



**JOHN DEERE**

**ENGINE PERFORMANCE CURVE**

Rating: Gross Power  
 Application: Generator  
 1800 RPM (60 Hz)

**PowerTech™ PSS 4.5L Engine**  
**Model: 4045HFG09**

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

Nominal Engine Power @ 1800 RPM			
Prime		Standby	
HP	kW	HP	kW
152	113	166	124

Generator Efficiency %	Fan Power (% of Standby)		Power Factor	Prime Rating		Standby Rating	
	hp	kW		kWe	kVA	kWe	kVA
88-92	10.1	7.5	0.8	96	119	105	131

Note 1: Based on nominal engine power; Fan Power is 6% of Standby Power.

**STANDARD CONDITIONS**

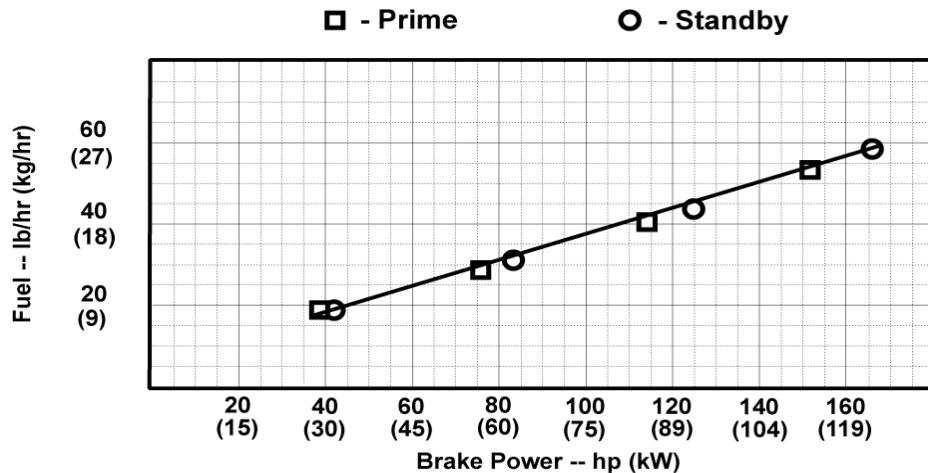
Air Intake Restriction.....12 in.H<sub>2</sub>O (3 kPa)  
 Exhaust Back Pressure.....30 in.H<sub>2</sub>O (7.5 kPa)

Gross power guaranteed within + or - 5% at SAEJ1995 and ISO 3046 conditions:  
 Air Inlet Temperature = 77 °F (25 °C)  
 Barometer = 29.31 in.Hg (99 kPa)  
 Fuel Inlet Temperature = 104 °F (40 °C)  
 Fuel Specific Gravity @ 60 °F (15.5 °C) = 0.853

**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: 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/apguidelines>.  
 2) A crankshaft Torsional Vibration Analysis is required on all Gen Set applications.



Designed/Calibrated to meet:	Certified by:
<ul style="list-style-type: none"> <li>CARB</li> <li>EPA Tier 4</li> </ul>	 24 Oct 2014
Ref: Engine Emission Label	

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## Engine Installation Criteria

### General Data

Model	4045HFG09	
Number of Cylinders	4	
Bore	106 mm	4.2 in.
Stroke	127 mm	5.0 in.
Displacement	4.5 L	275 in. <sup>3</sup>
Compression Ratio	17.2 : 1	
Valves per Cylinder, Intake/Exhaust	2 / 2	
Firing Order	1-3-4-2	
Combustion System	Direct Injection	
Engine Type	In-line, 4-cycle	
Aspiration	Turbocharged and air-to-air aftercooled	
Engine Crankcase Vent System	Open	

### Physical Data

Length	870 mm	34.3 in.
Width	635 mm	25.0 in.
Height	1130 mm	44.5 in.
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	8 mm	0.3 in.
Center of Gravity Location, Z-axis Above Crankshaft	155 mm	6.1 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
Weight, with oil & no coolant (Includes engine, flywheel housing, flywheel & electrics)	570 kg	1257 lb
Max. Continuous Damper Temp	NA	
Max. ECU Vibration, All Axis	6.00 gRMS	
Max. Torsional Vibration, Front of Crank	0.25 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. Voltage From Engine to Crankshaft, 12V	15 volts	
Max. Voltage From Engine to Crankshaft, 24V	30 volts	
Max. ECU Temperature	105 °C	221 °F
Max. VTG Actuator Surface Temp	NA	
Max. Air Throttle Electrical Actuator Temperature	NA	
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	19 kW	1081 BTU/min
Compressor Discharge Temperature @77°F(25°C) Ambient Air	177 °C	351 °F
Intake Manifold Pressure	185 kPa	26.8 psi
Compressor Discharge Temperature @117°F(47°C) 80 kPa Barometric pressure	217 °C	423 °F
Max. Temperature Out of Charge Air Cooler @All Ambient Conditions	88 °C	190 °F
Max. CAC System Volume	25 Liter	26 quart
Max. Pressure Drop through CAC	10 kPa	40.0 in. H <sub>2</sub> O
Min. Pressure Drop through CAC	5 kPa	20.0 in. H <sub>2</sub> 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	3.5 N·m	3 lb-ft
Max. Shear on Compressor Outlet	2.5 kg	6 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 kPa	34 psia
Min. Pump Inlet Pressure @203°F (95°C) Coolant	103 kPa	15 psia
Min. Pump Inlet Pressure @Max. Top Tank Temperature	165 kPa	24 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

### Exhaust System

Exhaust Flow	17.0 m <sup>3</sup> /min	600 ft. <sup>3</sup> /min
Exhaust Temperature	496 °C	925 °F
Max. Allowable Exhaust Restriction	22.8 kPa	91 in. H <sub>2</sub> 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		3
Exhaust Filter Pressure Drop (Clean)	17.8 kPa	71 in. H <sub>2</sub> O
Min. Mixing Length, Outlet to Exhaust Filter		NA
Max. Bending Moment on Exhaust Filter Inlet	83 N·m	61 lb-ft
Max. Bending Moment on Exhaust Filter Outlet	75 N·m	55 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 Δ°C	54 Δ°F

### Fuel System

ECU Description	L34 Controller	
Fuel Injection Pump	Denso HP3	
Governor Type	Electronic	
Total Fuel Flow	50 kg/hr	110 lb/hr
Fuel Consumption, Prime	24.0 kg/hr	53 lb/hr
Fuel Consumption, Standby	26.4 kg/hr	58 lb/hr
Fuel Temperature Rise, Inlet to Return	18 Δ°C	32 Δ°F
Min. Fuel Inlet Pressure	-30 kPa	-120 in. H <sub>2</sub> O
Max. Fuel Return Pressure	20 kPa	80 in. H <sub>2</sub> O
Min. Fuel Return Pressure	0 kPa	0 in. H <sub>2</sub> O
Max. Fuel Inlet Temperature	75 °C	167 °F
Fuel Filter @98% Efficiency		2 mic

### Lubrication System

Oil Pressure at Rated Speed	330 kPa	48 psi
Max. In-Pan Oil Temperature	138 °C	280 °F
Max. Crankcase Pressure	1.0 kPa	4 in. H <sub>2</sub> O

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## Engine Installation Criteria

### Air Intake System

Engine Air Flow	7.6 m <sup>3</sup> /min	268 ft. <sup>3</sup> /min
Air Mass Flow	525 kg/hr	1157 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 <sub>2</sub> O
Max. Air Intake Restriction, Dirty Air Cleaner	6.25 kPa	25.0 in. H <sub>2</sub> O
Air Cleaner Efficiency	99.9 %	

### Performance Data

Rated Power, Prime	113 kW	152 HP
Rated Power, Standby	124 kW	166 HP
Rated Speed	1800 rpm	
Low Idle Speed	NA	
Rated Torque, Prime	600 N·m	443 lb·ft
Rated Torque, Standby	658 N·m	485 lb·ft
BMEP, Prime	1685 kPa	244 psi
BMEP, Standby	1845 kPa	268 psi
Altitude Capability, Prime	2469 m	8100 ft
Altitude Capability, Standby	1768 m	5800 ft
Friction Power @Rated Speed	15 kW	20 HP
Air:Fuel Ratio, Prime	21.2 : 1	
Air:Fuel Ratio, Standby	19.9 : 1	
Noise @1 m Prime	88.1 dB(A)	
Noise @1 m Standby	88.8 dB(A)	
0-100% Standby Load Acceptance	1.9 sec	
Load Acceptance, ISO 8528-5	3	

Fuel Consumption	Prime		Standby	
	lb/hr	kg/h	lb/hr	kg/h
25 % Power	18.5	8.4	19.6	8.9
50 % Power	29.1	13.2	30.9	14.0
75 % Power	40.1	18.2	43.2	19.6
100 % Power	52.9	24.0	58.2	26.4

### DEF Data

Rating	Engine Speed	DEF Consumption*		Percent of Diesel Consumption**
		g/kWh	lb/hp-hr	
	RPM			%
Standby	1800	9.9	0.01629	3.6
Prime	1800	8.3	0.01366	3.0

\*DEF conversion factor: 1.087 kg/l (9.071 lb/gal)

\*\* Percent of diesel consumption by volume at 100% power

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