

17 March, 2008

031/fv

## **Power to the people...**

**We're told, constantly, that motorsport is no longer a sport but that it is a business employing thousands in a niche industry sector that we should all be proud of. And those observers of motorsport are right. However, to see that as the complete picture is to miss the point. Fundamentally.**

**Motorsport works on our gut emotions; it's about stirring the soul and is the reason why it is so much more than a mere industry sector. And for many, the noise of a V12 is a sound as evocative as any cathedral choir or bird song. A cathartic symphony that spreads joy in the wake of its scream.**

**So it was with great relish that the workforce at Menard Competition Technologies (MCT) set about the task of designing the first all-new V12 for many years from a clean sheet of paper. The project was commissioned by the team behind Superleague Formula, the new race series that combines motor sport and football, with individual clubs backing the efforts of race teams.**

**Designing a V12 from scratch is a huge undertaking, particularly when performance has to be married with uniformity and reliability, given the engine is a 12,000 rpm motor that must bring equality to twelve teams looking for anything but parity. So, Race Tech asked Dave Bedborough, the man behind the design of the powerplant, how MCT came up with an engine that would meet the twin objectives of both performance and reliability.**

“Power is the relatively simple element of the equation. We know the customer's requirements and it is easy to predict the engine output from simulation software, as well as using historical knowledge and previous experience. To deliver those performance levels, the engine designers know the loads they would see on every part of the engine. Taking the crankshaft as an example, it is relatively straightforward to obtain bearing loads on the main and pin bearings. Using bearing simulation software it is then possible to predict bearing orbit and oil film thickness, as well as determining the best position for oil feed holes, before it ever comes to cutting metal.

“Performance also comes from running the correct compression ratio and cam profiles on the engine, which as a package give us the performance curve that Superleague Formula demands. The customer requirement for running conventional valve springs led us to the use of finger follower technology in order to minimise the active mass on the valvetrain, as well as being able to employ more aggressive cam profiles.

“Power comes from exhaustive simulation work during the design stages, closely toleranced and machined parts from manufacture, as well as care and attention during the build process, ensuring that all losses are kept to an absolute minimum. It is also vital that we get the gas exchange area in the combustion chamber as efficient as possible, ensuring that we design a neat and compact chamber piston crown, that minimises valve shrouding, is not knock limited and flows the required amount of air. In addition to this, we will ensure that both the intake and exhaust lengths are tuned to our required parameters.”

”However, performance is useless without reliability and we’re staying very much within the stress limits of the components we’re using. Knowing where to draw the line comes from utilising all the tools available, including predictive software and the expertise that lies with our suppliers. Test-beds are then used as a final sign off for all components, before series production begins. It is essential that we maintain engine reliability, throughout its time in the car, for the entire grid, in order to allow for competitive racing.

“The Superleague series is a one make formula, with servicing intervals of 2500kms. With such distances between rebuilds, it is vital to not only have a well-designed unit but also for each engine to be built with utter commitment and care. In that way, we can ensure that all of the engines are within 1% of each other. And telemetry at the track will mean that engine parameters can be checked at all times. Reliability also comes from the people we employ, not just the components we make. All of our engineers and technicians are of the highest standard and bring experience from across the international motorsport stage to the project. In addition, all tools are calibrated and recalibrated, with all assembly specifications laid out on drawings.

“There will always be challenges though and that is why we’re now undergoing a comprehensive testing programme to iron out any issues that there may be. Power and reliability are there – and through close co-operation between our people, the chassis team and other suppliers, we are making sure that the total package is one that works harmoniously and will be ready for the pressure it will be put under by the race teams, come the first race at Donington Park in August.”

Ends.