

AUSTRALIAN manufacturing TECHNOLOGY

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A winning team

In the competitive world of motorsports, shaving off a few seconds can mean the difference between winning and losing a race. With the latest machine tools and CAD/CAM software for machining parts, Triple Eight Racing and its machine shop can quickly and efficiently produce components that help them stay in the game.

BY BARBARA SCHULZ

Being the superpower of V8 supercars is an achievement the young Triple Eight Racing team can be proud of. The level of competition is extremely high. The race cars have to comply with rigorous guidelines as far as weight, dimensions, engine or power are concerned – which makes the race authentic and enthralling with acceptable costs. The difference between winning and losing, however, is minimal and defined by the efficiency of each team. Many qualifying sessions in 2008 saw 20 cars crossing the finish line within the same second.

Jamie Whincup is a worthy title winner, too, having taken out six of the 14 rounds, including four of the last five. “We are now the 7th most popular sports team in Australia,” says Peter Jamieson, Commercial Operations Manager. “Overall in the V8 supercars we are the most popular team. It is a fantastic success considering we’ve only been racing for four years.”

Stability, continuity and hard work is the secret of the team’s success along

with the best available tools. That is why Triple Eight Racing decided to set up their own machine shop when Neil Prior, Machine Shop Manager, joined the team, after Anglo-Irish businessman Roland Dane bought the team from Brisbane-based John Briggs five years ago.

“Up until 2004, we’d been subcontracting all of the major machined parts,” Mr Prior says. “Now we produce our parts in-house for two main reasons: security and quality. This way we have absolute control over the quality, precision and availability of our components.”

Haas machines produce high-quality parts

There is no room for error at this level of racing. Hence, Mr Prior and his team took a careful look at what was available before investing in the first two Haas machines, an SL-30 CNC lathe and a VF-3 vertical machining centre. The VF-3 has 1016mm x 508mm x 635mm XYZ travels and is built utilising all American-made cast-iron components.



“With a long list of standard features and high-productivity options, the Haas VF-3 is one of the best values available today,” says Paul Bardsley, Director Alfex CNC Australia in Brisbane. Alfex has a long history in selling Haas machine tools in Australia, and the company’s high level of service convinced Triple Eight to go with Haas.

“Haas has a long history in motorsports itself,” Mr Prior explains his decision. “But Alfex provides a very good service, they are based in Brisbane and come out here within hours if we have a problem. Their after-sales service is second-to-none.”

“We had a look at different machines but thought the Haas machines were the best for us,” he says. “They are very good machines, hence we decided to invest in two more machines, an SL-20 lathe and a VF-5 vertical machining centre.”

Installed in August 2008, the two machines have been set to work producing a wide range of parts for the company’s growing range of in-house produced parts. Recently, Triple Eight has started to produce parts not only for themselves, but also for other V8 teams as well; a concept that worked out well and which was one of the reasons for the recent investment in new machine tools. “We are pretty flat out at the moment,” says Mr Prior. “That is why we bought the 5-axis VF-5. The machine features a 5-axis attachment which can be taken off, so the machine is used as a 3-axis.”

Looking at the Triple Eight Race Engineering Falcon BF – as well as the new FG model – there is not much left of the original Falcon; the original car even

Triple Eight Race Engineering and TeamVodafone

Triple Eight Race Engineering Australia is a recent V8 Supercar success story. Based just north of Brisbane’s CBD and employing experienced racing technologists, using absolute state-of-art design and engineering capabilities, the Team has enjoyed consistent on-track results, winning Bathurst in 2006, 2007 and 2008 and finishing second in the V8 Supercar Championship for the last three years.

Competing as TeamVodafone, drivers Craig Lowndes and Jamie Whincup have established a strong competitive reputation within the Australian V8 Supercar Championship. Jamie Whincup won the 2008 season, Craig Lowndes came fourth.



Left: Jamie Whincup secured the 2008 championship for TeamVodafone in 2008 - and high-quality machined parts for his Falcon BF on the recently installed Haas VF-5 vertical machining centre were part of the team's success. Photo: Triple Eight

Below left: Triple Eight Race Engineering designs and machines most parts of its Falcon BF in-house. Photo: Schulz



Neil Prior, Machine Shop Manager, Triple Eight Racing in Brisbane, took a careful look at what was available before investing in four Haas machines. "Haas has a long history in motorsports itself, and Alfex provides a very good service." Photo: Schulz

has to be shortened by 60mm to comply with the regulations. No wonder the team had a need for machining parts in-house. "All parts we make are our own design," Mr Prior says. "The only parts we don't touch are the carbon fibre components, which we outsource, if we can make a part in-house we will."

Building on an outstanding 2008 performance

Triple Eight Engineering is already busy working on the design that will build on TeamVodafone's outstanding 2008 performance; keeping them on top of the leader board for 2009. The brand new FG model will be created and thoroughly tested as a virtual prototype using MSC's FEA software, a simulation application based on technology originally developed for Nasa, before the final 'winning' composition is decided and unveiled on the race track.

"It's all about getting close to the limits," Chief Designer for Triple Eight Simon Holt explains of the highly regulated design process. "The weight and stiffness of the car is paramount and our primary objective is to maximise the torsional stiffness whilst scraping as much weight off as possible, while ensuring we still meet the rigorous safety demands with regard to strength and stress limits".

MSC Software's FEA is a finite element analysis (FEA) program based on Nastran, a product it originally created for Nasa in the late 1960s for the development of the Apollo Space Series spacecraft. Using FEA to introduce new design features, test stress limits and failure points and play out anticipated scenarios on a compu-

ter screen, Triple Eight expects to be able to achieve close to 90% of the design and testing in-house. The net result is a shorter design process, dramatically reduced manufacturing time and higher accuracy, giving them more bandwidth to perfect the performance of the new FG Falcon V8 Supercar for the 2009 season.

While the FG will retain several of the winning features of this year's BF Falcon, as the leading team, TeamVodafone is expected to hit the track with a brand new version next year, which means essentially starting with a clean sheet.


Upgrades throughout the current season have included an increase in torsional rigidity and modifications to the rear axle, swapping out spider gears for a more up-to-date tripod arrangement, while ensuring consistency within the other parameters.

"The future of V8 racing is in the hands of pioneering technology like MSC Software's," Mr Holt says. "We have relatively little time to produce five identical vehicles for next year, with virtually no room for error, so the ability to analyse the performance of individual components through race simulation is paramount to creating a championship winning car."

While Mr Holt admits there is no substitute for experience, he likens the current trend for making use of simulation

and analysis software in engineering to a tradesman picking the right tools for the job. "If you want the best possible outcome you have to be prepared to invest in the best available tools; the cost savings in the long run make it well worthwhile, not to mention the results!"

Road testing of the FG will begin early this year, with its TeamVodafone debut in Adelaide on March 22, 2009. Sridhar Dharmarajan, Senior Director Australia and New Zealand, MSC Software says: "Our software's ability to significantly reduce development costs and new product development time is a major bonus in this industry, where performance expectations are higher than ever but the current economic climate means that budgets also need to be kept in check."

"Triple Eight are recognised as the indisputable experts in their field; through our relationship with them we hope to drive the future of technology-assisted vehicle engineering with this readily available and easy to use technology." 

Triple Eight Race Engineering
www.tripleeight.com.au

Alfex CNC Australia
www.alfexcnc.com.au

MSC Software Australia
www.mssoftware.com.au

Who: Triple Eight Race Engineering, Brisbane
Situation: Decision to produce all parts for the V8 Falcon BF race car in-house; supply other teams with machined parts
Solution: Setting up a machine shop with now four Haas machines (SL-30, SL-20, VF-3 and VF-5)