



## Turbocharging systems for pass car gasoline engines

For a long time, the benefits of reduced consumption in gasoline engines were partially canceled out by increasing vehicle weight. However, the sophisticated turbochargers from BorgWarner today enable intelligent downsizing of the engine – thereby allowing new saving potential to be tapped. To benefit from this, the consumption advantage of a small displacement engine is combined with the performance characteristics and excellent torque curve of a large displacement engine.

Over the course of the last few years, exhaust gas turbocharging has therefore become increasingly attractive for vehicles with gasoline engines. We firmly believe that gasoline engine turbocharging will establish itself as a popular standard in modern vehicles within the next few years – as is already the case with diesel engines.

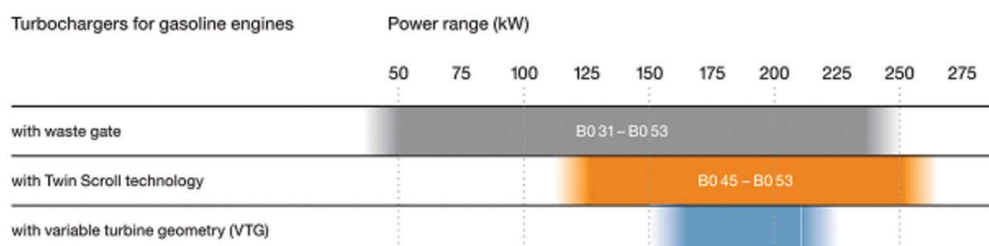
### The turbocharging systems for gasoline engines

#### The special requirements of gasoline engine applications:

- Temperature resistance up to 1,050 °C
- High degree of efficiency
- Broad scope impeller characteristics
- Flexible, precise regulation
- Dynamic response
- Individual construction
- Compact packaging

#### Our solutions:

- Specially developed range
- High grade materials
- Water-cooled bearing casings
- Further developed systems for high temperature applications up to 1,050 °C
- New generation of turbines and impellers
- Different boost concepts depending on engine strategy:
  - waste gate and boost pressure control valves – variable turbines – twin flow turbines – eBooster™
- Special design solutions such as integrated exhaust manifolds



The turbocharging systems for gasoline engines

Our new B0 range for gasoline engines consists of a broad portfolio of high performance and sophisticated turbocharging systems with waste gates and water-cooled bearing casings. Although the B range is extremely affordable, these robust turbochargers meet the highest quality standards.

Our offer ranges from the compact B0 31 right up to the B0 53, thereby covering engines with displacement from around 0.9 to 3.0 liters. Thanks to the 1050° technology our B turbochargers allow further reductions in fuel consumption of up to 20 percent. To save space and weight in the vehicle, we also offer integrated solutions with cast on exhaust manifolds or welded sheet metal manifolds.

Integrated diverter valves – actuated pneumatically or electrically – as well as mufflers are also possible.

With our efficient and reliable Twin Scroll turbochargers we offer you an innovative turbocharging technology that ensures dynamic power delivery even at very low engine speeds. The transient behavior of the engine is significantly improved, while full torque is available very early on – comparable with a modern diesel engine – and over a wide rev band. A CFD-optimized channel design helps our Twin Scroll turbochargers achieve the highest efficiency. For highly thermally stressed applications we offer these with water-cooled bearing casings.

The spectrum of applications ranges from the B0 45 up to the B0 53 – designed for gasoline engines with displacement of 1.6 to 3.0 liters.

For the toughest demands on dynamic driving performance – paired with impressively low fuel consumption – we offer our BV range of turbocharging systems with variable turbine geometry.

BorgWarner was the first manufacturer in the world to offer VTG turbochargers for gasoline engines in mass production. Here, we employ materials and designs that are optimally tuned to the high thermal loads in gasoline engines and have developed a robust VTG mechanism that works reliably even in the toughest of conditions. Our BV turbochargers also employ a CFD-optimized vane design and thereby offer excellent efficiency.

For fast turbine vane adjustment and lag-free adjustment to the respective engine operation point, electrical actuators are used. Water-cooled bearing casings make the BV turbocharging systems suitable for use in applications with high levels of thermal stress.