



Cummins Inc.
Columbus, Indiana 47202-3005
Engine Data Sheet

Basic Engine Model:
QSB7-G3 NR3

Curve Number:
FR-91910

G-DRIVE
QSB
1

Engine Critical Parts List:
CPL: 40656

Date:
31May07

Displacement : **6.69 litre (408 in³)**

Bore : **107 mm (4.21 in.)** Stroke : **124 mm (4.88 in.)**

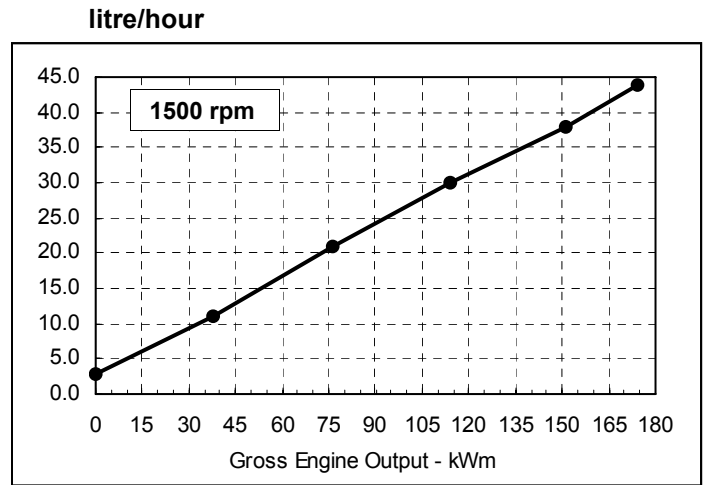
No. of Cylinders : **6**

Aspiration : **Turbocharged and Air to Air Aftercooled**

Engine Speed rpm	Standby Power		Prime Power		Continuous Power	
	kWm	hp	kWm	hp	kWm	hp
1500	174	233	151	203	134	180
1800	186	250	163	218	145	194

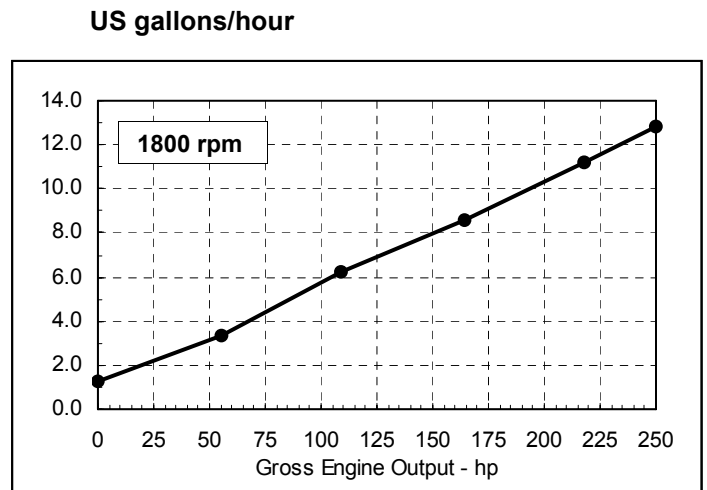
Engine Performance Data @ 1500 rpm

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	hp	kg/ kWm·h	lb/ hp·h	litre/ hour	US gal/ hour
STANDBY POWER						
100	174	233	0.214	0.351	44	11.5
PRIME POWER						
100	151	203	0.216	0.355	38	10.1
75	114	152	0.227	0.374	30	8.0
50	76	102	0.241	0.397	21	5.7
25	38	51	0.239	0.394	11	2.8
CONTINUOUS POWER						
100	134	180	0.222	0.365	35	9.3



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	187	250	0.221	0.363	48	12.8
PRIME POWER						
100	163	218	0.221	0.364	42	11.2
75	122	164	0.228	0.375	33	8.6
50	81	109	0.244	0.401	23	6.2
25	41	55	0.260	0.427	12	3.3
CONTINUOUS POWER						
100	145	194	0.224	0.369	38	10.1



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.

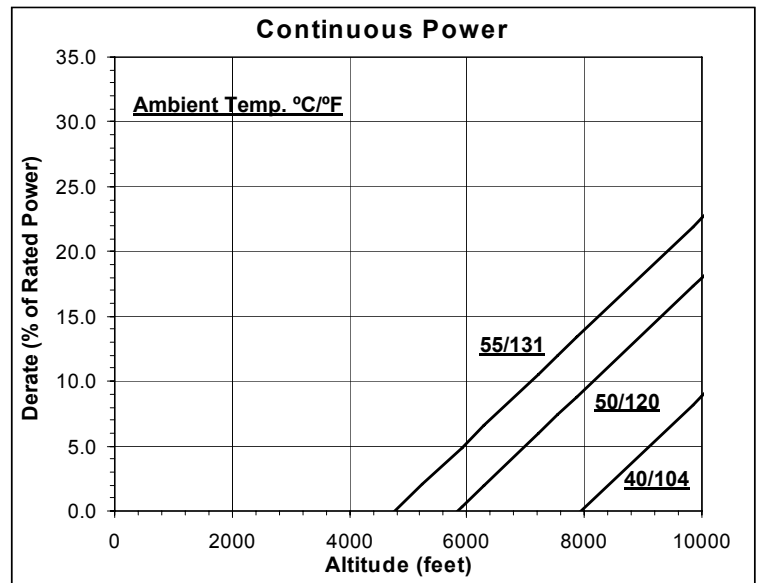
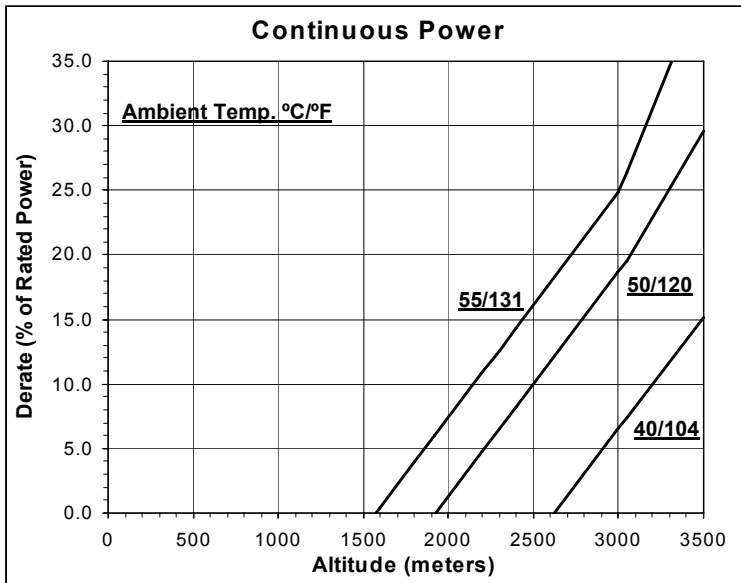
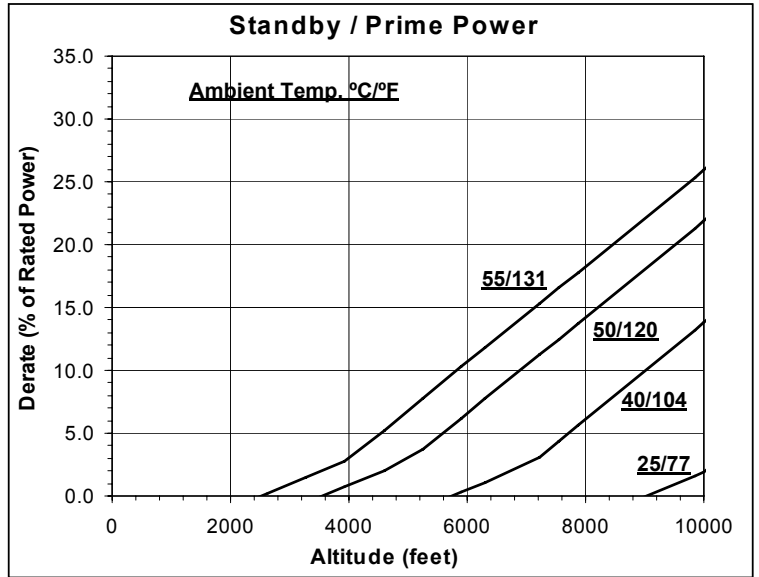
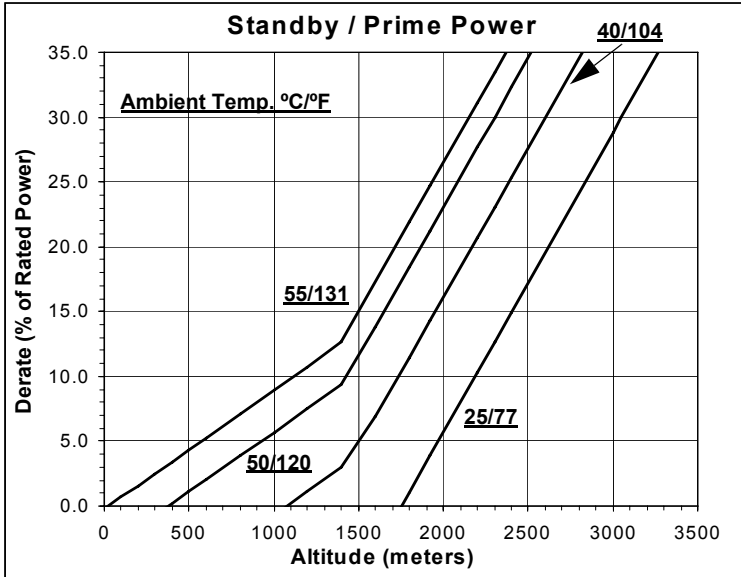
Data Status: --Limited Production--

Data Tolerance: ± 10%

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 7% per 300 m (1000 ft), and 7% per 10° C (18° F).

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

Operation At Elevated Temperature And Altitude:

For **Standby/Prime Operation** above these conditions, derate by an additional 4% per 300 m (1000 ft), and 8% per 10° C (18° F).

For **Continuous Operation** above these conditions, derate by an additional 4% per 300 m (1000 ft), and 9% per 10° C (18° F).

Cummins Inc.
Engine Data Sheet

ENGINE MODEL : QSB7-G3 NR3 **CONFIGURATION NUMBER : D313007GX03**

DATA SHEET : DS-91910

DATE : 31May07

PERFORMANCE CURVE : FR-91910

INSTALLATION DIAGRAM

• Fan to Flywheel: 4953684

CPL NUMBER

• Engine Critical Parts List: 40656

GENERAL ENGINE DATA

Type	4-Cycle; In-line; 6-Cylinder Diesel
Aspiration	Turbocharged and Charge Air Cooled
Bore x Stroke	4.21 x 4.88 (107 x 124)
Displacement	408 (6.69)
Compression Ratio	17.2 : 1
Dry Weight (Approximate), Fan to Flywheel Engine	1047 (475)
Wet Weight (Approximate), Fan to Flywheel Engine	1069 (485)
Moment of Inertia of Rotating Components	
• with FW 9857 Flywheel	24.7 (1.55)
• with FW 9878 Flywheel	36.8 (2.47)
Center of Gravity from Rear Face of Block	13.7 (348)
Center of Gravity Above Crankshaft Centerline	5.91 (150)
Maximum Static Loading at Rear Main Bearing	N/A (N/A)

ENGINE MOUNTING

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

Maximum Back Pressure	3 (10.2)
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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	2.7 (10.2)
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)	203 (95)

LUBRICATION SYSTEM

Oil Pressure @ Idle Speed	10 (69)
@ Governed Speed	40-60 (276-414)
Maximum Oil Temperature	280 (138)
Oil Capacity with OP 9457 Oil Pan : Low - High	4.0-4.6 (15.1-17.4)
Total System Capacity (Including Filter)	5.0 (18.9)

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	28 (106)	
Maximum Return Fuel Flow	27 (103)	
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	1100	(550)

COLD START CAPABILITY

Minimum Ambient Temperature for NFPA 110 Cold Start (90 degree F Coolant Temperature)	— °F (°C)	40	(4)
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		95.2

Governed Engine Speed	rpm
Engine Idle Speed	rpm
Gross Engine Power Output.....	hp (kW _m)
Brake Mean Effective Pressure.....	psi (kPa)
Piston Speed	ft/min (m/s)
Friction Horsepower	hp (kW _m)
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
Governed Engine Speed	1800 (174)	1500 (152)	1800 (150)	1500 (131)
Engine Idle Speed	700 - 900 (1744)	700 - 900 (1813)	700 - 900 (1489)	700 - 900 (1572)
Gross Engine Power Output.....	234 (174)	204 (152)	201 (150)	176 (131)
Brake Mean Effective Pressure.....	253 (1744)	263 (1813)	216 (1489)	228 (1572)
Piston Speed	1464 (7.4)	1220 (6.2)	1464 (7.4)	1220 (6.2)
Friction Horsepower	25 (19)	19 (14)	24.4 (20.4)	19 (14)
Engine Water Flow at Stated Friction Head External to Engine:				
• 2.5 psi Friction Head.....	38 (2.4)	32 (2.0)	38 (2.4)	32 (2.0)
• Maximum Friction Head	33 (2.1)	26 (1.6)	33 (2.1)	26 (1.6)
Intake Air Flow	522 (247)	417 (197)	505 (238)	386 (182)
Exhaust Gas Temperature	979 (526)	1045 (563)	900 (482)	998 (537)
Exhaust Gas Flow	1330 (627)	1108 (523)	1223 (577)	1002 (473)
Air to Fuel Ratio.....	24.5 : 1	21.7 : 1	27.0 : 1	23.2 : 1
Radiated Heat to Ambient	1529 (27)	1396 (25)	1264 (22)	1242 (22)
Heat Rejection to Jacket Coolant.....	4446 (78)	4199 (74)	3959 (70)	3704 (65)
Heat Rejection to Exhaust	9291 (163)	8069 (142)	8093 (142)	7057 (124)
Heat Rejected to Fuel	34 (0.6)	36 (0.6)	28 (0.5)	30 (0.5)
Heat Rejected to Aftercooler.....	2060 (36)	1604 (28)	1884 (33)	1334 (23)
Charge Air Flow.....	37 (17)	30 (14)	36 (16)	27 (12)
Turbocharger Compressor Outlet Pressure	60 (203)	54 (183)	56 (190)	47 (159)
Turbocharger Compressor Outlet Temperature.....	358 (181)	344 (173)	343 (173)	317 (158)

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

ENGINE MODEL : QSB7-G3 NR3
DATA SHEET : DS-91910
DATE : 31May07
Cummins Inc. Columbus, Indiana
CURVE NO. : FR-91910