

CHONGQING CUMMINS **ENGINE COMPANY Ltd.**

ENGINE PERFORMANCE CURVE

Basic Engine Model: KTA19-G2

CPL: 0520

Curve Number: FR-4125

Page No.

Engine Critical Parts List:

Date:

03JAN2004

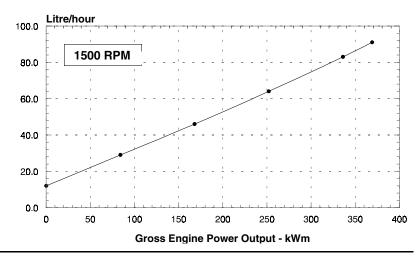
Displacement: 18.9 litre (1150 in3) Bore: 159 mm (6.25 in.) Stroke: 159 mm (6.25 in.)

No. of Cylinders: 6 Aspiration: Turbocharged and Aftercooled

Engine Speed	Standby Power		Prime Power		Continuous Power		
RPM	kWm	ВНР	kWm	ВНР	kWm	ВНР	
1500	369	495	336	450	328	440	
1800	448	600	392	525	336	450	

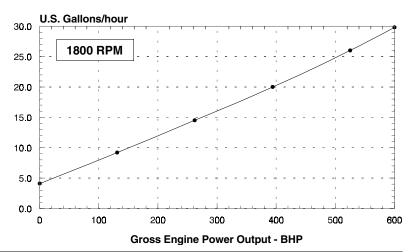
Engine Performance Data @ 1500 RPM

OUTPUT POWER			FUEL CONSUMPTION					
%	kWm	ВНР	kg/ lb/ kWm·h BHP·h		litre/ hour	U.S. Gal/ hour		
STAN	STANDBY POWER							
100	369	495	0.210	0.344	91	24.0		
PRIME	PRIME POWER							
100	336	450	0.209	0.344	83	21.8		
75	252	338	0.215	0.353	64	16.8		
50	168	225	0.232	0.382	46	12.1		
25	84	112	0.292	0.482	29	7.6		
CONT	CONTINUOUS POWER							
100	328	440	0.205	0.336	78	20.8		



Engine Performance Data @ 1800 RPM

OUTPUT POWER			FUEL CONSUMPTION					
%	kWm	ВНР	kg/ kWm∙h	•		U.S. Gal/ hour		
STAN	STANDBY POWER							
100	448	600	0.214	0.353	113	29.8		
PRIME	PRIME POWER							
100	392	525	0.213	0.352	98	26.0		
75	294	394	0.220	0.360	76	20.0		
50	195	262	0.240	0.393	55	14.5		
25	98	131	0.304	0.499	35	9.2		
CONT	CONTINUOUS POWER							
100	336	450	0.211	0.347	83	22.0		



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

1500 RPM up to 4,300 ft (1310 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).

Chongqing Cummins Engine Company Ltd.

Engine Data Sheet

DATA SHEET: DS-4084-F ENGINE MODEL: KTA19-G2 **CONFIGURATION NUMBER:** D193056DX02

DATE: 03JAN2004
PERFORMANCE CURVE: FR-4125

CPL NUMBER

INSTALLATION DIAGRAM

• Fan to Flywheel : 3003983

• Heat Exchanger Cooled : N.A. Engine Critical Parts List : 0520

GENERAL	ENGINE	DATA
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Type		4-Cycle; In-line;	6-Cylinder Diesel
Aspiration			and Aftercooled
Bore x Stroke — in x in (mm x mi	m)	6.25 x 6.25 (159	
Displacement—in ³ (lite	er)	1150 (18.9)	•
Compression Ratio		13.9 : 1	
Dry Weight			
Fan to Flywheel Engine — lb (k	(g)	4000	(1814)
Heat Exchanger Cooled Engine — lb (k	(g)	4421	(2005)
Wet Weight	•		
Fan to Flywheel Engine — lb (k	kg)	4159	(1886)
Heat Exchanger Cooled Engine — Ib (k	•	4723	(2142)
Moment of Inertia of Rotating Components			
• with FW 4001 Flywheel	า ²)	170	(7.2)
• with FW 4006 Flywheel — lb _m • ft ² (kg • m		199	(8.4)
Center of Gravity from Rear Face of Flywheel Housing (FH 4018)		28.4	(7 21)
Center of Gravity Above Crankshaft Centerline		9.0	(229)
Maximum Static Loading at Rear Main Bearing — lb (k	,	2000	(908)
ENGINE MOUNTING			
Maximum Bending Moment at Rear Face of Block — lb • ft (N • I	m)	1000	(1356)
EXHAUST SYSTEM			
Maximum Back Pressure— in Hg (mm H	la)	3	(76)
Maximum Intake Air Restriction • with Dirty Filter Element	O)	25 10 15	(635) (254) (381)
COOLING SYSTEM			
Coolant Capacity — Engine Only— US gal (lite	er)	8.0	(30)
— with HX 4073 Heat Exchanger— US gal (lite		17.5	(66)
Maximum Coolant Friction Head External to Engine — 1800 rpm — psi (kF	Pa)	10	(69)
— 1500 rpm — psi (kF	Pa)	8	(55)
Maximum Static Head of Coolant Above Engine Crank Centerline — ft (m)	60	(18.3)
Standard Thermostat (Modulating) Range	C)	180 - 200	(82 - 93)
Minimum Pressure Cap — psi (kP	Pa)	10	(69)
Maximum Top Tank Temperature for Standby / Prime Power	C)	220 / 212	(104 / 100)
Minimum Raw Water Flow @ 90°F to HX 4073 Heat Exchanger — US gpm (liter / m	,	54	(204)
Maximum Raw Water Inlet Pressure at HX 4073 Heat Exchanger — psi (kF		50	(345)
LUBRICATION SYSTEM			
Oil Pressure @ Idle Speed — psi (kP	Pa)	20	(138)
@ Governed Speed — psi (kP	,	50 - 70	(345 - 483)
Maximum Oil Temperature	,	250	(121)
Oil Capacity with OP 4019 Oil Pan : High - Low		10.0 - 8.5	(38 - 32)
Total System Capacity (Including Bypass Filter)		13.2	(50)
Angularity of OP 4019 Oil Pan — Front Down		. 3.2	30°
— Front Up			30°
— Side to Side			30°
0.00 0 0.00			

FUEL SYSTEM

Type Injection System	Direct Injection	Cummins PT
Maximum Restriction at PT Fuel Injection Pump— with Clean Fuel Filter	4.0	(102)
— with Dirty Fuel Filter	8.0	(203)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head) — in Hg (mm Hg)	6.5	(165)
Maximum Fuel Flow to Injection Pump— US gph (liter / hr)	104	(394)
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	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	

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%

STANDRY DOWER

Governed Engine Speedrpm
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:
• 3 psi Friction Head — US gpm (liter / s)
Maximum Friction Head — US gpm (liter / s)

— US gpm (liter / s)
anifold
cfm (liter / s)
°F (°C)
cfm (liter / s)
— air : fuel
— BTU / min (kW _m)
— BTU / min (kW _m)
BTU / min (kW _m)

60 hz 50 hz			6	PRIME 0 hz	POWER	<u>1</u>) hz	
00 HZ		<u> </u>	/ 112	0	UIIZ	50	/ 112
1	800	15	500	1800		1500	
675	5 - 775	675 - 775		675 - 775		675 - 775	
600	(448)	495	(369)	525	(392)	450	(336)
230	(1586)	227	(1565)	201	(1386)	207	(1427)
1875	(9.5)	1562	(7.9)	1875	(9.5)	1562	(7.9)
85	(63)	60	(45)	85	(63)	60	(45)
196	(12.4)	162	(10.2)	196	(12.4)	162	(10.2)
175	(11.0)	145	(9.1)	175	(11.0)	145	(9.1)
1320	(623)	945	, ,	1230	` '	915	, ,
955	(513)	985	(529)	920	(493)	975	(524)
3600	(1699)	2630	(1241)	3270	(1543)	2530	(1194)
27.	5 : 1	24.5 : 1		29.4 : 1		26.0 : 1	
3870	(68)	3120	(55)	3380	(59)	2830	(50)
15600	(274)	12870	(226)	13650	(240)	11700	(206)
19595	(344)	14970	(263)	16995	(299)	13580	(239)
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N.A. - Data is Not AvailableN/A - Not Applicable to this EngineTBD - To Be Determined

ENGINE MODEL: KTA19-G2 DATA SHEET: DS-4084-F

DRIME DOWER

DATE: 03JAN04 CURVE NO.: FR-4125