Waukesha® Engine manufactures spark ignited gaseous fueled engines and Enginator® systems for gas compression, electric power generation, cogeneration and mechanical drive applications — ranging in output from 160 to 4830 bhp (40-3430 kWe).

Waukesha Engine’s many years of experience have shown that natural gas engines can power or drive just about anything. Waukesha offers a full line of heavy-duty, gaseous-fueled engines that can be put to work in a variety of markets including gas compression, electric power generation, cogeneration, and general mechanical drive applications (pumps, air compressors, chillers, blowers).

With decades of experience in engine technology together with excellent engineering skills, Waukesha has found cost-effective solutions for many customer needs. Customers recognize that Waukesha engines can power all types of equipment and do it more cost effectively.

Waukesha Engine’s manufacturing facility (Waukesha, Wisconsin) is certified by the world’s leading registrar, Lloyd’s Register Quality Assurance (LQRA), to the ISO 9001:2000 Quality Management Standard. Regional sales offices stand ready to serve our customers, distributors, and OEMs.

With a global distribution network, Waukesha services all major marketing areas. Waukesha distributors are on call 24 hours a day, with the parts and service personnel to provide quick responsive solutions to customers’ needs.

Waukesha Engine has found solutions to almost any customer concern and need. Our innovative product design improvements keep pace with customers’ ever-increasing standards. From demands for higher loads and speeds, to simple, long-term reliability, Waukesha understands those needs and continues to design, build, and service the best engines in the marketplace.

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### Waukesha Engine Family Ranges

<table>
<thead>
<tr>
<th>BHP</th>
<th>0</th>
<th>1000</th>
<th>2000</th>
<th>3000</th>
<th>4000</th>
<th>5000</th>
</tr>
</thead>
<tbody>
<tr>
<td>BHP</td>
<td>320 - 2560</td>
<td>1565 - 4830</td>
<td>1390 - 4425</td>
<td>160 - 1175</td>
<td>166 - 260</td>
<td>1665 - 4830</td>
</tr>
</tbody>
</table>

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### BASIC FORMULAS

#### English

- **F** = (Degrees C x 1.8) + 32
- **Torque lb-ft** = \(\frac{5250 \times \text{BHP}}{\text{rpm}}\)
- **BMEP (psi)** = \(\frac{792,000 \times \text{BHP}}{\text{Displacement (cubic inches)} \times \text{rpm}}\)
- **BHP** = \(\frac{\text{BMEP} \times \text{Displacement (cubic inches)} \times \text{rpm}}{792,000}\)

#### Metric

- **C** = (Degrees F-32) / 1.8
- **Torque (N•m)** = \(\frac{kW_b \times 9550}{\text{rpm}}\)
- **BMEP (bar)** = \(\frac{kW_b \times 1200}{\text{Displacement (liters)} \times \text{rpm}}\)
- **kW_b** = \(\frac{\text{BMEP} \times \text{Displacement (liters)} \times \text{rpm}}{1200}\)

#### Displacement

\[\text{Displacement} = \frac{\pi D^2 S}{4}\]

Where: Displacement = cubic inch.  
D = Bore Dia. in.  
C = No. of cyl.  
S = Stroke in.  
p = 3.1416

#### Piston Speed

\[\text{Piston Speed} = \frac{\text{NS}}{6}\]

Where: P = Ft. per Min.  
N = rpm  
S = Stroke in

#### Formulas To Determine kW, KVA, Reactive KVA, BHP And Amperes

(for three phase AC)

- **KVA** = \(\frac{1.73 \times \text{Volts} \times \text{Amps}}{1000}\)
- **kW** = KVA x PF
- **kW_b** = KVA x Eff
- **BHP** = \(\frac{1.73 \times \text{Volts} \times \text{Amps} \times \text{PF}}{.746 \times 1000 \times \text{Eff}}\)
- **kW** = \(\frac{.746 \times \text{Eff}}{\text{BHP}}\)
- **AMPS** = \(\frac{\text{BHP} \times .746 \times 1000 \times \text{Eff}}{1.73 \times \text{Volts} \times \text{PF}}\)
- **AMPS** = \(\frac{\text{kW} \times 1000}{1.73 \times \text{Volts} \times \text{PF}}\)
- **AMPS** = \(\frac{\text{KVA} \times 1000}{1.73 \times \text{Volts}}\)
- **Reactive KVA** = KVA x \(\sqrt{1 - \text{PF}^2}\)

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*This Power Ratings Bulletin supersedes all Power Ratings Bulletins prior to December, 2005.*

Waukesha, Enginator, VHP, VGF, ATGL, APG, WKI, and ESM are trademarks/registered trademarks of Waukesha Engine, Dresser, Inc.
Product Designations

Engine Series
Waukesha manufactures five engine families — the ATGL, APG, VHP, VGF, and VSG.

Prefix Designations
The prefix attached to an engine model indicates the number of cylinders (except ATGL and APG which states actual number): P = 16, L = 12, H = 8, F = 6.
• VHP L7042GL engine is a 12 cylinder engine
• VGF P48 GL is a 16 cylinder engine
• 16V-AT27GL is a 16 cylinder engine

Numeric Designations
The numeric designation in each engine model name indicates the displacement of the engine model in either English units of cubic inches or metric units of liters.
• The ATGL series is designated by a numeric indicator of the bore size in millimeters. For example: the “27” of the 16V-AT27GL indicates a 275 millimeter bore.
• The APG series is designated by a numeric indicator of the bore size in millimeters. For example: the “150” of the 16V150LTD indicates a 152 millimeter bore.
• The VHP series show a displacement in cubic inches. For example: the VHP L7042GL indicates a displacement of 7,040 in³.
• The VGF and VSG series show a displacement in liters. For example: the VGF P48GL indicates a displacement of 48 liters.
• The VSG F11GSI indicates a displacement of 11 liters.

Suffix Designations
G = Naturally aspirated
GSI = Turbocharged, intercooled
GSID = Turbocharged, intercooled, draw-through
LT = Lean combustion turbulence
LTD = Lean combustion turbulence, draw-through
GL = Turbocharged, intercooled, lean burn
GLD = Turbocharged, intercooled, lean burn, draw-through

Other Waukesha Engine Products

Waukesha Power Systems Enginator® Series
The Enginator is a Waukesha Engine registered trademark of an engine generator set packaged by Waukesha Power Systems. WPS also designs and assembles Engomatic® panels (switchgear control systems).

Custom Engine Controls (CEC) Series
AFM = Air/Fuel Module
DSM = Detonation Sensing Module
IM = Ignition Module
TCM = Turbocharger Control Module
KDM = Knock Detection Module

Waukesha ESM®
ESM® = Engine System Manager
AFR = Air/Fuel Ratio Controller
These power ratings require pricebook option Code 1100 (176 BMEP) and DSM. They are available continuously when applied per WKI® Power and Timing Curve S7079-19. It is permissible to operate at up to 5% overload for two hours in each 24 hour period.

Inline engine ratings are 700-1000 rpm for low speed turbocharger operation and 1000-1200 rpm for high speed turbocharger operation.

Vee engine ratings are 1100-1600 rpm for low speed turbocharger operation and 1400-1800 rpm for high speed turbocharger operation.

Engine Family

<table>
<thead>
<tr>
<th>Model</th>
<th>Displacement</th>
<th>Bore/Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATGL®</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16V-AT27GL</td>
<td>17,398 in³</td>
<td>10.83 x 11.81&quot;</td>
</tr>
<tr>
<td></td>
<td>(285 L)</td>
<td>(275 x 300 mm)</td>
</tr>
<tr>
<td>12V-AT27GL</td>
<td>13,048 in³</td>
<td>10.83 x 11.81&quot;</td>
</tr>
<tr>
<td></td>
<td>(214 L)</td>
<td>(275 x 300 mm)</td>
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<tr>
<td>8L-AT27GL</td>
<td>8699 in³</td>
<td>10.83 x 11.81&quot;</td>
</tr>
<tr>
<td></td>
<td>(143 L)</td>
<td>(275 x 300 mm)</td>
</tr>
<tr>
<td>VHP®</td>
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<td></td>
</tr>
<tr>
<td>P9390</td>
<td>9388 in³</td>
<td>9.375 x 8.5&quot;</td>
</tr>
<tr>
<td></td>
<td>(154 L)</td>
<td>(238 x 216 mm)</td>
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<tr>
<td>L7042/L7044</td>
<td>7040 in³</td>
<td>9.375 x 8.5&quot;</td>
</tr>
<tr>
<td></td>
<td>(116 L)</td>
<td>(238 x 216 mm)</td>
</tr>
<tr>
<td>VGF®</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L5790/L5794/ L5774</td>
<td>5788 in³</td>
<td>8.5 x 8.5&quot;</td>
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<tr>
<td></td>
<td>(95 L)</td>
<td>(216 x 216 mm)</td>
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<tr>
<td>L36</td>
<td>2193 in³</td>
<td>9.375 x 8.5&quot;</td>
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<tr>
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<td>(36 L)</td>
<td>(238 x 216 mm)</td>
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<tr>
<td>P48</td>
<td>2924 in³</td>
<td>5.98 x 6.5&quot;</td>
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<tr>
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<td>(48 L)</td>
<td>(152 x 165 mm)</td>
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<tr>
<td>L36</td>
<td>2193 in³</td>
<td>5.98 x 6.5&quot;</td>
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<tr>
<td></td>
<td>(36 L)</td>
<td>(152 x 165 mm)</td>
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<tr>
<td>H24</td>
<td>1462 in³</td>
<td>5.98 x 6.5&quot;</td>
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<td>(24 L)</td>
<td>(152 x 165 mm)</td>
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<td>F18</td>
<td>1098 in³</td>
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<td>(18 L)</td>
<td>(152 x 165 mm)</td>
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<tr>
<td>VSG</td>
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<tr>
<td>F11</td>
<td>673 in³</td>
<td>5.5 x 5.71&quot;</td>
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<tr>
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<td>(11 L)</td>
<td>(127 x 145 mm)</td>
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</table>