



# Cummins Inc.

Columbus, Indiana 47201

## Engine Data Sheet

Basic Engine Model:  
**QSK23-G1 NR1**

Engine Critical Parts List:  
**CPL: 8352**

Curve Number:  
**FR-50007**

Date:  
**5May03**

**G-DRIVE**  
**QSK**  
**1**

Displacement : **23.15 litre (1413 in<sup>3</sup>)**

Bore : **170 mm (6.69 in.)** Stroke : **170 mm (6.69 in.)**

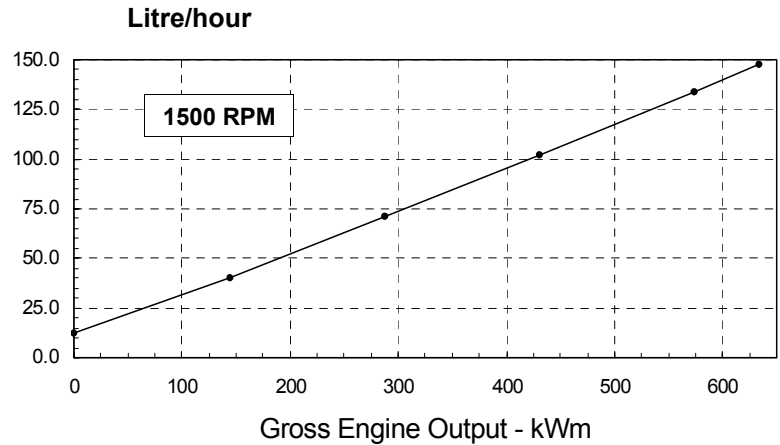
No. of Cylinders : **6**

Aspiration : **Turbocharged and Air to Air Aftercooled**

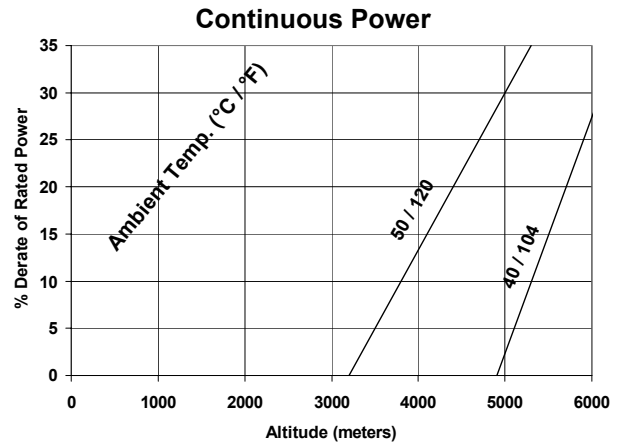
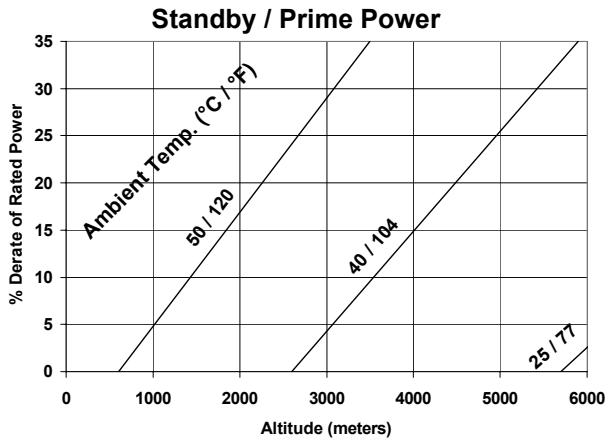
Engine Speed RPM	Standby Power		Prime Power		Continuous Power	
	kWm	BHP	kWm	BHP	kWm	BHP
1500	634	850	574	770	433	580
1800	675	905	608	815	504	675

## Engine Performance Data @ 1500 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm·h	lb/ BHP·h	litre/ hour	U.S. Gal/ hour
<b>STANDBY POWER</b>						
100	634	850	0.198	0.326	148	39.0
<b>PRIME POWER</b>						
100	574	770	0.198	0.327	134	35.5
75	431	578	0.201	0.330	102	26.9
50	287	385	0.210	0.345	71	18.7
25	144	193	0.236	0.390	40	10.6
<b>CONTINUOUS POWER</b>						
100	433	580	0.200	0.330	102	27.0



## Power Derate Curves @ 1500 RPM



### Operation At Elevated Temperature And Altitude:

For sustained operation above these conditions, derate by an additional 3.4% per 300 m (1000 ft), and 20% per 10° C (18° F).

### CONVERSIONS: (litres = U.S. Gal x 3.785) (U.S. Gal = litres x 0.2642)

These guidelines have been formulated to ensure proper application of generator drive engines in A.C. generator set installations. **STANDBY POWER RATING:** 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. **PRIME POWER RATING:** 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:** Limited Time 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. **CONTINUOUS POWER RATING:** 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.

### Data Subject to Change Without Notice

Reference AEB 10.47 for determining Electrical Output.

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. Derates shown are based on 15 in H<sub>2</sub>O air intake restriction and 2 in Hg exhaust back pressure.

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.

**Data Status:** Limited Production

**Data Tolerance:** ± 5%

**Chief Engineer:**

*D.K. Trueblood*



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Columbus, Indiana 47201

## Engine Data Sheet

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**QSK23-G1 NR1**

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**CPL: 8352**

Curve Number:  
**FR-50007**

Date:  
**5May03**

**G-DRIVE**  
**QSK**  
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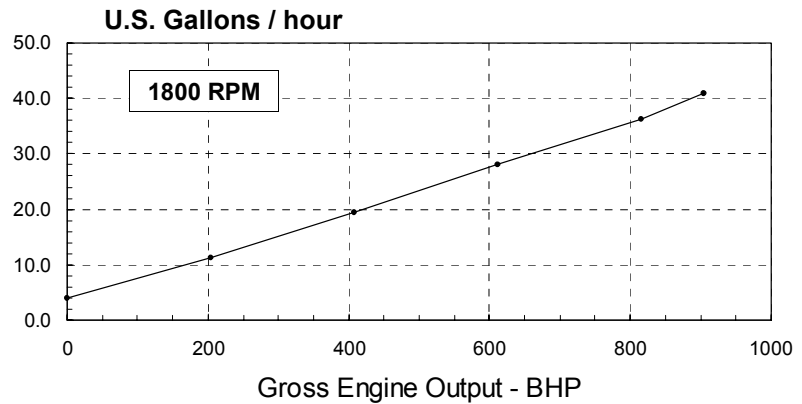
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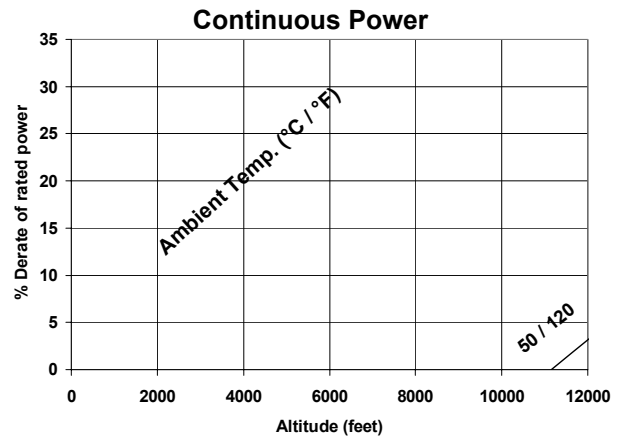
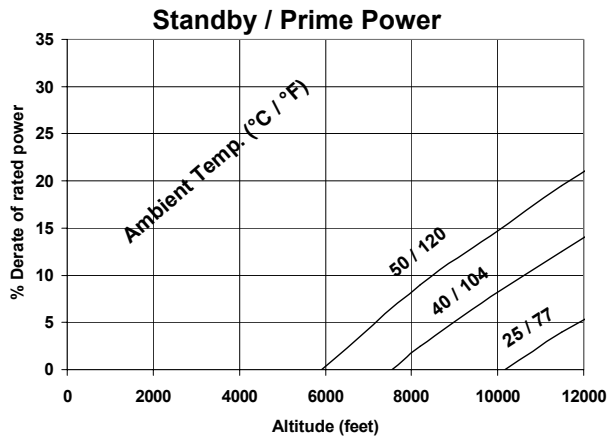
Engine Speed	Standby Power		Prime Power		Continuous Power	
	kWm	BHP	kWm	BHP	kWm	BHP
1500	634	850	574	770	433	580
1800	675	905	608	815	504	675

## Engine Performance Data @ 1800 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm·h	lb/ BHP·h	litre/ hour	U.S. Gal/ hour
<b>STANDBY POWER</b>						
100	675	905	0.195	0.322	155	41.0
<b>PRIME POWER</b>						
100	608	815	0.192	0.316	137	36.3
75	456	611	0.200	0.328	107	28.2
50	304	408	0.207	0.340	74	19.5
25	152	204	0.235	0.390	42	11.2
<b>CONTINUOUS POWER</b>						
100	504	675	0.191	0.314	113	29.9



## Power Derate Curves @ 1800 RPM



### Operation At Elevated Temperature And Altitude:

For sustained operation above these conditions, derate by an additional 5.0% per 300 m (1000 ft), and 7% per 10° C (18° F).

**CONVERSIONS:**(litres = U.S. Gal x 3.785) (U.S. Gal = litres x 0.2642)

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Data Tolerance: ± 5%

Chief Engineer:  
*D.K. Trueblood*

## Cummins Inc. Engine Data Sheet

**ENGINE MODEL :** QSK23-G1 NR1 **CONFIGURATION NUMBER :** D893001GX03 **DATA SHEET :** LP50007  
**DATE :** 5May03

**PERFORMANCE CURVE :** FR-50007

### INSTALLATION DIAGRAM

• Fan to Flywheel : 3170553

### CPL NUMBER

• Engine Critical Parts List : 8352

## GENERAL ENGINE DATA

Type .....	Inline 6-Cylinder Diesel
Aspiration .....	Turbocharged and Low Temperature Aftercooled
Bore x Stroke .....	170 x 170 (6.69 x 6.69)
Displacement .....	23.15 (1413)
Compression Ratio .....	16.0:1
Dry Weight	
Fan to Flywheel Engine .....	2755 (6060)
Wet Weight	
Fan to Flywheel Engine .....	2805 (6170)
Moment of Inertia of Rotating Components	
• with (SAE 0) .....	11.6 (270)
Center of Gravity from Front Face of Block .....	725 (28.5)
Center of Gravity Above Crankshaft Centerline .....	240 (9.5)
Maximum Static Loading at Rear Main Bearing .....	980 (2160)

## ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block .....	3205 (2340)
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## EXHAUST SYSTEM

Maximum Back Pressure .....	76.2 (3)
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## AIR INDUCTION SYSTEM

Maximum Intake Air Restriction:	
• with Dirty Filter Element .....	635 (25)
• with Clean Filter Element .....	381 (15)

## COOLING SYSTEM

Coolant Capacity — Engine Only .....	46.5 (12.3)
Minimum Pressure Cap .....	69 (10)

### Jacket Water Circuit Requirements

Maximum Static Head of Coolant Above Engine Crank Centerline .....	18.3 (60)
Standard Thermostat (Modulating) Range .....	82 - 95 (180 - 203)
Maximum Top Tank Temperature for Standby . Prime Power .....	104 - 100 (220 - 212)
Maximum Coolant Friction Head External to the Engine - 1800 RPM .....	48 (7)
-1500 RPM .....	34 (5)

### Air-to-Air Core Requirements

Maximum Temp. Rise Between Engine Air Intake and Intake Manifold —1500 / 1800 rpm ..	33 (60)
Maximum Air Press. Drop from Turbo Air Outlet to Intake Manifold — 1500 / 1800 rpm	102 (4)
Maximum Intake Manifold Temperature at 25° C (77° F) Ambient .....	60 (140)

## LUBRICATION SYSTEM

Oil Pressure @ Idle Speed .....	145 (21)
@ Governed Speed .....	345 - 448 (50 - 65)
Maximum Oil Temperature .....	120 (248)
Oil Capacity with OP TBD Oil Pan : Low - High .....	66 - 95 (17 - 25)
Total System Capacity (With Filters) .....	74 - 103 (19 - 27)

