VIBRATION DAMPER – Enclosed, viscous type.

TURBOCHARGER – Two, water cooled center housing, exhaust driven, with Turbocharger Control Module.

PISTON – Air-to-water, for 90° F (32° C) or option 130° F (54° C) inlet water.

INTERCOOLER – With 291 tooth ring gear. Machined for direct connected, single bearing generator shaft.

FLYWHEEL – With 291 tooth ring gear. Machined for direct connected, single bearing generator shaft.

CONNECTING RODS – Low alloy, forged, fully machined.

CRANKCASE – Single piece, stress relieved, gray iron casting. Main bearing caps are retained with vertical studs and lateral tie bolts.

CRANKSHAFT – Low alloy, forged, fully machined, counterweighted with seven main bearing journals. The crankshaft is flanged for full power transmission from each end. Bearings are heavy duty, replaceable, precision aluminum type.

CYLINDER HEAD – Twelve interchangeable, bore-cooled with two hard faced intake and two hard faced exhaust valves per head. Includes stainless steel intake and exhaust valve seats and prechamber fuel control valves.

CYLINDER LINER – Removable wet type with intermediate jacket water guide.

ENGINE MONITORING DEVICES – Thermocouples, K-type, for jacket water temperature, intake manifold temperature, lube oil temperature, individual cylinder exhaust temperatures and pre and post turbocharger temperatures are wired to a common junction box. Pressure taps piped to a common bulkhead for intake manifold pressure, lube oil pressure, prechamber fuel pressure, main chamber fuel pressure and jacket water pressure.

ENGINE PROTECTION DEVICES – Engine emergency shutdown/starter lockout palm button (2) mounted, one wired on either side of the engine.


INTERCOOLER – Air-to-water, for 90° F (32° C) or option 130° F (54° C) inlet water.

PISTON – Single piece, aluminum alloy with integrally cast cooling passages. Four piston rings with the top two compression rings housed in a Ni-resist ring carrier. 9:1 compression ratio.

TURBOCHARGER – Two, water cooled center housing, exhaust driven, with Turbocharger Control Module (TCM™), electronic controlled wastegate and air bypass. 24V DC required.

VIBRATION DAMPER – Enclosed, viscous type.

SYSTEMS

AIR INLET AND EXHAUST SYSTEMS

Air Inlet Connection – Two 14” (356 mm) round. Exhaust Manifold – Water cooled. Exhaust Outlet – Two 11.75” B.C. (298.4 mm) horizontal outlet flanges.


IGNITION SYSTEM – Crankshaft fired Waukesha Custom Engine Control Ignition Module with flange mounted coils. Ignition system meets Canadian Standards Association Class 1, Group D, Division 2 hazardous location requirements. Includes fuses for protection against reverse polarity. 24V DC power required.

LUBRICATION SYSTEM – Gear driven, externally mounted gear type pump with pressure regulator and bypass circuit. Discharge side has flange for connection to remote oil cooler. Includes shell and tube type lube oil cooler, not mounted, sized for connection in series with intercooler. Includes full flow, 45 gallon (170 litre) capacity oil filter. Not mounted. Includes 175° F (79° C) lube oil temperature control valve. Not mounted. Includes full flow filter strainer, mounted. Requires single customer lube oil inlet connection.

STARTING SYSTEM – One turbine type pneumatic starter with 24V DC starting valve and strainer. Requires 150 psig (10.3 bar) air/gas supply.

WATER CIRCULATION SYSTEM

Auxiliary Circuit – Includes gear driven water pump with discharge piped to intercooler. Suction side has single flange for customer connection. Requires single customer outlet connection. Includes 90° F (32° C) auxiliary water temperature control valve, not mounted.

Engine Jacket – Includes gear driven water pump with discharge to engine inlet. Suction side has single flange for customer connection. Requires single customer outlet connection. Includes 180° F (82° C) jacket water temperature control valve, not mounted.
**SPECIFICATIONS:** 12V-AT27GL SERIES - CONSTANT SPEED ENGINES

### Basic Model Specifications:

- **Type:** 4-cycle, 4-valve, lean burn, prechamber
- **Aspiration:** Turbocharged - Intercooled
- **Number of cylinders:** V-12
- **Bore x stroke:** 10.827 in. x 11.811 in. (275 x 300 mm)
- **Displacement:** 13048 cu. in. (214 litres)
- **Compression ratio:** 9.0:1
- **Piston speed:** 1969 ft./min. (10.0 m/sec.)
- **Low idle:** 650-750 rpm

### Bearings - Main:

- **Number:** 7
- **Diameter x width:** 8.858 x 4.094 in. (225 x 104 mm)
- **Projected area/bearing:** 36.27 in.² (23400 mm²)

### Bearing - Crankpin:

- **Diameter x width:** 7.677 x 3.071 in. (195 x 78 mm)
- **Projected area/bearing:** 23.58 in.² (15210 mm²)

### Lube Oil System:

- **Sump capacity including filters & coolers:** 252 gal. (955 litres)
- **Strainer screen:** .74 micron
- **Main filter efficiency:** 15 micron @ 90% efficiency
- **Normal lube oil pressure:** 55-65 psi (378-447 kPa)
- **Lube oil system pipe flange:** 4.0 in. ANSI (102 mm)
- **Prelube:**
  - Duration: 5 min. before start or 5 min. each hour not running
  - Pressure: 25 psi (172 kPa)**
  - Flow: 30 gpm (114 l/min.)
- **Postlube (after hot shutdown):** 5 min.

### Crankcase Breather System:

- **Volume, maximum flow:** 90 scfm (42.5 l/sec)
- **Suction vacuum:** 2 in. (51 mm)

### Cooling System:

- **Jacket capacity, engine only:** 97.2 gal. (368 litres)
- **Auxiliary water capacity:** 20.9 gal. (75.7 litres)
- **Maximum inlet head water pump - H₂O:** 50 ft. (15.2 m)
- **Minimum inlet head water pump - H₂O:** 14.1 ft. (4.3 m)
- **Normal jacket water temperature out of engine:** 180° F (82° C)
- **Auxiliary water pipe flange:** 6.0 in. ANSI (152 mm)
- **Jacket water pipe flange:** 6.0 in. ANSI (152 mm)

### Fuel System:

- Natural gas pressure range at regulator: 45 - 60 psi (310 - 414 kPa)
- Natural gas inlet, pipe flange: 2 in. ANSI (50.8 mm)

### Air Induction System (Ducting, Filter & Silencer):

- Maximum permissible restriction - H₂O: 15.0 in. (381 mm)
- Compressor inlet pipe diameter: 14 (356 mm)
- Required filtering efficiency (coarse dust per SAE726-C): 99.7%

### Exhaust System (Turbine Outlet):

- Maximum permissible backpressure - H₂O: 12.0 in. (305 mm)
- Turbine outlet pipe flange: 8 in. ANSI (203 mm)

### Starting System:

- Regulated starting air/gas pressure: 150 psi (1034 kPa)**
- Air inlet flange: 1.5 in. ANSI (38.1 mm)
- Air outlet flange: 4.0 in. (102 mm) O.D. Tube or 3.5 in. (89 mm) NPT Pipe

### Miscellaneous:

- Recommended spacing between engines: 114 in. (2900 mm)*
- Recommended distance to wall: 78 in. (2000 mm)*
- Recommended overhead clearance: 92 in. (2340 mm)*
- Engine dry weight without flywheel: 46,000 lb. (20,866 kg)
- Shipping skid: 3,440 lb. (1,560 kg)
- Flywheel: 1,767 lb. (802 kg)
- Heaviest engine part, top overhaul: cylinder head: 450 lb. (204 kg)

*From centerline of crankshaft
**Pressure is based on 50° F (10° C) lube oil temperature.

**NOTE:** All pipe diameters are typical.
### TECHNICAL DATA: 12V-AT27GL SERIES - CONSTANT SPEED ENGINES

<table>
<thead>
<tr>
<th>Continuous Duty Power Ratings - BHP (kWb)</th>
<th>1000 rpm</th>
<th>900 rpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>90° F (32° C) Intercooler Water Temperature</td>
<td>3295 (2458)</td>
<td>2970 (2216)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System Flows GPM (l/min)</th>
<th>1000 rpm</th>
<th>900 rpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jacket Water</td>
<td>480 (1817)</td>
<td>430 (1628)</td>
</tr>
<tr>
<td>Auxiliary Circuit Pump**</td>
<td>650 (2460)</td>
<td>585 (2214)</td>
</tr>
<tr>
<td>Lube Oil</td>
<td>145 (548)</td>
<td>145 (548)</td>
</tr>
<tr>
<td>Prelube Pump</td>
<td>30 (113)</td>
<td>30 (113)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard Temperatures</th>
<th>°F (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lube Oil - Out</td>
<td>195 (91)</td>
</tr>
<tr>
<td>Charge Air Cooler Water - In</td>
<td>90 (32)</td>
</tr>
<tr>
<td>Jacket Water - Out</td>
<td>180 (82)</td>
</tr>
</tbody>
</table>

### PERFORMANCE: 12V-AT27GL SERIES - CONSTANT SPEED ENGINES

<table>
<thead>
<tr>
<th>Intercooler Water Temperature</th>
<th>130°F (54°C)</th>
<th>90°F (32°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1000 rpm</td>
<td>900 rpm</td>
</tr>
<tr>
<td>Power</td>
<td>3130</td>
<td>2820</td>
</tr>
<tr>
<td>BSFC (Btu/bhp-hr)</td>
<td>6645 6480</td>
<td>6665 6425</td>
</tr>
<tr>
<td>NOx (grams/bhp-hr)</td>
<td>0.7 0.5</td>
<td>0.5 0.5</td>
</tr>
<tr>
<td>CO (grams/bhp-hr)</td>
<td>2.2 2.2</td>
<td>2.0 1.9</td>
</tr>
<tr>
<td>NMHC (grams/bhp--hr)</td>
<td>1.0 1.0</td>
<td>0.8 0.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Low NOx Settings</th>
<th>130°F (54°C)</th>
<th>90°F (32°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1000 rpm</td>
<td>900 rpm</td>
</tr>
<tr>
<td>Power</td>
<td>6430 6340</td>
<td>6420 6280</td>
</tr>
<tr>
<td>BSFC (Btu/bhp-hr)</td>
<td>1.1 0.7</td>
<td>0.7 0.7</td>
</tr>
<tr>
<td>NOx (grams/bhp-hr)</td>
<td>1.8 1.9</td>
<td>1.7 1.7</td>
</tr>
<tr>
<td>NMHC (grams/bhp--hr)</td>
<td>0.7 0.8</td>
<td>0.7 0.7</td>
</tr>
</tbody>
</table>

**NOTES:**

1) Performance ratings are based on ISO 3046/1-1995 with mechanical efficiency of 90% and Tcra limited to ± 10° F.
2) Fuel consumptions based on ISO 3046/1-1995 with a +5% tolerance for commercial quality natural gas having a 900 Btu/ft³ saturated low heat value.
3) Data based on standard conditions of 77° F (25° C) ambient temperature, 29.53 inches Hg (100kPa) barometric pressure, 30% relative humidity (0.3 inches Hg /1 kPa water vapor pressure).
4) Data will vary due to variations in site conditions. For conditions and/or fuels other than standard, consult the Waukesha Engine Division Sales Engineering Department.

**Charge air cooler and lube oil cooler plumbed in series.**
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