

Cummins Technical Operations



ENGINE MODEL : 6BTA5.9-C180
CURVE & DATASHEET : FR91536

REV 00 15JUL2006



Base Engine Data Sheet

ENGINE MODEL:	6BTA5.9-C180	CPL NUMBER :	8541	DATE: 15JUL06
CONFIGURATION NUMBER :	D403039CX02	CURVE NUMBER :	FR91536	
AFTERCOOLED SYSTEM :	Jacket Water	RATED POWER :	180 bhp @ 2200rpm	
FUEL SYSTEM :	Inline - WEIFU PW/RSV		132 kW @ 2200rpm	

GENERAL ENGINE DATA

Engine Wet Weight (Pricing Configuration).....	-kg	443
Moment of Inertia of Rotating Components (No Flywheel).....	-kg.m ²	0.25
Center of Gravity from Front Face of Block.....	-mm	391
Center of Gravity above Crankshaft Centerline.....	-mm	140
Crankshaft Thrust Bearing Load Limit		
—Maximum Intermittent.....	-N	3425
—Maximum Continuous.....	-N	1112

ENGINE MOUNTING

Maximum (Static) Bending Moment at Front Support Mounting Surface.....	-N.m	435
Maximum (Static) Bending Moment at Side Pad Mounting Surface.....	-N.m	TBD
Maximum (Static) Bending Moment at Rear Face of Block.....	-N.m	1356
Moment of Inertia of Complete Engine		
— Roll Axis.....	-kg.m ²	16.5
— Pitch Axis.....	-kg.m ²	41.1
— Yaw Axis.....	-kg.m ²	35.4

EXHAUST SYSTEM

Maximum Back Pressure.....	-mmHg	76
Exhaust Pipe Size Normally Acceptable.....	-mm	75
Maximum Static Supported Weight at the Turbocharger Outlet Flange.....	-N.m	13.5
Exhaust Manifold Insulation Acceptable.....	-Yes/No	No
Turbocharger Insulation Acceptable.....	-Yes/No	No

AIR INTAKE SYSTEM

Maximum Intake Air Restriction with Heavy Duty Air Cleaner		
— Clean Element.....	-mmH ₂ O	381
— Dirty Element.....	-mmH ₂ O	635
Minimum Dirt Holding Capacity with Heavy Duty Air Cleaner.....	-g/litre/sec.	53
Maximum Temperature Rise from Ambient to the Inlet of the Turbocharger.....	-	17
Maximum Pressure Drop from the Turbocharger Outlet to the Intake Manifold.....	-kPa	TBD

LUBRICATION SYSTEM

Normal Operating Oil Pressure Range.....	-kPa	69 - 345
Maximum Lube Oil Flow for Engine Accessories.....	-litre/min.	4.0
Maximum Sump Oil Temperature.....	-	127
Minimum Engine Oil Pressure for Engine Protection Devices:		
— At Rated Speed and Load.....	-kPa	276
— At Torque Peak Speed and Load.....	-kPa	207
— At Low Idle.....	-kPa	69
Minimum Required Lube System Capacity - Sump plus Filters.....	-litre	16.3
By-pass Filtration Required.....	-Yes/No	No
Angularity of Standard Oil Pan: (Values stated are for intermittent operation only):		
— Front Down.....	- °	45
— Front Up.....	- °	45
— Side to Side.....	- °	45



COOLING SYSTEM

Coolant Capacity - Engine Only.....	-litre	10.4
Maximum Engine Cooling Circuit External Resistance.....	-kPa	34
Minimum Pump Inlet Pressure with Open Thermostat and no Pressure Cap.....	-mmHg	TBD
Maximum Static Head of Coolant Above Engine Crankshaft Centerline.....	-m	TBD
Standard (modulating) Thermostat Range.....	-	82-93
Maximum Block Coolant Pressure with Closed Thermostat and no Pressure Cap.....	-kPa	276
Minimum Pressure Cap.....	-kPa	50
Maximum Engine Coolant Temperature at Engine Outlet.....	-	100
Maximum Engine Coolant Temperature for Engine Protection Devices.....	-	101.6
Minimum Engine Coolant Temperature.....	-	71
Minimum Fill Rate.....	-litre/min.	19
Maximum Initial Fill Time.....	-min.	5
Minimum Coolant Expansion Space.....	- %of System Capacity	6
Maximum Deaeration Time.....	-min.	25
Minimum Drawdown.....	— % of Total System Capacity	11%
(Drawdown Must Exceed the Volume Not Filled at Initial Fill & Must Not Include Expansion Space)		
Fan-on Engine Coolant Outlet Temperature.....	-	93
Shutter Opening Coolant Outlet Temperature.....	-	85
Shutter Opening Intake Manifold Air Temperature.....	-	N/A

CRANKING SYSTEM

Minimum Battery Capacity - Cold Soak at 0°F (-18°C) or Above		12V	24V
— Engine Only - Cold Cranking Amperes.....	-CCA	950	475
— Engine Only - Reserve Capacity.....	-min.	260	130
Maximum Starting Circuit Voltage Drop @ ----Amperes.....	-Volts	TBD	
Minimum Ambient Temperature for Unaided Cold Start.....	- (-°F)	-12	
Minimum Cranking Speed Required for Unaided Cold Start.....	-rpm	125	
Breakaway Torque at Minimum Unaided Start Temperature.....	-N.m(lb.-ft.)	TBD	
Cranking Torque at Minimum Unaided Start Temperature.....	-N.m(lb.-ft.)	TBD	
Cranking Torque at -10°F.....	-N.m(lb.-ft.)	TBD	

FUEL SYSTEM

Maximum Fuel Flow on the Supply Side of the Fuel Pump.....	-kg/hr	193
Maximum Fuel Inlet Restriction		
— with clean fuel filter.....	-mmHg	102
— with dirty fuel filter.....	-mmHg	203
Maximum Fuel Drain Restriction		
— with check valves.....	-mmHg	TBD
— less check valves.....	-mmHg	510
Maximum Fuel Inlet Temperature.....	-	71
Minimum Fuel Tank Air Venting Capability Required at 6 in. H ₂ O Back Pressure.....	-litre/hr	340



Base Engine Data Sheet

Low Idle Set Speed.....	-rpm	800
Maximum Governed Speed (10% of Rated Torque)	-rpm	2450
Maximum Overspeed Capability.....	-rpm	3750
Maximum altitude limit restriction		
—Continuous.....	-m	3000
Closed Throttle Torque @ 700 rpm (for 900 rpm Low Idle Speed).....	-N.m	TBD
Throttle Angle		
—High Idle.....	Deg.	103 ± 5
—Low Idle.....	Deg.	70± 5
—Delta.....	Deg.	33
Throttle Angle at Engine Shutdown		
—Engine Work.....	Deg.	105 ± 5
—Engine Shutdown.....	Deg.	46 ± 5

EMISSIONS:

Estimated Free Field Sound Pressure Level At 15 m (50 ft.) and Full-Load Governed Speed
(Excludes Noise from Intake, Exhaust, Cooling System and Driven Components)

—Right Side.....	-dBa	TBD
—Left Side.....	-dBa	TBD
—Front.....	-dBa	TBD
—Rear.....	-dBa	TBD

Gaseous Emissions per ISO 8178:

—Weight-Specific NOx.....	g/kW.h	7.69
—Weight-Specific HC.....	g/kW.h	0.42
—Weight-Specific CO.....	g/kW.h	0.43
—Weight-Specific Particulates.....	g/kW.h	0.168

Fuel Rating Option used for these Data: **FR91536**

Engine Speed.....	-rpm
Gross Power Output.....	-kW
Torque.....	-N.m
Intake Manifold Pressure.....	-kPa
Motoring Friction Horsepower.....	-kW
Turbocharger Compressor Outlet Pressure.....	-kPa
Intake Air Flow.....	-litre/sec.
Exhaust Gas Flow.....	-litre/sec.
Exhaust Gas Temperature - Dry Stack.....	-
Heat Rejection to Ambient (Dry Manifold).....	-kW
Heat Rejection to Coolant (Dry Manifold).....	-kW
Heat Rejection to Fuel.....	-kW
Engine Coolant Flow.....	-litre/sec.
External Cooling Circuit Resistance.....	- Kpa P
Altitude Limitations:	
—Intermittent.....	-m
—Continuous.....	-m
Steady State Smoke.....	-Bosch

RATED POWER	MAXIMUM POWER POINT	PEAK TORQUE
2200		1300
132		102
575		750
115		105
15		9
125		110
210		133
440		285
500		530
TBD		TBD
72		55
0.5		0.3
2.6		2.0
20.7		20.7
3500		3500
3000		3000
1		1.5

ALL DATA CERTIFIED WITHIN 5%

TBD = To Be Decided

N/A = Not Applicable

N.A. = Not Available

All data is subject to change without notice, sorry for inform.