DCEC CUMMINS ENGINE Co.,LTD

Generator Engine Performance Data

Basic Engine Model:

4BTA3.9-G2

FR92541
FR92578
FR93145

FR92541 @ 1500 RPM &1800RPM
FR92578 @ 1500 RPM &1800RPM
FR93145 @ 1500 RPM &1800RPM

Configuration	CPL Code	Revision
D383030DX02	CPL: 3116	2013/6/15

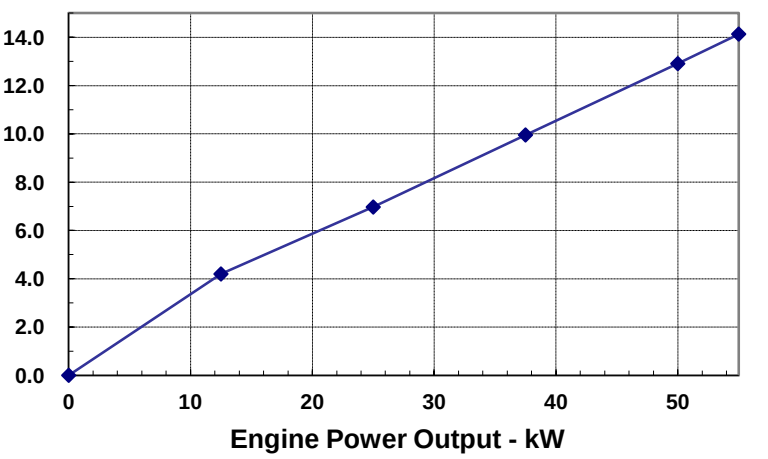
Compression Ratio:	**17.3:1**	Aspiration:	**Turbochanger& Aftercooler**
Bore:	**102 mm**	Displacement:	**3.9 L**
Storke:	**120 mm**	No. of Cylinders:	**4**
Emission Certification:		Fuel System:	**BYC A/Electronic Governor**
Governor Regulation:	**≤5%**		

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	55	74	50	67		
1800	66	88	60	80		

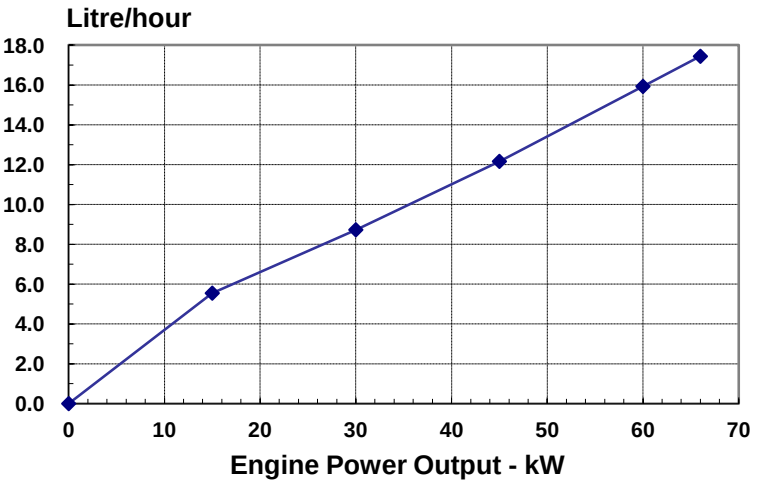
Engine Performance Data @ 1500 RPM

OUTPUT POWER			FUEL CONSUMPTION	
%	kW	HP	g/kW.h	L/h
STANDBY POWER				
100	55	74	212	14.1
PRIME POWER				
100	50	67	213	12.9
75	37.5	50.25	219	10.0
50	25	33.5	230	7.0
25	12.5	16.75	277	4.2
CONTINUOUS POWER				



Engine Performance Data @ 1800 RPM

OUTPUT POWER			FUEL CONSUMPTION	
%	kW	HP	g/kW.h	L/h
STANDBY POWER				
100	66	88	218	17.4
PRIME POWER				
100	60	80	219	15.9
75	45	60	223	12.2
50	30	40	240	8.7
25	15	20	305	5.5
CONTINUOUS POWER				



Curves shown above represent gross engine performance capabilities obtained and corrected in accordance with GB/T18297 conditions of 100kPa (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 hours.

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

GENERAL ENGINE DATA

Approximate Engine Weight (wet)	-kg	350
Mass Moment of Inertia of Rotating Components (No Flywheel)	-kg·m^2	0.143
Center of Gravity from Rear Face of Block	-mm	373
Center of Gravity above Crankshaft Centerline	-mm	163
Engine Idle Speed	-RPM	950-1050
Fire Order		1-3-4-2

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)	-kPa	345
Maximum Oil Temperature	-℃	121
Minimum Required Lube System Capacity - Sump plus Filters	-litre	10.9

FUEL SYSTEM

Type Injection System		BYC A Direct Injection
Maximum Restriction at Lift Pump	-kPa	13.6
Maximum Fuel Inlet Temperature	-℃	70
Total Drain Flow (constant for all loads)	-litre/hr	30

COOLING SYSTEM

Coolant Capacity - Engine Only	-litre	8.3
Maximum Coolant Friction Head External to Engine.. -1800 rpm	-kPa	35
-1500 rpm	-kPa	28
Maximum Static Head of Coolant Above Engine Crank Centerline	-m	14
Standard Thermostat (Modulating) Range	-℃	83 - 95
Minimum Pressure Cap	-kPa	69
Maximum Top Tank Temperature for Standby / Prime Power	-℃	104 / 100

ELECTRICAL SYSTEM

Cranking Motor (Heavy Duty, Positive Engagement).....	-volt	12V	24V
Battery Charging System, Negative Ground.....	-ampere	63	40
Maximum Allowable Resistance of Cranking Circuit.....	-ohm	0.00075	0.002
Minimum Recommended Battery Capacity			
—Cold Soak @ 0 to 32-F (-18 to 0-C).....	-0°F CCA	625	312

EMISSIONS

Gaseous Emissions per GB 20891-2007, at 1500rpm：

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

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

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

Fuel Rating Option used for these Data: **FR92541 FR92578 FR93145**

	STANDBY POWER		PRIME POWER	
Governed Engine Speed.....-rpm	1800	1500	1800	1500
Engine Idle Speed.....-rpm	950-1050	950-1050	950-1050	950-1050
Gross Engine Power Output.....-kW	66	55	60	50
Piston Speed.....-m/s	7.2	6.0	7.2	6.0
Friction Horsepower.....-kW	8.2	8.2	8.2	8.2
Engine Water Flow to Engine:.....-litre/sec.	2.8	1.6	2.8	1.6
Intake Air Flow.....-litre/sec.	73	52	66	49
Exhaust Gas Flow.....-litre/sec.	151	134	134	125
Exhaust Gas Temperature.....-˚C	405	548	393	526
Radiated Heat to Ambient.....-kW	TBD	17.1	TBD	16.2
Heat Rejection to Coolant.....-kW	TBD	31	TBD	29.1
Heat Rejection to Fuel.....-kW	TBD	49.2	TBD	46.6

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.