

12M33D1108E200 G-Drive Engine Data Sheet

Speed	Gross Engine Output		
	COP	PRP	ESP
rpm	kWm	kWm	kWm
1500	856	1007	1108

Ratings Definitions

	Continuous Power (COP)	Prime Power (PRP)	Standby Power (ESP)
Mean engine load factor	100%	≤70% per 250 h	≤80% per 24 h
Annual working time	Unlimited	Unlimited	≤200 h
Time at full load	Unlimited	≤500 h per year	≤25 h per year
Overload capacity	No	1 h per 12 h (10% overload)	No

- 1) The power ratings are in accordance with ISO 3046.
- 2) Test conditions: 100 kPa, 25 °C air inlet temperature, relative humidity of 30%, with fuel density 0.84 kg/L.
- 3) The engine maybe operated at : up to 1000m and 30 °C without power deration. For sustained operation above these conditions, derate by 3% per 300m, and 2% per 11 °C.
- 4) 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 and optional equipment.

Engine basic data

Engine model	12M33D1108E200	Cylinder number	12
bore diameter /stroke mm	150×185	Displacement(L)	39.2
Fuel System	Mechanical Pump	Aspiration	Turbocharged and Intercooled
Compression Ratio	15:1	Emission Standard	/
Overall Dimension (Length×Width×Height) (mm)	2019×1338×1730	Engine net weight (kg)	3390
Injection timing (°CA)	21-22		
Flywheel housing	SAE 0	Flywheel	18
Max. Permissible Fixing Angle (°)	Longitudinal Inclination	Front /Rear	/
	Cross Inclination	Left/Right	/
Dynamic angle (°)	Longitudinal Inclination	Front/Rear	/
	Cross Inclination	Exhaust pipe side /Intake pipe side	/

Permitted temperature ambient °C	-10~50	Permitted altitude limit m	2000
Valve lashes at cold (mm)	(intake valve:0.3±0.03) /(exhaust valve:0.4±0.03)		

Performance Data

Idle Speed (rpm)	700-750	Over Speed limit (rpm)	1545
Mean Piston Speed (m/s)	9.25	BMEP (MPa)	2.055
Friction Power (kW)	/	Fan Power (kW)	/
Load factor	Power kW	Fuel consum. g/kW.h	Fuel consum. L/h
10%	100.7	299.5	35.90
25%	251.75	221.4	66.35
50%	503.5	199.3	119.46
75%	755.25	194.6	174.97
85%	855.95	195	198.70
100%	1007	197	236.17
110%	1108	199.1	262.62

Air intake system

Intake air temperature rise (°C)	Permitted difference between turbocharger inlet temperature and ambient temperature(this parameter impacts emission ,LAT and altitude capability)	≤5
Intake air resistance (kPa)	Clean filter	≤3
	Dirty filter	≤5
Air filter mass flow (kg/h)		/
Air mass flow (kg/h)	Rated Power	4968
	Standby Power	5356
Clear efficiency of air filter (%)		0.995
Recommended Min. diameter of intake pipe (mm)		160

Inter cooling system

Intercooler heat dissipating capacity (KJ/S)	Rated Power	170.3
	Standby Power	198
Intercooler efficiency (%)	Rated Power	≥85
	Standby Power	≥85
Max. intake temperature (°C)		55

Max. difference between intake temperature and ambient temperature (°C)	30
Permitted max. intake pressure drop of intercooler (kPa)	12
Recommended intercooler radiator cooling area (m ²)	170

Exhaust system

Max. exhaust back pressure (kPa)	7.5	
Max. exhaust temperature (°C)	Before turbocharger	700
	After turbocharger	550 (rated power)
Recommended muffler mass flow/volume (kg/h)	/	
Exhaust-gas mass flow (kg/h)	Rated Power	5166
	Standby Power	5576
Recommended Min. diameter of exhaust pipe (mm)	220	
Max. bending moment of turbocharged flange (N•m)	10	

Lubrication system

Volume of oil pan (L)	146	
Oil pressure in normal condition (kPa)	Idle speed	≥200
	Rated Power	450~650
Alarm for low & high oil pressure (kPa)	200/1000	
Temperature range in main oil passage at rated working condition (°C)	85~105	
max. oil temperature (°C)	/	
Max. oil pressure while engine starting (kPa)	1000	
Opening pressure of main oil passage pressure limiting valve (kPa)	500-550	
Max. Oil flow (L/min)	≥392	
Oil consumption	≤0.4%	

Noise and Emission

Emission standard	Off-road stageII	
Exhaust smoke (FSN)	Rated Power	Rb≤1.5
	Standby Power	/
Diesel engine noise dB(A)	sound power level : 121	

Fuel system

Injection pump type	Mechanical
Governor	Electric governer
Steady speed governing factor	±3%

Max supply fuel restriction at rated power conditon (kPa)		13
Return restriction in pipe (kPa)		15
Max. supply fuel temperature at rated power condition (°C)		45
Max. flow of fuel suply (kg/h)	Rated Power	198.4
	Standby Power	220.45
Min. pressure of fuel pump (kPa)		35
Min. Ventilation rate of fuel tank (L/h)		/
Recommended diameter of inlet pipe (mm)		10
Recommended diameter of return pipe (mm)		10

Electrical system

Electrical system voltage (V)		24
Motor power/ working voltage (kW/V)		10/24
Battery charging Alternator/ working voltage (kW/V)		1.54/28
Permitted max. electric resistance of motor control lines (Ω)		0.002
Recommended Min. conductor cross-sectional area (mm ²)		70
The lowest cold starting temperature (°C)	No aided starting device	-5
	Aided starting device	-10

Cooling system

Water pump Transmission ratio		1.9
Min. coolant temperature of engine working (°C)		50
Min. water fill rate (L/min)		17.4
Max. initial fill time (min)		9
Recommended Min diameter of outside water pipe(mm)		45
Min. pressure at water pump inlet at No or only a part of degassing Device (kPa)		50
Min. pressure at water pump inlet at Complete degassing device (kPa)		0
Max. deaeration time(min)		15
Min. expansion tank volume (% total cooling system capacity)		/
Min expansion space (% total cooling system capacity)		/
Coolant capacity of engine (L)		75.94

Coolant capacity of radiator (L)	/
High temperature of alarm (°C)	95
Thermostat opening temp./ full open temp. (°C)	77(1/-2)/87
Min. permitted pressure in cooling system (kPa)	50
Max. permitted external resistance (at rated speed) (kPa)	50

Heat balance test data (ambient temperature: 28.5°C)

Pressure of water in/ water out (kPa / kPa)	Rated Power	left: -29.7/81.7; right: -36.8/72.2
	Standby Power	left: -25.9/77.2; right: -30.3/71.0
Coolant mass flow (m ³ /h)	Rated Power	left: 39.9; right: 37.9
	Standby Power	left: 38.3; right: 36.6
Temperature of water in/ water out (°C/°C)	Rated Power	left: 83.6/87.3; right: 83.5/87.7
	Standby Power	left: 88.5/92.6; right: 88.4/93.0
Temperature of intake air : before/after intercooler (°C/°C)	Rated Power	left: 168.0/54.7; right: 174.0/55.2
	Standby Power	left: 184.0/61.7; right: 189.0/61.3
Pressure of intake air :before /after intercooler (kPa / kPa)	Rated Power	left: 190.0/178.6; right: 199.6/185.4
	Standby Power	left: 215.6/205.5; right: 222.2/208.4
Heat be taken away by Coolant (kJ/s)	Rated Power	306.6
	Standby Power	350.6
Heat be taken away by intercooler (kJ/s)	Rated Power	170.3
	Standby Power	198
Heat be taken away by exhaust gas (kJ/s)	Rated Power	742.9
	Standby Power	841.7
Gross Heat of Engine (kJ/s)	Rated Power/Standby Power	2308.9/2563.3

Mounting system

Inertia of complete engine (kg•m ²)	/	
	/	
	/	
Inertia of flywheel (kg•m ²)	7.18	
Inertia of crankshaft (including crankshaft gear) (kg•m ²)	4.52	
Centroid position mm	X	/
	Y	/
	Z	/
Permitted static bending moment at flywheel housing flange face	/	