

#### **CUMMINS ENGINE COMPANY, INC**

Columbus, Indiana 47201

#### **ENGINE PERFORMANCE CURVE**

Basic Engine Model: NT855-G6

Curve Number: FR-1524

Page No.

Engine Critical Parts List: **CPL: 1381** 

Date: 30Sep98

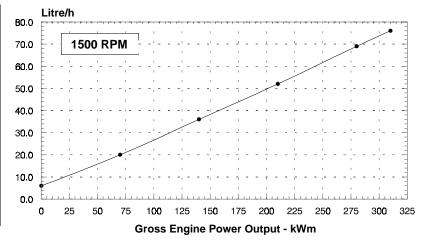
Displacement: 14.0 litre (855 in<sup>3</sup>) Bore: 140 mm (5.5 in.) Stroke: 152 mm (6.0 in.)

No. of Cylinders: 6 Aspiration: Turbocharged

Engine Speed	Standby Power		gine Speed Standby Power Prime Power		Continuous Power	
RPM	kWm	ВНР	kWm	ВНР	kWm	ВНР
1500	310	415	280	375	231	310
1800	325	435	295	395	254	340

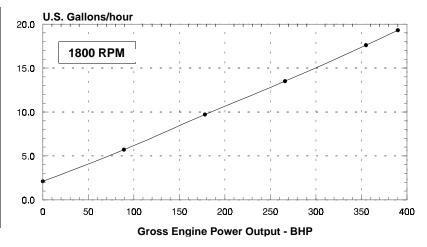
## **Engine Performance Data @ 1500 RPM**

OUTPUT POWER			FUEL CONSUMPTION				
%	kWm	ВНР	kg/ kWm∙h	lb/ BHP∙h	litre/ hour	U.S. Gal/ hour	
STAN	STANDBY POWER						
100	310	415	0.208	0.346	76	20.2	
PRIME	PRIME POWER						
100	280	375	0.209	0.343	69	18.1	
75	210	281	0.210	0.346	52	13.7	
50	140	188	0.219	0.363	36	9.6	
25	70	94	0.242	0.408	20	5.4	
CONTINUOUS POWER							
100	231	310	0.210	0.345	57	15.1	



## Engine Performance Data @ 1800 RPM

OUTPUT POWER		FUEL CONSUMPTION					
%	kWm	ВНР	kg/ kWm∙h	lb/ BHP∙h	litre/ hour	U.S. Gal/ hour	
STAN	STANDBY POWER						
100	325	435	0.214	0.353	82	21.6	
PRIME	PRIME POWER						
100	295	395	0.213	0.352	74	19.6	
75	221	296	0.215	0.355	56	14.8	
50	148	198	0.230	0.377	40	10.5	
25	74	99	0.264	0.445	23	6.2	
CONTINUOUS POWER							
100	254	340	0.214	0.354	64	16.9	



**CONVERSIONS:** 

(Litres = U.S. Gal x 3.785)

(Engine kWm = BHP x 0.746)

 $(U.S. Gal = Litres \times 0.2642)$ 

(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  $^{\rm o}$ F (40  $^{\rm o}$ C) without power deration.

1500 RPM up to 5,000 ft (1525 m) and 104  $^{\rm o}F$  (40  $^{\rm o}C)$  without power deration.

For sustained operation above these conditions, derate by 4% per 1,000 ft (300 m), and 1% per 10  $^{\rm o}$ F (2% per 11  $^{\rm o}$ C).

## **Cummins Engine Company, Inc.**

### **Engine Data Sheet**

DATA SHEET: DS-1524 ENGINE MODEL: NT855-G6 DATE: 30Sep98
PERFORMANCE CURVE: FR-1524 **CONFIGURATION NUMBER:** D092555DX02

INSTALLATION DIAGRAM
• Fan to Flywheel : 3626384
• Heat Exchanger Cooled : <u>CPL NUMBER</u>
• Engine Critical Parts List : 1381

Tieat Exchange	Coolea .

				6-Cylinder Diesel
•	in v		Turbocharged	150)
	—in x	`	5.5 x 6.0 (140 x 855 (14.0)	152)
·		, ,	14.0 : 1	
Dry Weight				
· · · · · · · · · · · · · · · · · · ·		— lb (ka)	2800	(1270)
, ,		` 0,	3030	(1374)
Wet Weight		15 (1.9)	0000	(101.1)
		— lb (ka)	2914	(1322)
Heat Exchanger Cooled Engine		— lb (kg)	3204	(1453)
Moment of Inertia of Rotating Compon	ents			
<ul> <li>with FW 1109 Flywheel</li> </ul>	— lb <sub>n</sub>	<sub>n</sub> • ft <sup>2</sup> (kg • m <sup>2</sup> )	118.5	(4.99)
	— lb <sub>n</sub>		180.3	(7.60)
	ywheel Housing		27.7	(704)
	enterline		5.5	(140)
Maximum Static Loading at Rear Main	Bearing	— lb (kg)		N.A.
ENGINE MOUNTING				
Maximum Bending Moment at Rear Fa	ace of Block –	– lb • ft (N • m)	1000	(1356)
EXHAUST SYSTEM				
Maximum Back Pressure	—i	n Hg (mm Hg)	3	(76)
ALD INDUCTION OVETEN				
AIR INDUCTION SYSTEM				
Maximum Intake Air Restriction			0.5	(005)
	— in H		25	(635)
	ean Filter Element — in H		10	(254)
• with Heavy Duty Air Cleaner and Cle	ean Filter Element — in F	1 <sub>2</sub> O (mm H <sub>2</sub> O)	15	(381)
COOLING SYSTEM				(12.2)
			5.0	(18.9)
— with HX 1134 H	eat Exchanger	– US gai (liter)	12.5	(47.3)
Maximum Coolant Friction Head Exter	nal to Engine — 1800 rpm	— psi (kPa)	6	(41)
	— 1500 rpm		5	(34)
	ve Engine Crank Centerline		60	(18.3)
	nge		180 - 200	(82 - 93)
			10	(69)
	Standby / Prime Power		220 / 212	(104 / 100)
	HX 1134 Heat Exchanger — US g		54	(204)
Maximum Raw Water Inlet Pressure a	t HX 1134 Heat Exchanger	— psi (kPa)	50	(345)
LUBRICATION SYSTEM				
			15	(103)
•		. , ,	35 - 45	(241 - 310)
			250	(121)
	gh - Low		9.5 - 7.5	(36.0 - 28.4)
	bo Filter)		10.2	(38.6)
3 ,	Front Up			45°
	Front Up			45°
	Side to Side			45°

#### **FUEL SYSTEM**

I OLL OTOTLIN		
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)	6.0	(152)
Maximum Fuel Flow to Injection Pump	76	(288)
ELECTRICAL SYSTEM		
Cranking Motor (Heavy Duty, Positive Engagement)	24	
Battery Charging System, Negative Ground — ampere	35	
Maximum Allowable Resistance of Cranking Circuit	0.002	
Minimum Recommended Battery Capacity		
• Cold Soak @ 50 °F (10 °C) and Above	600	
• Cold Soak @ 32 °F to 50 °F (0 °C to 10 °C)	640	
• Cold Soak @ 0 °F to 32 °F (-18 °C to 0 °C)	900	
COLD START CAPABILITY		
Minimum Ambient Temperature for Aided (with Coolant Heater) Cold Start within 10 seconds	50	(10)
Minimum Ambient Temperature for Unaided Cold Start	40	`(4)

#### 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) : 110 m (361 ft) Relative Humidity : 30%

+/- 0.25 Estimated Free Field Sound Pressure Level of a Typical Generator Set;

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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:
• 2 psi Friction Head (estimated) — US gpm (liter / s)
<ul> <li>Maximum Friction Head (estimated)— US gpm (liter / s)</li> </ul>
Engine Data with Dry Type Exhaust Manifold

<ul> <li>2 psi Friction Head (estimated)</li></ul>	
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> )	

STA	STANDBY PRIME POWER		
60 hz	50 hz	60 hz	50 hz
1800	1500	1800	1500
575 - 675	575 - 675	575 - 675	575 - 675
435 (324)	415 (309)	395 (295)	375 (280)
224 (1544)	256 (1765)	203 (1400)	232 (1600)
1800 (9.1)	1500 (7.6)	1800 (9.1)	1500 (7.6)
47 (35)	30 (22)	47 (35)	30 (22)
119 (7.5)	97 (6.1)	119 (7.5)	97 (6.1)
108 (6.8)	88 (5.6)	108 (6.8)	88 (5.6)
, ,	, ,	` ,	, ,
860 (406)	795 (375)	835 (394)	765 (361)
975 (524)	1125 (607)	950 (510)	1065 (574)
2400 (1133)	2450 (1156)	2290 (1081)	2270 (1071)
27.9 : 1	24.9 : 1	29.5 : 1	26.2 : 1
3465 (61)	3185 (56)	3060 (54)	2840 (50)
10005 (176)	9545 (168)	9085 (160)	8625 (152)
14845 (261)	13400 (236)	13535 (238)	11815 (208)
(201)	(200)	(200)	(200)

**ENGINE MODEL: NT855-G6** DATA SHEET: DS-1524

DATE: 30Sep98 **CURVE NO.:** FR-1524