



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:

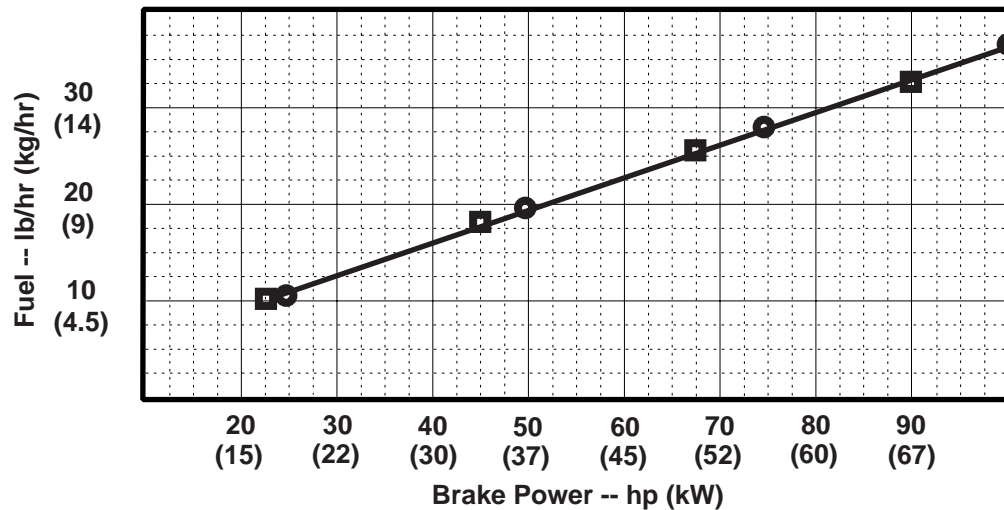
- 77 °F (25 °C) air inlet temperature
- 29.31 in.Hg (99 kPa) barometer
- 104 °F (40 °C) fuel inlet temperature
- 0.853 fuel specific gravity @ 60 °F (15.5 °C)

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.

■ - PRIME ● - STANDBY



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) <u>Forward</u> <u>Rearward</u>	
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.....	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.H ₂ O (kPa).....	25 (6.25)	
Clean Air Cleaner--in.H ₂ O (kPa)	12 (3)	
Engine Air Flow--ft ³ /min (m ³ /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.H ₂ O (kPa)		
Max.	55 (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--ft ³ /min (m ³ /min).....	477 (13.5)	508(14.4)
Exhaust Temperature--°F (°C)	959(515) .	1013 (545)
Max. Exhaust Restriction---in. H ₂ O (kPa).....	30 (7.5)	
Min. Exhaust Restriction---in. H ₂ 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**

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. H ₂ O (kPa)	80 (20)	
Max. Fuel Return Pressure--in. H ₂ O (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. H ₂ O (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 % Power	10.2 (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