# Dongfeng Cummins Techical Operations



ENGINE MODEL: 6BT5.9-G2

CURVE & DATASHEET: FR93146



# Generator Engine Performance Data

DONGFENG CUMMINS ENGINE Co.,LTD

Xiangfan, Hubei Province, China http://www.dcec.com.cn

Basic Engine Model:

6BT5.9-G2

FR93146

# FR93146 @ 1500 RPM &1800RPM

ConfigurationCPL CodeRevisionD402078GX02CPL: 30762013/10/15

Compression Ratio: 17.3:1 Aspiration: Turbochanger

Bore: 102 mm Displacement: 5.9 L Storke: 120 mm No. of Cylinders: 6

Emission Certification: Fuel System: BYC A/Electronic Governor

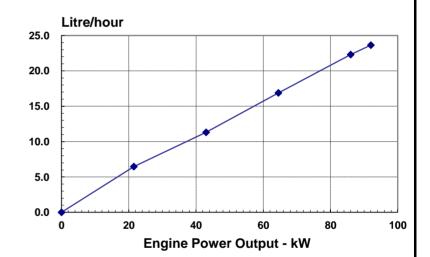
Governor Regulation: ≤5%

All data is based on the engine operating with fuel system, water pump, and 14.8 in  $H_2O$  (3.7 kPa) inlet air restriction with 5.98 in (152mm) inner diameter, and with 2.95 in Hg (10 kPa) exhaust restriction with 4.02 in (102 mm) inner diameter; not included are alternator, fan, optional equipment and driven components. Coolant flows and heat rejection data based on coolants as 50% ethylene glycol/50% water. All data is subject to change without notice.

Engine Speed	Standby Power		Prime Power		Continuous Power	
RPM	kW	HP	kW	HP	kW	HP
1500	92	123	86	115		
1800	110	147	100	133		

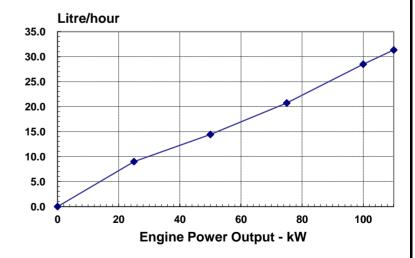
# **Engine Performance Data @ 1500 RPM**

OUTPUT POWER		FUEL CONSUMPTION		
%	kW	HP	g/kW.h	L/h
STANDBY POWER				
100	92	123	212	23.6
PRIME POWER				
100	86	115	214	22.3
75	64.5	86	216	16.9
50	43	58	217	11.3
25	21.5	29	248	6.5
CONTINUOUS POWER				



# Engine Performance Data @ 1800 RPM

OUTPUT POWER		FUEL CONSUMPTION		
%	kW	HP	g/kW.h	L/h
STANDE	BY POW	ER		
100	110	147	235	31.3
PRIME F	POWER			
100	100	133	235	28.5
75	75	100	228	20.7
50	50	67	238	14.4
25	25	33	297	9.0
CONTINUOUS POWER				



Curves shown above represent gross engine performance capabilities obtained and corrected in accordance with GB/T18297 conditions of 99kPa (29.61 in. Hg) barometric pressure, 25°C (77°F) inlet air temperature, and 1 kPa (0.30 in. Hg) water vapor pressure with No.0 diesel fuel.

# POWER RATING APPLICATION GUIDELINES FOR GENERATOR DRIVE ENGINES

These guidelines have been formulated to ensure proper application of generator drive engines in A.C. generator set installations. Generator drive engines are not designed for and shall not be used in variable speed D.C. generator set applications.

STANDBY POWER RATING is applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. Under no condition is an engine allowed to operate in parallel with the public utility at the Standby Power rating.

This rating should be applied where reliable utility power is available. A standby rated engine should be sized for a maximum of an 80% average load factor and 200 hours of operation per year. This includes less than 25 hours per year at the Standby Power rating. Standby ratings should never be applied except in true emergency power outages. Negotiated power outages contracted with a utility company are not considered an emergency.

CONTINUOUS POWER RATING is applicable for supplying utility power at a constant 100% load for an unlimited number of hours per year. No overload capability is available for this rating.

PRIME POWER RATING is applicable for supplying electric power in lieu of commercially purchased power. Prime Power applications must be in the form of one of the following two categories:

### UNLIMITED TIME RUNNING PRIME POWER

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

The total operating time at 100% Prime Power shall not exceed 500 hours per year.

A 10% overload capability is available for a period of 1 hour within a 12 hour period of operation. Total operating time at the 10% overload power shall not exceed 25 hours per year.

### LIMITED TIME RUNNING PRIME POWER

Prime Power is available for a limited number of hours in a non-variable load application. It is intended for use in situations where power outages are contracted, such as in utility power curtailment. Engines may be operated in parallel to the public utility up to 750 hours per year at power levels never to exceed the Prime Power rating. The customer should be aware, however, that the life of any engine will be reduced by this constant high load operation. Any operation exceeding 750 hours per year at the Prime Power rating should use the Continuous Power rating.

Above Source From CUMMINS AEB 26.02

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GENERAL ENGINE DATA		
Approximate Engine Weight (wet)	kg	411
Mass Moment of Inertia of Rotating Components (No Flywheel)	kg·m²	0.25
Center of Gravity from Rear Face of Block	mm	544
Center of Gravity above Crankshaft Centerline	mm	155
Engine Idle Speed	RPM	750-850
Fire Order		1-5-3-6-2-4
ENGINE MOUNTING		
Maximum (Static) Bending Moment at Rear Face of Block	N.m	1356
EXHAUST SYSTEM		
Maximum Back Pressure	kPa	10
AIR INTAKE SYSTEM		
Maximum Intake Air Restriction with Heavy Duty Air Cleaner		
— Dirty Element	kPa	6.2
— Clean Element	kPa	3.7
LUBRICATION SYSTEM		
Engine Oil Pressure for Engine Protection Devices:		
— Idle Speed(Minimum )	kPa	207
— Governed Speed(Maximum )		345
Maximum Oil Temperature		121
Minimum Required Lube System Capacity - Sump plus Filters		16.4
FUEL SYSTEM		
Type Injection System	BYC A	Direct Injection
Maximum Restriction at Lift Pump	kPa	13.6
Maximum Fuel Inlet Temperature	℃	40
Total Drain Flow (constant for all loads)	litre/hr	30
COOLING SYSTEM		
Coolant Capacity - Engine Only	litre	7.9
Maximum Coolant Friction Head External to Engine1800 rpm	kPa	35
-1500 rpm	kPa	28
Maximum Static Head of Coolant Above Engine Crank Centerline	m	14
Standard Thermostat (Modulating) Range	℃	82 - 95
Standard Thorniotiat (Wodalating) Trango		69
Minimum Pressure Cap	kPa	69

# **ELECTRICAL SYSTEM**

Cranking Motor (Heavy Duty, Positive Engagement)volt	12V	24V
Battery Charging System, Negative Groundamper	e 63	40
Maximum Allowable Resistance of Cranking Circuitohm	0.00075	0.002
Minimum Recommended Battery Capacity		
—Cold Soak @ 0 to 32-F (-18 to 0-C)0°F C0	CA 625	312

# **EMISSIONS**

Gaseous Emissions per GB 20891-2007, at 1500rpm:
—Weight-Specific NOv

—weight-Specific NOxg/k	.w.h
—Weight-Specific HCg/k	W.h
—Weight-Specific COg/k	W.h
—Weight-Specific Particulatesg/k	W.h

Gaseous Emissions per GB 20891-2007, at 1800rpm:

eous Emissions per OB 20091-2007, at 10001pm:	
—Weight-Specific NOx	a/kW.h
—Weight-Specific HC	_
—Weight-Specific CO	_
—Weight-Specific Particulates	g/kW.h

Fuel Rating Option used for these Data: FR93146

Governed Engine Speed	-rpm
Engine Idle Speed	-rpm
Gross Engine Power Output	-kW
Piston Speed	-m/s
Friction Horsepower	-kW
Engine Water Flow to Engine:	-litre/sec.
Intake Air Flow	-litre/sec.
Exhaust Gas Flow	-litre/sec.
Exhaust Gas Temperature	-°C
Radiated Heat to Ambient	-kW
Heat Rejection to Coolant	-kW
Heat Rejection to Fuel	-kW

STANDBY POWER		PRIME POWER		
1800	1500	1800	1500	
750-850	750-850	750-850	750-850	
110	92	100	86	
7.2	6.0	7.2	6.0	
12.7	12.7	12.7	12.7	
2.8	2.0	2.8	2.0	
112	108	111	100	
319	280	312	250	
577	565	564	526	
21	21	19	19	
71	61	68	54	
TBD	TBD	TBD	TBD	

# ALL DATA CERTIFIED WITHIN 5%

TBD = To Be Decided N/A = Not Applicable
All data is subject to change without notice, sorry for inform.
Dongfeng Cummins Engine Co., Ltd.

N.A. = Not Available