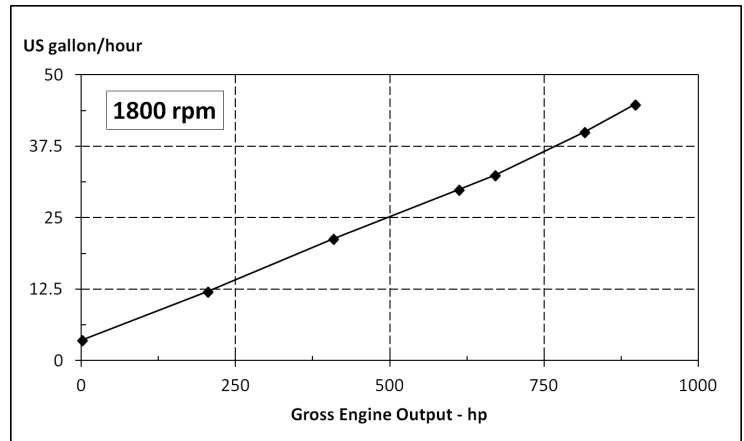
	Cummins Inc. Columbus, Indiana 47202-3005 ENGINE PERFORMANCE DATASHEET	Basic Engine Model: QSK19-G5	Curve Number: FR4581	G-DRIVE QSK 1
		Engine Critical Parts List: CPL : 3866	Date: 16 JAN 13	

Compression Ratio : 15.0 : 1	Displacement : 1,150 in³ (18.9 L)
Fuel System : Cummins MCRS	Aspiration : Turbocharged and Charge Air Cooled
Emission Certification : U.S. EPA Tier 2	

Engine Speed	Standby Power		Prime Power		Continuous Power	
RPM	bhp	kWm	bhp	kWm	bhp	kWm
1800	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
STANDBY POWER						
100	897	669	0.355	0.216	44.8	170
PRIME POWER						
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
CONTINUOUS POWER						
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

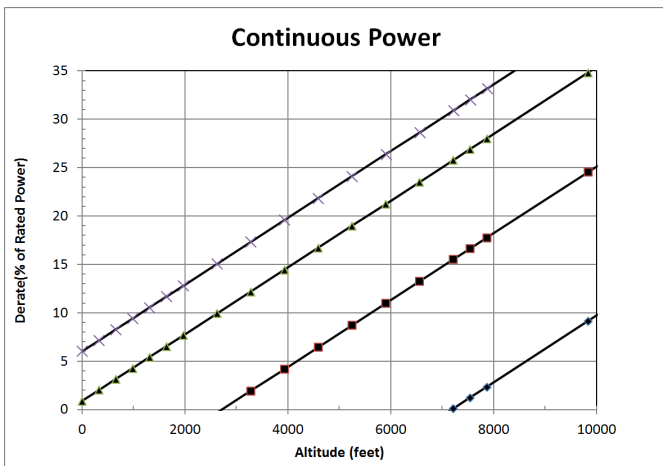
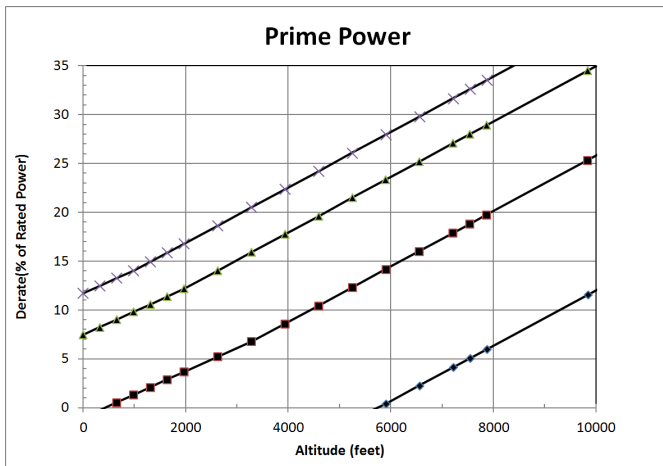
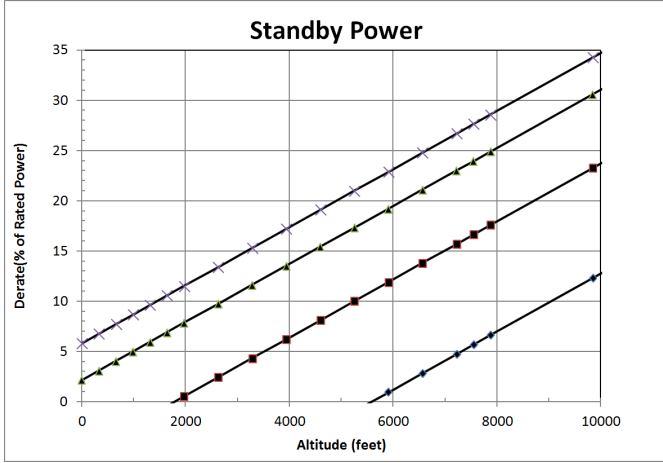
Reference AEB 10.47 for determining Electrical Output.

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 H₂O 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

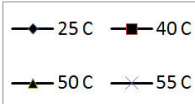


Operation at Elevated Temperature and Altitude:

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 MCRS	4
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)

	STANDBY POWER		PRIME POWER	
	60 hz	50 hz	60 hz	50 hz
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
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
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

Engine Data

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

ATA CAC

Heat Rejected to Aftercooler.....	BTU/min (kW)
Charge Air Flow.....	lb/min (kg/min)
Turbocharger Compressor Outlet Pressure	in Hg (kPa)
Turbocharger Compressor Outlet Temperature.....	°F (°C)

* 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