**PowerTech M™ 4.5L Engine**

Model: **4045TF280**

**68 hp (51 kW) Prime**

**75 hp (56 kW) Standby**

[See Option Code Tables]

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**ENGINE PERFORMANCE CURVE**

**Rating:** Gross Power

**Application:** Generator (60 Hz)

**Target:** 50 kWe Standby Market

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**Nominal Engine Power @ 1800 RPM**

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<th></th>
<th>Prime</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>HP (kW)</td>
<td>68</td>
<td>kW (hp)</td>
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</tr>
<tr>
<td>Standby</td>
<td>75</td>
<td>kWe</td>
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</tr>
</tbody>
</table>

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**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.

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**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.

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**Tier-3 Emission Certifications:**

Certified by:

**CARB; EPA**

Ref: Engine Emission Label

* Revised Data

Curve 4045TF280180075... Sheet 1 of 2

August 2007
**Engine Installation Criteria**

### General Data
- Model ......................... 4045TF280
- Number of Cylinders .................. 4
- Bore and Stroke—\(\text{in.} \times \text{mm}\) ...... 4.19 x 5.00 (106 x 127)
- Displacement—\(\text{in.}^3 (\text{L})\) ........ 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
- Engine Crankcase Vent System .......... Open

### Physical Data
- Length—\(\text{in.} (\text{mm})\) .................. 33.9 (860)
- Width—\(\text{in.} (\text{mm})\) .................. 24.1 (612)
- Height—\(\text{in.} (\text{mm})\) .................. 39.1 (994)
- Weight, with oil—\(\text{lb} (\text{kg})\) .......... 872 (396)
  (Includes flywheel hsg., flywheel & electrics)
- Center of Gravity Location (Estimated based on Tier 2)
  - From Flywheel Cage: \(\text{in. (mm)}\) ....... 900 (2286)
  - Right of Crankshaft (Y-axis)—\(\text{in. (mm)}\) .... -0.3 (-8)
- Max. Allow. Static Bending Moment at Rear
  - Face of Flywheel Hsg. with 5-G Load—\(\text{lb} (\text{kg})\) ..... 600 (814)
- Thrust Bearing Load Limit—\(\text{lb} (\text{N})\)
  - Forward ............. 25.0 (110)
  - Rearward .......... 25.0 (110)
- Intermittent ......................... 450 (2000)
- Continuous ......................... 225 (1000)
- Max. Front of Crank. Torsional Vibration—\(\text{DDA}\) .......... 0.25

### Air System
- Max. Allowable Temp Rise—\(\text{Ambient Air to Engine Inlet—}^\circ\text{F (C)}\) ........ 15 (8)
- Max. Air Intake Restriction
  - Dirty Air Cleaner—\(\text{in H}_2\text{O (kPa)}\) .......... 25 (6.25)
  - Clean Air Cleaner—\(\text{in H}_2\text{O (kPa)}\) .......... 12 (3)
- Engine Air Flow—\(\text{ft}^3 / \text{min (m}^3 / \text{min)}\) ........ 173 (4.9) x 180 (5.1)
- Intake Manifold Pressure—\(\text{psi (kPa)}\) .......... 8 (55) x 9 (62)
- Air Cleaner Efficiency—\% ................ 99.9

### Cooling System
- Engine Heat Reject—\(\text{BTU/min (kW)}\) ........... 1707 (30)
- Coolant Flow—\(\text{gal/min (L/min)}\) ........... 38 (144)
- Thermostat Open—\(\text{°F (°C)}\) ................... 182 (82)
- Thermostat Fully Open—\(\text{°F (°C)}\) ............... 202 (94)
- Engine Coolant Capacity—\(\text{qt (L)}\) .......... 14.5 (100)
- Max. Top Tank Temp—\(\text{°F (°C)}\) .......... 230 (110)
- Min. Pressure Cap—\(\text{psi (kPa)}\) ........... 14 (100)
- Min. Coolant Fill Rate—\(\text{gal/min (L/min)}\) .... 3 (11)
- Min. Air-to-Boil Temperature—\(\text{°F (°C)}\) ....... 176 (80)
- Min. Pump Inlet Pressure—\(\text{psi (kPa)}\) .......... 4.4 (30)

### Electrical System
- Battery Capacity—\(\text{CCA (amp)}\) ........... 640 (570)
- Max. Allow. Start. Circ't Resist.—\(\Omega\) ...... 0.002
- Starter Rolling Current:
  - Includes Flywheel Hsg., Flywheel & Electrics
  - At \(32^\circ\text{F (0 °C)}\)—\(\text{amp (amp)}\) ........... 780 (100)
  - At \(-22^\circ\text{F (-30 °C)}\)—\(\text{amp (amp)}\) .......... 1000 (700)
- Maximum Voltage From Engine Crankshaft/
  Generator Shaft to Ground—\(\text{VAC* (kV)}\) .......... 0.15 (15)

### Exhaust System
- Exhaust Flow—\(\text{ft}^3 / \text{min (m}^3 / \text{min)}\) ........ 424 (12.0) x 448 (12.7)
- Exhaust Temperature—\(\text{°F (°C)}\) ............... 918 (492)
- Max. Exhaust Restriction—\(\text{in. H}_2\text{O (kPa)}\) .......... 80 (20)
- Min. Exhaust Restriction—\(\text{in. H}_2\text{O (kPa)}\) .......... None
- Max. Bend. Moment, Turbo Out—\(\text{lb} (\text{kg})\) ...... 24 (11)
- Max. Shear on Turbo Outlet—\(\text{lb} (\text{kg})\) .......... 5.2 (7.0)
- Generator Shaft to Ground—\(\text{VAC* (kV)}\) .......... 0.15 (15)

### Fuel System
- Fuel Injection Pump .................. Stanadyne DB4
- Governor Type ..................... Mechanical
- Total Fuel Flow—\(\text{lb/hr (kg/hr)}\) .......... 212 (96.0) x 212 (96.0)
- Fuel Consumption—\(\text{lb/hr (kg/hr)}\) .......... 27 (12.3) x 29.3 (13.3)
- Max. Fuel Inlet Temp—\(\text{°F (°C)}\) .......... 176 (80)
- Max. Fuel Inlet Restriction—\(\text{in. H}_2\text{O (kPa)}\) .......... 80 (20)
- Max. Fuel Return Pressure—\(\text{in. H}_2\text{O (kPa)}\) .......... 80 (20)

### Lubrication System
- Oil Press. at Rated Speed—\(\text{psi (kPa)}\) .......... 50 (345) x 50 (345)
- Min. Oil Pressure—\(\text{psi (kPa)}\) .......... 15 (105)
- Max. Oil Carryover in Blow-by—\(\text{lb/hr (kg/hr)}\) .......... 0.002 (1.0)
- Max. Airflow in Blow-by—\(\text{gal/min (L/min)}\) .......... 26 (100)
- Max. Crankcase Pressure—\(\text{in. H}_2\text{O (kPa)}\) .......... 2 (0.5)

### Performance Data
- Rated Power—\(\text{hp (kW)}\) ........... 68 (51) x 75 (56)
- Rated Speed—\(\text{rpm (r/min)}\) .......... 1800 x 1800
- Low Idle Speed—\(\text{rpm (r/min)}\) .......... 1150 x 1150
- Rated Torque—\(\text{lb-ft (N-m)}\) .......... 367 (271) x 403 (297)
- BMEP—\(\text{psi (kPa)}\) .......... 109 (751) x 120 (825)
- Friction Power
  - @ Rated Speed—\(\text{hp (kW)}\) .......... 17 (13) x 17 (13)
  - Altitude Capability—\(\text{ft (m)}\) .......... 10,000 (3050) x 10,000 (3050)
  - Ratio—Air : Fuel ..................... 28.6 : 1 x 25.5 : 1
  - Smoke @ Rated Speed—Bosch No. .......... 1.7 x 1.8
  - Noise—\(\text{dB(A)} @ 1 \text{m (kW)}\) .......... 86.0* x 86.3*

### Fuel Consumption
- \(\text{lb/hr (kg/hr)}\) .......... 25 % Power .............. 9.0 (4.1) x 9.7 (4.4)
- 50 % Power ....................... 15.0 (6.8) x 15.7 (7.1)
- 75 % Power ....................... 21.2 (9.6) x 23.1 (10.5)
- 100 % Power .................... 27.1 (12.3) x 29.3 (13.3)

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

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* Revised Data

Curve 4045TF280180075 .......... Sheet 2 of 2
August 2007

Engine Performance Curves
4045 - Generator
May 2008