

# Cummins Inc.

## Marine Engine General Data Sheet

Engine Model: QSL9

Data Sheet: DS-3005

Date: 30 Jan 07

### GENERAL ENGINE DATA

#### Metric [U.S. Customary]

Type .....		4 Cycle, Inline, 6 Cylinder
Bore .....	mm [in]	114.02 [4.49]
Stroke .....	mm [in]	145 [5.71]
Displacement .....	liter [in <sup>3</sup> ]	8.9 [542]

### ENGINE MOUNTING & ACCESSORY DRIVES

Max. Allowable Bending Moment at Rear Face of Block .....	N·m [ft·lb]	1356 [1000]
Max. Allowable Axial Thrust Load on Crankshaft .....	N [lb]	4448 [1000]
Max. Allowable Radial Load on Crankshaft		
At 0° .....	N [lb]	854 [192]
At 90° .....	N [lb]	2180 [490]
At 180° .....	N [lb]	4919 [1106]
At 270° .....	N [lb]	854 [192]

#### Installation/Operating Angles - Engine Installation Angles

##### In-Line drive: Installation: Static Installed Engine Pitch Angle

Engine Front Up From Horizontal .....	Min.	0°
Engine Front Up From Horizontal .....	Max.	12°

##### Vee Drive: Installation: Static Installed Engine Pitch

Engine Front Up From Horizontal .....	Min.	2°
Engine Front Up From Horizontal .....	Max.	12°

##### All Drives: Static Installed Engine Roll Angle

From vertical "Right/Left" Viewed from Flywheel End of Engine .....	Max. Right	N/A
From vertical "Right/Left" Viewed from Flywheel End of Engine .....	Max. Left	N/A

#### Engine Angles - Vessel Operating

##### Steady-State Operation - Engine Pitch Angle

Engine Front Up From Horizontal .....	Min.	-15°
Engine Front Up From Horizontal .....	Max.	25°

##### All Drives: Intermittent Operation - Eng. Roll Angle

From Vertical "Right/Left" viewed from Flywheel End of Engine .....	Max. Right	45°
From Vertical "Right/Left" viewed from Flywheel End of Engine .....	Max. Left	45°

##### All Drives: Intermittent Operation - Engine Pitch Angle

Engine Front Up From Horizontal .....	Min.	-25°
Engine Front Up From Horizontal .....	Max.	35°

### FUEL SYSTEM

#### Maximum Allowable Restriction to Fuel Pump

Clean Filter .....	kPa [in Hg]	8 [2.5]
Dirty Filter .....	kPa [in Hg]	14 [4.0]
Maximum Allowable Return Line Pressure .....	kPa [in Hg]	34 [10]
Maximum Static Pressure at Fuel Pump .....	kPa [in Hg]	34 [10]
Maximum Height of Fuel In Tank Above Fuel Pump .....	m [ft]	4.12 [13.5]

### EXHAUST SYSTEM

Maximum Allowable Back Pressure .....	kPa [in Hg]	10 [3]
Maximum Bending Moment at Turbine Outlet Mounting Flange .....	N·m [ft·lb]	19 [14]
Maximum Incremental Direct Load at Turbine Outlet Mounting Flange .....	kg [lb]	9 [20]

### AIR INDUCTION SYSTEM

#### Max. Allowable Intake Restriction - Turbocharged

Clean Filter .....	mm H <sub>2</sub> O [in H <sub>2</sub> O]	381 [15]
Dirty Filter .....	mm H <sub>2</sub> O [in H <sub>2</sub> O]	635 [25]
Maximum Air Cleaner Inlet Temperature Rise Over Ambient .....	°C [°F]	17 [30]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

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**COLUMBUS, INDIANA**

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### LUBRICATION SYSTEM

Oil Consumption Rate (Volume Percent of Fuel Consumption Rate) .....	%	0.08
Oil Pressure at Normal Operating Temperature		
Idle Speed - Minimum in Filter Head Upstream of Filter .....	kPa [psi]	N.A.
Idle Speed - Minimum in Main Oil Gallery .....	kPa [psi]	179 [26]
Rated Speed - Measured in Filter Head Upstream of Filter (Low) .....	kPa [psi]	N.A.
Rated Speed - Measured in Filter Head Upstream of Filter (High) .....	kPa [psi]	N.A.
Rated Speed - Measured in Main Oil Gallery (Low) .....	kPa [psi]	386 [56]
Rated Speed - Measured in Main Oil Gallery (High) .....	kPa [psi]	490 [71]
Max. Allowable Oil Temperature (Sump) .....	°C [°F]	121 [250]
Oil Pan Capacity (Shallow) OP 9467		
Low .....	liter [gal]	17.0 [4.5]
High .....	liter [gal]	20.8 [5.5]
Oil Pan Capacity (Deep) OP 9397		
Low .....	liter [gal]	18.9 [5.0]
High .....	liter [gal]	22.7 [6.0]
Total System Capacity (Max. Sump + Filter) .....	liter [gal]	25.4 [6.7]
By-Pass Oil Filter Capacity .....	liter [gal]	2.6 [0.7]

### COOLING SYSTEM

Coolant Capacity		
Engine Only .....	liter [gal]	24.6 [6.5]
Engine Including Heat Exchanger and Integral .....	liter [gal]	29.3 [7.75]
Min. Coolant Makeup Capacity .....	liter [gal]	1.4 [0.38]
Max. Pressure Drop Across Any External Cooling System Circuit .....	kPa [psi]	34 [5]
Max. Allowable Block Coolant System Pressure .....	kPa [psi]	483 [70]
Max. Coolant Head From Crankshaft Centerline With 15 psi Pressure Cap .....	m [ft]	2 [5]
Max. Coolant Temperature at Engine Outlet .....	°C [°F]	96 [205]
Min. Block Coolant Temperature (Warm Engine) .....	°C [°F]	71 [160]
Min. Allowable Coolant Expansion Space .....	% of System Capacity	6
Maximum Sea Water Pressure .....	kPa [psi]	103 [15]
Maximum Sea Water Pressure Drop Across Heat Exchanger .....	kPa [psi]	34 [5]
Maximum Sea Water Inlet Restriction .....	kPa [in Hg]	-17 [-5]

### ELECTRICAL AND STARTER SYSTEM

Electrical		<b>12V</b>	<b>24V</b>
Min. Recommended Battery Capacity			
Cold Cranking Amperes Rating (CCA) .....		1250	625
Marine Cranking Amperes Rating (MCA) .....		1563	781
Reserve Capacity (Discharging 25 Amps @ 80°F) .....	minutes	360	180
Min. Allowable System Voltage (@ Battery While Running) .....	Volts	12	24
Max. Allowable System Voltage (@ Battery While Running) .....	Volts	15.5	31.0
Max. Allowable Voltage Drop of Starting Circuit (While Cranking) .....	Volts	1.0	2.0
Min. Engine Cranking Torque .....	ft-lb	N.A.	N.A.
Min. Break-away Engine Cranking Torque .....	ft-lb	N.A.	N.A.
Min. Engine Cranking Speed .....	rpm	150	150
Max. Engine (Running) Current Draw .....	Amps	N.A.	N.A.
Min. Ambient Temperature for Cold Start (No Aids) .....	°C [°F]	-12 [10]	-12 [10]
Air Starter			
Regulated Pressure for Air Starter System .....	kPa [psi]	N/A	N/A
Min. Air-Flow for Air Starter System .....	l/sec [cfm]	N/A	N/A
Min. Recommended Tank Volume .....	liter [gal]	N/A	N/A

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