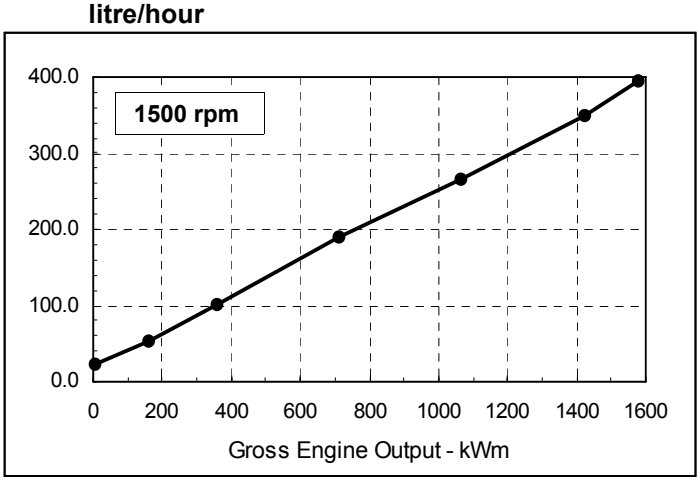
Cummins Inc.	Basic Engine Model:	Curve Number:	*G-DRIVE*
Columbus, Indiana 47202-3005	**QSK50-G7 NR2**	**FR-6653**	**QSK**
Engine Data Sheet	Engine Critical Parts List: **CPL: 43140**	Date: **28Jul09**	**1**

Displacement : **50.3** litre (**3067** in^3)	Bore : **159** mm (**6.25** in.) Stroke : **159** mm (**6.25** in.)
No. of Cylinders : **16**	Aspiration : **Turbocharged and Low Temperature Aftercooled (2 Pump/2 Loop)**

Engine Speed	Standby Power		Prime Power		Continuous Power	
rpm	kWm	hp	kWm	hp	kWm	hp
1500	1581	2120	1421	1905	1253	1680

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	1581	2120	0.212	0.349	394	104.1
PRIME POWER						
100	1421	1905	0.209	0.343	349	92.0
75	1066	1429	0.211	0.348	265	70.0
50	711	953	0.226	0.373	189	50.0
25	356	476	0.241	0.397	101	26.6
CONTINUOUS POWER						
100	1253	1680	0.210	0.346	310	81.8



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 15 in H_2O 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--

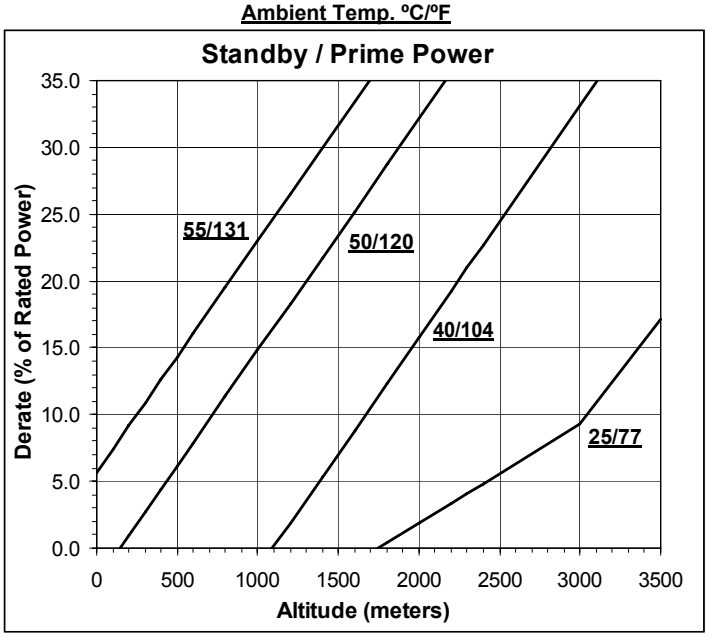
Data Tolerance: ± 5%

Chief Engineer:

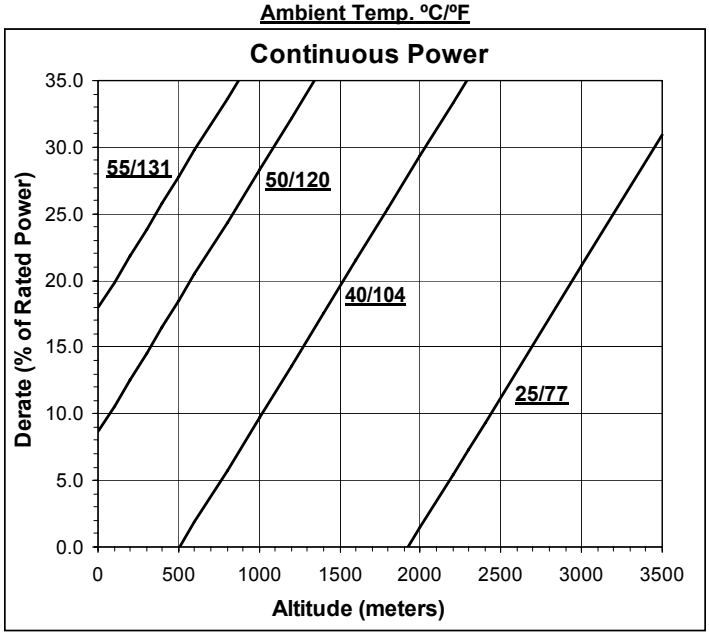
QSK50-G7 NR2

1500 rpm Derate Curves

Ambient Temp. ºC/ºF



Ambient Temp. ºC/ºF



Operation At Elevated Temperature And Altitude:

For **Standby/Prime Operation** above these conditions, derate by an additional 5% per 300 m (1000 ft), and 16% per 10^{o} C (18^{o} F).

For **Continuous Operation** above these conditions, derate by an additional 6% per 300 m (1000 ft), and 19% per 10^{o} C (18^{o} F).

Cummins Inc.
Engine Data Sheet

ENGINE MODEL : QSK50-G7 NR2 **CONFIGURATION NUMBER :**

DATA SHEET : DS-6653
DATE : 28Jul09
PERFORMANCE CURVE : FR-6653

INSTALLATION DIAGRAM
• Fan to Flywheel: 3170631

CPL NUMBER
• Engine Critical Parts List: 43140

GENERAL ENGINE DATA

Type		4-Cycle; 60 Vee; 16-Cyliner Diesel
Aspiration		Turbocharged and Low Temperature Aftercooled (2 Pump/2 Loop)
Bore x Stroke	— in x in (mm x mm)	159 x 159 (6.25 x 6.25)
Displacement	— in^3 (litre)	50.3 (3067)
Compression Ratio		15.0 : 1
Dry Weight (Approximate),		
Fan to Flywheel Engine (with SAE 0 Flywheel and Flywheel Housing)	— lb (kg)	11927 (5410)
Wet Weight (Approximate),		
Fan to Flywheel Engine	— lb (kg)	12593 (5712)
Moment of Inertia of Rotating Components		
• with FW 6066 Flywheel	— $lb_m \cdot ft^2$ ($kg \cdot m^2$)	301 (12.7)
• with FW 6057 Flywheel	— $lb_m \cdot ft^2$ ($kg \cdot m^2$)	515 (21.7)
Center of Gravity from Rear Face of Block	— in (mm)	47.5 (1206)
Center of Gravity Above Crankshaft Centerline	— in (mm)	11 (279)
Maximum Static Loading at Rear Main Bearing	— lb (kg)	2000 (908)

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block	— lb • ft (N • m)	4500 (6100)

EXHAUST SYSTEM

Maximum Back Pressure	— in Hg (kPa)	2 (6.8)

AIR INDUCTION SYSTEM

Maximum Intake Air Restriction		
• with Dirty Filter Element	— in H_2O (kPa)	25 (6.2)
• with Clean Filter Element	— in H_2O (kPa)	15 (3.7)

COOLING SYSTEM

Coolant Capacity — Engine	— US gal (litre)	37 (140)
Minimum Pressure Cap (for Cooling Systems with less than 2m [6 ft.] Static Head)	— psi (kPa)	14 (96)
Maximum Static Head of Coolant Above Engine Crank Centerline	— ft (m)	60 (18.3)
Jacket Water Circuit Requirements:		
Maximum Coolant Friction Head External to Engine — 1500 rpm	— psi (kPa)	7 (48)
Maximum Top Tank Temperature for Standby / Prime Power	— °F (°C)	220/212 (104/100)
Thermostat (Modulating) Range	— °F (°C)	180-200 (82-93)
Aftercooler Circuit Requirements:		
Coolant Capacity — Aftercoolers	— US gal (litre)	9 (34)
Maximum Coolant Friction Head External to Engine — 1500 rpm	— psi (kPa)	5 (35)
Maximum Inlet Water Temperature to Aftercoolers @ 25 °C (77 °F)	— °F (°C)	120 (49)
Maximum Inlet Water Temperature to Aftercoolers for Standby / Prime Power	— °F (°C)	160/150 (71/66)
Thermostat (Modulating) Range	— °F (°C)	115-135 (46-57)

LUBRICATION SYSTEM

Oil Pressure @ Idle Speed	— psi (kPa)	20 (138)
@ Governed Speed	— psi (kPa)	50-70 (345-483)
Maximum Oil Temperature	— °F (°C)	250 (121)
Oil Capacity with OP 6027 Oil Pan : Low - High	— US gal (litre)	46-54 (174-204)
Total System Capacity (Including Filter)	— US gal (litre)	62 (235)

FUEL SYSTEM

Type Injection System		Cummins MCRS	
Maximum Restriction at Lift Pump(clean/dirty filter)	— in Hg (kPa)	5.0/9.0	(17/34)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head)	— in Hg (kPa)	10.0	(34)
Maximum Fuel Flow to Injector Pump @ 1500 rpm	— US gph (litre/hr)	227	(859)
Maximum Return Fuel Flow .@ 1500 rpm	— US gph (litre/hr)	116	(439)
Maximum Fuel Inlet Temperature	— °F (°C)	160	(70)

ELECTRICAL SYSTEM

Cranking Motor (Heavy Duty, Positive Engagement)	— volt	24	
Battery Charging System, Negative Ground	— ampere	55	
Maximum Allowable Resistance of Cranking Circuit	— ohm	.002	
Minimum Recommended Battery Capacity			
• Cold Soak @ 0 °F to 32 °F (-18 °C to 0 °C)	— 0°F CCA	1800	

COLD START CAPABILITY

Minimum Ambient Temperature for NFPA 110 Cold Start (90 degree °F Coolant Temperature)	— °F (°C)	50	(10)
Minimum Ambient Temperature for Unaided Cold Start	— °F (°C)	45	(7)

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); @ 1500 rpm	— dBA	95 (est.)	
Exhaust Noise at 1 m Horizontal from Centerline of Exhaust Pipe Outlet Upwards at 45 °	— dBA	125 (est.)	

	STANDBY POWER		PRIME POWER	
	60 hz	*50 hz*	*60 hz*	*50 hz*
Governed Engine Speed — rpm	1800	1500	1800	1500
Engine Idle Speed — rpm		700 - 900		700 - 900
Gross Engine Power Output — hp (kW)		2120 (1581)		1905 (1421)
Brake Mean Effective Pressure — psi (kPa)		365 (2517)		328 (2261)
Piston Speed — ft/min (m/s)		1562 (7.9)		1562 (7.9)
Friction Horsepower — hp (kW)		155 (116)		155 (116)
Engine Water Flow at Stated Friction Head External to Engine:				
• 4 psi Friction Head — US gpm (litre/s)		448 (28)		448 (28)
• Maximum Friction Head — US gpm (litre/s)		416 (26)		416 (26)
Engine Data	**Not Available For 1800 RPM Operation**		**Not Available For 1800 RPM Operation**	
Intake Air Flow — cfm (litre/s)		4400 (2080)		4100 (1935)
Exhaust Gas Temperature — °F (°C)		960 (520)		915 (490)
Exhaust Gas Flow — cfm (litre/s)		11355 (5360)		10325 (4875)
Air to Fuel Ratio — air : fuel		25.3 : 1		26.7 : 1
Radiated Heat to Ambient — BTU/min (kW)		9020 (160)		7975 (145)
Heat Rejection to Engine Jacket Radiator — BTU/min (kW)		38720 (685)		32855 (580)
Heat Rejection to Exhaust — BTU/min (kW)		64555 (1135)		58005 (1020)
Heat Rejected to Fuel* — BTU/min (kW)		475 (8)		475 (8)
Engine Aftercooler Data				
Heat Rejection to Coolant — BTU/min (kW)		23150 (410)		19590 (345)
Aftercooler Water Flow at Stated Friction Head External to Engine				
• 2 psi Friction Head — US gpm (litre/s)		123 (8)		123 (8)
• Maximum Friction Head — US gpm (litre/s)		121 (7.6)		121 (7.6)

* 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 : **QSK50-G7 NR2**
DATA SHEET : DS-6653
DATE : 28Jul09
CURVE NO. : FR-6653