



CANADIAN NATURAL GAS PRODUCER UPGRADES 29-ENGINE FLEET TO REUP® VHP® SERIES FIVE

Tourmaline
Energy Exploration and Production Company
Canada



Background

Tourmaline, a large Canadian energy exploration and production company, wanted to reduce the emissions from its aging rich- and lean-burn Waukesha VHP fleet. They turned to INNIO Group's Waukesha reUp® Remanufacturing program to upgrade their engines to the VHP Series Five. With the reUp program, customers can update their engines to the latest technologies for added benefits, such as increased horsepower and reduced emissions, without needing additional floorspace.

A smart solution: The Waukesha reUp program

The Waukesha reUp program offers complete engines, short and long blocks, and parts. The core exchange program allows customers to return core Series Two and Series Four engines for like-new Series Five engines. The engines are disassembled, cleaned, and inspected using advanced technology and are backed by the Waukesha Service team's rigorous testing and leading-in-class warranty.

Here are the five steps in the reUp process:

Disassembly and cleaning: Skilled personnel disassemble and clean all engine parts to eliminate and remove elements that can hide flaws.

Inspection: All engines and parts are carefully inspected and thoroughly tested. Original Equipment Manufacturer (OEM) dimensions and tolerances are used to ensure specifications are met.

Machine and assembly: Skilled assemblers follow exact standards and specifications from the most current engineering drawings when remanufacturing parts. The reUp process will replace all worn parts that do not meet the Waukesha strict requirements with new OEM parts.

Testing: Every engine and part that leaves the factory undergoes a comprehensive check. Waukesha records and stores each test electronically to ensure quality control.

Painting, packing, and shipping: The Waukesha team carefully paints or preserves engines and parts, and packages them carefully, to protect them from the elements and enable their installation directly out of the box.



A POWERFUL FUTURE



Results

Cross-functional teams from Tourmaline and Waukesha determined that 29 engines in the fleet would benefit from the reUp process after conducting a thorough review of performance needs, emission requirements, and existing conditions. By the end of 2024, Waukesha's reUp process will install all of the 1,500-1,900 horsepower (HP) engines across multiple locations in British Columbia and Alberta.

NGIF Emissions Testing Centre

In July 2024, Alberta's Minister of Environment held a press conference announcing a \$15 million investment in the NGIF Emissions Testing Centre (ETC) Program.





The NGIF ETC program, established in 2021, offers complimentary simulated testing facilities at the University of Calgary, live testing facilities at Tourmaline and Perpetual Energy, and commercialization support through NGIF Accelerator. This allows companies to validate technologies designed to measure, monitor, or reduce methane emissions.

Tourmaline invited Waukesha to attend the press announcement, making Waukesha one of only nine companies invited. This highlights the strong commitment of both Tourmaline and Waukesha to reduce emissions.

Key Technical Data

Number and type of units	29 x Waukesha VHP Series Five engines
Power output	1,500-1,900 hp
Commissioning	2024
Energy source	Natural gas

Customer advantages of VHP® Series Five

			
Lower emissions, including methane intensity, with delivery of up to 85% lower CH4 and VOC emissions and up to 10% lower CO2e than any other engine in its category	Fuel flexibility to operate on nearly any fuel, from field gas and propane to commercial-quality natural gas without pre-treatment	High performance, even in extreme heat with up to 120°F (49°C) ambient capability before derate	Readily available factory-direct technical support and parts commonality across the VHP product series

About the NGIF Emissions Testing Centre Program

The NGIF Emissions Testing Centre program involves collaboration between industry, academia, and government. It involves public support to ensure cleantech companies have a dedicated space to develop, test, and field-validate technologies to measure, monitor, and reduce methane emissions and to fast-track methane technologies to market through

knowledge dissemination and fostering commercialization. The program is unique in that it provides cleantech companies with free access to testing and commercialization support for rapid scale-up of technologies from concept to commercial-ready deployment. The ETC lab at the University of Calgary provides capabilities to test and de-risk technologies in

a controlled environment, complemented by live field trials at the West Wolf Lake Gas Plant (jointly owned by Tourmaline Oil Corp. and Perpetual Energy), along with other Tourmaline assets. NGIF Accelerator supports technology developers in scaling up by disseminating knowledge and providing commercialization support.

Waukesha – an INNIO Group brand - INNIO Group's Waukesha engines are at the forefront of the energy transition, providing reliable 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, Waukesha digital solutions include SkidIQ, a collaborative solution with Detechtion Technologies for gas compression applications and INNIO Group's AI-powered myPlant platform for power generation applications. Both solutions provide customers with enhanced monitoring and optimization capabilities, resulting in improved performance and reduced downtime.

The Waukesha team connects locally with its customers to enable a rapid response to their service needs, providing enhanced support through a 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 Group's Waukesha website at waukeshaengine.com or follow Waukesha engines on [LinkedIn](https://www.linkedin.com/company/waukesha).

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