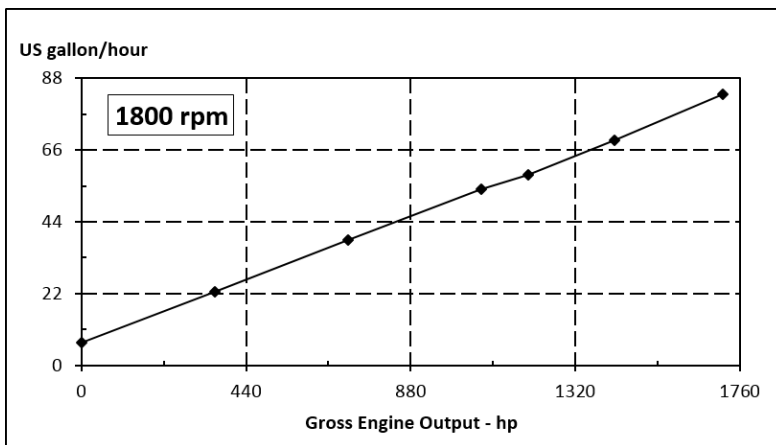


	Cummins Inc. Columbus, Indiana 47202-3005	Basic Engine Model: QSK38-G4	Curve Number: FR6789	<i>G-DRIVE</i> QSK 1
	ENGINE PERFORMANCE DATASHEET	Engine Critical Parts List: CPL : 3572	Date: 18 AUG 17	
Compression Ratio : 15:1		Displacement : 37.7 L (2301 in³)		
Fuel System : Cummins MCRC		Aspiration : Turbocharged and Low Temp Aftercooled (2P/2L)		
Emission Certification : U.S. EPA Tier 2				

Engine Speed		Standby Power		Prime Power		Continuous Power	
rpm		bhp	kWm	bhp	kWm	bhp	kWm
1800		1845	1376	1650	1231	1400	1044

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	1845	1376	0.338	0.206	87.9	333
PRIME POWER						
100	1650	1231	0.339	0.206	78.7	298
75	1238	923	0.352	0.214	61.4	232
50	825	615	0.379	0.230	44.0	167
25	413	308	0.420	0.255	24.4	92
CONTINUOUS POWER						
100	1400	1044	0.338	0.206	66.7	253



CONVERSIONS:(litres = US Gal x 3.785) (US 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 10/15 in H₂O air intake restriction and 1.5/2.0 in Hg exhaust back pressure @ 1500/1800 RPM.

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.

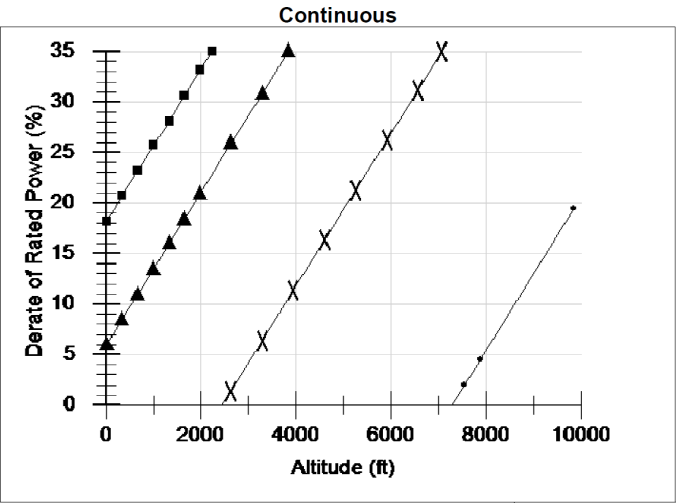
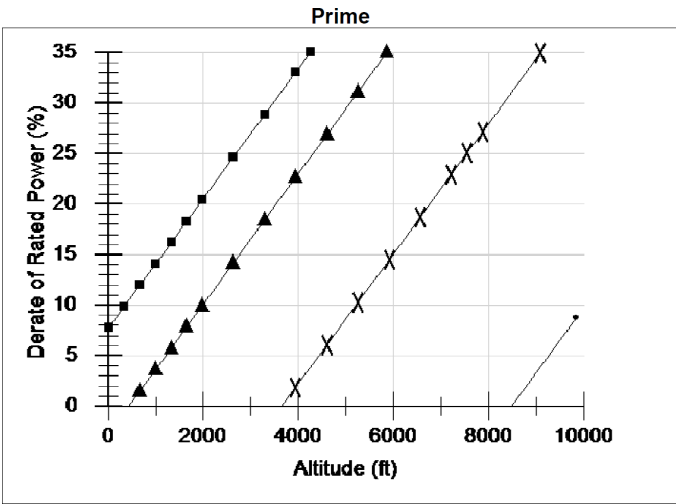
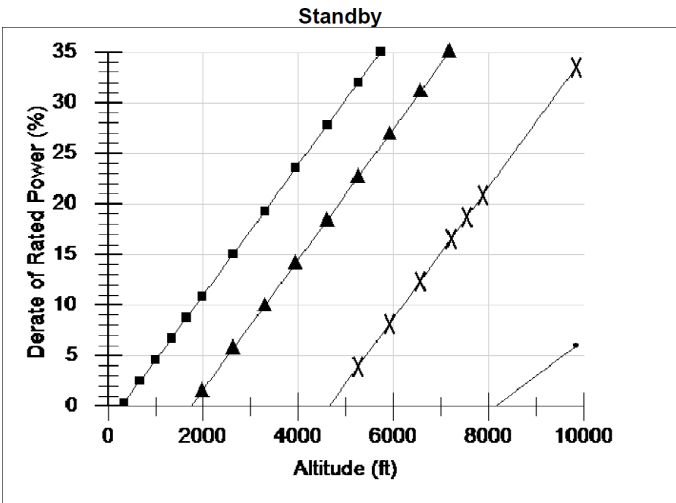
Data Status: **Final**

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 6% per 1000 ft (300 m), and 19% per 18 delta deg F (10 delta deg C)

For Prime operation above these conditions, derate by an additional 6% per 1000 ft (300 m), and 21% per 18 delta deg F (10 delta deg C)

For Continuous operation above these conditions, derate by an additional 7% per 1000 ft (300 m), and 24% per 18 delta deg F (10 delta deg C)



Cummins Inc.

Engine Data Sheet

ENGINE MODEL : QSK38-G4

CONFIGURATION NUMBER : D233042GX03

DATA SHEET: FR6789

DATE: 25 AUG 14

INSTALLATION DIAGRAM

• Fan to Flywheel: 4954124

CPL NUMBER

• Engine Critical Parts List: 3572

GENERAL ENGINE DATA

Type	Four Cycle; Vee; 12 Cylinder	
Aspiration	Turbocharged and Low Temp Aftercooled	
Bore x Stroke	6.25 x 6.25	(159 x 159)
Displacement	2,301	(37.7)
Compression Ratio	15 : 1	
Dry Weight (Approximate)	8,433	(3,825)
Wet Weight (Approximate)	9,039	(4,100)
Moment of Inertia of Rotating Components		
• with FW 6074 Flywheel	246.8	(10.4)
• with FW 6077 Flywheel	493.6	(20.8)
Center of Gravity from Rear Face of Block	31.5	(801)
Center of Gravity Above Crankshaft Centerline	6.8	(173)
Maximum Static Loading at Rear Main Bearing	2,000	(907)

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block	4,500	(6,101)
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EXHAUST SYSTEM

Maximum Back Pressure at Standby Power	2	(7)
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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	15	(3.7)

COOLING SYSTEM**Jacket Water Circuit Requirement**

Coolant Capacity — Engine	28	(106)
Minimum Pressure Cap Rating at Sea Level	11	(76)
Maximum Static Head of Coolant Above Crankshaft Centerline	60	(18.3)
Maximum Coolant Temperature (Max Top Tank Temp) for Standby/Prime Power	220 / 212	(104 / 100)
Thermostat (Modulating) Range	180 - 202	(82 - 94)
Maximum coolant friction head external to engine - 1800 RPM	10	(68.9)

Aftercooler Circuit Requirements

Coolant Capacity — Aftercooler	6	(22.7)
Maximum Coolant Friction Head External to Engine - 1800 RPM	10	(68.9)
Maximum Coolant Temperature into Aftercooler @ 77 °F (25 °C) Ambient	120	(49)
Maximum Coolant Temperature into Aftercooler @		
Limiting Ambient Conditions for Standby/Prime power	160 / 150	(71 / 66)
Thermostat (Modulating) Range	115 - 135	(46 - 57)

LUBRICATION SYSTEM

Oil Pressure @ Minimum Idle Speed	20	(138)
@ Governed Speed	50 - 70	(344.7 - 482.6)
Maximum Oil Temperature	248	(120)
Oil Capacity with OP 6107 Oil Pan : Low - High	37 - 44	(140.4 - 166.6)
Total System Capacity (with Combo Filter)	45	(170.3)

FUEL SYSTEM

Type Injection System.....	Cummins MCRS	
Maximum Fuel Supply Restriction at Fuel Pump Inlet (clean/dirty filter)	5 / 10	(16.9 / 34)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head)	10	(34)
Maximum Fuel Inlet Temperature	160	(71)
Maximum Supply Fuel Flow - 1800 RPM.....	159	(602)
Maximum Return Fuel Flow - 1800 RPM.....	94	(356)

ELECTRICAL SYSTEM

System Voltage.....	— volt	24
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 °C to 32°F)	— CCA	1,800
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)	45 (7.2)

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		99.4
Exhaust Noise at 1 m Horizontal from Centerline of Exhaust Pipe Outlet Upwards at 45° @ 1800 RPM.....	— dBA		96.3

	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	1,845 (1,376)	N/A	1,650 (1,231)	N/A
Brake Mean Effective Pressure	353 (2,433)	N/A	316 (2,176)	N/A
Piston Speed	1,562 (7.9)	N/A	1,562 (7.9)	N/A
Friction Horsepower	115 (86)	N/A	115 (86)	N/A
Engine Water Flow at Stated Friction Head External to Engine:				
• 4 psi Friction Head.....	328 (21)	N/A	328 (21)	N/A
• Maximum Friction Head	250 (16)	N/A	250 (16)	N/A
Engine Data				
Intake Air Flow	3,832 (1,809)	N/A	3,576 (1,688)	N/A
Exhaust Gas Temperature - Dry Stack	907 (486)	N/A	880 (472)	N/A
Exhaust Gas Flow	9,353 (4,415)	N/A	8,627 (4,072)	N/A
Air to Fuel Ratio	26.3 : 1	N/A	27.5 : 1	N/A
Radiated Heat to Ambient	7,612 (134)	N/A	6,819 (120)	N/A
Heat Rejection to Jacket Coolant	26,484 (466)	N/A	24,956 (439)	N/A
Heat Rejection to Exhaust	58,506 (1,028)	N/A	51,878 (912)	N/A
Heat Rejected to *Fuel	414 (8)	N/A	414 (8)	N/A
2P / 2L				
Heat Rejection to Aftercooler Coolant	19,021 (335)	N/A	16,424 (289)	N/A
Aftercooler Water Flow at Stated Friction Head External to Engine:				
• 2 psi Friction Head.....	164 (10)	N/A	164 (10)	N/A
• Maximum Friction Head	139 (9)	N/A	139 (9)	N/A

* This is the maximum heat rejection to fuel.

ENGINE MODEL : QSK38-G4
DATA SHEET : FR6789
DATE : 25 AUG 14

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