

A New Look At Reliable, Compact, Low Emission Gas Engines.

Whether you're designing an engine package for a new installation or retrofitting an engine room, space is always an issue. Your customers want more power squeezed into smaller spaces. So, how do you reconcile the need for more power and limited space? Simple, size up the Waukesha VGF family of gas engines. This series of compact, fuel efficient, low emission gas engines comes in 6, 8, 12 and 16 cylinder outputs with both inline and vee configurations to meet almost any installation requirements.

Driving Down the Cast of Horsepower.

This compact engine is purposefully designed from the ground up for stationary, spark ignited, gaseous fuel applications. The VGF is not limited to weight-sensitive mobile equipment requirements. Its high weight-to-power ratio provides a solid foundation for years of consistent and dependable operation. For the size and

price of other high speed engines, the VGF provides full power around the clock, with substantially reduced maintenance and operating costs. You get more engine, more reliability, more performance, more uptime, and more value - at less cost.

Because of their size to power ratio and high speed continuous-duty capability, VGF engines are remarkably cost-effective to buy and run. Their high output results in lower initial purchase cost per unit of power, and installation costs are reduced because their "clean" design requires less piping.

Strong Resemblance.

The VGF series reflects Waukesha's usual robust structural strength, along with sophisticated engineering features. Derived from the design and manufacturing integrity of the classic Waukesha VHP, these engines have inherently long component life. So overhaul intervals will be few and far between. The performance and durability of the

VGF series make this engine line a design classic in itself.

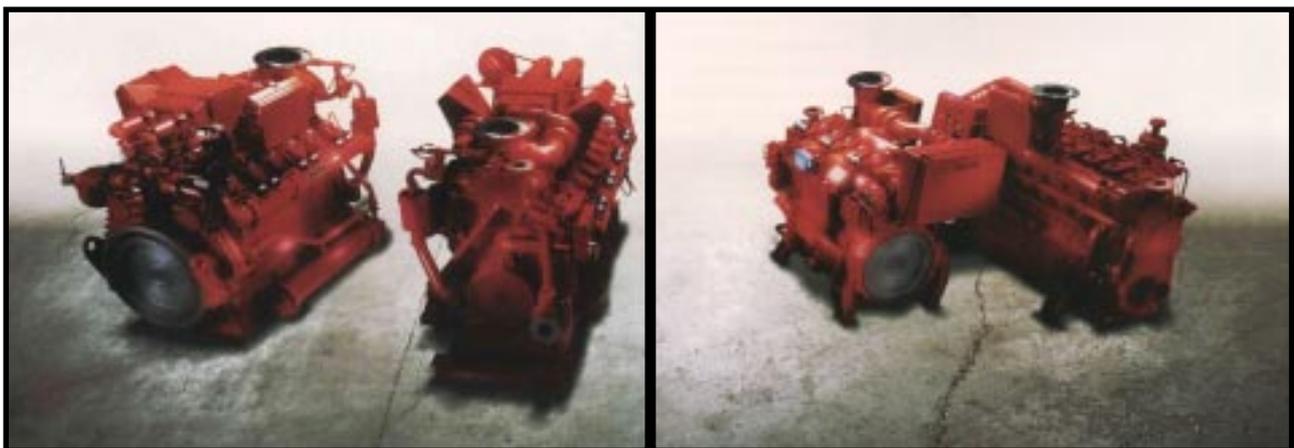
Fast and Lean.

VGF engines lead a clean life, thanks to Waukesha's lean burn technology. Our patented combustion system allows the VGF engine to meet clean air standards throughout the world. (Consult your distributor for site specific requirements.) Both GL (Gas Lean Burn) and GLD (Gas Lean Burn Draw Thru) models are available as standard engines. They are designed to run efficiently with high or low fuel pressure systems for maximum application flexibility.

The VGF is also available in a rich burn naturally aspirated version (G) for applications where less horsepower is required or a 3-way catalyst is desired.

The Waukesha VCF Series. Simple to buy. Simple to install. Simple to run. Simple to meet emissions requirements. Simple to maintain. How much simpler can we make your engine choice?

A Family of Compact Engines to Fit Your Requirements.



How this Hard-Working Engine Works so Well

First of all, we need to drive home a simple point. This is not a warmed over automotive engine designed for occasional rpm spikes. The VGF is industrial strength continuous high rpm horsepower in a range from 160 BHP (120 kW_b) to 1065 BHP (800 kW_b).

- *Individual, four valve, water cooled cylinder heads* ensure optimum performance and reliability. Cooler cylinder head operation results in longer valve train component life and lower maintenance cost.

- The *CL (Lean Burn) fuel system and high turbulence combustion chamber* provide excellent fuel efficiency and optimum combustion stability.

- VGF's *optimum BMEP* results in better service life for key compo-

nents and long maintenance intervals.

- *Patented high turbulence combustion chamber* allows ability to burn lean air fuel mixtures with an open combustion chamber. This produces low emissions across engine load and speed range. It also provides lower fuel consumption, which is typically 91 % of life cycle costs.

- *Low fuel pressure CLD model* has draw-thru carburetion capability which increases application potential. It allows operation with fuel supply pressure as low as 8" H₂O (203 mm) while maintaining the ability to carry full load.

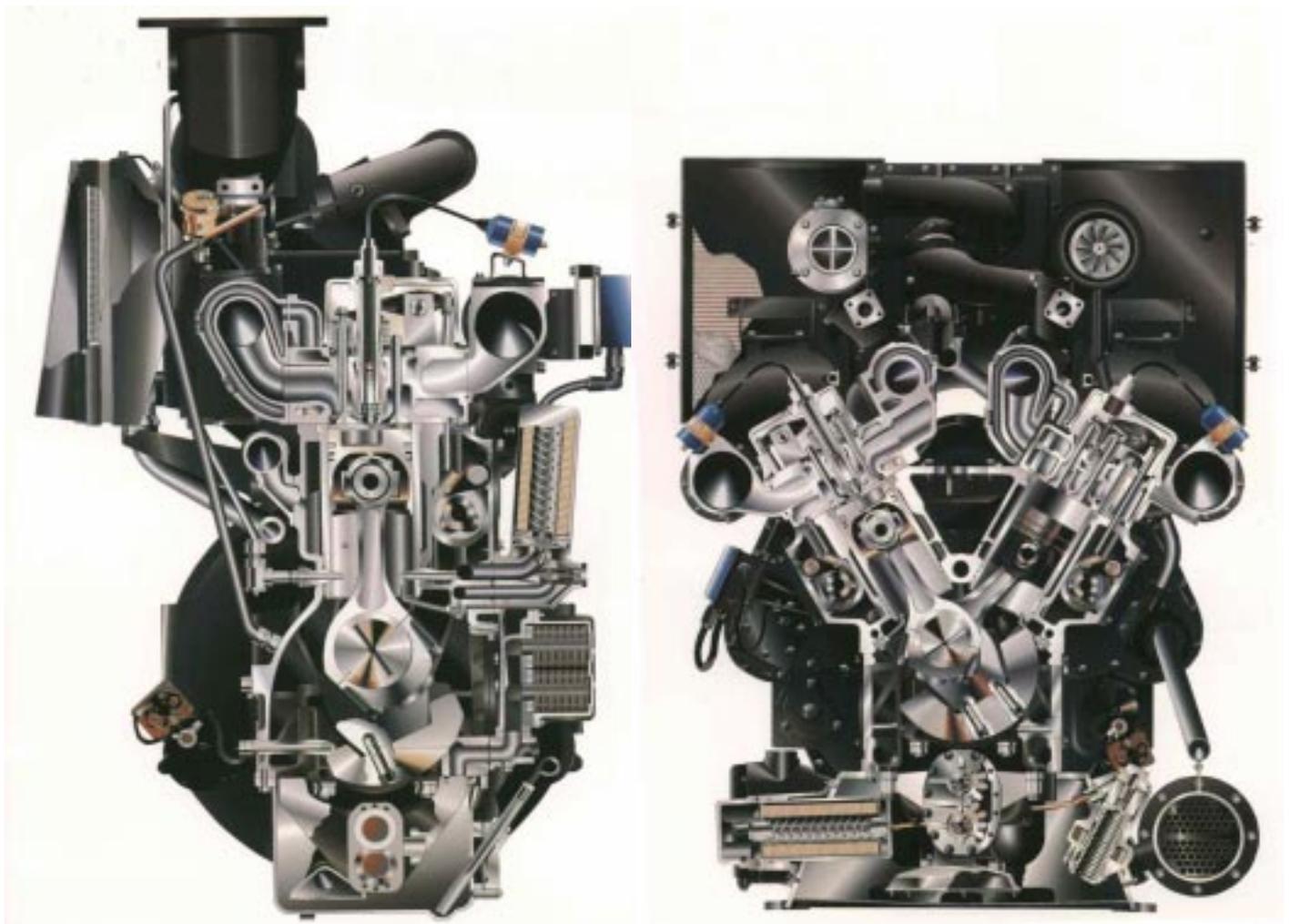
- Waukesha's *multi-fuel capability* means you have various options for primary fuel requirements - unlike typical dual fuel systems where one fuel is used for primary require-

ments and the second fuel as back-up. The VGF is adaptable to natural gas and propane as well as digester gas and even landfill gas.

- Standard *Custom Engine Control*® (CEC) Ignition Module provides precise timing and control for reduced emissions and fuel costs. No wearing parts means consistent ignition performance and lower maintenance costs.

- Because of the *tremendous torque* of VGF engines, rpms can be turned down to reduce fuel consumption and still maintain constant torque capability.

- When required by local restrictions, the VGF can be ordered in a *rich burn draw thru GSID form*. The GSID is compatible with three-way catalysts and can be used with low or high gas pressure.





you're running different models of the VGF.

- A fully counterweighted crankshaft helps prevent engine vibration for a smoother running package. It minimizes main and rod bearing loads and maximizes component life. VGF shafts are T-drilled for continuous lubrication of main bearings, keeping them cooler and cleaner for longer life.

- *Flanged connection points* make installation and alignment easy. Compact packaging simplifies set-up and adjustments for reduced costs.

- *Maintenance is simplified* because the size of the engine and the thoughtful location of service points and controls places everything convenient-

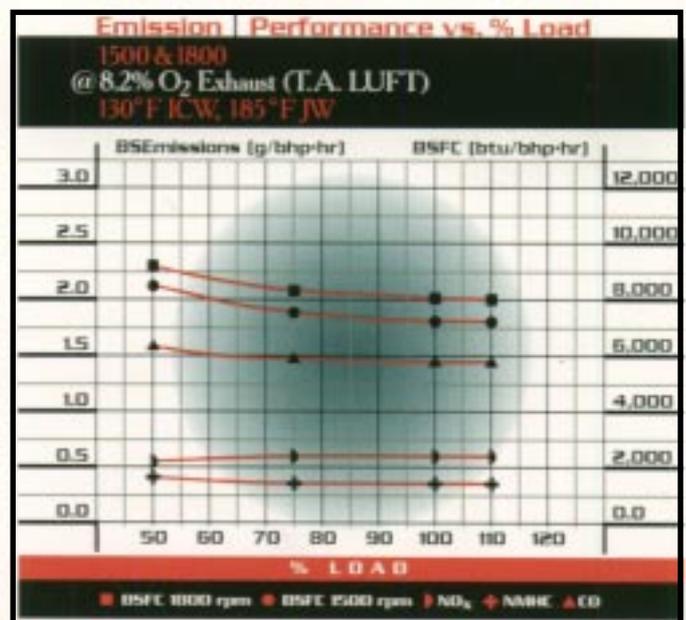
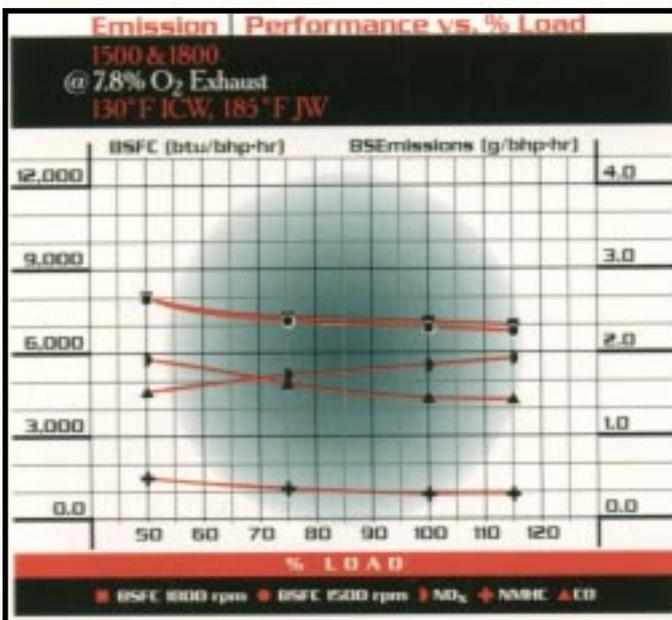
ly within the technician's reach. The VGF engine series allows *complete in-place maintenance and in-frame overhaul*. All VGFs have camshaft and connrod/crankshaft inspection doors. Vee engines have a base-type oil pan with inspection doors.

- All these features point to the fact that the VGF is intelligently designed and quality built to provide you with a compact, high speed gas engine in the Waukesha tradition of rugged reliability. This is an engine that will work long and hard for you. And It will have overhaul intervals so far apart you'll forget the meaning of downtime. *When it comes to life cycle numbers, the Waukesha VCF adds up to be the right choice.*

- *High temperature cooling capability* increases heat recovery opportunities, making the VGF a better fit for chiller or cogeneration applications.

- Virtually all *wearing components* of the VGF series are *interchangeable* across the VGF engine series. This includes major components - pistons, rings, sleeves, connrods, cylinder heads, bearings and valve train parts. So not only do you have proven component reliability, you have lower parts inventory requirements even if

Engine Performance Reflects Company Performance.



From design and development to manufacturing to total aftermarket support,

the VGF family of engines symbolizes Waukesha's commitment to its customers. We build engines worthy of your installation and your investment. And we stand

behind them with a worldwide distributor network.

The Best in the Business.

The VGF line is backed by the best warrant of any industrial engine manufacturer. On new engines, all parts and labor are covered for one full year. Five years

on major forgings and castings. New service parts are warranted for one year along with the labor costs to replace them.

We built and backed this engine so you can be sure. The Waukesha VCF is the easy choice. The smart choice. The right choice.

Why You Should Specify the Waukesha VGF.

VGF PERFORMANCE		Continuous Brake Horsepower (kW _b) at Indicated RPM			
Configuration	Engine Model	Temperature °F (°C)	1200 rpm	1500 rpm	1800 rpm
V16	P48GL/GLD	130° (54°)	710 (530)	885 (660)	1065 (800)
V12	L36GL/GLD	130° (54°)	530 (400)	665 (500)	800 (600)
Inline 8	H24GL/GLD	130° (54°)	355 (265)	445 (330)	530 (400)
	H24G		215 (160)	265 (200)	320 (240)
Inline 6	F18GL/GLD	130° (54°)	265 (200)	330 (250)	400 (300)
	F18G		160 (120)	200 (150)	240 (180)

VGF STANDBY RATINGS		Continuous Brake Horsepower (kW _b) at Indicated RPM	
Configuration	Engine Model	1500 rpm (50Hz)	1800 rpm (60Hz)
V16	P48GL/GLD	1025 (765)	1230 (918)
V12	L36GL/GLD	770 (574)	920 (686)
Inline 8	H24GL/GLD	510 (380)	615 (460)
Inline 6	F18GL/GLD	385 (285)	460 (345)

VGF SIZES								
All data are based on standart conditions of 29.54 inches Hg. (100 kPa) barometric pressure, 77° F (25° C) ambient and induction air temperature, 30% relative humidity at 0.3 inches Hg. (1 kPa) water vapor pressure, 185° F (85°C) engine jacket water outlet temperature. Rating fuel standart: Commercial quality dry natural gas.	Configuration	Engine Model	Bore x Stroke in (mm)	Displacement cu in (liters)	Weight lbs (Kgs)	Height in (mm)	Length in (mm)	Width in (mm)
	V16	P48GL/GLD	5.98x6.5 (152x165)	2924 (48)	14,900 (6,759)	75.5 (1918)	106.5 (2705)	62.0 (1574)
	V12	L36GL/GLD	5.98x6.5 (152x165)	2193 (36)	11,525 (5,228)	75.5 (1918)	88.0 (2235)	62.0 (1574)
	Inline 8	H24GL/GLD	5.98x6.5 (152x165)	1462 (24)	7,200 (3,265)	68.0 (1727)		50.0 (1264)
		H24G	5.98x6.5 (152x165)	1462 (24)	7,200 (3,265)	68.0 (1727)	94.5 (2395)	50.0 (1264)
	Inline 6	F18GL/GLD	5.98x6.5 (152x165)	1096 (18)		68.0 (1727)		50.0 (1264)
		F18G	5.98x6.5 (152x165)	1096 (18)	5,500 (2,495)	68.0 (1727)	80.5 (2043)	50.0 (1264)

Strong Work Ethic.

Waukesha has nearly a century of stationary gas engine experience in rugged applications all over the world. Simply put, Waukesha engines are built to work. The VGF continues that heritage.

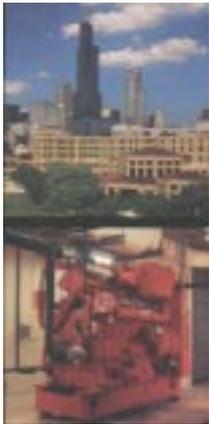
The VGF Is the perfect blend of

compact size, brute strength and the right technology. No wasted weight, space or hardware. The result is an engine of timely design and enduring reliability. It is economical to own and operate. And it lends itself to extraordinary installation versatility.

The VGF Is manufactured in the USA at Waukesha Engine Division in Wisconsin and In Europe at Waukesha Engine Division, Ap-pingedam, The Netherlands.

Nearly one thousand VCF engines have been installed since product introduction in 1987.

The Proof is in the Performance.



University of Illinois in Chicago installed an L36GL standby set.



Elkerliek Hospital in The Netherlands uses a P48GLD and an H24GLD for standby power and cogeneration.



CNG Transmission Corp. in Utica, NY, has a VGF H24GL driving a 375 kW generator for standby electrical power at a compressor station.

Waukesha VGF F18G drives 90 kW induction generator in parallel with utility for Canonsburg, Pennsylvania, wastewater treatment plant.

Recovered heat is used to maintain temperature in digeters.



A 700 kW VGF P48GL cogen system generates electricity and warehouse heat for this grain drying operation in Dungannon, Ontario.



A VGF H24GL genset rated at 350 kW_e is used for peak shaving at Lethbridge Regional Hospital in Alberta, Canada. Exhaust heat is converted to steam via a waste heat boiler.



A landfill at Vlagheide in Schijndel, The Netherlands, has five H24GLDs efficiently generating electricity from low BTU landfill gas.



This greenhouse in Antwerpen, Holland, obtains electricity and heat from an F18GLD cogeneration system.



The Stegeman Meat Factory in Deventer, The Netherlands, has an L36GLD cogen system supplying electricity as well as hot water for absorption cooling.