



JOHN DEERE

ENGINE PERFORMANCE CURVE

Rating: Gross Power
 Application: Generator
 Emergency Stationary (300 kWe Market)
 1800 RPM (60 Hz)

PowerTech™ E 9.0L Engine
Model: 6090HFG86

NA hp (NA kW) Prime
 463 hp (345 kW) Standby

Nominal Engine Power @ 1800 RPM			
Prime		Standby	
HP	kW	HP	kW
NA	NA	463	345

Generator Efficiency %	Fan Power (4% of Standby)		Power Factor	Prime Rating		Standby Rating	
	hp	kW		kWe	kVA	kWe	kVA
90-94	18.5	13.8	0.8	NA	NA	298-311	373-389

Note 1: Based on nominal engine power.

STANDARD CONDITIONS

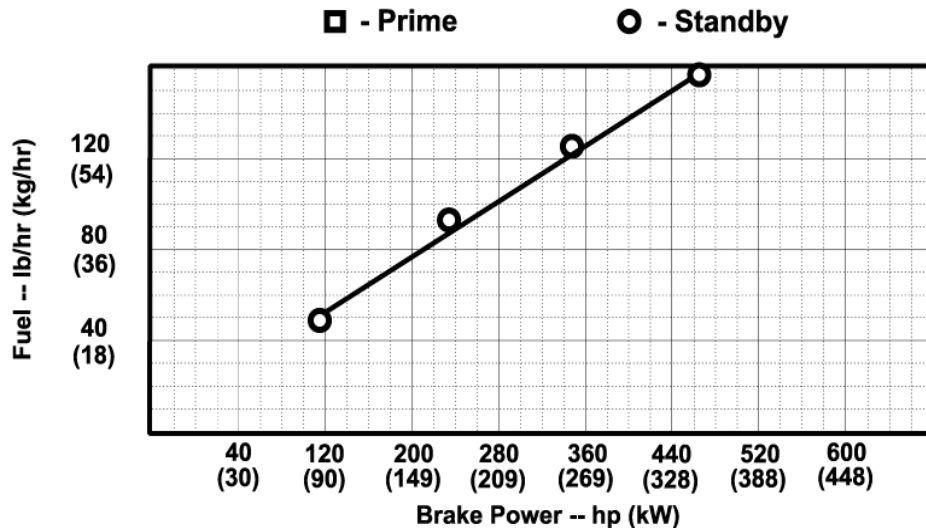
Air Intake Restriction.....12 in.H₂O (3 kPa)
 Exhaust Back Pressure.....30 in.H₂O (7.5 kPa)

Gross power guaranteed within + or - 5% at SAE J1995 and ISO 3046 conditions:
 77 °F (25 °C) air inlet temperature
 29.31 in.Hg (99 kPa) barometer
 104 °F (40 °C) fuel inlet temperature
 0.853 fuel specific gravity @ 60 °F (15.5 °C)

Conversion factors:
 Power: kW = hp x 0.746
 Fuel: 1 gal = 7.1 lb, 1 L = 0.85kg
 Torque: N·m = lb·ft x 1.356

All values are from currently available data and are subject to change without notice.

Notes: All OEM Gen Set Engine Applications must be pre-screened for torsional vibration compatibility with the respective alternator end hardware. OEM Engine Application Engineering will perform this computer-based analysis work upon request.



Designed/Calibrated to meet:	Certified by:
• EPA Tier 3	<i>Shane Koalberg</i> 22 Dec 10
Ref: Engine Emission Label	

Performance Curve: 6090HFG86_A

Engine Installation Criteria

General Data

Model	6090HFG86	
Number of Cylinders	6	
Bore	118.4 mm	4.7 in.
Stroke	136 mm	5.4 in.
Displacement	9.0 L	549 in. ³
Compression Ratio	16.0 : 1	
Valves per Cylinder, Intake/Exhaust	2 / 2	
Firing Order	1-5-3-6-2-4	
Combustion System	HPCR	
Engine Type	In-line, 4-cycle	
Aspiration	Turbocharged and air-to-air aftercooled	
Charge Air Cooling System	Air-to-Air	
Engine Crankcase Vent System	Open	

Physical Data

Length	1208 mm	47.6 in.
Width	635 mm	25.0 in.
Height	1132 mm	44.6 in.
Weight, with oil & no coolant (Includes engine, flywheel housing, flywheel & electrics)	841 kg	1854 lb
Center of Gravity Location, X-axis From Rear Face of Block	-400.8 mm	-15.8 in.
Center of Gravity Location, Y-axis Right of Crankshaft	-18.6 mm	-0.7 in.
Center of Gravity Location, Z-axis Above Crankshaft	76.2 mm	3.0 in.
Max. Allowable Static Bending Moment At Rear Face of Flywheel Housing with 5-G Load	814 N·m	600 lb-ft
Thrust Bearing Load Limit Forward, Intermittent	13000 N	2923 lb
Thrust Bearing Load Limit Forward, Continuous	8600 N	1933 lb
Thrust Bearing Load Limit Rearward, Intermittent	6000 N	1349 lb
Thrust Bearing Load Limit Rearward, Continuous	4000 N	899 lb
Max. Continuous Damper Temp	82 °C	180 °F
Max. Torsional Vibration, Front of Crank	0.25 DDA	

Electrical System

Recommended Battery Capacity, 12V @32 °F (0 °C)	1100 amps	
Recommended Battery Capacity, 24V @32 °F (0 °C)	750 amps	
Starter Rolling Current, 12V @32 °F (0 °C)	920 amps	
Starter Rolling Current, 24V @32 °F (0 °C)	600 amps	
Starter Rolling Current, 12V @-22 °F (-30 °C)	1300 amps	
Starter Rolling Current, 24V @-22 °F (-30 °C)	700 amps	
Min. Voltage at ECU during Cranking, 12V	6 volts	
Min. Voltage at ECU during Cranking, 24V	10 volts	
Max. Voltage Drop, Battery to Starter	0.8 volts	
Max. Allowable Start Circuit Resistance, 12V	0.0012 Ohm	
Max. Allowable Start Circuit Resistance, 24V	0.002 Ohm	
Max. Voltage From Engine to Crankshaft, 12V	0.15 volts	
Max. Voltage From Engine to Crankshaft, 24V	0.15 volts	
Max. ECU Temperature	105 °C	221 °F
Max. VTG Actuator Surface Temp	NA	
Max. Harness Temperature	125 °C	257 °F
Max. Alternator Temperature	120 °C	248 °F
Max. Starter Temperature	120 °C	248 °F
Max. Temperature, All Other Electronics	125 °C	257 °F

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Engine Installation Criteria

Charge Air Cooling System

Air-to-Air Heat Rejection	99.1 kW	5641 BTU/min
Intake Manifold Pressure	273.5 kPa	39.7 psi
Compressor Discharge Temperature @77°F(25°C) Ambient Air	253.2 °C	488 °F
Compressor Discharge Temperature @117°F(47°C) 80 kPa Barametric pressure		NA
Max. Temperature Out of Charge Air Cooler @All Ambient Conditions	88 °C	190 °F
Intake Manifold Temperature at which Power De-rate Occurs	89.5 °C	193 °F
Intake Manifold Temperature at which Severe Power De-rate Occurs	91 °C	195.8 °F
Max. CAC System Volume		NA
Max. Pressure Drop through CAC	16 kPa	64.0 in. H ₂ O
Max. Temperature Out of Charge Air Cooler @77°F (25°C) Ambient Air	45 °C	113 °F
Min. Temperature Out of Charge Air Cooler @77°F (25°C) Ambient Air		NA
Max. Bending Moment on Compressor Outlet	6 N-m	4 lb-ft
Max. Shear on Compressor Outlet	4 kg	9 lb

Cooling System

Engine Heat Rejection	114 kW	6489 BTU/min
Engine Radiated Heat	13.5 kW	768 BTU/min
Coolant Flow	294.6 L/min	78 gal/min
Thermostat Start to Open	82 °C	180 °F
Thermostat Fully Open	94 °C	201 °F
Engine Coolant Capacity	16 Liter	16.9 quart
Min. Coolant Fill Rate	12 L/min	3.2 gal/min
Min. Pump Inlet Pressure @194°F (90°C) Coolant		NA
Min. Pump Inlet Pressure @203°F (95°C) Coolant	30 kPa	4 psia
Min. External Coolant Restriction		NA
Max. External Coolant Restriction	40 kPa	6 psi
Max. Top Tank Temperature	110 °C	230 °F
Max. Top Tank Temperature 95% of Operating Hours	100 °C	212 °F
Min. Limiting Ambient Temperature	47 °C	117 °F

Exhaust System

Exhaust Flow	63.6 m ³ /min	2246 ft. ³ /min
Exhaust Temperature	497 °C	927 °F
Max. Allowable Exhaust Restriction	7.5 kPa	30 in. H ₂ O
Min. Allowable Exhaust Restriction		NA
Max. Bending Moment on Turbo Outlet	7 N-m	5.2 lb-ft
Max. Shear on Turbine Outlet	11 kg	24 lb

Fuel System

ECU Description	L14 Controller	
Fuel Injection Pump	Denso HP4	
Governor Type	Electronic	
Governor Regulation	Selectable	
Total Fuel Flow	204 kg/hr	450 lb/hr
Fuel Consumption	71.2 kg/hr	157.0 lb/hr
Fuel Temperature Rise, Inlet to Return	30 Δ°C	54 Δ°F
Max. Fuel Inlet Restriction	30 kPa	120 in. H ₂ O
Min. Fuel Inlet Pressure	-30 kPa	-120 in. H ₂ O
Max. Fuel Inlet Pressure	20 kPa	80 in. H ₂ O
Max. Fuel Return Pressure	20 kPa	80 in. H ₂ O
Max. Fuel Inlet Temperature	80 °C	176 °F
Fuel Filter @98% Efficiency		2 mic

Lubrication System

Oil Pressure at Rated Speed	260 kPa	38 psi
Oil Pressure at Low Idle		NA
In-Pan Oil Temperature	116 °C	241 °F
Max. Oil Carryover in Blow-By	1.0 g/hr	0.002 lb/hr
Max. Airflow in Blow-By	150 L/min	39.6 gal/min
Max. Crankcase Pressure	0.5 kPa	2 in. H ₂ O

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Air Intake System

Engine Air Flow	26.5 m ³ /min	936 ft. ³ /min
Air Mass Flow	1700 kg/hr	3748 lb/hr
Maximum Allowable Temperature Rise, Ambient Air to Engine Inlet	8 Δ°C	15 Δ°F
Max. Air Intake Restriction, Clean Air Cleaner	3.75 kPa	15.0 in. H ₂ O
Max. Air Intake Restriction, Dirty Air Cleaner	6.25 kPa	25.0 in. H ₂ O
Air Cleaner Efficiency	99.9 %	

Performance Data

Rated Power, Prime	NA	NA
Rated Power, Standby	463 HP	345 kW
Rated Speed	1800 rpm	
Low Idle Speed	NA	
Rated Torque, Prime	NA	
Rated Torque, Standby	1830 N·m	1350 lb-ft
BMEP, Prime	NA	
BMEP, Standby	2556 kPa	371 psi
Altitude Capability	762 m	2500 ft
Friction Power @Rated Speed	24 kW	32 HP
Air:Fuel Ratio	23.9 : 1	
Smoke @Rated Speed	0.22 Bosch No.	
Noise @1 m	dB(A)	
Block Load Capability, ISO 8528	G3	

Fuel Consumption	Prime		Standby	
	lb/hr	kg/h	lb/hr	kg/h
25 % Power	0.0	0.0	49.2	22.3
50 % Power	0.0	0.0	92.8	42.1
75 % Power	0.0	0.0	126.3	57.3
100 % Power	0.0	0.0	157.0	71.2

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