



JOHN DEERE

**ENGINE PERFORMANCE**

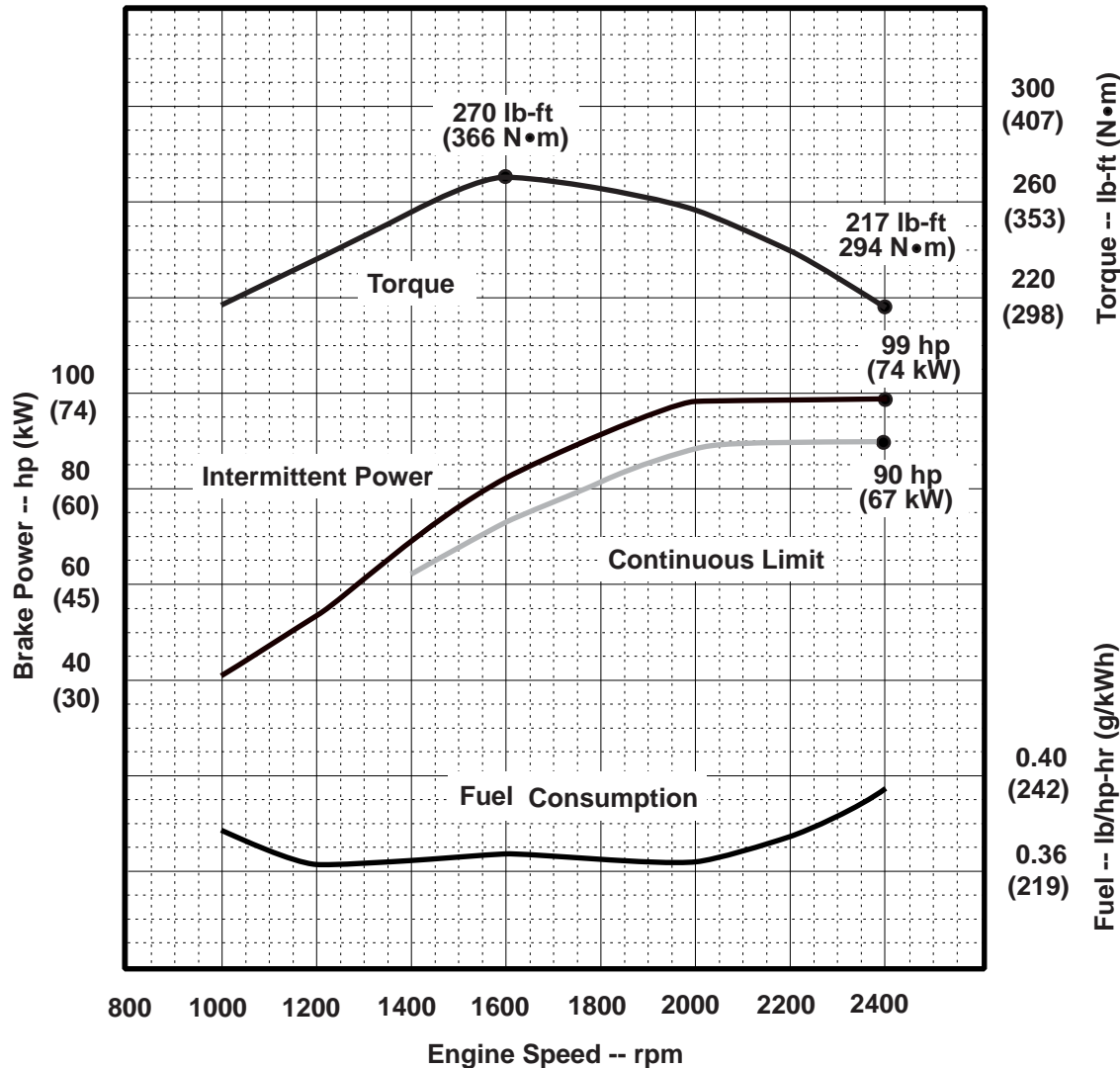
Rating: Gross Power  
Application: Industrial  
Intermittent / Continuous

**PowerTech M™ 4.5 L Engine**

**Model: 4045HF280**

**99 hp @ 2400 rpm**

**74 kW @ 2400 rpm**



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:

Tier-3 Emission Certifications:

Certified by:

**CARB; EPA; EU**  
Ref: Engine Emission Label

*Vincent...*  
08-24-07

\* Revised Data

Curve: 4045HF28099\_2400 ..... Sheet 1 of 2  
August 2007

**General Data**

Model ..... 4045HF280  
 Number of Cylinders ..... 4  
 Bore and Stroke--in. (mm)..... 4.20 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 ..... Direct Injection  
 Engine Type ..... In-line, 4-Cycle  
 Aspiration ..... Turbocharged  
 Charge Air Cooling System..... Air-to-Air  
 Engine Crankcase Vent System ..... Open  
 Maximum Crankcase Pressure--in. H<sub>2</sub>O (kPa) ..... 2 (0.5)

**Physical Data**

Length--in. (mm) ..... 33.9 (860)  
 Width--in. (mm) ..... 24.1 (612)  
 Height--in. (mm) ..... 39.1 (994)  
 Weight, dry--lb (kg) ..... 872 (396)  
 (Includes flywheel housing, flywheel & electrics)  
 Center of Gravity Location  
 From Rear Face of Block (X-axis)--in. (mm) . 10.5 (267)  
 Right of Crankshaft (Y-axis)--in. (mm) ..... 0.5 (13)  
 Above Crankshaft (Z-axis)--in. (mm)..... 4.3 (109)  
 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 (Forward)--lb (N) ..... 900 (4003)

**Electrical System**

**12 Volt 24 Volt**

Min. Battery Capacity (CCA)--amp..... 640 ..... 570  
 Max. Allow. Starting Circuit 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  
 Min. Voltage at ECU during Cranking--volts..... 6 ..... 10  
 Maximum ECU Temperature--°F (°C) ..... 221 (105)  
 Maximum Harness Temperature--°F (°C) ..... 248 (120)

**Air System**

Maximum 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) ..... 12 (3)  
 Engine Air Flow--ft<sup>3</sup>/min (m<sup>3</sup>/min) [I] ..... 264 (7.3)  
 [C] ..... 253 (7.0)

**Engine Installation Criteria**

**Charge Air Cooling System**

Air/Air Heat Rejection--BTU/min (kW) [I]..... 547 (9.5)  
 [C]..... 495 (8.7)  
 Compressor Discharge Temp.(Rated)  
 @ 77 °F (25°C) Ambient Air--°F (°C)..... 235 (113)  
 Max. Pressure Drop, thru CAC--in.H<sub>2</sub>O (kPa) ..... 52\* (13)  
 Min. Pressure Drop, thru CAC--in.H<sub>2</sub>O (kPa) ..... None  
 Intake Manifold Pressure--psi (kPa) [I] ..... 10 (69)  
 [C]..... 9 (61)  
 Max CAC Out Temp @ 77°F (25°C) Amb.--°F (°C) 140(60)  
 Max CAC Out Temp @ any Ambient--°F (°C) ..... 190 (88)  
 Min. CAC Out Temp--°F (°C)..... 118 (48)

**Cooling System**

Engine Heat Rejection--BTU/min (kW) [I]..... 2220 (39)  
 [C]..... 2045 (36)  
 Coolant Flow--gal/min (L/min) ..... 52 (196)  
 Thermostat Start to Open--°F (°C) ..... 180 (82)  
 Thermostat Fully Open--°F (°C)..... 201 (94)  
 Engine Coolant Capacity--qt (L) ..... 9 (8.5)  
 Recommended Pressure Cap--psi (kPa)..... 10 (69)  
 Maximum Top Tank Temp--°F (°C) ..... 221 (105)  
 Minimum Coolant Fill Rate--gal/min (L/min) ..... 3 (11)  
 Minimum Air-to-Boil Temperature--°F (°C)..... 117 (47)  
 Min. Pump Inlet Pressure--psi (kPa)..... 4.4 (30)

**Exhaust System**

Exhaust Flow--ft<sup>3</sup>/min (m<sup>3</sup>/min) [I] ..... 625 (17.7)  
 [C]..... 607 (17.2)  
 Exhaust Temperature--°F (°C) [I] ..... 907 (486)  
 [C]..... 883 (473)  
 Max. Allowable Back Pressure--in. H<sub>2</sub>O (kPa) ..... 30 (7.5)  
 Rec'd. Exhaust Pipe Diameter--in. (mm) ..... 4.0 (101.6)

**Fuel System**

Fuel Injection Pump ..... Stanadyne DB4  
 Governor Regulation..... 7-10 %  
 Governor Type ..... Mechanical  
 Total Fuel Flow--lb/hr (kg/hr) [I] ..... 155 (70)  
 Fuel Consumption--lb/hr (kg/hr) [I]..... 39 (17.8)  
 [C]..... 35 (16.0)  
 Maximum Fuel Transfer Pump Suction--ft (m) fuel... 3 (0.9)  
 Maximum Fuel Inlet Temp.--°F (°C) ..... 212 (100)  
 Fuel Filter Micron Size @ 98% Efficiency..... 2

**Lubrication System**

Oil Pressure at Rated Speed--psi (kPa) ..... 50 (345)  
 Oil Pressure at Low Idle-psi (kPa) ..... 15 (105)  
 In Pan Oil Temperature--°F (°C) ..... 248 (120)  
 Engine Angularity Limits any direction--degrees  
 Intermittent..... 45  
 Continuous..... 20

**Performance Data**

Rated Power--hp (kW) [I]..... 99 (74)  
 [C]..... 90 (67)  
 Rated Speed--rpm ..... 2400  
 Peak Torque--lb-ft (N•m) [I]..... 270 (366)  
 [C]..... 242 (328)  
 Peak Torque Speed--rpm..... 1600  
 Low Idle Speed--rpm ..... 850  
 BMEP--psi (kPa) [I]..... 119 (818)  
 [C]..... 108 (740)  
 Friction Power @ Rated Speed--hp (kW) ..... 28 (21)  
 Altitude Capability -- ft (m) ..... 10,500 (3200)  
 Ratio--Air : Fuel [I]..... 28.0 : 1  
 [C]..... 29.3 : 1  
 Smoke @ Rated Speed--Bosch No. [I]..... 1.1  
 [C]..... 1.0  
 Noise--dB(A) @ 1 m [I] ..... 94.5\*  
 [C]..... 94.5\*

Engine Speed rpm	Contin. Limit hp(kW)	Intermit. Power hp(kW)	Intermit. Torque lb-ft(N•m)	BSFC lb/hp-hr (g/kWh)
2400	90 (67)	99 (74)	217 (294)	0.394 (240)
2200	90 (67)	99 (74)	240 (325)	0.375 (228)
2000	88 (66)	98 (73)	257 (349)	0.365 (222)
1800	82 (61)	91 (68)	265 (360)	0.365 (222)
1600	73 (55)	82 (61)	270 (366)	0.368 (224)
1400	62 (46)	69 (51)	258 (350)	0.365 (222)
1200	-----	54 (40)	236 (320)	0.372 (226)
1000	-----	41 (31)	218 (295)	0.378 (230)

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

\* Revised Data  
 Curve: 4045HF28099\_2400 ..... Sheet 2 of 2  
 August 2007