

	Cummins Inc. Columbus, Indiana 47201 Engine Data Sheet	Basic Engine Model: QSK45-G4	Curve Number: FR-6317	G-DRIVE QSK 1
		Engine Critical Parts List: CPL: 2655	Date: 10Apr03	
Displacement : 45.1 litre (2752 in³)		Bore : 159 mm (6.25 in.) Stroke : 190 mm (7.48 in.)		
No. of Cylinders : 12		Aspiration : Turbocharged and Low Temperature Aftercooled (2 Pump/2 Loop)		
Emissions: U.S. EPA Nonroad 1 Certified and 4 g/nm³ NOx TA-Luft Compliant. Refer to Emission Data Sheet for Details.				

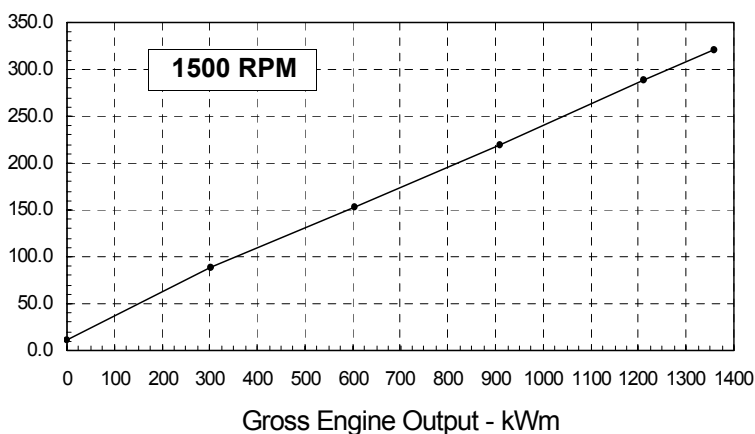
Engine Ratings:

Engine Speed RPM	Standby Power		Prime Power		Continuous Power	
	kWm	BHP	kWm	BHP	kWm	BHP
1500	1360	1823	1210	1622	1090	1461
1800	1380	1850	1210	1622	1105	1481

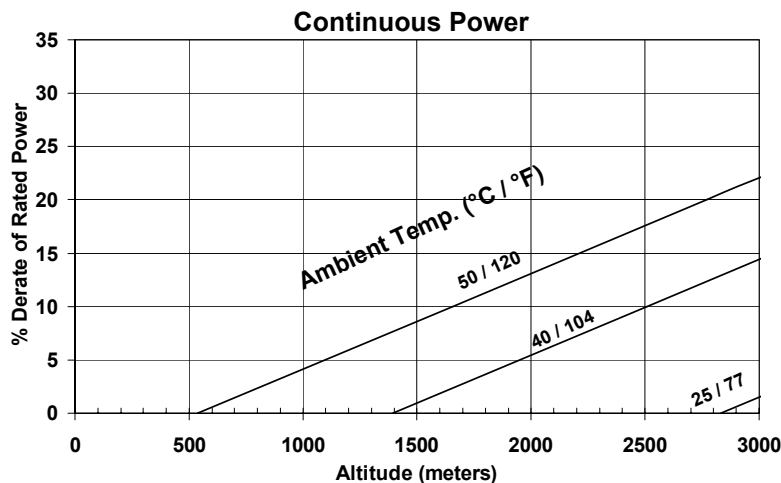
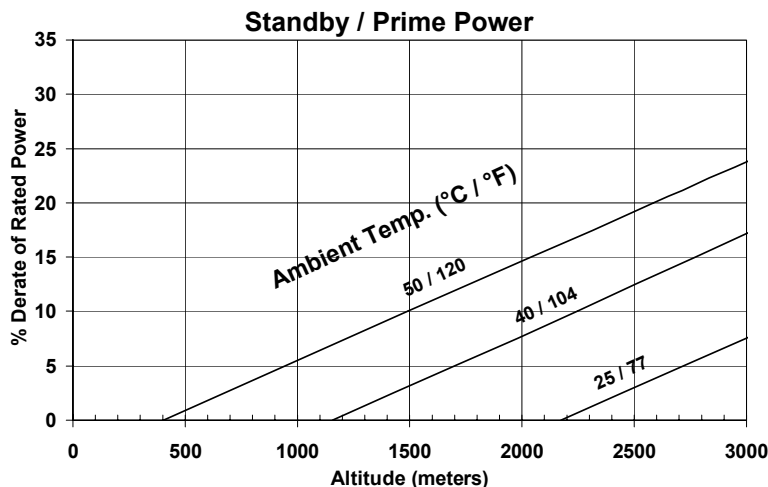
Engine Fuel Consumption @ 1500 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm·h	lb/ BHP·h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	1360	1823	0.201	0.330	321	84.7
PRIME POWER						
100	1210	1622	0.202	0.333	288	76.1
75	908	1217	0.206	0.339	220	58.1
50	605	811	0.216	0.356	154	40.7
25	303	406	0.248	0.408	88	23.3
CONTINUOUS POWER						
100	1090	1461	0.202	0.332	259	68.3

Litre / hour



Power Derate Curves @ 1500 RPM:



Operation At Elevated Temperature And Altitude:

For sustained operation above these conditions, derate by an additional 3% per 300 m (1000 ft), and 8% per 11° C (1% per 10° F).

CONVERSIONS: (litres = U.S. Gal x 3.785) (U.S. 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 ₂ O 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: 

	Cummins Inc. Columbus, Indiana 47201 Engine Data Sheet	Basic Engine Model: QSK45-G4	Curve Number: FR-6317
		Engine Critical Parts List: CPL: 2655	Date: 10Apr03
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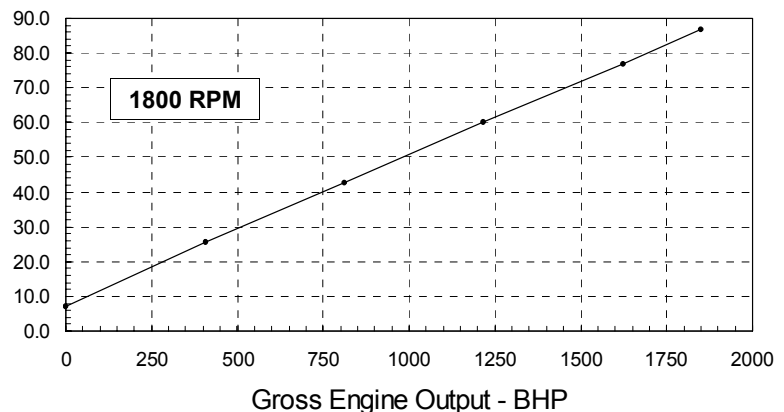
Engine Ratings:

Engine Speed RPM	Standby Power		Prime Power		Continuous Power	
	kWm	BHP	kWm	BHP	kWm	BHP
1500	1360	1823	1210	1622	1090	1461
1800	1380	1850	1210	1622	1105	1481

Engine Fuel Consumption @ 1800 RPM

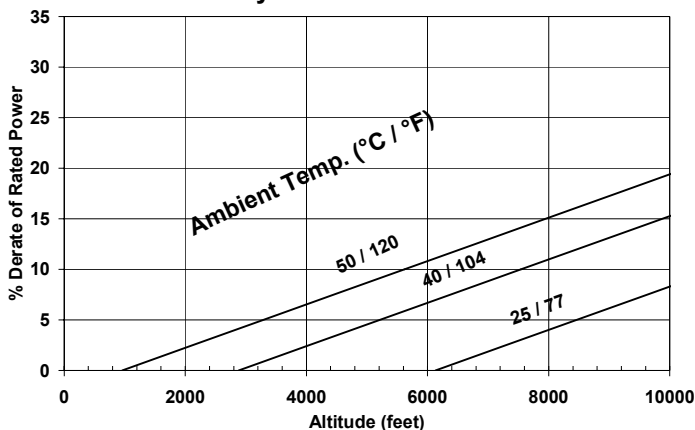
OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm·h	lb/ BHP·h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	1380	1850	0.202	0.333	329	86.8
PRIME POWER						
100	1210	1622	0.204	0.336	291	76.8
75	908	1217	0.213	0.350	227	60.0
50	605	811	0.228	0.375	162	42.8
25	303	406	0.272	0.448	97	25.6
CONTINUOUS POWER						
100	1105	1481	0.206	0.339	268	70.7

U.S. Gallons / hour

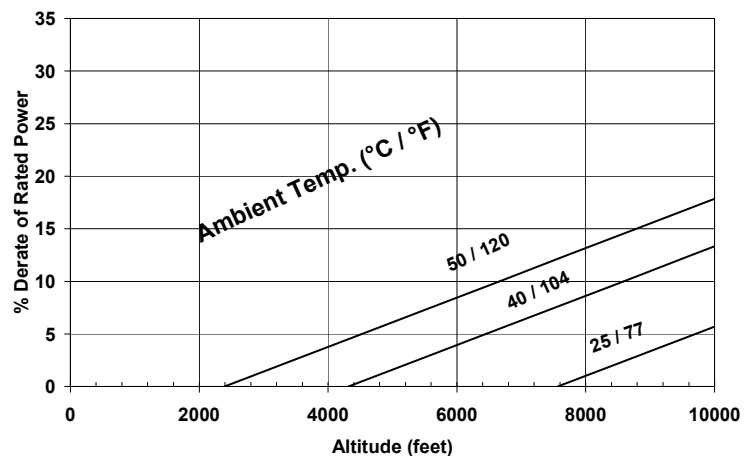


Power Derate Curves @ 1800 RPM:

Standby / Prime Power



Continuous Power



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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 : **QSK45-G4**

CONFIGURATION NUMBER : D583002GX03

DATA SHEET : DS-6317-LP

DATE : 10Apr03

PERFORMANCE CURVE : FR-6317

INSTALLATION DIAGRAM

• Fan to Flywheel : 3170275

CPL NUMBER

• Engine Critical Parts List

: 2655

GENERAL ENGINE DATA

Type	4 Cycle; 60° Vee; 12-Cylinder Diesel	
Aspiration	Turbocharged and Low Temperature	
	Aftercooled (2 Pump/2 Loop)	
Bore x Stroke	159 x 190 (6.25 x 7.48)	
Displacement	45.1 (2752)	
Compression Ratio	14.5:1	
Dry Weight		
Fan to Flywheel Engine	5640	(12434)
Wet Weight		
Fan to Flywheel Engine	TBD	(TBD)
Moment of Inertia of Rotating Components		
• with FW 6038 Flywheel (SAE 0)	14.6	(347)
• with FW 6034 Flywheel (SAE 00)	25.1	(594)
Center of Gravity from Front Face of Block	748	(29.5)
Center of Gravity Above Crankshaft Centerline	211	(8.3)
Maximum Static Loading at Rear Main Bearing	TBD	(TBD)

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block	10350	(7634)
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EXHAUST SYSTEM

Maximum Back Pressure	51	(2)
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AIR INDUCTION SYSTEM

Maximum Intake Air Restriction:		
• with Dirty Filter Element	508	(20)
• with Clean Filter Element	381	(15)

COOLING SYSTEM (2 Pump/2 Loop Aftercooling Required)

Coolant Capacity — Engine Only	110	(29)
— Aftercooler Only	30	(8)
Minimum Pressure Cap (for Cooling Systems with Less than 2 m [6 ft] Static Head)	76	(11)
Maximum Top Tank Temperature for Standby / Prime Power	104 / 100	(220 / 212)
Maximum Static Head of Coolant Above Engine Crank Centerline (Both Circuits)	18.3	(60)

Jacket Water Circuit Requirements:

Maximum Coolant Friction Head External to Engine — 1500 / 1800 rpm	48 / 69	(7 / 10)
Thermostat (Modulating) Range	82 - 93	(180 - 200)

Aftercooler Circuit Requirements:

Maximum Coolant Friction Head External to Engine — 1500 / 1800 rpm	35 / 48	(5 / 7)
Maximum Inlet Water Temperature to Aftercoolers @ 25 °C (77 °F)	49	(120)
Maximum Inlet Water Temperature to Aftercoolers	65	(150)
Thermostat (Modulating) Range	46 - 57	(115 - 135)

LUBRICATION SYSTEM

Oil Pressure @ Idle Speed	138	(20)
@ Governed Speed	345 - 483	(50 - 70)
Maximum Oil Temperature	121	(250)
Oil Capacity with OP TBD Oil Pan : Low - High	254 - 278	(67 - 73.5)
Total System Capacity (With Combo Filters)	286	(75.6)

FUEL SYSTEM

Type Injection System	Cummins HPI-PT
Maximum Restriction at PT Fuel Injection Pump — with Clean Fuel Filter	102 (4.0)
— with Dirty Fuel Filter.....	203 (8.0)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head).....	229 (9.0)
Maximum Fuel Inlet Temperature.....	70 (160)
Maximum Fuel Flow to Injection Pump — 1500/1800 rpm.....	1100/1400 (290/370)
Maximum Drain Flow — 1500/1800 rpm	950/1135 (250/300)

ELECTRICAL SYSTEM

Cranking Motor (Heavy Duty, Positive Engagement).....	— volt	24
Battery Charging System, Negative Ground.....	— ampere	35
Maximum Allowable Resistance of Cranking Circuit.....	— ohm	0.002
Minimum Recommended Battery Capacity		
• Cold Soak @ 10 °C (50 °F) and Above	— 0°F CCA	1280
• Cold Soak @ 0 °C to 10 °C (32 °F to 50 °F).....	— 0°F CCA	1800
• Cold Soak @ -18 °C to 0 °C (0 °F to 32 °F).....	— 0°F CCA	1800

COLD START CAPABILITY

Minimum Ambient Temperature for Cold Start with _____ watt Coolant Heater to Rated Speed.....	— °C (°F)	TBD (TBD)
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%
Air Intake Restriction :	381 mm H ₂ O (15 in H ₂ O)	Exhaust Restriction :	51 mm Hg (2 in Hg)

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

	STANDBY POWER		PRIME POWER	
	60 hz	50 hz	60 hz	50 hz
Governed Engine Speed	1800	1500	1800	1500
Engine Idle Speed.....	725 - 775	725 - 775	725 - 775	725 - 775
Gross Engine Power Output..... — kW _m (BHP)	1380 (1850)	1360 (1823)	1210 (1622)	1210 (1622)
Brake Mean Effective Pressure..... — kPa (psi)	2062 (299)	2406 (349)	1862 (270)	2144 (311)
Piston Speed..... — m / s (ft / min)	11.4 (2243)	9.4 (1869)	11.4 (2243)	9.4 (1869)
Friction Horsepower..... — kW _m (HP)	155 (208)	97 (130)	155 (208)	97 (130)
Engine Jacket Water Flow at Stated Friction Head External to Engine:				
• 4 psi Friction Head..... — litre / s (US gpm)	23.1 (366)	18.3 (290)	23.1 (366)	18.3 (290)
• Maximum Friction Head..... — litre / s (US gpm)	21.1 (334)	17.4 (276)	21.1 (334)	17.4 (276)
Engine Data				
Intake Air Flow..... — litre / s (cfm)	2085 (4415)	1865 (3945)	1990 (4215)	1715 (3630)
Exhaust Gas Temperature	420 (790)	460 (860)	395 (745)	440 (825)
Exhaust Gas Flow..... — litre / s (cfm)	4885 (10350)	4650 (9845)	4480 (9490)	4185 (8865)
Air-to-Fuel Ratio	30.1 : 1	27.4 : 1	32.5 : 1	28.5 : 1
Radiated Heat to Ambient	135 (7520)	130 (7340)	120 (6650)	115 (6590)
Heat Rejection to Engine Jacket Radiator.....	415 (23625)	390 (21970)	375 (21120)	345 (19410)
Heat Rejection to Exhaust.....	975 (55360)	985 (55970)	870 (49460)	915 (52020)
Heat Rejection to Fuel*	30 (1710)	25 (1425)	30 (1710)	25 (1425)
Engine Aftercooler Data				
Heat Rejection to Aftercooler Radiator	370 (20950)	335 (18900)	320 (18215)	280 (15940)
Aftercooler Water Flow at Stated Friction Head External to Engine:				
• 2 psi Friction Head..... — litre / s (US gpm)	8.5 (135)	7.1 (112)	8.5 (135)	7.1 (112)
• Maximum Friction Head..... — litre / s (US gpm)	8.2 (130)	6.8 (108)	8.2 (130)	6.8 (108)

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

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

ENGINE MODEL : QSK45-G4
DATA SHEET : DS-6317-LP
DATE : 10Apr03
CURVE NO. : FR-6317

Cummins Inc.

Columbus, Indiana 47202-3005