Cummins Inc.	Basic Engine Model: QSK78-G6	Curve Number: FR-6422	G-DRIVE QSK 1
Columbus, Indiana 47201	Engine Critical Parts List: CPL: 8241	Date: 15Mar05	
Engine Data Sheet			

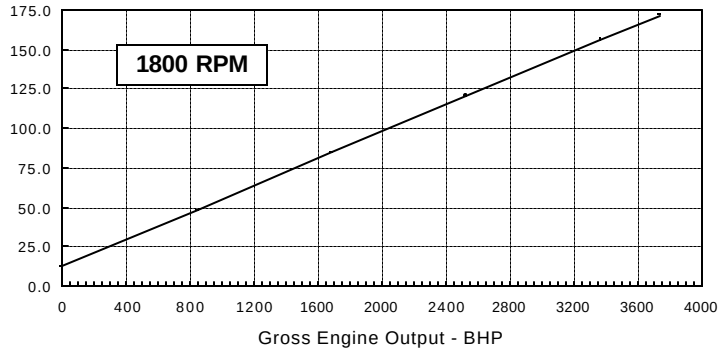
Displacement : **77.6** litre (**4735** in^3)	Bore : **170** mm (**6.69** in.) Stroke : **190** mm (**7.48** in.)
No. of Cylinders : **18**	Aspiration : **Turbocharged and Low Temperature Aftercooled (2 Pump / 2 Loop)**

Engine Speed	Standby Power		Prime Power		Continuous Power	
RPM	kWm	BHP	kWm	BHP	kWm	BHP
1800	2790	3740	2515	3371	2115	2835

Engine Performance Data @ 1800 RPM

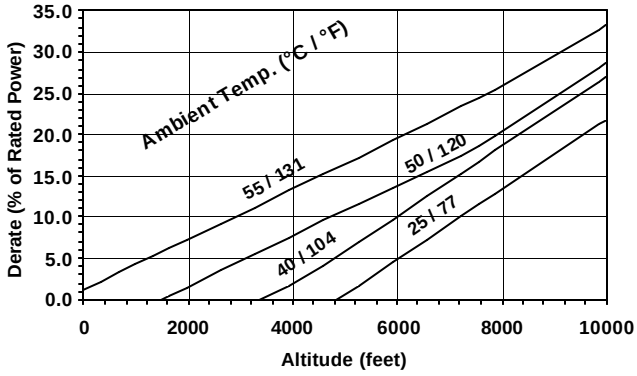
OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm·h	lb/ BHP·h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	2790	3740	0.199	0.327	652	172.1
PRIME POWER						
100	2515	3371	0.200	0.329	592	156.1
75	1886	2528	0.206	0.339	457	120.5
50	1257	1686	0.216	0.355	320	84.4
25	629	843	0.245	0.404	181	47.9
CONTINUOUS POWER						
100	2115	2835	0.202	0.332	502	132.4

U.S. Gallons/hour

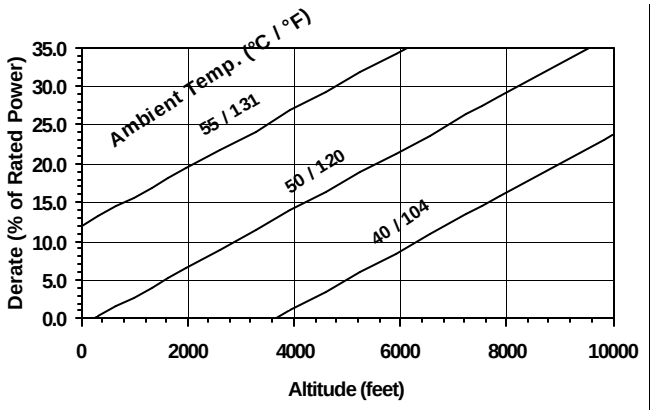


Power Derate Curves:

Standby / Prime Power



Continuous Power



Operation At Elevated Temperature And Altitude:

For sustained operation above these conditions, derate by an additional 5% per 300 m (1000 ft), and 25% per 10° C (18° F).

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

Data Subject to Change Without Notice

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.

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_20 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 : QSK78-G6 **CONFIGURATION NUMBER :** D773002GX03

DATA SHEET : DS-6422
DATE : 15Mar05
PERFORMANCE CURVE : FR-6422

INSTALLATION DIAGRAM
• Fan to Flywheel : 3170543

CPL NUMBER
• Engine Critical Parts List : 8241

GENERAL ENGINE DATA

Type		4-Cycle; 60° Vee; 18-Cylinder Diesel	
Aspiration		Turbocharged and Low Temperature Aftercooled (2 Pump / 2 Loop)	
Bore x Stroke	— mm x mm (in x in)	170 x 190 (6.69 x 7.48)	
Displacement	— litre (in^3)	77.6 (4735)	
Compression Ratio		15.3 : 1	
Dry Weight			
Fan to Flywheel Engine (with SAE 00 Flywheel and Flywheel Housing)	— kg (lb)	9180	(20238)
Wet Weight			
Fan to Flywheel Engine	— kg (lb)	TBD	(TBD)
Moment of Inertia of Rotating Components			
• with FW 6057 Flywheel (SAE 00)	— kg • m^2 (lb_m • ft^2)	32.7	(775.5)
Center of Gravity from Front Face of Block	— mm (in)	1088	(42.8)
Center of Gravity Above Crankshaft Centerline	— mm (in)	311	(12.2)
Maximum Static Loading at Rear Main Bearing	— kg (lb)	TBD	(TBD)

ENGINE MOUNTING

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

EXHAUST SYSTEM

Maximum Back Pressure at 1800 RPM (Standby Power)	— mm Hg (in Hg)	51	(2)

AIR INDUCTION SYSTEM

Maximum Intake Air Restriction			
• with Dirty Filter Element	— kPa (in H_2O)	6.2	(25)
• with Clean Filter Element	— kPa (in H_2O)	3.7	(15)

COOLING SYSTEM (Separate Circuit Aftercooling Required)

Coolant Capacity — Engine	— litre (US gal)	166.6	(44)
— Aftercoolers	— litre (US gal)	56.8	(15)
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 — 1800 rpm	— kPa (psi)	69	(10)
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 — 1800 rpm	— kPa (psi)	48	(7)
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)	207	(30)
@ Governed Speed	— kPa (psi)	414-483	(60-70)
Maximum Oil Temperature	— °C (°F)	121	(250)
Oil Capacity with OP6085 Oil Pan: Low - High	— litre (US gal)	378 - 413	(100 - 109)
Total System Capacity (with Combo Filter)	— litre (US gal)	466	(123)

FUEL SYSTEM

Type Injection System		Cummins HPI-PT	
Maximum Restriction at Fuel Injection Pump	— with Clean Fuel Filter — mm Hg (in Hg)	127	(5)
	— with Dirty Fuel Filter — mm Hg (in Hg)	228	(9)
Typical Restriction for Engine Fuel Filter Head and Clean Fuel Filter	— mm Hg (in Hg)	TBD	(TBD)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head)	— mm Hg (in Hg)	254	(10)
Maximum Fuel Inlet Temperature	—°C (°F)	70	(160)
Maximum Fuel Flow to Injection Pump	— litre / hr (US gph)	2225	(590)
Maximum Drain Flow	— litre / hr (US gph)	2100	(555)

ELECTRICAL SYSTEM

Cranking Motor (Heavy Duty, Positive Engagement)	— volt	24	
Maximum Allowable Resistance of Cranking Circuit	— ohm	.002	
Minimum Recommended Battery Capacity			
• Cold Soak @ 10 °C (50 °F) and Above	— 0°F CCA	2200	
• Cold Soak @ 0 °C to 10 °C (32 °F to 50 °F)	— 0°F CCA	2200	
• Cold Soak @ -18 °C to 0 °C (0 °F to 32 °F)	— 0°F CCA	2700	

COLD START CAPABILITY

Minimum Ambient Temperature for Cold Start with_____watt Coolant Heater to Rated Speed	— °C (°F)	-32	(-25)
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%

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

	STANDBY POWER 60 hz	STANDBY POWER 50 hz	PRIME POWER 60 hz	PRIME POWER 50 hz
Governed Engine Speed — rpm	1800		1800	
Engine Idle Speed — rpm	700 - 900		700 - 900	
Gross Engine Power Output — kW_m (BHP)	2790 (3741)		2515 (3371)	
Brake Mean Effective Pressure — kPa (psi)	2390 (347)		2160 (313)	
Piston Speed — m / s (ft / min)	11.4 (2244)		11.4 (2244)	
Friction Horsepower — kW_m (HP)	266 (357)		266 (357)	
Engine Jacket Water Flow at Stated Friction Head External to Engine:				
• 4 psi Friction Head — litre / s (US gpm)	38.7 (615)		38.7 (615)	
• Maximum Friction Head — litre / s (US gpm)	37 (590)		37 (590)	
Engine Data		**Not Applicable for 1500 RPM Operation**		**Not Applicable for 1500 RPM Operation**
Intake Air Flow — litre / s (cfm)	3720 (7885)		3515 (7450)	
Exhaust Gas Temperature — °C (°F)	450 (845)		440 (820)	
Exhaust Gas Flow — litre / s (cfm)	8715 (18465)		8130 (17225)	
Air to Fuel Ratio — air : fuel	27.7:1		28.8:1	
Radiated Heat to Ambient — kW_m (BTU / min)	265 (14915)		240 (13530)	
Heat Rejection to Engine Jacket Radiator — kW_m (BTU / min)	945 (53765)		875 (49560)	
Heat Rejection to Exhaust — kW_m (BTU / min)	1830(104130)		1680 (95565)	
Heat Rejection to Fuel* — kW_m (BTU / min)	45 (2500)		45 (2500)	
Engine Aftercooler Data				
Heat Rejection to Coolant — kW_m (BTU / min)	700 (39725)		615 (34935)	
Aftercooler Water Flow at Stated Friction Head External to Engine:				
• 2 psi Friction Head — litre / s (US gpm)	17.6 (279)		17.6 (279)	
• Maximum Friction Head — litre / s (US gpm)	16.6 (263)		16.6 (263)	

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

ENGINE MODEL : QSK78-G6
DATA SHEET : DS-6422
DATE : 15Mar05
CURVE NO. : FR-6422