

WP4D108E200 G-Drive Engine Data Sheet

Speed	Gross Engine Output		
	COP	PRP	ESP
rpm	kWm	kWm	kWm
1500	/	/	108

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	WP4D108E200	Cylinder number/Valve number	4/8
bore diameter /stroke mm	105×130	Displacement(L)	4.5
Fuel System	Mechanical Pump	Aspiration	Turbocharged and Intercooled
Compression Ratio	18:1	Emission Standard	Off-road StageII
Overall Dimension (Length×Width×Height) (mm)	1000×688×980	Engine net weight (kg)	580±50
Injection timing (°CA)	7±0.5		
Flywheel housing	SAE3	Flywheel	11.5
Max. Permissible Fixing Angle (°)	Longitudinal Inclination	Front /Rear	10/10
	Cross Inclination	Left/Right	10/10
Dynamic angle (°)	Longitudinal Inclination	Front/Rear	/
	Cross Inclination	Exhaust pipe side /Intake pipe side	/

Permitted temperature ambient °C	-30-50	Permitted altitude limit m	2000
Valve lashes at cold (mm)	intake: 0.2~0.25/ exhaust: 0.3~0.35		

Performance Data

Idle Speed (rpm)	650±25	Over Speed limit (rpm)	1545
Mean Piston Speed (m/s)	6.5	BMEP (MPa)	1.918
Friction Power (kW)	/	Fan Power (kW)	4.5
Load factor	Power kW	Fuel consum. g/kW.h	Fuel consum. L/h
10%	10.1	298.8	3.00
25%	24.5	225.1	5.52
50%	49.1	203.4	9.99
75%	73.7	198.8	14.65
80%	78.7	198.3	15.61
100%	98.2	199.2	19.55
110%	108	202	21.81

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)	≤15
Intake air resistance (kPa)	Clean filter	≤3.5
	Dirty filter	≤6
Air filter mass flow (kg/h)		562
Air mass flow (kg/h)	Rated Power	458
	Standby Power	/
Clear efficiency of air filter (%)		99.9
Recommended Min. diameter of intake pipe (mm)		65

Inter cooling system

Intercooler heat dissipating capacity (KJ/S)	Rated Power	10.2
	Standby Power	/
Intercooler efficiency (%)	Rated Power	/
	Standby Power	/
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)	/

Exhaust system

Max. exhaust back pressure (kPa)	4±0.5	
Max. exhaust temperature (°C)	Before turbocharger	700
	After turbocharger	550
Recommended muffler mass flow/volume (kg/h)	588	
Exhaust-gas mass flow (kg/h)	Rated Power	490
	Standby Power	/
Recommended Min. diameter of exhaust pipe (mm)	65	
Max. bending moment of turbocharged flange (N·m)	10, using elastic connections	

Lubrication system

Volume of oil pan (L)	10	
Oil pressure in normal condition (kPa)	Idle speed	≥120
	Rated Power	300~600
Alarm for low & high oil pressure (kPa)	80/1000	
Temperature range in main oil passage at rated working condition (°C)	85~105	
max. oil temperature (°C)	/	
Max. oil pressure while engine starting (kPa)	800	
Opening pressure of main oil passage pressure limiting valve (kPa)	540~750	
Max. Oil flow (L/min)	39	
Oil consumption	≤0.2	

Noise and Emission

Emission standard	Off-road StageII	
Exhaust smoke (FSN)	Rated Power	≤2.0
	Standby Power	/
Diesel engine noise dB(A)	Acoustic power level : 112	

Fuel system

Injection pump type	Mechanical Pump
Governor	Electronic Governor
Steady speed governing factor	≤3%

Max supply fuel restriction at rated power conditon (kPa)		≤9
Return restriction in pipe (kPa)		≤12
Max. supply fuel temperature at rated power condition (°C)		≤70
Max. flow of fuel suply (kg/h)	Rated Power	21.81
	Standby Power	/
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)		6/24
Battery charging Alternator/ working voltage (kW/V)		0.98/28
Permitted max. electric resistance of motor control lines (Ω)		0.004
Recommended Min. conductor cross-sectional area (mm ²)		50
The lowest cold starting temperature (°C)	No aided starting device	-10
	Aided starting device	-30

Cooling system

Water pump Transmission ratio		1.4
Min. coolant temperature of engine working (°C)		50
Min. water fill rate (L/min)		3~7
Max. initial fill time (min)		5
Recommended Min diameter of outside water pipe(mm)		42
Min. pressure at water pump inlet at No or only a part of degassing Device (kPa)		-2
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)		0.15
Min expansion space (% total cooling system capacity)		0.1
Coolant capacity of engine (L)		5.3
Coolant capacity of radiator (L)		/

High temperature of alarm (°C)	100
Thermostat opening temp./ full open temp. (°C)	76±2 / 90
Min. permitted pressure in cooling system (kPa)	15
Max. permitted external resistance (at rated speed) (kPa)	50

Heat balance test data

Pressure of water in/ water out (kPa / kPa)	Rated Power	3.6/11.4
	Standby Power	/
Coolant mass flow (m ³ /h)	Rated Power	7.6
	Standby Power	/
Temperature of water in/ water out (°C/°C)	Rated Power	82.7/87.5
	Standby Power	/
Temperature of intake air : before/after intercooler (°C/°C)	Rated Power	133.8/51
	Standby Power	/
Pressure of intake air :before /after intercooler (kPa / kPa)	Rated Power	131.9/129.6
	Standby Power	/
Heat be taken away by Coolant (kJ/s)	Rated Power	46.3
	Standby Power	/
Heat be taken away by exhaust gas (kJ/s)	Rated Power	10.2
	Standby Power	/
Heat be taken away by intercooler (kJ/s)	Rated Power	70.6
	Standby Power	/
Gross Heat of Engine (kJ/s)	Rated Power: 148 / Standby Power: /	

Mounting system

Inertia of complete engine (kg•m ²)	I _{xx} =21.0 / I _{xy} = - 1.2	
	I _{yy} =42.0 / I _{yz} = - 4.8	
	I _{zz} =33.2 / I _{xz} = - 2.2	
Inertia of flywheel (kg•m ²)	0.886	
Inertia of crankshaft (including crankshaft gear) (kg•m ²)	0.27	
Centroid position mm	X	433.2
	Y	15.8
	Z	121.9
Permitted static bending moment at flywheel housing flange face	/	

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