	<b>CUMMINS INC.</b> Charleston, SC 29405 Marine Performance Curves	Basic Engine Model: <b>QSK60-DM</b>	Curve Number: <b>DM-6771</b>	
		Engine Configuration: <b>D593009MX03</b>	CPL Code: <b>3478</b>	Date: <b>14-Jun-12</b>

Displacement: **60.1726619125 [3672 in³]**  
 Bore: **159 mm [6.25 in]**  
 Stroke: **190 mm [7.48 in]**  
 Cylinders: **16**  
 Fuel System: **Modular Common Rail (MCRS) with C3.0 Injectors**

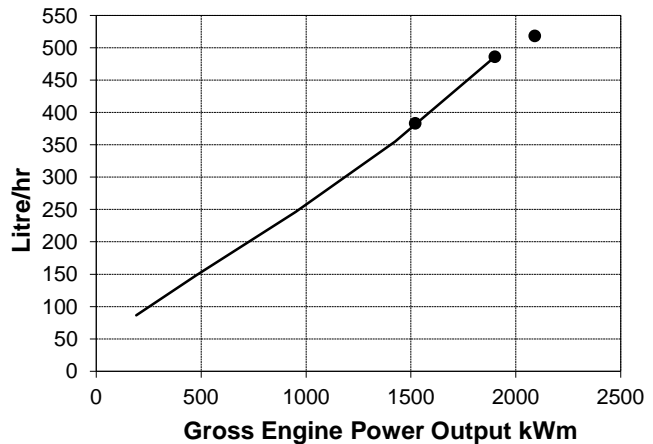
Advertised Power: **1900 [2547] @ 1800**  
 Aspiration: **Turbocharged / Low Temp. Aftercooler**  
 Exhaust Type: **Dry**

CERTIFIED: This marine diesel engine complies with or is certified to the:  
 IMO Tier II (Two) 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)  
 Rhine Ships Inspection Regulations as adopted by the Central Commission for Rhine navigation (CCNR)  
 EU Stage IIIa - EC Nonroad Mobile Machinery Directive (2004/26/EC)

Engine Speed	Overload Capacity		Prime Power		Continuous Power	
RPM	kWm	BHP	kWm	BHP	kWm	BHP
1800	2090	2802	1900	2547	1520	2038

### Engine Performance Data @ 1800 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	Kg/ kW-h	Lb/ BHP-h	Liter/ hour	U.S. Gal/ hour
<b>10% OVERLOAD CAPACITY</b>						
110%	2090	2802	0.208	0.342	518.5	137.0
<b>PRIME POWER</b>						
100%	1900	2547	0.215	0.353	486.3	128.5
75%	1425	1910	0.209	0.344	355.1	93.8
50%	950	1273	0.217	0.357	246.1	65.0
25%	475	637	0.261	0.430	148.0	39.1
10%	190	255	0.380	0.626	86.2	22.8
<b>CONTINUOUS POWER</b>						
80%	1520	2038	0.211	0.348	383.4	101.3



**Rating Conditions:** Ratings are in accordance with ISO 15550 and ISO 8528-5 reference conditions; air pressure at 100 kPa (29.61 in Hg), air temperature 25°C (77°F), and 30% relative humidity. The fuel consumption data is based on No. 2 diesel fuel weight at 0.85 kg/liter (7.001 lb/U.S. gal).

Power output curves are based on the engine operating with fuel system, water pump, and lubricating oil pump; not included are battery charging alternator, fan, optional equipment, and driven components.

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.

Unless otherwise specified, tolerance on all values is +/-5%.

**Prime Power Rating** is applicable for supplying continual electrical power at varied load. The following are the Prime Rating parameters:

- \* Prime Power is available for an unlimited number of hours per year in a variable load application. Variable load should not exceed a 70% average of the Prime Power rating during any operating period of 250 hours.
- \* The total operating time at 100% Prime Power shall not exceed 500 hours per year.
- \* There is a 10% overload capability for a period of 1 hour within a 12 hour period of operation. Total operating time at 10% overload shall not exceed 25 hours per year.

*Nickel Anderson*

TECHNICAL DATA DEPT.

CHIEF ENGINEER

# Auxiliary Marine Engine Performance Data

Curve No. **DM-6771**  
 DS : **D59-MX-1**  
 CPL : **3478**  
 DATE: **14-Jun-12**

## General Engine Data

Engine Model .....	QSK60-DM			
Rating Type .....	Prime Power		Overload	
Rated Engine Power .....	1900	[2547]	2090	[2802]
Governed Engine Speed .....		1800		
Rated HP Production Tolerance .....		3		
Rated Engine Torque .....	10076	[7432]	11084	[8176]
Default Idle Speed Setting .....		800		
Low Idle Speed Range				
Minimum .....		600		
Maximum .....		1200		
Brake Mean Effective Pressure .....	2104	[305]	2315	[336]
Compression Ratio .....		14.5		
Piston Speed .....	11	[2245]		
Firing Order .....	2-1-6-5-4-3-10-7-16-15-12-11-14-13-8-9			
Steady State Stability Band at Constant Load .....		[5]		
Weight Dry - Engine Only .....	8754	[19300]		
Weight Dry - Engine With Heat Exchanger .....	9136	[20142]		

## Noise and Vibration

Average Noise Level - Top	(Idle) .....	dBA @ 1m	N.A.
	(Rated) .....	dBA @ 1m	106
Average Noise Level - Right Side	(Idle) .....	dBA @ 1m	N.A.
	(Rated) .....	dBA @ 1m	105
Average Noise Level - Left Side	(Idle) .....	dBA @ 1m	N.A.
	(Rated) .....	dBA @ 1m	105

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

Approximate Fuel Flow to Pump .....	964.7	[254.8]	999.9	[264.1]
Maximum Allowable Fuel Supply to Pump Temperature .....	60	[140]	60	[140]
Approximate Fuel Flow Return to Tank .....	478.4	[126.4]	481.4	[127.2]
Approximate Fuel Return to Tank Temperature .....	51	[123.3]	52	[125.78]
Maximum Heat Rejection to Drain Fuel .....	2.6	[150]	3.0	[170]
Fuel Rail Pressure .....	150000	[21756]	160000	[23206]
Average Fuel Consumption- Emissions ISO 8178 D2 Test Cycle .....	239.8	[63.4]		

## Air System<sup>1</sup>

Intake Manifold Pressure .....	315	[92.9]	331	[97.7]
Intake Air Flow .....	3009	[6375]	3119	[6608]
Heat Rejection to Ambient .....	84	[4799]	90	[5144]

## Exhaust System<sup>1</sup>

Exhaust Gas Flow .....	6741	[14283]	7041	[14920]
Exhaust Gas Temperature (Turbine Out) .....	418	[784.4]	430	[806]
Exhaust Gas Temperature (Manifold) .....	614	[1136]	637	[1178]
Heat Rejection to Exhaust .....	1594	[90717]	1715	[97615]

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.

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 COLUMBUS, INDIANA

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<http://marine.cummins.com>

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<b>DS :</b>	<b>D59-MX-1</b>
<b>CPL :</b>	<b>3478</b>
<b>DATE:</b>	<b>14-Jun-12</b>

### Emissions (in accordance with ISO 8178 Cycle D2)

NOx (Oxides of Nitrogen) .....	g/kw-hr [g/bhp-hr]	6.45	[4.81]	
HC (Hydrocarbons) .....	g/kw-hr [g/bhp-hr]	0.25	[0.19]	
CO (Carbon Monoxide) .....	g/kw-hr [g/bhp-hr]	1.51	[1.13]	
PM (Particulate Matter) .....	g/kw-hr [g/bhp-hr]	0.14	[0.10]	

### Emissions (in accordance with ISO 8178 Cycle E2)

NOx (Oxides of Nitrogen) .....	g/kw-hr [g/bhp-hr]	6.48	[4.83]	
HC (Hydrocarbons) .....	g/kw-hr [g/bhp-hr]	0.21	[0.16]	
CO (Carbon Monoxide) .....	g/kw-hr [g/bhp-hr]	0.96	[0.72]	
PM (Particulate Matter) .....	g/kw-hr [g/bhp-hr]	0.11	[0.08]	

### 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]	

### Two Loop Low Temperature Aftercooling (LTA )

#### Main Engine Circuit

Coolant Flow to Main Cooler (with 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 <sup>3</sup> .....	kW [Btu/min]	536	[30487]	594 [33801]

#### Aftercooler (LTA) Circuit

Coolant Flow to LTA Cooler (with open thermostat).....	l/min [gal/min]	511	[135]	
LTA Thermostat Operating Range	Start to open.....	46	[115]	
	Full open.....	57	[135]	
Heat Rejection to Engine Coolant <sup>3</sup> .....	kW [Btu/min]	621	[35327]	645 [36715]
Maximum Coolant Inlet Temperature from LTA Cooler				
For Keel Cooled.....	°C [°F]	49	[120]	

### Engines with Radiator Cooling

#### Main Engine Circuit

Coolant Flow to Main Cooler (with open thermostat).....	l/min [gal/min]	1817	[480]	
Standard Thermostat Operating Range	Start to open.....	82	[180]	
	Full open.....	95	[202]	
Heat Rejection to Engine Coolant <sup>3</sup> .....	kW [Btu/min]	536	[30487]	594 [33801]

#### Aftercooler (LTA) Circuit

Coolant Flow to Radiator (Blocked open thermostat) .....	l/min [gal/min]	511	[135]	
Standard Thermostat Operating Range	Start to open.....	46	[115]	
	Full open.....	57	[135]	
Heat Rejection to Engine Coolant <sup>3</sup> .....	kW [Btu/min]	621	[35327]	645 [36715]
Maximum Coolant Inlet Temperature from LTA Cooler				
For Radiator @ 35° C [95° F] Ambient Air.....	°C [°F]	49	[120]	
For Radiator @ 50° C [122° F] Ambient Air.....	°C [°F]	68	[155]	

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- <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.
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