

	Cummins Inc. Columbus, Indiana 47201 Engine Data Sheet	Basic Engine Model: QSK60-G3	Curve Number: FR-6283	<i>G-DRIVE</i> QSK 1
		Engine Critical Parts List: CPL: 2824	Date: 6Feb03	
Displacement : 60.2 litre (3673 in³)		Bore : 159 mm (6.25 in.) Stroke : 190 mm (7.48 in.)		
No. of Cylinders : 16		Aspiration : Turbocharged and Low Temperature Aftercooled (2 Pump / 2 Loop)		
Emissions: Refer to Emission Data Sheet for Details.				

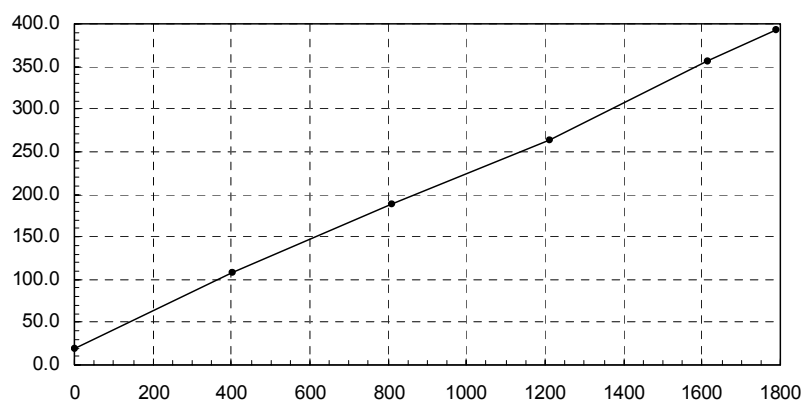
Engine Ratings:

Engine Speed RPM	Standby Power		Prime Power		Continuous Power	
	kWm	BHP	kWm	BHP	kWm	BHP
1500	1790	2399	1615	2165	1305	1749

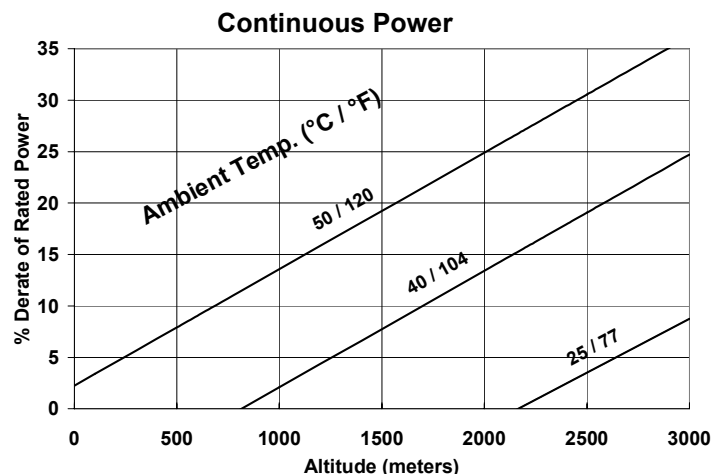
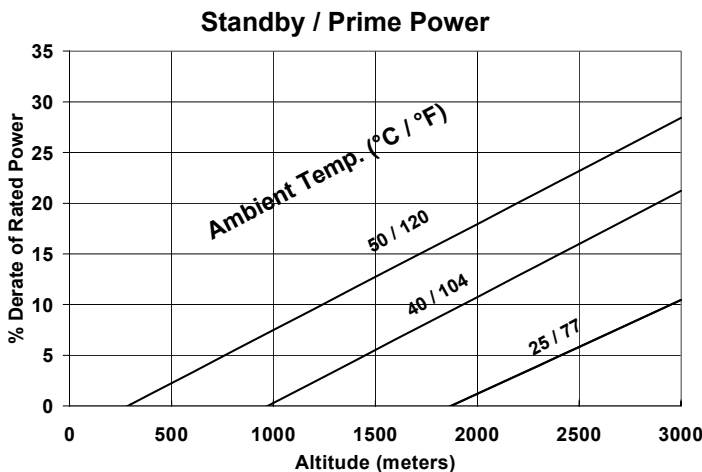
Engine Fuel Consumption @ 1500 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm·h	lb/ BHP·h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	1790	2399	0.187	0.307	393	103.8
PRIME POWER						
100	1615	2165	0.187	0.308	356	93.9
75	1211	1624	0.184	0.303	263	69.3
50	808	1082	0.199	0.327	189	49.9
25	404	541	0.230	0.379	109	28.9
CONTINUOUS POWER						
100	1305	1749	0.187	0.307	287	75.6

Litre / hour



Power Derate Curves:



Operation At Elevated Temperature And Altitude:

For sustained operation above these conditions, derate by an additional 3.3% per 300 m (1000 ft), and 10% 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 H₂O 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

Cummins Inc.

Engine Data Sheet

ENGINE MODEL : **QSK60-G3**

CONFIGURATION NUMBER : D593002GX03

DATA SHEET : DS-6283-LP

DATE : 6Feb03

PERFORMANCE CURVE : FR-6283

INSTALLATION DIAGRAM

• Fan to Flywheel : 3170381

CPL NUMBER

• Engine Critical Parts List : 2824

GENERAL ENGINE DATA

Type.....	4-Cycle; 60° Vee; 16-Cylinder Diesel	
Aspiration	Turbocharged and Low Temperature	
	Aftercooled (2 Pump / 2 Loop)	
Bore x Stroke	— mm x mm (in x in)	159 x 190 (6.25 x 7.48)
Displacement.....	— litre (in ³)	60.2 (3673)
Compression Ratio.....		14.5 : 1
Dry Weight		
Fan to Flywheel Engine (with SAE 0 Flywheel and Flywheel Housing).....	— kg (lb)	7185 (15835)
Wet Weight		
Fan to Flywheel Engine.....	— kg (lb)	7540 (16620)
Moment of Inertia of Rotating Components		
• with FW 6043 Flywheel (SAE 0)	— kg • m ² (lb _m • ft ²)	15.77 (375.5)
• with FW 6037 Flywheel (SAE 00)	— kg • m ² (lb _m • ft ²)	26.23 (622.4)
Center of Gravity from Front Face of Block	— mm (in)	1001 (39.4)
Center of Gravity Above Crankshaft Centerline	— mm (in)	219 (8.6)
Maximum Static Loading at Rear Main Bearing.....	— kg (lb)	1134 (2500)

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block	— N • m (lb • ft)	10350 (7634)
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EXHAUST SYSTEM

Maximum Back Pressure at 1500 RPM (Standby Power)	— mm Hg (in Hg)	51 (2)
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AIR INDUCTION SYSTEM

Maximum Intake Air Restriction		
• with Dirty Filter Element	— kPa (in H ₂ O)	6.2 (25)
• with Clean Filter Element	— kPa (in H ₂ O)	3.7 (15)

COOLING SYSTEM (Separate Circuit Aftercooling Required)

Coolant Capacity — Engine	— litre (US gal)	157 (42)
— Aftercoolers.....	— litre (US gal)	34 (9)
Minimum Pressure Cap (for Cooling Systems with less than 2m [6 ft.] Static Head)	— kPa (psi)	76 (11)
Maximum Static Head of Coolant Above Engine Crank Centerline.....	— m (ft)	18.3 (60)

Jacket Water Circuit Requirements:

Maximum Coolant Friction Head External to Engine — 1500 rpm	— kPa (psi)	48 (7)
Maximum Top Tank Temperature for Standby / Prime Power.....	— °C (°F)	104 / 100 (220 / 212)
Thermostat (Modulating) Range.....	— °C (°F)	82 - 93 (180 - 200)

Aftercooler Circuit Requirements:

Maximum Coolant Friction Head External to Engine — 1500 rpm	— kPa (psi)	35 (5)
Maximum Inlet Water Temperature to Aftercoolers @ 25 °C (77 °F)	— °C (°F)	49 (120)
Maximum Inlet Water Temperature to Aftercoolers	— °C (°F)	65 (150)
Thermostat (Modulating) Range.....	— °C (°F)	46 - 57 (115 - 135)

LUBRICATION SYSTEM

Oil Pressure @ Idle Speed	— kPa (psi)	138 (20)
@ Governed Speed.....	— kPa (psi)	345-483 (50-70)
Maximum Oil Temperature	— °C (°F)	121 (250)
Oil Capacity with OP6073 Oil Pan: Low-High.....	— litre (US gal)	231-261 (61-69)
Total System Capacity (with Combo Filter)	— litre (US gal)	280 (74)

FUEL SYSTEM

Type Injection System.....	Cummins HPI-PT	
Maximum Restriction at PT Fuel Injection Pump — with Clean Fuel Filter..... — mm Hg (in Hg)	120	(4.0)
— with Dirty Fuel Filter..... — mm Hg (in Hg)	203	(8.0)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head)..... — mm Hg (in Hg)	229	(9.0)
Maximum Fuel Inlet Temperature..... °C (°F)	70	(160)
Maximum Fuel Flow to Injection Pump..... — litre / hr (US gph)	1515	(400)
Maximum Drain Flow..... — litre / hr (US gph)	1400	(370)

ELECTRICAL SYSTEM

Cranking Motor (Heavy Duty, Positive Engagement)..... — volt	24
Battery Charging System, Negative Ground..... — ampere	40
Maximum Allowable Resistance of Cranking Circuit..... — ohm	0.002
Minimum Recommended Battery Capacity	
• Cold Soak @ 10 °C (50 °F) and Above..... — 0°F CCA	1800
• Cold Soak @ 0 °C to 10 °C (32 °F to 50 °F)..... — 0°F CCA	1800
• Cold Soak @ -18 °C to 0 °C (0 °F to 32 °F)..... — 0°F CCA	2200

COLD START CAPABILITY

Minimum Ambient Temperature for Cold Start with _____ watt Coolant Heater to Rated Speed..... — °C (°F)	TBD	(TBD)
Minimum Ambient Temperature for Unaided Cold Start to Idle Speed..... — °C (°F)	-12	(10)
Minimum Ambient Temperature for NFPA 110 Cold Start (90° F Minimum Coolant Temperature)..... — °C (°F)	10	(50)

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%
Air Intake Restriction	: 381 mm H ₂ O (15 in H ₂ O)	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 93.4 (est.)

Exhaust Noise at 1 m Horizontally from Centerline of Exhaust Pipe Outlet Upwards at 45° — dBA 108 (est.)

Governed Engine Speed..... — rpm	
Engine Idle Speed..... — rpm	
Gross Engine Power Output..... — kW _m (BHP)	
Brake Mean Effective Pressure..... — kPa (psi)	
Piston Speed..... — m / s (ft / min)	
Friction Horsepower..... — kW _m (HP)	
Engine Jacket Water Flow at Stated Friction Head External to Engine:	
• 4 psi Friction Head..... — litre / s (US gpm)	
• Maximum Friction Head..... — litre / s (US gpm)	

Engine Data

Intake Air Flow..... — litre / s (cfm)	
Exhaust Gas Temperature..... — °C (°F)	
Exhaust Gas Flow..... — litre / s (cfm)	
Air to Fuel Ratio..... — air : fuel	
Radiated Heat to Ambient..... — kW _m (BTU / min)	
Heat Rejection to Engine Jacket Radiator..... — kW _m (BTU / min)	
Heat Rejection to Exhaust..... — kW _m (BTU / min)	
Heat Rejection to Fuel*..... — kW _m (BTU / min)	

Engine Aftercooler Data

Heat Rejection to Aftercooler Radiator..... — kW _m (BTU / min)	
Aftercooler Water Flow at Stated Friction Head External to Engine:	
• 2 psi Friction Head..... — litre / s (US gpm)	
• Maximum Friction Head..... — litre / s (US gpm)	

STANDBY POWER		PRIME POWER	
60 hz	50 hz	60 hz	50 hz
Not Applicable for 1800 RPM Operation	1500	Not Applicable for 1800 RPM Operation	1500
	700 - 900		700 - 900
	1790 (2399)		1615 (2165)
	2379 (345)		2144 (311)
	9.5 (1869)		9.5 (1869)
	146 (196)		146 (196)
	26.5 (420)		26.5 (420)
	24.0 (380)		24.0 (380)
	2255 (4780)		2150 (4555)
	440 (820)		415 (775)
	5525 (11700)		5105 (10815)
	27.8:1		29.2:1
	160 (9020)		145 (8165)
	460 (26000)		420 (23950)
	1120 (63700)		1020 (57950)
	35 (2000)		35 (2000)
	405 (22925)		355 (20175)
	7.1 (112)		7.1 (112)
	6.9 (109)		6.9 (109)

* This is the maximum heat rejection to fuel, which is at low load

N.A. - Data is Not Available

N/A - Not Applicable to this Engine

TBD - To Be Determined

ENGINE MODEL : **QSK60-G3**

DATA SHEET : DS-6283-LP

DATE : 6Feb03

CURVE NO. : FR-6283

Cummins Inc.

Columbus, Indiana 47202-3005