Cummins	**CUMMINS ENGINE COMPANY, INC** Columbus, Indiana 47201 **ENGINE PERFORMANCE CURVE**	Basic Engine Model: **6CTAA8.3-G1**	Curve Number: **FR-90645**	*G-DRIVE* **C8.3** **1**
		Engine Critical Parts List: **CPL: 2664**	Date: **11May00**	

Displacement : **8.3**litre (**505** in^3)	Bore : **114** mm (**4.49** in.) Stroke : **135** mm (**5.32** in.)
No. of Cylinders : **6**	Aspiration : **Turbocharged and Charge Air Cooled**

•• PRELIMINARY ••

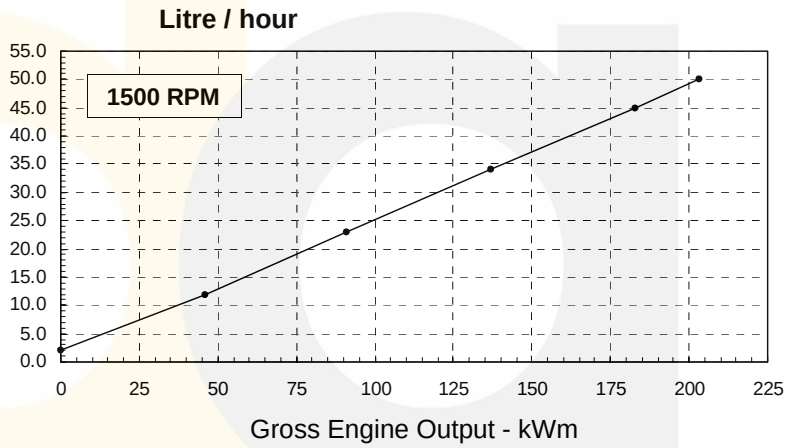
Engine Speed	Standby Power		Prime Power		Continuous Power	
RPM	kWm	BHP	kWm	BHP	kWm	BHP
1500	203	272	183	245	120	161
1800	237	317	213	285	200	268

Emissions Certification

This engine complies with certain emissions requirements established by US EPA/CARB and by the German TA-Luft.
See Exhaust Emissions Data Sheet for conformance specifics.

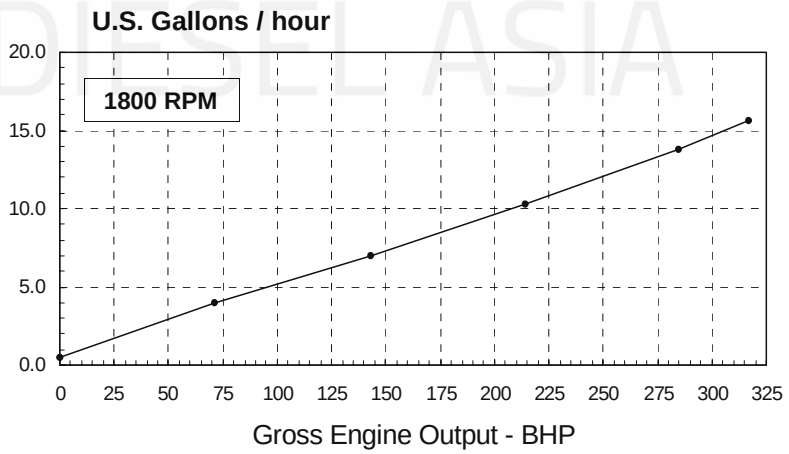
Engine Performance Data @ 1500 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm·h	lb/ BHP·h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	203	272	0.204	0.335	50	13.2
PRIME POWER						
100	183	245	0.203	0.333	45	11.8
75	137	184	0.201	0.331	34	8.8
50	91	123	0.203	0.334	23	6.0
25	46	61	0.222	0.366	12	3.3
CONTINUOUS POWER						
100	120	161	0.202	0.332	30	7.7



Engine Performance Data @ 1800 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm·h	lb/ BHP·h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	237	317	0.206	0.338	59	15.6
PRIME POWER						
100	213	285	0.203	0.334	52	13.8
75	160	214	0.201	0.331	39	10.3
50	106	143	0.205	0.337	27	7.0
25	53	71	0.231	0.380	15	4.0
CONTINUOUS POWER						
100	200	268	0.202	0.333	49	12.9



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.

TECHNICAL DATA DEPT. **CERTIFIED WITHIN 5%** **CHIEF ENGINEER**

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.

Operation At Elevated Temperature And Altitude:

For installations with a cooling system meeting the requirements on this data sheet, the engine may be operated at:

1800 RPM up to 3280 ft (1000 m) and 104 °F (40 °C) ambient without power deration. For sustained operation above these conditions, derate by 4% per 1000 ft (300 m) and 3.3% per 10 °F (6% per 10 °C).

1500 RPM up to 3280 ft (1000 m) and 95 °F (35 °C) ambient without power deration. For sustained operation above these conditions, derate by 4% per 1000 ft (300 m) and 8.3% per 10 °F (15% per 10 °C).

For installations with cooling package option RA9050, the engine may be operated without derate at:

1800 RPM up to 1000 m (3280 ft) and 45 °C (113 °F) air available to cooling fan. For sustained operation above these conditions, derate by 4% per 300 m (1000 ft) and 15% per 10 °C (8.3% per 10 °F).

1500 RPM up to 1000 m (3280 ft) and 35 °C (95 °F) air available to cooling fan. For sustained operation above these conditions, derate by 4% per 300 m (1000 ft) and 15% per 10 °C (8.3% per 10 °F).

Cummins Engine Company, Inc.
Engine Data Sheet

ENGINE MODEL : **6CTAA8.3-G1** **CONFIGURATION NUMBER :** D413035GX02

DATA SHEET : DS-90645
DATE : 11May00
PERFORMANCE CURVE : FR-90645

INSTALLATION DIAGRAM
• Fan to Flywheel : 3170244

CPL NUMBER
• Engine Critical Parts List : 2664

GENERAL ENGINE DATA

Type	4-Cycle; In-line; 6-Cylinder Diesel	
Aspiration	Turbocharged and Charge Air Cooled	
Bore x Stroke — in x in (mm x mm)	4.49 x 5.32 (114 x 135)	
Displacement — in^3 (liter)	505 (8.3)	
Compression Ratio	16.8 : 1	
Dry Weight		
Fan to Flywheel Engine — lb (kg)	1505	(684)
Fan to Flywheel Engine with RA 9050 (Radiator and Charger Air Cooler Mounted) — lb (kg)	1727	(783)
Wet Weight		
Fan to Flywheel Engine — lb (kg)	1572	(715)
Fan to Flywheel Engine with RA 9050 (Radiator and Charger Air Cooler Mounted) — lb (kg)	1849	(839)
Moment of Inertia of Rotating Components		
• with FW 9023 Flywheel — $lb_m \cdot ft^2$ ($kg \cdot m^2$)	37.6	(1.58)
• with FW 9061 Flywheel — $lb_m \cdot ft^2$ ($kg \cdot m^2$)	50.2	(2.12)
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.	N.A.

ENGINE MOUNTING

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

EXHAUST SYSTEM

Maximum Back Pressure — in Hg (mm Hg)	3	(75)

AIR INDUCTION SYSTEM

Maximum Intake Air Restriction		
• with Dirty Filter Element — in H_2O (mm H_2O)	25	(635)
• with Normal Duty Air Cleaner and Clean Filter Element — in H_2O (mm H_2O)	10	(254)
• with Heavy Duty Air Cleaner and Clean Filter Element — in H_2O (mm H_2O)	15	(381)

COOLING SYSTEM

Coolant Capacity — Engine Only — US gal (liter)	3.25	(12.3)
— with RA 9050 Radiator — US gal (liter)	8.45	(32.0)
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 for Standby / Prime Power — °F (°C)	220 / 212	(104 / 100)
Minimum Raw Water Flow @ 90°F to HX —— Heat Exchanger — US gpm (liter / min)		N/A
Maximum Raw Water Inlet Pressure at HX —— Heat Exchanger — psi (kPa)		N/A

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 9012 Oil Pan : High - Low — US gal (liter)	5 - 4	(18.9 - 15.1)
Total System Capacity (Including Combo Filter) — US gal (liter)	6.3	(23.8)
Angularity of OP 9012 Oil Pan — Front Down		45°
— Front Up		45°
— Side to Side		45°

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FUEL SYSTEM

Type Injection System	Bosch P3000 Direct Injection	
Maximum Restriction at Lift Pump — in Hg (mm Hg)	4	(102)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head) — in Hg (mm Hg)	10	(254)
Maximum Fuel Flow to Injection Pump — US gph (liter / hr)	55	(208)

ELECTRICAL SYSTEM

Cranking Motor (Heavy Duty, Positive Engagement) — volt	12	24
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 @ 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 & 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)
— @1800 RPM — in Hg (mm Hg)	4	(102)

	STANDBY 60 hz	STANDBY 50 hz	PRIME POWER 60 hz	PRIME POWER 50 hz
Governed Engine Speed — rpm	1800	1500	1800	1500
Engine Idle Speed — rpm	700 - 900	700 - 900	700 - 900	700 - 900
Gross Engine Power Output — BHP (kW_m)	317 (237)	272 (203)	285 (213)	245 (183)
Brake Mean Effective Pressure — psi (kPa)	277 (1910)	285 (1966)	249 (1717)	256 (1768)
Piston Speed — ft / min (m / s)	1596 (8.1)	1330 (6.8)	1596 (8.1)	1330 (6.8)
Friction Horsepower — HP (kW_m)	30 (22)	23 (17)	30 (22)	23 (17)
Engine Water Flow at Stated Friction Head External to Engine:				
• 1 psi Friction Head — US gpm (liter / s)	64 (4.0)	53 (3.3)	64 (4.0)	53 (3.3)
• Maximum Friction Head — US gpm (liter / s)	55 (3.5)	45 (2.8)	55 (3.5)	45 (2.8)
Engine Data with Dry Type Exhaust Manifold				
Intake Air Flow — cfm (liter / s)	666 (314)	465 (220)	610 (289)	425 (200)
Exhaust Gas Temperature — °F (°C)	920 (493)	1059 (571)	886 (474)	1037 (553)
Exhaust Gas Flow — cfm (liter / s)	1622 (765)	1256 (595)	1448 (683)	1124 (530)
Air to Fuel Ratio — air : fuel	26.4 : 1	21.7 : 1	27.3 : 1	22.2 : 1
Radiated Heat to Ambient — BTU / min (kW_m)	1275 (22)	1560 (27)	1250 (22)	1595 (28)
Heat Rejection to Coolant — BTU / min (kW_m)	4725 (83)	4420 (78)	4250 (74)	4090 (72)
Heat Rejection to Exhaust — BTU / min (kW_m)	10905 (192)	9225 (162)	9550 (167)	8220 (144)
Heat Rejected to Aftercooler — BTU / min (kW_m)	2640 (46)	1585 (28)	2055 (36)	1290 (23)
Charge Air Flow — lb / min (kg / min)	47 (21)	33 (15)	43 (19)	30 (14)
Turbocharger Compressor Outlet Pressure — in Hg (mm Hg)	61.7 (1566)	46 (1168)	53.2 (1350)	39.2 (996)
Turbocharger Compressor Outlet Temperature — °F (°C)	358 (181)	312 (156)	327 (164)	286 (141)

N.A. - Data is Not Available
N/A - Not Applicable to this Engine
TBD - To Be Determined

•• PRELIMINARY ••

ENGINE MODEL : **6CTAA8.3-G1**
DATA SHEET : DS-90645
DATE : 11May00
CURVE NO. : FR-90645