ENGINE PERFORMANCE CURVE

PowerTech™ E 9L Engine
Model: 6090HF484
JD Electronic Control

381 hp (284 kW) Prime
422 hp (315 kW) Standby

Nominal Engine Power @ 1800 RPM

<table>
<thead>
<tr>
<th>Prime</th>
<th>Standby</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP kW</td>
<td>HP kW</td>
</tr>
<tr>
<td>381</td>
<td>284</td>
</tr>
<tr>
<td>422</td>
<td>315</td>
</tr>
</tbody>
</table>

Generator Efficiency %

<table>
<thead>
<tr>
<th>Fan Power (6% of Standby)</th>
<th>Power Factor</th>
<th>Prime Rating kW kVA</th>
<th>Standby Rating kW kVA</th>
<th>ISO 8528 G2 Block Load Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP kW</td>
<td></td>
<td>242-253</td>
<td>303-316</td>
<td>266-278</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>333-348</td>
</tr>
</tbody>
</table>

Note 1: Based on nominal engine power.

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 = 0.85kg
- 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:
- CARB
- EPA

Ref: Engine Emission Label

* Revised Data
Curve 6090HF484_A_S0_R0
# Engine Installation Criteria

## General Data
- **6** Cylinders
- **118.4 mm** Bore
- **136.0 mm** Stroke
- **9 L** Displacement
- **16.0 : 1** Compression Ratio
- **2/2** Valves per Cylinder
- **1-5-3-6-2-4** Firing Order
- **HPCR** Combustion System
- **In-line, 4-Cycle** Engine Type

### Air-to-Air Aftercooled Aspiration
- **Air-to-Air** Charge Air Cooling System
- **Open** Engine Crankcase Vent System

## Physical Data
- **434.4 mm** X-axis, Center of Gravity Location
- **2.24 mm** Y-axis, Center of Gravity Location
- **201.4 mm** Z-axis, Center of Gravity Location
- **1113 mm** Height
- **1208 mm** Length
- **82 °C** Max. Continuous Damper Temp
- **8600 N** Continuous, Thrust Bearing Load Limit
- **13000 N** Intermittent, Thrust Bearing Load Limit
- **4000 N** Continuous, Thrust Bearing Load Limit
- **6000 N** Intermittent, Thrust Bearing Load Limit
- **901 kg** Weight- with oil and no coolant
- **630 mm** Width
- **814 N-m** Max. Allowable Static Bending Moment
- **0.25 DDA** Front of Crank

## Electrical System
- **105 °C** Max. ECU Temperature
- **125 °C** Max. Harness Temperature
- **NA** Max. VTG Actuator Surface Temp
- **6 volts** Min. Voltage at ECU during Cranking- 12V
- **10 volts** Min. Voltage at ECU during Cranking- 24V
- **1100 amps** Recommended Battery Capacity- 12V
- **750 amps** Recommended Battery Capacity- 24V
- **920 amps** At 0 °C - 12V, Starter Rolling Current
- **600 amps** At 0 °C - 24V, Starter Rolling Current
- **1300 amps** At -30 °C - 12V, Starter Rolling Current
- **700 amps** At -30 °C - 24V, Starter Rolling Current
- **0.0012 Ohm** Max. Allowable Start Circuit Resistance- 12V
- **0.002 Ohm** Max. Allowable Start Circuit Resistance- 24V
- **Maximum Voltage From Engine Crankshaft- 12V
- **Maximum Voltage From Engine Crankshaft- 24V

## Charge Air Cooling System
- **252** Intake Manifold Pressure Prime
- **256** Intake Manifold Pressure Standby
- **88 °C** Intake Manifold Temperature at which Power De-rate Occurs
- **86.5 kWbhp** Air/Air Exch’. Heat Rej. Prime
- **88.0 kWbhp** Air/Air Exch’. Heat Rej. Standby
- **223 °C** Compressor Discharge Temperature @ 77°F (25°C) Ambient Air Prime
- **225 °C** Compressor Discharge Temperature @ 77°F (25°C) Ambient Air Standby
- **255 °C** Compressor Discharge Temperature @ 117°F
- **256 °C** F(47°C) 80 kPa Barometric pressure Prime
- **13 kPa** Maximum Pressure Drop through CAC
- **NA** Minimum Pressure Drop through CAC
- **45 °C** Maximum Temperature Out of Charge Air Cooler Prime
- **45 °C** Maximum Temperature Out of Charge Air Cooler Standby

## Additional Data
- **223 °C** Intake Manifold Temperature at which Power De-rate Occurs
- **86.5 kWbhp** Air/Air Exch’. Heat Rej. Prime
- **88.0 kWbhp** Air/Air Exch’. Heat Rej. Standby
- **223 °C** Compressor Discharge Temperature @ 77°F (25°C) Ambient Air Prime
- **225 °C** Compressor Discharge Temperature @ 77°F (25°C) Ambient Air Standby
- **255 °C** Compressor Discharge Temperature @ 117°F
- **256 °C** F(47°C) 80 kPa Barometric pressure Prime
- **13 kPa** Maximum Pressure Drop through CAC
- **NA** Minimum Pressure Drop through CAC
- **45 °C** Maximum Temperature Out of Charge Air Cooler Prime
- **45 °C** Maximum Temperature Out of Charge Air Cooler Standby
### Engine Installation Criteria

#### Cooling System
- **16 Liter** | Engine Coolant Capacity
- **94 °C** | Thermostat Fully Open
- **82 °C** | Thermostat Start to Open
- **110 °C** | Max. Top Tank Temperature Prime
- **110 °C** | Max. Top Tank Temperature Standby
- **14 kPa** | Max. Radiator System Restriction
- **12 L/min** | Minimum Coolant Fill Rate
- **100 kPa** | Min. Pressure Cap
- **30 kPa** | Min. Pump Inlet Pressure
- **280 L/min** | Coolant Flow
- **94 kW/min** | Engine Heat Rejection Prime
- **104 kW/min** | Engine Heat Rejection Standby
- **-30 kPa** | Max. Water Pump Inlet Restriction
- **47 °C** | Min. Air-to-Boil Temperature Prime
- **47 °C** | Min. Air-to-Boil Temperature Standby

#### Exhaust System
- **7.0 N·m** | Max. Bending Moment on Turbo Outlet
- **11 kg** | Max. Shear on Turbo Outlet
- **7.5 kPa** | Maximum Allowable Exhaust Restriction
- **NA** | Minimum Allowable Exhaust Restriction
- **58.5 m³** | Exhaust Flow Prime
- **59.0 m³** | Exhaust Flow Standby
- **638 °C** | Exhaust Temperature Prime
- **638 °C** | Exhaust Temperature Standby

#### Fuel System
- **L14 Controller ECU Description**
- **Denso HP4** | Fuel Injection Pump
- **Electronic** | Governor Type
- **20 kPa** | Max. Fuel Inlet Pressure
- **20 kPa** | Max. Fuel Inlet Restriction
- **80 °C** | Max. Fuel Inlet Temperature
- **20 kPa** | Max. Fuel Return Pressure
- **59.3 kg/hr** | Fuel Consumption Prime
- **63.2 kg/hr** | Fuel Consumption Standby
- **37 °C** | Fuel Temperature Rise, Inlet to Return Prime
- **37 °C** | Fuel Temperature Rise, Inlet to Return Standby
- **204 kg/hr** | Total Fuel Flow Prime
- **204 kg/hr** | Total Fuel Flow Standby

#### Lubrication System
- **0.5 kPa** | Max. Crankcase Pressure
- **40 L/min** | Max. Airflow in Blow-By
- **3 g/hr** | Max. Oil Carryover in Blow-By
- **190 kPa** | Oil Pressure at Low Idle
- **260 kPa** | Oil Pressure at Rated Speed

#### Air Intake System
- **8 °C** | Maximum Allowable Temp Rise—Ambient Air to Engine Inlet
- **25.5 m³** | Engine Air Flow Prime
- **25.5 m³** | Engine Air Flow Standby
- **99.9 %** | Air Cleaner Efficiency
- **3.75 kPa** | Clean Air Cleaner, Maximum Air Intake Restriction
- **6.25 kPa** | Dirty Air Cleaner, Maximum Air Intake Restriction
<table>
<thead>
<tr>
<th>Performance Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>29.0:1 Prime, Air:Fuel Ratio</td>
</tr>
<tr>
<td>27.0:1 Standby, Air:Fuel Ratio</td>
</tr>
<tr>
<td>0.5 Smoke @ Rated Speed Prime</td>
</tr>
<tr>
<td>0.3 Smoke @ Rated Speed Standby</td>
</tr>
<tr>
<td>1677 m Altitude Capability Prime</td>
</tr>
<tr>
<td>1677 m Altitude Capability Standby</td>
</tr>
<tr>
<td>24 kW Friction Power @ Rated Speed</td>
</tr>
<tr>
<td>1000 rpm Low Idle Speed</td>
</tr>
<tr>
<td>91.1 dBa Noise @ 1 m Prime</td>
</tr>
<tr>
<td>91.3 dBa Noise @ 1 m Standby</td>
</tr>
<tr>
<td>284 kW Rated Power Prime</td>
</tr>
<tr>
<td>315 kW Rated Power Standby</td>
</tr>
<tr>
<td>1800 rpm Rated Speed</td>
</tr>
<tr>
<td>1671 N·m Rated Torque Standby</td>
</tr>
<tr>
<td>1504 N·m Rated Torque Prime</td>
</tr>
<tr>
<td>2333 kPa Standby BMEP</td>
</tr>
<tr>
<td>2100 kPa Prime BMEP</td>
</tr>
<tr>
<td>59.3 kg/hr 100%Power Prime</td>
</tr>
<tr>
<td>18.8 kg/hr 25%Power Prime</td>
</tr>
<tr>
<td>36.3 kg/hr 50%Power Prime</td>
</tr>
<tr>
<td>51.2 kg/hr 75%Power Prime</td>
</tr>
<tr>
<td>63.2 kg/hr 100%Power Standby</td>
</tr>
<tr>
<td>20.0 kg/hr 25%Power Standby</td>
</tr>
<tr>
<td>38.7 kg/hr 50%Power Standby</td>
</tr>
<tr>
<td>54.6 kg/hr 75%Power Standby</td>
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