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Basic Engine Model

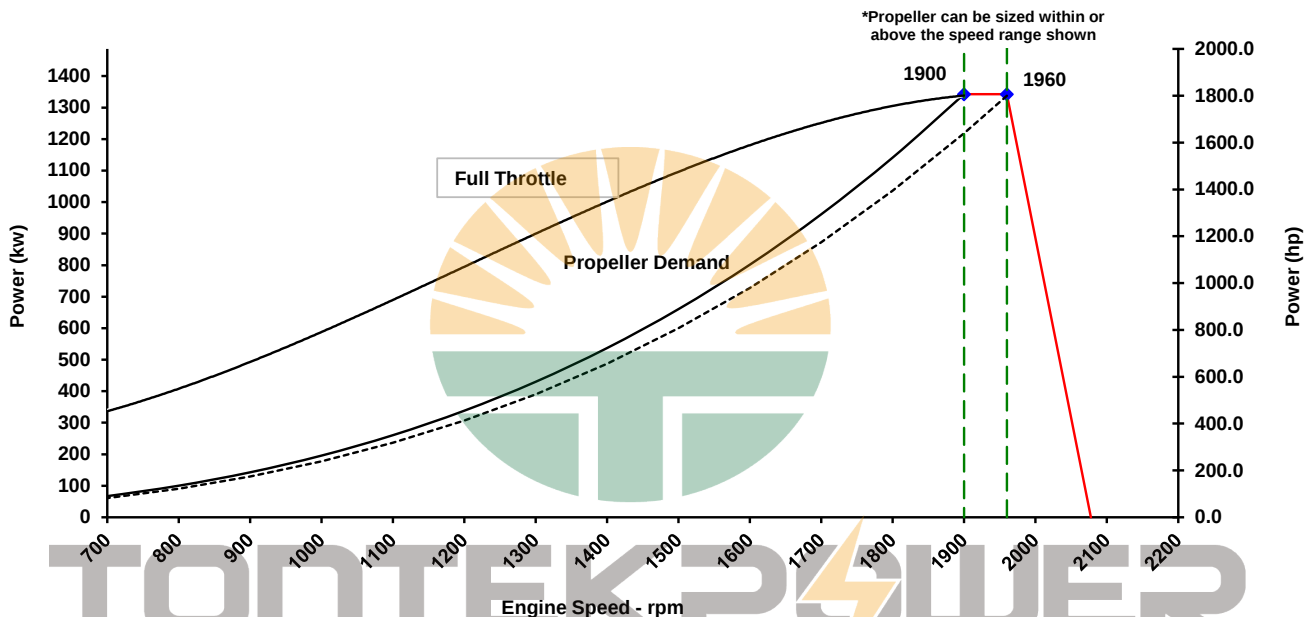
KTA50-M2

Rated Power:1342 kw[1800 bhp]

Displacement: **50 liter [3069 in³]**
Bore: **159 mm [6.25 in]**
Stroke: **159 mm [6.25 in]**
Cylinders: **16**
Fuel System: **PT (CENTRY AND V.S.)**

Rated Power: **1342 kw [1800 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	1342	(1800)	6540	(4824)					
1900	1342	(1800)	6746	(4976)	1342	(1,800.0)	6746	(4,975.6)	345.4 (91.2)
1800	1294	(1735)	6863	(5062)	1141	(1,530.5)	6054	(4,465.6)	289.5 (76.5)
1700	1236	(1657)	6942	(5120)	961	(1,289.3)	5400	(3,983.2)	243.5 (64.3)
1600	1169	(1568)	6980	(5148)	802	(1,074.9)	4784	(3,528.4)	206.6 (54.6)
1500	1103	(1479)	7020	(5178)	660	(885.7)	4205	(3,101.1)	173.7 (45.9)
1400	1001	(1343)	6829	(5037)	537	(720.1)	3663	(2,701.4)	137.0 (36.2)
1300	901	(1209)	6620	(4883)	430	(576.6)	3158	(2,329.3)	111.5 (29.5)
1200	794	(1065)	6318	(4660)	338	(453.5)	2691	(1,984.7)	89.9 (23.7)
1100	686	(920)	5957	(4394)	260	(349.3)	2261	(1,667.7)	71.3 (18.8)
1000	590	(792)	5636	(4157)	196	(262.4)	1869	(1,378.3)	55.0 (14.5)
900	500	(670)	5304	(3912)	143	(191.3)	1514	(1,116.4)	41.4 (10.9)
800	417	(559)	4973	(3668)	100	(134.4)	1196	(882.1)	30.2 (8.0)

*** 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 draggers, 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].

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.

Propulsion Marine Engine Performance Data

General Engine Data

Engine Model	KTA50-M2
Rating Type	Heavy Duty
Rated Engine Power	1342 [1800]
Rated Engine Speed	1900
Rated Power Production Tolerance	±% 3
Rated Engine Torque	6746 [4976]
Peak Engine Torque @ 1500 rpm.....	7020 [5178]
Brake Mean Effective Pressure	1686 [244]
Indicated Mean Effective Pressure.....	3382 [490]
Maximum Allowable Engine Speed	2375

Maximum Continuous Torque Capacity from Front of Crank Specifications

Maximum Torque Capacity from Front of Crank ²	4341 [3202]
Compression Ratio	13.9:1
Piston Speed	10.1 [1980]
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%
High Speed Governor Break Point.....	rpm	1960
Minimum Idle Speed Setting	rpm	650
Normal Idle Speed Variation	±rpm	25
High Idle Speed Range Minimum	rpm	1960
Maximum	rpm	2078

Noise and Vibration

Average Noise Level - Top	(Idle).....	dBa @ 1m	96
	(Rated)	dBa @ 1m	106
Average Noise Level - Right Side	(Idle).....	dBa @ 1m	94
	(Rated)	dBa @ 1m	104
Average Noise Level - Left Side	(Idle).....	dBa @ 1m	95
	(Rated)	dBa @ 1m	104
Average Noise Level - Front	(Idle).....	dBa @ 1m	94
	(Rated)	dBa @ 1m	104

Fuel System¹

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle	l/hr [gal/hr]	236.7 [62.5]
Fuel Consumption at Rated Speed	l/hr [gal/hr]	342.7 [90.5]
Approximate Fuel Flow to Pump	l/hr [gal/hr]	590.5 [156.0]
Maximum Allowable Fuel Supply to Pump Temperature	°C [°F]	60.0 [140]
Approximate Fuel Flow Return to Tank	l/hr [gal/hr]	247.8 [65.5]
Approximate Fuel Return to Tank Temperature	°C [°F]	73.9 [165]
Maximum Heat Rejection to Drain Fuel	kW [Btu/min]	4.3 [245]
Fuel Pressure - Pump Out/Rail . Mechanical Gauge	kPa [psi]	1060 [154]
INSITE Reading	kPa [psi]	1107 [160]

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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Propulsion Marine Engine Performance Data

Air System¹

Intake Manifold Pressure	kPa [in Hg]	220 [65]
Intake Air Flow	l/sec [cfm]	1923 [4075]
Heat Rejection to Ambient	kW [Btu/min]	81 [4615]

Exhaust System¹

Exhaust Gas Flow	l/sec [cfm]	4713 [9,985]
Exhaust Gas Temperature (Turbine Out)	°C [°F]	478 [892]
Exhaust Gas Temperature (Manifold)	°C [°F]	639 [1,182]

Emissions (in accordance with ISO 8178 Cycle E3)

NOx (Oxides of Nitrogen)	g/kw·hr [g/hp·hr]	7.75 [5.78]
HC (Hydrocarbons)	g/kw·hr [g/hp·hr]	0.27 [0.20]
CO (Carbon Monoxide)	g/kw·hr [g/hp·hr]	0.59 [0.44]

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]	256 [37]
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]	1181 [312]
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]	522 [29684]

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	°C [°F]	66 [150]
Full open	°C [°F]	80
Heat Rejection to Engine Coolant ³	kW [Btu/min]	257 [14644]
Maximum Coolant Inlet Temperature from LTA Cooler	°C [°F]	8124 [14644]

Full open..... °C [°F] [175]

TBD= To Be Determined

N/A = Not Applicable

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- ¹ Unless otherwise specified, all data is at rated power conditions and can vary ± 5%.
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- 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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