



JOHN DEERE

**ENGINE PERFORMANCE CURVE**

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

**PowerTech E™ 4.5L Engine**

Model: **4045TF285**

**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 (6% of Standby) |     | Power Factor | Prime Rating <sup>2</sup> |       | Standby Rating <sup>1,2</sup> |       | ISO 8528 G2 Block Load Capability |
|------------------------|---------------------------|-----|--------------|---------------------------|-------|-------------------------------|-------|-----------------------------------|
|                        | hp                        | kW  |              | kWe                       | kVA   | kWe                           | kVA   |                                   |
| 88-92                  | 7.0                       | 5.2 | 0.8          | 54-57                     | 68-71 | 61-63                         | 76-79 | NA                                |

Note 1: Based on nominal engine power. Derate \_\_\_% for 100% block load capability.  
 Note 2: kWe / kVA rating assumes 90% efficiency. "Generator Efficiency %" will vary.

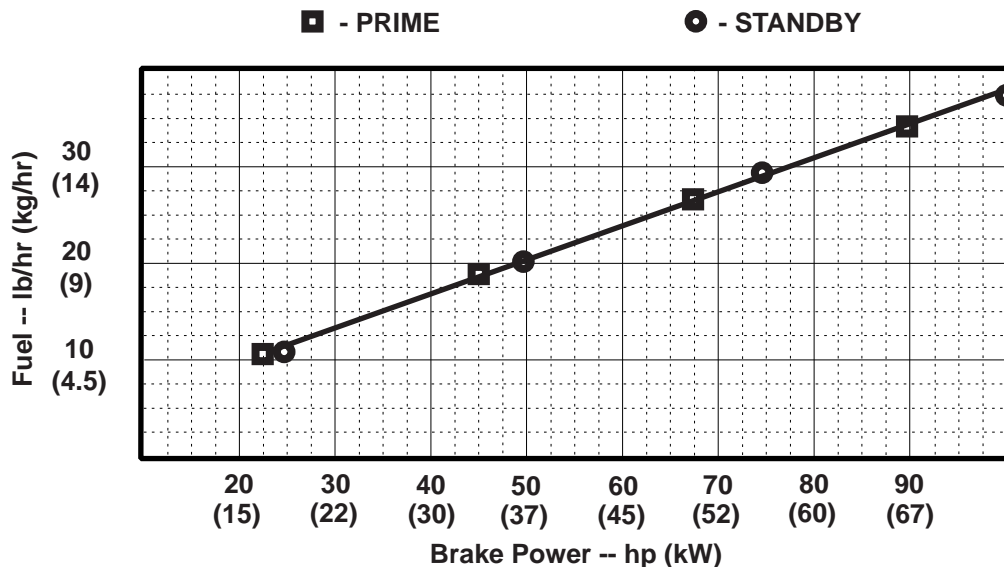
**STANDARD CONDITIONS**

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:         |
| <b>CARB; EPA</b>                | <i>Vincent Penner</i> |
| Ref: Engine Emission Label      | <b>6 June '07</b>     |

\* Revised Data  
 Curve 4045TF285180099..... Sheet 1 of 2  
 June 2007

## Engine Installation Criteria

### General Data

|   |                         |
|---|-------------------------|
| Model .....                               | 4045TF285               |
| 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 .....           | None                    |
| Engine Crankcase Vent System .....        | Open                    |

### Physical Data (Estimated)

|   |                             |
|---|-----------------------------|
| 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) .....                      | 2.2 (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                        |

### Air System

|   | <u>Prime</u>  | <u>Standby</u> |
|---|---------------|----------------|
| 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) ..... | 167(4.72) ... | 169(4.79)      |
| Intake Manifold Pressure--psi (kPa).....                          | 7(49.6) ..... | 8(54.1)        |
| Air Cleaner Efficiency--% .....                                   | 99.9          |                |

### Cooling System

|   | <u>Prime</u>   | <u>Standby</u> |
|---|----------------|----------------|
| Engine Heat Reject.--BTU/min (kW)....         | 2561(45) ..... | 2789 (49)      |
| Coolant Flow--gal/min (L/min).....            | 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)       |                |

### Electrical System

|  | <u>12 Volt</u> | <u>24 Volt</u> |
|--|----------------|----------------|
| 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)      |                |
| Max. Voltage From Engine Crankshaft/<br>Generator Shaft to Ground--VAC ..... | 0.15           |                |

### Exhaust System

|   | <u>Prime</u>  | <u>Standby</u> |
|---|---------------|----------------|
| Exhaust Flow--ft <sup>3</sup> /min (m <sup>3</sup> /min)..... | 479 (13.6) .. | 500(14.2)      |
| Exhaust Temperature--°F (°C) .....                            | 1108(598) ..  | 1155(624)      |
| 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

|   | <u>Prime</u>   | <u>Standby</u> |
|---|----------------|----------------|
| ECU Description .....   | L16 Controller |                |
| Fuel Injection Pump .....                                     | Denso HP3      |                |
| Governor Type .....   | Electronic     |                |
| Total Fuel Flow--lb/hr (kg/hr).....                           | 84(38.0) ..... | 90(41.0)       |
| Fuel Consumption--lb/hr (kg/hr).....                          | 35(15.7) ..... | 37 (17.0)      |
| Max. Fuel Inlet Temp.--°F (°C) .....                          | 176 (80)       |                |
| Fuel Temp. Rise, Inlt to Retrn--°F (°C).....                  | 51.7(29) ..... | 59.8(33)       |
| 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

|  | <u>Prime</u> | <u>Standby</u> |
|--|--------------|----------------|
| Oil Press. at Rated Speed--psi (kPa).....                | 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

|                                     | <u>Prime</u>    | <u>Standby</u> |
|-------------------------------------|-----------------|----------------|
| 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).....      | 532 (392).....  | 532 (392)      |
| BMEP--psi (kPa) .....               | 159 (1096)....  | 159 (1096)     |
| Friction Power                      |                 |                |
| @ Rated Speed--hp (kW) .....        | 17 (13).....    | 17 (13)        |
| Altitude Capability--ft (m) .....   | 10,000(3050) .. | 10,000(3050)   |
| Ratio--Air : Fuel.....              | 21 : 1.....     | 19 : 1         |
| Smoke @ Rated Speed--Bosch No. .... | 1.23.....       | 2.02           |
| Noise--dB(A) @ 1 m .....            | 88.4.....       | 88.8           |

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

|                   |                  |             |
|-------------------|------------------|-------------|
| 25 % Power .....  | 10.6 (4.8).....  | 11.7 (5.3)  |
| 50 % Power .....  | 18.5 (8.4).....  | 20.3 (9.2)  |
| 75 % Power .....  | 26.9 (12.2)..... | 29.5 (13.4) |
| 100 % Power ..... | 34.2 (15.5)..... | 37.5 (17.0) |

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

\* Revised Data  
Curve 4045TF285180099 ..... Sheet 2 of 2  
June 2007