

Cummins Technical Operations



ENGINE MODEL: 4BTA3.9-C130
CURVE & DATASHEET: FR92188

REV 00 15FEB2007



Engine Performance Curve

Basic Engine Model:
4BTA3.9-C130

Curve Number:
FR92188

Pg. No.

Engine Family: **D38**
CPL Code: **2039**

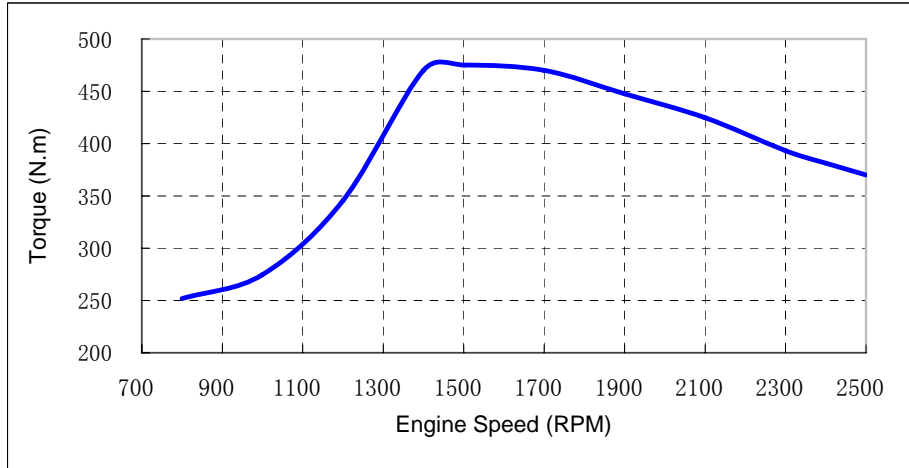
Date:
2007-2

01

Displacement: **3.9 L** Aspiration: **Turbocharged & JWAC**
 Bore: **102 mm** kW (BHP) @ RPM
 Stroke: **120 mm** No. of Cylinders: **4** **97 (130)** **2500**
 Emission Control: Fuel system: **Inline-WEIFU PW2000/RQV-K** **8% Governor Regulation**

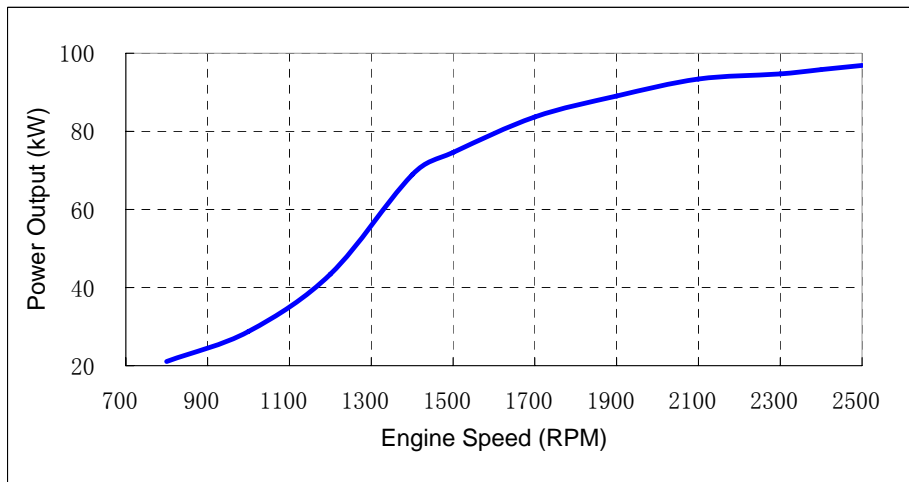
All data are based on the engine operating with fuel system, water pump, lubricating oil pump, and 250 mm H₂O (10 in. H₂O) inlet air restriction and with 50 mm Hg (2.0 in. Hg) exhaust restriction; not included are alternator, fan, optional equipment and driven components.

Performance curve



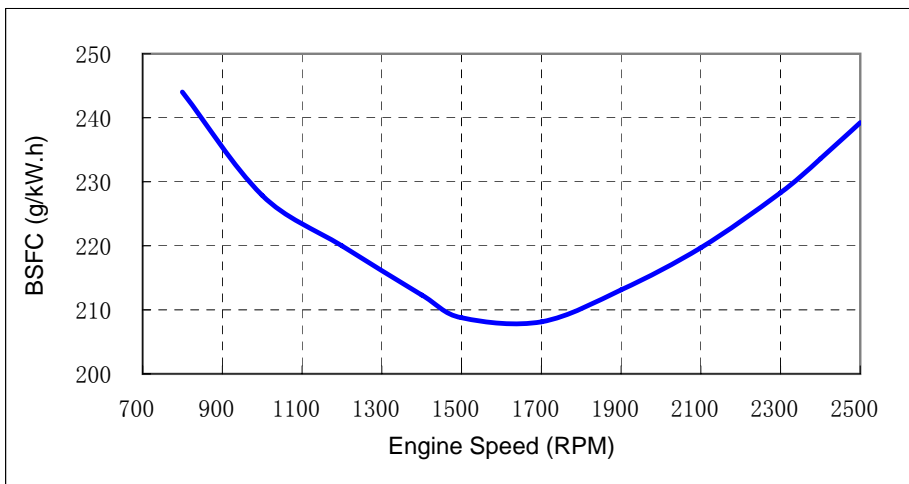
TORQUE

RPM	N.m
800	252
1000	275
1200	346
1400	470
1500	475
1700	470
1900	448
2100	425
2300	393
2400	381
2500	370



POWER OUTPUT

RPM	kW
800	21
1000	29
1200	43
1400	69
1500	75
1700	84
1900	89
2100	93
2300	95
2400	96
2500	97



FUEL CONSUMPTION

RPM	g/kW.h
800	244
1000	228
1200	220
1400	212
1500	209
1700	208
1900	213
2100	220
2300	228
2400	234
2500	239

All performance data based on the standard status and GB/T18297 conditions.



Base Engine Data Sheet

Pg. No.

02

ENGINE MODEL:	4BTA3.9-C130	CPL NUMBER:	2093	DATE:	15FEB07
CONFIGURATION NUMBER:	D383055CX02	CURVE NUMBER:	FR92188		
AFTERCOOLED SYSTEM:	Jacket Water	RATED POWER:	130 bhp @ 2500rpm		
FUEL SYSTEM:	Inline - WEIFU PW2000/RQV-K		97 kW @ 2500rpm		

GENERAL ENGINE DATA

Engine Wet Weight (Pricing Configuration).....	-kg	355
Moment of Inertia of Rotating Components (No Flywheel).....	-kg·m ²	0.143
Center of Gravity from Front Face of Block.....	-mm	262
Center of Gravity above Crankshaft Centerline.....	-mm	160
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	11.1
— Pitch Axis.....	-kg·m ²	19.1
— Yaw Axis.....	-kg·m ²	14.7

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.....	-°C	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.....	-°C	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	9.0
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	8.3
Maximum Engine Cooling Circuit External Resistance.....	-kPa	TBD
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.....	-°C	82-93
Maximum Block Coolant Pressure with Closed Thermostat and no Pressure Cap.....	-kPa	TBD
Minimum Pressure Cap.....	-kPa	50
Maximum Engine Coolant Temperature at Engine Outlet.....	-°C	100
Maximum Engine Coolant Temperature for Engine Protection Devices.....	-°C	101.6
Minimum Engine Coolant Temperature.....	-°C	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.....	-°C	93
Shutter Opening Coolant Outlet Temperature.....	-°C	85
Shutter Opening Intake Manifold Air Temperature.....	-°C	N/A

CRANKING SYSTEM

Minimum Battery Capacity - Cold Soak at 0°F (-18°C) or Above		12V	24V
— Engine Only - Cold Cranking Amperes.....	-CCA	800	400
— Engine Only - Reserve Capacity.....	-min.	160	80
Maximum Starting Circuit Voltage Drop @ ----Amperes.....	-Volts	TBD	
Minimum Ambient Temperature for Unaided Cold Start.....	-°C(-°F)		TBD
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.....	-°C	71
Minimum Fuel Tank Air Venting Capability Required at 6 in. H ₂ O Back Pressure.....	-litre/hr	340



Low Idle Set Speed.....	-rpm	900
Maximum Governed Speed (10% of Rated Torque)	-rpm	2780
Maximum Overspeed Capability.....	-rpm	3750
Maximum altitude limit restriction		
—Continuous.....	-°C -m	2000
Closed Throttle Torque @ 700 rpm (for 900 rpm Low Idle Speed).....	-N.m	230
Throttle Angle		
—High Idle.....	Deg.	107 ± 5
—Low Idle.....	-°C Deg.	71± 5
—Delta.....	Deg.	TBD
Throttle Angle at Engine Shutdown		
—Engine Work.....	Deg.	TBD
—Engine Shutdown.....	Deg.	TBD

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	TBD
—Weight-Specific HC.....	g/kW.h	TBD
—Weight-Specific CO.....	g/kW.h	TBD
—Weight-Specific Particulates.....	g/kW.h	TBD

Fuel Rating Option used for these Data: **FR92188**

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.....	-°C
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
2500		1500
97		75
370		475
138		112
TBD		TBD
140		115
128		71
TBD		TBD
590		540
8.8		8.2
67.2		45.1
0.7		0.2
3.7		1.8
20.7		20.7
TBD		TBD
2000		2000
1.2		0.8

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.