

## 12M33D1210E200 G-Drive Engine Data Sheet

Speed	Gross Engine Output		
	COP	PRP	ESP
rpm	kWm	kWm	kWm
<b>1500</b>	<b>880</b>	<b>1100</b>	<b>1210</b>

### 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	12M33D1210E200	Cylinder number/valve number	12/48
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)	2.245
Friction Power (kW)	/	Fan Power (kW)	/
<b>Load factor</b>	<b>Power kW</b>	<b>Fuel consum. g/kW.h</b>	<b>Fuel consum. L/h</b>
10%	110	288.7	37.81
25%	275	217.4	71.17
50%	550	197.3	129.18
75%	825	194.2	190.73
85%	935	194.7	216.72
100%	1100	197.5	258.63
110%	1210	200.5	288.82

## 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	5520
	Standby Power	5938
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	248.3
	Standby Power	278.5
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 <sup>2</sup> )	170

## Exhaust system

Max. exhaust back pressure (kPa)	7.5	
Max. exhaust temperature (°C)	Before turbocharger	700
	After turbocharger	550
Recommended muffler mass flow/volume (kg/h)	/	
Exhaust-gas mass flow (kg/h)	Rated Power	5739
	Standby Power	6181
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 : 121.6	

## 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	219.5
	Standby Power	243.3
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 <sup>2</sup> )		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: 40.3°C)

Pressure of water in/ water out (kPa / kPa)	Rated Power	left: -18.8/65.6; right: -31.0/84.6
	Standby Power	left: -12.4/50.7; right: -28.4/67.2
Coolant mass flow (m <sup>3</sup> /h)	Rated Power	left: 41.5; right: 38.8
	Standby Power	left: 38.5; right: 35.3
Temperature of water in/ water out (°C/°C)	Rated Power	left: 85.4/89.7; right: 85.4/89.9
	Standby Power	left: 84.4/89.9; right: 84.4/89.8
Temperature of intake air : before/after intercooler (°C/°C)	Rated Power	left: 208.0/58.2; right: 202.0/58.6
	Standby Power	left: 213.0/57.4; right: 212.0/58.6
Pressure of intake air :before /after intercooler (kPa / kPa)	Rated Power	left: 209.0/195.9; right: 212.6/193.8
	Standby Power	left: 239.6/223.8; right: 232.9/214.2
Heat be taken away by Coolant (kJ/s)	Rated Power	411.5
	Standby Power	450.6
Heat be taken away by intercooler (kJ/s)	Rated Power	248.2
	Standby Power	280.6
Heat be taken away by exhaust gas (kJ/s)	Rated Power	840.6
	Standby Power	927.7
Gross Heat of Engine (kJ/s)	Rated Power/Standby Power	2308.9/2563.3

### Mounting system

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