ENGINE DEVELOPMENTS LTD

CASE STUDY

Do you have the ability to make race-winning commitments…?

Engine Developments Ltd have! John Judd says, "We have announced to our customers that the already successful JUDD Power GV5 V10 will be significantly lighter this year, whilst maintaining its outstanding performance and unmatched race reliability. What's more, we can be certain of having it available to our customers in time for the start of the 2006 sports car racing season."

Engine Developments Ltd have re-designed the engine from the fire-face upward. Particular emphasis has been placed on the cylinder head, incorporating integral barrel throttle and cam cover castings with integral bearing caps and water outlets to achieve the bulk of their significant race-winning weight reduction. To complete the extensive engineering work required in the limited and fixed timescale prior to the start of the 2006 racing season, Dave Salisbury, Chief Designer at Engine Developments Ltd has deployed 3D modelling software supplied by NT CADCAM in the form of their SolidWorks package. This has made it possible for them to transfer their weight-saving concept into 3D models. Salisbury explains, "SolidWorks has been vital in enabling our design team to generate models and check the intricate casting detail quickly yet reliably, which means we can get the engine to our customers in the shortest time possible".

Tom Sharp, of TSMD, was recruited by Engine Developments Ltd to work on the project. TSMD produced the bulk of the solid models and production drawings and contributed to the detail design. I asked Sharp, who specialises in design consultancy using 3D computerised modelling and in particular SolidWorks, to explain how the software has boosted the design team at Engine Developments Ltd in their pursuit of glory - ultimately at Le Mans - for the leading 2006 sports car teams using Judd Power.

"Taking the development of the cylinder head and cam cover castings, for example, the software makes it possible to generate the graphically complicated shapes that make up the internal and external cores of these major and vital components. Every detail, for example the water-cooling flow path, can be clearly visualised at an early stage in the process. Compared with traditional 2D drawings, the 3D modelling enables the Engine Developments Ltd design team to analyse the casting quickly and accurately, including stress analysis." Stress analysis is made possible through COSMOS software, also supplied by NT CADCAM. "Combined with early elimination of possible glitches you can see how it is possible to maintain the project schedule whilst reducing costs through the potentially hundreds of man hours saved."

Casting quality is also enhanced by eliminating the degree of licence traditionally granted to a pattern-maker when creating the pattern from 2D drawings. SolidWorks enables fast and precise two-way communication with pattern makers via e-drawings: pattern considerations are accommodated as part of the design process, and the pattern is then made direct and exact in every detail from the 3D computerised model, thus ensuring the engine's performance and strength.

Engine Developments Ltd are also helping their race teams keep their projects on schedule through installation and shake-down by providing their customers with computerised 3D models of the engine. Now a car's body shape and aerodynamics, as well as engine fixture points, can easily be planned well in advance of delivery of the engine.

Sharp summarises, "SolidWorks 3D design has been vital in helping speed up the design and pattern-making process of the complicated engine castings. Having worked with NT CADCAM you know you always have their support to take on tasks and complete them quickly and efficiently. Their staff are readily available, and will work with you, often through real time web-link, to ensure you really are on the road to a win".