



CUMMINS ENGINE COMPANY, INC

Columbus, Indiana 47201

ENGINE PERFORMANCE CURVE

Basic Engine Model:

QST30-G2

Engine Critical Parts List:

CPL: 2839

Curve Number:

FR-5186

Date:

29Mar01

G-DRIVE

Q30

1

Displacement : **30.48 litre (1860 in³)**

Bore : **140 mm (5.51 in.)** Stroke : **165 mm (6.50 in.)**

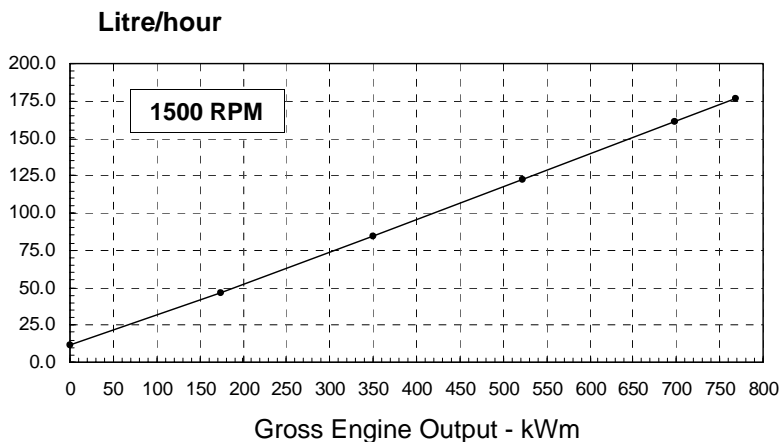
No. of Cylinders : **12**

Aspiration : **Turbocharged and Aftercooled**

Engine Speed RPM	Standby Power		Prime Power		Continuous Power	
	kWm	BHP	kWm	BHP	kWm	BHP
1500	768	1030	698	935	537	720
1800	895	1200	809	1085	652	875

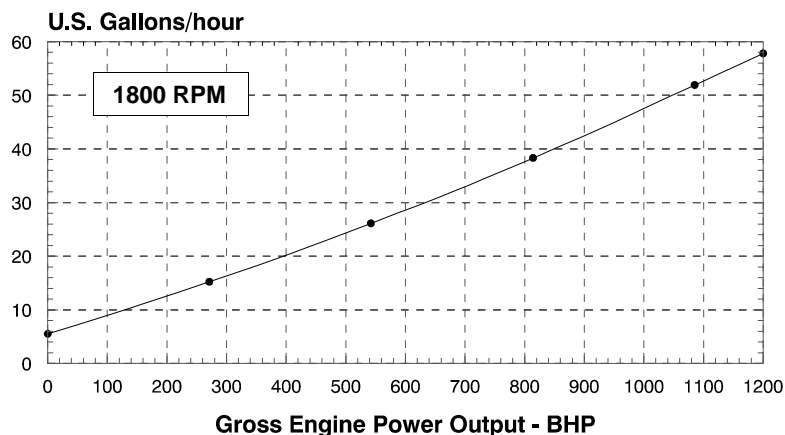
Engine Performance Data @ 1500 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm·h	lb/ BHP·h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	768	1030	0.197	0.323	177	46.9
PRIME POWER						
100	698	935	0.197	0.324	161	42.7
75	523	701	0.199	0.327	122	32.3
50	349	468	0.205	0.337	84	22.2
25	174	234	0.230	0.377	47	12.4
CONTINUOUS POWER						
100	537	720	0.199	0.326	125	33.1



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	895	1200	0.208	0.342	219	57.8
PRIME POWER						
100	809	1085	0.207	0.340	197	51.9
75	607	814	0.203	0.334	145	38.3
50	404	542	0.213	0.351	102	26.8
25	202	271	0.242	0.399	58	15.2
CONTINUOUS POWER						
100	652	875	0.202	0.333	149	41.0



CONVERSIONS: (Litres = U.S. Gal x 3.785) (kWm = BHP x 0.746) (U.S. Gal = Litres x 0.2642) (BHP = kWm x 1.34)

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. See reverse side for application rating guidelines.

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.

D.K. Trueblood
CHIEF ENGINEER

POWER RATING APPLICATION GUIDELINES FOR GENERATOR DRIVE ENGINES

These guidelines have been formulated to ensure proper application of generator drive engines in A.C. generator set installations. Generator drive engines are not designed for and shall not be used in variable speed D.C. generator set applications.

STANDBY POWER RATING is 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.

CONTINUOUS POWER RATING is 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.

PRIME POWER RATING is 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

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.

Reference Standards:

BS-5514 and DIN-6271 standards are based on ISO-3046.

Operation At Elevated Temperature And Altitude:

The engine may be operated at:

1800 RPM up to 1524 m (5,000 ft) and 35 °C (95 °F) without power deration.

1500 RPM up to 1524 m (5,000 ft) and 35 °C (95 °F) without power deration.

Note:

For altitudes less than 305 m (1,000 ft), the engine may be operated at 1500 RPM and 1800 RPM up to 52 °C (125 °F) without power deration.

For sustained operation above these conditions, derate by 4% per 300 m (1,000 ft), and 2% per 11° C (1% per 10° F).

Cummins Engine Company, Inc.

Engine Data Sheet

G-DRIVE

Q30

3

ENGINE MODEL : QST30-G2

CONFIGURATION NUMBER : D573001GX03

DATA SHEET : DS-5186

DATE : 29Mar01

PERFORMANCE CURVE : FR-5186

INSTALLATION DIAGRAM

- Fan to Flywheel : 3626434
- Heat Exchanger Cooled : N/A

CPL NUMBER

- Engine Critical Parts List : 2839

GENERAL ENGINE DATA

Type	4-Cycle; 50° Vee; 12-Cylinder Diesel
Aspiration	Turbocharged and Aftercooled
Bore x Stroke..... — mm x mm (in x in)	140 x165 (5.51 x 6.50)
Displacement..... — liter (in ³)	30.48 (1860)
Compression Ratio.....	14.0 : 1
Dry Weight	
Fan to Flywheel Engine..... — kg (lb)	2967 (6540)
Wet Weight	
Fan to Flywheel Engine..... — kg (lb)	3062 (6750)
Moment of Inertia of Rotating Components	
• with FW 5050 Flywheel	— kg • m ² (lb _m • ft ²) 8.7 (206)
Center of Gravity from Rear Face of Flywheel Housing (FH 5031).....	— mm (in) 845 (33.3)
Center of Gravity above Crankshaft Centerline.....	— mm (in) 195 (7.7)
Maximum Static Loading at Rear Main Bearing.....	— kg (lb) 950 (2100)

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block.....	— N • m (lb • ft)	3100 (2286)
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EXHAUST SYSTEM

Maximum Back Pressure.....	— mm Hg (in Hg)	76 (3.0)
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AIR INDUCTION SYSTEM

Maximum Intake Air Restriction	
• with Dirty Filter Element.....	— mm H ₂ O (in H ₂ O) 635 (25)
• with Normal Duty Air Cleaner and Clean Filter Element.....	— mm H ₂ O (in H ₂ O) 254 (10)
• with Heavy Duty Air Cleaner and Clean Filter Element.....	— mm H ₂ O (in H ₂ O) 381 (15)

COOLING SYSTEM

Coolant Capacity — Engine Only	— liter (US gal)	85 (22.4)
Maximum Coolant Friction Head External to Engine		
— 1800 rpm.....	— kPa (psi)	69.0 (10.0)
— 1500 rpm.....	— kPa (psi)	48.0 (7.0)
Maximum Static Head of Coolant Above Engine Crank Centerline.....	— m (ft)	14 (46)
Standard Thermostat (Modulating) Range	— °C (°F)	82 - 95 (180 - 203)
Minimum Pressure Cap	— kPa (psi)	69.0 (10)
Maximum Top Tank Temperature for Standby / Prime Power	— °C (°F)	104 / 100 (220 / 212)

LUBRICATION SYSTEM

Oil Pressure @ Idle Speed	— kPa (psi)	166 (24.0)
@ Governed Speed	— kPa (psi)	310 - 386 (45.0 - 56.0)
Maximum Oil Temperature.....	— °C (°F)	121 (250)
Oil Capacity with OP 5133 Oil Pan : High - Low	— liter (US gal)	133 - 114 (35 - 30)
Total System Capacity (Including Bypass Filter).....	— liter (US gal)	154 (40.7)
Angularity of OP 5133 Oil Pan		
— Front Down		17°
— Front Up		35°
— Side to Side.....		35°

FUEL SYSTEM

Type Injection System.....	Bosch P7100 Direct Injection	
Maximum Restriction at Lift Pump — with Clean Fuel Filter	— mm Hg (in Hg)	102 (4)
— with Dirty Fuel Filter	— mm Hg (in Hg)	203 (8)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head).....	— mm Hg (in Hg)	508 (20)
Maximum Fuel Flow to Injection Pumps (LB and RB combined) — 1800 RPM.....	— liter / hr (US gph)	382 (101)
— 1500 RPM.....	— liter / hr (US gph)	370 (98)
Maximum Drain Flow (@ Minimum load) — 1800 RPM.....	— liter / hr (US gph)	363 (96)
— 1500 RPM.....	— liter / hr (US gph)	356 (94)
Maximum Fuel Inlet Temperature.....	— °C (°F)	66 (150)

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 @ 50 °F (10 °C) and Above.....	— 0°F CCA	1200
• Cold Soak @ 32 °F to 50 °F (0 °C to 10 °C).....	— 0°F CCA	1280
• Cold Soak @ 0 °F to 32 °F (-18 °C to 0 °C).....	— 0°F CCA	1800

COLD START CAPABILITY

Minimum Ambient Temperature for Aided (with Coolant Heater) Cold Start within 10 seconds to Rated Speed	— °C (°F)	10 (50)
Minimum Ambient Temperature for Aided (with Grid Heater) Cold Start	— °C (°F)	-10 (14)
Minimum Ambient Temperature for Unaided Cold Start.....	— °C (°F)	0 (32)

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	: 99 kPa (29.3 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 / 1500 rpm — dBA 94 / 92

Exhaust Noise at 1 m Horizontally from Centerline of Exhaust Pipe Outlet Upwards at 45° (1800 rpm / 1500 rpm).....— dBA 118 / 117

Governed Engine Speed.....	— rpm
Engine Idle Speed.....	— rpm
Gross Engine Power Output	— kW _m (BHP)
Brake Mean Effective Pressure	— kPa (psi)
Piston Speed.....	— m / s (ft / min)
Friction Horsepower.....	— kW _m (HP)
Engine Water Flow at Stated Friction Head External to Engine:	
• 5 psi Friction Head.....	— liter / s (US gpm)
• Maximum Friction Head.....	— liter / s (US gpm)

Engine Data with Dry Type Exhaust Manifold

Intake Air Flow.....	— liter / s (cfm)
Exhaust Gas Temperature.....	— °C (°F)
Exhaust Gas Flow.....	— liter / s (cfm)
Air to Fuel Ratio.....	— air : fuel
Radiated Heat to Ambient	— kW _m (BTU / min)
Heat Rejection to Coolant	— kW _m (BTU / min)
Heat Rejection to Exhaust.....	— kW _m (BTU / min)

STANDBY		PRIME POWER	
60 hz	50 hz	60 hz	50 hz
1800	1500	1800	1500
700 - 900	700 - 900	700 - 900	700 - 900
895 (1200)	768 (1030)	809 (1085)	698 (935)
1958 (284)	2013 (292)	1772 (257)	1827 (265)
9.9 (1949)	8.3 (1634)	9.9 (1949)	8.3 (1634)
82 (110)	58 (78)	82 (110)	58 (978)
15.5 (246)	12.5 (198)	15.5 (246)	12.5 (198)
15.0 (238)	12.0 (190)	15.0 (238)	12.0 (190)
1152 (2440)	864 (1830)	1072 (2270)	776 (1644)
496 (924)	557 (1035)	467 (873)	538 (1000)
3118 (6603)	2526 (5349)	2794 (5917)	2216 (4693)
25.8 : 1	22.1 : 1	26.7 : 1	22.3 : 1
132 (7510)	112 (6370)	119 (6750)	101 (5765)
516 (29355)	424 (24120)	469 (26675)	382 (21750)
657 (37380)	562 (31980)	581 (33045)	508 (28908)

N.A. - Data is Not Available

N/A - Not Applicable to this Engine

TBD - To Be Determined