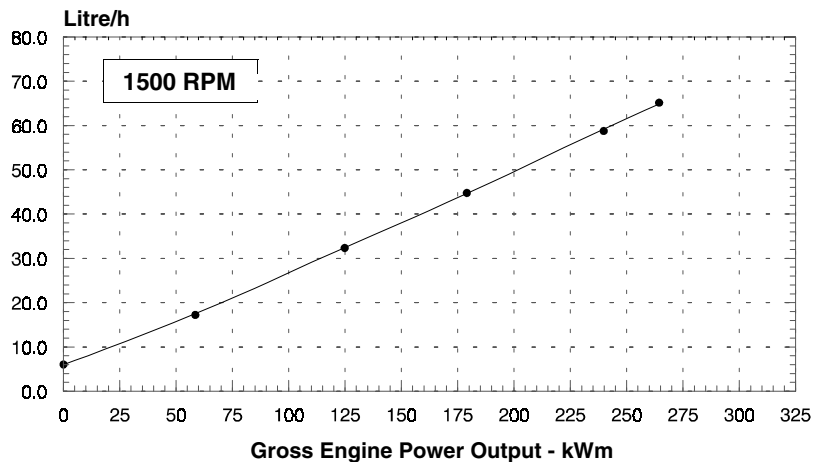
	CHONGQING CUMMINS ENGINE COMPANY Ltd. ENGINE PERFORMANCE CURVE	Basic Engine Model: NTA855-G1	Curve Number: C-3936	Page No. 1
		Engine Critical Parts List: CPL: CQ001	Date: 06Jan2004	
Displacement : 14.0 litre (855 in ³)		Bore : 140 mm (5.5 in.) Stroke : 152 mm (6.0 in.)		
No. of Cylinders : 6		Aspiration : Turbocharged and Aftercooled		

Engine Speed RPM	Standby Power		Prime Power		Continuous Power	
	kWm	BHP	kWm	BHP	kWm	BHP
1500	265	355	240	322	206	277
1800	317	425	287	385	247	331

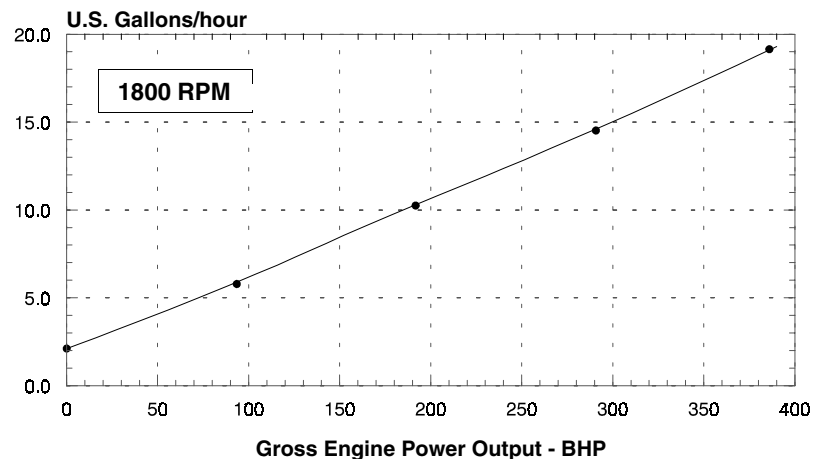
Engine Performance Data @ 1500 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm·h	lb/ BHP·h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	265	355	0.225	0.369	70	18.4
PRIME POWER						
100	240	320	0.220	0.361	62	16.5
75	180	240	0.213	0.349	45	12.0
50	120	160	0.220	0.361	31	8.2
25	60	80	0.255	0.419	18	4.7
CONTINUOUS POWER						
100	206	277	0.215	0.353	52	13.7



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	317	425	0.220	0.361	82	21.6
PRIME POWER						
100	287	386	0.219	0.360	74	19.6
75	215	290	0.221	0.364	56	14.8
50	144	193	0.236	0.388	40	10.5
25	72	97	0.272	0.446	23	6.2
CONTINUOUS POWER						
100	247	331	0.220	0.362	64	16.9



CONVERSIONS: (Litres = U.S. Gal x 3.785) (Engine kWm = BHP x 0.746) (U.S. Gal = Litres x 0.2642) (Engine BHP = Engine 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.

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.

Reference Standards:

BS-5514 and DIN-6271 standards are based on ISO-3046.

Operation At Elevated Temperature And Altitude:

The engine may be operated at:

1800 RPM up to 2,500 ft (760 m) and 104 °F (40 °C) without power deration.

1500 RPM up to 5,000 ft (1525 m) and 104 °F (40 °C) without power deration.

For sustained operation above these conditions, derate by 4% per 1,000 ft (300 m), and 1% per 10 °F (2% per 11 °C).

Cummins Engine Company, Inc.

Engine Data Sheet

ENGINE MODEL : **NTA855-G1**

CONFIGURATION NUMBER : D093405DX02

DATA SHEET : DS-3936

DATE : 06Jan2004

PERFORMANCE CURVE : C-3936

INSTALLATION DIAGRAM

- Fan to Flywheel :
- Heat Exchanger Cooled :

CPL NUMBER

- Engine Critical Parts List : CQ001

GENERAL ENGINE DATA

Type	4-Cycle; In-line; 6-Cylinder Diesel
Aspiration	Turbocharged
Bore x Stroke	5.5 x 6.0 (140 x 152)
Displacement	855 (14.0)
Compression Ratio	1 4.5:1
Dry Weight	
Fan to Flywheel Engine	2900 (1315)
Heat Exchanger Cooled Engine	3130 (1420)
Wet Weight	
Fan to Flywheel Engine	3018 (1369)
Heat Exchanger Cooled Engine	3308 (1501)
Moment of Inertia of Rotating Components	
• with FW 1109 Flywheel	118.5 (4.99)
• with FW 1001 Flywheel	180.3 (7.60)
Center of Gravity from Rear Face of Flywheel Housing	27.7 (704)
Center of Gravity above Crankshaft Centerline	5.5 (140)
Maximum Static Loading at Rear Main Bearing	N.A.

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block	1000 (1356)
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EXHAUST SYSTEM

Maximum Back Pressure	3 (76)
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AIR INDUCTION SYSTEM

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

COOLING SYSTEM

Coolant Capacity — Engine Only	5.5 (20.8)
— with HX 1134 Heat Exchanger	13.0 (49.2)
Maximum Coolant Friction Head External to Engine — 1800 rpm	7 (48)
— 1500 rpm	6 (41)
Maximum Static Head of Coolant Above Engine Crank Centerline	60 (18.3)
Standard Thermostat (Modulating) Range	180 - 200 (82 - 93)
Minimum Pressure Cap	10 (69)
Maximum Top Tank Temperature for Standby / Prime Power	220 / 212 (104 / 100)
Minimum Raw Water Flow @ 90°F to HX 1134 Heat Exchanger	54 (204)
Maximum Raw Water Inlet Pressure at HX 1134 Heat Exchanger	50 (345)

LUBRICATION SYSTEM

Oil Pressure @ Idle Speed	15 (103)
@ Governed Speed	35 - 45 (241 - 310)
Maximum Oil Temperature	250 (121)
Oil Capacity with OP 1396 Oil Pan : High - Low	9.5 - 7.5 (36.0 - 28.4)
Total System Capacity (Including Combo Filter)	10.2 (38.6)
Angularity of OP 1396 Oil Pan — Front Down	45°
— Front Up	45°
— Side to Side	45°

FUEL SYSTEM

Type Injection System.....	Direct Injection Cummins PT	
Maximum Restriction at PT Fuel Injection Pump — with Clean Fuel Filter..... — in Hg (mm Hg)	4.0	(102)
— with Dirty Fuel Filter..... — in Hg (mm Hg)	8.0	(203)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head)..... — in Hg (mm Hg)	6.0	(152)
Maximum Fuel Flow to Injection Pump..... — US gph (liter / hr)	81	(307)

ELECTRICAL SYSTEM

Cranking Motor (Heavy Duty, Positive Engagement)	— volt	24
Battery Charging System, Negative Ground	— ampere	35
Maximum Allowable Resistance of Cranking Circuit.....	— ohm	0.002
Minimum Recommended Battery Capacity		
• Cold Soak @ 50 °F (10 °C) and Above	— 0°F CCA	600
• Cold Soak @ 32 °F to 50 °F (0 °C to 10 °C).....	— 0°F CCA	640
• Cold Soak @ 0 °F to 32 °F (-18 °C to 0 °C).....	— 0°F CCA	900

COLD START CAPABILITY

Minimum Ambient Temperature for Aided (with Coolant Heater) Cold Start within 10 seconds	— °F (°C)	50	(10)
Minimum Ambient Temperature for Unaided Cold Start.....	— °F (°C)	20	(-7)

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	— %	+/- 0.25
Estimated Free Field Sound Pressure Level of a Typical Generator Set;		
Excludes Exhaust Noise; at Rated Load and 7.5 m (24.6 ft); 1800 rpm / 1500 rpm.....	— dBA	89 / 87
Exhaust Noise at 1 ft. Horizontally from Centerline of Exhaust Pipe Outlet Upwards at 0°.....	— dBA	124

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

	STANDBY		PRIME POWER	
	60 hz	50 hz	60 hz	50 hz
Governed Engine Speed.....	1800	1500	1800	1500
Engine Idle Speed	575 - 675	575 - 675	575 - 675	575 - 675
Gross Engine Power Output.....	425 (317)	355 (265)	385 (287)	322 (240)
Brake Mean Effective Pressure.....	219 (1510)	233 (1610)	196 (1358)	200 (1379)
Piston Speed.....	1800 (9.1)	1500 (7.6)	1800 (9.1)	1500 (7.6)
Friction Horsepower	59 (44)	44 (33)	59 (44)	30 (22)
Engine Water Flow at Stated Friction Head External to Engine:				
• 2 psi Friction Head (estimated).....	123 (7.8)	101 (6.4)	123 (7.8)	101 (6.4)
• Maximum Friction Head (estimated).....	108 (6.8)	88 (5.6)	108 (6.8)	88 (5.6)
Intake Air Flow	980 (463)	730 (345)	900 (425)	679 (321)
Exhaust Gas Temperature.....	1010 (543)	1007 (541)	856 (460)	804 (432)
Exhaust Gas Flow	2654 (1253)	2010 (949)	2180 (1029)	1860 (878)
Air to Fuel Ratio	28.0 : 1	23.1 : 1	28.4 : 1	24.1 : 1
Radiated Heat to Ambient	2829 (50)	2320 (41)	2546 (45)	2093 (37)
Heat Rejection to Coolant.....	11511 (202)	9630 (169)	10428 (183)	8719 (153)
Heat Rejection to Exhaust	16019 (281)	13282 (233)	14220 (250)	11830 (208)

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 _m)	
Heat Rejection to Coolant.....	— BTU / min (kW _m)	
Heat Rejection to Exhaust	— BTU / min (kW _m)	

ENGINE MODEL : **NTA855-G1**
DATA SHEET : DS-3936
DATE : 06Jan2004
CURVE NO. : C-3936