



JOHN DEERE

**ENGINE PERFORMANCE CURVE**

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

**PowerTech E™ 4.5L Engine**

Model: **4045HF285**

**144 hp (107 kW) Prime**  
**158 hp (118 kW) Standby**

[See Option Code Tables]

Nominal Engine Power @ 1800 RPM			
Prime		Standby	
HP	kW	HP	kW
144	107	158	118

Generator Efficiency %	Fan Power (6% of Standby)		Power Factor	Prime Rating <sup>2</sup>		Standby Rating <sub>1,2</sub>		ISO 8528 G2 Block Load Capability
	hp	kW		kWe	kVA	kWe	kVA	
88-92	8.7	6.5	0.8	89-93	111-116	98-103	123-129	100%

Note 1: Based on nominal engine power.  
 Note 2: kWe / kVA rating assumes 90% efficiency. "Generator Efficiency %" will vary.

**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 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:

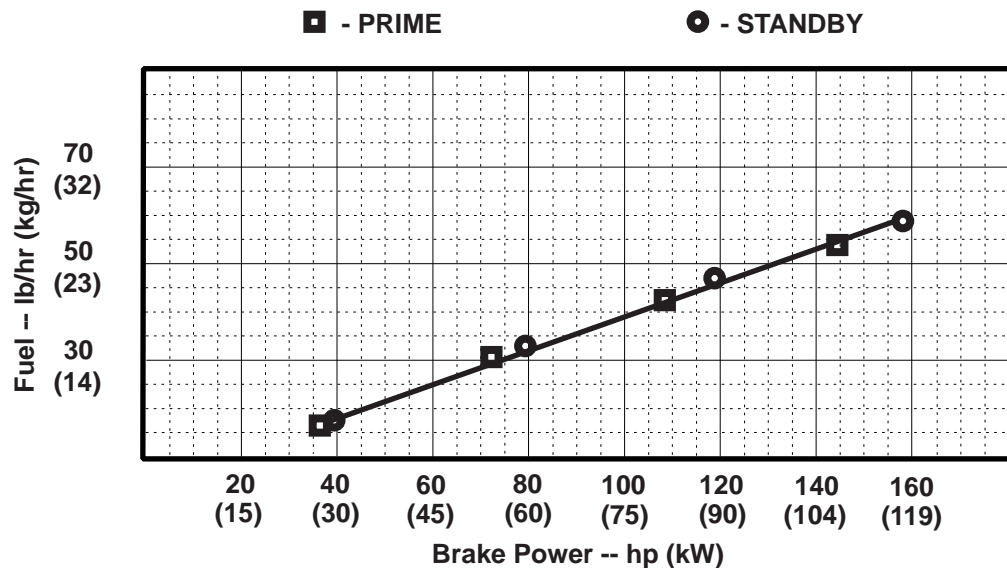
- Power: kW = hp x 0.746
- Fuel: 1 gal = 7.1 lb, 1 L = 0.85 kg
- Torque: N·m = lb-ft x 1.356

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.*



Tier-3 Emission Certifications:	Certified by:
CARB; EPA	<i>Vincent...</i>
Ref: Engine Emission Label	22 June '07

\* Revised Data  
 Curve 4045HF2851800158 ..... Sheet 1 of 2  
 June 2007

## Engine Installation Criteria

### General Data

Model ..... 4045HF285  
 Number of Cylinders ..... 4  
 Bore and Stroke--in. (mm)..... 4.19 x 5.00 (106 x 127)  
 Displacement--in.<sup>3</sup> (L) .....275 (4.5)  
 Compression Ratio ..... 19.0:1  
 Valves per Cylinder--Intake/Exhaust ..... 1 / 1  
 Firing Order ..... 1-3-4-2  
 Combustion System ..... Unit Injection  
 Engine Type ..... In-line, 4-Cycle  
 Aspiration ..... Turbocharged  
 Charge Air Cooling System ..... Air-to-Air  
 Engine Crankcase Vent System ..... Open

### Physical Data

Length--in. (mm) .....33.9 (860)  
 Width--in. (mm) .....24.1 (612)  
 Height--in. (mm) .....40.9 (1039)  
 Weight, with oil--lb (kg).....1083 (491)  
 (Includes flywheel hsg., flywheel & electrics)  
 Center of Gravity Location  
 From Rear Face of Block (X-axis)--in. (mm) . 9.8 (249)\*  
 Right of Crankshaft (Y-axis)--in. (mm) ..... 2.17 (55)\*  
 Above Crankshaft (Z-axis)--in. (mm) ..... 5.7 (145)\*  
 Max. Allow. Static Bending Moment at Rear  
 Face of Flywhl Hsg w/ 5-G Load--lb-ft (N\*m) ..600 (814)  
 Thrust Bearing Load Limit --lb (N) Forward Rearward  
 Intermittent.....899 (4000) .....450 (2000)  
 Continuous .....495 (2200).....225 (1000)  
 Max. Front of Crank. Torsional Vibration--DDA ..... 0.25

### Electrical System

**12 Volt      24 Volt**

Min. Battery Capacity (CCA)--amp..... 800 ..... 570  
 Max. Allow. Start. Circ't Resist.--Ohm .. 0.0012 ..... 0.002  
 Starter Rolling Current:  
 At 32 °F ( 0 °C)--amp ..... 920 ..... 600  
 At -22 °F (-30 °C)--amp ..... 1300 ..... 700  
 Min. Volts at ECU while Cranking--volts.....6 ..... 10  
 Max. ECU Temperature--°F (°C) .....221 (105)  
 Max. Harness Temperature--°F (°C) .....248 (120)  
 Maximum Voltage From Engine Crankshaft/  
 Generator Shaft to Ground--VAC ..... 0.15 ..... 0.15

### Air System

**Prime      Standby**

Max. Allowable Temp Rise--Ambient Air to  
 Engine Inlet--°F (°C).....15 (8)  
 Maximum Air Intake Restriction  
 Dirty Air Cleaner--in.H<sub>2</sub>O (kPa).....25 (6.25)  
 Clean Air Cleaner--in.H<sub>2</sub>O (kPa).....15 (3.75)  
 Engine Air Flow--ft<sup>3</sup>/min (m<sup>3</sup>/min) ....273 (7.73) ..288 (8.16)  
 Air Cleaner Efficiency--% .....99.9

### Charge Air Cooling System

**Prime      Standby**

Air/Air Exchanger Heat Rejection--  
 BTU/min (kW) ..... 1002(17.6) ...1127 (19.8)  
 Compress. Dischrg. Temp.(Rated)  
 @ 77 °F (25°C) Amb. Air--°F (°C)349(176.2) ... 373(189.6)  
 Compress. Dischrg. Temp.(Max.)  
 @ 47°C amb. and  
 80 kPa bar.--°F (°C) .....NA (NA) ..... NA (NA)  
 Press. Drop, thru CAC--in.H<sub>2</sub>O (kPa)  
 Max. ....52 (13)  
 Min. .... None\*  
 Intake Manifold Pressure--psi (kPa) ....22(149) ..... 24 (165)  
 CAC Out Temp @ 77°F (25°C) Amb.--°F (°C)  
 Max. ....140 (60)  
 Min. ....118 (48)  
 CAC Out Temp @ any Ambient--°F (°C)  
 Max. ....190 (88)

### Cooling System

**Prime      Standby**

Engine Heat Reject.--BTU/min (kW)....NA(NA) ..... 3544 (62)  
 Coolant Flow--gal/min (L/min).....48(180) ..... 48(180)  
 Thermostat Start to Open--°F (°C) .....180 (82)  
 Thermostat Fully Open--°F (°C).....203 (95)  
 Engine Coolant Capacity--qt (L) ..... 9 (8.5)\*  
 Min. Pressure Cap--psi (kPa) .....14.5 (100)  
 Max. Top Tank Temp--°F (°C) .....230 (110)  
 Min. Coolant Fill Rate--gal/min (L/min) .....3 (11)  
 Min. Air-to-Boil Temperature--°F (°C) .....117 (47)  
 Min. Pump Inlet Pressure--psi (kPa) .....4.4 (30)

### Exhaust System

**Prime      Standby**

Exhaust Flow--ft<sup>3</sup>/min (m<sup>3</sup>/min).....750 (21.2) ... 805(22.8)  
 Exhaust Temperature--°F (°C) ..... 1040(560) .1076 (580)  
 Max. Exhaust Restriction---in. H<sub>2</sub>O (kPa) .....30 (7.5)  
 Min. Exhaust Restriction---in. H<sub>2</sub>O (kPa).....None  
 Max. Bend. Moment, Turbo Out.--lb-ft (N\*m) .5.2 (7.0)  
 Max. Shear on Turbo Outlet--lb (kg) .....24 (11)

### Fuel System

**Prime      Standby**

ECU Description .....L16 Controller  
 Fuel Injection Pump ..... Denso HP3  
 Governor Type ..... Electronic  
 Total Fuel Flow--lb/hr (kg/hr).....122(55.3) ..... 140(63.5)  
 Fuel Consumption--lb/hr (kg/hr) .....51(23.0) ..... 58 (26.5)  
 Max. Fuel Inlet Temp.--°F (°C).....176 (80)  
 Fuel Temp. Rise, Inlt to Retr--°F (°C)82.6(46) ..... 87.3(49)  
 Max. Fuel Inlet Restriction--in. H<sub>2</sub>O (kPa) ..... 80 (20)  
 Max. Fuel Inlet Pressure--in. H<sub>2</sub>O (kPa) .....NA (NA)  
 Max. Fuel Return Pressure--in. H<sub>2</sub>O (kPa) .....80 (20)

### Lubrication System

**Prime      Standby**

Oil Press. at Rated Speed--psi (kPa) .. 46(320) ..... 46 (320)  
 Min. Oil Pressure--psi (kPa)..... 15 (105)  
 Max. Oil Carryover in Blow-by--lb/hr (g/hr) 0.002 (1.0)  
 Max. Airflow in Blow-by--gal/min (l/min).....26 (100)  
 Max. Crankcase Pressure--in. H<sub>2</sub>O (kPa).....2 (0.5)

### Performance Data

**Prime      Standby**

Rated Power--hp (kW) ..... 144 (107) ..... 158 (118)  
 Rated Speed--rpm ..... 1800 ..... 1800  
 Low Idle Speed--rpm ..... 1150 .....1150  
 Rated Torque--lb-ft (N\*m)..... 772 (569) ..... 849 (626)  
 BMEP--psi (kPa) ..... 230 (1589)..... 254 (1748)  
 Friction Power  
 @ Rated Speed--hp (kW) ..... 17 (13) ..... 17 (13)  
 Altitude Capability--ft (m) ..... 10,000(3050) .....7500(2286)  
 Ratio--Air : Fuel..... 22 : 1 ..... 21 : 1  
 Smoke @ Rated Speed--Bosch No. .... 0.67 ..... 1.3  
 Noise--dB(A) @ 1 m ..... 86.7\* ..... 87\*

### Fuel Consumption -- lb/hr (kg/h)

**Prime      Standby**

25 % Power ..... 16.3 (7.4) ..... 17.8 (8.1)  
 50 % Power .....30.6 (13.9) ..... 33.3 (15.1)  
 75 % Power .....42.8 (19.4) ..... 46.6 (21.1)  
 100 % Power .....53.6 (24.3) ..... 58.3 (26.5)

All values at rated speed and power with standard options unless otherwise noted.

\* Revised Data

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 June 2007