



CUMMINS ENGINE COMPANY, INC

Columbus, Indiana 47201

ENGINE PERFORMANCE CURVE

Basic Engine Model:
KTA19-G3

Engine Critical Parts List:
CPL: 1455

Curve Number:
FR-4128

Date:
08Sep98

Page No.

Displacement : **18.9 litre (1150 in³)**

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

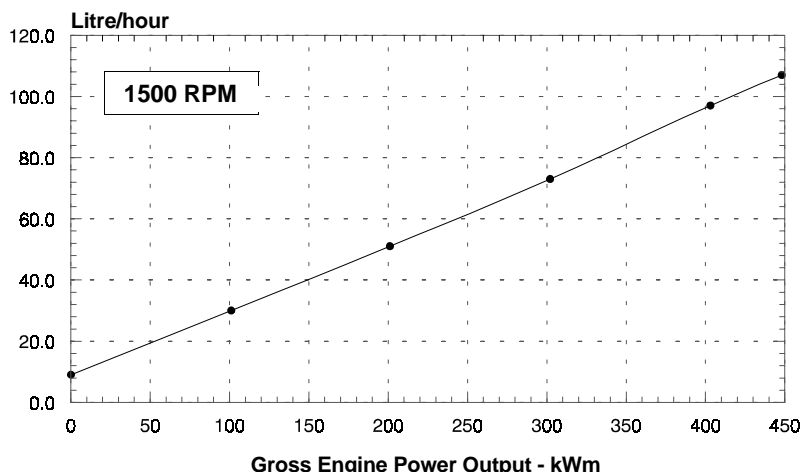
No. of Cylinders : **6**

Aspiration : **Turbocharged and Aftercooled**

Engine Speed RPM	Standby Power		Prime Power		Continuous Power	
	kWm	BHP	kWm	BHP	kWm	BHP
1500	448	600	403	540	354	475
1800	511	685	463	620	388	520

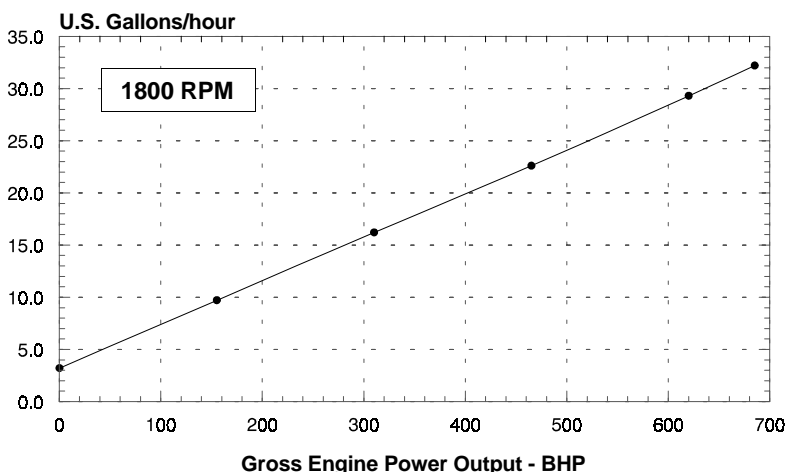
Engine Performance Data @ 1500 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm·h	lb/ BHP·h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	448	600	0.203	0.334	107	28.2
PRIME POWER						
100	403	540	0.204	0.335	97	25.5
75	302	405	0.207	0.340	73	19.4
50	201	270	0.215	0.352	51	13.4
25	101	135	0.249	0.410	30	7.8
CONTINUOUS POWER						
100	354	475	0.211	0.347	88	23.2



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	511	685	0.203	0.334	122	32.2
PRIME POWER						
100	463	620	0.204	0.336	111	29.3
75	347	465	0.210	0.345	86	22.6
50	231	310	0.226	0.371	61	16.2
25	116	155	0.270	0.444	37	9.7
CONTINUOUS POWER						
100	388	520	0.210	0.345	96	25.3



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.

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:

1800 RPM up to 5,000 ft. (1525 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 : **KTA19-G3**

CONFIGURATION NUMBER : D193088DX02

DATA SHEET : DS-4780-B

DATE : 08Sep98

PERFORMANCE CURVE : FR-4128

INSTALLATION DIAGRAM

• Fan to Flywheel : 3003983

CPL NUMBER

• Engine Critical Parts List : 1455

GENERAL ENGINE DATA

Type	4-Cycle; In-line; 6-Cylinder Diesel
Aspiration	Turbocharged and Aftercooled
Bore x Stroke	6.25 x 6.25 (159 x 159)
Displacement	1150 (18.9)
Compression Ratio	13.9 : 1

Dry Weight

Fan to Flywheel Engine	— lb (kg)	4000	(1814)
Heat Exchanger Cooled Engine	— lb (kg)	4421	(2005)

Wet Weight

Fan to Flywheel Engine	— lb (kg)	4159	(1886)
Heat Exchanger Cooled Engine	— lb (kg)	4723	(2142)

Moment of Inertia of Rotating Components

• with FW 4001 Flywheel	— lb _m • ft ² (kg • m ²)	170	(7.2)
• with FW 4006 Flywheel	— lb _m • ft ² (kg • m ²)	199	(8.4)
Center of Gravity from Rear Face of Flywheel Housing (FH 4018)	— in (mm)	28.4	(721)
Center of Gravity Above Crankshaft Centerline	— in (mm)	9.0	(229)
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)	1000	(1356)
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EXHAUST SYSTEM

Maximum Back Pressure	— in Hg (mm Hg)	3	(76)
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AIR INDUCTION SYSTEM

Maximum Intake Air Restriction

• with Dirty Filter Element	— in H ₂ O (mm H ₂ O)	25	(635)
• 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

Coolant Capacity — Engine Only	— US gal (liter)	8.0	(30)
— with HX 4073 Heat Exchanger	— US gal (liter)	17.5	(66)

Maximum Coolant Friction Head External to Engine — 1800 rpm	— psi (kPa)	10	(69)
— 1500 rpm	— psi (kPa)	8	(55)

Maximum Static Head of Coolant Above Engine Crank Centerline	— ft (m)	60	(18.3)
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Standard Thermostat (Modulating) Range	— °F (°C)	180 - 200	(82 - 93)
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Minimum Pressure Cap	— psi (kPa)	10	(69)
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Maximum Top Tank Temperature for Standby / Prime Power	— °F (°C)	220 / 212	(104 / 100)
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Minimum Raw Water Flow @ 90°F to HX 4073 Heat Exchanger	— US gpm (liter / min)	54	(204)
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Maximum Raw Water Inlet Pressure at HX 4073 Heat Exchanger	— psi (kPa)	50	(345)
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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)
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Oil Capacity with OP 4019 Oil Pan : High - Low	— US gal (liter)	10.0 - 8.5	(38 - 32)
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Total System Capacity (Including Bypass Filter)	— US gal (liter)	13.2	(50)
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Angularity of OP 4019 Oil Pan — Front Down		30°	
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— Front Up		30°	
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— Side to Side		30°	
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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)	60 (227)

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)	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)	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	N.A.
Exhaust Noise at 1 m Horizontally from Centerline of Exhaust Pipe Outlet Upwards at 45°	— dBA	N.A.

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:		
• 3 psi Friction Head	— US gpm (liter / s)	
• Maximum Friction Head.....	— US gpm (liter / s)	

	STANDBY POWER		PRIME POWER	
	60 hz	50 hz	60 hz	50 hz
Governed Engine Speed.....	1800	1500	1800	1500
Engine Idle Speed	675 - 775	675 - 775	675 - 775	675 - 775
Gross Engine Power Output.....	685 (511)	600 (448)	620 (463)	540 (403)
Brake Mean Effective Pressure.....	262 (1806)	275 (1896)	237 (1634)	248 (1710)
Piston Speed.....	1875 (9.5)	1562 (7.9)	1875 (9.5)	1562 (7.9)
Friction Horsepower	85 (63)	60 (45)	85 (63)	60 (45)
Engine Water Flow at Stated Friction Head External to Engine:				
• 3 psi Friction Head	196 (12.4)	162 (10.2)	196 (12.4)	162 (10.2)
• Maximum Friction Head.....	175 (11.0)	145 (9.1)	175 (11.0)	145 (9.1)
Intake Air Flow	1370 (647)	1130 (533)	1295 (611)	1030 (486)
Exhaust Gas Temperature.....	915 (491)	990 (532)	880 (471)	975 (524)
Exhaust Gas Flow	3630 (1713)	3155 (1489)	3345 (1579)	2850 (1345)
Air to Fuel Ratio	26.4 : 1	24.9 : 1	27.5 : 1	25.2 : 1
Radiated Heat to Ambient	4185 (74)	3665 (64)	3805 (67)	3315 (58)
Heat Rejection to Coolant	17810 (313)	15600 (274)	16120 (283)	14040 (247)
Heat Rejection to Exhaust	18665 (328)	16335 (287)	17210 (302)	14945 (263)

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)	

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

ENGINE MODEL : KTA19-G3
DATA SHEET : DS-4780-B
DATE : 08Sep98
CURVE NO. : FR-4128