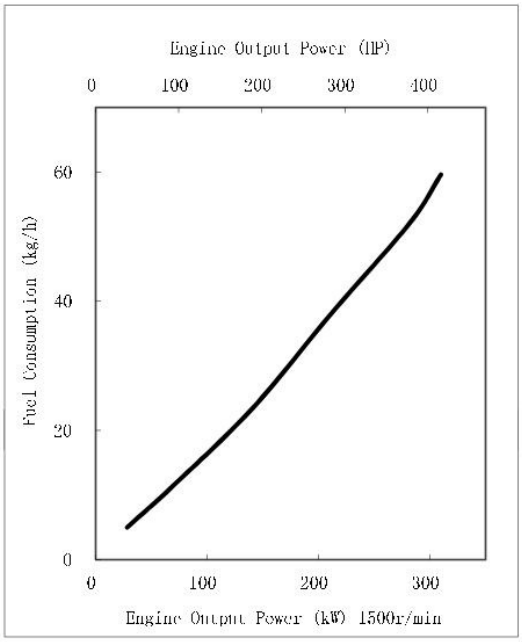
	CUMMINS ENGINE PERFORMANCE CURVE	Engine Model MTAA11-G3		Curve No. C-0237A	Date 2008.07
		CPL Code CQ223	Data Sheet C-0237A	Emission Level	

Displacement:	14L	[855 in.^{3}]	Cylinders:	6	Fuel System: PT
Bore:	125mm	[5.50 in.]	Speed:	1500r/min	Cfg. Number: D353009GX03
Stroke:	152mm	[6.00in.]	Aspiration:	Turbocharged and Charged Air Cooled	

Standby Power		Prime Power		Continuous Power	
kW	HP	kW	HP	kW	HP
310	415	282	378	210	282



	Output Power		Fuel Consumption
	HP	kW	kg/h
Standby100%	415	310	59.6
Prime100%	378	282	52.1
75%	284	212	38.2
50%	189	141	23.5
25%	95	71	11.7
10%	37	28	5.0
Cont.100%	282	210	40

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, optional equipment and driven components.

--Engine operating with fuel corresponding to grade No.2-D per ASTM D975.

--ISO 3046, Part1, Standard Reference Conditions of : Barometric Pressure:100kPa(29.5in.Hg); Air Temperature: 25°C (77°F) ; Relative Humidity: 30% .

Tolerance is certified within 5%.

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 5000 ft. (1525 m) and 104 °F (40 °C) without power deration.

1500 RPM up to 5000 ft. (1525 m) and 104 °F (40 °C) without power deration.

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

Cummins Engine Co. Ltd.

Engine Data Sheet

MODEL:	**MTAA11-G3**	**DATA SHEET:**	**C-237A**
CONFIGURATION NO.:	**D353009GX03**	**PERFORMANCE CURVE:**	**C-237A**
CPL NUMBER:	**CQ223**	**INSTALLATION DIAGRAM:**	**4915163**
PRIME POWER	**282kW/1500r/min@50Hz**	**DATE:**	**2008.07**
STANDBY POWER:	**310kW/1500r/min@50Hz**	**EMISSION LEVEL:**	

GENERAL ENGINE DATA

Type	6-Cylinder;In-line;4-Cycle	
Aspiration	Turbocharged and Charged Air Cooled	
Bore x Stroke - in.×in. (mm×mm)	4.92 ×5.79	(125 × 147)
Displacement - $in.^3$(L)	661	(10.8)
Compression Ratio	15.0:1	
Firing Order	1-5-3-6-2-4	
Dry Weight		
--Including Flywheel and Generator		
Excluding other Electrial Component - lb. (kg)	2059	(934)
Wet Weight		
--Engine Only - lb. (kg)	2141	(971)
Moment of Inertia of Rotating Components		
- With FW2141 flywheel - $lb.\cdot ft.^2$ ($kg\cdot m^2$)	62.4	(2.63)
Center of Gravity from Front Face of Block - in.(mm)	17.7	(450)
Center of Gravity Above Crankshaft Centerline - in.(mm)	7.5	(190)

ENGINE MOUNTING

Maximum Allowable Bending Moment at Rear Face of Block - lb.·ft. (N·m)	1000	(1356)

EXHAUST SYSTEM

Maximum Allowable Back Pressure - in.Hg (kPa)	3.0	(10)

AIR INDUCTION SYSTEM

Maximum Allowable Intake Air Restriction - in. H2O (kPa)		
--with Dirty Filter Element	25	(6.2)
--with Normal Duty Air Cleaner and Clean Filter Element	10	(2.5)
--with Heavy Duty Air Cleaner and Clean Filter Element	15	(3.7)

CHARGE AIR COOLING

Design Parameters for Ambients		
Max. Inlet Manifold Temperature - °C (°F)	55	(131)
Max. △P between Turbocharger Outlet and Intake Manifold - kPa	16.7	
Intake Pipe Size Allowable - mm	100	

COOLING SYSTEM

Coolant Capacity - Engine Only - U.S. gal (L)	2.5	(9.5)
- With Radiator - U.S. gal (L)	N/A	
Maximum Coolant Friction Head External to Engine		
-1800rpm - PSI (kPa)	6	(41)
-1500rpm - PSI (kPa)	5	(34)
Maximum Static Head of Coolant Above Engine Crank Centerline -ft. (m)	46	(14.0)
Standard Thermostat (Modulating) Range - °F (°C)	180 - 202	(82 - 94)
Minimum Allowable Pressure Cap -PSI (kPa)	7	(50)
Maximum Top Tank Temperature -for Standby/Prime °F (°C)	220/212	(104/100)

LUBRICATION SYSTEM

Oil Pressure @ Idle Speed - PSI (kPa)	10	(69)
@ Governed Speed - PSI (kPa)	30-50	(207 - 345)
Maximum Allowable Oil Temperature - °F (°C)	250	(121)
Oil Pan Capacity with OP2152 - Low / High - U.S. gal. (L)	7 / 9	(26.5 / 34.0)
Total System Capacity(with LF9009 Combine Filter) - U.S. gal. (L)	9.7	(36.7)

Angularity of OP2152 OIL PAN

Rear Down	45°
Front Down	42°
Exhaust Side Down	45°
Fuel Pump Side Down	40°

FUEL SYSTEM

Type Injection System	Direct Injection Cummins PT	
Maximum Allowable Restriction to Fuel Pump		
-- With Clean Fuel Filter - in.Hg (kPa)	4.0	(13.5)
-- With Dirty Fuel Filter - in.Hg (kPa)	8.0	(27.1)
Maximum Allowable Head on Injector Return Line		
-- With Check Valve - in.Hg (kPa)	6.5	(22.0)
-- Without Check Valve - in.Hg (kPa)	2.5	(8.5)

ELECTRICAL SYSTEM

Standard Cranking Motor (Heavy Duty , Positive Engagement） - volt	24
Standard Battery Charging System , Negative Ground - ampere	35
Maximum Allowable Resistance of Cranking Circuit - ohm	0.002
Minimum Recommended Battery Capacity	
- 50°F（ 10°C ）and Above-CCA	600
- 32°F-50°F（0°C-10°C）-CCA	640
- 0°F-32°F（-18°C-0°C）-CCA	900

CRANKING SYSTEM

-- Minimum Cranking Speed Required for Unaided Cold Start -r/min	150

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 driven components.

--Engine operating with fuel corresponding to grade No.2-D per ASTM D975.

--ISO 3046, Part1, Standard Reference Conditions of : Barometric Pressure:100kPa(29.5in.Hg); Air Temperature: 25°C (77°F) ; Relative Humidity: 30% .

Steady State Stability Band at any Constant Load -% +/-0.25

	Standby Power	Prime Power
Governed Engine Speed -rpm	1500	1500
Engine Idle Speed -rpm	675-700	675-700
Gross Engine Power Output - kW	310	282
Friction Horsepower - kW	22	22
Engine Water Flow - L/s	3.8	3.8
Engine Data with Dry Type Exhaust Manifold		
Intake Air Flow - L/s	395	365
Exhaust Gas Temperature - °C	595	580
Exhaust Gas Flow - L/s	950	850
Heat Rejection to Ambient - kW	43	40
Heat Rejection to Coolant - kW	95	83
Heat Rejection to Exhaust - kW	270	234

Engine Model: MTAA11-G3
Data Sheet: C-237A
Date: 2012.07

CUMMINS ENGINE CO. LTD.