

Press Release



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Integral Powertrain supports Bentley Motors in achieving LEV2 emissions compliance and improved performance for its 2007 Arnage model.

Engine technology specialist Integral Powertrain has worked with Bentley Motors on a major emissions and performance upgrade for the 2007 Model Year Arnage model. IP used its advanced simulation technology to provide Bentley with an analysis to enable the development of a more powerful and responsive version of its mighty 6 ³/₄ -litre V8 engine that now meets the most stringent global emissions regulations, without the need for unusual or complex aftertreatment.

The Bentley Arnage is the quintessential British luxury car, but underneath its classic, restrained styling, the Arnage is a highly sophisticated vehicle that is constantly evolving to meet the demands of its owners.

Among the challenges faced by Bentley's engineers was the need to meet demanding US emissions regulations, while delivering effortless performance and driveability. The 2007 MY Arnage now meets CARB LEV-2 as well as Euro Stage 4 emissions standards, while producing 500bhp and 1000Nm of torque.

"We have worked with Bentley on a number of projects over the past five years," explains John McLean, IP's head of powertrain controls, "So we had demonstrated our ability to tackle challenging engineering projects and deliver solutions that have met its extremely demanding standards. We're proud that Bentley trusted us to support it with these major upgrades to the Arnage's engine and delighted to have helped deliver such an impressive result."

IP worked with Bentley's engineers to specify a pair of improved turbochargers which, together with the Arnage's new 6-speed transmission, enhanced the Arnage's throttle response.

“We are pleased with the improvements to performance and responsiveness delivered to the Arnage,” said Roger Duckworth, IP’s head of engine development. “The changes should be immediately noticeable to Bentley’s customers.”

To meet one of the world’s most demanding emissions standards in a 6 ¾ -litre, V8-powered vehicle weighing 2585kgs, IP employed its armoury of sophisticated simulation methods. Control system simulation and model-based calibration tools were used to optimise vehicle driveability and emissions performance. To comply with stringent engine misfire monitor legislation, dynamics simulation tools were used to revise the Bentley engine’s valvetrain, improving its performance.

“There was concern that the LEV-2 legislation might require a fundamental re-design of the vehicle’s emissions aftertreatment system,” explains McLean. “We demonstrated that it was possible to meet the targets with an improved engine control calibration and coating of the catalysts, while boosting the effortless power that is a hallmark of the brand.”

While Bentley’s engineers were confident that the Arnage’s V8 could be adapted to meet LEV-2 standards, IP was able to prove the project’s feasibility, using advanced control technology and relatively conventional exhaust catalysts. A key challenge had been the control of catalyst light-off after engine start. Despite the presence of turbine housings in front of the catalysts, the team’s strategy ensured that the catalysts became operational only 17 seconds after starting the engine and achieved 95 per cent conversion efficiency in just 30 seconds.

The Arnage V8 is now set to continue its long history of powering Bentley’s most prestigious products for many years to come and Integral Powertrain is proud to have been part of the team that achieved this major milestone. – **End**

About Integral Powertrain

Integral Powertrain is an independent consultancy providing innovative powertrain engineering services to many of the world's vehicle manufacturers and Tier 1 suppliers. IP is a world leader in automated, intelligent engine design, vehicle CO₂ reduction, engine management system application methods and tools, and casting tooling design.

Photograph

Available from Jonathan Ward by email (see below) or from www.autopresspoint.co.uk



Integral Powertrain used its engine simulation and optimisation technology to help Bentley achieve LEV2 emissions standards in its 07 model year Arnage

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