

booster magazine

SEPTEMBER 2006



INNOVATION AND PARTNERSHIP

**Driving the Future
through Technology**

Honeywell



On Track

- Global perspective... Honeywell has realigned its turbo business around passenger vehicles and commercial vehicles. It is the combination of global scale, local responsiveness and advanced technologies that deliver the boosting solutions that customers need as emission standards tighten and converge worldwide.
- Two isn't always better than one... but in the case of the new Peugeot 407, Honeywell's parallel sequential dual-stage turbocharger system was not only a world first, it also helped to deliver enormous performance and driveability gains in a 4-cylinder diesel engine.
- The most advanced turbocharger application in Asia is helping to boost sales in Korea of the new 2 liter GM Daewoo Winstorm diesel SUV by delivering impressive levels of peak performance and torque.
- China is on course to become a major automotive manufacturer in the next five years. Add to this the enormous economic expansion underway in India, and it's clear that Asia is on an unprecedented growth path for both passenger cars and commercial vehicles.
- Sensing and turbo control... an innovative partnership involving two Honeywell businesses is delivering optimum boost control for OEMs using latest generation sensing technology.
- Winning all the way... Audi's stunning R10 TDI sportscar made history in 2006 by becoming the first turbodiesel to win at the 24 Hours of Le Mans. Now the team has taken the record-setting technology across the Atlantic and won the American Le Mans Series crown.

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Listening and Learning

Dear Readers,

Providing value for our customers has long been Honeywell's most important objective. At Honeywell, we seek to provide you with value in a number of ways – through technology, through reliability and through our service.

To this end, we have put in place a new business structure for our Turbo Technologies business that places our customers firmly at the heart of everything we do. By organizing ourselves from a regional structure to one aligned globally around Passenger Vehicles and Commercial Vehicles, I believe we will be better positioned to deliver value through technological innovations, systems reliability and responsive service.

Heading these two global businesses are familiar names with increased responsibilities. Alex Ismail, who formerly led our Europe region, is now President of the Passenger Vehicles business. And Jeff Donnell, who previously headed our Americas region, has been named President of our Commercial Vehicles business.

This issue of *Booster* features interviews with both Alex and Jeff who speak about how this new business model allows their teams to add value by thinking more globally as they work to provide you with innovative solutions. Most important, it enables us to better develop the quality of partnerships that will leverage optimum technological benefits.

The result will be an organization fit for an industry that seeks to balance major challenges with tremendous capabilities. We look forward to playing our part and I welcome your personal feedback on how we're doing.

Adriane M. Brown

Adriane Brown
President and CEO
Honeywell Transportation Systems

booster magazine



COVER:
The new Peugeot 407
featuring the Honeywell
Parallel Sequential
Dual-Stage

Two-Stage is Diesel First

It's a world first – and it's the result of innovative engineering and Honeywell's commitment to technological achievement through partnership.

The new Peugeot 407 and 607, and the Citroën C5 and C6, all house the only 4-cylinder passenger car engine to benefit from a parallel sequential dual-stage turbocharger system. This latest Honeywell advance redefines two-stage turbo technology, helping to deliver up to 30 percent more torque compared to PSA's 2.2 liter baseline diesel engine and improving third gear acceleration in the 30kph-60kph range by 30-50 percent or a 20 percent time to speed reduction.

All this is the result of a partnership between Honeywell and PSA engineers which began in 2003 when Peugeot set a challenge to uprate the performance of its 2.2 liter diesel engine to match the power output of an equivalent 2.5 to 3 liter single turbocharged unit.

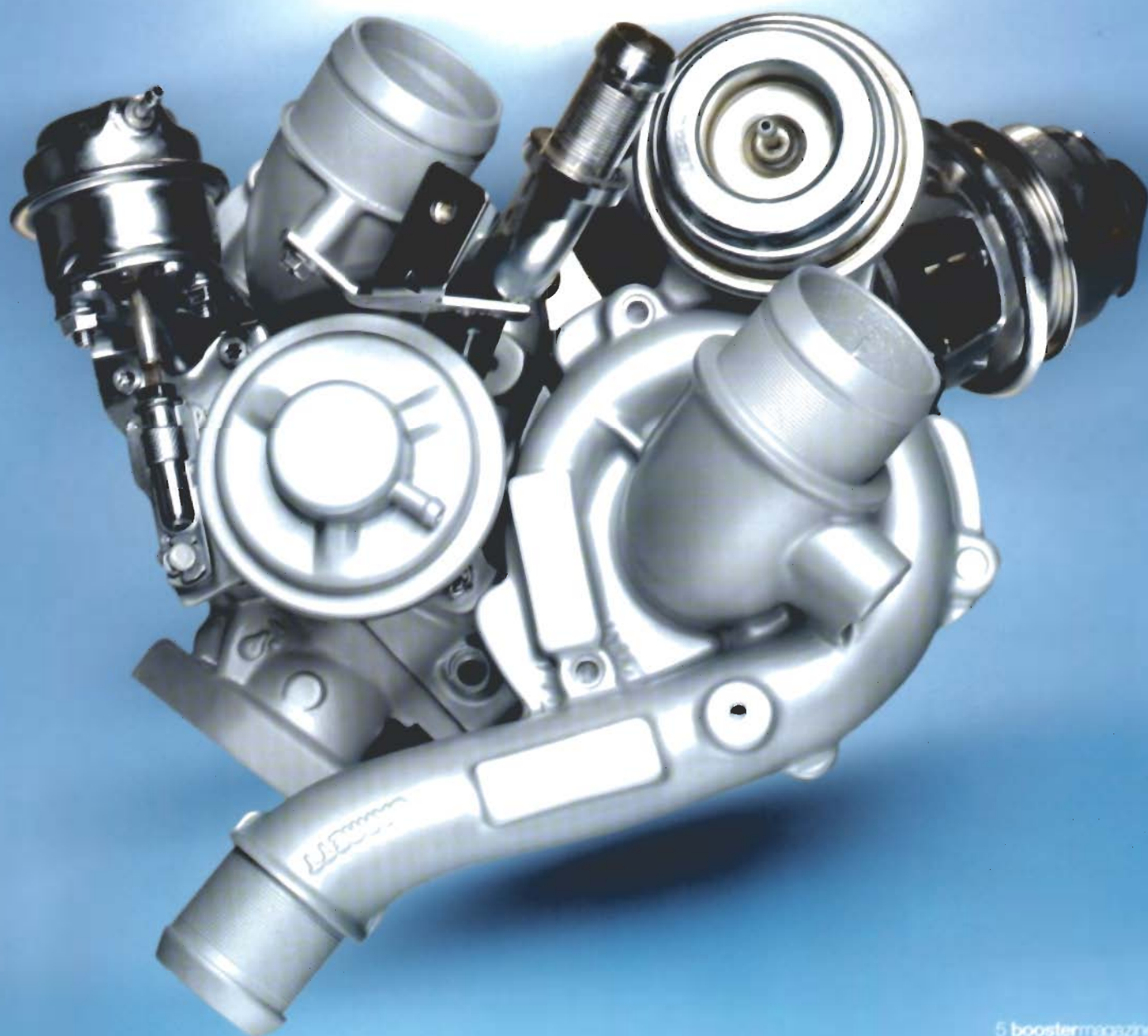
Rather than opting for a serial sequential turbocharging configuration, where a smaller high pressure turbo works in advance of a much larger turbo, PSA and Honeywell engineers identified the value of a parallel sequential arrangement, where two small turbos work side-by-side at high rpm but only one small turbo delivers the power at low rpm. This configuration would meet the customer's low-end torque and fuel efficiency requirements yet deliver better emission control in more effective packaging.

"We considered both serial and parallel options for PSA," says Craig Balis, Vice President of Platform Management for Passenger Vehicles at Honeywell Turbo Technologies, "but packaging and the ability of the turbo arrangement to provide quicker catalytic light-off, high EGR rate and better after-treatment synergy had to be factored in together with the requirement for exceptional low-end engine performance."

What makes Honeywell's parallel sequential dual-stage turbo technology so effective for PSA is the specially-designed and patented progressive control valve that accelerates the second turbo even when it is idling during the first engine phase. Pressurized air from turbo one is used to avoid any likelihood of oil leakage. The system also includes a position feedback sensor which is controlled by the ECU. The results of the partnership are stunning. The 2.2 liter HDi diesel engine now delivers full torque of 330Nm at 1300rpm and 370Nm at 1500rpm, which are unprecedented in an engine of this size at such low rpm. Looking ahead, Craig Balis sees the parallel sequential architecture as a key building block for dual-stage turbo systems. Honeywell is also supporting the development of several serial sequential programs expected to be introduced around 2007, and is thus able to provide both parallel sequential and serial sequential solutions. "With both technologies in the product portfolio," says Craig, "Honeywell is able to tailor the best solutions for OEM needs for all engine types, displacements, performance and emission targets."



Solution



Boosting Success



Peugeot 407

Engine Specifications

- Engine Layout – 4 in line
- Displacement – 2179cm³
- Maximum Power – 170hp @ 4000rpm
- Maximum Torque – 370Nm @ 1500rpm/400Nm for automatic gear box applications
- Diesel direct injection common rail
- Compliant with Euro IV emission regulations

Turbocharger Features

- Parallel sequential dual-stage with one GT14 wastegate and one GT12 free-floating turbocharger.
- High temperature precision control valves provide smooth regulation of the system.
- Air-pressurized sealing system ensures oil sealing during unique system operating conditions.
- Mechanical decouplers eliminate inter-component thermal and mechanical stresses.

Turbocharger Key Benefits

- Boost pressure available at low rev and high speed.
- Improved performance and torque; short response time.
- Very compact solution provides better packaging compromise in the vehicle environment.
- Low thermal inertia and high temperature capability conducive to aftertreatment lightoff and future emission requirements.



GT14/GT12 Turbo

First parallel sequential dual-stage turbo technology for a 4-cylinder engine

ess...

Across the globe and in every vehicle segment, Honeywell's turbocharging technology is helping automotive manufacturers meet the challenges of today and tomorrow. A spirit of partnership is driving the leading-edge technology programs that are delivering emission control and fuel efficiency without compromising performance on the road. Here are just a few examples of how engineering excellence and innovation are boosting the automotive industry around the world.

VW Passat

Engine Specifications

- Engine Layout – 4 in line
- Displacement – 1968cm³
- Maximum Power – 170hp @ 4000rpm
- Maximum Torque – 350Nm @ 1800-2500rpm
- Diesel direct injection pump injector

Turbocharger Features

- GTB17 VNT™ 3rd generation
- Pneumatic actuation with position sensor
- Integrated turbo manifold

Turbocharger Key Benefits

- Improved performance and driveability
- High-temperature capabilities enabling diesel particulate filters

Utilizing sensing technology
for precise control



GTB17 VNT™ Turbo



Mercedes E 320 TDI (Bluetec in the U.S.)

Engine Specifications

- Engine Layout – V6
- Displacement – 2987cm³
- Maximum Power – 225hp @ 3800rpm
- Maximum Torque – 510-540Nm @ 1600-2800rpm
- Diesel direct injection common rail

Turbocharger Features

- GT20 VNT™ 3rd generation
- Controlled by Rotary Electronic Actuation (REA)

Turbocharger Key Benefits

- Improved performance
- High-temperature capabilities enabling diesel particulate filters

Third Generation VNT™
enabling compliance
with U.S. diesel emissions



GT20 VNT™ Turbo



Whether it's on the roads of Europe, the U.S. or Asia, the desire among drivers for impressive automotive performance crosses continents. Honeywell is playing its part in meeting this demand by developing innovative turbocharging solutions that help OEMs create engines that are more responsive, more fuel efficient, better for the environment..

...arc

Renault Espace

Engine Specifications

- Engine Layout – 4 in line
- Displacement – 1995cm³
- Maximum Power – 175hp @ 3750rpm
- Maximum Torque – 360Nm @ 1750rpm

Turbocharger Features

- GT17 VNT™
- Pneumatic actuation
- Water-cooled center housing
- Full back disk turbine wheel

Turbocharger Key Benefits

- Improved performance and driveability
- High-temperature capabilities enabling diesel particulate filters



GT17 VNT™ Turbo

Enhanced performance and driveability

Volvo V70

Engine Specifications

- Engine Layout – 5 cylinders
- Displacement – 2400cm³
- Maximum Power – 185hp @ 4000rpm
- Maximum Torque – 400Nm @ 2000-2750rpm

Turbocharger Features

- GT20 VNT™ 3rd generation
- Controlled by Rotary Electronic Actuation
- Water-cooled center housing
- First integrated manifold for 5-cylinder engine

Turbocharger Key Benefits

- Improved performance and driveability
- High-temperature capabilities enabling diesel particulate filters



GT20 VNT™ Turbo

Integrating the latest performance and control technology in a 5-cylinder engine

und the World

Iveco Daily

Engine Specifications

- Engine Layout – 4 in line
- Displacement – 2998cm³
- Maximum Power – 166hp @ 3000-3500rpm
- Maximum Torque – 380Nm @ 1250-3070rpm

Turbocharger Features

- GT22 VNT™
- Pneumatic actuation
- Water-cooled center housing
- Integrated backplate

Turbocharger Key Benefits

- Improved performance
- Higher durability



GT22 VNT™ Turbo



Offering VNT™ benefits for light commercial vehicles

TATA Indica

Engine Specifications

- Engine Layout – 4 in line
- Displacement – 1396cm³
- Maximum Power – 90hp @ 4000rpm
- Maximum Torque – 190Nm @ 1750-3000rpm

Turbocharger Features

- GT14 VNT™
- Pneumatic actuation

Turbocharger Key Benefits

- Improved performance and driveability



GT14 VNT™ Turbo



VNT™ technology makes its debut in fast-growing region



Honeywell has refocused the way it supports its passenger and commercial vehicle customers, moving from a regional structure to one globally aligned around each of these business areas. The passenger vehicle business is being led by Alex Ismail, while the commercial vehicle organization is being headed up by Jeff Donnell.

In this interview, Alex Ismail outlines the company's strategy for the future and looks at some of the key challenges facing the organization and its worldwide passenger vehicle customers.

More Global More Responsive



What will the changes in the Honeywell Passenger Vehicles business mean for customers?

Customers are going to see us more global, more responsive and faster to bring innovation to market. As a result of these changes we will drive clear accountability around customers and products on a global scale and we will be better positioned to capture all growth opportunities.

What will be the main areas of focus for Honeywell's passenger vehicle business over the next few years?

Our main focus will be on achieving growth by delivering quality and reliability alongside technological differentiation and on-site support to our customers. Quality and reliability will become hallmarks of our support for customers in an environment where PPM and reliability per thousand vehicles (R/1000) must move close to zero. We will continue as well to invest significant resources in innovation and technology to push the envelope of performance and fuel economy to new standards.

How does the passenger vehicle segment look over the next five years – what do you expect in terms of growth and trends?

I would say that the next five years will be exciting for Honeywell and the industry as a whole. We anticipate good levels of growth, mostly as a result of a very strong win rate in Europe and the expansion of our activities in the Asian countries, including India, China, Thailand and Korea. We're also going to see the emergence of dieselization in the Americas as the first European passenger vehicles equipped with our latest technology will start to be rolled out throughout the U.S. Consequently we will continue to introduce new technologies to address the needs of the performance segment in diesel and gasoline while at the same time increasing our focus on the small passenger car diesel and gasoline engines by delivering cost efficient turbocharger technologies. Displacement below 2 liters represents a significant percentage of the industry and with increasing cost of oil and evermore stringent emissions requirements, smaller will become better.

What is on the horizon in terms of emission regulations and what is being done to help customers meet these emission standards?

Emission regulations in the next 5-10 years are going to become even tougher as the industry moves beyond Euro V and begins to focus on the challenges of the U.S. Tier2 Bin5 and Euro VI as well as targeting reductions – averaging 30 percent – in CO₂ emissions. Honeywell is partnering with customers to develop new turbocharger technologies to deliver the necessary improvements in efficiency, control, transient and temperature capabilities – collaborations that also extend to ensuring compatibility with low-pressure exhaust-gas recirculation (EGR) for reduced engine NO_x emissions. We will also continue to support our partners in the industry to increase awareness of diesel technologies and the benefits of turbocharged engines specifically in the U.S. and China.

Alex Ismail

As President of Passenger Vehicles at Honeywell Turbo Technologies, Alex Ismail is the global leader of a business with annual revenues of about US\$ 1.7 billion headquartered in Switzerland.

Prior to this new appointment, Alex served as Vice President and General Manager for the Europe region of Honeywell Turbo Technologies, which also included activities in the Middle-East, Africa and India.

He joined Honeywell in 1997 and held positions in aerospace and the automotive business with increasing responsibilities before joining Honeywell's turbocharging business in 1999. He has lived and worked in several countries around the world including the United States, Belgium, Madagascar and France.

Alex holds a master's degree in Finance from the University of Paris-Dauphine, and received his MBA from the HEC School of Management in Paris and the Anderson School at the University of California, Los Angeles. He is a certified Six Sigma Black Belt.

QUICKER, BETTER DECISION-MAKING FOR CUSTOMERS
TECHNOLOGY ROADMAP LEADS TO EMISSION CONTROL



Jeff Donnell, new President of Commercial Vehicles at Honeywell Turbo Technologies, considers the drivers impacting on the commercial vehicle segment and points to the growing importance of technology and innovation in addressing the industry's biggest challenges.

Solutions for Global Challenges



You are now leading the global CV business as a result of the new reorganization. Can you explain how these structural changes will benefit Honeywell's customers?

Historically, our customers have asked us to adopt a truly global perspective, so they can have a single point of contact as they interact with us. The changes will enable us to make decisions a lot quicker and at a lower level of the organization and will lead to better decision-making. Whether it's in Europe, U.S. or Asia, emission standards are setting the agenda for commercial vehicle manufacturers. At a time when these standards are converging, OEMs are increasingly looking to global companies like Honeywell to deliver the technological solutions they require. Our worldwide footprint and our technology differentiation are key factors in meeting these challenges.

How does the global commercial vehicle segment look today?

The global market for commercial vehicles looks very positive in every continent around the world, with our customers expecting us to deliver technologies that will help them meet challenging environmental targets. As a business we need to make sure that we meet the objectives of our customers - this requires us to have the deep technical discussions with our customers up front early in the programs.

What do you expect in terms of growth and trends?

Asia is going to be a very important region of the world for the commercial vehicle business. In Japan, OEMs have announced plans to build light truck diesel engines for the North American marketplace. China is a very growth oriented region of the world. We've got a sound strategy for working with our customers in this region and we aim to ensure that we continue the growth that we've historically shown in China. We're also investing heavily in Europe, because we are seeing significant opportunities resulting from our ability to leverage Honeywell technologies to help CV customers respond to challenging emission targets. Likewise, our proven technology roadmap in US continues to deliver success in numerous partnership programs and is a fantastic platform for future development.

What's in the technology pipeline?

Over the next three to four years, there will be significant changes in the portfolio that will be available to commercial vehicle customers. In particular, we're working on a technology that delivers the performance of two turbochargers in a single turbo package. Emission standards are getting more stringent in all continents of the world, whether in Japan, North America or Europe. It's getting increasingly challenging for our customers to meet their emission targets - our role is to help them by delivering cost-effective solutions founded on the best available technology.

Jeff Donnell

As President of Commercial Vehicles at Honeywell Turbo Technologies, Jeff Donnell oversees a business with annual revenue of about US\$ 1 billion.

Before this new appointment, Jeff served as Vice President and General Manager for the Americas Region of Honeywell Turbo Technologies since 2002. In this position, he was responsible for overseeing all business functions and operations for Honeywell Turbo's business within North and South America.

Prior to this, Jeff spent almost two years as the Vice President and General Manager for the Aftermarket Turbo business. Before joining Honeywell, Jeff worked in a variety of finance positions for both the Ford Motor Company and IBM. He began his career as a radar systems design engineer.

A certified Green Belt, Jeff holds a Bachelor of Science degree in electrical engineering from the University of Illinois in Urbana, and an MBA from the University of Michigan.

THIRD GENERATION VNT™ BOOSTS FIRST GM DAEWOO SUV
TURBOS HELP TACKLE TOUGH EMISSION TARGETS

Setting New Standards in Korea



GM Daewoo created history with its first diesel SUV when it was launched this summer - the vehicle became the first in Asia to benefit from Honeywell's third generation VNT™ turbo with Rotary Electronic Actuator (REA) - a system that is delivering major gains in peak power and torque.

The new 2 liter Winstorm SUV positions GM Daewoo strongly in a marketplace that has already seen the successful introduction of third generation VNT™ technology on Hyundai and Kia SUVs in 2005. According to Korea Herald, Winstorm is "emerging as the No.2 SUV on the market after Hyundai's Santa Fe." GM group is also progressively releasing 4 new SUVs based on the same platform: in Europe by Chevrolet ("Captiva") and Opel ("Antara"), in Australia by Holden ("Captiva") and in North America by Saturn ("Outlook").

"Compared to earlier VNT™ technology, the third generation VNT™ with REA designed for GM Daewoo offers 17 percent improvement in peak power and 7 percent gain in torque," says B.H. Lim, General Manager of Honeywell Turbo Technologies in Korea.

In the second half of 2005, vehicles conforming to Euro IV emission standards were first sold in Korea. Since then, Honeywell's third generation VNT™ technology has become increasingly viewed as a key enabling technology to meet the stringent emission standards.

While total SUV sales in Korea for 2006 are expected to increase by 32 percent over 2005, the sales of SUVs this year equipped with Honeywell's third generation VNT™ turbos are projected to grow at a much faster pace over 2005, a further testament to the superiority of this advanced boosting technology.

According to published reports, GM Daewoo Automotive & Technology aims to sell more than 120000 of the SUVs next year, of which 30000 units are for domestic buyers. Overall, GM Daewoo is doing very well this year, selling more than 600000 vehicles from January to May, up 47.1 percent from a year ago.

Currently, Honeywell's third generation VNT™ turbochargers can be found in the Hyundai Tucson, Kia Sportage, Ssangyong Kyron and the new GM Daewoo Winstorm.



Boosting China's Automotive Industry

As China's passenger car market expands, turbocharging is playing a bigger role in shaping the driving habits of an entire nation.

Turbocharged cars from Audi, Volkswagen, Volvo, Saab and Cadillac are already making an impact, but Chinese carmakers - such as Brilliance, Cherry and Shanghai Automotive Group - are introducing their own turbo models in an increasingly competitive marketplace.

"The benefits of turbo are very compelling for passenger cars in China," according to Olivier Rabiller, Vice President of Customer Management for Passenger Vehicles at Honeywell Turbo Technologies.

"The increasing rate of car ownership combined with high oil prices at the pump makes turbocharging a very appealing proposition for drivers in China."

According to the China Merchant Journal (Hua Shang Bao), turbocharged cars offer considerable benefits. First, a newly implemented Consumption Tax Regulation penalizes large-displacement cars while favoring turbo models, the majority of which concentrate at 1.8 liter and below. Secondly, turbo models offer great performance - as evidenced by the fact that a 1.8 liter turbo engine can offer power equivalent to that of a 2.3 liter naturally-aspirated engine. Lastly, turbo models are more fuel efficient, an advantage gaining popularity as oil prices continue to rise.

"Today, less than 2 percent of gasoline cars in China are turbocharged," says Olivier Rabiller, "but we predict that by 2011, the penetration rate will reach 5-6 percent." Moreover, this does not take into account the growing interest in turbodiesel cars, which are increasingly viewed favorably in a country which currently imports 47 percent of its oil.

But for now, gasoline turbocharging is taking the lead. China Brilliance, a major domestic carmaker, is scheduled to introduce its Honeywell turbocharged Junjie 1.8T model this September. Honeywell is also working with several other major domestic Chinese carmakers, with three more engines turbocharged by Honeywell to be introduced in China from now to March 2007.

Sensing Synergy

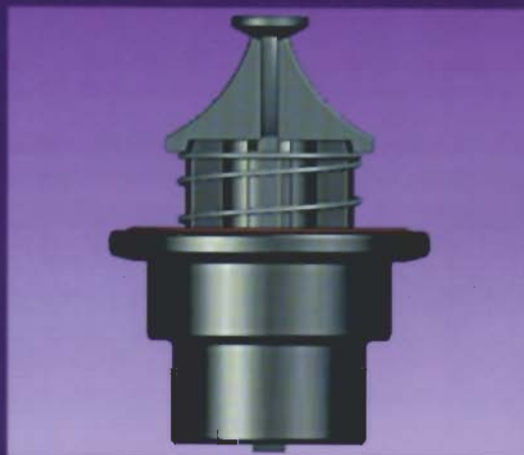


Sensing and control technologies are playing an ever more important role in optimizing the powertrain components that are helping automotive manufacturers meet emission obligations.

In the case of turbocharging, this means developing sensing units for actuation that not only feed data to engine control modules but also accommodate turbo operating speeds of up to 300000rpm and temperatures in excess of 1100°C.

The pneumatic actuator uses engine vacuum to adjust the angle of the turbo blades in the exhaust gas flow, thus controlling the speed that the turbo is allowed to spin.

"At lower engine rpm there is less exhaust gas available to provide power to the turbo and the vanes need to be more closed to capture the flow," explains Mike Skillman at Honeywell Sensing & Control. "The Honeywell linear position sensor integrates into the pneumatic actuator assembly and provides instantaneous feedback to the engine control module in order to regulate the angle of the turbo blades and thus provide more precise control of turbo speed."





Honeywell Sensing & Control and Turbo Technologies have been working together since early 2003 to develop technologies that aim at meeting the future requirements of commercial vehicle and passenger car manufacturers, resulting in the first Honeywell linear position sensor application for a 2007 pneumatically actuated turbocharger for use on a European 2.0 liter engine program.

Sharing expertise and knowledge, the two Honeywell businesses jointly visit and present turbo sensing and control strategies to car and truck manufacturers all over the world. This collaboration resulted in selection of a Honeywell linear position sensor for a European 1.6 liter engine program.

"The joint expertise of our businesses means we can utilize the maximum advantage from turbocharging on behalf of our customers," says Chris Greentree, who leads Sensing and Actuation programs at Honeywell Turbo. "The performance curves are attracting a lot of interest in Europe, the U.S. and Asia among customers who recognize the potential of utilizing Honeywell synergies in addressing pressing issues of emission control."



Honeywell Sensing Capabilities

For the last 25 years, Honeywell Sensing & Control has been providing high-volume, on-time sensing solutions with enhanced reliability to passenger car and commercial vehicle manufacturers. It is known for its breadth of sensing technologies and its ability to drive innovation through concept, modeling, IC design and sensor packaging.

"This approach has led to three decades of innovation – from the breakthrough introduction of Hall effect vane sensors to the latest angular and linear positions sensors," says Tim Tessendorf, Director of Global Product and Market Management. "Today's advanced vehicles need innovative, high quality, reliable sensors for engine management, ABS systems, transmission control, on-board diagnostics and, of course, for delivering maximum turbocharger performance."

The Honeywell business is continuing to grow globally, with increasing expansion in Asia and Europe to complement its U.S. presence, and augmented by design centers in Korea, China and North America and a global manufacturing footprint.

Currently in development are sensors focused on improving vehicle emissions and performance. Next generation technologies include Surface Acoustic Wave (SAW) technology with wireless applications, already planned for pressure sensors in commercial vehicle tires and for a transmission torque sensor. Beyond SAW, other developmental efforts are focused on gas sensors to enhance vehicle emission systems.

Defining India through Innovation



Mr Vinod K. Dasari
Chief Operating Officer
Ashok Leyland

The big automotive winners in one of the world's most diverse and fastest growing economies will be those businesses that successfully embrace a culture of innovation.

So says Mr Vinod K Dasari, Chief Operating Officer of Ashok Leyland in India, whose company has recorded a compound annual growth of 23 percent over the last 3 years in a country investing heavily in its road infrastructure and showing an annual increase in GDP of 8-10 percent.

Despite these impressive statistics, Ashok Leyland recognizes that competition is growing fast and that its technology partners, including Honeywell, have a vital role to play in helping to deliver competitive advantage.

He comments: "Our customers are telling us that they are looking for vehicles where the upfront cost is lower, which will deliver very good fuel economy and which are tailored specifically to their needs. Innovation in terms of technology and in the way we support our customers is essential if we are to differentiate Ashok Leyland from the competition.

"In the future, we will need to work closer and faster with our partners because speed in innovation is going to be a critical factor in our success."

In the case of Honeywell this means working with the company's engineering teams in helping to optimize engine performance, emission control and fuel efficiency.

"We seek genuine partnerships with our suppliers," says Mr Dasari. "For example, with the turbocharger we are not just buying a commodity, we are buying knowledge and know-how. If I need an extra 10hp from a particular engine I need an answer to the question 'What can you do to help me achieve this?'."

Mr Dasari is equally clear about the culture that is needed to deliver success. "In the past, Leyland has been seen as a conservative company but we are now responding much more aggressively to the challenges in the marketplace. Any company that does not move fast or take calculated risks will be left behind.

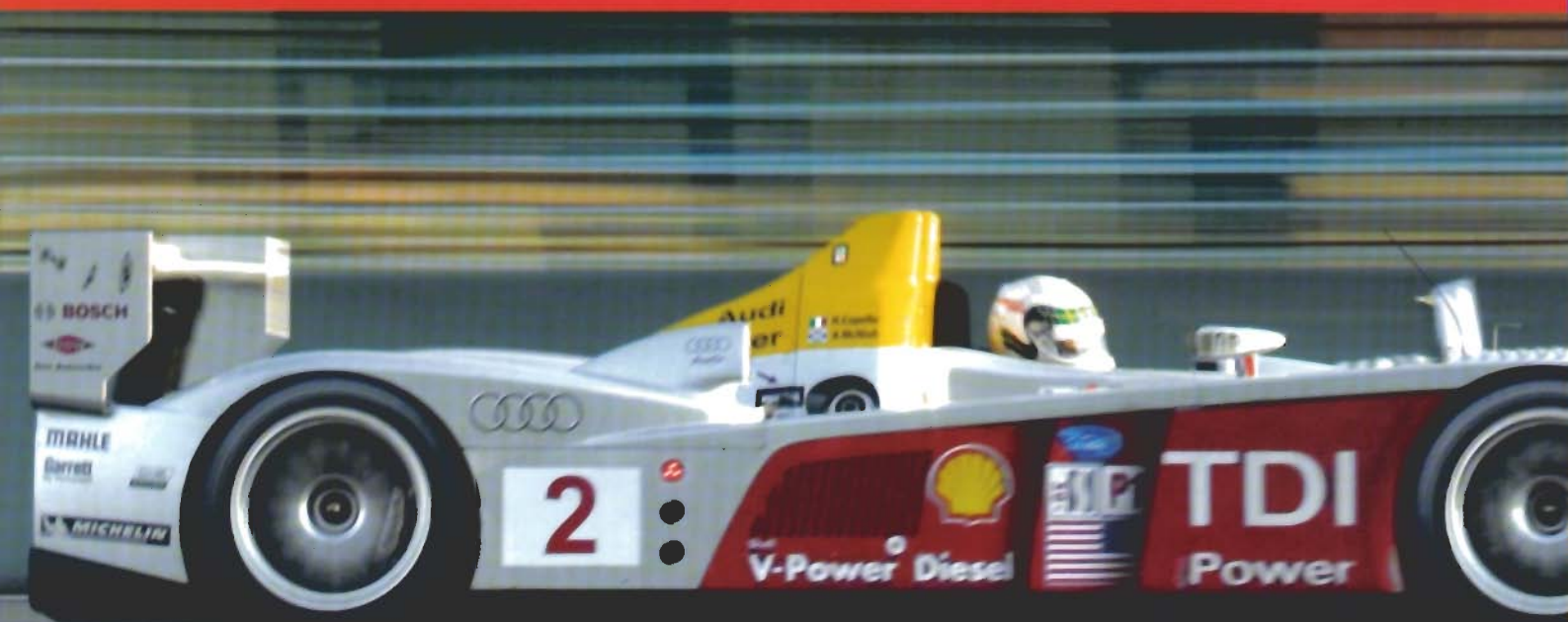
"This goes hand in hand with effective communication to ensure that our 12000 employees share in this vision of the future and have a clear understanding of where the company is going and what is happening in the marketplace."



s Future



Winning all th



Audi's turbodiesel success story goes from winning line to winning line.

Fresh from becoming the first turbodiesel to claim victory at the world's most famous endurance event at Le Mans, the Honeywell-turbocharged Audi Sport R10 TDI then crossed the Atlantic to carry on where the team had left off in France by winning the crown of the American Le Mans Series (ALMS). With victory in the eighth race of the season at Mosport (Canada), Allan McNish (Scotland) and Dindo Capello (Italy) in their Audi R10 TDI clinched the LM-P1 title in the series ahead of time. With their fifth outright race victory of the season, the two Audi drivers now have an unassailable championship lead with the final two races at Road Atlanta and Laguna Seca remaining.

"By prematurely clinching the drivers' title in the American Le Mans Series with the R10 TDI, Audi has yet again demonstrated 'Vorsprung durch Technik' on the race track," commented Dr. Wolfgang Ullrich, Head of Audi Motorsport after the race. "Bringing new technology in

to a racing series and immediately clinching the title is a tremendous achievement."

Dindo Capello handed over his leading Audi R10 TDI to his co-driver Allan McNish in the 73rd minute. After various lead changes, McNish won with a gap of 2.79 seconds ahead of the two Dyson Lolas.

After the success with the legendary R8, the latest Audi R10 win is the seventh title in the prototype class for Audi. Since its race-winning debut at Sebring in March, the Audi R10 TDI remains unbeaten and is the first diesel-powered sportscar to win an important championship.

While Allan McNish was already ALMS champion in 2002, his co-driver Dindo Capello won the championship for the first time on this occasion. The two 2006 American Le Mans Series champions shared their excitement after the historical victory:

e Way



Allan McNish
(Audi R10 TDI #2):

"I'm very pleased to have wrapped up the Drivers' title in such a hard race and ultimately a victory. Audi's diesel sportscar made history when Dindo, Tom (Kristensen) and I won at Sebring, Emanuele (Pirro) and Marco (Werner) made history by winning Le Mans and now Dindo and I have made history by winning an international championship with a diesel which makes me proud."

Dindo Capello
(Audi R10 TDI #2):

"Having finished second in the ALMS championship in 2000 and 2002, I'm very proud to have finally won the Drivers' title and that it was decided in such a close race which required us to push hard from start to finish."



The World's Fastest Diesel

On August 22, 2006, the Honeywell-turbocharged JCB DIESELMAX became the world's fastest-ever diesel, when RAF pilot Andy Green drove the car to an FIA-sanctioned speed of 328.767mph (526.027kph) at the Bonneville Salt Flats. A day later, he went even faster, setting a new world mark of 350.092mph (563.418kph) after two passes within one hour.

As he celebrated his stunning achievement, Andy Green said: "I am so pleased that we have got the car to 350mph, which was always our ultimate goal. This is another great result for a wonderful team and a testament to British engineering."

Powering the stunning, nine meter long JCB DIESELMAX car are two JCB444 diesel engines, which usually drive JCB's backhoe loaders but developed for this project to produce 750bhp each and currently the world's most powerful diesel engine per liter. The twin 4.44 liter engines are each boosted by two Honeywell turbochargers in a series dual-stage configuration.



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