



JOHN DEERE

ENGINE PERFORMANCE CURVE

Rating: Gross Power
Application: Generator
100 kWe Standby Market
1800 RPM (60 Hz)

PowerTech™ PVX 4.5L Engine
Model: 4045HFG93

151 hp (113 kW) Prime
166 hp (124 kW) Standby

Nominal Engine Power @ 1800 RPM			
Prime		Standby	
HP	kW	HP	kW
151	113	166	124

Generator Efficiency %	Fan Power (% of Standby)		Power Factor	Prime Rating		Standby Rating	
	hp	kW		kWe	kVA	kWe	kVA
88-92	13.3	9.9	0.8	91-95	114-119	100-105	125-131

STANDARD CONDITIONS

Air Intake Restriction.....12 in.H₂O (3 kPa)
Exhaust Back Pressure.....60 in.H₂O (15 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:

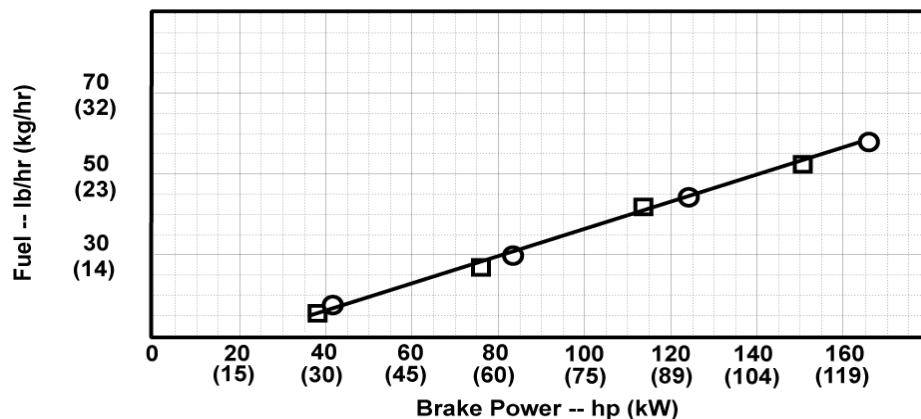
Power: kW = hp x 0.746

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.

□ - Prime ○ - Standby



Notes: 1) This Performance Curve provides installation requirements necessary for the engine to emit at its certified emission levels. For additional information necessary to meet applicable regulatory requirements, refer to the John Deere Emissions-related Installation Instructions (AG01):
<https://power.deere.com/wps/myportal/jdps/products/engines/appguidelines>.
2) A crankshaft Torsional Vibration Analysis is required on all Gen Set applications.

Designed/Calibrated to meet:

- CARB
- EPA Interim Tier 4

Ref: Engine Emission Label

Certified by:

[Signature]
6 Aug 2012

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Engine Installation Criteria

General Data

Model	4045HFG93	
Number of Cylinders	4	
Bore	106 mm	4.2 in.
Stroke	127 mm	5.0 in.
Displacement	4.5 L	275 in. ³
Compression Ratio	16.5 : 1	
Valves per Cylinder, Intake/Exhaust	2 / 2	
Firing Order	1-3-4-2	
Combustion System	HPCR	
Engine Type	In-line, 4-cycle	
Aspiration	Turbocharged and air-to-air aftercooled	
Engine Crankcase Vent System	Open	

Physical Data

Length	867 mm	34.1 in.
Width	680 mm	26.8 in.
Height	1076 mm	42.4 in.
Weight, with oil & no coolant (Includes engine, flywheel housing, flywheel & electrics)	570 kg	1257 lb
Center of Gravity Location, X-axis From Rear Face of Block	265 mm	10.4 in.
Center of Gravity Location, Y-axis Right of Crankshaft	11 mm	0.4 in.
Center of Gravity Location, Z-axis Above Crankshaft	146 mm	5.7 in.
Max. Bending Moment about Main Bearings Front and Rear	480 N·m	354 lb-ft
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	4000 N	899 lb
Thrust Bearing Load Limit Forward, Continuous	2200 N	495 lb
Thrust Bearing Load Limit Rearward, Intermittent	2000 N	450 lb
Thrust Bearing Load Limit Rearward, Continuous	1000 N	225 lb
Max. Continuous Damper Temp	NA	
Max. ECU Vibration, All Axis	9.00 gRMS	
Max. Torsional Vibration, Front of Crank	0.25 DDA	
Max. Engine Torsional Vibration in Overspeed	0.40 DDA	

Electrical System

Min. Instantaneous Cranking	50 rpm	
Min. Steady State Cranking	120 rpm	
Starter Rolling Current, 12V @32 °F (0 °C)	450 amps	
Starter Rolling Current, 24V @32 °F (0 °C)	250 amps	
Starter Rolling Current, 12V @-22 °F (-30 °C)	700 amps	
Starter Rolling Current, 24V @-22 °F (-30 °C)	400 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. ECU Temperature	105 °C	221 °F
Max. VTG Actuator Surface Temp	125 °C	257 °F
Max. Air Throttle Electrical Actuator Temperature	125 °C	257 °F
Max. Harness Temperature	125 °C	257 °F
Max. Alternator Temperature	105 °C	221 °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	18 kW	1025 BTU/min
Intake Manifold Pressure	182 kPa	26.4 psi
Compressor Discharge Temperature @77°F(25°C) Ambient Air	179 °C	354 °F
Compressor Discharge Temperature @117°F(47°C) 80 kPa Barametric pressure	200 °C	392 °F
Max. Temperature Out of Charge Air Cooler @All Ambient Conditions	88 °C	190 °F
Intake Manifold Temperature at which Power De-rate Occurs	121.5 °C	251 °F
Intake Manifold Temperature at which Severe Power De-rate Occurs	123 °C	253.4 °F
Max. CAC System Volume	25 Liter	26 quart
Max. Pressure Drop through CAC	10 kPa	40.0 in. H ₂ O
Min. Pressure Drop through CAC	5 kPa	20.0 in. H ₂ O
Max. Temperature Out of Charge Air Cooler @77°F (25°C) Ambient Air	56 °C	133 °F
Min. Temperature Out of Charge Air Cooler @77°F (25°C) Ambient Air	47 °C	117 °F
Max. Bending Moment on Compressor Outlet	0.6 N·m	0 lb-ft
Max. Shear on Compressor Outlet	0.4 kg	1 lb

Cooling System

Engine Heat Rejection	75 kW	4269 BTU/min
Coolant Flow @10 kPa External Restriction	245 L/min	65 gal/min
Coolant Flow @40 kPa External Restriction	218 L/min	58 gal/min
Thermostat Start to Open	85 °C	185 °F
Thermostat Fully Open	97 °C	207 °F
Engine Coolant Capacity	8.5 Liter	9.0 quart
Min. Coolant Fill Rate	12 L/min	3.2 gal/min
Max. Water Pump Inlet Pressure	235 kPaa	34 psia
Min. Pump Inlet Pressure @203°F (95°C) Coolant	103 kPaa	15 psia
Min. Pump Inlet Pressure @Max. Top Tank Temperature	174 kPaa	25 psia
Max. External Coolant Restriction	40 kPa	6 psi
Max. Top Tank Temperature	113 °C	235 °F
Max. Top Tank Temperature 95% of Operating Hours	103 °C	217 °F
Min. Limiting Ambient Temperature	47 °C	117 °F

Exhaust System

Exhaust Flow	16.8 m³/min	593 ft.³/min
Exhaust Temperature	466 °C	871 °F
Max. Allowable Exhaust Restriction	17 kPa	68 in. H ₂ O
Max. Bending Moment on Turbo Outlet	7.4 N·m	5.5 lb-ft
Max. Shear on Turbine Outlet	2.5 kg	6 lb
Exhaust Filter Size		4
Exhaust Filter Pressure Drop (Clean)	4.3 kPa	17 in. H ₂ O
Min. Mixing Length, Outlet to Exhaust Filter		NA
Max. Bending Moment on Exhaust Filter Inlet	75 N·m	55 lb-ft
Max. Bending Moment on Exhaust Filter Outlet	59 N·m	44 lb-ft
Max. Exhaust Leakage Rate, Engine to Exhaust Filter @30kPa	5 L/min	1.3 gal/min
Max. Temperature Drop, Engine to Exhaust Filter	30 °C	86 °F

Fuel System

ECU Description	L23 Controller	
Fuel Injection Pump	Denso HP3	
Governor Type	Electronic	
Total Fuel Flow	108 kg/hr	238 lb/hr
Fuel Consumption, Prime	25 kg/hr	55 lb/hr
Fuel Consumption, Standby	26.2 kg/hr	58 lb/hr
Fuel Temperature Rise, Inlet to Return	50.6 Δ°C	91 Δ°F
Min. Fuel Inlet Pressure	-30 kPa	-120 in. H ₂ O
Max. Fuel Inlet Pressure		NA
Max. Fuel Return Pressure	20 kPa	80 in. H ₂ O
Min. Fuel Return Pressure	0 kPa	0 in. H ₂ O
Max. Fuel Inlet Temperature	75 °C	167 °F
Fuel Filter @98% Efficiency		2 mic

Lubrication System

Oil Pressure at Rated Speed	313 kPa	45 psi
Oil Pressure at Low Idle		NA
Max. In-Pan Oil Temperature	138 °C	280 °F
Max. Crankcase Pressure	2 kPa	8 in. H ₂ O

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Engine Installation Criteria

Air Intake System

Engine Air Flow	7.6 m³/min	268 ft.³/min
Air Mass Flow	520 kg/hr	1146 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	151 HP	113 kW
Rated Power, Standby	166 HP	124 kW
Rated Speed	1800 rpm	
Low Idle Speed	1800 rpm	
Rated Torque, Prime	599 N·m	442 lb-ft
Rated Torque, Standby	658 N·m	485 lb-ft
BMEP, Prime	1708 kPa	248 psi
BMEP, Standby	1850 kPa	268 psi
Altitude Capability, Prime	2286 m	7500 ft
Altitude Capability, Standby	1676 m	5500 ft
Friction Power @Rated Speed	14.3 kW	19 HP
Air:Fuel Ratio, Prime	20.8 : 1	
Air:Fuel Ratio, Standby	19.5 : 1	
Noise @1 m Prime	89 dB(A)	
Noise @1 m Standby	89 dB(A)	
0-100% Standby Load Acceptance	sec	
Load Acceptance, ISO 8528-5	G3	

Fuel Consumption	Prime		Standby	
	lb/hr	kg/h	lb/hr	kg/h
25 % Power	15.4	7.0	17.0	7.7
50 % Power	27.1	12.3	29.8	13.5
75 % Power	42.5	19.3	44.1	20.0
100 % Power	52.5	23.8	57.8	26.2

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