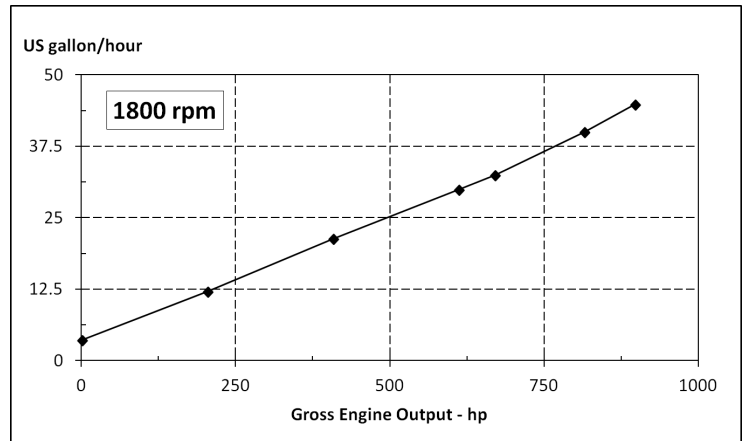
	<b>Cummins Inc.</b> Columbus, Indiana 47202-3005 <b>ENGINE PERFORMANCE DATASHEET</b>	Basic Engine Model: <b>QSK19-G5</b>	Curve Number: <b>FR4581</b>	<b>G-DRIVE QSK 1</b>
		Engine Critical Parts List: <b>CPL : 3866</b>	Date: <b>16 JAN 13</b>	

Compression Ratio : <b>15.0 : 1</b>	Displacement : <b>1,150 in<sup>3</sup> (18.9 L)</b>
Fuel System : <b>Cummins MCRS</b>	Aspiration : <b>Turbocharged and Charge Air Cooled</b>
Emission Certification : <b>U.S. EPA Tier 2</b>	

Engine Speed	Standby Power		Prime Power		Continuous Power	
RPM	bhp	kWm	bhp	kWm	bhp	kWm
<b>1800</b>	897	669	815	608	670	500

## Engine Performance Data @ 1800 rpm

OUTPUT POWER			FUEL CONSUMPTION			
%	bhp	kWm	lb/ hp-h	kg/ kWm-h	US gal/ hour	litre/ hour
<b>STANDBY POWER</b>						
100	897	669	0.355	0.216	44.8	170
<b>PRIME POWER</b>						
100	815	608	0.349	0.212	40.0	151
75	611	456	0.347	0.211	29.9	113
50	408	304	0.371	0.226	21.3	81
25	204	152	0.422	0.257	12.1	46
<b>CONTINUOUS POWER</b>						
100	670	500	0.344	0.209	32.4	123



### CONVERSIONS:(litres = US Gal x 3.785) (US 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 2.0 in Hg exhaust back pressure.

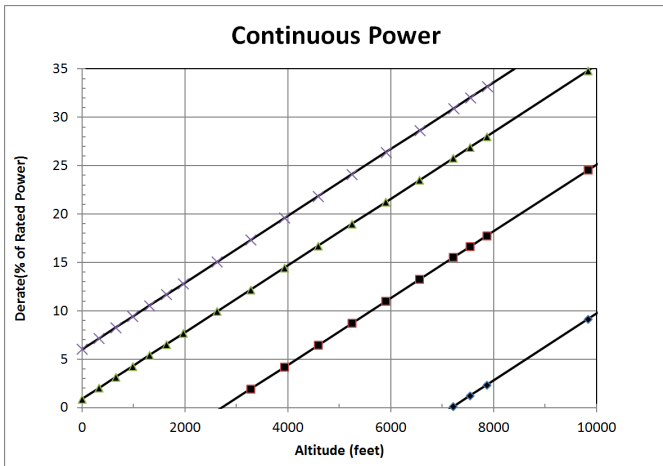
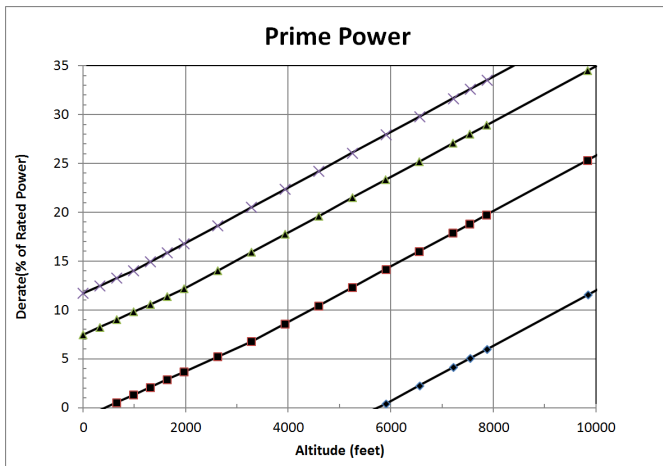
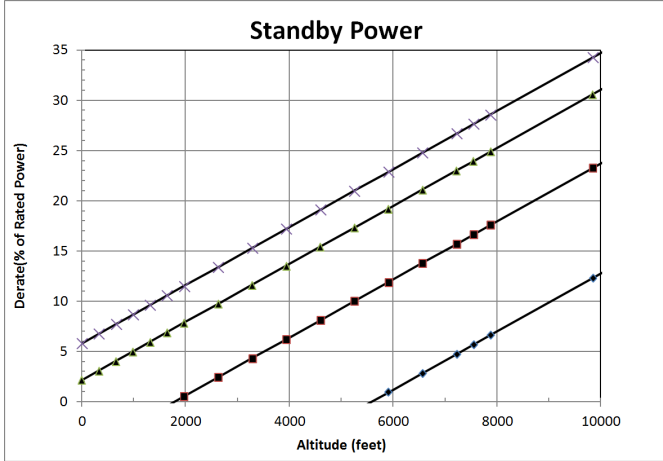
The fuel consumption data is based on No. 2 diesel fuel weight at 0.85 kg/litre (7.1 lbs/US gal). Power output curves are based on the engine operating with fuel system, water pump and lubricating oil pump; not included are battery charging alternator, fan, optional equipment and driven components.

Data Status: --Limited Production--

Data Tolerance: ± 5%

Chief Engineer: 

### 1800 rpm Derate Curves

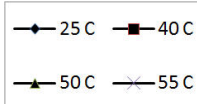


**Operation at Elevated Temperature and Altitude:**

For **Standby** operation above these conditions, derate by an additional 3% per 1000 ft (300 m), and 7% per 18 delta deg F (10 delta deg C)

For **Prime** operation above these conditions, derate by an additional 3% per 1000 ft (300 m), and 9% per 18 delta deg F (10 delta deg C)

For **Continuous** operation above these conditions, derate by an additional 3% per 1000 ft (300 m), and 10% per 18 delta deg F (10 delta deg C)



# Cummins Inc.

## Engine Data Sheet

ENGINE MODEL : QSK19-G5

CONFIGURATION NUMBER : D193103GX03

DATA SHEET: FR4581

DATE: 16 JAN 13

**INSTALLATION DIAGRAM**• Fan to Flywheel: **TBD****CPL NUMBER**

• Engine Critical Parts List: 3866

**GENERAL ENGINE DATA**

Type .....	Four Cycle; Inline; 6 Cylinder	
Aspiration .....	Turbocharged and Charge Air Cooled	
Bore x Stroke .....	6.25 x 6.25	159 x 159
Displacement .....	1150	18.9
Compression Ratio .....	15.0 : 1	
Dry Weight (Approximate), Fan to Flywheel Engine .....	4190	1901
Wet Weight (Approximate), Fan to Flywheel Engine .....	4350	1973
Moment of Inertia of Rotating Components • with FW 4023 Flywheel .....	194.6	8.2
Center of Gravity from Rear Face of Block .....	23.55	598
Center of Gravity Above Crankshaft Centerline .....	11.1	282
Maximum Static Loading at Rear Main Bearing .....	2000	907

**ENGINE MOUNTING**

Maximum Bending Moment at Rear Face of Block .....	1000	1356
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**EXHAUST SYSTEM**

Maximum Back Pressure @ 1800 RPM .....	2	6.8
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**AIR INDUCTION SYSTEM**

Maximum Intake Air Restriction • with Dirty Filter Element .....	25	6.2
• with Normal Duty Air Cleaner and Clean Filter Element @ 1800 RPM .....	15	3.7

**COOLING SYSTEM**

Coolant Capacity — Engine Only .....	11	41.6
Minimum Pressure Cap .....	15	103
Maximum Static Head of Coolant Above Engine Crank Centerline .....	60	18.3
Maximum Coolant Temperature (Max Top Tank Temp) for Standby / Prime Power .....	220 / 212	104 / 100
Thermostat (Modulating) Range .....	181 - 203	83 - 95

**Jacket Water Circuit Requirements**

Maximum Coolant Friction Head External to Engine @ 1800 RPM .....	5	34.5
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**Charge Air Cooler Requirements**

Maximum Temp. Rise Between Engine Air Intake and Intake Manifold - 1800 rpm .....	53	29
Maximum Air Pressure Drop from Turbo Air Outlet to Intake Manifold - 1800 rpm .....	4	13.5
Maximum Intake Manifold Temperature @ 77 °F (25 °C) Ambient - 1800 rpm .....	130	54
Maximum Intake Manifold Temperature for Engine Protection (Shut Down Threshold) .....	180	82

**LUBRICATION SYSTEM**

Oil Pressure @ Idle Speed .....	20	138
@ Governed Speed .....	40 - 60	275.8 - 413.7
Maximum Oil Temperature .....	250	121
Oil Capacity with OP 4084 Oil Pan : High - Low .....	19 - 17	71.9 - 64.4
Total System Capacity (Including Filter) .....	22.3	84.4

**FUEL SYSTEM**

Type Injection System .....	Cummins MCERS	<b>4</b>
Maximum Restriction at Lift Pump(clean/dirty filter)..... — in Hg (kPa)	5 / 9 16.9 / 30	
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head) ..... — in Hg (kPa)	10 34	
Maximum Fuel Inlet Temperature ..... — °F (°C)	160 71	
Maximum Supply Fuel Flow @ 1800 RPM..... — US gph (litre/hr)	125 473	
Maximum Return Fuel Flow @ 1800 RPM..... — US gph (litre/hr)	78 295	

**ELECTRICAL SYSTEM**

Cranking Motor (Heavy Duty, Positive Engagement) .....	— volt	24
Minimum Recommended Battery Capacity		
• Cold Soak @ 50 °F (10 °C) and above .....	— °F CCA	600
• Cold Soak @ 32 °F to 50 °F (0 °C to 10 °C) .....	— °F CCA	640
• Cold Soak @ 0 °F to 32 °F (-18 °C to 0 °C) .....	— °F CCA	900
Maximum Starting Circuit Resistance.....	— Ohm	0.002

**COLD START CAPABILITY**

Unaided Cold Start

Minimum Cranking Speed.....	— RPM	150
Minimum Ambient Temperature for Unaided Cold Start .....	— °F (°C)	10 -12.2

**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 .....	— dBA		93.3
Exhaust Noise at 1 m Horizontal from Centerline of Exhaust Pipe Outlet Upwards at 45° @ 1800 RPM.....	— dBA		118.9

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

	<b>STANDBY POWER</b>		<b>PRIME POWER</b>	
	<b>60 hz</b>	<b>50 hz</b>	<b>60 hz</b>	<b>50 hz</b>
Governed Engine Speed .....	1,800	N/A	1,800	N/A
Engine Idle Speed .....	700 - 900	N/A	700 - 900	N/A
Gross Engine Power Output.....	897 (669)	N/A	815 (608)	N/A
Brake Mean Effective Pressure.....	343 (2,365)	N/A	312 (2,151)	N/A
Piston Speed .....	1,875 (9.5)	N/A	1,875 (9.5)	N/A
Friction Horsepower.....	79 (59)	N/A	79 (59)	N/A
Engine Water Flow at Stated Friction Head External to Engine:				
• 2.5 psi Friction Head.....	196 (742)	N/A	196 (742)	N/A
• Maximum Friction Head .....	175 (662)	N/A	175 (662)	N/A
<b>Engine Data</b>				
Intake Air Flow .....	2,112 (997)	N/A	1,989 (939)	N/A
Exhaust Gas Temperature .....	946 (508)	N/A	906 (486)	N/A
Exhaust Gas Flow .....	5,319 (2,510)	N/A	4,901 (2,313)	N/A
Air to Fuel Ratio.....	28.5 : 1	N/A	30.0 : 1	N/A
Radiated Heat to Ambient .....	3,880 (68)	N/A	3,468 (61)	N/A
Heat Rejection to Jacket Coolant.....	12,761 (224)	N/A	10,535 (185)	N/A
Heat Rejection to Exhaust .....	30,658 (539)	N/A	29,008 (510)	N/A
Heat Rejected to *Fuel.....	252 (4.4)	N/A	252 (4.4)	N/A
<b>ATA CAC</b>				
Heat Rejected to Aftercooler.....	11,398 (200)	N/A	8,863 (156)	N/A
Charge Air Flow.....	151 (68)	N/A	142 (64)	N/A
Turbocharger Compressor Outlet Pressure .....	90 (305)	N/A	81 (274)	N/A
Turbocharger Compressor Outlet Temperature.....	435 (224)	N/A	406 (208)	N/A

\* This is the maximum heat rejection to fuel.

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

**ENGINE MODEL : QSK19-G5**  
**DATA SHEET : FR4581**  
**DATE : 16 JAN 13**