

ORIGINAL GARRETT® TURBOS FROM HONEYWELL PROVE WHOLE-LIFE BENEFIT

Vehicle owners tempted by the lure of cheaper copy or remanufactured VNT™ turbos should be aware of the pitfalls of making what often turns out to be a false economy, and may even be heading for serious turbo and engine damage.

Research undertaken by Honeywell Turbo Technologies shows that its market-leading Garrett® range of turbos delivers significantly better whole-life value than lower-cost non-genuine alternatives when taking into account reliability, performance, fuel efficiency and longevity.

“We understand the economic pressure everyone is feeling at the moment, but choosing a poor-quality copy turbo or a remanufactured VNT™ turbo is truly a false economy,” says Ed Goodwin, Director, Global Aftermarket at Honeywell Turbo Technologies. “Garrett® turbos meet the exacting original specifications of passenger car and truck manufacturers and deliver levels of performance and a whole-life* return on investment that is not achievable with non-genuine turbos that fall below Honeywell’s quality standards. There is also the risk that the use of copy or remanufactured turbos could lead to significant engine damage.”

VNT™ Turbos – Excellence in Engineering and Performance

When Honeywell introduced the Garrett® VNT™ (Variable Nozzle Turbine) turbocharger in 1991, it heralded the arrival of the world’s most successful engine boosting system.

Honeywell’s VNT™ technology – now in its third generation – is installed in millions of cars around the world and continues to enable automotive manufacturers to raise the bar on performance. More power, more torque, greater fuel efficiency and lower emissions – VNT™ is truly a technology in tune with the needs of the 21st century.

Garrett® VNT™ turbos are highly complex units, engineered and calibrated to meet the exacting performance parameters of automotive manufacturers. For example, the specialist process of setting the turbo’s minimum flow vane position takes account of the VNT’s intricately engineered composition

– Garrett® Turbos from Honeywell

and its performance-critical tolerances and involves using a highly accurate turbine flow bench to measure and compensate for any variation in gas flow.

Highly skilled technicians then set and lock the minimum flow vane position to suit the requirements of each individual application. It is only when the 'minimum flow vane open' position is set that it is possible to calibrate the unit (to three decimal places), using four checkpoints to ensure correct operation.

Each of these steps is vital in ensuring the optimum performance of Garrett® VNT™ turbochargers. Indeed, these engineering complexities cannot be compromised – which is why the company's official Aftermarket distributors are committed to supplying only new Garrett® VNT™ turbos that are quality assured and matched to the original OEM specification.

Copy Turbos – Not up to the Task

Every single Garrett® turbocharger distributed through the global Aftermarket is guaranteed to meet the original specification demanded by car and truck manufacturers: the same performance, the same calibration and the same whole-life advantages – without any of the risks associated with poor-quality copy turbos sold around the world as supposed replacements.

Research shows that around 70% of copy turbos have faults with bearing systems, which can lead to serious failures. And while bearing problems are most commonplace in copies, the quality of the bolts joining the turbine housing to the center housing can also be an issue. The bolts are known to 'relax', which can lead to gas leakage, mechanical damage and oil leakage that can in turn contaminate the catalytic converter or the DPM system.

“Virtually every copy turbo that we have tested has difficulty coping with the stresses and temperatures associated with modern passenger car and truck engines,” says Ed Goodwin. “And with the growing complexity of turbo technology linked to increasing demands for performance, fuel efficiency and emissions control, the problems associated with copy turbos can only get worse.”

In fact, not even an economic case can be made for using copies – tests performed by Honeywell show that Garrett® turbos deliver around four times the whole-life value of copy turbos.

- Garrett® Turbos from Honeywell

Copy and Remanufactured Turbos – Potential Risks

Copies of Honeywell’s best-in-class Garrett® turbos – or remanufactured turbos using substitute parts can lead to serious performance issues. These include:

- Low flow/pressure, causing poor response
- Over-rich diesel fuel/air mix, causing excessively high temperatures, damaging both the turbo and the engine
- High flow/pressure, causing over-speeding of the turbo, wheel bursting and damage to turbo and engine
- Excessive boost pressure, causing physical damage to the engine

The use of these non-genuine products may also impact negatively on engine efficiency and on the environment. The potential problems include:

- Reduced Performance – leading to lower vehicle value and poor driveability on the road
- Increased Fuel Consumption – leading to higher running costs and greatly increased whole-life expenditure
- Increased Emissions – leading to higher CO₂ and NO_x output, which could mean vehicles being identified as un-roadworthy at statutory inspections
- Conflict with the engine management system – leading to vehicles running in reduced power safety mode and creating immediate conflict with the ECU on engine start-up

Comments Ed Goodwin: “Our customers rely upon our commitment to technical excellence and world-class manufacturing processes – and that’s why our distributors will supply only new Garrett® turbochargers guaranteed to meet the engine requirements specified by OEMs in terms of power output, reliability, emissions control and fuel efficiency.”

Garrett® turbochargers are products of Honeywell Turbo Technologies, a division of Honeywell Transportation Systems. With \$4.6 billion in revenues in 2008, Honeywell Transportation Systems also manufactures Bendix® brake products, Fram® filters, Prestone® antifreeze, Autolite® spark plugs and Holts® automotive products.

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Honeywell International (www.honeywell.com) is a Fortune 100 diversified technology and manufacturing leader, serving customers worldwide with aerospace products and services; control technologies for buildings, homes and industry; automotive products; turbochargers; and specialty materials. Based in Morris Township, N.J., Honeywell's shares are traded on the New York, London, and Chicago Stock Exchanges. For more news and information on Honeywell, please visit www.honeywellnow.com.

** (footnote page 1) This does not modify Honeywell's standard contractual warranty for aftermarket turbochargers which is limited to the earlier of 12 months, 100,000 km, or 18 months from Honeywell's delivery to buyer.*

This release contains forward-looking statements as defined in Section 21E of the Securities Exchange Act of 1934, including statements about future business operations, financial performance and market conditions. Such forwardlooking statements involve risks and uncertainties inherent in business forecasts as further described in our filings under the Securities Exchange Act.

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