

All new Corvette Z06 showcases PBR Xtreme brake muscle | 3



Inside this issue: (click on links below)

| | | | |
|--|---|---|---|
| PBR Wins Two Major Toyota Awards | 2 | Expanded Research Facilities | 5 |
| All new Corvette Z06 showcases PBR Xtreme brake muscle | 3 | Outstanding PBR presence at AAAA Trade Show | 6 |
| Sustainability reporting holds the key | 3 | Oz industry update | 7 |
| New Asian plants commence production | 4 | New Website Improves Communication | 7 |
| First Australian brake modules through Mitsubishi | 4 | Performance Toyota draws on PBR | 7 |
| Fibre reinforcement - adding strength, reducing weight | 5 | PBR Design Award won by U.S. team | 7 |

Want to know more? Join us online www.pbr.com.au
or click here to subscribe to [ON THE MOVE](#)



Sydney showcase
for PBR brand

6

Introduction



Grant Anderson
PBR International

Welcome to the latest edition of *On The Move*. With the first quarter of 2005 now over, PBR is working steadily towards the next growth stage for the company as preparations are made for new contracts commencing in 2006.

New manufacturing facilities are taking shape in Thailand and China which is an important element of our overall growth strategy for the Asian market.

We are very proud to be the recipient of two significant awards from Toyota which recognise the hardworking efforts of a very dedicated PBR team.

Our continued growth in the area of brake module development is a feature of this edition of *On The Move* where we highlight the new 2006 Corvette Z06 brake module and the first Australian brake module business for PBR through Mitsubishi.

Since our last edition we have launched a new website as part of our goal to improve communications and lift the PBR brand presence in the global market. I encourage you all to take a closer look at www.pbr.com.au and experience this first hand.

In this issue we also take a closer look at some of PBR's development work in the area of fibre reinforced brake calipers and review the aftermarket team's successful participation at the recent Australian Automotive Aftermarket Association trade show in Sydney.

We hope you enjoy reading this latest issue.

Grant Anderson

PBR wins two major toyota awards

PBR's recognition as a valued supplier to the Toyota Corporation has just been lifted significantly after winning the inaugural Regional Contribution Award at the 2005 Toyota Global Supplier's Convention on the 17th March and the Engineering Excellence Award at the 2005 Toyota Australia Supplier Conference on the 8th April.

The Regional Contribution Award was established for the first time this year and is awarded to suppliers who have delivered a significant contribution to the Toyota global business by winning three consecutive "Superior" awards from their regional Toyota affiliate.

Toyota Australia Divisional General Manager, Purchasing, Mr Rob Jakobi, joined PBR's Alan Stevens and Mark Ehrman at the global convention for the award ceremony. Over 400 companies and 1,000 participants, including the entire Toyota board of directors, attended the two day event held in Nagoya, Japan, close to Toyota's global headquarters in Toyota City.

The impact of this award is significant given that PBR was one of only a handful of non-Japanese suppliers to be recognised during the event and one of only five suppliers to receive a Regional Contribution Award.

"PBR was one of only a handful of non-Japanese suppliers to be recognised."

The Engineering Excellence Award was presented to PBR's Alan Stevens, Vince Joy and Mark Ehrman at a ceremony conducted at Toyota Australia's head office in Port Melbourne.

This award is significant in that it recognises PBR's drive for innovation through product,

process, technology and service and the ability to apply this to the benefit of Toyota Australia's operation.

As PBR's relationship with Toyota continues to grow, these achievements demonstrate that PBR has the capability of becoming a truly global partner in Toyota Corporation's future growth.

At present, PBR supplies Toyota Australia with brake calipers, disc rotors and Banksia park brakes for their Camry and Avalon models and will commence supply of knuckles in 2006.



Toyota Corporation Region Contribution Award



Toyota Australia Engineering Excellence Award

All new Corvette Z06 showcases PBR Xtreme brake muscle

When Chevrolet unveiled the 2006 Corvette Z06 at the North American International Auto Show it was also revealed that it is the fastest, most powerful car ever offered by Chevrolet and General Motors.

Not surprising when you consider the all-new LS7 7.0 litre V8 which uses racing-derived lightweight technology to produce 500 horsepower and 475 lb.-ft. of torque.

For a car that reportedly goes from 0-60mph in less than 4 seconds, covers the quarter mile in less than 12 seconds and delivers a top speed of more than 190mph on the race track, the new Z06 required some serious brake muscle to bring it safely to a stop.

That's where the PBR design team stepped in to develop an equally aggressive brake system.

“PBR supplies the Z06 brake system as brake corner modules.”

The PBR designed Z06 brake system features unique six-piston calipers mounted over substantial 355mm vented and cross-drilled rotors on the front and four-piston calipers mounted over 340mm vented and cross-drilled rotors on the rear.

These all-new high performance brake calipers feature a single-pad-per-piston system which delivers more equalised wear compared to a pair of otherwise very long single-piece pads as used on alternative systems.



Z06 brake modules manufactured in PBR's Columbia facility

The much larger brakes deliver excellent stopping capability, fade resistance and lining life giving the Z06 a real competitive edge.

PBR supplies the Z06 brake system as brake corner modules consisting of brake caliper, disc rotor and knuckle from their manufacturing facility in Columbia, South Carolina. By designing and assembling the system as modules PBR can maximise the overall performance integrity of the system.



Going Green

SUSTAINABILITY REPORTING HOLDS THE KEY

When companies undertake to implement the ISO14001 standard for environmental systems management it comes with a long term commitment. PBR is now operating ISO14001 in all of its seven manufacturing sites around the globe but the key to long term success of the program rests with the ability to accurately report and review the progress of each facility.

So PBR has developed a global reporting structure based on the Australian Government's guidelines for sustainability reporting which will facilitate the gathering of uniform data across all manufacturing sites.

The new PBR Environment Sustainability Report captures 2004 data as the basis for future improvement and monitors the following key elements.

- Gas, electricity and water usage
- Waste products including landfill and regulatory waste
- Levels of recycling
- Legislation involvement
- Community based activities

The report will be used to develop ongoing benchmarks and Key Performance Indicator (KPI) measures to drive the ongoing improvement of PBR's environmental impact.



Around the globe

NEW ASIAN PLANTS COMMENCE PRODUCTION

PBR's strategy to position itself as a key brake system manufacturer in the growing Asian automotive market is progressing well with the commencement of production at their new manufacturing facilities in Rayong, Thailand and Dalian, China.

The Thailand automotive market is quickly becoming the Asian hub for light truck production with many global platforms being transferred into the area. With PBR's strong presence in the North American light truck market, the expansion of operations in Thailand will provide a strong base from which to capitalise on the continuing growth of this vehicle market sector.

The new Thai facility is a twin factory complex which accommodates brake caliper production along with production of PBR's renowned Banksia single-shoe park brakes for a variety of local and global contracts.

The new facility in Dalian, China is the first of two manufacturing centres that will facilitate the production of PBR brake products from this region. This plant has been designed to accommodate machining, plating and assembly operations and will be supported by a new foundry which is due to commence construction later this year.

At this stage the China operations will focus on the production of components for PBR's brake calipers and Banksia park brakes.



PBR's new facility in Rayong, Thailand, is now operational



The new facility in Dalian, China, prepares for production

First Australian brake modules through Mitsubishi



PBR's continued expansion of its brake module business will see Mitsubishi become the first Australian vehicle manufacturer to adopt a PBR corner module system.

"This allows PBR to provide a "total system solution."

Mitsubishi Australia has been fitting PBR brake systems to locally produced vehicles for many years at their Tonsley Park assembly plant in South Australia. When production of Mitsubishi's all new vehicle (code named PS41) commences in August this year it will roll off

the line complete with a PBR corner module comprising brake caliper, disc rotor, suspension knuckle and bearing.

This approach allows PBR to provide a "total system solution" to Mitsubishi and become more involved in the broader system integration. PBR has assisted Mitsubishi by upgrading the brakes to include larger disc rotors and an all new lightweight twin-piston aluminium front caliper.

Final assembly of the module will be conducted at PBR's new facility in Lonsdale South Australia and by doing so will assist Mitsubishi in achieving its stated goal of producing the "Best Quality Car Built in Australia".

Product spotlight

FIBRE REINFORCEMENT - ADDING STRENGTH, REDUCING WEIGHT

High performance ceramic fibre reinforcement in calipers adds strength, reduces weight and improves performance – that is the finding of research work done by PBR and PGT together with 3M and DaimlerChrysler.

The research shows that a fibre-reinforced aluminium caliper is half the

weight of an iron caliper. For the aluminium caliper used in the study, the reinforcement improved stiffness by 25%.

In a presentation to a Society of Automotive Engineers forum on brake

technologies last year, PBR Engineering Manager, Graham Scull, Bill Satzer of 3M and Steve Brown of DaimlerChrysler put forward the case for fibre-reinforced aluminium calipers.

“For the aluminium caliper used in the study, the reinforcement improved stiffness by 25%.”

They said 3M ceramic fibre in aluminium calipers:

- Matched cast iron stiffness but with impressive weight savings
- Had lower volume and weight than a pure aluminium caliper
- Noise could be reduced by adjusting the stiffness through shaping changes
- Brake performance was enhanced through better pad contact, drag, pedal travel and rotor size



Above: All FRBC calipers hit the designed stiffness prediction with 25% increase over the baseline
Bottom left: Good fatigue response on all tested calipers – FRBC averaged over 150,000 cycles at 16MPa loads



PBR and PGT worked with 3M last year on the development of the Fibre Reinforced Brake Caliper (FRBC) and the prototypes were thoroughly evaluated on the test bench. DaimlerChrysler then did vehicle tests and confirmed the findings.



Further testing is being carried out and commercialisation is expected in the future. This exercise is another example of how PBR and PGT work closely with other industry leaders to develop advanced brake system technologies and bring them to market.

Expanded Research Facilities

PBR's presence in the global automotive industry has grown significantly over the past decade and one of the keys to that success is the ability to conduct full vehicle test programs through the company's design centre in Australia.

For 25 years, PBR has tested brake systems at the 1000-hectare proving ground at the Australian Automotive Research Centre, Anglesea, Victoria. Recently the site has undergone a significant expansion to cope with the increased testing requirements from new and existing Original Equipment customers along with the expanding development program for PBR's brake-by-wire products.

PBR's new facility is almost four times larger and includes increased security measures, expanded workshop and all new machining facilities.

Vehicle testing at Anglesea assesses brake performance and component durability over a wide variety of terrains. Test cars are driven to specific, rigorous, procedures on highway, gravel and other special road surfaces. Other test procedures measure brake sensitivity to water and mud penetration and determine levels of noise generated by brake system components.

This work is critical in ensuring that PBR brake systems developed for the global automotive market continue to exceed the expectations of today's drivers.



PBR's vehicle test facility at Anglesea, Victoria

Outstanding PBR presence at AAAA Trade Show



Above: The PBR brand was highly visible at this year's show

PBR's standing as Australia's leading brake parts manufacturer was unquestionably reinforced at the recent Australian Automotive Aftermarket Association (AAAA) Trade Show held in Sydney.

The AAAA show is the ultimate platform for Australian aftermarket companies and was the perfect venue for PBR to launch their latest product additions and catalogue releases.

Spanning almost five halls of the Exhibition Centre at Darling Harbour the show ran for three days and attracted a crowd of almost 6,500 visitors including a number from overseas.

PBR Aftermarket used the show as an opportunity to reinforce the brand and tease the audience with an advanced showing of their new Performance products due for release in June. In addition to the Performance brake upgrade kits released last year the PBR Performance range has been expanded to include; performance disc brake pads, steel braided performance brake hoses and racing brake fluid.

In line with PBR's commitment to develop aftermarket solutions that add-value to people's businesses, the show also provided the ideal platform to discuss many of the value-add programs PBR has developed for

the trade market such as their Jetstream rotor program and their expanded replacement brake caliper range.

The other key announcement was the imminent release of the H06 Brake Parts catalogue which was extremely well received by visitors to the stand. In conjunction with this, visitors were able to participate in demonstrations of the latest on-line version of the catalogue. Those who use the on-line catalogue regularly were impressed by the significant improvement in information retrieval rates.

"It was a great way to establish how well we are staying in touch with the market."

To add a bit of interest the PBR team issued a challenge for visitors to test their knowledge of PBR products by answering a few key questions to enter the draw for a workshop tool kit and a PBR Performance brake upgrade. "It was a great way to establish how well we are staying in touch with the market," said Phil Matthias, Aftermarket Sales and Marketing Manager. "The response was good and it gives us some good feedback to work with."



The two competition winners were.

First prize - Workshop tool kit – Matthew Ballard from Tolland Auto Repairs

Second prize – PBR Performance brake upgrade kit – Mary Duong from Turbo Auto Spares

The AAAA trade show is the largest show of its kind in Australia and this year attracted 345 exhibitors including 80 international companies. It provides the perfect venue for companies such as PBR to make contact with all levels of the automotive aftermarket in an environment focussed on showcasing the latest products and services the industry has to offer.

Oz industry update

Expectations of a strong start to the year for the Australian auto industry have been realised with vehicle sales for the first quarter up 4.5 per cent on the same period in 2004.

The industry closed 2004 with a record year of 955,215 vehicle sales and the Federal Chamber of Automotive Industries (FCAI) latest forecast for 2005 sees the trend continuing with the possibility of reaching 980,000 for the full year. However much of this activity is likely

to come from imported vehicles as local production shows signs of softening.

Sales of SUV's continue to remain strong with a 16.2 per cent YTD increase over 2004, whilst there is some softening of the large passenger car market in favour of small and medium sized options which could be a reaction to rising interest rates and petrol prices.

In the brand race Holden just pipped Toyota for the second month in a row whilst Toyota still holds a narrow (0.4 per cent) lead over

Holden for overall market leadership.

Vehicle exports remain a strong focus for the industry with Toyota and Holden both enjoying record exports in 2004. Toyota exported in excess of 65,000 cars – largely Camrys - in 2004 followed by Holden with just over 52,000. Holden's export program largely consists of Pontiac GTOs going to the United States and long wheelbase Chevrolet Caprice models for the Middle East.

New Website Improves Communication

On April 1st regular users of the PBR website could be excused for thinking they were taking part in an elaborate April fools prank, such was the radical change undertaken with the launch of their new website.

As one of the leading brands in brake system design and development the PBR website is regularly visited by a range of key stakeholders including; vehicle engineers, replacement parts distributors, suppliers, workshops and institutions.

The new PBR website features a complete change in look and feel including significant improvements in navigation making it much easier to locate vital product and company information. Increasing the level of interactivity for visitors was also an important criterion in the development process in order to enhance the PBR web experience.

Product information at all levels of the business; original equipment, aftermarket and heavy vehicle systems, has been substantially increased providing a greater understanding of product features and benefits.

For Australian aftermarket businesses the product catalogue format has been revised making it simpler to use and much faster to locate products. The number of technical bulletins available for aftermarket and heavy vehicle system customers has also been increased and for the first time product brochures are available on-line making the new PBR site a much more valuable reference tool.

For visitors wanting to stay in touch with the latest brake technology developments they can access the latest editions of PBR's eNewsletter, *On The Move*, or subscribe to have it delivered personally through their email.



A new standard in PBR communication

All up the new PBR website delivers a significant improvement in communications relating to lightweight, high performance brake systems.

Performance Toyota draws on PBR

For the past couple of years Toyota Australia has tempted Australian car enthusiasts by regularly unveiling a concept vehicle at the Melbourne International Motor Show. And this year was no exception with their release of the supercharged Camry TS-01.

The Camry Sportivo-based TS-01 signalled that Toyota is seriously considering developing a range of performance vehicles for the Australian market.

"Toyota worked with PBR to develop some aggressive twin-piston performance brake calipers and larger front discs."

The TS-01 was developed from racing bloodlines through the inclusion of a Roots-style supercharger – sourced from Toyota Racing

Development in the United States – and a clutch derived from the Celica GT4 race-car. A considerable amount of work was also carried out on suspension and handling.

As for the brake package, Toyota worked with PBR to develop some aggressive twin-piston performance brake calipers and larger front discs.

Toyota claim that the TS-01 outperformed a range of benchmark cars including HSV and FPV cars and Subaru's Liberty GT.

PBR Design Award won by U.S. team

For the first time the PBR Brake System Design Award, which forms part of the Formula SAE-A event, has left Australian shores under the proud ownership of the Rochester Institute of Technology (RIT) in New York.

Monash University has won the award for the past two years but was pipped by RIT who finished fifth in the overall 2004 competition after a very solid performance at the new Victoria University venue.

PBR has been a longstanding sponsor of the Brake Design Award which encourages engineering students to develop a brake system that equally focuses on technical specifications, innovation and cost.

The overall winner of the 2004 competition was the University of Wollongong with a narrow lead over RMIT University and the University of Western Australia.



The Rochester team in action