



JOHN DEERE

ENGINE PERFORMANCE CURVE

Rating: Gross Power
 Application: Generator (60 Hz)
 Target: 65 kWe Standby Market

PowerTech M™ 4.5L Engine
 Model: **4045HF280**

90 hp (67 kW) Prime
99 hp (74 kW) Standby

[See Option Code Tables]

Nominal Engine Power @ 1800 RPM			
Prime		Standby	
HP	kW	HP	kW
90	67	99	74

Generator Efficiency %	Fan Power (3% of Standby)		Power Factor	Prime Rating ²		Standby Rating _{1,2}		ISO 8528 G2 Block Load Capability
	hp	kW		kWe	kVA	kWe	kVA	
88-92	3.0	2.2	0.8	57-60	71-75	63-66	79-83	NA

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.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:

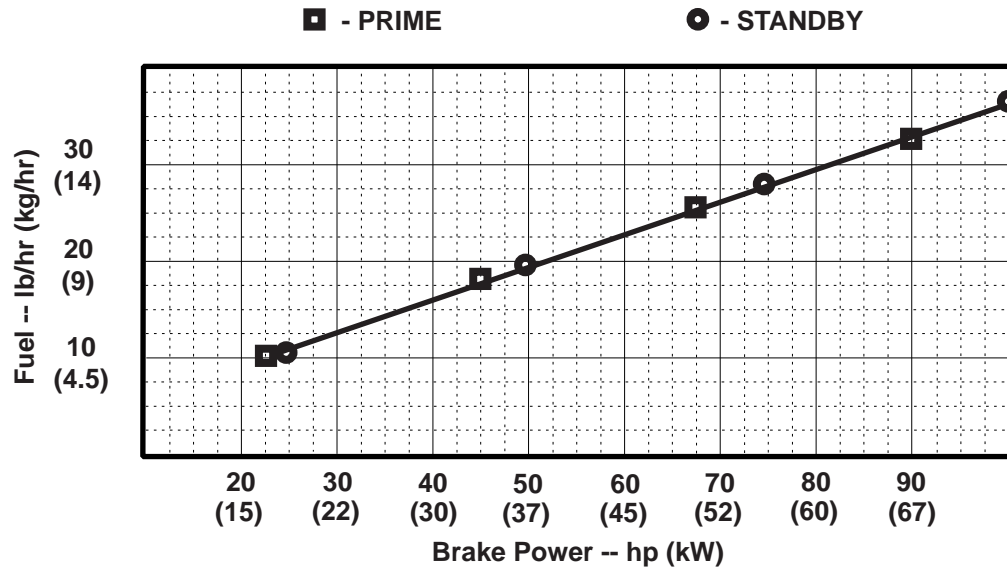
- Power: kW = hp x 0.746
- Fuel: 1 gal = 7.1 lb, 1 L = 0.85 kg
- Torque: N•m = lb-ft x 1.356

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

Ref: Engine Emission Label

Vincent...
 08-24-07

* Revised Data

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 August 2007

Engine Installation Criteria

General Data

Model 4045HF280
 Number of Cylinders 4
 Bore and Stroke--in. (mm)..... 4.19 x 5.00 (106 x 127)
 Displacement--in.³ (L)275 (4.5)
 Compression Ratio 19.0 : 1
 Valves per Cylinder--Intake/Exhaust 1 / 1
 Firing Order 1-3-4-2
 Combustion System Direct Injection
 Engine Type In-line, 4-Cycle
 Aspiration Intercooled
 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 (Estimated based on Tier 2)
 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)
 Continuous495 (2200).....225 (1000)
 Max. Front of Crank. Torsional Vibration--DDA..... 0.25

Electrical System

12 Volt **24 Volt**

Min. Battery Capacity (CCA)--amp..... 640 570
 Max. Allow. Start. Circ't Resist.--Ohm ..0.0012 0.002
 Starter Rolling Current:
 At 32 °F (0 °C)--amp 780 600
 At -22 °F (-30 °C)--amp..... 1000 700
 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.H₂O (kPa).....25 (6.25)
 Clean Air Cleaner--in.H₂O (kPa) 12 (3)
 Engine Air Flow--ft³/min (m³/min) 187 (5.3).....191 (5.4)
 Air Cleaner Efficiency--% 99.9

Charge Air Cooling System

Prime **Standby**

Air/Air Exchanger Heat Rejection--
 BTU/min (kW)233 (4) 278 (5)
 Compress. Dischrg. Temp.(Rated)
 @ 77 °F (25°C) Amb. Air--°F (°C) 214(101) 232(111)
 Press. Drop, thru CAC--in.H₂O (kPa)
 Max.52* (13)
 Min.None
 Intake Manifold Pressure--psi (kPa)9 (61) 10 (70)
 CAC Out Temp @ 77°F (25°C) Amb.--°F (°C)
 Max. 140 (60)
 Min. 113 (45)

Cooling System

Prime **Standby**

Engine Heat Reject.--BTU/min (kW).... 1849(33) 1979(35)
 Coolant Flow--gal/min (L/min)..... 38(144)
 Thermostat Start to Open--°F (°C) 180 (82)
 Thermostat Fully Open--°F (°C)..... 202 (94)
 Engine Coolant Capacity--qt (L) 9 (8.5)
 Min. Pressure Cap--psi (kPa) 10 (69)
 Max. Top Tank Temp--°F (°C) 221 (105)
 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--ft³/min (m³/min).....477 (13.5) .. 508(14.4)
 Exhaust Temperature--°F (°C)959(515) . 1013 (545)
 Max. Exhaust Restriction---in. H₂O (kPa) 30 (7.5)
 Min. Exhaust Restriction---in. H₂O (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**

Fuel Injection Pump Stanadyne DB4
 Governor Type Mechanical
 Total Fuel Flow--lb/hr (kg/hr).....212(96) 212(96)
 Fuel Consumption--lb/hr (kg/hr)33.2(15.1) 36.3(16.5)
 Max. Fuel Inlet Temp.--°F (°C)..... 176 (80)
 Max. Fuel Inlet Restriction--in. H₂O (kPa) 80 (20)
 Max. Fuel Return Pressure--in. H₂O (kPa) 80 (20)

Lubrication System

Prime **Standby**

Oil Press. at Rated Speed--psi (kPa) .. 50(345) 50(345)
 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. H₂O (kPa)..... 2 (0.5)

Performance Data

Prime **Standby**

Rated Power--hp (kW) 90 (67)..... 99 (74)
 Rated Speed--rpm 1800..... 1800
 Low Idle Speed--rpm 1150.....1150
 Rated Torque--lb-ft (N*m)..... NA (NA)..... NA (NA)
 BMEP--psi (kPa) 143 (985).... 158 (1090)
 Friction Power
 @ Rated Speed--hp (kW) 17 (13)..... 17 (13)
 Altitude Capability--ft (m) 10,000(3050) .. 10,000(3050)
 Ratio--Air : Fuel..... 23 : 1..... 22 : 1
 Smoke @ Rated Speed--Bosch No. 1.8..... 2.2
 Noise--dB(A) @ 1 m 87.0*..... 87.0*

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

Prime **Standby**

25 % Power10.2 (4.6)..... 11.0 (5.0)
 50 % Power 18.1 (8.2)..... 19.8 (9.0)
 75 % Power 25.6 (11.6)..... 28.0 (12.7)
 100 % Power 33.2 (15.1)..... 36.3 (16.5)

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

* Revised Data

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August 2007