

# VANGUARD®



## EFI – THE NEXT GENERATION OF PETROL ENGINES

DISCOVER HOW ELECTRONIC FUEL INJECTION TECHNOLOGY IS HELPING REDUCE COSTS AND IMPROVE EFFICIENCIES WHILE DELIVERING THE POWER THAT YOUR BUSINESS NEEDS.



For many years, diesel engines have been considered the ideal solution for sectors such as construction and agriculture where power is essential. But things have changed and technological advancements of petrol engines mean that many of the traditional diesel-powered applications can now be carried out by electronic fuel injected (EFI) petrol engines.

It's not an exaggeration to describe EFI technology as a game changer: EFI has come a long way since the 1950s, when the classic cars of the time became some of the first models known to use an EFI system. Since then, EFIs have evolved from automotive and power sports and moved into a myriad of different machinery, even down to the smallest of engines and products, such as outdoor power equipment.

The benefits of EFI technology are many and varied, particularly when it comes to the drive for maximum engine efficiency across a variety of industries such as agriculture, chore, construction or industrial. Add to this the enhanced user experience and reduced environmental impact, and you have a technology that is making real-time improvements on efficiencies and costs across multiple industries.

**Read below the top 5 reasons why your business will benefit from switching to petrol engines that feature EFI technology:**

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## HOW DOES AN EFI SYSTEM WORK?

*Unlike a carburetor that mixes air and fuel, an EFI system injects fuel directly into an engine's manifold or cylinder using an injector controlled by the ECU. This means, power tools or vehicles consistently operate at peak performance, with much less risk of failure. A traditional carburetor clogs more easily than an EFI system with high pressure injectors, adversely affecting performance and reducing the engine's ability to run at an optimal level. The carburetor's reliance on fuel and its ability to run low, means the engine cannot operate to its full capacity or potential in these circumstances. Conversely, if the engine is running rich and receiving too much fuel, the spark plugs and valves can become clogged. For engines that are business-critical this sort of failure can seriously impact delivery and working hours, causing unnecessary downtime and potentially impacting business reputation. A more reliable EFI system eliminates this concern, reduces downtime and safeguards smooth operations.*

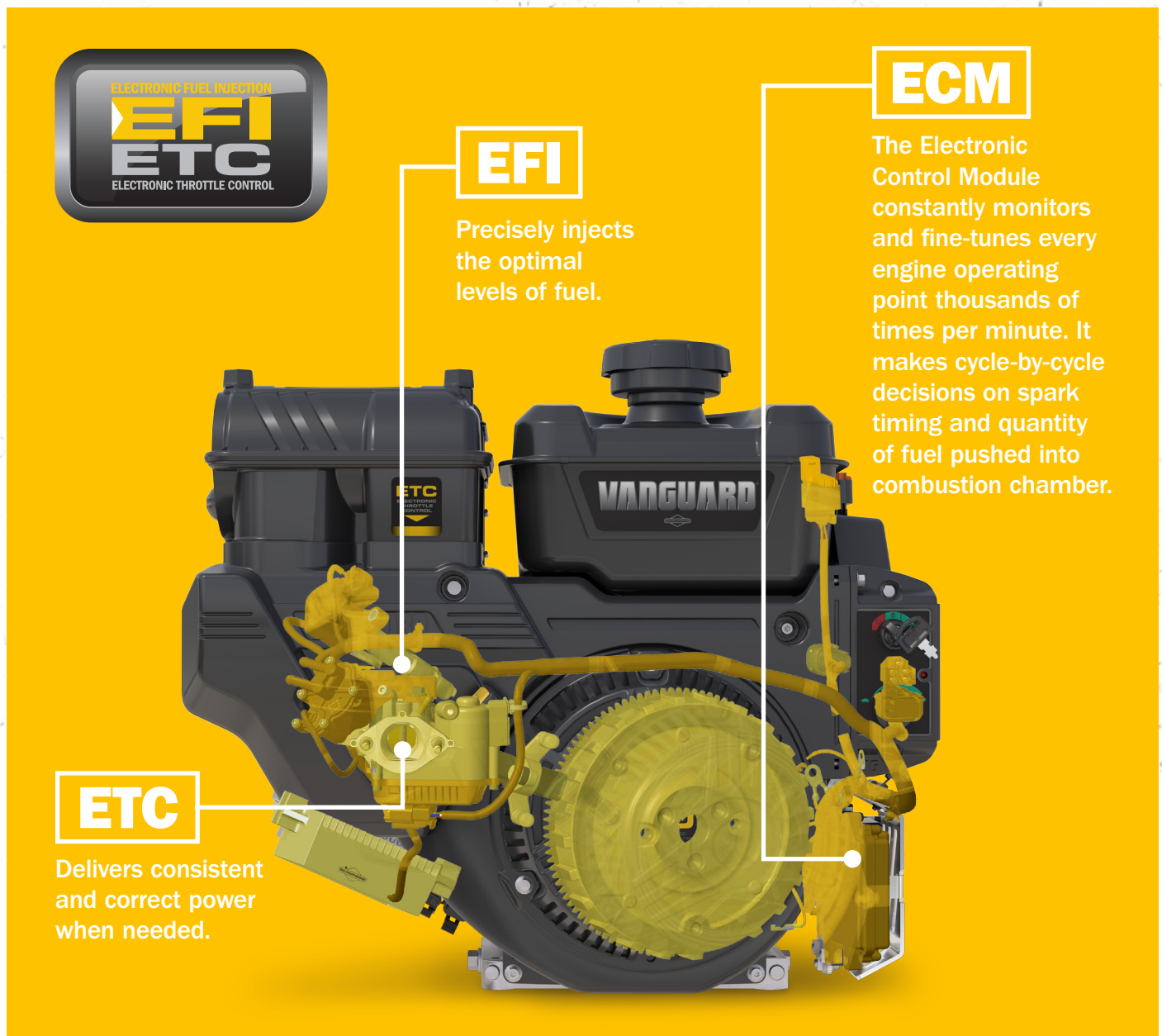
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# 1 EFI ENGINES OFFER OUTSTANDING POWER-TO-WEIGHT RATIO

EFI petrol engines offer an exceptional power-to-weight ratio, particularly when compared to their diesel counterparts. The advanced system ensures that the engine delivers more usable power from a similar block of weight to their carburetor alternatives. The reduced engine weight enables the overall equipment to be lighter and easier to manoeuvre in comparison to a diesel alternative. Modern EFI engines such as the Briggs & Stratton® Vanguard® 29.9 Gross kW\* BIG BLOCK™ EFI/ETC come in a compact design with superior power-to-weight ratio, offering an ideal power solution for weight sensitive applications.



\*Engines are stated in gross kilowatt at 3 600 rpm per SAE J1940 as rated by Briggs & Stratton.

# 2 EFI TECHNOLOGY REDUCES THE TOTAL COST OF OWNERSHIP

Fuel economy savings are very much application and usage dependent. A commercial mower powered by a carburetor petrol engine working way below its maximum load may see considerable fuel savings with an EFI engine while other applications might see little to no savings at all.

A real issue to most engines, however, is stale fuel. This particularly applies to seasonal applications which are kept in storage for extended periods of time, such as wood chippers. EFI engines have a great tolerance for stale fuel - which results in a reduction of expensive maintenance or repair work due to stale fuel in the system or fuel gumming.

Briggs & Stratton's vast Vanguard EFI engine portfolio ranges from Single Cylinder EFI engines to medium-sized V-Twins and BIG BLOCKS up to 40HP. All Vanguard engines are, as a standard, equipped with a number of innovative technologies that ensure longevity of engine life while not missing out on power. The newest edition, the Vanguard 400 EFI/ETC 408cc single cylinder, for instance, enjoys streamlined operation thanks to its combined EFI technology and Standard Integrated Cyclonic Air Filtration. These technologies jointly boost productivity, power and performance while at the same time delivering 200 hours of use between oil replacement and up to 600 hours of use between air cleaner changes, doubling the industry standard, and therefore significantly reducing downtime and costly repairs.

That's not all. EFI furthermore allows convenient monitoring and diagnostics on your laptop via CAN-Bus System. This makes it much easier to identify issues before having to do repair work and thus substantially reduces troubleshooting and repair time - consequently increasing equipment uptime and productivity.

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## WHAT IS ELECTRONIC THROTTLE CONTROL (ETC)?

*In recent years, outdoor power equipment has moved more and more into electronic throttle control (ETC) on EFI engines. This technology helps to deliver precise control of airflow into the engine, thanks to a robust and responsive control unit. In addition, reactions to load demands are instantaneous and the engine speed is controlled more precisely. The electronic throttle control maintains engine speed at the operating limits, eliminating the loss of power that comes from any mechanical issues and maintaining maximum power levels. For the user this means a much better quality product and more efficient and reliable performance.*

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# 3 EFI REDUCES THE ENVIRONMENTAL IMPACT

Cost reductions are not the only advantage of fuel efficient EFI engines. EFI systems deliver air and fuel with more accuracy meaning they generally have fewer emissions than diesel models. It is always worth checking whether the engine provider adheres to the relevant emissions regulations. Briggs & Stratton's Vanguard EFI engine range is specifically designed to comply with EU and US emission requirements. On top of that, they do not require an expensive after treatment filter system or diesel particulate filter (DPF) to remove particulate matter or soot from the exhaust gas.

What does that mean for your business? Not only does this help to reduce the upfront capital costs. It also makes EFI engines an ideal power solution in areas where emissions zones may limit the use of diesel, such as inner cities, while providing the power and robust durability expected.





# 4 EFI ENGINES WORK EVEN IN HARSHTEST CONDITIONS

Industries where power tools featuring traditional forms of engine starting with choke are regularly deployed, are generally very much affected by ambient conditions, as often seen in construction. This - again - makes them unreliable. EFI engines completely negate this problem through improved chokeless starting at almost any temperature and altitude, delivering a consistent and efficient start to any job.

For businesses operating in more challenging working environments, such as at high altitude, EFI systems are particularly interesting as they automatically adapt the air-fuel mixture accordingly. This ensures optimal combustion and performance regardless of altitude to prevent any engine failure due to environmental pressures, thereby providing for improved user experience and reduced downtime.

Moreover, when combined with Electronic Throttle Control (ETC) technology as found in the majority of Vanguard's EFI engine range, EFI engines can produce the required torque, together with optimised load acceptance, to provide the perfect alternative to diesel.





# 5 EFI ENGINES EASILY INTEGRATE INTO YOUR APPLICATION

Integrating an EFI petrol engine in existing applications can be easy - if you choose the right manufacturer carefully; someone who can become your trusted partner rather than just a seller.

While there are multiple EFI options on the market, it is crucial that the manufacturer will work with you to integrate new EFI and ETC petrol technology into your current carbureted or diesel powered application to ensure optimal performance. This helps to fast-track development times and reduce engineering resources and cost.

With over 110 years of application expertise and Power Application Centers with dedicated engineers around the globe, it is fair to say that Briggs & Stratton | Vanguard understands how to apply power like no other manufacturer. Their center of engineering excellence, the Power Application Center Europe (PACE), is centrally located in Viernheim near Frankfurt, Germany, and offers a broad range of services. Furthermore, all Vanguard engines are supplied with a three-year limited commercial warranty<sup>2</sup> and are backed by a factory-trained global service and support network.

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**Electronic fuel injection (EFI) technology offers a multitude of benefits to their carbureted and diesel alternatives – that many more companies could be taking advantage of. By upgrading fleets to feature equipment that uses this modern technology a great many industries could be running more efficiently and sustainably, allowing end users and OEMs to maximise productivity. With all that in mind, EFI can be considered a truly empowering alternative.**



<sup>2</sup>See [www.vanguardpower.com](http://www.vanguardpower.com) for warranty details.

# CONTACT US NOW

## AND FIND OUT HOW TO INTEGRATE EFI TECHNOLOGY IN YOUR EQUIPMENT.



Contact us via email to: [vanguardpower.emea@basco.com](mailto:vanguardpower.emea@basco.com)



Find out more about EFI technology on: [www.vanguardpower.com](http://www.vanguardpower.com)



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