

# Waukesha® reUp® Engine

## VHP® Series Five F3524GSI S5 with ESM® 2

### Upgrade Offering

#### Product Description

INNIO's Waukesha® reUp® Engine Program converts and upgrades existing engines to the latest gas compression specification, equivalent to new units. The addition of new technology increases engine performance and reliability. Downtime is reduced by providing a swing engine at site before the existing engine is removed or utilizing Waukesha's stock reUp engine program in the event of an unexpected failure.

#### Product Details

- Zero hour overhaul engine with new & reUp components
- Each upgraded VHP® includes:
  - xCooled heads
  - ESM® 2 control system
  - Air-fuel ratio control (AFR2)
  - Advanced crankcase breather system
  - emPact emission control upgrade (optional)
  - Gas compression specification options (flywheel, alternator, high pressure air/gas starter, front crank pulley, and water connections)
- Upgraded engines are dynamometer tested at full load and come with an updated bill of material

#### Customer Benefits

- **Improved Package Economics:** VHP reUp Engines use the latest technology to increase engine horsepower and compressor flow at the lowest capital cost. Upgraded remanufactured engines also have increased service intervals (identical to new). Increased power and reduced operational expense combine to greatly improve package economics.
- **Latest Technology:** Each reUp VHP includes the latest parts and control systems to ensure equivalent to new engine performance and reliability. Newly

designed power cylinder components allow increased horsepower. ESM 2 and AFR2 improve engine fuel flexibility and the speed and load response required in gas compression applications. The emPact system attains low emissions with little to no operator adjustment.

- **Reliability:** VHP reUp Engine components are remanufactured in production environments with supporting quality systems. Engine assembly is completed by trained personnel with the same equipment, processes, and tools used to build new units.
- **Component fallout:** Core credit is determined based on pre-teardown inspection of the core engine. **No added fees** are applied if components fall out later in the remanufacturing process.
- **Warranty:** Waukesha Extended Limited Warranty applies - one year from date of service or two years from sale.

#### Units Available

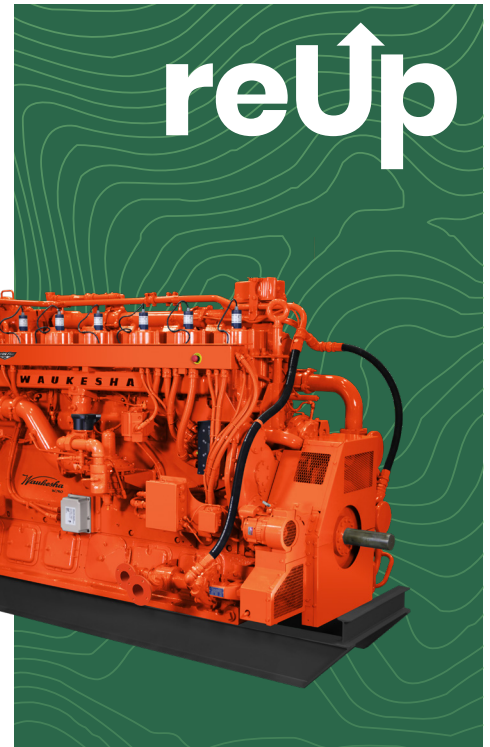
VHP	Core Exchange <sup>2</sup>	reUp Engine
	F3521G F3521GL F3521GSI F3514GSI F3524GSI	F3524GSI S5 <sup>3</sup>

<sup>2</sup> Core return must have internal oil header crankcase. Waukesha may also accept VHP 12-cylinder engines as core

<sup>3</sup> Latest GC specification

#### Multiple power levels available

740 BHP  
840 BHP  
950 BHP



### Series Five Benefits

- 10% lower fuel consumption than traditional GSI<sup>1</sup>
- 15% lower CO2e footprint than GL or GSI<sup>1</sup>
- Lowest achievable NOx, methane, and CO2e in its class
- Lower temperatures at critical components **increase reliability and service intervals**

<sup>1</sup> Compared to Series Four at same power level.



# VHP Series Five F3524GSI S5

## Performance Data

Intercooler Water Temperature 130°F (54°C)		1,200 RPM	1,000 RPM
	Power bhp (kWb)	950 (708)	792 (590)
	BSFC (LHV) Btu/bhp-hr (kJ/kWh)	7,156 (10,124)	7,026 (9,940)
	Fuel Consumption Btu/hr x 1000 (kW)	6,798 (1,991)	5,564 (1,629)
emPact Catalyst- Out Emissions	NOx g/bhp-hr (mg/Nm <sup>3</sup> @ 5% O <sub>2</sub> )	0.15 (64)	
	CO g/bhp-hr (mg/Nm <sup>3</sup> @ 5% O <sub>2</sub> )	0.3 (127)	
	NMHC g/bhp-hr (mg/Nm <sup>3</sup> @ 5% O <sub>2</sub> )	0.016 (7)	
	THC g/bhp-hr (mg/Nm <sup>3</sup> @ 5% O <sub>2</sub> )	0.33 (141)	
Engine-Out Emissions	NOx g/bhp-hr (mg/Nm <sup>3</sup> @ 5% O <sub>2</sub> )	11.3 (4,809)	10.9 (4,722)
	CO g/bhp-hr (mg/Nm <sup>3</sup> @ 5% O <sub>2</sub> )	9.0 (3,817)	8.9 (3,838)
	NMHC g/bhp-hr (mg/Nm <sup>3</sup> @ 5% O <sub>2</sub> )	0.047 (20)	0.057 (25)
	THC g/bhp-hr (mg/Nm <sup>3</sup> @ 5% O <sub>2</sub> )	0.50 (201)	0.6 (250)
Heat Balance	Heat to Jacket Water Btu/hr x 1000 (kW)	1,859 (545)	1538 (451)
	Heat to Lube Oil Btu/hr x 1000 (kW)	244 (72)	194 (57)
	Heat to Intercooler Btu/hr x 1000 (kW)	339 (99)	231 (68)
	Heat to Radiation Btu/hr x 1000 (kW)	282 (83)	266 (78)
	Total Exhaust Heat Btu/hr x 1000 (kW)	1,788 (524)	1,426 (418)
Intake/ Exhaust System	Induction Air Flow scfm (Nm <sup>3</sup> /hr)	1,272 (1,915)	1,041 (1,568)
	Exhaust Flow lb/hr (kg/hr)	5,914 (2,683)	3,288 (2,195)
	Exhaust Temperature °F (°C)	1,097 (592)	1,069 (576)

All data according to full load and subject to technical development and modification.

emPact catalyst-out emissions valid from 100% - 75% load and 1,200 rpm to 900 rpm and assume proper engine/catalyst maintenance and manual adjustment as necessary.

Consult your local Waukesha engine representative for system application assistance. The manufacturer reserves the right to change or modify without notice, the design or equipment specifications as herein set forth without incurring any obligation either with respect to equipment previously sold or in the process of construction except where otherwise specifically guaranteed by the manufacturer.

**Waukesha – an INNIO brand** - INNIO's Waukesha engines are at the forefront of the energy transition, providing reliable and compliant energy solutions for distributed gas compression and power generation applications. The brand's rich and lean-burn engines, ranging from 335 hp to 5,000 hp, set an industry standard for low emissions, high reliability, and fuel flexibility.

Waukesha products are continuously upgraded to help operators stay emission-compliant without sacrificing operational excellence. These upgrades include new and remanufactured engines and parts, as well as conversion and modification kits, all of which are backed by OEM warranty and more than 115 years of engine expertise. Additionally, our Waukesha digital solutions include a collaborative solution with Detection Technologies for gas compression applications and INNIO's myPlant platform for power generation applications. Both solutions provide customers with enhanced monitoring and optimization capabilities, resulting in improved performance and reduced downtime.

We connect locally with our customers to enable a rapid response to their service needs, providing enhanced support through our broad network of distributors and solution providers with parts, services, and digital offerings.

Waukesha engines are engineered in Waukesha, Wisconsin, U.S., and manufactured in Welland, Ontario, Canada. To learn more about the company's products and services, please visit INNIO's website at [www.waukeshaengine.com](http://www.waukeshaengine.com) or follow Waukesha engines on [LinkedIn](#).

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