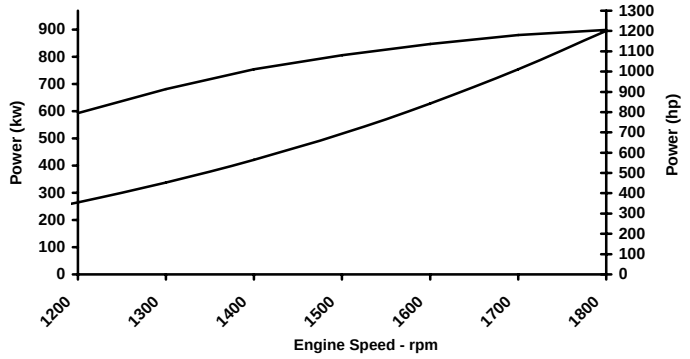
| CUMMINS INC. Columbus, IN 47201 | Basic Engine Model | Curve Number: | |
|---|---|---|---|
| Marine Performance Curves | **KTA38-M2** | **M-6192** | |
| | Engine Configuration | CPL Code: | Date: |
| | **D233034MX02** | **2404** | **9-May-07** |

Displacement: **37.7 liters** **[2300 $in^3$]**
Bore: **159 mm** **[6.25 in]**
Stroke: **159 mm** **[6.25 in]**
Fuel System: **PT**
Cylinders: **12**

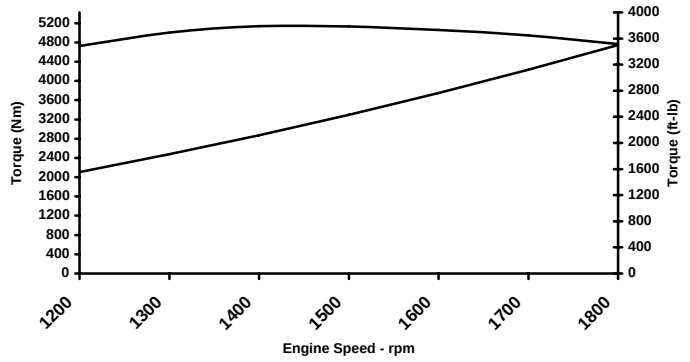
kW [bhp, mhp] @ rpm
Advertised Power: **895[1200]@1800**
Aspiration: **TURBOCHARGED/AFTERCOOLED**
Rating Type: **Continuous**

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



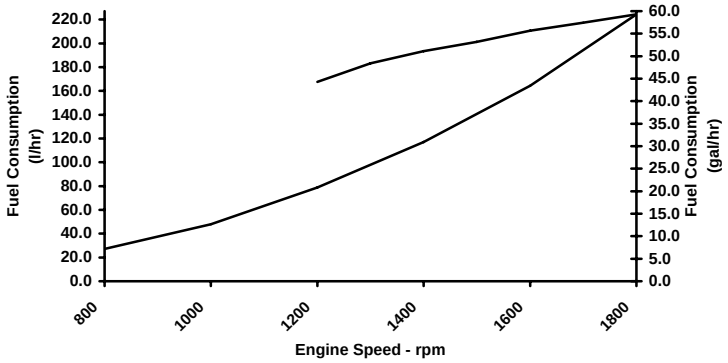

**RATED POWER OUTPUT CURVE**

| rpm | kw | bhp |
|---|---|---|
| 1800 | 895 | 1200 |
| 1700 | 880 | 1180 |
| 1600 | 848 | 1136 |
| 1500 | 806 | 1081 |
| 1400 | 754 | 1011 |
| 1300 | 682 | 914 |
| 1200 | 594 | 796 |




**FULL LOAD TORQUE CURVE**

| rpm | N-m | ft-lb |
|---|---|---|
| 1800 | 4747 | 3501 |
| 1700 | 4944 | 3646 |
| 1600 | 5056 | 3730 |
| 1500 | 5131 | 3785 |
| 1400 | 5141 | 3792 |
| 1300 | 5005 | 3692 |
| 1200 | 4723 | 3483 |




**FUEL CONSUMPTION - PROP CURVE**

| rpm | l/hr | gal/hr |
|---|---|---|
| 1800 | 224.5 | 59.3 |
| 1600 | 164.4 | 43.4 |
| 1400 | 117.1 | 30.9 |
| 1200 | 79.0 | 20.9 |
| 1000 | 47.8 | 12.6 |
| 800 | 27.1 | 7.2 |

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

Rated Curves (upper) represents rated power at the crankshaft for mature gross engine performance capabilities obtained and corrected in accordance with ISO 3046. Propeller Curve (lower) is based on a typical fixed propeller demand curve using a 3.0 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 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].

Continuous Rating (CON): Intended for continuous use in applications requiring uninterrupted service at full power. This rating is an ISO 3046 standard power rating.

CHIEF ENGINEER

# Propulsion Marine Engine Performance Data

**Curve No.** **M-6192**
**DS :** **4983**
**CPL :** **2404**
**DATE:** **9-May-07**

## General Engine Data

| | | |
|---|---|---|
| Engine Model | | KTA38-M2 |
| Rating Type | | Continuous |
| Rated Engine Power | kW [hp] | 895 [1200] |
| Rated Engine Speed | rpm | 1800 |
| Rated Power Production Tolerance | ±% | 3 |
| Rated Engine Torque | N·m [lb·ft] | 4747 [3501] |
| Peak Engine Torque @ 1500 rpm | N·m [lb·ft] | 5210 [3843] |
| Brake Mean Effective Pressure | kPa [psi] | 1582 [229] |
| Indicated Mean Effective Pressure | kPa [psi] | N.A. [N.A.] |
| Minimum Idle Speed Setting | rpm | 650 |
| Normal Idle Speed Variation | ±rpm | 25 |
| High Idle Speed Range Minimum | rpm | 1815 |
| Maximum | rpm | 2016 |
| Maximum Allowable Engine Speed | rpm | 2375 |
| Maximum Torque Capacity from Front of Crank[2] | N·m [lb·ft] | 4341 [3202] |
| Compression Ratio | | 13.9:1 |
| Piston Speed | m/sec [ft/min] | 9.5 [1875] |
| Firing Order | | 1R-6L-5R-2L-3R-4L-6R-1L-2R-5L-4R-3L |
| Weight (Dry) - Engine Only - Average | kg [lb] | 4218 [9300] |
| Weight (Dry) - Engine With Heat Exchanger System - Average | kg [lb] | 4538 [10005] |
| Weight Tolerance (Dry) Engine Only | 3xStd Dev( ±%) | 10.5 |

## 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 System[1]

| | | |
|---|---|---|
| Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle | l/hr [gal/hr] | 155 [41] |
| Fuel Consumption at Rated Speed | l/hr [gal/hr] | 224 [59] |
| Approximate Fuel Flow to Pump | l/hr [gal/hr] | 397 [105] |
| Maximum Allowable Fuel Supply to Pump Temperature | °C [°F] | 60 [140] |
| Approximate Fuel Flow Return to Tank | l/hr [gal/hr] | 173 [46] |
| Approximate Fuel Return to Tank Temperature | °C [°F] | 68 [155] |
| Maximum Heat Rejection to Drain Fuel | kW [Btu/min] | 3 [143] |
| Fuel Transfer Pump Pressure Range | kPa [psi] | N/A |
| Fuel Pressure - Pump Out/Rail ..Mechanical Gauge | kPa [psi] | 841 [122] |
| INSITE Reading | kPa [psi] | 883 [128] |

## Air System[1]

| | | |
|---|---|---|
| Intake Manifold Pressure | kPa [in Hg] | 183 [54] |
| Intake Air Flow | l/sec [cfm] | 1227 [2599] |
| Heat Rejection to Ambient | kW [Btu/min] | 78 [4461] |

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

1 **All Data at Rated Conditions.**
2 **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.**

**CUMMINS ENGINE COMPANY, INC**

**COLUMBUS, INDIANA**

# Propulsion Marine Engine Performance Data

| | |
|---|---|
| **Curve No.** | **M-6192** |
| **DS :** | **4983** |
| **CPL :** | **2404** |
| **DATE:** | **9-May-07** |

**Exhaust System[1]**

| | |
|---|---|
| Exhaust Gas Flow ……l/sec [cfm] | 2970 [6,293] |
| Exhaust Gas Temperature (Turbine Out) ……°C [°F] | 454 [849] |
| Exhaust Gas Temperature (Manifold) ……°C [°F] | N.A. |

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

| | |
|---|---|
| NOx (Oxides of Nitrogen) ……g/kw·hr [g/hp·hr] | 8.51 [6.35] |
| HC (Hydrocarbons) ……g/kw·hr [g/hp·hr] | 0.20 [0.15] |
| CO (Carbon Monoxide) ……g/kw·hr [g/hp·hr] | 0.56 [0.42] |
| PM (Particulate Matter) ……g/kw·hr [g/hp·hr] | N.A. |

**Cooling System[1]**

| | |
|---|---|
| Sea Water Pump Specifications ……MAB 0.08.17-07/16/2001 | |
| Pressure Cap Rating (With Heat Exchanger Option) ……kPa [psi] | 103 [15] |

**Engines without Low Temperature Aftercooling (LTA )**

**Jacket Water Aftercooled Engine (JWAC)**

| | |
|---|---|
| Coolant Flow to Engine Heat Exchanger ……l/min [gal/min] | 1268 [335] |
| Standard Thermostat Operating Range (Start to Open) ……°C [°F] | 82 [180] |
| Standard Thermostat Operating Range (Full Open) ……°C [°F] | 95 [202] |
| Heat Rejection to Engine Coolant[3] ……kW [Btu/min] | 563 [32072] |

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

**Two Loop LTA**

***Main Engine Circuit***

| | | |
|---|---|---|
| Coolant Flow to Main Cooler (with open thermostat)……l/min [gal/min] | | 980 [259] |
| Standard Thermostat Operating Range | Start to open……°C [°F] | 82 [180] |
| | Full open……°C [°F] | 95 [202] |
| Heat Rejection to Engine Coolant[3] ……kW [Btu/min] | | 424 [24130] |

***Aftercooler (LTA) Circuit***

| | | |
|---|---|---|
| Coolant Flow to LTA Cooler (with open thermostat)……l/min [gal/min] | | 288 [76] |
| LTA Thermostat Operating Range | Start to open……°C [°F] | 66 [150] |
| | Full open……°C [°F] | 80 [175] |
| Heat Rejection to Engine Coolant[3] ……kW [Btu/min] | | 140 [7941] |
| Maximum Coolant Inlet Temperature from LTA Cooler……°C [°F] | | 71 [160] |

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

1 **All Data at Rated Conditions.**
2 **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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