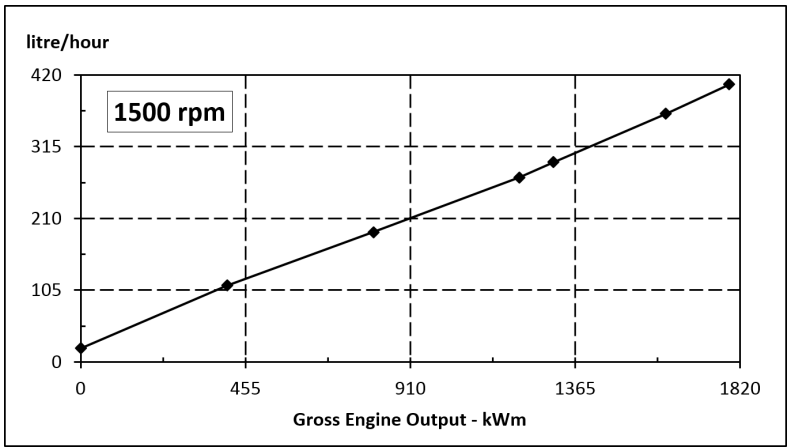
	Cummins Inc. Columbus, Indiana 47202-3005 Engine Data Sheet	Basic Engine Model: QSK60-G3	Curve Number: FR60181	<i>G-DRIVE</i> QSK 1
		Engine Critical Parts List: CPL: 4504	Date: 2015-03-19	
Compression Ratio : 14.5 : 1		Displacement : 3673 in³ (60.2 litre)		
Fuel System : Cummins HPI-PT		Aspiration : Turbocharged and Low Temperature Aftercooled (2 Pump / 2 Loop)		
Emission Certification : Non-Certified				

Engine Speed	Standby Power		Prime Power		Continuous Power	
	rpm	kWm	bhp	kWm	bhp	kWm
1500	1,790	2,399	1,615	2,165	1,305	1,749


Engine Performance Data @ 1500 rpm

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	bhp	kg/ kWm·h	lb/ bhp·h	litre/ hour	US gal/ hour
STANDBY POWER						
100	1,790	2,399	0.193	0.317	406	107.1
PRIME POWER						
100	1,615	2,165	0.191	0.314	363	95.7
75	1,211	1,624	0.190	0.312	270	71.3
50	808	1,082	0.200	0.329	190	50.2
25	404	541	0.235	0.387	112	29.5
CONTINUOUS POWER						
100	1,305	1,749	0.190	0.313	292	77.1

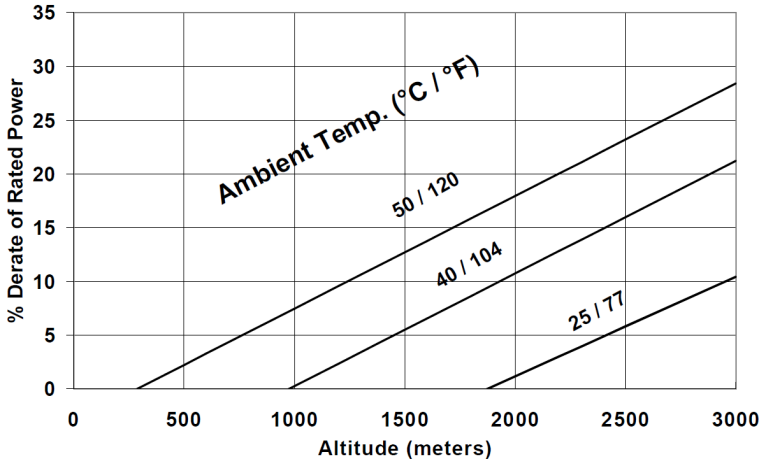


CONVERSIONS:(litres = US Gal x 3.785) (US Gal = litres x 0.2642)

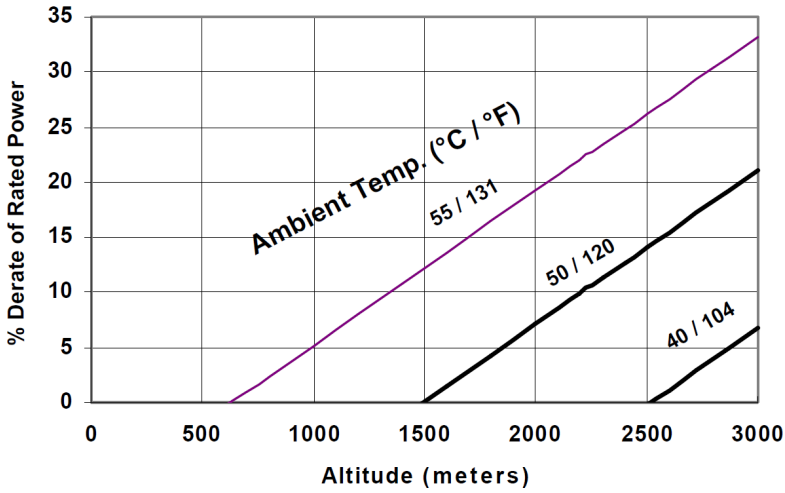
Data Subject to Change Without Notice

<p>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: 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. 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.</p>	<p>Reference AEB 10.47 for determining Electrical Output.</p> <p>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.</p> <p>The fuel consumption data is based on No. 2 diesel fuel weight at 0.85 kg/litre (7.1 lbs/US 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.</p>
<p>Data Status: Limited Production</p>	
<p>Data Tolerance: ± 5%</p>	
<p>Chief Engineer:</p> 	

1500 rpm Derate Curves
Standby / Prime Power



Continuous Power



Operation at Elevated Temperature and Altitude:

For **Standby/Prime** operation above these conditions, derate by an additional 3.3% per 1000 ft (300 m), and 10% per 18 delta deg F (10 delta deg C)

For **Continuous** operation above these conditions, derate by an additional 3.3% per 1000 ft (300 m), and 10% per 18 delta deg F (10 delta deg C)

Cummins Inc.

Engine Datasheet

G-DRIVE
QSK

ENGINE MODEL : **QSK60-G3**

CONFIGURATION NUMBER : D593002GX03

DATA SHEET : FR60181 **3**
DATE : 2015-03-19

INSTALLATION DIAGRAM

• Fan to Flywheel: 4360969

CPL NUMBER

• Engine Critical Parts List: 4504

GENERAL ENGINE DATA

Type	Four Cycle; 60° Vee; 16 Cylinder Diesel
Aspiration	Turbocharged & Low Temp Aftercooled (2P2L)
Bore x Stroke	6.25 x 7.48 (159 x 190)
Displacement	3673 (60.2)
Compression Ratio	14.5 : 1
Dry Weight (Fan to Flywheel Engine with SAE 0 Flywheel and Flywheel Housing).....	15,835 7,185
Wet Weight (Fan to Flywheel Engine)	16,620 7,540
Moment of Inertia of Rotating Components	
• with FW 6064 Flywheel (SAE 0).....	375.5 (15.77)
Center of Gravity from Front Face of Block	39.4 (1,001)
Center of Gravity Above Crankshaft Centerline	8.6 (219)
Maximum Static Loading at Rear Main Bearing	2,500 (1,134)

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block	7,634 (10,350)
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EXHAUST SYSTEM

Maximum Back Pressure at 1500 rpm (Standby Power)	2 (6.8)
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AIR INDUCTION SYSTEM

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

COOLING SYSTEM (Separate Circuit Aftercooling Required)

Jacket Water Circuit Requirements

Coolant Capacity — Engine	42 (157)
Minimum Pressure Cap (for Cooling Systems with less than 2m [6 ft] Static Head)	11 (76)
Maximum Static Head of Coolant Above Crankshaft Centerline	60 (18.3)
Maximum Top Tank Temperature for Standby/Prime Power	220 / 212 (104 / 100)
Thermostat (Modulating) Range	180 - 200 (82 - 93)
Maximum Coolant Friction Head External to Engine - 1500 RPM	7 (48)

Aftercooler Circuit Requirements

Coolant Capacity — Aftercooler	9 (34)
Maximum Coolant Friction Head External to Engine - 1500 RPM	5 (35)
Maximum Inlet Water Temperature to Aftercoolers @ 25 °C (77 °F)	120 (49)
Maximum Inlet Water Temperature to Aftercoolers	150 (65)
Thermostat (Modulating) Range	115 - 135 (46 - 57)

LUBRICATION SYSTEM

Oil Pressure @ Minimum Idle Speed	20 (138)
@ Governed Speed	50 - 70 (345 - 483)
Maximum Oil Temperature	250 (121)
Oil Capacity with OP 6095 Oil Pan : Low - High	61 - 69 (231 - 261)
Total System Capacity (with Combo Filter)	74 (280)

FUEL SYSTEM

Type Injection System	Cummins HPI-PT
Maximum Restriction at PT Fuel Injection Pump (clean/dirty filter)	4 / 8 (13.5 / 27)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head)	9 (30)
Maximum Fuel Inlet Temperature	160 (70)
Maximum Fuel Flow to Injection Pump	400 (1,515)
Maximum Drain Flow	370 (1,400)

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.....	— CCA	1,800
• Cold Soak @ 0 °C to 10 °C (32 °F to 50°F)	— CCA	1,800
• Cold Soak @ -18 °C to 0 °C(0 °F to 32°F)	— CCA	2,200

COLD START CAPABILITY

Minimum Ambient Temperature for cold Start with _____ watt Coolant Heater to Rated Speed	— °F (°C)	TBD	(TBD)
Minimum Ambient Temperature for Unaided Cold Start to Idle Start.....	— °F (°C)	10	(-12)
Minimum Ambient Temperature for NFPA 110 Cold Start.....	— °F (°C)	40	(4.4)

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); @ 1500 rpm	— dBA		93.4 (est.)
Exhaust Noise at 1 m Horizontal from Centerline of Exhaust Pipe Outlet Upwards at 45° @ 1500 rpm.....	— dBA		108 (est.)

Governed Engine Speed	rpm
Engine Idle Speed.....	rpm
Gross Engine Power Output	bhp (kW)
Brake Mean Effective Pressure	psi (kpa)
Piston Speed	ft/min (m/s)
Friction Horsepower	bhp (kW)
Engine Water Flow at Stated Friction Head External to Engine:	
• 4 psi Friction Head.....	gpm (L/min)
• Maximum Friction Head	gpm (L/min)

	STANDBY POWER		PRIME POWER	
	60 hz	50 hz	60 hz	50 hz
Governed Engine Speed	N/A	1,500	N/A	1,500
Engine Idle Speed.....	N/A	700 - 900	N/A	700 - 900
Gross Engine Power Output	N/A	2,399 (1,790)	N/A	2,165 (1,615)
Brake Mean Effective Pressure	N/A	345 (2,379)	N/A	311 (2,144)
Piston Speed	N/A	1,869 (9.5)	N/A	1,869 (9.5)
Friction Horsepower	N/A	196 (146)	N/A	196 (146)
Engine Water Flow at Stated Friction Head External to Engine:				
• 4 psi Friction Head.....	N/A	420 (26.5)	N/A	420 (26.5)
• Maximum Friction Head	N/A	400 (25.2)	N/A	400 (25.2)
Engine Data				
Intake Air Flow	N/A	4,780 (2,255)	N/A	4,555 (2,150)
Exhaust Gas Temperature - Dry Stack	N/A	820 (440)	N/A	775 (415)
Exhaust Gas Flow	N/A	11,700 (5,525)	N/A	10,815 (5,105)
Air to Fuel Ratio	N/A	26.9 : 1	N/A	28.7 : 1
Radiated Heat to Ambient	N/A	9,020 (160)	N/A	8,165 (145)
Heat Rejection to Jacket Coolant	N/A	26,000 (460)	N/A	23,950 (420)
Heat Rejection to Exhaust.....	N/A	63,700 (1,120)	N/A	57,950 (1,020)
Heat Rejected to *Fuel	N/A	2,000 (35)	N/A	2,000 (35)
2P / 2L				
Heat Rejection to Aftercooler Coolant	N/A	22,925 (405)	N/A	20,175 (355)
Aftercooler Water Flow at Stated Friction Head External to Engine:				
• 2 psi Friction Head.....	N/A	112 (7.1)	N/A	112 (7.1)
• Maximum Friction Head	N/A	109 (6.9)	N/A	109 (6.9)

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

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

ENGINE MODEL : QSK60-G38
DATA SHEET : FR60181
DATE : 2015-03-19