



CUMMINS ENGINE COMPANY, INC

Columbus, Indiana 47201

ENGINE PERFORMANCE CURVE

Basic Engine Model:
KTA50-G7

Curve Number:
FR-6230

Page
No.

Engine Critical Parts List:
CPL: 6238

Date:
20Mar98

Displacement : **50.3 litre (3067 in³)**

Bore : **159 mm (6.25 in.)** Stroke : **159 mm (6.25 in.)**

No. of Cylinders : **16**

Aspiration : **Turbocharged and Separate Circuit Aftercooled**

Engine Speed RPM	Standby Power		Prime Power		Continuous Power	
	kWm	BHP	kWm	BHP	kWm	BHP
1500	1228	1645	1097	1470	866	1160

Engine Emissions

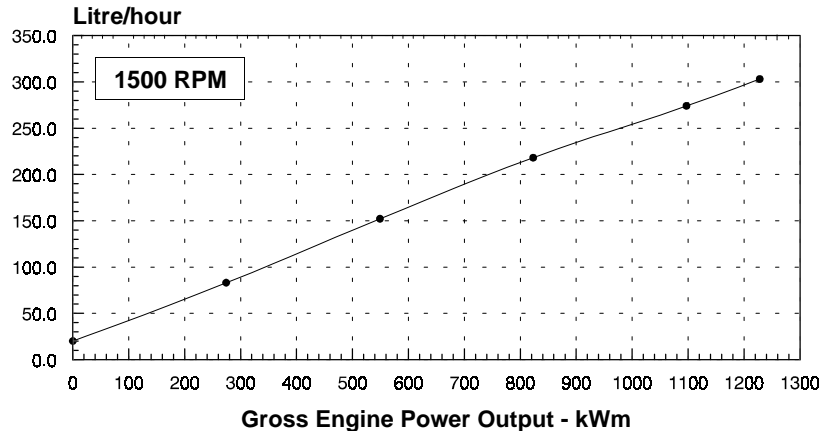
Prime rated engine complies with the following TA-Luft emissions limits :

NOx : 2000 mg/nm³
CO : 650 mg/nm³

NMHC : 150 mg/nm³
Particulates : 130 mg/nm³

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	1228	1645	0.210	0.346	303	80.2
PRIME POWER						
100	1097	1470	0.212	0.350	274	72.5
75	823	1103	0.222	0.365	218	56.7
50	549	735	0.237	0.389	152	40.3
25	274	368	0.257	0.423	83	21.9
CONTINUOUS POWER						
100	866	1160	0.220	0.362	224	59.1



Engine for use at 1500 RPM operation only.

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. For TA-Luft emissions compliance, fuel specification must meet ASTM D975 No. 2-D diesel fuel with a maximum 0.2% sulfur content (by weight) and have a minimum 45 cetane number.

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 lb/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.

Engine must be applied to Cummins application guidelines and installation recommendations relevant to the product.

D.K. Trueblood

CHIEF ENGINEER

TECHNICAL DATA DEPT.

CERTIFIED WITHIN 5%

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 target intake manifold temperatures at Prime Power to:

1500 RPM up to 3,000 ft. (1,000 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 3% per 5 °F (4% per 5 °C).

Cummins Engine Company, Inc.

Engine Data Sheet

ENGINE MODEL : **KTA50-G7**

CONFIGURATION NUMBER : D283031DX02

DATA SHEET : DS-6230

DATE : 20Mar98

PERFORMANCE CURVE : FR-6230

INSTALLATION DIAGRAM

• Fan to Flywheel : 3626419

CPL NUMBER

• Engine Critical Parts List : 6238

GENERAL ENGINE DATA

Type	4-Cycle; 60° Vee; 16-Cylinder Diesel
Aspiration	Turbocharged and Aftercooled
Bore x Stroke..... — in x in (mm x mm)	6.25 x 6.25 (159 x 159)
Displacement..... — in ³ (liter)	3067 (50.3)
Compression Ratio.....	16.7 : 1

Dry Weight		
Fan to Flywheel Engine..... — lb (kg)	11820	(5360)

Wet Weight		
Fan to Flywheel Engine..... — lb (kg)	12480	(5660)

Moment of Inertia of Rotating Components		
• with FW 6009 Flywheel — lb _m • ft ² (kg • m ²)	271	(11.4)
• with FW 6017 Flywheel — lb _m • ft ² (kg • m ²)	515	(21.7)
Center of Gravity from Rear Face of Flywheel Housing (FH 6024)..... — in (mm)	47.5	(1206)
Center of Gravity Above Crankshaft Centerline — in (mm)	11.0	(279)
Maximum Static Loading at Rear Main Bearing..... — lb (kg)	2000	(908)

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block..... — lb • ft (N • m)	4500	(6100)
---	------	--------

EXHAUST SYSTEM

Maximum Back Pressure..... — in Hg (mm Hg)	2	(51)
--	---	------

AIR INDUCTION SYSTEM

Intake Manifold Temperature Required for Emissions Compliance..... — °F (°C)	122	(50)
Maximum Intake Air Restriction		
• with Dirty Filter Element..... — in H ₂ O (mm H ₂ O)	20	(508)
• with Normal Duty Air Cleaner and Clean Filter Element..... — in H ₂ O (mm H ₂ O)	10	(254)
• with Heavy Duty Air Cleaner and Clean Filter Element..... — in H ₂ O (mm H ₂ O)	15	(381)

COOLING SYSTEM (Separate Circuit Aftercooling Required)

Coolant Capacity — Engine Only..... — US gal (liter)	47.3	(180)
Minimum Pressure Cap (for Cooling Systems with less than 2 m [6 ft.] Static Head)..... — psi (kPa)	14	(96)
Maximum Static Head of Coolant Above Engine Crank Centerline..... — ft (m)	60	(18.3)

Jacket Water Circuit Requirements:

Maximum Coolant Friction Head External to Engine — 1500 rpm..... — psi (kPa)	10	(69)
Maximum Top Tank Temperature for Standby / Prime Power..... — °F (°C)	220 / 212	(104 / 100)
Standard Thermostat (Modulating) Range..... — °F (°C)	180 - 200	(82 - 93)

Aftercooler Circuit Requirements:

Maximum Coolant Friction Head External to Engine — 1500 rpm (SW 6016)..... — psi (kPa)	5	(35)
Pump Flow at Maximum Friction Head with SW6016 — 1500 rpm..... — US gpm (liter / sec)	90	(5.6)
Coolant Temperature Out of Engine Aftercoolers at 77 °F (25 °C) Ambient..... — °F (°C)	108	(42)
Coolant Temperature to Engine Aftercoolers for Emissions Compliance..... — °F (°C)	104	(40)
Maximum Coolant Temperature to Engine Aftercoolers at Prime Power..... — °F (°C)	131	(55)

LUBRICATION SYSTEM

Oil Pressure @ Idle Speed..... — psi (kPa)	20	(138)
@ Governed Speed..... — psi (kPa)	50 - 70	(345 - 483)
Maximum Oil Temperature..... — °F (°C)	250	(121)
Oil Capacity with OP 6014 Oil Pan : High - Low..... — US gal (liter)	54 - 46	(204 - 174)
Total System Capacity (Including Bypass Filter)..... — US gal (liter)	59	(223)
Oil Capacity with OP 6027 Oil Pan : High - Low..... — US gal (liter)	47 - 39	(178 - 148)
Total System Capacity (Including Bypass Filter)..... — US gal (liter)	52	(197)

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)	6.5 (165)	
Maximum Fuel Flow to Injection Pump..... — US gph (liter / hr)	162 (613)	

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	1280
• Cold Soak @ 32 °F to 50 °F (0 °C to 10 °C)..... — 0°F CCA	1800
• Cold Soak @ 0 °F to 32 °F (-18 °C to 0 °C)..... — 0°F CCA	1800

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)	45 (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)
 - Altitude : 110 m (361 ft)
 - Air Intake Restriction : 381 mm H₂O (15 in H₂O)
 - Air Temperature : 25 °C (77 °F)
 - Relative Humidity : 30%
 - Exhaust Restriction : 51 mm Hg (2 in Hg)

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); @1500 rpm.....	— dBA	92.4
Exhaust Noise at 1 m Horizontally from Centerline of Exhaust Pipe Outlet Upwards at 45°	— dBA	125

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

Engine Jacket Water Flow at Stated Friction Head External to Engine:

- 4 psi Friction Head..... — US gpm (liter / s)
- Maximum Friction Head..... — US gpm (liter / s)

Engine Data

Intake Air Flow

Exhaust Gas Temperature..... — °F (°C)

Exhaust Gas Flow

Air to Fuel Ratio..... — air : fuel

Radiated Heat to Ambient

Heat Rejection to Engine Jacket Radiator

Heat Rejection to Exhaust..... — BTU / min (kW_m)

Turbocharger Compressor Outlet Temperature..... — °F (°C)

Engine Aftercooler Data

Heat Rejection to Aftercooler Radiator..... — BTU / min (kW_m)

Total Pressure Drop through Engine Aftercoolers:
 — @ 90 US gpm..... — psi (kPa)

	STANDBY POWER		PRIME POWER	
	60 hz	50 hz	60 hz	50 hz
		1500		1500
		725 - 775		725 - 775
		1645 (1228)		1470 (1097)
		283 (1951)		253 (1744)
		1562 (7.9)		1562 (7.9)
		155 (116)		155 (116)
		440 (27.8)		440 (27.8)
		400 (25.2)		400 (25.2)
Not Applicable for 1800 RPM Operation			Not Applicable for 1800 RPM Operation	
	3474 (1640)		3240 (1530)	
	885 (474)		882 (472)	
	8100 (3822)		7600 (3586)	
		26.2:1		27.0 : 1
	9800 (173)		8765 (154)	
	28000 (493)		26000 (458)	
	52000 (916)		48000 (845)	
	368 (187)		347 (175)	
		14000 (246)		12000 (211)
		8 (55)		8 (55)

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

ENGINE MODEL : KTA50-G7
DATA SHEET : DS-6230
DATE : 20Mar98
CURVE NO. : FR-6230