3)**

NOx (Oxides of Nitrogen) .....	g/kw-hr [g/hp-hr]	7.71 [5.75]
HC (Hydrocarbons) .....	g/kw-hr [g/hp-hr]	0.29 [0.22]
CO (Carbon Monoxide) .....	g/kw-hr [g/hp-hr]	0.88 [0.66]

**Cooling System<sup>1</sup>**

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]	228 [33]
Max. Pressure Drop Across Any External Cooling System Circuit .....	kPa [psi]	34 [5]

**Engines with Low Temperature Aftercooling (LTA )**

**Two Loop LTA (For both 1 & 2 pump systems)**

**Main Engine Circuit**

Coolant Flow to Main Cooler (with blocked open thermostat).....	l/min [gal/min]	1033 [273]
Standard Thermostat Operating Range	Start to open.....	82 [180]
	Full open.....	95 [202]
Heat Rejection to Engine Coolant <sup>3</sup> .....	kW [Btu/min]	468 [26637]

**Aftercooler (LTA) Circuit**

Coolant Flow to LTA Cooler (with blocked open thermostat).....	l/min [gal/min]	303 [80]
LTA Thermostat Operating Range	Start to open.....	66 [150]
	Full open.....	80 [175]
Heat Rejection to Engine Coolant <sup>3</sup> .....	kW [Btu/min]	171 [9723]
Maximum Coolant Inlet Temperature from LTA Cooler.....	°C [°F]	71 [160]

TBD= To Be Determined

N/A = Not Applicable

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