



Cummins Inc.

Columbus, Indiana 47201

Engine Data Sheet

Basic Engine Model:
QSL9-G3 NR3

Engine Critical Parts List:
CPL: 41404

Curve Number:
FR-91996

Date:
31Mar06

G-DRIVE
QSL
1

Displacement : **8.8 litre (543 in³)**

Bore : **114 mm (4.49 in.)** Stroke : **145 mm (5.69 in.)**

No. of Cylinders : **6**

Aspiration : **Turbocharged and Charge Air Cooled**

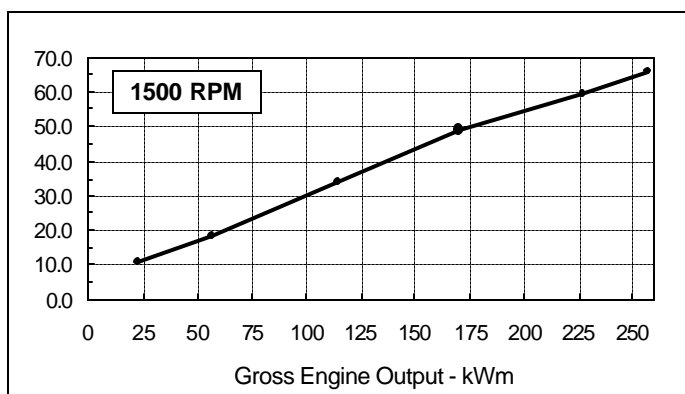
Engine Speed RPM	Standby Power		Prime Power		Continuous Power	
	kWm	BHP	kWm	BHP	kWm	BHP
1500	257	345	227	305	193	259
1800	297	399	262	352	223	299

Engine Performance Data @ 1500 RPM

Para mayor información visite: www.plantaselectricasdemexico.com

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm-h	lb/ BHP-h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	257	345	0.217	0.357	66	17.3
PRIME POWER						
100	227	305	0.221	0.364	59	15.6
75	170	228	0.246	0.405	49	13.0
50	114	152	0.253	0.416	34	8.9
25	57	76	0.264	0.435	18	4.7
CONTINUOUS POWER						
100	193	259	0.234	0.386	53	14.1

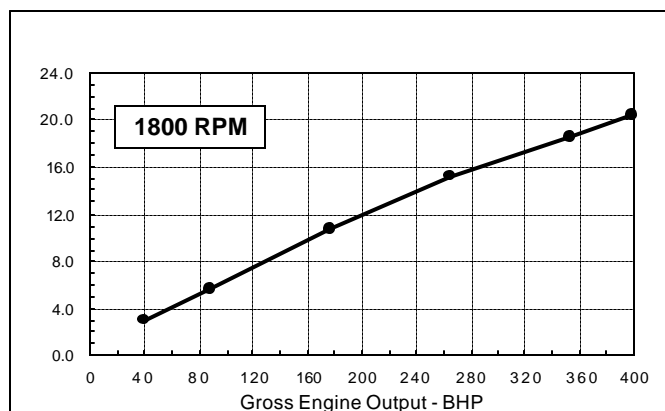
Litre/hour



Engine Performance Data @ 1800 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm-h	lb/ BHP-h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	297	399	0.221	0.364	77	20.4
PRIME POWER						
100	262	352	0.226	0.373	70	18.5
75	197	264	0.248	0.409	58	15.2
50	131	176	0.266	0.437	41	10.8
25	66	88	0.274	0.451	21	5.6
CONTINUOUS POWER						
100	223	299	0.241	0.396	63	16.7

U.S. Gallons / hour



CONVERSIONS: (litres = U.S. Gal x 3.785) (U.S. 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 15 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/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.

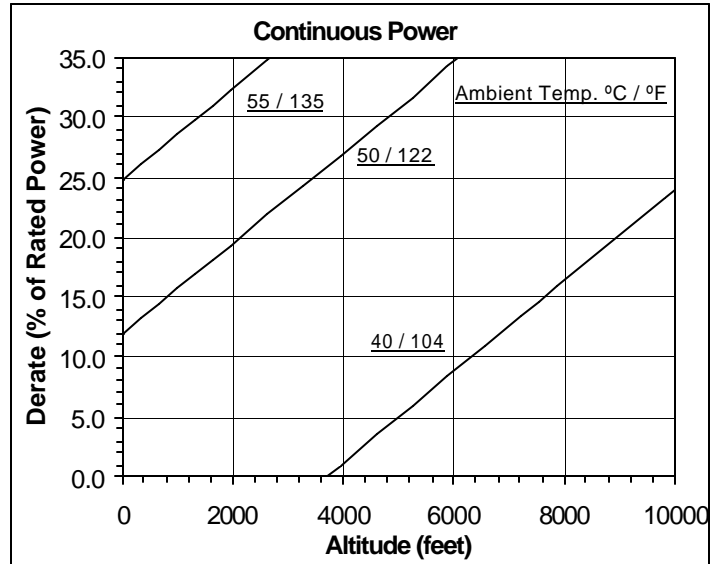
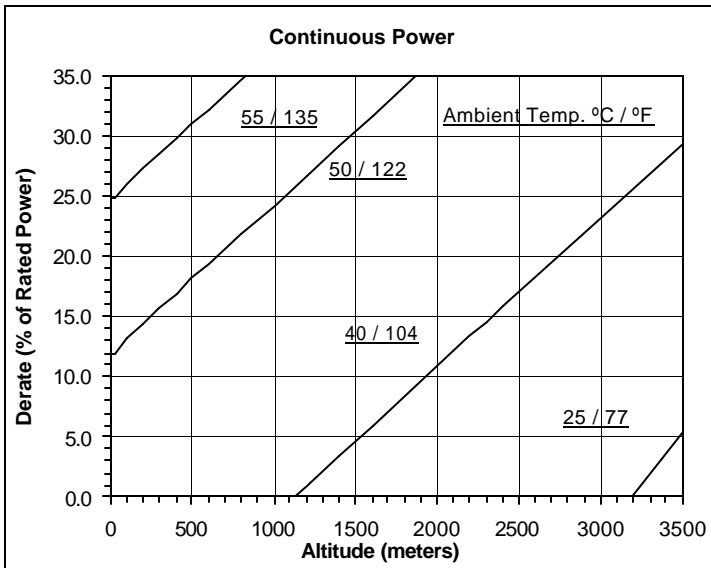
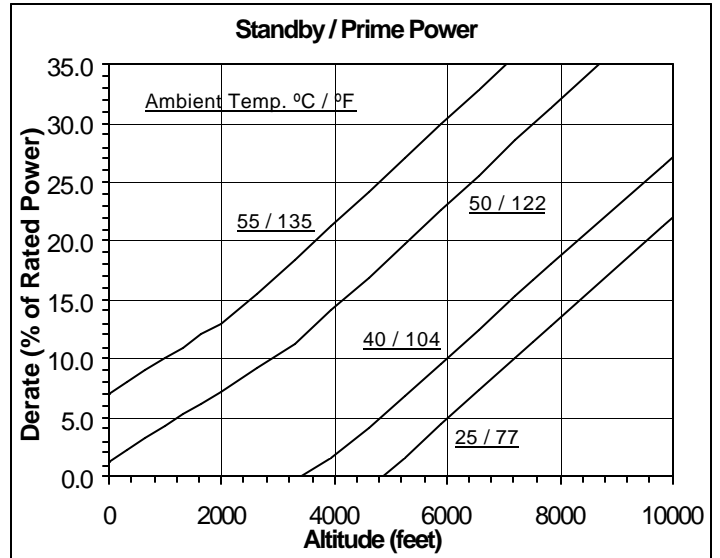
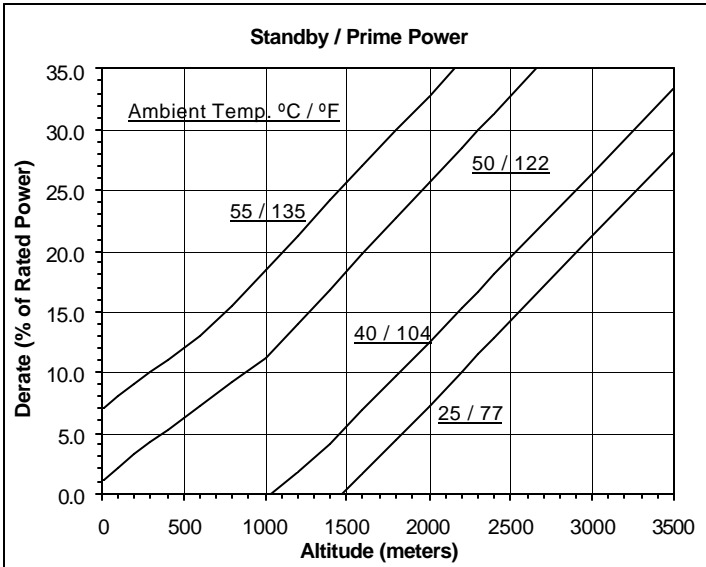
Data Status: --Limited Production--

Data Tolerance: ± 5%

Chief Engineer:

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 5.0% per 300 m (1000 ft), and 15% per 10° C (18° F).

For **Continuous operation** above these conditions, derate by an additional 4.0% per 300 m (1000 ft), and 25% per 10° C (18° F).

Operation At Elevated Temperature And Altitude:

For **Standby/Prime operation** above these conditions, derate by an additional 5.0% per 300 m (1000 ft), and 15% per 10° C (18° F).

For **Continuous operation** above these conditions, derate by an additional 4.0% per 300 m (1000 ft), and 25% per 10° C (18° F).

Cummins Inc.
Engine Data Sheet

ENGINE MODEL : **QSL9-G3 NR3** CONFIGURATION NUMBER : D563007GX03

DATA SHEET : DS41404

DATE : 31Mar06

PERFORMANCE CURVE : FR-91996

INSTALLATION DIAGRAM

• Fan to Flywheel : xxxxxxxx

CPL NUMBER

• Engine Critical Parts List : 41404

GENERAL ENGINE DATA

Type	4-Cycle; In-line; 6-Cylinder Diesel
Aspiration	Turbocharged and Charge Air Cooled
Bore x Stroke	4.49 x 5.69 (114 x 145)
Displacement	543 (8.8)
Compression Ratio	16.8 : 1
Dry Weight	
Fan to Flywheel Engine	1575 (714)
Wet Weight	
Fan to Flywheel Engine	1627 (738)
Moment of Inertia of Rotating Components	
• with FW 9520 Flywheel	44.85 (1.89)
• with FW 9525 Flywheel	58.66 (2.47)
Center of Gravity from Rear Face of Block	16.89 (429)
Center of Gravity Above Crankshaft Centerline	8.35 (212)
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 (76) |

AIR INDUCTION SYSTEM

Maximum Intake Air Restriction	
• with Dirty Filter Element	25 (635)
• with Clean Filter Element	15 (381)

COOLING SYSTEM

Jacket Water Circuit Requirements

Coolant Capacity — Engine Only	2.9 (11)
Maximum Static Head of Coolant Above Engine Crank Centerline	60 (18.3)
Standard Thermostat (Modulating) Range	180 - 199 (82 - 93)
Minimum Pressure Cap	15 (103)
Maximum Top Tank Temperature for Standby / Prime Power	230 / 219 (110 / 104)
Maximum Coolant Friction Head External to Engine	5 (35)
— 1500 rpm	4 (28)

Air-to-Air Core Requirements

Maximum Temp. Rise Between Engine Air Intake and Intake Manifold	45 (25)
Maximum Air Pressure Crop from Turbo Air outlet to Intake Manifold — 1800 rpm	4 (102)
— 1500 rpm	2.5 (63.5)

LUBRICATION SYSTEM

Oil Pressure @ Idle Speed	15 (103)
@ Governed Speed	40 - 60 (276 - 414)
Maximum Oil Temperature	250 (121)
Oil Capacity with OP 9451 Oil Pan : High - Low	5.3-6.3 (20-24)
Total System Capacity (Including Combo Filter)	7 (26.5)
Angularity of OP 9451 Oil Pan — Front Down	45°
— Front Up	45°
— Side to Side	45°

FUEL SYSTEM

Type Injection System	Bosch HPCR	
Maximum Restriction at Lift Pump	6	(152)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head).....	10	(254)
Maximum Fuel Flow to Injector Pump.....	43	(165)
Maximum Return Fuel Flow.....	8	(30)
Maximum Fuel Inlet Temperature	160	(70)

ELECTRICAL SYSTEM

Cranking Motor (Heavy Duty, Positive Engagement).....	12	24
Battery Charging System, Negative Ground.....	100	70
Maximum Allowable Resistance of Cranking Circuit.....	0.001	0.002
Minimum Recommended Battery Capacity		
Cold Soak @ 50-F (10-C) and Above.....	TBD	(TBD)
Cold Soak @ 32 to 50-F (0 to 10-C)	TBD	(TBD)
Cold Soak @ 0 to 32-F (-18 to 0-C)	1500	(750)

COLD START CAPABILITY

Minimum Ambient Temperature for Aided (with Coolant Heater) Cold Start within 10 seconds.....	TBD	(TBD)
Minimum Ambient Temperature for Unaided Cold Start	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
Exhaust Noise at 1 m Horizontal from Centerline of Exhaust Pipe Outlet Upwards at 45 °.....	--- dBA	TBD

Governed Engine Speed	— rpm
Engine Idle Speed	— rpm
Gross Engine Power Output.....	— BHP (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		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	399 (298)	345 (257)	352 (262)	305 (227)
Engine Idle Speed	325 (2241)	338 (2330)	287 (1979)	297 (2048)
Gross Engine Power Output.....	1707 (8.7)	1422 (7.2)	1707 (8.7)	1422 (7.2)
Brake Mean Effective Pressure	47 (35)	35 (26)	47 (35)	35 (26)
Piston Speed	64 (4.0)	52 (3.3)	64 (4.0)	52 (3.3)
Friction Horsepower	60 (3.8)	47 (3.0)	60 (3.8)	47 (3.0)
Engine Water Flow at Stated Friction Head External to Engine:				
• 2.5 psi Friction Head.....	785 (370)	660 (315)	770 (365)	655 (310)
• Maximum Friction Head.....	1105 (595)	1080 (585)	1035 (560)	995 (535)
Intake Air Flow.....	2165 (1020)	1800 (850)	2040 (965)	1685 (795)
Exhaust Gas Temperature	23 : 1	23 : 1	25 : 1	25 : 1
Exhaust Gas Flow	1160 (25)	1090 (20)	1145 (25)	960 (20)
Air to Fuel Ratio.....	6940 (125)	6030 (110)	6310 (115)	5535 (100)
Radiated Heat to Ambient	16015 (285)	13150 (235)	14510 (255)	11735 (210)
Heat Rejection to Jacket Coolant.....	65 (1.1)	65 (1.1)	65 (1.1)	65 (1.1)
Heat Rejection to Exhaust	3600 (65)	3005 (55)	3430 (65)	2925 (55)
Heat Rejected to Fuel	56 (26)	47 (22)	55 (25)	46 (22)
Heat Rejected to Aftercooler.....	65 (1651)	64 (1626)	63 (1600)	61 (1549)
Charge Air Flow.....	374 (190)	368 (187)	364 (184)	357 (181)
Turbocharger Compressor Outlet Pressure				
Turbocharger Compressor Outlet Temperature.....				

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

ENGINE MODEL : QSL9-G3 NR3
DATA SHEET : DS-41404
DATE : 31Mar06
CURVE NO. : FR-91996