



# 6CTAA8.3-G2 Advantage Data Sheet

Cummins Engine Company, Inc. Columbus, Indiana 47201

Curve Number: <b>FR-90767</b>	Engine Critical Parts List: <b>CPL 2894</b>	Date: <b>30Oct03</b>
Displacement: <b>8.3 litre (505 in<sup>3</sup>)</b>	Bore: <b>114 mm (4.49 in.)</b>	Stroke: <b>135 mm (5.32 in.)</b>
No. of Cylinders: <b>6</b>	Aspiration: <b>Turbocharged and Charge Air Cooled</b>	

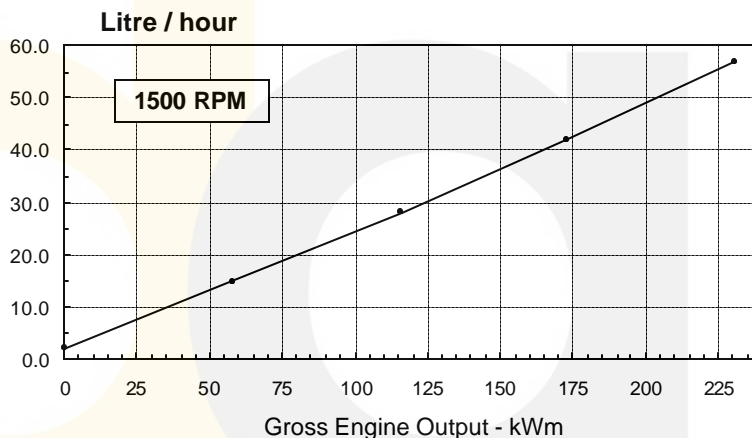
## •• PRELIMINARY ••

### Emergency Standby Ratings for application in Corporate Generator Sets Only

Engine Speed RPM	Standby Power	
	kWm	BHP
1500	231	310
1800	263	352

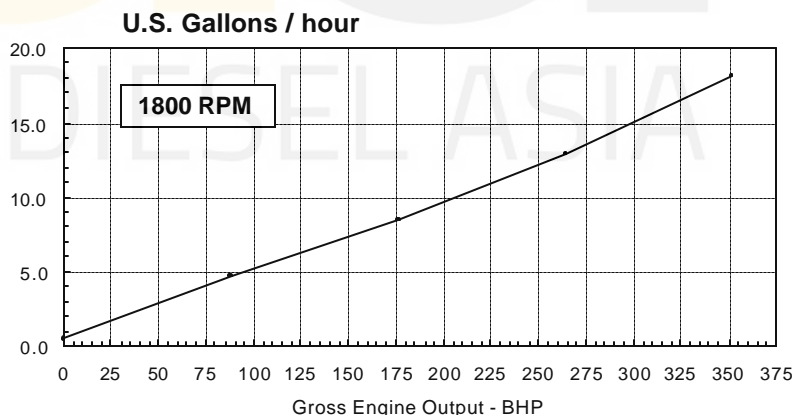
### Engine Performance Data @ 1500 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm-h	lb/ BHP-h	litre/ hour	U.S. Gal/ hour
<b>STANDBY POWER</b>						
100	231	310	0.204	0.335	57	15
75	173	233	0.197	0.325	42	11
50	116	155	0.199	0.325	28	7.3
25	58	78	0.213	0.355	15	4



### Engine Performance Data @ 1800 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm-h	lb/ BHP-h	litre/ hour	U.S. Gal/ hour
<b>STANDBY POWER</b>						
100	263	352	0.215	0.354	68	18.1
75	197	264	0.204	0.336	49	12.9
50	132	176	0.203	0.334	32	8.5
25	66	88	0.225	0.370	17	4.7



**CONVERSIONS:** (litres = U.S. Gal x 3.785)      (kWm = BHP x 0.746)      (U.S. Gal = litres x 0.2642)      (BHP = kWm x 1.34)

Data shown above represent gross engine performance capabilities obtained and corrected in accordance with ISO-3046 conditions of 100 kPa (29.53 in Hg) barometric pressure [110 m (361 ft) altitude], 25 °C (77 °F) air inlet temperature, and relative humidity of 30% with No. 2 diesel or a fuel corresponding to ASTM D2. See reverse side for application rating guidelines.

The fuel consumption data is based on No. 2 diesel fuel weight at 0.85 kg/litre (7.1 lbs/U.S. gal).

Power output curves are based on the engine operating with fuel system, water pump and lubricating oil pump; not included are battery charging alternator, fan, optional equipment and driven components.



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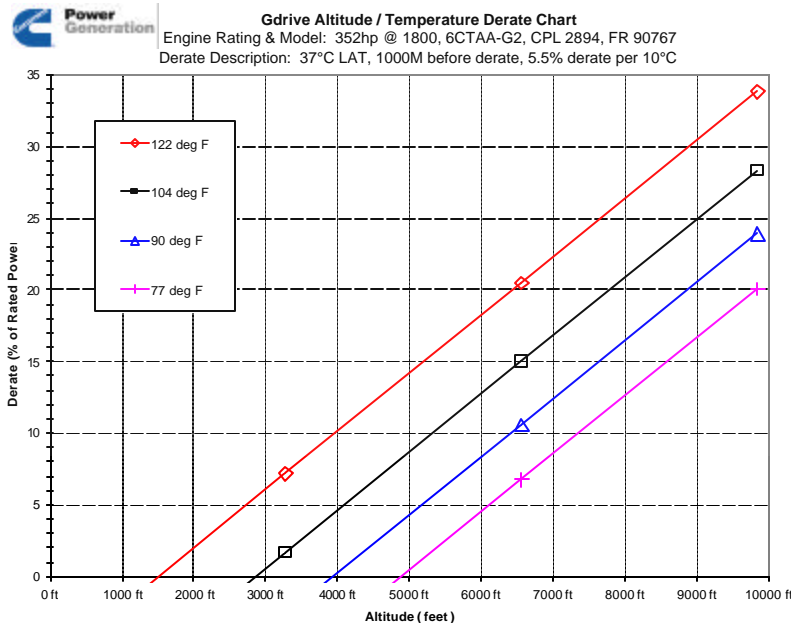
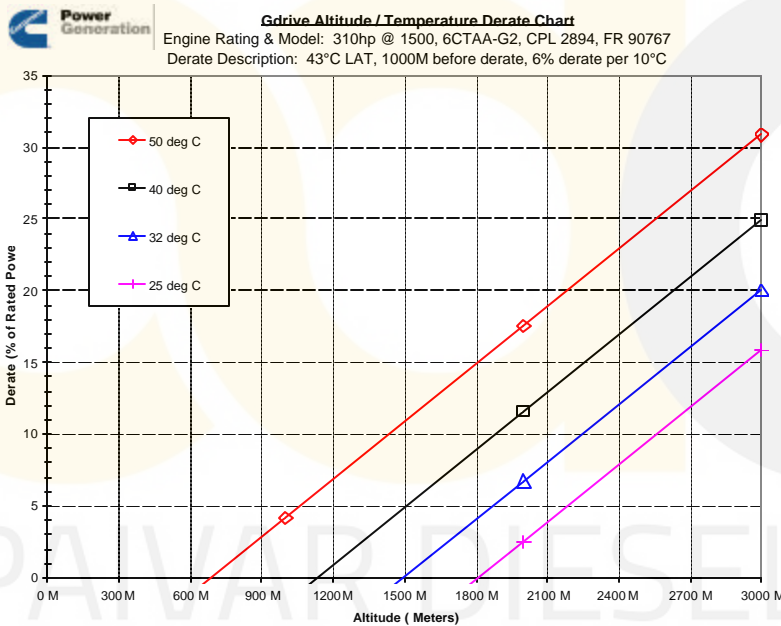
Cummins Engine Company, Inc. Columbus, Indiana 47201

••PRELIMINARY••

## POWER RATING APPLICATION GUIDELINES FOR EMERGENCY STANDBY ENGINES FOR APPLICATION IN CORPORATE GENERATOR SETS ONLY

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

Applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this standby rating. Under no condition is an engine allowed to operate in parallel with the public utility at the Emergency Standby Power rating. This rating should be applied where reliable utility power is available. An emergency standby rated engine should be sized for a maximum of an **70%** typical load factor and **200 hours** of operation per year. This includes a maximum of **1 hour** in a **12 hour** period at the Emergency Standby Power rating. Emergency Standby rating should never be applied except in true emergency power outages. Negotiated power outages contracted with a utility company are not considered an emergency.





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## GENERAL ENGINE DATA

Type.....	4-Cycle; In-line; 6-Cylinder Diesel
Aspiration.....	Turbocharged and Charge Air Cooled
Bore x Stroke .....	4.49 x 5.32 (114 x 135)
Displacement .....	505 (8.3)
Compression Ratio.....	16.7 : 1
Dry Weight	
Fan to Flywheel Engine .....	— lb (kg)                      1505                      (684)
Wet Weight	
Fan to Flywheel Engine .....	— lb (kg)                      1572                      (715)
Moment of Inertia of Rotating Components	
• with FW 9232 Flywheel .....	— lb <sub>m</sub> • ft <sup>2</sup> (kg • m <sup>2</sup> )                      36.5                      (1.54)
Center of Gravity from Rear Face of Flywheel Housing .....	— in (mm)                      21.3                      (541)
Center of Gravity Above Crankshaft Centerline.....	— in (mm)                      6.4                      (163)
Maximum Static Loading at Rear Main Bearing.....	— lb (kg)                      N.A.

## ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block.....	— lb • ft (N • m)                      1000                      (1356)
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## EXHAUST SYSTEM

Maximum Back Pressure.....	— in Hg (mm Hg)                      3                      (76)
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## AIR INDUCTION SYSTEM

Maximum Intake Air Restriction	
• with Dirty Filter Element .....	— in H <sub>2</sub> O (mm H <sub>2</sub> O)                      25                      (635)
• with Normal Duty Air Cleaner and Clean Filter Element.....	— in H <sub>2</sub> O (mm H <sub>2</sub> O)                      10                      (254)
• with Heavy Duty Air Cleaner and Clean Filter Element .....	— in H <sub>2</sub> O (mm H <sub>2</sub> O)                      15                      (381)

## COOLING SYSTEM

Coolant Capacity — Engine Only .....	— US gal (liter)                      3.25                      (12.3)
Maximum Coolant Friction Head External to Engine	
— 1800 rpm.....	— psi (kPa)                      5                      (35)
— 1500 rpm.....	— psi (kPa)                      4                      (28)
Maximum Static Head of Coolant Above Engine Crank Centerline.....	— ft (m)                      60                      (18.3)
Standard Thermostat (Modulating) Range .....	— °F (°C)                      180 - 203                      (82 - 95)
Minimum Pressure Cap.....	— psi (kPa)                      10                      (69)
Maximum Top Tank Temperature .....	— °F (°C)                      220                      (104)

## LUBRICATION SYSTEM

Oil Pressure @ Idle Speed .....	— psi (kPa)                      15                      (103)
@ Governed Speed.....	— psi (kPa)                      40 - 60                      (276 - 414)
Maximum Oil Temperature .....	— °F (°C)                      250                      (121)
Oil Capacity with OP 9006 Oil Pan : High - Low.....	— US gal (liter)                      5 - 4                      (18.9 - 15.1)
Total System Capacity (Including Full Flow Filter).....	— US gal (liter)                      6.3                      (23.8)
Angularity of OP 9006 Oil Pan	
— Front Down.....	45°
— Front Up.....	45°
— Side to Side.....	45°



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## FUEL SYSTEM

.... Type Injection System.....Bosch P7100 Direct Injection

## ELECTRICAL SYSTEM

Cranking Motor (Heavy Duty, Positive Engagement).....	— volt	12	24
Battery Charging System, Negative Ground.....	— ampere	64	40
Maximum Allowable Resistance of Cranking Circuit.....	— ohm	0.00075	0.002
Minimum Recommended Battery Capacity (Cold Soak @ 10° F (-12° C) and Above.....	— 0° F CCA	950	475

## COLD START CAPABILITY

Minimum Ambient Temperature for Aided (with Coolant Heater) Cold Start within 10 seconds .....	— °F (°C)	TBD	(TBD)
Minimum Ambient Temperature for Unaided Cold Start.....	— °F (°C)	TBD	(TBD)

## PERFORMANCE DATA

- All data is based on:
- Engine operating with fuel system, water pump, lubricating oil pump, air cleaner and exhaust silencer; not included are battery charging alternator, fan, and optional driven components.
  - Engine operating with fuel corresponding to grade No. 2-D per ASTM D975.
  - ISO 3046, Part 1, Standard Reference Conditions of:

Barometric Pressure	: 100 kPa (29.53 in Hg)	Air Temperature	: 25 °C (77 °F)
Altitude	: 110 m (361 ft)	Relative Humidity	: 30%

Steady State Stability Band at any Constant Load .....	— %	+/- 0.50
Maximum Temperature Rise Between Engine Air Inlet and Intake Manifold.....	— °F (°C)	45 (25)
Maximum Air Pressure Drop from Turbo Air Outlet to Intake Manifold - @ 1500 RPM.....	— in Hg (mm Hg)	2.5 (63.5)
Maximum Air Pressure Drop from Turbo Air Outlet to Intake Manifold - @ 1800 RPM.....	— in Hg (mm Hg)	4 (102)

Governed Engine Speed .....	— rpm
Engine Idle Speed.....	— rpm
Gross Engine Power Output.....	— BHP (kW <sub>m</sub> )
Brake Mean Effective Pressure .....	— psi (kPa)
Piston Speed .....	— ft / min (m / s)
Friction Horsepower .....	— HP (kW <sub>m</sub> )
Engine Water Flow at Stated Friction Head External to Engine:	
• 1 psi Friction Head.....	— US gpm (liter / s)
• Maximum Friction Head.....	— US gpm (liter / s)

STANDBY POWER			
		1800	1500
950 - 1150		950 - 1150	950 - 1150
Gross Engine Power Output	220 (164)	195 (145)	195 (145)
Brake Mean Effective Pressure	307 (2119)	323 (2230)	323 (2230)
Piston Speed	1416 (7.2)	1180 (6.0)	1180 (6.0)
Friction Horsepower	22 (16.4)	17 (12.7)	17 (12.7)
Engine Water Flow at 1 psi Friction Head	38 (2.4)	32 (2.0)	32 (2.0)
Engine Water Flow at Maximum Friction Head	30 (1.9)	24 (1.5)	24 (1.5)
Intake Air Flow	664 (313)	540 (255)	540 (255)
Exhaust Gas Temperature	1103 (595)	1050 (565)	1050 (565)
Exhaust Gas Flow	1846 (871)	1443 (681)	1443 (681)
Air to Fuel Ratio	22.7 : 1	22.2 : 1	22.2 : 1
Radiated Heat to Ambient	1365 (24)	1378 (24)	1378 (24)
Heat Rejection to Coolant	5311 (93)	4549 (80)	4549 (80)
Heat Rejection to Exhaust	13139 (231)	10223 (180)	10223 (180)
Heat Rejection to Aftercooler	2771 (49)	2173 (38)	2173 (38)
Charge Air Flow	47 (21)	38 (17)	38 (17)
Turbocharger Compressor Outlet Pressure	62 (1575)	58.1 (1475)	58.1 (1475)
Turbocharger Compressor Outlet Temperature	360 (182)	347 (175)	347 (175)

### Engine Data with Dry Type Exhaust Manifold

Intake Air Flow .....	— cfm (liter / s)
Exhaust Gas Temperature .....	— °F (°C)
Exhaust Gas Flow .....	— cfm (liter / s)
Air to Fuel Ratio .....	— air : fuel
Radiated Heat to Ambient .....	— BTU / min (kW <sub>m</sub> )
Heat Rejection to Coolant.....	— BTU / min (kW <sub>m</sub> )
Heat Rejection to Exhaust .....	— BTU / min (kW <sub>m</sub> )
Heat Rejection to Aftercooler.....	— BTU / min (kW <sub>m</sub> )
Charge Air Flow .....	— cfm (liter / s)
Turbocharger Compressor Outlet Pressure .....	— psi (kPa)
Turbocharger Compressor Outlet Temperature.....	— °F (°C)

**ENGINE MODEL :** 6CTAA8.3-G2  
**DATA SHEET :** DS-90767  
**DATE :** 30Oct03  
**CURVE NO. :** FR-90767



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## Typical Exhaust Emissions @ 1500 RPM

Component	Standby Power		
	g/BHP-h	mg/m <sup>3</sup>	PPM
HC (Total Unburned Hydrocarbons)	0.13	60	N.A.
NOx (Oxides of Nitrogen as NO <sub>2</sub> )	6.0	2820	N.A.
CO (Carbon Monoxide)	0.6	260	N.A.
PM (Particulate Matter)	0.3	120	N.A.

## Typical Exhaust Emissions @ 1800 RPM

Component	Standby Power		
	g/BHP-h	mg/m <sup>3</sup>	PPM
HC (Total Unburned Hydrocarbons)	0.15	60	N.A.
NOx (Oxides of Nitrogen as NO <sub>2</sub> )	4.5	2020	N.A.
CO (Carbon Monoxide)	0.6	270	N.A.
PM (Particulate Matter)	0.2	100	N.A.

**NOTE** mg/m<sup>3</sup> and PPM numbers are corrected to 5% O<sub>2</sub> content.

Data was recorded during steady state rated engine speed ( $\pm 25$  RPM) with full load ( $\pm 2\%$ ). Pressures, temperatures, and emission rates were stabilized.

**Fuel Specification:** ASTM D975 No. 2-D diesel fuel with 0.2% sulfur content (by weight) and 42-50 cetane number.  
**Fuel Temperature:** 99° F  $\pm$  9° (at fuel pump inlet)  
**Intake Air Temperature:** 77° F  $\pm$  9°  
**Barometric Pressure:** 29.6 in. Hg  $\pm$  1 in. Hg  
**Humidity:** NOx measurement corrected to 75 grains H<sub>2</sub>O/lb dry air

The HC, NOx, and CO emissions data tabulated here were taken from a single engine under the test conditions shown above. Data for the other components are estimates. This data is subject to instrumentation, measurement, and engine-to-engine variability. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels. Specifications May Change Without Notice.