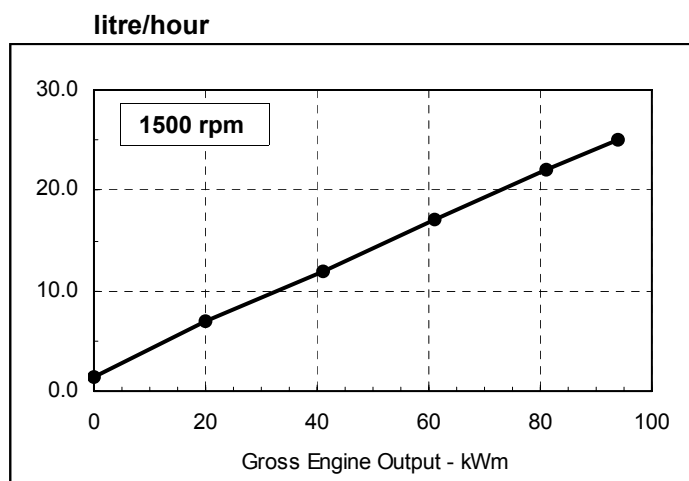


	Cummins Inc. Columbus, Indiana 47202-3005		Basic Engine Model: QSB5-G3 NR3	Curve Number: FR-91964	<i>G-DRIVE</i> QSB 1
	Engine Data Sheet		Engine Critical Parts List: CPL: 1100	Date: 17Sep07	
Displacement : 4.5 litre (272 in³)			Bore : 107 mm (4.21 in.) Stroke : 124 mm (4.88 in.)		
No. of Cylinders : 4			Aspiration : Turbocharged and Air to Air Aftercooled		

Engine Speed rpm	Standby Power		Prime Power		Continuous Power	
	kWm	hp	kWm	hp	kWm	hp
1500	94	126	81	109	74	99
1800	108	145	94	126	86	115

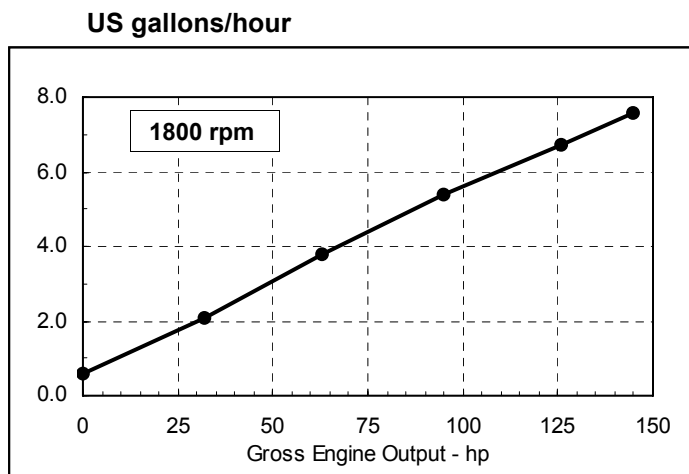
Engine Performance Data @ 1500 rpm

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	hp	kg/ kWm·h	lb/ hp·h	litre/ hour	US gal/ hour
STANDBY POWER						
100	94	126	0.223	0.366	25	6.7
PRIME POWER						
100	81	109	0.229	0.376	22	5.9
75	61	82	0.241	0.397	18	4.7
50	41	55	0.248	0.406	12	3.2
25	20	27	0.289	0.474	6	1.7
CONTINUOUS POWER						
100	74	99	0.237	0.389	21	5.6



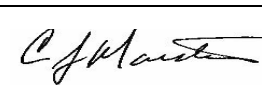
Engine Performance Data @ 1800 rpm

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	hp	kg/ kWm·h	lb/ hp·h	litre/ hour	US gal/ hour
STANDBY POWER						
100	108	145	0.226	0.370	29	7.7
PRIME POWER						
100	94	126	0.230	0.377	26	6.9
75	70	95	0.249	0.408	21	5.6
50	47	63	0.260	0.427	15	3.9
25	23	32	0.289	0.474	8	2.2
CONTINUOUS POWER						
100	86	115	0.232	0.380	24	6.2

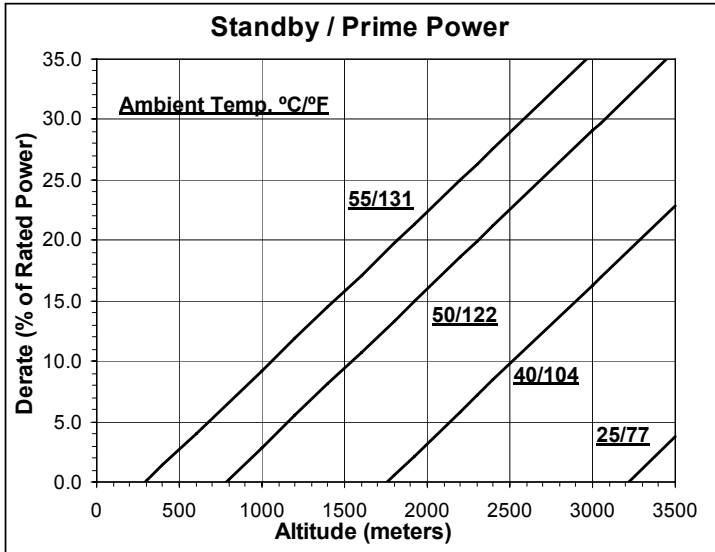


CONVERSIONS:(litres = US Gal x 3.785) (US Gal = litres x 0.2642)

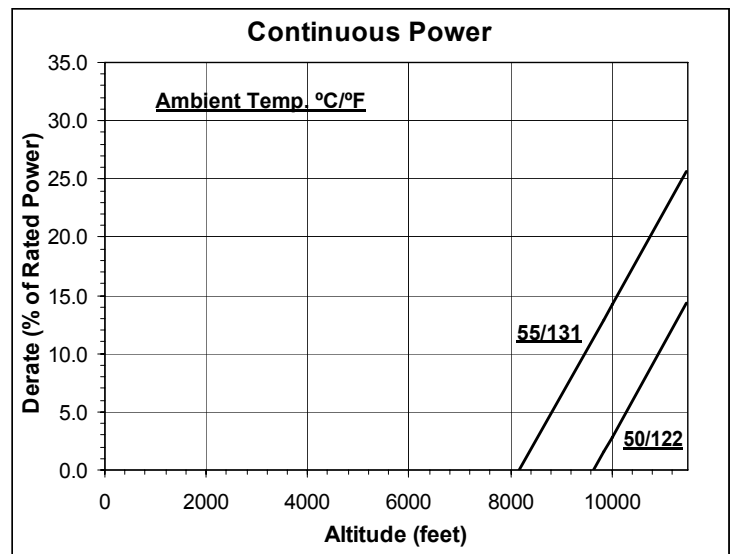
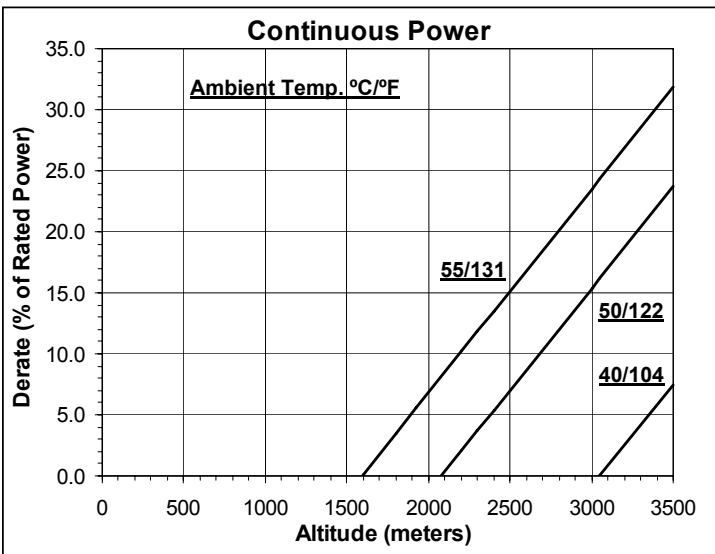
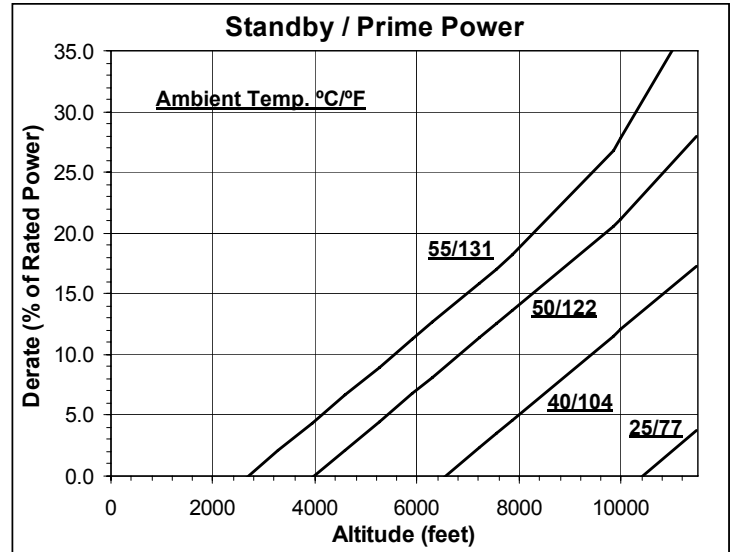
Data Subject to Change Without Notice

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 in H₂O 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/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: --Preliminary--
	Data Tolerance: ± 5%
	Chief Engineer: 

1500 rpm Derate Curves



1800 rpm Derate Curves



Operation At Elevated Temperature And Altitude:

For **Standby/Prime Operation** above these conditions, derate by an additional 4% per 300 m (1000 ft), and 13% per 10 °C (18 °F).

For **Continuous Operation** above these conditions, derate by an additional 5% per 300 m (1000 ft), and 16% per 10 °C (18 °F).

Operation At Elevated Temperature And Altitude:

For **Standby/Prime Operation** above these conditions, derate by an additional 7% per 300 m (1000 ft), and 21% per 10 °C (18 °F).

For **Continuous Operation** above these conditions, derate by an additional 8% per 300 m (1000 ft), and 23% per 10 °C (18 °F).

Cummins Inc.**Engine Data Sheet****ENGINE MODEL : QSB5-G3 NR3** **CONFIGURATION NUMBER : D323007GX03****DATA SHEET : DS-91964****DATE : 17Sep07****PERFORMANCE CURVE : FR-91964****INSTALLATION DIAGRAM**

• Fan to Flywheel: 4953685

CPL NUMBER

• Engine Critical Parts List: 1100

GENERAL ENGINE DATA

Type	4-Cycle; In-line; 4-Cylinder Diesel
Aspiration	Turbocharged and Charge Air Cooled
Bore x Stroke	4.21 x 4.88 (107 x 124)
Displacement	272 (4.5)
Compression Ratio	17.3 : 1
Dry Weight (Approximate), Fan to Flywheel Engine	776 (352)
Wet Weight (Approximate), Fan to Flywheel Engine	818 (371)
Moment of Inertia of Rotating Components	
• with FW 9857 Flywheel	16.9 (0.71)
• with FW 9878 Flywheel	29 (1.22)
Center of Gravity from Rear Face of Block	9.4 (239)
Center of Gravity Above Crankshaft Centerline	6.4 (163)
Maximum Static Loading at Rear Main Bearing	N.A. (N.A.)

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block	1000 (1356)
--	-------------

EXHAUST SYSTEM

Maximum Back Pressure	3 (10)
-----------------------------	--------

AIR INDUCTION SYSTEM

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

COOLING SYSTEM**Jacket Water Circuit Requirements**

Coolant Capacity — Engine Only	2.25 (8.5)
Maximum Static Head of Coolant Above Engine Crank Centerline	60 (18.3)
Standard Thermostat (Modulating) Range	175-203 (79-95)
Minimum Pressure Cap	15 (103)
Maximum Top Tank Temperature for Standby / Prime Power	233/225 (112/107)
Maximum Coolant Friction Head External to Engine	5 (35)

Charge Air Cooler Requirements

Maximum Temp. Rise Between Engine Air Intake and Intake Manifold - 1500/1800 rpm	45 (25)
Maximum Air Pressure Drop from Turbo Air outlet to Intake Manifold - 1500/1800 rpm .	2.5/4 (8.5/13.5)
Maximum Intake Manifold Temperature @ 77 °F (25 °C) ambient - 1500/1800 rpm	122 (50)
Maximum Intake Manifold Temperature for engine protection (Shut Down Threshold)	210 (99)

LUBRICATION SYSTEM

Oil Pressure @ Idle Speed	10 (69)
@ Governed Speed	40-60 (276-414)
Maximum Oil Temperature	280 (138)
Oil Capacity with OP 9458 Oil Pan : Low - High	2.4-2.9 (9-11)
Total System Capacity (Including Filter)	3.2 (12.2)

FUEL SYSTEM

Type Injection System	Bosch HPCR	
Maximum Restriction at Lift Pump(clean/dirty filter)..... — in Hg (kPa)	5/10	(17/34)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head) — in Hg (kPa)	6	(20)
Maximum Fuel Flow to Injector Pump	35	(133)
Maximum Return Fuel Flow	33	(125)
Maximum Fuel Inlet Temperature	160	(71)

ELECTRICAL SYSTEM

Cranking Motor (Heavy Duty, Positive Engagement)	— volt	12	24
Battery Charging System, Negative Ground	— ampere	100	70
Maximum Allowable Resistance of Cranking Circuit	— ohm	0.001	0.002
Minimum Recommended Battery Capacity			
• Cold Soak @ 0 °F to 32 °F (-18 °C to 0 °C)	— 0°F CCA	1000	(500)

COLD START CAPABILITY

Minimum Ambient Temperature for NFPA 110 Cold Start (90 degree F Coolant Temperature)	— °F (°C)	10	(-12)
Minimum Ambient Temperature for Unaided Cold Start	— °F (°C)	10	(-12)

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 88

Exhaust Noise at 1 m Horizontal from Centerline of Exhaust Pipe Outlet Upwards at 45 ° — dBA 109

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/s)
• Maximum Friction Head	US gpm (litre/s)

STANDBY POWER		PRIME POWER	
60 hz	50 hz	60 hz	50 hz
1800	1500	1800	1500
700 - 900	700 - 900	700 - 900	700 - 900
145 (108)	126 (94)	126 (94)	109 (81)
232 (1600)	242 (1669)	203 (1400)	209 (1441)
1464 (7.4)	1220 (6.2)	1464 (7.4)	1220 (6.2)
17 (13)	10 (7)	17 (13)	10 (7)
43 (2.8)	34 (2.2)	43 (2.8)	34 (2.2)
39 (2.5)	30 (1.9)	39 (2.5)	30 (1.9)
319 (151)	253 (119)	316 (149)	243 (115)
909 (490)	932 (500)	828 (445)	901 (485)
775 (370)	650 (310)	727 (345)	612 (290)
25.9 : 1	24.2 : 1	28.8 : 1	26.1 : 1
655 (30)	565 (10)	585 (15)	500 (10)
2765 (50)	2410 (45)	2455 (45)	2195 (40)
5215 (95)	4325 (20)	4595 (85)	3975 (70)
63 (1.1)	45 (0.8)	64 (1.1)	45 (0.8)
1365 (25)	1070 (20)	1320 (25)	960 (20)
23 (10)	19 (9)	23 (10)	18 (8)
27 (183)	24 (163)	26 (180)	22 (152)
359 (182)	339 (171)	352 (178)	324 (162)

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)
Heat Rejected to Aftercooler.....	BTU/min (kW)
Charge Air Flow	lb/min (kg/min)
Turbocharger Compressor Outlet Pressure	psi (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 : QSB5-G3 NR3

DATA SHEET : DS-91964

DATE : 17Sep07

CURVE NO. : FR-91964